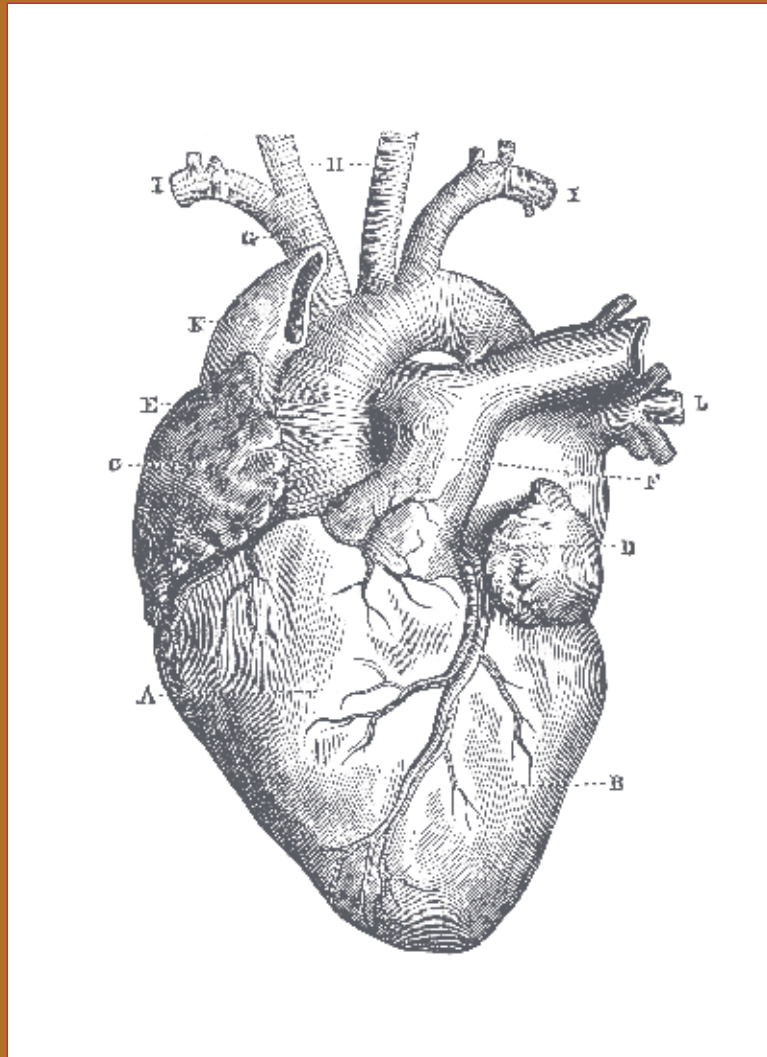


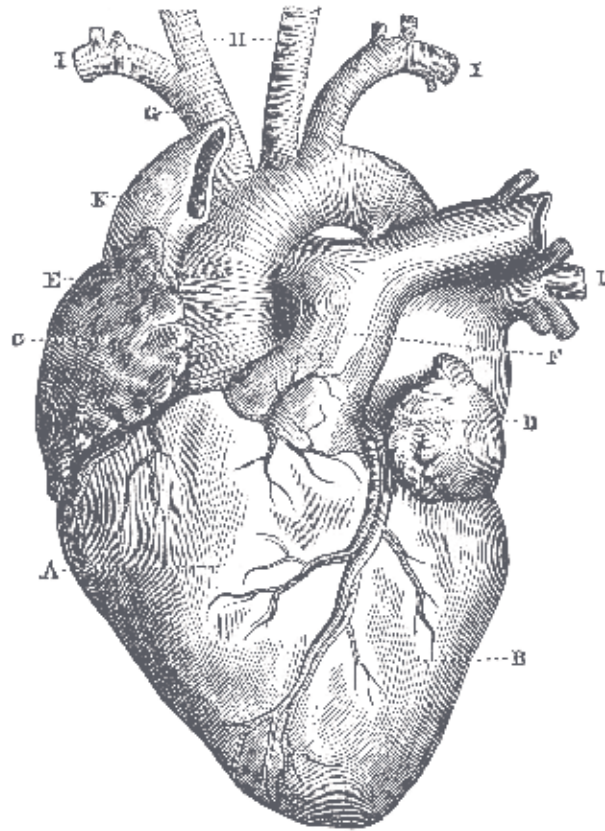
art | science | healing



UKHealthCare
Gill Heart Institute

2014 State of the Heart

art | science | healing



CELEBRATING 10 YEARS

“Healing is best accomplished when
art and science are conjoined,
when body and spirit are probed together.”

— Bernard Lown, MD, *The Lost Art of Healing*



2014 State of the Heart

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About the Linda and Jack Gill Heart Institute

This year marks the 10th anniversary of the opening of the Linda and Jack Gill Heart Institute at the University of Kentucky. Once a free-standing structure, the Gill building's outer walls now form the northern end of the atrium of the new 1.2 million-square-foot Pavilion A of the Albert B. Chandler Hospital. The expansion in the physical footprint of UK HealthCare has been matched by extraordinary growth in the medical center's academic stature in the last decade. Continuing this development, our adult cardiovascular hospital service will relocate from older areas of the medical center to occupy the two towers of the 8th floor of Pavilion A. This includes an impressive 32-bed cardiovascular ICU – one of the largest in the country – with specialized facilities to handle the complex cardiovascular and transplant cases that we now receive as an academic hub.

Art, Science, Healing, are more than just words, they define our approach to patient care. As William Osler wrote, *"The practice of medicine is an art, not a trade; a calling, not a business; a calling in which your heart will be exercised equally with your head."* The Gill team of doctors, nurses, pharmacists and staff embody this calling, treating patients with compassion using the latest science to provide safe and appropriate treatments. The uplifting, original artwork that line the walls of the new cardiovascular floor and our clinic promotes the healing process. Glimpses of this art, made possible by the generosity of patrons of the Gill, are featured throughout these pages. As we plan for the future, 2014 seems a fitting time to reflect on our University's rich tradition of cardiovascular medicine.

Since 1997, when the Gill Heart Institute was founded, our researchers and clinicians have been at the forefront in the battle against heart disease. Our mission remains to improve the nation's heart health by providing clinical services based on the latest evidence and technology, by advancing knowledge through research, and by educating those in training, in practice, as well as our patients. Our greatest asset is our faculty – a multidisciplinary team of physicians and scientists, who draw from disciplines of cardiovascular medicine, cardiac and vascular surgery, radiology, anesthesiology, pharmacy, physiology, pharmacology, biomedical engineering and more. As the region's top teaching and research center, supported by the NIH-funded Kentucky Center for Clinical and Translational Science, our bench-to-bedside approach ensures that patients benefit from nearly "real-time" scientific advances. Participation in clinical trials is an integral part of our cardiovascular service, which allows us to offer treatments not available elsewhere in the state or the region. With our state-of-the-art facilities and the most advanced and appropriate care, we are improving patient outcomes and setting the standard for clinical care.

The following pages describe our service, accomplishments, and our rich history in the field of cardiovascular medicine. In them, you will see evidence of our commitment to achieving the utmost standards in the diagnosis and treatment of heart and vascular disease and our dedication to scholarly pursuits that will improve the future of heart health in Kentucky and beyond.



Susan S. Smyth, MD, PhD

*Jeff Gill Professor of Cardiology
Chief, Division of Cardiovascular Medicine
Medical Director, Gill Heart Institute
Director, MD/PhD Program*

The University of Kentucky's cardiovascular medicine program has a distinguished 50-year history, a flourishing present, and a promising future using our discoveries and innovations to treat patients who need it most. With our state-of-the-art facilities and the most advanced and appropriate care, we are improving outcomes and setting the standard for clinical care.

Highlights of our recent accomplishments

- 2013 recipient of the Rising Star Award from University Health System Consortium given to UK Healthcare, ranking it 12th among the nation's leading university hospitals for overall quality of patient care
- Formation of the Gill Heart Network with regional hospital partners and office locations throughout Kentucky and beyond its borders
- Expanded research programmatic strengths in thematic areas supported by substantial NIH, VA, AHA and other funding
- Renewal of the T32 program to train clinicians and scientists in translational cardiovascular investigation
- 2014 Gifted Educator Award from the American College of Cardiology presented to pediatric cardiologist Jackie Noonan, MD
- 2014 Richard Popp Excellence in Teaching Award from the American Society of Echocardiography presented to Mikel D. Smith, MD
- 2013 Jeffrey M. Hoeg Arteriosclerosis Award for Basic Science and Clinical Research from the American Heart Association presented to Susan S. Smyth, MD, PhD
- 2014 publication of *Questions, Tricks, and Tips for the Echocardiography Boards* by Vincent L. Sorrel, MD
- Editor-in-chief of the American College of Cardiology's *CathSAP*® 4 is David J. Moliterno, MD
- Continuing as editor-in-chief of *Arteriosclerosis, Thrombosis, and Vascular Biology* is Alan Daugherty, PhD, Dsc



"Because of the breadth and quality of faculty recruited and our educational and research agenda, critical clinical programs are made available to the state, ensuring Kentuckians have access to the best of contemporary care. We are now poised to serve as a clinical destination for patients from beyond our historic boundaries."

— Michael Karpf, MD, Executive Vice President for Health Affairs, UK HealthCare

Adult Cardiovascular Medicine

Faculty and staff committed to patient-centered care



“The poets did well to conjoin music and medicine...
because the office of medicine is but to tune the
curious harp of man’s body and reduce it to harmony.”

– Francis Bacon, *The Advancement of Learning*

Adult Cardiovascular Medicine

Inpatient Services

The Gill Heart Institute's clinical care programs target the extraordinary incidence of heart disease in the region. Our physicians, scientists, nurses, and staff are committed to the highest level of care and to delivering safe and appropriate treatments. Superb clinical care is provided by more than 150 nursing and clinical staff who manage adult and surgical cardiovascular cases in an integrated intensive care unit and in acute-care beds on a dedicated cardiovascular floor.

As we emerge as a quaternary destination site, our case-mix index, a measure of the clinical complexity of the care (based on associated medical conditions) has risen above the 75th percentile among teaching hospitals. As an example, hypothermia, EKOS ultrasound-accelerated catheter-based delivery of thrombolytic drugs, percutaneous and surgically-implanted ventricular assist devices, and extracorporeal membrane oxygenation (ECMO) technology, are employed daily in the intensive care unit. More than 50 of our nurses are certified in critical care areas that include transplant, cardiothoracic surgery, and complex cardiovascular cases.



While the care we provide has become more complex and diverse, we maintain the highest standards of clinical care for quality. A testament to this is the Gill's recent receipt of the 2014 Get with the Guidelines – Resuscitation Gold Quality Achievement Award from the American Heart Association – the first hospital in Kentucky to receive this recognition. The award signifies that the institute has reached an aggressive goal in using guidelines-based care to improve patient outcomes from in-hospital cardiac arrest.

UK has recently received the University HealthSystem Consortium (UHC) Rising Star Award. This award recognizes significant improvements in ranking in UHC's annual Quality and Accountability Study, which identifies exemplary performance in patient safety, mortality, clinical effectiveness, and equity of care. UK HealthCare has not only shown improvement from previous years, it has the highest jump in rankings in UHC's history with a Quality and Accountability Ranking of 12th among the nation's 118 academic medical centers.



Heart failure care July 2012-June 2013

Patient given discharge instructions

UK HealthCare	100%
KY average	92%
U.S. average	94%

Patient given an evaluation of left ventricular systolic (LVS)

UK HealthCare	100%
KY average	98%
U.S. average	99%

Patient given ACE inhibitor or ARB for left ventricular dysfunction (LVSD)

UK HealthCare	100%
KY average	94%
U.S. average	97%

Heart attack care July 2012-June 2013

Aspirin at discharge

UK HealthCare	100%
KY average	99%
U.S. average	99%

Percutaneous coronary intervention (PCI) within 90 minutes of arrival

UK HealthCare	90%
KY average	96%
U.S. average	96%

Prescription for a statin at discharge

UK HealthCare	100%
KY average	98%
U.S. average	97%

Cardiogenic Shock

The Gill Heart Institute is a regional destination site for the management of patients in cardiogenic shock. In keeping, the proportion of cardiogenic shock patients among our interventional cases is almost five-fold that of other U.S. hospitals. We have amassed expertise in the management of cardiogenic shock with the use of complex mechanical hemodynamic support that includes a team of critical care cardiologists, interventionalists, and CT surgeons who work seamlessly, and in 24/7-fashion, to provide support options ranging from percutaneous ventricular assist devices to ECMO.

Pulmonary Embolism

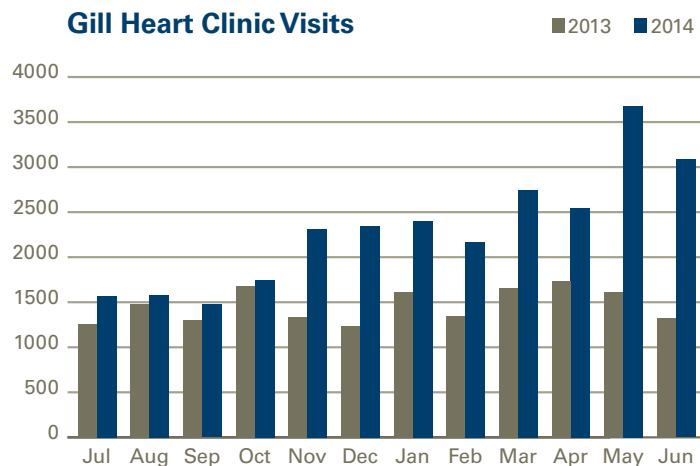
As one of the SEATTLE trial sites, we have expertise in the use of a catheter-based ultrasonic system (EKOS, or Ekosonic® endovascular system) to deliver thrombolytic therapy in the pulmonary arteries and peripheral vessels. In close collaboration with the emergency department, a 24-hour multidisciplinary Activate for Pulmonary Embolism (APE) team rapidly assess patients for appropriateness for catheter-directed thrombolytic therapy.



Outpatient Visits

General cardiology services at the Gill Heart Institute includes preventive cardiology, sophisticated diagnostic and treatment services, and referral as needed, to one of our dedicated cardiology specialty programs. Our team excels in collaboration, bringing together physicians from all areas of cardiology to create an individualized diagnosis and treatment program for patients.

Housed within the Gill Heart building, the heart center provides all patient care in the same location, including clinics, non-invasive cardiac diagnostics, and interventional cardiac techniques such as cardiac catheterization, angioplasty and electrophysiology. The Gill also provides a base for the physicians providing this care, and has special focus on counseling cardiac patients and their families.



A Lucky Day

One minute Deborah Lander was on her way to a performance at the Lexington Opera House. The next, she lay dead on the sidewalk. What Lander experienced on that February day was sudden cardiac arrest, where the heart unexpectedly stops pumping blood to vital organs. More than 1,000 Americans die a day from sudden cardiac arrest. Only about one out of 10 people survive.

Lucky for Deborah, someone saw her collapse. The swift actions of bystanders who knew CPR was the first step in saving her life. Next, an EMS team arrived and drove Deborah to UK's Albert B. Chandler Hospital ED, where a Gill Heart cardiac resuscitation team was waiting. Doctors performed therapeutic hypothermia on Deborah, a process using catheters to cool the body to 90-93 degrees Fahrenheit for about 24 hours.

For patients who experience sudden cardiac arrest, much of the damage happens after the heart starts pumping blood again. The rush of blood returning to the brain can cause inflammation and other complications that often result in neurological damage and a slow, challenging recovery. Cooling the body as the cardiac team did with Deborah, helps her body adapt to the return of blood flow. Because she received immediate CPR and then therapeutic hypothermia at UK, Deborah has returned to a normal, healthy life. She's back to her vocation, playing classical music on her viola.

"The whole series of events had to happen for me to recover properly like this," Deborah said. **"I was extremely lucky. UK took good care of me."**



Deborah Lander



Now healthy, John Doty credits cardiac rehab with helping him return to wellness following 17 months on a ventricular assist device, which he no longer needs.

Cardiovascular Wellness and Rehabilitation

UK's Cardiac Rehabilitation and Wellness Program offers a comprehensive program of medical evaluation, supervised exercise, risk-factor modification, and medication optimization, to improve the chance of survival and lower the risk of another cardiac event. Headed by Director of Preventive Cardiology, Alison L. Bailey, MD, the cardiac rehab team includes cardiologists, a cardiac nurse specialist, exercise physiologists, and registered dietitians.

Working with the team, each patient learns how to lower his or her own risk of future cardiac events and become more educated about heart disease. Another aspect is to increase physical activity levels and improve their quality of life.

Once structured cardiac rehabilitation is completed, individuals may enroll in the "OH" program for Optimal Health, an ongoing cardiovascular risk-reduction plan to help patients maintain and improve their lifestyle and healthy habits.



UK HealthCare Gill Heart Institute Cardiac Rehabilitation Program has received certification not once but twice from the American Association

of Cardiovascular and Pulmonary Rehabilitation (AACVPR). This certification recognizes the UK program for its commitment to improving quality of life by enhancing standards of care.



Alison L. Bailey, MD, coaches recovering heart surgery patient Kimberly Campbell of Lexington.

Women's Heart Health Program

Cardiovascular disease is the leading cause of death in U.S. women with nearly a quarter million women dying from coronary heart disease, heart failure and stroke every year. Indeed, more women will die from these causes than from the top five forms of cancer combined. Women in Kentucky die from heart disease at a rate 23 percent higher than the national average. Nearly 80 percent of all cardiac events in women could be prevented if women made the right choices for their hearts involving diet, exercise and abstinence from smoking. Recent studies show that women with suspected CVD are less likely than men to be referred for diagnostic testing and less likely to undergo invasive testing or aggressive early treatment. This gender bias alone is reason enough for women to take a proactive role in understanding their risk of CVD. For these reasons, the Gill Heart Institute's Women's Heart Health Program was created to serve the needs of women by providing a comprehensive approach to their cardiac care.

The Women's Heart Health Program is dedicated to offering support, education and clinical services to help women prevent and live with heart disease. The program is led by a team of female cardiologists and nurse practitioners with advanced training in cardiovascular medicine. Our faculty is actively engaged in understanding why heart disease is different in men and women and optimizing strategies for the treatment of women patients.



Heart care for women by women



Drs. Bailey, Lacey Buckler and Charles Campbell at the UK Arboretum with Walk with a Doc participants.

Walk with a Doc

It's a myth that only strenuous exercise provides adequate health benefits. Recent research



comparing runners and walkers demonstrated that moderate-intensity walking and vigorous-intensity running resulted in similar

reductions in risk for high cholesterol, high blood pressure, and diabetes, which are significant risk factors for cardiovascular disease.

The Gill Heart Institute's cardiologist Alison L. Bailey, MD, leads Lexington's chapter of Walk with a Doc, part of a national fitness program, to inspire patients, UK employees, and members of the community to put on their walking shoes and get moving. The walking group meets bimonthly for day and evening walks on the UK campus and at the nearby Arboretum. The goal of Walk with a Doc, which has 148 chapters, is to encourage people to get the 150 minutes a week of moderate aerobic activity recommended by the Centers for Disease Control and Prevention.



The UK TAVR team led by Dr. John C. Gurley

Cardiovascular Interventions

A culture of innovation

Operating in four, state-of-the-art catheterization laboratories situated in 20,000-square-feet on the second floor of the Gill building, our team of cardiologists, nurses, pharmacists, and technicians employ sophisticated technologies for complex cases safely and with exceptional outcomes. UK's contributions to interventional cardiology are not new – intravascular ultrasound imaging of human coronary arteries was born at UK in the late-1980s; we have been engaged in transcatheter approaches to valve disease since the mid-1980s; and, our interventional cardiology training program at UK was one of the first-ever established in the U.S.

UK's hybrid OR suite is optimal for collaborative procedures between interventional cardiologists and CT surgeons for the many challenging, high-risk cases referred to us.

Coronary Interventions

As a tertiary center, the cardiac catheterization laboratory performs complex coronary interventions. In addition to standard coronary angioplasty, we have special expertise in more complex interventional approaches that provide a higher level of diagnostic accuracy. Increasingly, we use the radial approach for greater comfort during the procedure and earlier ambulation after the procedure. Approximately 80% of our diagnostic cases and 50% of our interventional coronary procedures are performed via the radial artery.

Peripheral Interventions

In addition to coronary procedures, UK interventional cardiologists are also highly experienced in peripheral and cerebrovascular interventional procedures. Many of these procedures are referred to the Gill from other hospitals for their complexity, and require innovative approaches such as transpopliteal access, subintimal dissection with ultrasound-guided re-entry, and/or atherectomy. We also perform extra-cranial cerebrovascular interventions including subclavian, vertebral, and carotid angioplasty and stenting. The team has been part of the national FDA-mandated registry that examined the outcomes of carotid stenting following approval of devices for clinical use, and is committed to the highest technical success and utmost attention to patient safety.

Transcatheter Approaches to Valvular and Structural Heart Disease

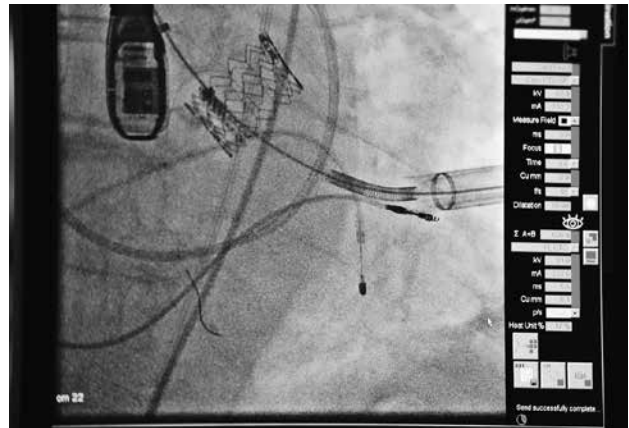
Building on nearly 30 years of expertise, our physicians have expanded the range of catheter-based approaches to mitral, pulmonic, and aortic valve diseases. Led by two of 2014's Best Doctors in America™, Dr. John C. Gurley, director of UK's Interventional Cardiology Program, and Dr. Khaled M. Ziada, director of UK's catheterization laboratories, UK offers the greatest expertise in structural heart disease in central Kentucky.

60% of cases performed with transapical approach compared to ~27% nationally

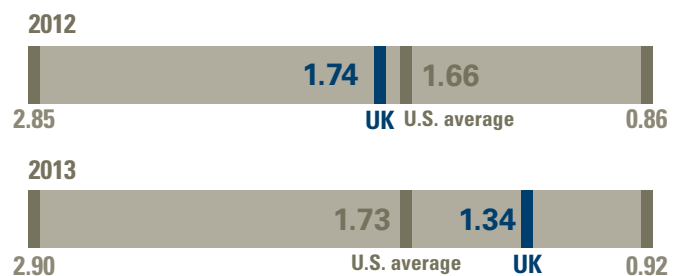
Along with interventional cardiologists, UK's structural heart team includes cardiac surgeons, advanced imaging specialists, cardiac anesthesiologists, critical care cardiologists, nurse practitioners and care coordinators working together either in the hybrid operating room or the catheterization laboratory, and in the integrated Cardiovascular ICU after the procedure.

- The Transcatheter Aortic Valve Replacement (TAVR) program for high-risk or inoperable patients with severe, symptomatic aortic stenosis offers the Edwards Sapien transcatheter heart valve, the Sapien XT system, and the Medtronic Core Valve to provide the most options available for patients. Since 2012, we have performed transfemoral and transapical, and more recently have incorporated the transaortic approaches to aortic valve replacement.
- Catheter-based mitral valve intervention for mitral stenosis.
- MitraClip™ device for noninvasive repair of mitral valve closure.
- Left atrial appendage closure using the LARIAT™ suture delivery device for patients with atrial fibrillation unable to tolerate anticoagulant therapy.
- Catheter-based closure of patent foramen ovale, atrial septal defect, and ventricular septal defect.
- Alcohol septal ablation for hypertrophic obstructive cardiomyopathy in select patients.

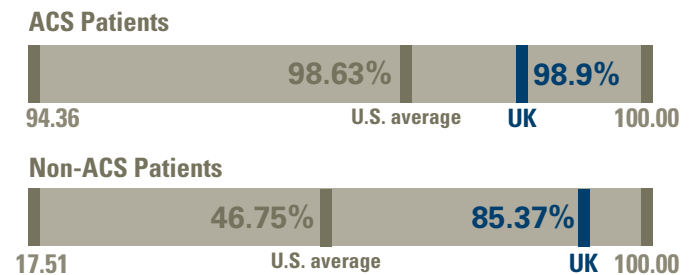
UK offers all FDA-approved TAVR approaches



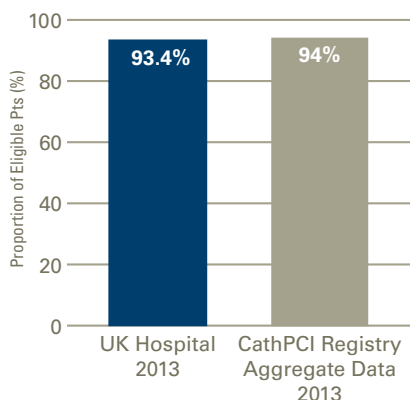
Overall PCI Risk-Adjusted Mortality



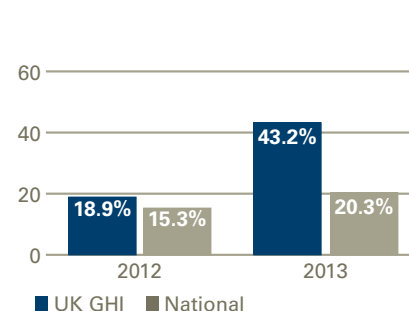
Appropriateness of PCI Procedures in 2013



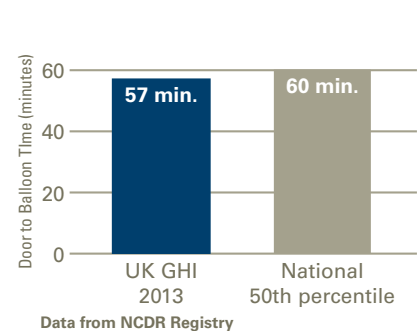
Discharge Medicines



Radial Access for PCI



Median Time to Primary PCI (D2B)



Cardiology Faculty



Susan S. Smyth, MD, PhD
*Jeff Gill Professor of Cardiology
Chief, Division of
Cardiovascular Medicine
Medical Director, Gill Heart Institute*

- General cardiology
- Antithrombotic therapy



Lacey T. Buckler DNP, RN, ACNP
*Director, Cardiovascular
Nursing Services
Co-Director, Office of
Advanced Practice*

- Cardiovascular outcomes
- Transition of care



Melina Aguinaga-Meza, MD
Assistant Professor of Medicine

- General cardiology
- Critical care cardiology
- Women's heart health



Paul Anaya, MD, PhD
Associate Professor of Medicine

- Echocardiography
- Nuclear cardiology
- Critical care cardiology



Alison L. Bailey, MD
*Associate Professor of Medicine
Director, Preventive and Ambulatory
Cardiology and Cardiac Rehab*

- Cardiac rehab, heart disease prevention
- Women's heart health
- Critical care cardiology



Craig Chasen, MD
*Associate Professor of Medicine
Clinical Cardiology*

- General cardiology
- Heart disease prevention



Nancy C. Flowers, MD
*Professor of Medicine
Heart Station*

- Electrocardiography



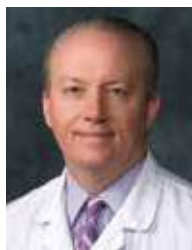
Leo G. Horan, MD
*Professor of Medicine
Heart Station*

- Electrocardiography



Chien-Suu Kuo, MD
*Associate Professor
Director, Heart Station*

- Electrocardiography



Rick R. McClure, MD
*Professor of Medicine
Director, Gill Heart Network*

- General cardiology



Sarah Rugg, MD
Assistant Professor of Medicine

- General cardiology
- Nuclear cardiology
- Women's heart health



Thomas F. Whayne, MD, PhD
*Professor of Medicine
Director, Lipid Management Clinic*

- General cardiology
- Heart disease prevention

Dedicated Pharmacy Specialists

Eight doctors of pharmacy, six of whom are board-certified, and four with added qualifications in cardiology, provide comprehensive and individualized review of care for Gill Heart patients. Hospitalized patients benefit from 24-hour clinical pharmacy coverage and daily medication review by our pharmacy team members. Cardiology pharmacy faculty are jointly appointed to the UK College of Pharmacy, one of the Top Five Colleges of Pharmacy in the nation, according to *U.S. News & World Report*. Our pharmacy services are one of only eighteen accredited Cardiology Pharmacy Residency training programs in the country.



Tracy E. Macaulay, PharmD
*Assistant Professor of
Pharmacy-Adjunct
Director, CV Pharmacy Services
Director, UKHC Transitional Care
Pharmacy Services
Pharmacy Residency Program
Director, PGY2 Cardiology*



Sarah Brouse, PharmD
*Associate Professor of
Pharmacy-Adjunct
Cardiovascular Pharmacy Clinical
Coordinator*



Terri Cook, PharmD
Cardiovascular Clinical Pharmacist



Mary Blanton Covell, PharmD
Cardiovascular Clinical Pharmacist



George A. Davis, PharmD
Anticoagulation Pharmacy Specialist



Jessie Dunne, PharmD
Cardiovascular Clinical Pharmacist



Komal Pandya, PharmD
Cardiovascular Clinical Pharmacist

not pictured

Jeremy Flynn, PharmD
*Assistant Professor of Pharmacy
and Surgery-Adjunct
Mechanical Circulator Support
and Heart/Lung transplant Clinical
Pharmacy Specialist*

Heather Hesselson, PharmD
Cardiovascular Clinical Pharmacist

New Anti-Coagulation Consult Service

The Gill Heart Institute recently established a multidisciplinary consultative service with physicians and cardiovascular pharmacists that provide recommendations for the care of inpatients and outpatients with acute or chronic arterial and venous thrombosis. Led by George A. Davis, Pharm D, BCPS, and supported by vascular medicine specialists Drs. Susan Smyth, Alison L. Bailey, and Eleftherios Xenos, the service suggests the most appropriate anti-coagulation therapy for individual patients, including duration and monitoring. The team also sponsors educational activities, such as Grand Rounds and a regional symposium on *Stroke Prevention 2014: Focus on Management of Atrial Fibrillation* held at UK's Albert B. Chandler Hospital.



Interventional Cardiology Faculty



Ahmed Abdel-Latif, MD, PhD
Associate Professor of Medicine
• Coronary interventions
• Stem cell therapy



David C. Booth, MD
*Endowed Professor of Medicine
Director, Pulmonary Hypertension
Chief, Cardiology, Lexington VAMC*
• Coronary interventions
• Acute cardiac disease
• Pulmonary hypertension
• Heart and lung transplantation



John C. Gurley, MD
*Professor of Medicine
Director of Interventional Cardiology*
• Coronary, structural heart and
vascular interventions
• Transcatheter valve procedures
• Emerging technologies



Adrian Messerli, MD
Associate Professor of Medicine
• Coronary interventions
• Peripheral vascular interventions



David J. Moliterno, MD
*Jack M. Gill Professor and Chairman
Department of Internal Medicine
Vice Dean of Clinical Affairs*
• Coronary interventions
• Ischemic heart disease



Lawrence Rajan, MD
Assistant Professor of Medicine
• Coronary interventions
• Peripheral vascular interventions



Khaled M. Ziada, MD
*Gill Foundation Professor of Interventional Cardiology
Director, Cardiac Catheterization Laboratories and
Interventional Fellowship Program*
• Coronary and peripheral interventions
• Transcatheter valve procedures
• Carotid interventions



Vicky Turner, APRN
Valve Program Coordinator

Publications

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Photography by David McRae, PA-C

Clinical Trials

The Gill Heart Institute Cardiology Research Center is designed to facilitate all aspects of patient-based clinical research. This includes coordination of Phase I-IV multi-center trials, support of the infrastructure for clinical trials as well as education of faculty and fellows in clinical research methodology.

Randomized trial of ticagrelor for severe community acquired pneumonia (TCAP)

Principal Investigator (site): Susan S. Smyth, MD, PhD

Early use of rosuvastatin in acute coronary syndromes: targeting platelet-leukocyte interactions (AVATAR)

Principal Investigator (overall): Susan S. Smyth, MD, PhD

Targeting platelet activation, platelet-leukocyte aggregates, and acute lung injury in pneumonia with ticagrelor (THIPPE)

Principal Investigator (overall): Susan S. Smyth, MD, PhD

Functional validation of lysophospholipid metabolism pathways identified by human genetics of CAD

Principal Investigator (overall): Susan S. Smyth, MD, PhD

International study of comparative health effectiveness with medical and invasive approaches (ISCHEMIA)

Principal Investigator (site): David C. Booth, MD

A study of evacetrapib in high-risk vascular disease (ACCELERATE)

Principal Investigator (site): Khaled M. Ziada, MD

Prevention of cardiovascular events in patients with prior heart attack using ticagrelor compared to placebo on a background of aspirin (PEGASUS)

Principal Investigator (site): Khaled M. Ziada, MD

A single ascending dose study examining the safety and pharmacokinetic profile of reconstituted high density lipoprotein (CSL112) administered to patients

Principal Investigator (site): Alison L. Bailey, MD

Cardiovascular Inflammation Reduction Trial (CIRT): Event-driven trial of weekly low-dose methotrexate (LDM) in the prevention of recurrent cardiovascular events among stable, post-MI patients with type 2 diabetes/metabolic syndrome

Principal Investigator (site): Alison L. Bailey, MD

The PARIS Registry: Patterns of non-adherence to anti-platelet regimens in stented patients – an observational single-arm study

Principal Investigator (site): David J. Moliterno, MD

SOLID TIMI-52 The stabilization of plaques using darapladib-thrombolysis in myocardial infarction 52

Principal Investigator (site): Charles L. Campbell, MD

IMPROVE-IT: Improved reduction of outcomes: Vytorin efficacy international trial

Principal Investigator (site): Charles L. Campbell, MD

A multicenter, controlled, open-label extension study to assess the long-term safety and efficacy of AMG 145

Principal Investigator (site): Alison L. Bailey, MD

LAPLACE: TIMI 57 – A double-blind, randomized, placebo-controlled, multicenter, dose-ranging study to evaluate tolerability and efficacy of AMG 145 on LDL-C in combination with HMG-CoA reductase inhibitors in hypercholesterolemic subjects

Principal Investigator (site): Alison L. Bailey, MD

NIH: Rural health outreach special initiative: Heart health in rural Kentucky Phase II

Co-Investigator: Alison L. Bailey, MD

Interventional Cardiology Clinical Trials

ABSORB IV: A Clinical Evaluation of Absorb™ BVS, the everolimus-eluting bioresorbable vascular scaffold in the treatment of subjects with de novo native coronary artery lesions

Principal Investigator (site): Khaled M. Ziada, MD

Randomized open label parallel group study to determine the efficacy and safety of the Reg1 anticoagulation system compared to bivalrudin in patients undergoing PCI (Regulate PCI)

Principal Investigator (site): Ahmed Abdel-Latif, MD, PhD

Aegis-1: A Phase 2b, multi-center study to investigate the safety and tolerability of multiple dose administration of CSL112 in subjects with acute MI

Principal Investigator (site): Alison L. Bailey, MD

AMR-001 versus placebo post-ST segment elevation myocardial infarction (PreSERVE AMI)

Principal Investigator (site): Ahmed Abdel-Latif, MD, PhD

Global assessment of plaque regression with a PCSK9 antibody as measured by intravascular ultrasound (GLAGOV)

Principal Investigator (site): Khaled M. Ziada, MD

GORE HELEX septal occluder and antiplatelet medical management for reduction of recurrent stroke or imaging-confirmed TIA in patent foramen ovale (PFO) (the REDUCE study)

Principal Investigator (site): John C. Gurley, MD

Drug-eluting stents vs. bare metal stents in saphenous vein graft angioplasty (DIVA)

Principal Investigator (site): Khaled M. Ziada, MD

Carotid stenting for high surgical risk patients

Principal Investigator (site): Khaled M. Ziada, MD

A prospective, single-arm, multi-center trial of Ekosonic® endovascular system and activase for treatment of acute pulmonary embolism (SEATTLE II)

Principal Investigator (site): John C. Gurley, MD

PREMIUM migraine trial – prospective randomized investigation to evaluate incidence of headache reduction in subjects with migraine and PFO using the AMPLATZER PFO occluder compared to medical management

Principal Investigator: John C. Gurley, MD

WATCHMAN left atrial appendage system for embolic protection in patients with atrial fibrillation

Principal Investigator (site): John C. Gurley, MD

AMPLATZER Cardiac Plug (ACP) clinical study

Principal Investigator (site): John C. Gurley, MD

Closure of muscular ventricular septal defects with the Amplatzer muscular VSD occluder – post approval study

Principal Investigator (site): John C. Gurley, MD

Closure of atrial septal defects with the Amplatzer septal occluder – post market study II (ASD PMS II)

Principal Investigator (site): John C. Gurley, MD



Gill Heart Network

World-class care close to home



“The practice of medicine is an art, not a trade; a calling, not a business; a calling in which your heart will be exercised equally with your head.”

– Sir William Osler

Affiliates and Outreach

Gill Heart Network

Our cardiologists provide the region's most comprehensive services, diagnostic assessment, and therapeutic strategies at approximately 15 locations in Kentucky and even beyond the state's borders in West Virginia. Working closely with local physicians and hospitals, we help broaden treatment options by providing access to the latest therapeutic advances, whether it's providing a much-needed specialist in the local community, remote interpretation of a test though tele-radiology, or accepting the transfer of a critically ill patient at UK hospital in Lexington.

The Gill's services are tailored to the needs of each community and range from nuclear stress testing to consultative services for electrophysiology, or referral to one of our experts in advanced heart failure and transplant. These partnerships include:

- Since January 2014, UK cardiologist Joseph Thomas, MD, has provided daily heart care to patients hospitalized at Georgetown Regional Hospital in Georgetown, Kentucky, as well as in outpatient settings. Thomas is also medical director of cardiac rehab services at Georgetown.
- At Clark Regional Medical Center in Winchester, Charles Salters, MD, provides general cardiology for patients both in hospital and in the clinic.
- Electrophysiology, interventional and general cardiology are among the services provided by Gill Heart cardiologists at Rockcastle Regional Hospital, located in Mount Vernon, Ephraim McDowell Regional Medical Center in Danville, and at St. Claire Regional Medical Center in Morehead, Kentucky.

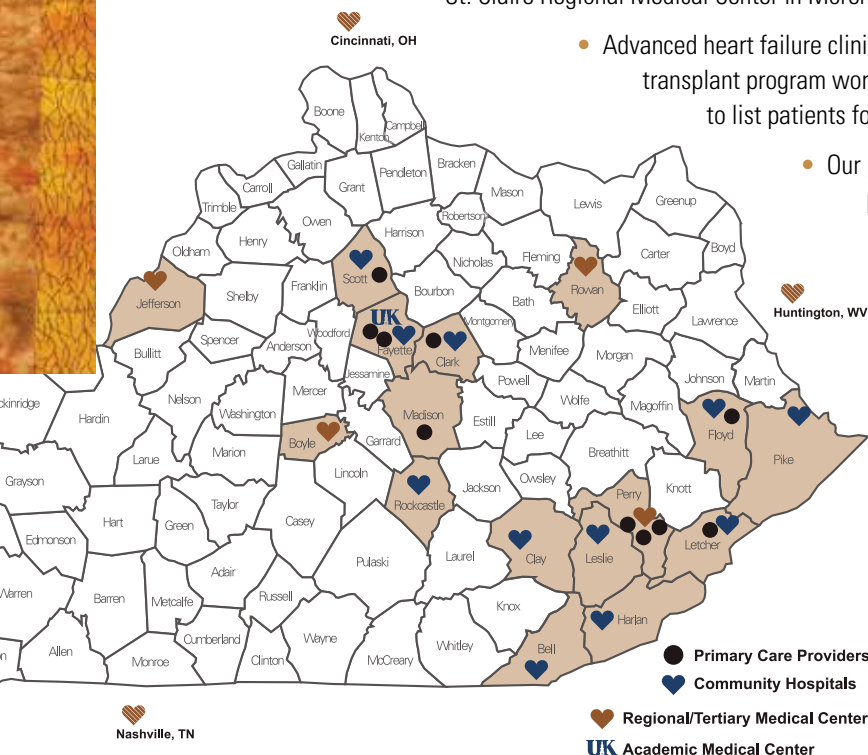
- Advanced heart failure clinics are also held in West Virginia and UK's cardiac transplant program works in partnership with hospital systems outside of Kentucky to list patients for heart transplant.

- Our partnership with Norton Healthcare in Louisville allows patients in need of cardiac transplantation or ventricular assist devices to have their initial evaluation close to home and we offer residents of Louisville access to the most experienced structural heart and valve team in the region for minimally invasive procedures, such as transcatheter aortic valve replacement (TAVR).

- Another aspect of our Norton partnership allows for our cardiology fellows to perform part of their training at Norton Healthcare.



Since 2011, UK CT surgeon Dr. Edward Setser has performed cardiothoracic operations at Hazard ARH Medical Center.



Local care and prompt referrals can be lifesaving during heart attacks when lost minutes means loss of heart muscle

UK HealthCare and Appalachian Regional Hospital (ARH) jointly administer and manage cardiovascular services at ARH hospitals in Hazard, Harlan, Whitesburg, McDowell, Hyden and South Williamson, Kentucky. Eastern Kentuckians benefit from improved access to high-quality care close to home and the availability of the latest technology and therapies offered by an academic medical center. Since 2011, UK cardiothoracic surgeon Edward Setser, MD, has been performing CT procedures – including coronary revascularization and heart valve replacements – at ARH-Hazard.

Based in Hazard, Appalachian Heart Center (AHC), is now a part of the UK Gill Network, and has clinics in Harlan, Hyden and Cumberland, Kentucky. AHC cardiologists Vidya Yalamanchi, MD, Rao Podapati, MD, and Srini R. Appakondur, MD, provide a full range of services for the prevention, diagnosis and treatment of heart disease, allowing patients there to continue to see the same local doctors and receive the latest medical treatments without leaving their community.

In early 2014, the Gill Heart Institute announced it would be working closely with Mountain Comprehensive Healthcare to improve heart care in eastern Kentucky. This outreach is delivered via ARH Cardiology Associates in affiliation with the Gill, offering cardiology services at the Mountain Comprehensive clinic in Whitesburg, which serves the people of Letcher, Harlan, Perry, Owsley and adjacent counties.

Additionally, in July 2014, the Gill entered an affiliation agreement with Manchester Memorial Hospital in Manchester, Kentucky, where ARH cardiologist Keerthana Karumbaiah, MD, now practices inpatient and office-based general cardiology.

Pastoral Care

As chaplain for Hospice of the Bluegrass Mountain Community, Pastor James “Jim” Sluss counsels families in the midst of emotional end-of-life decisions. But two years ago, he faced his own life-threatening health condition. Luckily he was able to receive all the care he needed for it in his local community of Hazard.

On a routine visit to his family physician, Sluss mentioned he was having occasional chest pains to his doctor, who promptly ordered an EKG. Sluss was quickly referred to cardiologist Vidya Yalamanchi, MD. One of three UK cardiologists who practice at the Gill Heart Institute/Appalachian Heart Center in Hazard, Yalamanchi recommended a diagnostic heart catheterization to determine the extent of Sluss’s coronary heart disease, which demonstrated multi-vessel coronary artery disease.

“In a couple of days I went from feeling like a relatively healthy 72-year-old to facing open heart surgery and a triple bypass” said Sluss, who chose to stay in Hazard for care instead of traveling several hours to Lexington.

Just 48 hours after the diagnosis, UK CT surgeon Edward Setser, MD, performed coronary bypass surgery. Sluss later said he was impressed by Dr. Setser’s bedside manner and felt confident as he was part of UK’s CT surgery team.

“It was important to me that Dr. Setser is a part of our community,” said Sluss, who also participated in the ARH cardiac rehab program at the Hazard Medical Mall. **“It was comforting to me to get all the care I needed right here.”**



Pastor Jim Sluss

Gill Heart Network Physicians



Rick McClure, MD
Professor of Medicine
Director, Gill Heart Network



Srini R. Appakondur, MD
Appalachian Heart Center



Keerthana Karumbaiah, MD
Manchester Memorial Hospital



Rao Podapati, MD
Appalachian Heart Center



Charles Salters, MD
Assistant Professor of Medicine
Clark Regional Medical Center



Edward Setser, MD
Assistant Professor of Surgery
ARH-Hazard



Joseph Thomas, MD
Assistant Professor of Medicine
Georgetown Community Hospital



Vidya Yalamanchi, MD
Appalachian Heart Center



Syed Bokhari, MD
ARH-Hazard



Kenneth Dulnuan, MD
ARH-Williamson



Pablo Lopez, MD
ARH-Whitesburg



Georges Damaa, MD
ARH-Harlan

Cardiothoracic and Vascular Surgery

Dedicated to caring and improving lives



“Extreme remedies are very appropriate for extreme diseases.”

– Hippocrates

Cardiothoracic and Vascular Surgery



Complex cardiac procedures require a well-trained team working together for the best outcome.

Cardiothoracic Surgery

At UK, surgeons collaborate with researchers and clinicians at the Markey Cancer Center, UK Transplant Center, and at the Saha Cardiovascular Research Center. With this bench-to-bedside approach, we continually improve and advance surgical techniques so that patients with complex and advanced diseases can live more productive and fulfilling lives.

Over the last 15 years, the scope and breadth of CT surgery has expanded exponentially and our cardiovascular services are more comprehensive, with a higher level of expertise. Dr. Michael Sekela joined the faculty in 2013, bringing extensive skill and experience in complex cardiac surgery, reoperative procedures, and innovative valve surgeries such as robotic mitral valve repair.

Advancing education, research, and clinical care through collaboration and innovation.

In partnership with interventional cardiologist Dr. John C. Gurley, CT surgeon Hassan Reda, MD, performs the Transcatheter Aortic Valve Replacement (TAVR) procedure in UK's hybrid operating room. The team performed its first TAVR procedure in Lexington in October 2012 and has since built one of the most comprehensive programs in the region.

Along with accomplished vascular surgeon, Dr. David Minion, Dr. Saha helps some of the region's more critical patients in need of complicated aortic aneurysm repair. Our faculty also provides CT surgery to underserved communities in eastern Kentucky. Surgeon Dr. Edward Setzer practices full time in Hazard, offering cardiothoracic surgery services at our affiliates so that patients can remain close to home for as much of their medical care as possible.

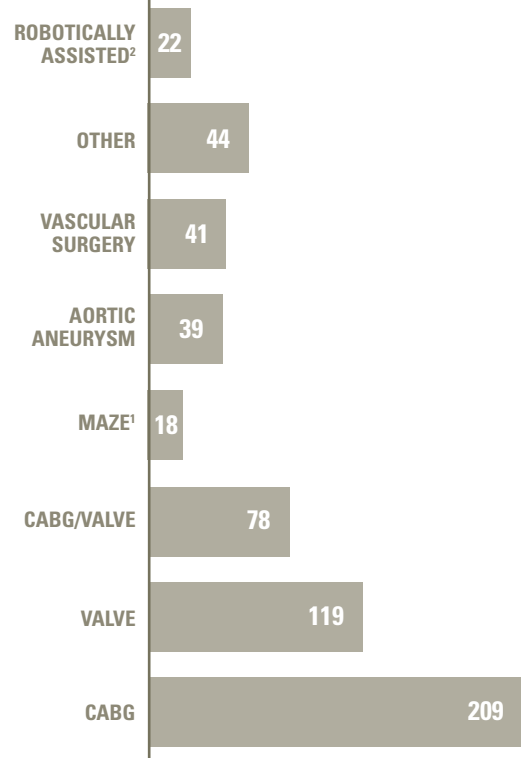
Surgical approaches to atrial fibrillation

For patients whose atrial fibrillation (AF) cannot be managed through medications or catheter-based ablation, Dr. Theodore S. Wright provides expertise in the innovative and minimally invasive MAZE procedures. The video-assisted MAZE procedure includes creation of lines of conduction that block the abnormal impulses that cause AF, enabling restoration of normal sinus rhythm. This is accomplished using cryoablation or radiofrequency energy. In collaboration with interventional cardiologist, Dr. John C. Gurley, video-assisted surgical ablation may also include exclusion of the left atrial appendage, the primary source of strokes in patients with atrial fibrillation.



Theodore S. Wright, MD

Adult Cardiac Surgery Cases, 2013



¹ MAZE – represents both concomitant and sole surgical management of AF

² Robotically assisted cases includes both cardiac and thoracic service lines



The cardiothoracic surgery team at UK has extensive skill and expertise in treating some of the region's sickest patients.

Cardiothoracic Surgery Faculty



Sibü P. Saha, MD, MBA

*Frank C. Spencer, MD, Endowed
Chair in Surgery
Professor of Surgery and
Bioengineering
Chief, Division of Cardiothoracic
Surgery
Chairman, Director's Council of
Gill Heart Institute*

- Thoracic surgery
- Open and endovascular surgery for arterial occlusive and aneurysmal diseases
- Device therapy for resistant hypertension



Victor A. Ferraris, MD, PhD

Tyler Gill Professor of Surgery

- Thoracic Surgery
- Transfusion medicine/blood conservation
- Hemostatic agents
- Platelet function in lung cancer



Angela L. Mahan, MD

Assistant Professor of Surgery

- Thoracic oncology
- Minimally invasive thoracic surgery
- Foregut surgery



Jeremiah T. Martin MB, BCh

Assistant Professor of Surgery

- Video-assisted thoracic surgery
- Thoracic oncology
- Surgical robotics (da Vinci)
- Foregut surgery
- 3-port esophageal resection



Timothy W. Mullett, MD

Professor of Surgery

- Video-assisted thoracic surgery
- Navigational bronchoscopy/Ebus-guided biopsy for lung cancer staging
- Endobronchial stent, deployment of endobronchial valve and ablative procedures



Hassan K. Reda, MD

Associate Professor of Surgery

- Valvular heart disease
- Coronary artery revascularization
- Surgery for aneurysm of thoracic aorta
- Transcatheter aortic valve replacement (TAVR)



Michael Sekela, MD

Professor of Surgery

- Coronary artery revascularization
- Transmyocardial revascularization
- Robotic mitral valve surgery
- Reoperative /complex adult cardiac surgery / thoracic aneurysm



Edward R. Setser, MD
Assistant Professor of Surgery
 • Adult cardiac and vascular surgery



Theodore S. Wright, MD
Assistant Professor of Surgery
 • Robotic cardiac surgery
 • Surgical approaches to atrial fibrillation
 • Valve repair and replacement
 • Coronary artery revascularization



Joseph B. Zwischenberger, MD
*Johnston-Wright Professor and Chairman
 Surgeon-in-Chief, UK HealthCare*
 • Acute respiratory failure
 • Esophageal cancer
 • Lung cancer

Cardiothoracic Surgery Research Faculty



Cherry Ballard-Croft, PhD
Assistant Professor of Surgery
 • Ischemic heart disease
 • Ventricular assist devices (VADs)



Dongfang Wang, MD, PhD
*Associate Professor of Surgery
 Director of Artificial Organ Laboratory*
 • Heart and lung assist devices
 • Paracorporeal artificial lung
 • LVAD-Plug and Play transapical to aorta
 mini LVAD

Highly trained staff deliver expert care in our Cardiovascular ICU. The unit is made up of:

33

CCRN Critical Care Certified Nurses

9

CSC Cardiac Surgery Certified Nurses

4

CMC Cardiac Medicine Certified Nurses

3

Platinum Level Clinical Ladder Nurses

1

CCTN (Transplant) Certified Nurse

Vascular and Endovascular Surgery

A journey through the vessels

The division of Vascular and Endovascular Surgery is staffed with thought leaders in the treatment of vascular disorders of the arterial, venous, and lymphatic system, including treatment of cerebrovascular disease, aneurysmal and occlusive disease of the aorta, iliac, and peripheral arteries.

Led by Eric M. Endean, MD, the division's faculty have authored surgical textbooks and invented surgical techniques considered cutting edge in the field of vascular medicine. While both open and endovascular techniques are utilized for treatment of our patients, UK vascular surgery faculty are especially interested in translating the latest findings into minimally invasive surgical procedures for some of the most complicated cases in the region.



Eric D. Endean, MD

UK houses an advanced and nationally certified vascular laboratory dedicated to ultrasound and imaging tests. Together with state-of-the-art computerized tomography and MRI technology, our vascular imaging capabilities enable the diagnosis and severity of vascular disease before any invasive procedure is undertaken.

Many of the vascular surgeries are performed in UK's state-of-the-art hybrid operating room, which is equipped with all the tools needed for treating the most complex vascular conditions. The new hybrid, catheterization/OR is the only one of its kind in the region. Here, doctors can perform both open surgery and catheter-based procedures guided by fluoroscopy and ultrasound. The space allows our program's team to provide unparalleled comprehensive care to challenging, high-risk patients.

The vascular surgery faculty is actively involved in research pertaining to the development of endovascular techniques, acute mesenteric ischemia, effects of obesity on surgical outcome, and treatment of aneurysms. They are joined by basic and translational investigators with international recognition in developing preclinical models for studying the development and progression of abdominal aneurysms. Led by Alan Daugherty, PhD, DSc, UK researchers have been instrumental in defining the role of inflammation in the disease process and non-surgical therapy for abdominal aortic aneurysm.

Our surgeons are also committed to education of surgery residents, who rotate on the vascular and endovascular surgery service during their first, third and fifth years of training, and gain experience in major vascular operations including carotid, aortic, and lower extremity revascularizations.

Further advanced training in vascular and endovascular surgery is offered through an ACGME-approved fellowship. The fellowship is two years in duration, with the first year focusing primarily on open vascular surgical reconstructions. The second year includes an intensive endovascular experience and training in the non-invasive vascular laboratory.

The division's faculty have authored surgical textbooks and invented surgical techniques considered cutting edge in the field of vascular medicine.

Vascular and Endovascular Surgery Faculty



Eric D. Endean, MD
*Gordon L Hyde Endowed Professor
Chair, Vascular Surgery Program
Director, General Surgery Residency Program*

- Abdominal aortic aneurysm
- Carotid artery disease
- Mesenteric ischemia
- Peripheral vascular occlusive disease



Joseph L. Bobadilla, MD
Assistant Professor

- Carotid stenting
- Endovascular open thoracic aortic aneurysm repair
- Spinal ischemia after complex aortic surgery
- Venous disease



David J. Minion, MD
Associate Professor

- Carotid stenting
- Cerebrovascular arterial disease
- Endovascular aortic aneurysm repair
- Ischemic nephropathy
- Thoracic aneurysm repair



Ehab E. Sorial, MD
Assistant Professor

- Abdominal aortic aneurysm
- Carotid artery disease
- Cerebrovascular disease
- Mesenteric ischemia
- Peripheral vascular occlusive disease

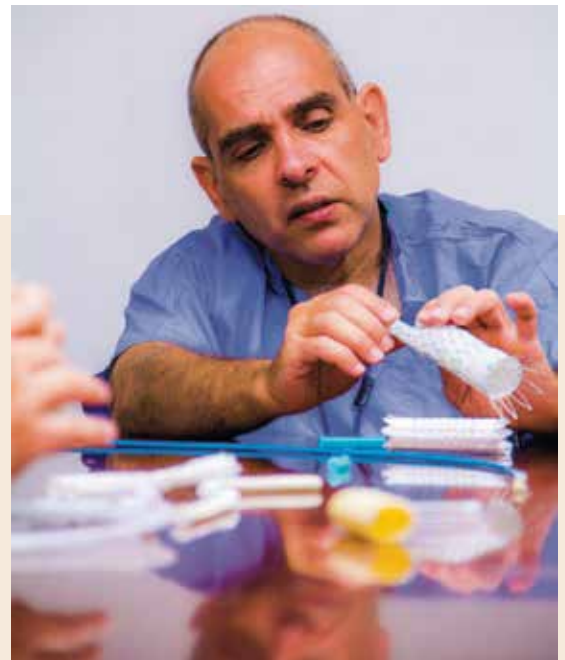


Eleftherios S. Xenos, MD, PhD
Assistant Professor

- Abdominal aortic aneurysm
- Dialysis access
- Renovascular hypertension
- Thoracoabdominal aneurysm

Vascular surgeon Eleftherios S. Xenos, MD serves as UK HealthCare's Medical Director of Patient Safety. In this position, Dr. Xenos strengthens our effort to provide safe and high quality care to every patient and provides enterprise-wide leadership to enhance our culture of safety and eliminate patient harm.

A particularly important function of his position is fostering constructive relationships between clinical and administrative leaders across the medical center.



Cardiothoracic Surgery Publications

Publications from this division represent our activities in both clinical and basic research.

Sachdeva S and **Saha SP**. Transradial approach to cardiovascular interventions: An Update. *Int J Angiol*. 2014;23:77-84.

Long K, Skinner S, **Martin J**. Epithelioid hemangioendothelioma encasing the left brachiocephalic vein. *J Surg Case Rep*. 2014 Jun 4;2014(6).

Zanotti G, Hartwig MG, Castleberry AW, **Martin JT**, Shaw LK, Williams JB, Lin SS, Davis RD. Preoperative mild-to-moderate coronary artery disease does not affect long-term outcomes of lung transplantation. *Transplantation*. 2014 May 27;97(10):1079-85.

Arbra CA, Valentino JD, **Martin JT**. Vascular sequelae of mediastinal fibrosis. *Asian Cardiovasc Thorac Ann*. 2014 May 15 [Epub ahead of print].

Vyas KS, **Saha SP**, Davenport DL, **Ferraris VA** and **Zwischenberger JB**. Trends and practice patterns in the management of thoracic empyema. *Asian Cardiovascular and Thorac Annals*. 2014;22:455.

Wang D, Plunkett M, Gao G, Zhou X, **Ballard-Croft C**, **Reda H**, **Zwischenberger JB**. A practical and less invasive total cavopulmonary connection sheep model. *ASAIO J*. 2014 Mar-Apr;60(2):178-82.

Martin J, **Ferraris VA** and **Saha SP**. Pneumonectomy for non-malignant disease. *Asian Cardiovascular and Thorac Annals*. 2014 Jan 31 [Epub ahead of print].

Saha SP, **Ziada KM** and **Wayne TF**. Surgical, interventional, and device innovations in the management of hypertension. *Int J Angiol*. 2014.

Cheng I and **Saha SP**. Long-term outcomes of carotid endarterectomy with primary closure. *Int J Angiol*. 2014 [In press].

Bender M, **Ferraris VA** and **Saha SP**. Modern management of thoracic empyema: A single center experience. *South Med J*. 2014 [In press].

Saha SP, Kalathiya RJ, Davenport DL, **Ferraris VA**, **Mullett TW**, and **Zwischenberger JB**. Survival after pneumonectomy for stage III non-small cell lung cancer. *Oman Med J*. 2014;29(1):24-7.

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CT Surgery Clinical Trials

Platelet function in early stage lung cancer – A pilot study

Primary Investigator: Victor Ferraris, MD, PhD

Comparison of operative risk scoring algorithms as applied to a local series of cardiothoracic surgery patients

Primary Investigator: Victor Ferraris, MD, PhD

A comparison of post-operative thrombotic complication for on-pump versus off-pump CABG

Primary Investigator: Victor Ferraris, MD, PhD

Surgery for infective endocarditis, a retrospective review of outcomes

Primary Investigator: Victor Ferraris, MD, PhD

Comparison of operative risk scoring algorithms as applied to a local series of cardiothoracic surgery patients

Primary Investigator: Victor Ferraris, MD, PhD

OCEAN: Effectiveness and safety of Celstat as an adjunct to hemostasis in cardiothoracic, general and vascular surgery

Primary Investigator: Victor Ferraris, MD, PhD

Surgical lung cancer upstaging

Primary Investigator: Jeremiah T. Martin, MB, BCh

Prospective post-approval study with Spiration® IBV Valve System for treatment of prolonged air leak

Primary Investigator: Timothy W. Mullett, MD

Spiration® IBV/endobronchial valve retrospective review and outcomes analysis

Primary Investigator: Timothy W. Mullett, MD

Spiration® IBV Valve System-humanitarian use device

Primary Investigator: Timothy W. Mullett, MD

A multi-center trial to compare efficacy and safety of TachoSil® versus Surgicel® Original for the secondary hemostatic treatment of needle hole bleeding in vascular surgery

Primary Investigator: Sibiu Saha, MD

A study to evaluate the safety and efficacy of intramuscular injections of Allogeneic PLX-PAD cells for the treatment of subjects with intermittent claudication

Primary Investigator: Sibiu Saha, MD

Rheos Pivotal Trial for resistant hypertension

Primary Investigator: Sibiu Saha, MD

Cardiac tumors and surgical management: A retrospective review

Primary Investigator: Sibiu Saha, MD

Ds RNA cloning and visualization in human atherosclerosis

Co-Investigators: Bradley Gelfund, PhD and Sibiu Saha, MD

Trends and practice in management of spontaneous pneumothorax: A single center experience

Primary Investigator: Sibiu Saha, MD

Impacts of citrulline and lycopene on cardiovascular health

Co-Investigators: Shubin Saha, PhD, Sibiu Saha, MD, Alan Daugherty, PhD, DSc

Lobectomy/wedge resection for lung cancer: An outcomes analysis of 500 cases from 2002–2013

Primary Investigator: Sibiu Saha, MD

Diffuse optical assessment of peripheral arterial disease (PAD) and revascularization

Co-Investigators: Guoqiang Yu, PhD, Sibiu Saha, MD

A retrospective review and comparison of open thoracotomy versus video-assisted thoracic surgery from 2009-2013

Primary Investigator: Sibiu Saha, MD

Vascular Surgery Clinical Trials

A Phase IIIb study to compare ticagrelor with clopidogrel treatment on the risk of cardiovascular death, myocardial infarction and ischemic stroke in patients with established peripheral artery disease (EUCLID – Examining Use of tiCagreLor In paD)

Primary Investigator: Eric Endean, MD

Impact of Resident Schedule on Patient Outcomes

Primary Investigator: Eric Endean, MD

Predicting Academic and Clinical Success in Surgical Training

Primary Investigator: Eric Endean, MD

Occurrences of abdominal compartment syndrome, open vs. EVAR, a retrospective chart review

Primary Investigator: Eric Endean, MD

Clinical outcomes of the snorkel technique to treat juxtarenal aortic aneurysms, a retrospective chart review

Primary Investigator: David Minion, MD

Clinical outcomes of aortic aneurysms, retrospective chart review

Primary Investigator: David Minion, MD

The rate, risk factors and financial impact of readmissions in a university-based practice of vascular surgery, retrospective chart review

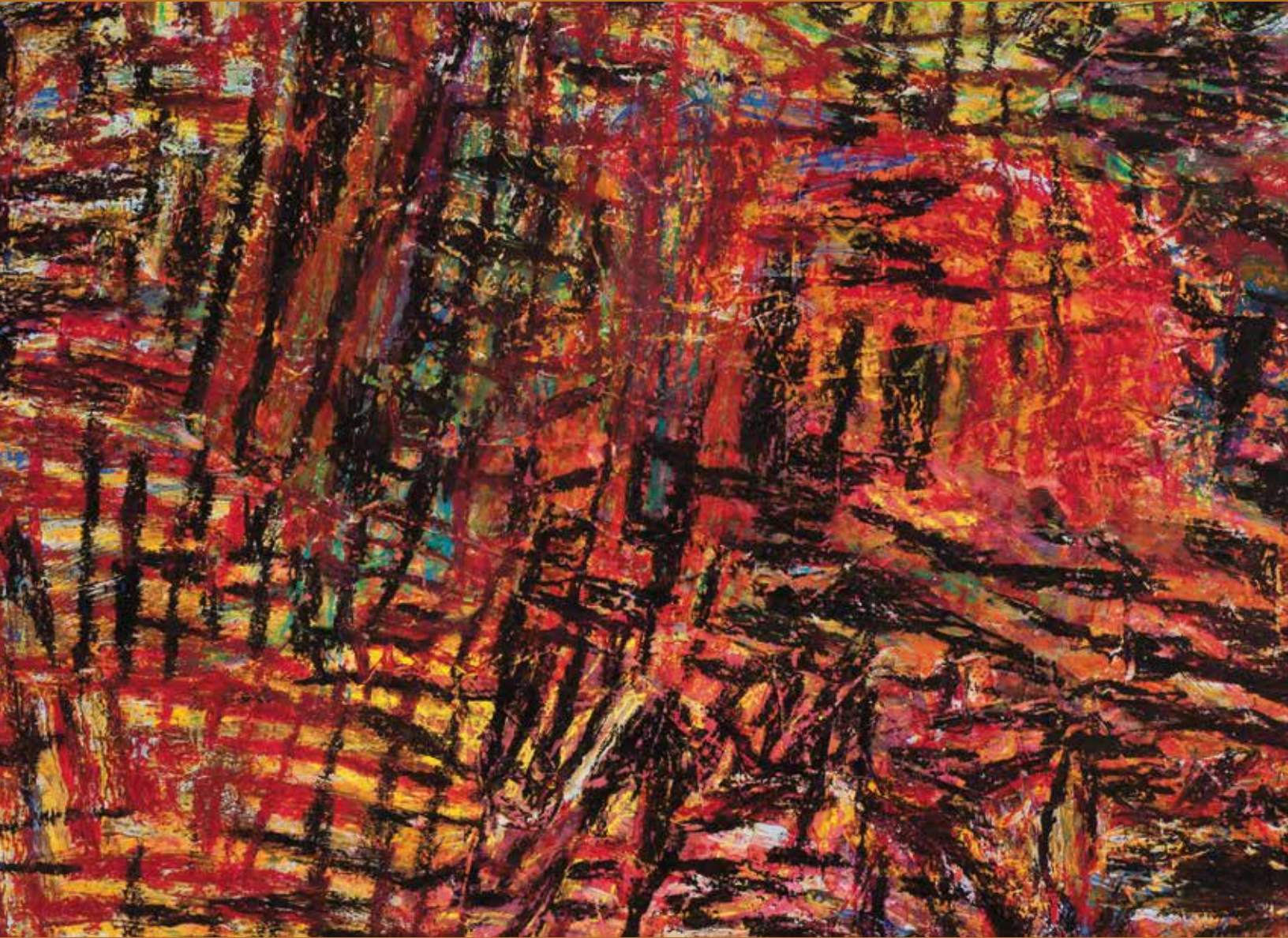
Primary Investigator: Eleftherios Xenos, MD

HeRo (Hemodialysis Reliant Outflow) graft using inside-out central venous access: an analysis of outcomes, retrospective chart review

Primary Investigator: Eleftherios Xenos, MD

Electrophysiology

Changing the game of healing the heart



“You cannot separate passion from pathology any more than you can separate a person’s spirit from his body.”

– Richard Selzer, *Letters to a Young Doctor*

Electrophysiology



Drs. Samy-claude Elayi and Gustavo Morales

Heart Rhythm Program

The Gill Heart Institute's Heart Rhythm Program brings together a team of certified cardiac electrophysiologists, cardiovascular surgeons, cardiologists and cardiac anesthesiologists for the management and treatment of cardiac rhythm disorders. Leading the team are UK electrophysiologists Samy-claude Elayi, MD, and Gustavo Morales, MD, who have performed hundreds of procedures at UK Gill Heart Institute, in addition to the Cleveland Clinic and the University of Miami Hospital, respectively. Their collaborative approach enables the development of patient-centered, combination treatment therapies with high success and low complications rates.

Our services include implantation of MRI-compatible pacemakers, implantable cardioverter defibrillators (ICDs), including biventricular devices, device extraction and advanced ablation procedures for rhythm disturbances such as atrial fibrillation (AF), atrial flutter, supraventricular tachycardia or ventricular tachycardia. Our highly skilled team utilize the latest technology to perform procedures such as robotic systems, magnetic catheter guidance, or the latest 3-D mapping technology.

Custom treatments for atrial fibrillation

Treating a rhythm disturbance is highly complex and is based on multiple factors, such as the patient's symptoms, co-morbidities or the clinical context. While some patients may require only adjustment of medical therapy, others may need interventions such as implantations of pacemakers or catheter ablations.

Research has shown catheter ablation to be superior to medical therapy in preventing AF episodes and potentially improving quality of life and heart function for the patient. Although catheter ablation is an effective treatment for AF, appropriate patient selection is necessary to achieve the best results.

For patients whose atrial fibrillation (AF) cannot be managed through medications or catheter-based ablation, CT surgeon Dr. Theodore S. Wright

provides expertise in the innovative and minimally invasive video-assisted MAZE procedures. In collaboration with interventionalist Dr. John C. Gurley, the procedure may also include, or be limited to, the exclusion of the left atrial appendage, the primary source of strokes in patients with atrial fibrillation. The team is experienced in and offers both LARIAT and Atra Clip for appendage occlusion.

94.8%
of patients in 2013
received ICD for class
I or II guideline
indications – well above
the 50th percentile for
US hospitals at 91.5%

Clinical Cardiac Electrophysiology Fellowship

The Clinical Cardiac Electrophysiology Fellowship, directed by Gustavo Morales, MD, provides advanced training in electrophysiologic studies and ablation of a variety of arrhythmias, including atrial fibrillation and ventricular tachycardia. Trainees also learn about interrogation of devices, implantation of devices (pacemakers, ICDs, BiV-ICDs, loop monitors, and subcutaneous devices), and troubleshooting devices. With approximately 40 device implants, and 20 electrophysiology studies/ablation cases performed each month, fellows have ample opportunity to gain expertise in a wide variety of cases.

Electrophysiology Faculty



Samy-Claude Elayi, MD

Associate Professor
Director, EP Laboratory

- Atrial fibrillation management
- Hybrid ablation therapies



Yousef Darrat, MD

Assistant Professor

- Device-based therapy
- Atrial fibrillation management
- Supraventricular arrhythmia ablation



Gustavo X. Morales, MD

Assistant Professor

- Invasive treatment of atrial fibrillation
- Atrial flutter ablation
- Ablation of supraventricular tachycardia



Rae Wagoner and Dr. Samy-claude Elayi

From V-tach to Victory

By Laura Dawahare

Samy-claude Elayi loves doing victory dances. “It is a real blessing to wake up and enjoy doing a job that I am so passionate about,” said the physician-electrophysiologist at UK’s Gill Heart Institute. “I live for those magic moments where I can make a difference in my patients’ lives.”

Perhaps the most vivid example of his “magic moments” involves a woman named Rae Wagoner. A petite blonde with a wistful smile, Rae had always made being fit and healthy a priority. The 44-year-old former high school gymnast worked out at a gym at least three days a week, and ran on the “off” days. When she had difficulty keeping up her normal pace, Rae knew something was not quite right.

In just six months, Rae went from feeling a little off to barely being able to walk from her bedroom to the kitchen. “I was so out of steam that I couldn’t work, watch my son play football or baseball games ... I was essentially housebound,” said Rae.

She went from one doctor to the next, looking for answers for her weight loss, breathlessness, and muscle atrophy. Each appointment left her feeling disappointed and confused. “I began to think I was losing it,” she said. “I didn’t feel as if anyone was taking my symptoms seriously.”

Repeated fainting spells brought her to a Lexington hospital ED. An EKG revealed abnormalities, and she was referred to the Gill where Drs. Craig Chasen and Elayi completed her workup. They used a Holter Monitor to record Rae’s heartbeats over a 24-hour period. “Turns out she had a serious V-tach. Forty percent of Rae’s beats were abnormal,” said Elayi.

Medications usually resolve V-tach, but were ineffective on Rae so she returned to the clinic. When Elayi saw her he was stunned: “She was visibly blue,” he recalled. Rae was quickly transported to the Gill’s second floor cath lab. Elayi and his team – electrophysiologist Dr. Gustavo Morales, and interventionalist Dr. John C. Gurley – began the procedure to hunt down the nerve pathways destroying Rae’s heart.

Guiding a catheter up through Rae’s femoral artery, Elayi and his team first explored the interior chambers of her heart. Nothing. The next step was to explore Wagoner’s epicardium. This requires insertion of the catheter through the chest just below the ribs. To prevent injury to the coronary artery, only large medical centers with a high level of expertise are equipped to do this complex procedure.

Dr. Elayi found the rogue heart cells causing Wagoner’s dyssynchrony and ablated them. “I’ll never forget when her heart went back into normal rhythm,” said Elayi. “There’s that magic moment.” Cue the victory dance.

Since these cells typically do not regenerate, Rae should not have this problem again. The grateful patient is running again and counting the days until she can return to the tennis court, **“I believe that if it weren’t for Dr. Elayi I wouldn’t have come out of it at all.”**

Electrophysiology Clinical Trials

The Gill Heart Institute is the site of many national clinical trials for heart rhythm disorders such as atrial fibrillation. For more information, please contact Jennifer Isaacs at 859-323-4738.

CADENCE – Ascending dose of study of OPC-108459 intravenous infusion in patients with paroxysmal and persistent atrial fibrillation

Principal Investigator (site): Samy-claude Elayi, MD

Enhance CRT – CRT implant strategy using the longest electrical delay for non-LBB patients

Principal Investigator (site): Gustavo Morales, MD

VEST – Vest prevention of early sudden death trial and VEST registry

Principal Investigator (site): Samy-claude Elayi, MD

Electrophysiology Publications

Bai R, Di Biase L, Mohanty P, Santangeli P, Mohanty S, Pump A, **Elayi CS**, Natale A, et al. Catheter ablation of atrial fibrillation in patients with mechanical mitral valve: Long-term outcome of single procedure of pulmonary vein antrum isolation with or without nonpulmonary vein trigger ablation. *J Cardiovasc Electrophysiol*. 2014 Apr 11.

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Whitbeck MG, **Charnigo RJ**, Shah J, **Morales G, Leung SW, Fornwalt B, Bailey AL, Ziada K, Sorrell VL**, Zegarra MM, Thompson J, Hosn NA, **Campbell CL, Gurley J, Anaya P, Booth DC**, Di Biase L, Natale A, **Smyth S, Moliterno DJ, Elayi CS**; AFFIRM investigators. QRS duration predicts death and hospitalization among patients with atrial fibrillation irrespective of heart failure: evidence from the AFFIRM study. *Europace*. 2014 Jun;16(6):803-11.

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Whitbeck MG, **Charnigo RJ**, Khairy P, **Ziada K, Bailey AL**, Zegarra MM, Shah J, **Morales G, Macaulay T, Sorrell VL, Campbell CL, Gurley J, Anaya P**, Nasr H, Bai R, Di Biase L, **Booth DC**, Jondeau G, Natale A, Roy D, Smyth S, **Moliterno DJ, Elayi CS**. Increased mortality among patients taking digoxin-analysis from the AFFIRM study *Eur Heart J*. 2013 May;34(20):1481-8.

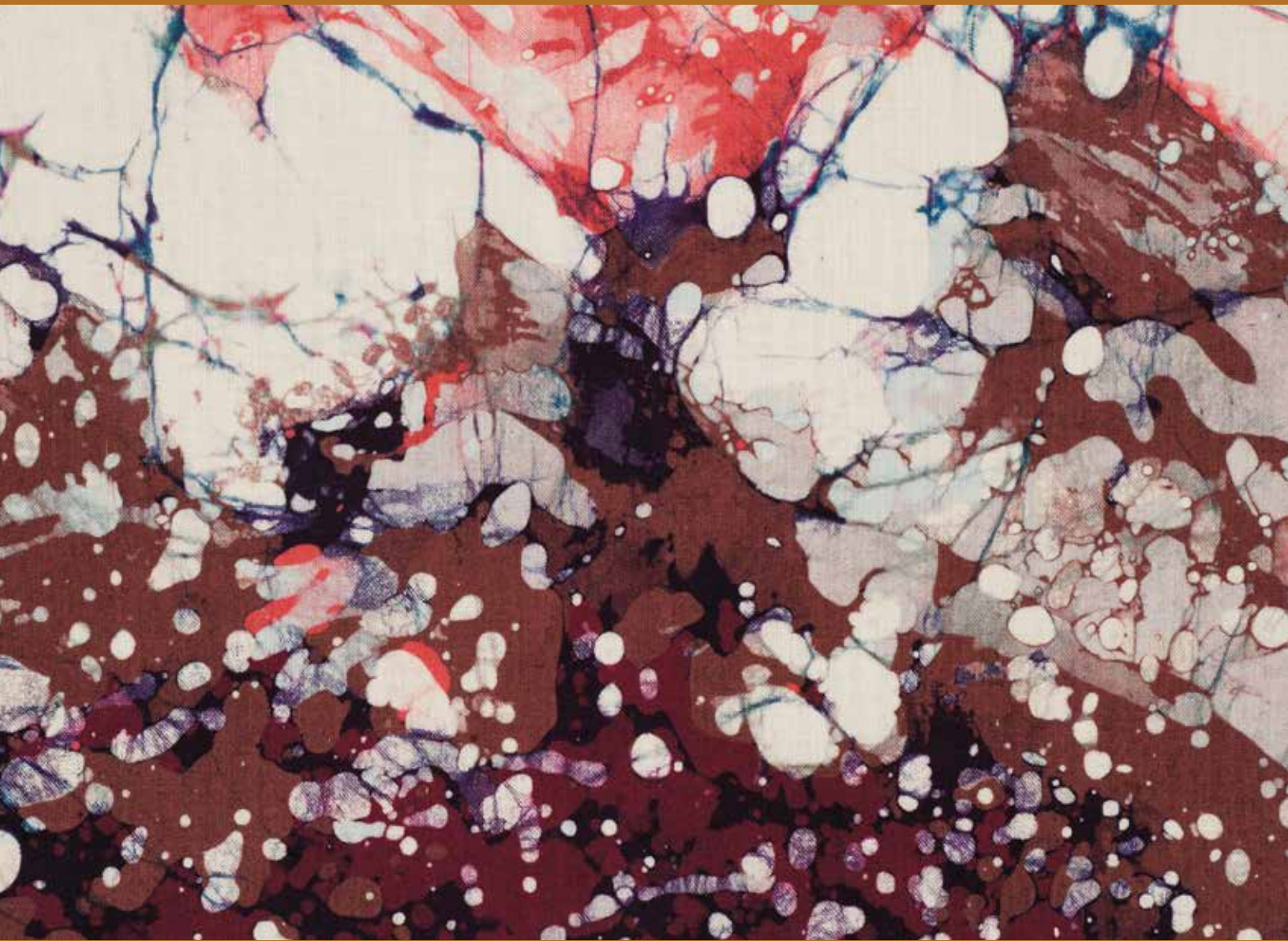
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Cardiovascular Imaging

Seeing inside the heart



“Healing is best accomplished when art and science are conjoined, when body and spirit are probed together.”

— Bernard Lown, MD, *The Lost Art of Healing*

Cardiovascular Imaging



Mikel D. Smith

Image-guided, patient centered

UK's Advanced Cardiovascular Imaging Program provides Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) of the heart and great vessels for adult and pediatric patients. The Gill Imaging Center was the first site in Kentucky to offer dual-source CT scanner. Our ability to perform dual energy scanning improves imaging of calcific coronary arteries and with LV devices. Two MRI scanners – the 1.5 Tesla and 3.0 Tesla – expand UK's advanced imaging capabilities. In addition to routine 3-D volumetric, functional, contrast viability cardiac MRI studies, real-time, 3-D time-resolved MRA, and pharmacologic stress MRI is regularly performed. LV strain imaging has become a recent addition. Also, the Gill is one of only a few sites in the country that routinely perform MRI scans in certain patients with pacemakers and ICDs.

The Gill's Adult Echo Lab has a long-standing commitment to providing excellent care and education to people in Kentucky. Accredited by the Intersocietal Accreditation Commission for Echocardiography (ICAEL) continuously since 1999, the echo lab upholds the highest standards. The echo lab provides essential support for the Gill Structural Heart Program, including during TAVR and mitral valve procedures.

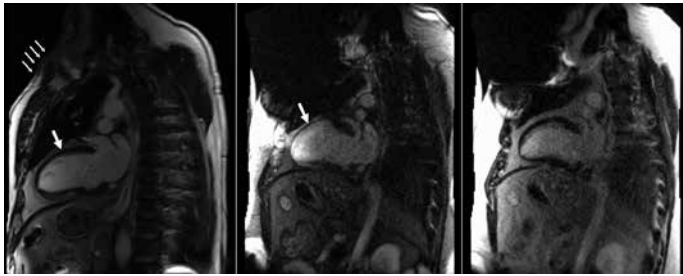
All of our interpreting cardiologists are certified by the National Board of Echocardiography and we have more than 130 combined years of cardiac sonographer experience in echocardiography. Historically, the adult echo lab faculty contributed to developments in Doppler, color-flow imaging and 3-D echo. Additionally, the echo lab faculty and cardiac sonographers have a regional and national reputation for organizing ultrasound imaging courses and providing hands-on training to physicians and sonographers in the region.

The Gill's nuclear imaging lab utilizes a state-of-the-art, upright, dual-head SPECT camera with attenuation correction and off-line workstations using advanced Cedars-Sinai Quantitative Perfusion and Gated SPECT software. Three-D regional perfusion, global and regional function at rest and after stress, and quantitative summed stress scores are measured in all patients. New capabilities that have been added include stress-only imaging protocols to reduce radiation exposure.

Cardiovascular Imaging Fellowship

Our cardiovascular imaging fellowship program is unique in that there is a close collaboration between cardiology and radiology, offering the opportunity to learn sophisticated tomographic anatomy as well as advanced cardiovascular physiology. Fellows develop in-depth knowledge of cardiac imaging techniques, appropriate applications, and research applications, as part of a multi-disciplinary team imaging ventricular mechanics, ischemic heart disease, hypertrophic cardiomyopathy, congenital heart disease, and valvular disease. Currently two fellows are training in advanced CV imaging, with a plan to add a third fellow in 2015.

MRI scan of ICD



From left, a normal cardiac MRI, where an arrow points to the myocardium; the chest wall (multiple small arrows) can be easily seen. Above middle, images in a patient with an ICD, which causes a significant amount of artifact. At right, images reformatted using new sequences to overcome artifacts.

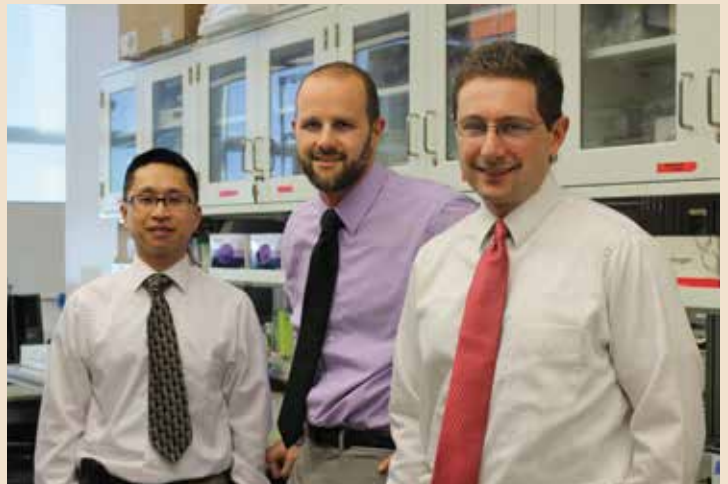
Traditionally, patients with pacemakers and implantable cardioverter-defibrillators (ICDs), have been unable to undergo MRI due to concerns of having a metallic object inside the powerful magnet. Studies have demonstrated this can be safely performed with precautions, including changing the device settings and having knowledgeable personnel available for screening. The device can cause a large amount of MRI artifacts in the image, which can make the study uninterpretable. Using new sequences obtained from Dr. Peng Hu at UCLA, the Gill is now able to overcome these artifacts (see images above).

Cardiovascular Imaging Research Team and KL2 Imaging Scholars

The Cardiovascular Imaging Research Team (CVIRT) is an active collaboration of adult and pediatric cardiovascular clinical imaging specialists (cardiology and radiology), physiologists, vascular biologists, anatomists, and nephrologists. The team participates in investigator-initiated basic and clinical research, and single and multicenter clinical trials that have an emphasis on cardiac imaging. CVIRT members are involved in imaging sequence development and quality improvement initiatives. Their major interest is in creating a patient-centered, cost-effective, image-guided approach to managing patients with cardiovascular disease.

The team receives significant support from the Kentucky Center for Clinical and Translational Science. The CCTS offers a KL2 program, competitive research training for faculty looking to jump-start their careers in clinical and translational research. The goal of the KL2 program is to assist awardees in becoming independent investigators with National Institutes of Health (NIH) funding. Among the first three KL2 Scholars at UK, Dr. Brandon Fornwalt, earned an NIH Director's Early Independence Award for his research in using MRI technology to study dyssynchrony in pediatric heart disease. Fornwalt is the first UK faculty member to receive the prestigious award.

Moriel Vandsburger, also a KL2 Scholar, was recently awarded an American Heart Association Clinical Innovation Award for his work on translational magnetization transfer MR imaging of myocardial fibrosis. The most recent CVIRT member to be supported by the KL2 program, Steve Leung, MD, is using MRI in differentiating athlete's heart and hypertrophic cardiomyopathy.



From left, KL2 Scholars Drs. Steve Leung, Brandon Fornwalt, and Moriel Vandsburger.

Cardiovascular Imaging Faculty



Vincent L. Sorrell, MD
Professor of Medicine
Anthony N. DeMaria Chair of Cardiovascular Imaging
Director, Cardiovascular Imaging

- Myocarditis
- Cardiac syndrome X and microvascular heart disease
- Mitral valve diseases



Mikel D. Smith, MD
Professor of Medicine
Alberto Mazzoleni Professor of Cardiology
Director, Echocardiography Laboratory

- Cardiovascular disease
- Echocardiography
- Valvular heart disease



Brandon Fornwalt, MD, PhD
Assistant Professor
Division of Pediatric Cardiology
Department of Biomedical Engineering

- Cardiac MRI
- Pediatric Heart Disease



Steve Leung, MD
Assistant Professor of Medicine
Associate Director, Advanced Cardiovascular Imaging
Director, Cardiovascular Imaging, Lexington VAMC

- Cardiovascular MRI and CT
- Echocardiography
- Nuclear cardiac imaging



Moriel Vandsburger, PhD
Assistant Professor of Physiology

- Cardiac MRI



M. Elizabeth Oates, MD
Professor and Chair, Radiology
Rosenbaum Endowed Chair of Radiology

- Nuclear cardiology
- Single photon emission computed tomography (SPECT)
- Computed tomography (CT) fusion imaging



Michael A. Brooks, MD
Assistant Professor of Radiology
Director of Residency Program

- Cardiovascular MRI and CT
- High resolution computed tomography (CT) of lung
- Occupational lung diseases



Stephen B. Hobbs, MD
Assistant Professor of Radiology

- Diffuse pulmonary parenchymal diseases
- Infiltrative cardiomyopathies
- Pulmonary hypertension



Michael A. Winkler, MD
Assistant Professor

- Cardiovascular computed tomography (CT)
- Coronary artery disease
- Pericardial disease

Cardiovascular Imaging Publications

Wallace EL, Smith MD, and Sorrell VL. Septal perforator size may play a key role in alcohol septal ablation success. *Can J Cardiol.* 2014 Aug;30(8):957.e5.

Haggerty CM, Kramer SP, Skrinjar O, Binkley CM, Powell DK, Mattingly AC, Epstein FH, **Fornwalt BK.** Quantification of left ventricular volumes, mass, and ejection fraction using cine displacement encoding with stimulated echoes (DENSE) MRI. *J Magn Reson Imaging.* 2014 Aug;40(2):398-406.

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Nguyen KL, Bandettini WP, Shanbhag S, **Leung SW,** Wilson JR, Arai AE. Safety and tolerability of regadenoson CMR. *Eur Heart J Cardiovasc Imaging.* 2014 Jul;15(7):753-60.

Spacek M, **Sorrell VL,** Veselka J. Transcranial Doppler Ultrasound in the Current Era of Carotid Artery Stenting. *Ultraschall Med.* 2014 Jun 25 [Epub ahead of print].

Leung SW, Gurley JC, Ziada KM, Reda HK, Smith MD, Sorrell VL. Open wide: Transient wide-open mitral regurgitation during transcatheter aortic valve implantation. *J Am Coll Cardiol.* 2014 May 6;63(17):e45.

White MS, Bodiwala KN, **Bailey AL, Sorrell VL.** Symptomatic pericardial cyst in the presence of partial congenital absence of the pericardium. *Eur Heart J Cardiovasc Imaging.* 2014 May;15(5):531.

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Seratnaehai A, Leung SW, Charnigo RJ, Cummings MS, **Sorrell VL, Smith MD.** The changing "face" of endocarditis in Kentucky: A rise in tricuspid cases. *Am J Med.* 2014 Apr 21 [Epub ahead of print].

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Wallace EL, Thompson JJ, **Faulkner MW, Gurley JC,** and **Smith MD.** Septal perforator anatomy and variability of perfusion bed by myocardial contrast echocardiography: A study of hypertrophic cardiomyopathy patients undergoing alcohol septal ablation. *J Interv Cardiol.* 2013 Dec;26(6):604-12.

Kramer SP, Powell DK, Haggerty CM, Binkley CM, Mattingly AC, Cassis LA, Epstein FH, **Fornwalt BK.** Obesity reduces left ventricular strains, torsion, and synchrony in mouse models: a cine displacement encoding with stimulated echoes (DENSE) cardiovascular magnetic resonance study. *J Cardiovasc Magn Reson.* 2013 Dec 31;15(1):109.

Vandoorne K, **Vandsburger MH,** Weisinger K, Brumfeld V, Hemmings BA, Harmelin A, Neeman M. Multimodal imaging reveals a role for Akt1 in fetal cardiac development. *Physiol Rep.* 2013 Nov;1(6):e00143.

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Singh S, Bansal M, Maheshwari P, Adams D, Sengupta SP, Price R, Dantin L, **Smith M,** et al.; **Sorrell V** (collaborator); ASE-REWARD Study Investigators. American Society of Echocardiography: Remote echocardiography with web-based assessments for referrals at a distance (ASE-REWARD) study. *J Am Soc Echocardiogr.* 2013 Mar;26(3):221-33.

Costello JR, Mullins ME, Votaw JR, Karolyi DR, Kalb B, Gonzales P, **Fornwalt BK,** Meltzer CC. Establishing a new radiology residency research track. *Acad Radiol.* 2013; 20(2): 243-8.

Chen MY, Steigner ML, **Leung SW,** Kumamaru KK, Schultz K, Mather RT, Arai AE, Rybicki FJ. Simulated 50% radiation dose reduction in coronary CT angiography using adaptive iterative dose reduction in three-dimensions (AIDR3D). *Int J Cardiovasc Imaging.* 2013 Feb 13 [Epub ahead of print].

Cardiovascular Imaging Publications, *continued*

Thomas VC, Cumbermack KM, Lamphier CK, Phillips CR, Fyfe DA, **Fornwalt BK**. Measures of dyssynchrony in the left ventricle of healthy children and young patients with dilated cardiomyopathy. *J Am Soc Echocardiogr*. 2013 Feb;26(2):142-53.

Winkler MA, von Herrmann PF, **Brooks MA**, **Hoopes CW**, Attili A, **Sorrell VL**. Synthetic ECG-gated cardiac computed tomography for in vivo imaging of the temporary total artificial heart. *Circulation*. 2013 Jan 1;127(1):e4-5.

Cardiovascular Imaging Clinical Trials

ISCHEMIA (NHLBI/NYUSOM) International Study of Comparative Health Effectiveness with Medical and Invasive Approaches
Principal Investigator (site): David Booth, MD

Advanced cardiac MR Imaging to evaluate new cardiovascular MRI sequences in patients who are undergoing a clinically indicated cardiovascular MRI
Principal Investigator (site): Vincent Sorrell, MD

PROMISE (NHLBI) Prospective Multicenter Imaging Study for Evaluation of Chest Pain
Principal Investigator: Vincent Sorrell, MD

Contrast media on the safety, quality and rapidity of computed tomography angiography
Principal Investigator: Michael Winkler, MD

Investigation of situs inversus totalis, its phenotypes, and its relationship to congenital heart disease in the Appalachian population
Principal Investigator: Michael Winkler, MD

Reporting of coronary artery calcification visible on CT scans of the abdomen
Principal Investigator: Michael Winkler, MD

Dyssynchrony in patients with heart failure and congenital heart disease
Principal Investigator: Brandon Fornwalt, MD, PhD

MRI of Myocardial Fibrosis to develop a translational and non-invasive MRI technique for early identification and quantification of myocardial fibrosis based on magnetization transfer (MT) encoded collagen imaging
Principal Investigator: Michael Winkler, MD

Translational magnetization transfer MR Imaging of myocardial fibrosis
Principal Investigator: Moriel Vandsburger, PhD

Heart Failure, Transplant and Mechanical Circulatory Support

Providing hope, restoring lives



“Wherever the art of medicine is loved,
there also is love of humanity.”

– Hippocrates

Heart Failure, Transplant and Mechanical Circulatory Support

Providing hope, restoring lives

The UK Transplant Center is at the forefront of clinical technology in heart failure care, heart transplant, and VAD services. We are the only full-service transplant center serving central and eastern Kentucky, and many patients come to us from elsewhere for treatment not offered at hospitals in their home state. Transplant patients benefit from our expert, multidisciplinary approach to evaluation, treatment and management of advanced heart failure.

Our integrated Cardiothoracic and Vascular Intensive Care Unit (CTV-ICU) is staffed by a team of skilled caregivers made up of board-certified cardiologists and cardiothoracic surgeons, advanced practice nurses, critical care-certified registered nurses, mechanical circulatory system coordinators, as well as specialty pharmacists, physical, occupational, and speech therapists; nutritionists, and social workers. This team works together to keep patients informed of their options at every stage, and to assist them with managing their long-term care.

The cardiac transplant program at UK was established in 1991 by Dr. Michael Sekela, and has since performed approximately 285 heart transplants. Dr. Charles W. Hoopes, director of the UK Transplant Program, is nationally recognized for performing highly complex transplant procedures, artificial heart and lung implantations and ambulatory extracorporeal membrane oxygenation (ECMO).



1 year survival rate of
96.3%
better than the
expected rate of 90.5%

The Gill Heart Institute employs the full spectrum of mechanical devices to optimally help a range of patients and conditions. Temporary support systems, such as the Impella CP or the Impella 5, can be placed percutaneously or through an arterial cut-down in patients in critical cardiogenic shock, or who need additional circulatory support. For those with refractory heart failure, the HeartMate II LVAD or the HeartWare LVAD may serve as a bridge to transplant; HeartMate II LVAD is also implanted as destination therapy in certain patients.

The CentriMag pump is used in patients needing hemodynamic stabilization. UK was the first health care provider in the state to implant Syncardia's Total Artificial Heart and UK's transplant program has also performed combined heart-kidney transplants, and it is the only combined heart-lung transplant program in Kentucky.

Pulmonary Hypertension Program

The Institute provides the region's only expertise in the management of pulmonary hypertension. Many of our patients are referred from other area hospitals for treatment. Our program includes a multidisciplinary team of cardiologists, transplant surgeons, pulmonologists, and nurse practitioners who work together to help patients who suffer from this condition. For those who do not respond sufficiently to treatment, referral to our lung transplant specialists is provided.

Led by cardiologist Dr. David C. Booth, the aim of the Gill pulmonary services is to provide compassionate, patient-centered care to individuals with all types of pulmonary hypertension, endeavoring to provide accurate diagnosis, modify and continuously improve care processes, and offer the latest and emerging therapies in pulmonary hypertension.

Transplant and MCS Cases, 2013

HEART	HEART/ LUNG	LUNG	VAD	ECMO
15	1	25	23	61

Advancing ECMO

UK is one of only a few centers in the U.S. to offer ambulatory extracorporeal membrane oxygenation (ECMO) utilizing a double-lumen cannula.

Extracorporeal membrane oxygenation uses an artificial lung device that provides cardiac and/or pulmonary support to patients whose heart and/or lungs are so severely damaged that they can no longer function without assistance. Serving as a bridge to transplant, ECMO allows patients to not only survive, but to be physically rehabilitated prior surgery.

Department of Surgery Chairman, Joseph B. Zwischenberger, MD, and Director of the Artificial Organ Laboratory, Dongfang Wang, MD, PhD, received FDA approval of a bi-caval double lumen catheter inserted to perform ECMO. The Avalon Elite™ Bi-Caval Double Lumen Catheter is manufactured and offered by Avalon Laboratories Inc. The high-performance DLC accomplishes total gas exchange for patients of all sizes with lung disease.

Dr. Charles W. Hoopes is focused on the advances in ECMO technology to bridge patients for lung transplantation. Using the Avalon cannula, Dr. Hoopes places patients on veno-venous ECMO and rehabilitates patients awaiting transplant. Research done by Dr. Hoopes and others shows that by re-conditioning patients prior to surgery, there is less risk of complications after transplant, as well as an improvement in their overall outcome.

In recognition of our exceptional care, training and education, as well as achieving optimal levels of performance, innovation, satisfaction, and quality, UK has been designated as a Center of Excellence with receipt of the Excellence in Life Support Award from the Extracorporeal Life Support Organization. UK is among a small number of medical centers in the U.S. to receive a triple designation for its comprehensive ECMO treatment of neonatal, pediatric and adult patient populations.

Getting back on the bike

Mike Hill went to bed the night before his 54th birthday wondering what kind of cake he might have the next day. A phone call early the next morning changed those plans. Instead of cake, he'd get a new heart.

With a history of heart problems dating back to the 1990s, Mike's first heart attack happened while he was at work, operating a bulldozer. Doctors in his hometown of Hazard, were able to place two stents in his heart to open a blockage.

Another heart attack followed in 2010. That time, it was the "widow maker," a type of heart attack that stems from an almost completely blocked left coronary artery that often leads to death. Mike recovered with the help of his doctors in Hazard, but Mike's heart was getting weaker. Knowing that Mike needed a higher level of care, his doctors referred him to the Gill Heart Institute.

"They said my heart was so bad, there was really nothing else they could do for me there," Mike said. "My doctor in Hazard said he had a friend at UK and could get me in to see him. That's when I was introduced to the whole UK team."

In September 2011, Mike saw Navin Rajagopalan, MD, medical director of heart transplantation at the UK Gill Heart Institute. Dr. Rajagopalan adjusted Mike's blood pressure medication and put him on another drug for heart failure that helps the heart pump. He told Mike he would be a good candidate for a heart transplant as he was otherwise fairly healthy. Mike returned home to Hazard to wait for a heart donor. About 5 a.m. on Sept. 19, 2013, Mike's 54th birthday, a nurse from UK called to say a donor heart was on the way.

"We have three grandsons, all boys," Mike said. "That's all that was running through my mind, just to be able to get outside and play with them and enjoy life as it was before."

Later that afternoon, Mike underwent a five-hour surgery to receive his new heart, which had belonged to a 30-year-old man. Mike said he woke up feeling entirely different than before the surgery.

"I felt like my chest was shaking because I hadn't had a normal, beating heart in so long," he said. **"My wife put her hand on my chest, and it was just a joy to feel that new heart inside me beating so strongly."**



Mike Hill

The day after surgery, Mike was able to get out of bed for a while. On the second day, he walked 1.2 miles through the hospital. Mike is back home in Hazard and can now enjoy playing with his grandchildren and has returned to one of his favorite activities – riding his Harley-Davidson Sportster motorcycle.

"Every bike I see or hear, I have to stop and look at it," he said. "They said as soon as I got back home, there's no limitations to what I could do, as long as I feel OK. I'm ready to go."

Heart Failure, Transplant and Mechanical Circulatory Support Faculty



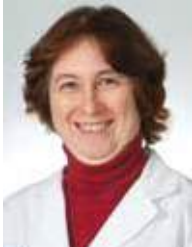
Charles W. Hoopes, MD
Associate Professor of Surgery
Director, Transplant Institute
Director, Mechanical Circulatory Support

- Artificial heart/lung mechanical devices
- End-stage lung disease
- Heart transplantation
- Lung and multi-organ transplantation



David C. Booth, MD
Endowed Professor of Medicine
Director, Pulmonary Hypertension Services
Chief, Cardiology, Lexington VAMS

- Pulmonary hypertension
- Acute cardiac disease
- Heart and lung transplantation



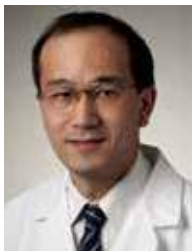
Maya Guglin, MD
Professor of Medicine
Medical Director, Ventricular Assist Devices

- Heart failure



Navin Rajagopalan, MD
Assistant Professor of Medicine
Director, Advanced Heart Failure Program
Medical Director, Cardiac Transplantation

- Cardiomyopathy
- Heart failure
- Heart transplantation
- Pulmonary hypertension



Roh Yanagida, MD
Assistant Professor of Surgery
Heart and Lung Transplant Team

- Extracorporeal membrane oxygenation
- Heart and lung transplantation

Mechanical Circulatory Support and Transplant Coordinators



Donna Dennis, RN, CCTC
Heart Transplant Coordinator



Candice Falls, APRN, ACNP
VAD Nurse Practitioner



Amanda Hart, RN
VAD Coordinator



Thomas Tribble
Mechanical Circulatory Support Technician



The Gift of Life Wall just outside the Gill Heart Institute entrance, honors those who have donated tissues and organs and provided hope and a new life for patients and their families. Nearly 1,000 individuals have donated tissue and organs since UK began its transplant program in 1964.

Heart Failure, Transplant and Mechanical Circulatory Support Publications

Guglin M, Lynch K and Krischer J. Heart failure as a risk factor for diabetes mellitus. *Cardiology*. 2014 [In press].

Rajagopalan N, Guglin M, Hoopes CW. Role of left ventricular assist devices in assessment of patients for combined heart-kidney transplantation. *Am J Transplant*. 2014 Jul 8.

Scholfield M, Schabath MB, **Guglin M**. Longitudinal trends, hemodynamic profiles, and prognostic value of abnormal liver function tests in patients with acute decompensated heart failure: An analysis of the ESCAPE Trial. *J Card Fail*. 2014 Jul;20(7):476-84.

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Haq M, Patel A, **Guglin M**. Cardiac lymphoma: sinus pauses disappear after chemotherapy. *Ann Hematol*. 2014 May;93(5):891-2.

Cousin E, Scholfield M, Faber C, Caldeira C, **Guglin M**. Treatment options for patients with mobile left ventricular thrombus and ventricular dysfunction: A case series. *Heart Lung Vessel*. 2014;6(2):88-91.

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Law C, Khaliq A, **Guglin M**. Reversible cardiogenic shock due to catecholamine-induced cardiomyopathy: A variant of takotsubo? *Am J Emerg Med*. 2013 Nov;31(11):1621.e1-3.

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Yanagida R, Czer LS, Ruzza A, Schwarz ER, Simsir SA, Jordan SC, Trento A. Use of ventricular assist device as bridge to simultaneous heart and kidney transplantation in patients with cardiac and renal failure. *Transplant Proc*. 2013 Jul-Aug;45(6):2378-83.

Guglin M. Heart rate reduction in heart failure: Ivabradine or beta blockers? *Heart Fail Rev*. 2013 Jul;18(4):517-28.

Diaz-Guzman E, **Hoopes CW, Zwischenberger JB**. The evolution of extracorporeal life support as a bridge to lung transplantation. *ASAIO J*. 2013 59:3-10.

Heart Failure, Transplant and Mechanical Circulatory Support Publications, *continued*

Guglin M, Verma S, Chen R. Association between weight loss and improvement of ventricular systolic function in advanced heart failure. *Congest Heart Fail*. 2013 Jul-Aug;19(4):186-91.

Hoopes CW, Kukreja J, Golden J, Davenport DL, Diaz-Guzman E, **Zwischenberger JB**. Extracorporeal membrane oxygenation as a bridge to pulmonary transplantation. *J Thorac Cardiovasc Surg*. 2013 145:862-7.

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Aitchison S, **Hoopes CW**, Roth JS. Venovenous extracorporeal membrane oxygenation for the treatment of acute pulmonary embolism after ventral hernia repair. *Am Surg*. 2013 Apr;79(4):444-6.

Guglin M, Curtis AB. Cardiac resynchronization therapy: 150 is not a magic number! *Circ Arrhythm Electrophysiol*. 2013 Apr;6(2):429-35.

Guglin M, Mehra S, Mason TJ. Comparison of drugs for pulmonary hypertension reversibility testing: A meta-analysis. *Pulm Circ*. 2013 Apr;3(2):406-13.

Miller LW, **Guglin M**. Patient selection for ventricular assist devices: a moving target. *J Am Coll Cardiol*. 2013 Mar 26;61(12):1209-21.

Kaufman M, **Guglin M**. Uric acid in heart failure: A biomarker or therapeutic target? *Heart Fail Rev*. 2013 Mar;18(2):177-86.

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Antonetti I, Lorch D, Coe B, Maxey TS, Nallamshetty L, Dadlani GH, Berlowitz MS, Cohen AJ, **Guglin ME**. Unrepaired tetralogy of fallot with major aortopulmonary collateral arteries in an adult patient. *Congenit Heart Dis*. 2013 Jan-Feb;8(1):E24-30.

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Heart Failure, Transplant and Mechanical Circulatory Support Clinical Trials

Biologic commonalities associated with degeneration in function of cardiac skeletal and respiratory muscles in patients with heart failure

Principal Investigator: Charles W. Hoopes, MD

Extracorporeal membrane oxygenation (ECMO) support compared to mechanical ventilation for acute respiratory failure: a pilot study

Principal Investigator: Charles W. Hoopes, MD

Ex-Vivo lung perfusion (lung in the box) study

Principal Investigator: Charles W. Hoopes, MD

INTERMACS-VAD therapy database

Principal Investigator: Charles W. Hoopes, MD

NIH: Immune activation and myocardial recovery in peripartum Cardiomyopathy

Principal Investigator: Navin Rajagopalan MD

Left atrial pressure monitoring to optimize heart failure therapy (LAPTOP-HF)

Principal Investigator (site): John C. Gurley, MD

Retrograde infusion of JVS-100 for adults with ischemic heart failure (Retro HF)

Principal Investigator (site): John C. Gurley, MD

PASS 2: Effects of combination of bosentan and sildenafil versus sildenafil monotherapy on morbidity and mortality in symptomatic patients with pulmonary arterial hypertension – a multicenter, double-blind, randomized, placebo-controlled phase IV study

Principal Investigator (site): David C. Booth, MD

Inhaled nitric oxide/INOpulse DS for pulmonary arterial hypertension (IKARIA)

Principal Investigator (site): David C. Booth, MD

Cardiovascular Research Center

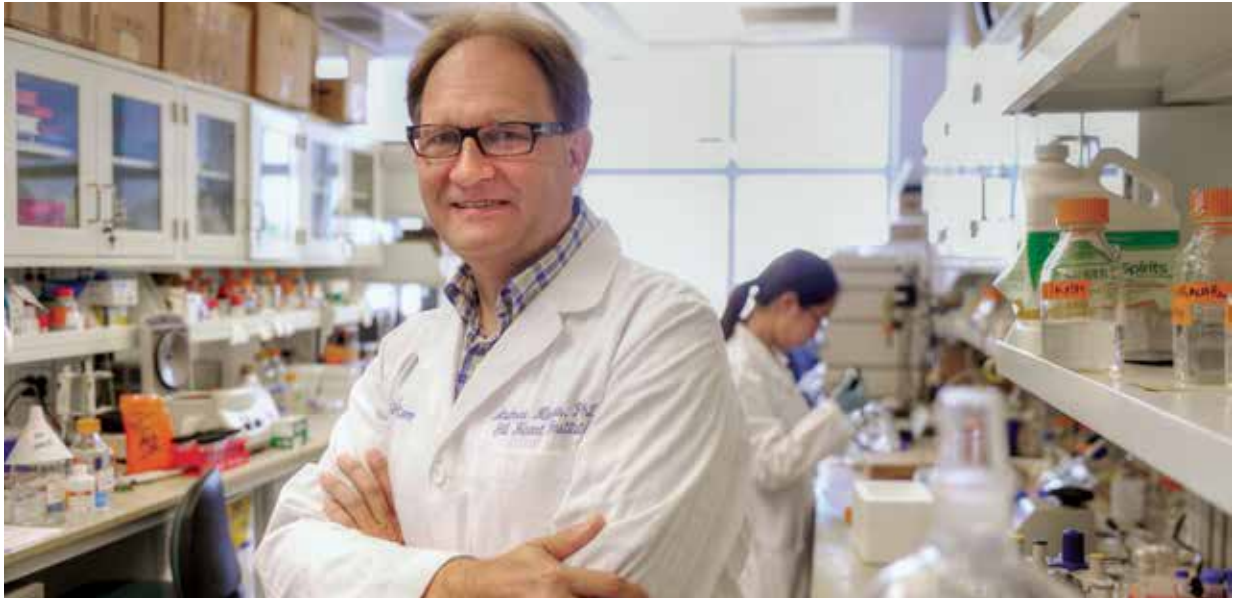
Advancing cardiovascular care through research



“Medicine is not only a science; it is also an art...it deals with the very processes of life, which must be understood before they may be guided.”

– Paracelsus

Cardiovascular Research Center



Andrew J. Morris, PhD, in the small molecule mass spectrometry facility housed within the Biological/Biomedical Sciences Research Building.

Saha Cardiovascular Research Center

Working in partnership with the Gill Heart Institute is the Dr. Siby and Becky Saha Cardiovascular Research Center, where physicians and scientists pursue their research interests alongside basic and translational science researchers, and to translate research discoveries to medical therapies more quickly.

UK was one of 61 institutions to receive a Clinical and Translational Science award to transform and increase the efficiency and speed of clinical and translational research across the country.

Led by director Alan Daugherty, PhD, the Saha CVRC faculty, fellows, staff and students, work on an array of research related to the prevention, diagnosis and treatment of cardiovascular disease. The ranks of Saha CVRC faculty include physicians and scientists drawn primarily from the fields of cardiology, nutrition, endocrinology, physiology and pharmacology. Many faculty hold joint appointments with the Center for Muscle Biology, the Barnstable Brown Diabetes and Obesity Research Center, the Graduate Center for Nutritional Sciences, the College of Medicine, and other areas across the healthcare campus, which exemplifies the university's commitment to interdisciplinary research.

In the last year, UK renewed its T32 in Clinical Cardiovascular Science. UK investigators received a prestigious NIH Director's DP5 Award, a Clinical and Population Research Award, and several K99/R00 awards in cardiovascular investigations.

In the most recent fiscal year, the Saha CVRC totaled \$4.1 million in NIH funding, \$321,000 in American Heart Association Awards, \$164,000 in American Diabetes Association Awards, and an additional \$500,000 from other sources, making it a powerhouse in the field of cardiovascular research.

Dr. Daugherty is editor-in-chief of *Arteriosclerosis, Thrombosis, and Vascular Biology*, the premier journal in the field. Other Saha CVRC faculty serve on committees and editorial review boards for major scientific journals. Members of the core Saha CVRC faculty have published more than 90 papers in the past year, and also presented at numerous national and international conferences.

Three years ago, the NIH awarded UK's Center for Clinical and Translational Science \$20 million to move research discoveries to health care solutions more quickly. Awarded through the NIH's institutional Clinical and Translational Science Awards, this designation makes UK's Center for Clinical and Translational Science a part of a select national biomedical research consortium.

Goals of the University of Kentucky Saha Cardiovascular Research Center:

- To develop a nationally and internationally recognized center of excellence in cardiovascular research.
- To provide an environment for the development and retention of productive faculty.
- To facilitate the training of students, including postdoctoral fellows, graduate students, medical students and residents.
- To encourage the development of translational and clinical research with funding from federal agencies and industry.

Born Lucky

Danny Lucky's life lives up to his surname. In 2007 he became one of the first patients in Kentucky enrolled in the Rheos Pivotal Trial for hypertensive patients whose severe condition does not respond to traditional medical therapy.

The novel hypertension control device therapy consists of an implanted pulse generator and carotid-sinus leads that can lower blood pressure through the stimulation of carotid baroreflex receptors. When the baroreceptors are activated, signals are sent through neural pathways to the brain. In response, the brain sends impulses to slow the heart, dilate blood vessels, and to the kidneys, which excrete sodium and water. As a result, blood pressure lowers. Since the study began in 2007, follow up studies have shown a sustained result for more than five years.

After the Rheos device was implanted, Danny Lucky's blood pressure went from a shaky 200/110 to normal at his most recent appointment in July, 2014. Says Danny, who has also changed his diet and exercise habits for the better: **"I feel very fortunate to have a great last name and to being here today. I now have a second chance at life."**



Dr. Sib Saha (left), Danny Lucky, and Connie Dampier, RN, CT Surgery Clinical Research Manager.

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Cardiovascular Research Center Publications

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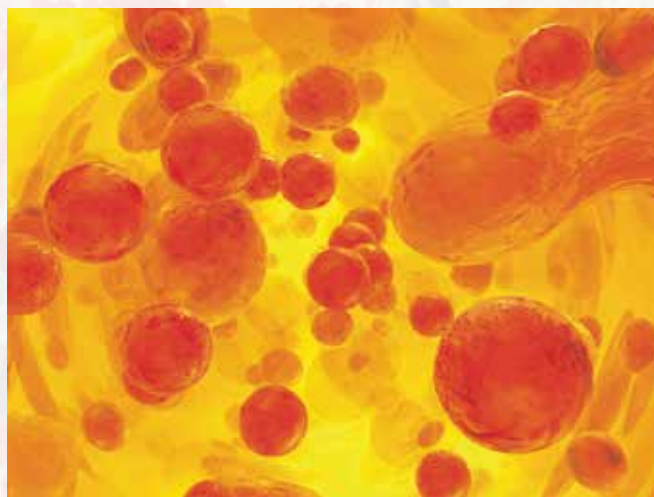
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Cardiovascular Education

Teaching tomorrow's best cardiologists



“ We profess to teach the principles and practice of medicine, or...
the science and art of medicine. Science is knowledge
reduced to principles; art is knowledge reduced to practice.
The knowing and doing, however, are distinct. ... Your knowledge,
therefore, is useless unless you cultivate the art of healing.”

– Sir Samuel Wilks

Cardiovascular Education



Dr. Alison Bailey, co-director of our fellowship program, goes over the finer points of echocardiography.

Teaching tomorrow's best cardiologists

"I strongly believe that education plays the critical role for success in life. Education enables the best opportunities for personal growth and development, career and professional achievement, income and family security, and success in building satisfying relationships."

—Jack M. Gill

The Cardiovascular Fellowship Program at the University of Kentucky is an accredited three-year program. Fellows receive superb clinical training in an active academic medical center, the affiliated Veterans Administration Hospital, and a community experience at the UK Good Samaritan Hospital. The program is geared towards assuring an exceptional educational experience that prepares fellows to provide quality medical care in whatever arena they ultimately pursue. The fellowship provides:



Eric Wallace, DO, receives an award for best poster at last year's Kentucky ACC meeting.

- Dedicated didactic lecture series covering the core curriculum of cardiovascular diseases.
- Specialized lecture series that complement the core curriculum in electrophysiology, EKG interpretation, cardiac imaging, cardiac catheterization, research skills and statistics, and prevention.
- Exposure to state-of-the-art patient care.
- Professionalism in all aspects of patient care, education and research.
- Development of outstanding communication skills with patients, their families, and other health care professionals.
- Team-based approach within a multifaceted health care system to optimize patient care.
- And, most importantly, how to continue the self-learning process well beyond the completion of their fellowship training.

The University is fortunate to have renewed highly competitive extramural support for trainees in the cardiovascular area:

The University of Kentucky T32 Training Program for fellows in Cardiovascular Science – Susan S. Smyth, MD, PhD, Program Director.

Drs. Khaled M. Ziada (left) and Damien Marycz



19

general cardiology fellows

4

interventional cardiology fellows

4

fellows in research training

2

advanced CV imaging fellows, with 3 in 2015

2

cardiac electrophysiology fellows

1

advanced heart failure fellow, beginning in 2015



I-6 surgery resident Michael Bolanos and Dr. Tim Mullet

Six-Year CT Surgery Program

UK's Division of Cardiothoracic Surgery designed its integrated, six-year training program to provide the resident in-depth experience in many aspects of cardiac and thoracic care, which are most relevant to CT surgery. The ACGME-accredited program, directed by Timothy W. Mullet, MD, allows physicians to begin their CT surgery training immediately after graduating from medical school rather than the traditional five years of general surgery.

Having six years in a comprehensive curriculum allows surgical trainees the time necessary to learn many of the skill sets presently being neglected, such as cutting edge catheter-based techniques, cardiac electrophysiology, thoracic oncology, interventional bronchoscopy, benign foregut surgery, and vascular surgery techniques, to name a few. UK's program is divided into three introductory years, where time is allotted for rotations in general surgery, radiology, pulmonary medicine, endoscopy, trauma, cardiology, and cardiac imaging. The training culminates with more intensive, hands-on operative experience in adult cardiac and thoracic surgery, and transplantation.

For more information about our program, contact Residency Program Coordinator, Hannah Pagan at hannah.pagan@uky.edu or call (859) 323-5057.

Cardiovascular Fellows



Neil Aboul-Hosn, DO
Cardiology



Dennis Bruemmer, MD, PhD
Cardiology



Andrew Burchett, MD
Cardiology



Rafael Cavalcanti, MD
Cardiology



Bennet George, MD
Cardiology



Vedant Gupta, MD
*Junior Chief Fellow
Cardiovascular*



Sun Moon Kim, MD
Cardiology



Andrew Kolodziej, MD
Cardiology



John Kotter, MD
Cardiology



Damien Marycz, MD
Cardiology



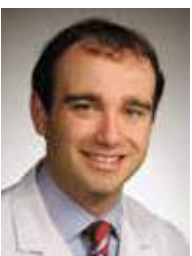
Mohamed Metawee, MD
Cardiology



Kevin Parrot, MD
Cardiology



Martin Rains, MD
*Chief Fellow
Cardiology*



Sebastian Virgadamo, DO
Cardiology



Anthony Voelkel, MD
Cardiology

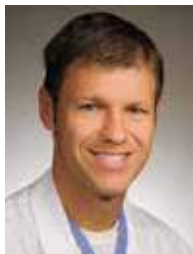


Ryan Wilson, MD
Cardiology



Paul Zellers, DO
Cardiology

Interventional Cardiovascular Fellows



Christopher Adams, MD
Interventional Cardiology



Michael Faulkner, MD
Interventional Cardiology



Eric Wallace, DO
Interventional Cardiology



Madhan Shanmugasundaram, MD
Interventional Cardiology

Electrophysiology Fellows



Yousef Darrat, MD
Electrophysiology



Luis Jimenez-Reyes, MD
Electrophysiology



Michael Mikolaj, MD
Cardiology/Imaging



Arash Sertnaheei, MD
Cardiology/Imaging

Imaging Fellows

Vascular/Endovascular Surgery Fellows



Nathan Orr, MD – PGY8



Noah Scherrer, MD – PGY7

Cardiothoracic Surgery Fellows



Michael Bolanos, MD – PGY2
Integrated Six-Year Surgery Resident



Tyler Gunn, MD – PGY1



Nathan Kister, MD – PGY7



Marion Hochstetler, MD – PGY2

Select Fellow Publications

Wallace EL, Smith MD, and Sorrell VL. Septal perforator size may play a key role in alcohol septal ablation success. *Canadian Journal of Cardiology*. 2014 Aug;30(8):957.e5.

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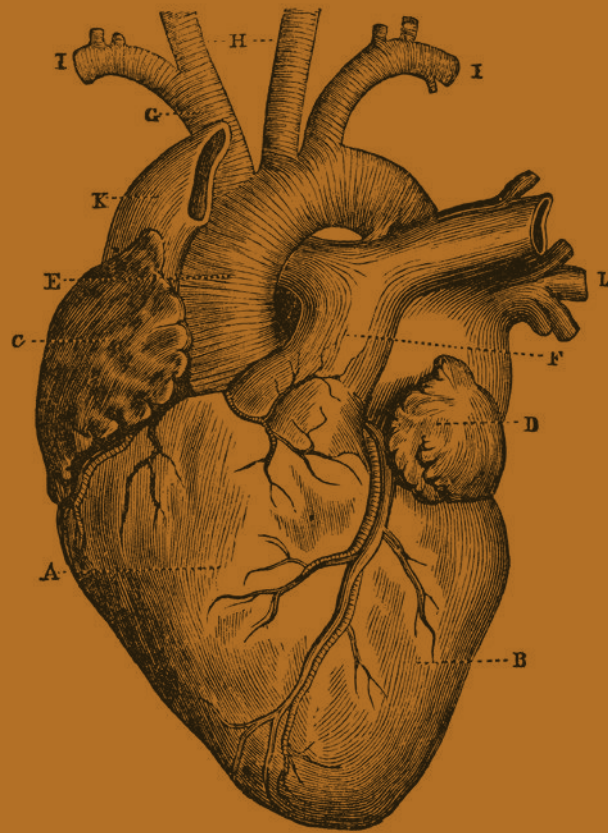
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