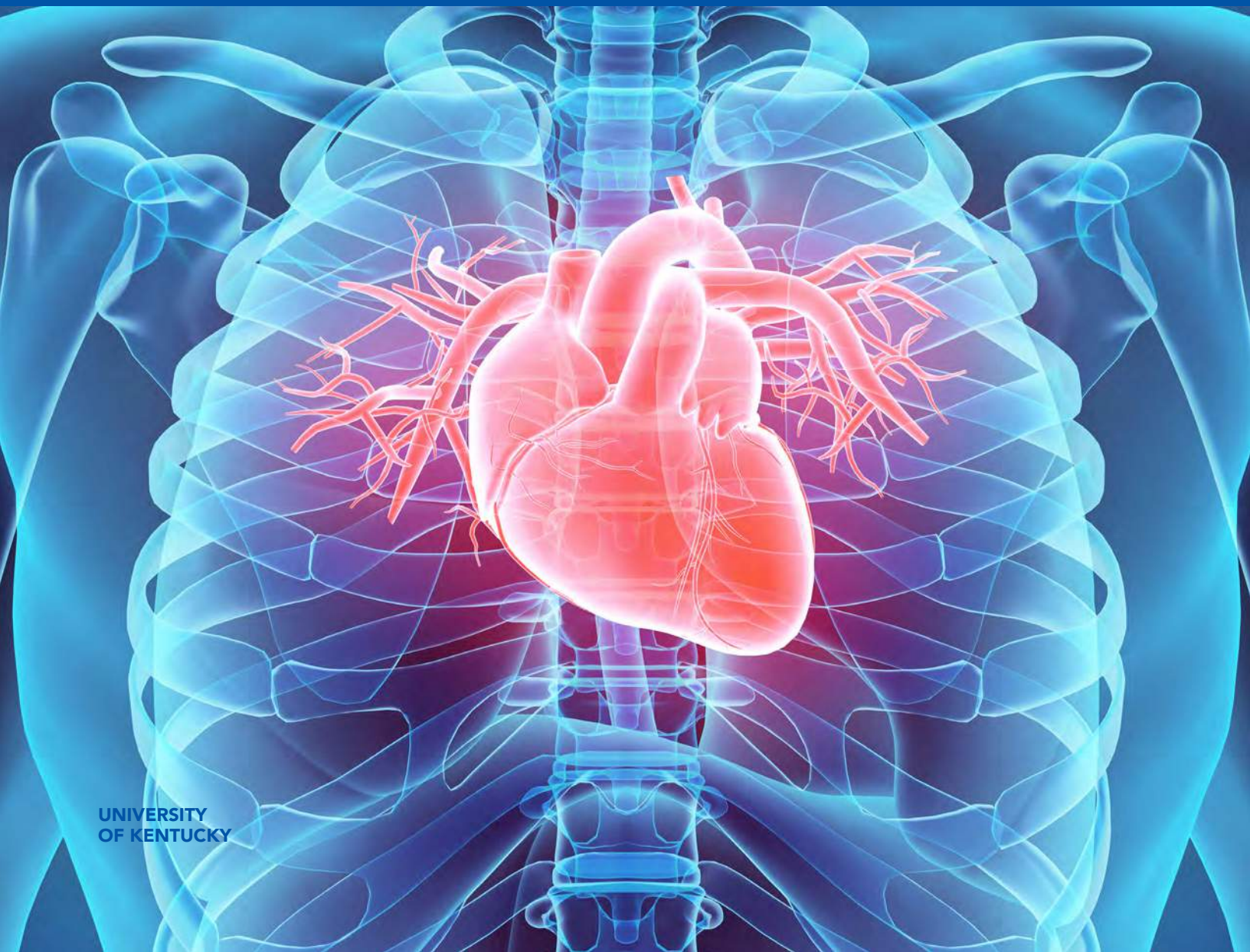


# STATE OF THE HEART

2017



# ABOUT THE **GILL HEART & VASCULAR INSTITUTE**

The UK Gill Heart & Vascular Institute (GHVI) is at the forefront in the battle against heart disease and stroke in Kentucky and is nationally recognized as a leader in advancing the treatment and prevention of cardiovascular disease.

The GHVI was founded in 1997 with a gift of \$5 million from philanthropists Linda and Jack Gill to establish a comprehensive academic program in cardiovascular medicine and science. GHVI's comprehensive approach to heart and vascular health begins with promoting cardiovascular wellness and extends to treating life-threatening complications with the newest therapies and devices.

Our strategic aspiration is to advance cardiovascular care by being a national leader and innovator in comprehensive patient-centered care, research, education and collaboration. Our mission is to provide:

- Seamless, high-quality and comprehensive care that is patient- and family- centered care.
- Value to those we serve (patients, families, referring providers, partners, payers) across the care continuum, at the most appropriate level of care, and at convenient locations across Kentucky and beyond.
- Leading-edge innovation and discovery research as a platform for current and future care.
- Leadership in education.

Our greatest asset is our faculty and staff – 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. The following pages describe our service, accomplishments and our rich history in the field of cardiovascular medicine. 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.



UK Albert B. Chandler Hospital is ranked **No. 1 in Kentucky in the U.S. News & World Report Best Hospitals Ranking.** This acknowledges the exemplary work of our health care team in providing the highest quality patient care in the Commonwealth. UK is committed to being one of the premier academic medical centers in the country, dedicated to serving those who need complex medical care in Kentucky and beyond.





LINDA AND JACK GILL HEART INSTITUTE

“At the University of Kentucky College of Medicine and UK HealthCare we are a national leader in solving the challenges in health care through transdisciplinary and transformational education, research and advanced clinical care. From undergraduate students to seasoned physicians, it is our priority to train and educate those who will change the landscape of health care.”

– **Robert S. DiPaola, MD**  
Dean, UK College of Medicine  
Vice President, Clinical Academic Affairs

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# GILL HEART & VASCULAR INSTITUTE

## LEADERSHIP

**Susan S. Smyth, MD, PhD**  
Director  
Chief, Cardiovascular Medicine

**Michael Sekela, MD**  
Deputy Director

**Eric D. Endean, MD**  
Deputy Director  
Chief, Vascular Surgery

**Justin W. Campbell, MBA, MSHA**  
Associate Hospital Administrator

**Lacey Buckler, DNP, RN, ACNP**  
Assistant Chief Nurse Executive

**Alan Daugherty, PhD, DSc**  
Director, Saha Cardiovascular Research Center

## OFFICE OF THE EXECUTIVE VICE PRESIDENT FOR HEALTH AFFAIRS

**Mark F. Newman, MD**  
Executive Vice President for Health Affairs

**Robert S. DiPaola, MD**  
VP & Dean, UK College of Medicine

**Craig C. Collins**  
VP & Chief Financial Officer

**Robert “Bo” Cofield**  
VP & Chief Clinical Operations Officer

**Mark D. Birdwhistell**  
VP for Administration & External Affairs



# PROGRAMS

## CLINICAL CARDIOLOGY

- Preventative and General Cardiology
- Cardiac Rehab and Wellness
- Women's Heart Health
- Affiliate Network
- Integrative Medicine

## ADVANCED CARDIOVASCULAR IMAGING

## CARDIAC AND VASCULAR SURGERY

# GILL HEART & VASCULAR INSTITUTE

AT A GLANCE

## ADVANCED SPECIALTY PROGRAMS

- Adult Congenital Heart Disease
- Regenerative Medicine
- Vascular Medicine
- Pulmonary Hypertension

## INTERVENTIONAL SERVICES & ELECTROPHYSIOLOGY

- Heart Attack Emergency Care
- Interventional Cardiology
- Structural and Valvular Heart Disease
- Electrophysiology and Heart Rhythm

## HEART FAILURE, TRANSPLANT AND MCS





# CLINICAL CARDIOLOGY

The Gill Heart & Vascular 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 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. More than 50 of our nurses are certified in critical care areas that include transplant, cardiothoracic surgery and complex cardiovascular cases. As we continue as

a quaternary destination site, our case-mix index, a measure of the clinical complexity of care has risen above the 75th percentile among teaching hospitals. 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. While the care we provide has become more complex and diverse, we maintain the highest standards of quality.

# CLINICAL CARDIOLOGY



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

39

CCRN Critical Care-Certified Nurses

3

CMC Cardiac Medicine-Certified Nurses

1

National Telemetry Nurse Specialist

3

CSC Cardiac Surgery-Certified Nurses

1

CCTN (Transplant)-Certified Nurse



# CLINICAL CARDIOLOGY

## INTERIORS GET TO THE HEART OF DESIGN

Innovative research conducted by University of Kentucky College of Design faculty Lindsey Fay and Allison Carll-White and their students is getting to the heart of health care design. The researchers, in partnership with UK HealthCare, recently completed a pre- and post-occupancy evaluation for the new eighth floor cardiovascular unit at Albert B. Chandler Hospital-Pavilion A.

As new facilities in Pavilion A opened in recent years, UK HealthCare had approximately a year dedicated to the design of its cardiovascular floor. The process, which involved providers, staff and facilities personnel, aimed to create an uplifting, healing space. As the group proceeded they also began receiving feedback from employees as to what impacts the changes might make on service.

Dr. Susan Smyth sees only positives to this research-based design approach as UK HealthCare continues to grow:

“To be able to collect data in terms of how effective this care delivery model is, how active the nurses are on the floor, how this has impacted care really will be of critical value as we roll out new floors and as we try to tweak what we’re doing on a day-to-day basis,” said Smyth.



## PREVENTATIVE AND GENERAL CARDIOLOGY

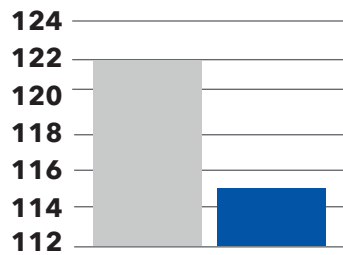
General cardiology services at the Gill Heart & Vascular Institute include preventive cardiology, sophisticated diagnostic and treatment services, and referral as needed to one of our dedicated cardiology specialty programs. Our team excels in collaboration, bringing together physicians from all areas of cardiology to create an individualized diagnosis and treatment program for each patient. Housed within the Gill building, the heart center provides all patient care in the same location. This includes clinics, non-invasive cardiac diagnostics and interventional cardiac techniques such as cardiac catheterization, angioplasty and electrophysiology. The GHVI also provides a base for the physicians providing this care, and has special focus on counseling cardiac patients and their families.



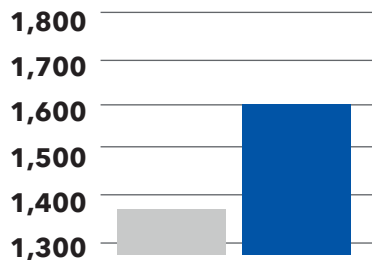


## 2016 CARDIOVASCULAR REHABILITATION OUTCOMES DATA

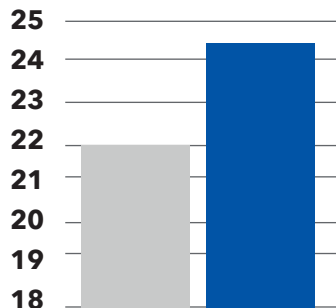
■ At Entry ■ On Completion



Systolic Blood Pressure



Six-minute Walk Distance



Quality of Life

## REHAB AND WELLNESS

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. The cardiac rehab team includes a cardiologist, cardiac nurse, cardiac physiologist and a nutritionist. 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 aim 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.



## WOMEN'S HEART HEALTH



**Gretchen Wells, MD, PhD**  
Thomas F. Whayne Professor in  
Women's Health  
Director of Women's Heart Health  
Professor of Medicine  
• General cardiology  
• Women's heart health

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. 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 and Vascular Institute's Women's Heart Health Program was created to serve the needs of women by providing a comprehensive approach to their cardiac care.

This year, we have continued taking steps in launching our cardio-oncology program. Cancer outcomes have improved tremendously with cancer death rates declining overall by 25 percent in the past 25 years, due largely to more effective chemotherapy drugs, including anthracycline drugs and trastuzumab (Herceptin). These drugs unfortunately may cause acute cardiac effects or long-term cardiac effects. The American Society of Clinical Oncology recently released guidelines for the screening and diagnosis of cardiotoxicity in this setting, but optimal treatment strategies remain elusive. The Women's Heart Health program is collaborating with Medical Oncology to identify





these women early and to begin treatment. We have also been invited to participate in a multicenter NIH-funded trial of medications targeted to prevent the development of cardiotoxicity in this high-risk population. This trial will also leverage our strengths in cardiac imaging.



## VOLCANO COMBOMAP TARGETS MCD IN WOMEN

For years, women with chest pain and abnormal stress tests who underwent cardiac catheterization only to find no obstructive coronary artery disease were reassured that “everything was okay.” However, the data told a different story: These women were at a much higher risk compared with those women who did not have cardiac symptoms and/or normal stress tests. Microvascular coronary dysfunction (MCD), defined as either limited coronary flow

reserve or endothelial dysfunction, is the primary mechanism of ischemia in these women and is found in 50 percent of women with the triad of persistent chest pain, no obstructive coronary artery disease and ischemia as evidenced by stress testing. This year saw the arrival of the Volcano Corporation ComboMap<sup>®</sup> system to the GHVI cardiac catheterization laboratory, a one of a kind system allowing for the definitive diagnosis of MCD in this population of women.



## PATIENT CARE, RESEARCH AND COMMUNITY SERVICE UNITE AROUND RARE DISEASE

In 2015, identical twins Gardner and Jon Wes Adams, then in their mid-20s, both nearly died when their hearts suddenly stopped beating.

Jon Wes' heart stopped first, while he was running. Bystander CPR kept him alive until EMS arrived. At the Gill Heart & Vascular Institute, doctors ran a battery of tests to determine why this healthy young man went into cardiac arrest. When results indicated Brugada syndrome, the care team knew they needed to test his twin. They weren't surprised to find that he had the syndrome, too.

Jon Wes received an implantable cardioverter defibrillator (ICD). Due to increased hereditary risk in Brugada syndrome, Gardner and the doctors decided that he, too, should receive an ICD.

Only months later, Gardner's heart stopped while he was running. The ICD saved his life.

Genetic testing revealed a mutation in the twins. Their brother and father also had the mutation, but they had no symptoms.

With support from a high-impact pilot award from the UK Center for Clinical and Translational Science, Samy Claude Elayi, MD, and a multidisciplinary group of researchers are trying to find answers. The team includes Mark Farman, PhD, associate director of UK Genomics, and Brian Delisle, PhD and Jonathan Satin, PhD, both professors of physiology. The case inverts the oft-quoted paradigm of "bench to bedside."

The researchers are looking at cells from the family with the hypothesis that they will exhibit differences in electrophysiological properties and gene expression patterns. Blood samples were sent to collaborators at Stanford Cardiovascular Institute, where they reprogram them into inducible pluripotent stem cells (iPSC). The iPSCs will then be sent back to UK, where Satin will make them into heart cells the team can study.

The team hopes to make a type of cardiomyocyte that few labs have been able to create, which

would constitute a major advancement of science at UK. They also hope that better knowledge of the genetic factors of Brugada syndrome could advance treatment.

Elayi and Jon Wes are taking their story into the community to emphasize the importance of CPR. They visited a Lexington middle school to talk with students who had just received CPR training. Jon Wes told his story of being saved by CPR, and Elayi shared facts about the heart, demonstrated CPR and how to use an AED.

"I go to schools because CPR saved my life," said Jon Wes. "I think the earlier we can teach students about heart health, the better."

"When the kids learn about CPR, it's all theoretical, but when someone who made it because of CPR tells you their story, it's different. It's real life and it's personal," Elayi said.



Gardner and Jon Wes Adams



# CLINICAL CARDIOLOGY

## CARDIOLOGY FACULTY



**Susan S. Smyth, MD, PhD**  
Jeff Gill Professor of Cardiology  
Chief, Division of Cardiovascular  
Medicine  
• General cardiology  
• Antithrombotic therapy



**Thomas F. Whayne Jr., MD, PhD**  
Professor of Medicine  
Director, Lipid Management Clinic  
• General cardiology  
• Heart disease prevention



**Paul Anaya, MD, PhD**  
Associate Professor of Medicine  
• Echocardiography  
• Nuclear cardiology  
• Critical care cardiology



**Meenakshi Bhalla, MD**  
Director, Preventive Cardiology  
• Mechanical circulatory support  
• Preventive cardiology  
• Pulmonary hypertension  
• Women's heart health



**Craig Chasen, MD**  
Associate Professor of Medicine  
• Clinical Cardiology  
• General cardiology  
• Heart disease prevention



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



**John Kotter, MD**  
Assistant Professor of Medicine  
• General cardiology  
• Echocardiography



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



**Gretchen Wells, MD, PhD**  
Thomas F. Whayne Professor in  
Women's Health  
Director of Women's Heart Health  
Professor of Medicine  
• General cardiology  
• Women's heart health

## RELEVANT PUBLICATIONS

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**Whayne TF, J**. Medical Management and Risk Reduction of the Cardiovascular Effects of Underwater Diving. Current Vascular Pharmacology. 2017. In press.

**Whayne TF, J**. Is There an Ideal Low-Density Lipoprotein Cholesterol Level? Confusion regarding Lipid Guidelines, Low-Density Lipoprotein Cholesterol Targets, and Medical Management. The International Journal of Angiology: Official Publication of the International College of Angiology, Inc. 2017. 26(2): 73-77.

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**Kotter J**, Lolay G, Charnigo R, Leung S, McKibbin C, Sousa M, Jimenez L, Gurley J, Biase LD, Natale A, **Smyth S**, Darrat Y, Morales G, Elayi CS. Predictors, Morbidity, and Costs Associated with Pneumothorax during Electronic Cardiac Device Implantation. Pacing and Clinical Electrophysiology: PACE. 2016. 39(9): 985-991.

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Guglin M, Rajagopalan N, **Anaya P**, Charnigo R. Sildenafil in Heart Failure with Reactive Pulmonary Hypertension (Sildenafil HF) Clinical Trial (rationale and design). Pulmonary Circulation. 2016. 6(2): 161-167.

**Wells GL**. Cardiovascular Risk Factors: Does Sex Matter? Current Vascular Pharmacology. 2016. 14(5): 452-457.



## CLINICAL TRIALS

GHVI Cardiology Research Center is designed to facilitate all aspects of patient-based clinical research. This includes coordination of Phase I-IV multicenter trials and support of the infrastructure for clinical trials as well as education of faculty and fellows in clinical research methodology.

**Aegis-2001:** A Phase 2, Multicenter, Double-blind, Randomized, Placebo-controlled, Parallel-group, Study to Investigate the Safety and Tolerability of Multiple Dose Administration of CSL112 in Subjects with Moderate Renal Impairment and Acute Myocardial Infarction

Primary Investigator:  
**John Kotter, MD**

**Emanate:** A Phase IV Trial to Assess the Effectiveness of Apixaban Compared with Usual Care Anticoagulation in Subjects with Non-Valvular Atrial Fibrillation Undergoing Cardioversion

Primary Investigator:  
**Adrian Messerli, MD**

**Re-Dual:** A prospective Randomized, open label, blinded endpoint (PROBE) study to Evaluate DUAL antithrombotic therapy with dabigatran etexilate (110mg and 150mg b.i.d.) plus clopidogrel or ticagrelor vs. triple therapy with warfarin (INR 2.0-3.0) plus clopidogrel or ticagrelor and aspirin in patients with non valvular atrial fibrillation (NVAf) that have undergone a percutaneous coronary intervention (PCI) with stenting

Primary Investigator:  
**Adrian Messerli, MD**

**Cardiovascular Inflammation Reduction Trial (CIRT)**

Primary Investigator:  
**Adrian Messerli, MD**



## TOP SPOT AS PREFERRED PROVIDER

According to the Kentucky Hospital Association's first-quarter 2017 inpatient data, UK HealthCare's Gill Heart and Vascular Institute has claimed the top spot as Lexington's preferred provider of cardiovascular care. GHVI's market share has increased every fiscal year since 2010, and with a share of 35.9 percent in the first quarter of fiscal year 2017 surpassed that of all other Lexington hospitals. "Our physicians and staff have worked

tirelessly to provide top-notch cardiovascular care to patients in Kentucky and beyond," said Dr. Susan Smyth, director of the Gill Heart & Vascular Institute. "This milestone is a reflection of that work and I couldn't be more proud of this team." Gill is also a leader in heart transplantation services and ranked Top 10 in the U.S. in the number of heart transplants performed in the 2015-16 fiscal year.

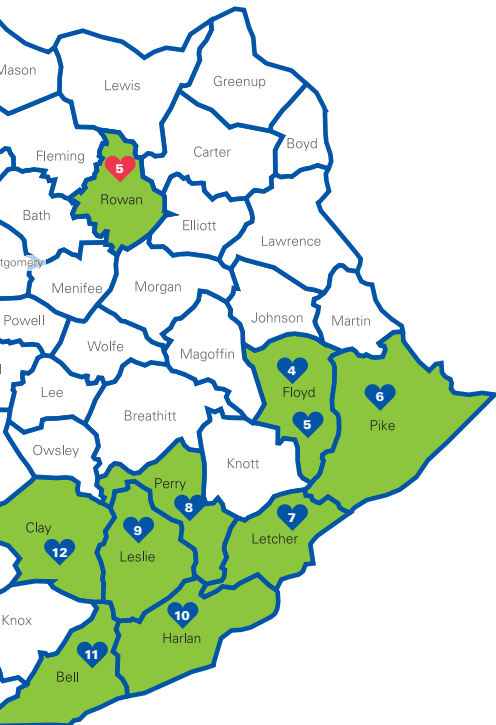






## OUTREACH CLINICS

1. Louisville  
Norton Audobon Hospital
2. Frankfort  
Frankfort Regional Medical Center
3. Danville  
Ephraim McDowell Regional Center
4. Mount Vernon  
Rockcastle Regional Hospital
5. Morehead  
St. Claire Regional Medical Center
6. Huntington, WV  
Marshall University (not shown)



## AFFILIATE PARTNERS

1. Georgetown  
Georgetown Community Hospital
2. Cynthiana  
Harrison Memorial Hospital
3. Winchester  
Clark Regional Medical Center
4. Prestonburg  
Highlands Heart and Vascular
5. McDowell  
McDowell ARH Hospital
6. South Williamson  
Tug Valley ARH
7. Whitesburg  
Whitesburg ARH Hospital
8. Hazard  
Hazard ARH Regional Medical Center
9. Hyden  
Mary Breckinridge ARH Hospital
10. Harlan  
Harlan ARH Hospital
11. Middlesboro  
Middlesboro ARH Hospital
12. Manchester  
Manchester Memorial Hospital
13. Owensboro  
Owensboro Health Regional Hospital

## GILL HEART NETWORK PHYSICIANS



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



**Michael McKinney, MD**  
Assistant Professor  
Lake Cumberland Regional Hospital



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



**Joseph Thomas, MD**  
Assistant Professor of Medicine  
Georgetown Community Hospital

# INTEGRATIVE MEDICINE

## NARRATIVE MEDICINE



**Robert Slocum, MD**

Narrative Medicine sessions can encourage patients to rediscover personal identity and meaning by telling or writing their stories. Insights from Narrative Medicine visits may also be helpful for the treatment team as they seek to assess patient needs, attitudes, and abilities. Though talking

points vary greatly from patient to patient, one thing that remains consistent in each session are a series of questions asked by Narrative Medicine Facilitator Dr Robert Slocum, the first being:

**“What is your source of hope?”**

Heart disease can change a person’s life overnight. For many this could mean unexpected financial burdens, taxing treatments and time away from loved ones. Slocum believes the way to maintain patient hope is through patients sharing their story and experiences. Opportunities for self-expression

and reflection can enhance patients’ quality of life as they put their experiences and perceptions into words and clarify their own understandings.

Narrative medicine is just one of the ways that Gill Heart and Vascular Institute has worked to nurture hope, strength and courage in their patients. Their integrative medicine program helps to find alternative medicine practices that complement a patient's existing treatment. Gill offers a wide range of integrative programs including narrative medicine, journaling, art therapy, healthy food cooking demonstrations and relaxation techniques such as Jin Shin Jyutsu, yoga and Tai Chi.

## CARMINE AND SELAH, THD

Pet therapy provides comfort through companionship. Interacting with a calm, goodnatured pet provides a number of physical and mental health benefits. Pet therapy can:

- Provide relaxation.
- Lower blood pressure.
- Lessen anxiety.
- Improve depression.
- Increase socialization.
- Reduce loneliness.

Last year, Carmine, an English Labrador Retriever, came to the Gill Heart & Vascular Institute to help get cardiovascular

patients up and walking. Carmine, now 2 ½ years old, has been a source of inspiration and motivation to patients that have been in the hospital for extended periods. Cardiovascular patients that were once too weak to get out of bed are now able to walk off the hospital floor and enjoy lunch outside thanks to Carmine and his therapy visits. Now his 1- year old sister, Selah, is here to help patients recover as well. Together, they drive home the notion that cardiovascular patients who get moving soon after treatment tend to recover better and faster.





# ADVANCED CARDIOVASCULAR IMAGING

## ECHOCARDIOGRAPHY



GHVI's Adult Echo Lab has a longstanding commitment to providing excellent care and education to people in Kentucky. Accredited by the Intersocietal Accreditation Commission

for Echocardiography Laboratories (ICAEL) continuously since 1999. All of our interpreting cardiologists are certified by the National Board of Echocardiography and together possess multiple decades of cardiac sonographer experience.

Historically, the adult echo lab faculty contributed to developments in Doppler, color-flow imaging and 3-D echo. Today, the echo lab provides essential support for the GHVI Structural Heart Program, including during TAVR, mitral valve and left atrial occlusion procedures. 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. GHVI has participated in early clinical research on nearly all of the new imaging technologies, including color Doppler, spectral Doppler, stress, trans-esophageal, and 3-D echo.

## IMPROVING PATIENT EXPERIENCE AND RESULTS IN PEDIATRIC IMAGING

Article excerpt from *Journal of Cardiovascular Magnetic Resonance*, Sep. 2016.

Advanced medical imaging, such as magnetic resonance imaging (MRI), plays an important role in the evaluation of heart disease, particularly for children with complex congenital heart disease. To get clear images of the heart, it is important to account for a subject's breathing. This restriction lengthens the time a subject needs to remain motionless inside the magnet, which may be a challenge for young children.

Researchers in the Gill Heart & Vascular Institute recently completed a project to help address these challenges in a very kid-friendly way using a videogame. The team designed a videogame that can be viewed and "played" while inside the magnet, in which the subject moves a fish character on the screen by breathing in and out. The object of the game is to acquire points by eating bubbles with the fish. To test the videogame, the team recruited healthy kids and

collected images of their hearts while playing the videogame. As expected, they found that playing the game reduced the scan time by half and slightly improved the image quality. The game is now being shared with other institutions, including children's hospitals, to help sick kids who need a heart MRI.

Hamlet SM, Haggerty CM, Suever JD, Wehner GJ, Grabau JD, Andres KN, Vandsburger MH, Powell DK, Sorrell VL, Fornwalt BK. An interactive videogame designed to improve respiratory navigator efficiency in children undergoing cardiovascular magnetic resonance. *J Cardiovasc Magn Reson*. 2016 Sep 6;18(1):54. doi: 10.1186/s12968-016-0272-z

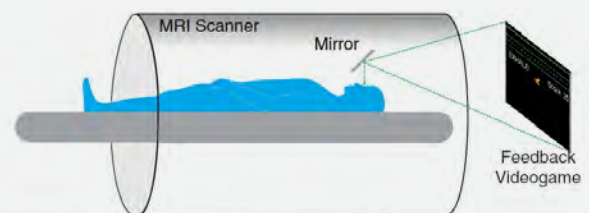
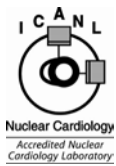


Fig. 2 Feedback videogame was shown to children during CMR with an angled mirror and MR-compatible projector

## NUCLEAR CARDIOLOGY



The GHVI Exercise Physiology and Nuclear Lab offers exercise and pharmacologic perfusion imaging studies. No diagnostic imaging tool can compare with the vast experience and history provided by nuclear cardiology. For more than 60 years, nuclear SPECT myocardial perfusion imaging testing has been safely performed, and it is now considered the most robust, reproducible and accurate tool to assess patients with known or suspected coronary artery disease (CAD). Since more than 500,000 men and women in the U.S. die each year from CAD, this remains a highly requested exam. Nuclear imaging exposes patients to a small amount radiation. The nuclear cardiology team has worked diligently to greatly lower this radiation exposure, and we have successfully arrived at much lower radiation doses while maintaining high-quality images.

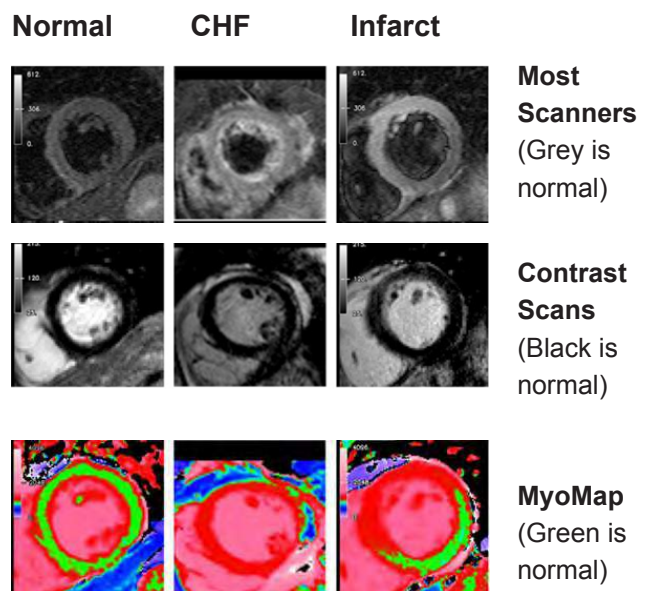
The GHVI Nuclear Lab is accredited by Intersocietal Accreditation Commission for Nuclear Laboratories (ICANL).

## CARDIAC MRI

Two MRI scanners – the 1.5 Tesla and 3.0 Tesla – expand UK's advanced imaging capabilities. In addition to routine cardiac MRI studies, real-time, 3-D time-resolved MRA, LV strain imaging and pharmacologic stress MRI are regularly performed. Cardiovascular MRI (CMR) stress examinations are safer, quicker and more accurate than nuclear stress testing and an important area of diagnostic growth for the Gill Imaging Center. Also, the GHVI is one of only a few sites in the country that has the capability to routinely perform MRI scans in patients with pacemakers and ICDs. In collaboration with researchers from UCLA, our physicians have combined these imaging capabilities to perform stress perfusion CMR in patients with a pacemaker.

## CARDIAC CT

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. Both CT and MRI are accredited by the American College of Radiology. The Gill Imaging Center offers the latest state-of-the-art FDA approved CT scanner, which is a 384-slice dual detector system that is capable of performing an entire cardiac image exam within one heartbeat. The scanner also utilizes advanced image reconstruction software that requires fewer X-rays to achieve better image quality. The impact of this technology is less radiation exposure, less contrast and a higher-quality image. With this scanner the reduction in radiation exposure is significant (>90 percent reduction compared to previous exposure).



"T1 mapping comprises an important part of the imager's armamentarium for differentiating cardiomyopathies. It [may] supersede the [need for contrast]. It is with confidence that we state that the age of noninvasive myocardial biopsy is upon us."



# ADVANCED CARDIOVASCULAR IMAGING



## CARDIOVASCULAR IMAGING FACULTY



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

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



**Michael A. Brooks, MD**  
Associate Professor of Radiology  
Co-director, Cardiothoracic Imaging

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



**Vedant Gupta, MD**  
Assistant Professor of Medicine

- Echocardiology
- Advanced cardiac imaging



**Stephen B. Hobbs, MD**  
Medical Director, Radiology Informatics and Information Technology  
Assistant Professor of Radiology

- Diffuse pulmonary parenchymal diseases
- Infiltrative cardiomyopathies
- Pulmonary hypertension

## CARDIOVASCULAR IMAGING FACULTY



**John Kotter, MD**  
Assistant Professor of Medicine  
• General cardiology  
• Echocardiography



**Steve Leung, MD**  
Assistant Professor of Medicine  
Associate Director, Advanced  
Cardiovascular Imaging  
Director, Cardiovascular MRI,  
Lexington VAMC  
• Cardiovascular MRI and CT  
• Echocardiography  
• Nuclear cardiac imaging



**Conor Lowry, MD**  
Assistant Professor of Radiology  
• Cardiomyopathy  
• Interstitial lung disease  
• Lung cancer



**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



**Mikel D. Smith, MD**  
Professor of Medicine  
Alberto Mazzoleni Professor of  
Cardiology  
Director, Echocardiography Laboratory  
• Cardiovascular disease  
• Echocardiography  
• Valvular heart disease



**Michael A. Winkler, MD**  
Assistant Professor of Radiology  
• Cardiovascular computed tomography  
(CT)  
• Coronary artery disease  
• Pericardial disease



**Marianna Zagurovskaya, MD**  
Assistant Professor of Radiology  
Director, Nuclear Cardiology  
• Diffuse lung diseases  
• Cardiovascular diseases  
• Lung cancer

## RELEVANT PUBLICATIONS

Gupta VA, Nanda NC, **Sorrell VL**. Role of Echocardiography in the Diagnostic Assessment and Etiology of Heart Failure in Older Adults: Opacify, Quantify, and Rectify. *Heart Failure Clinics*. 2017. 13(3): 445-466.

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Harolds JA, Guiberteau MJ, **Oates ME**. Recruitment into a Combined Radiology/Nuclear Medicine Subspecialty. *Journal of the American College of Radiology: JACR*. 2017. 14(1): 122-124.

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Walker CM, **Hobbs SB**, Carter BW, Chung JH. Dyspnea, Cough, and Abnormal Thoracic Imaging after Lung Transplantation. *Annals of the American Thoracic Society*. 2016. 13(1):134-136.

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## CLINICAL TRIALS

Protocol CV002004: A Longitudinal Evaluation of Disease & Fibrosis Biomarkers in Different Groups of Heart Failure Patients to Enhance the Early Clinical Development of Compounds with Anti-fibrotic Activity in the Heart (Bristol Myers Squibb)

Primary Investigator: **Vincent Sorrell, MD**

Opus Registry

Primary Investigator: **David C. Booth, MD**

International Study of Comparative Health Effectiveness with Medical and Invasive Approaches (ISCHEMIA)

Primary Investigator: **David C. Booth, MD**



# ADVANCED CARDIOVASCULAR IMAGING



## CARDIOVASCULAR IMAGING FELLOWSHIPS

Our advanced cardiovascular imaging (ACI) fellowship program is unique in that there is a close collaboration between cardiology and radiology. This program offers 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 multidisciplinary team imaging ventricular mechanics, ischemic heart disease, hypertrophic cardiomyopathy, congenital heart disease and valvular disease. Currently three fellows are training in advanced CV imaging.

In addition to our advanced cardiac imaging fellowship, an echocardiography fellowship has been approved. This fellowship will blend nicely with the ACI fellowship in that fellows will improve their echo skills by participating in the ACI activities and the ACI fellows will have an opportunity to expand their ECHO skills through advanced echo fellowship rotations. With the growth of the structural heart program, echo (transesophageal, transthoracic and intracardiac) is becoming more widespread in the cath labs, hybrids labs, EP labs and operating rooms.

16

Registered Diagnostic  
Cardiac Sonographers

2

Certified Nuclear  
Cardiology  
Technologists

8

Dedicated  
Cardiovascular  
Technologists

4

Cardiovascular Magnetic  
Imaging Resonance  
Imaging Technicians

# ADVANCED SPECIALTY PROGRAMS

## ADULT CONGENITAL HEART DISEASE

The Kentucky Adult Congenital Heart (KACH) Program at the UK Gill Heart & Vascular Institute is the only such program in Central and Eastern Kentucky. Our experts provide personalized, adult-focused care and treatment of congenital heart defects. Our KACH program is led by Andrew R. Leventhal, MD, PhD, one of only a few adult congenital heart disease specialists in the nation. With broad cardiovascular disease experience – including heart valve repair, structural heart conditions and interventional cardiology – Dr. Leventhal provides personalized, expert management and treatment of your unique congenital heart condition.

## ADULT CONGENITAL HEART DISEASE FACULTY



**Andrew Leventhal, MD, PhD**  
Director, Adult Congenital Heart Disease  
Assistant Professor of Medicine

- Adult congenital heart disease
- Structural heart program
- Cardiac catheterization



**Douglas Schneider, MD**  
Chief, Division of Pediatric Cardiology  
Medical director, Kentucky Children's Hospital Congenital Heart Program  
Director, Pediatric Catheterization Lab

## RELEVANT PUBLICATION

George B, Voelkel A, Kotter J, **Leventhal A**, Gurley J. A Novel Approach to Percutaneous Removal of Large Tricuspid Valve Vegetations using Suction Filtration and Veno-Venous Bypass: A Single Center Experience. *Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Intervention*. 2017. In Press.

## CLINICAL TRIAL

Pulmonary Hypertension Clinical Trials

COMPASSION S3: COngenital Multicenter trial of Pulmonic vAlve dysfunction Studying the SAPIEN 3 interventIOnal THV

Primary Investigator: **Andrew Leventhal, MD, PhD**

## NATIONAL PERT CONSORTIUM



The GHVI is a founding member of the National Pulmonary Embolism

Response Team (PERT) Consortium. Established in 2015, the consortium “brings together clinicians who focus on pulmonary embolism to better the treatment of these patients.” Using a multidisciplinary approach, the consortium enables rapid evaluation of risks, formulation of a treatment plan and mobilization of the necessary resources to provide the highest level of care to those in need. The PERT Consortium was established to guide and influence pulmonary embolism (PE) care and research in institutions across the U.S. and to be the driving force behind increased survival rates and the future of PE treatment.



## PULMONARY HYPERTENSION

The Gill Heart & Vascular 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, pulmonologists and nurse practitioners who work together to help patients who suffer from this condition. We employ a collaborative approach that involves screening, diagnosis – including right heart catheterization with vasodilator testing and pharmacologic as well as non-pharmacologic management – oral and inhaled therapies, intravenous and subcutaneous infusion treatments, and cardiopulmonary rehabilitation. For those who do not respond sufficiently to treatment, referral to our lung transplant specialists is provided.

David Booth, MD, of the Gill Heart & Vascular Institute and Joey Maggard of the American Heart Association were recently featured on WKYT-TV to educate Kentuckians about the differences between hypertension and pulmonary hypertension.



## PULMONARY HYPERTENSION FACULTY



**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



**Ketan Buch, MD**  
Associate Professor of Medicine

- COPD
- Pulmonary Hypertension
- Critical care medicine
- Respiratory illness associated with neuromuscular diseases



**Andrew Kolodziej, MD**  
Assistant Professor of Medicine

## RELEVANT PUBLICATION

Acharjee S, Teo KK, Jacobs AK, Hartigan PM, Barn K, Gosselin G, Tanguay JF, Maron DJ, Kostuk WJ, Chaitman BR, Mancin GB, Spertus JA, Dada MR, Bates ER, **Booth DC**, Weintraub WS, O'Rourke RA, Boden WE, COURAGE Trial Research, G. Optimal Medical Therapy with or without Percutaneous Coronary Intervention in Women with Stable Coronary Disease: A Pre-specified Subset Analysis of the Clinical Outcomes Utilizing Revascularization and Aggressive druG Evaluation (COURAGE) Trial. American Heart journal. 2016. 173: 108-117.

# ADVANCED SPECIALTY PROGRAMS

## THROMBOSIS PREVENTION AND MANAGEMENT FACULTY



**George A. Davis, PharmD**  
Anticoagulation Pharmacy Specialist



**Eleftherios S. Xenos, MD, PhD**  
Associate Professor of Vascular Surgery  
Associate Chief Medical Director  
Medical Director of Patient Safety  
Medical Director of Vascular Laboratory

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

## REGENERATIVE MEDICINE

The use of stem cells in cardiac repair after heart attack and in heart failure has gained attention in the scientific and clinical fields alike. Heart failure is approaching an epidemic state in the Western World and is mostly caused by heart attacks that damage large portions of the heart muscles. While no therapies exist to replace the dead heart tissue, new and exciting treatments, using stem cells aimed at repairing heart damage after a heart attack, a process called regeneration, have emerged. The research team at the Gill Heart & Vascular Institute, led by Drs Ahmed Abdel-Latif and Michael Sekela, is harnessing some of the most advanced clinical and research tools to offer novel therapies to patients with severe heart failure and no available treatment options. The research team combines state-of-the-art laser transmyocardial revascularization therapy with stem cells. Patients undergo bone marrow cell harvest followed by the isolation of highly selected stem cell progenitors using advanced technologies. Cells are then injected in the affected areas of the heart muscle in combination with laser revascularization therapy, which offers additional signal for stem cell retention in the heart. This work represents a leap forward in stem cell studies and the field of cardiac regeneration and addresses some of the short-comings of prior studies.

## REGENERATIVE MEDICINE FACULTY



**Ahmed Abdel-Latif, MD, PhD**  
Associate Professor of Medicine

- Coronary interventions
- Stem cell therapy



**Michael Sekela, MD**  
Surgical Director, Cardiac Transplantation  
Professor of Surgery

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

## CLINICAL TRIALS

ALLSTAR Allogeneic Heart Stem Cells to Achieve Myocardial Regeneration in patients with ischemic heart failure - See more at: <http://ukhealthcare.uky.edu/gill/for-professionals/#tabsToAccordion2>

Primary Investigator: **Ahmed Abdel-Latif, MD PhD**

DREAM HF Efficacy and Safety Study of Allogeneic stem cells in Patients with Chronic Heart Failure Due to Left Ventricular Systolic Dysfunction of Either Ischemic or Nonischemic Etiology

Primary Investigator: **Ahmed Abdel-Latif, MD PhD**

# ADVANCED SPECIALTY PROGRAMS

## AORTOPATHY AND DISEASES OF AORTA



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

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

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

## MONTALCINO AORTIC CONSORTIUM (MAC)



**Mary Sheppard, MD**  
Assistant Professor of Family  
and Community Medicine

- Aortic aneurysms
- Genetics
- Vascular medicine

The Montalcino Aortic Consortium (MAC) formed in 2013 around the need for international cooperation in the study of human diseases that affect the aorta and its major branches and that are largely determined by variation in genes. MAC is a consortium of prominent clinical, basic and translational investigators from academic medical centers around the world committed to diagnosing and managing aortic disorders and discovering their genetic causes and modifiers. Membership in MAC is voluntary and offered to experienced and inquisitive researchers and clinicians pledged to collaboration in improving management and outcome for people with thoracic aortic diseases. Dr Mary Sheppard of the Gill Heart & Vascular Institute was accepted by the board of directors as a member within the last year.

## HEART TO HEART SUPPORT GROUP



Heart to Heart is a patient support group for patients, who have undergone a heart transplant or implantation of an artificial heart or ventricular assist device, and their families. Its goal is to provide holistic care for each patient (and caregivers) to meet their physical, emotional and spiritual needs in all phases of their care. The support group, which meets each month, includes cardiothoracic surgeons, transplant cardiologists, heart transplant coordinators, a chaplain, a social worker, a dietitian and nurses who provide care to these patients every day.



# HEART FAILURE, TRANSPLANT AND MCS

The Advanced Heart Failure & Transplant program at UK HealthCare offers a comprehensive and multidisciplinary approach to the treatment of heart disease. We bring together a team of renowned physicians from all areas of cardiology that focus on the diagnosis and treatment of heart failure. 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 have performed more than 200 heart transplants with excellent results. 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 and 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 Gill Heart & Vascular 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. It is the only combined heart-lung transplant program in Kentucky.

## 2017 RECIPIENT OF THE ELSO AWARD FOR EXCELLENCE IN LIFE SUPPORT - GOLD LEVEL!



The ELSO Excellence in Life Support Award recognizes ECLS programs worldwide that distinguish themselves by having processes, procedures and systems in place that promote excellence and exceptional care in extracorporeal membrane oxygenation.

ELSO's goal is to recognize and honor ECLS programs that reach the highest level of performance, innovation, satisfaction and quality.

A designated Center of Excellence has demonstrated extraordinary achievement in the following three categories:

1. Excellence in promoting the mission, activities, and vision of ELSO;
2. Excellence in patient care by using the highest quality measures, processes and structures based upon evidence; and
3. Excellence in training, education, collaboration, and communication supporting ELSO guidelines that contributes to a healing environment for families, patients and staff.

The ELSO Award signifies to patients and families a commitment to exceptional patient care. It also demonstrates to the healthcare community an assurance of high-quality standards, specialized equipment and supplies, defined patient protocols, and advanced education of all staff members. The ELSO Award of Excellence is recognized by US News and World Report and Parents magazine as one criterion for top institutions.

# HEART FAILURE, TRANSPLANT AND MCS

## PERCENT FREE FROM DEVICE MALFUNCTION AND/OR THROMBOSIS

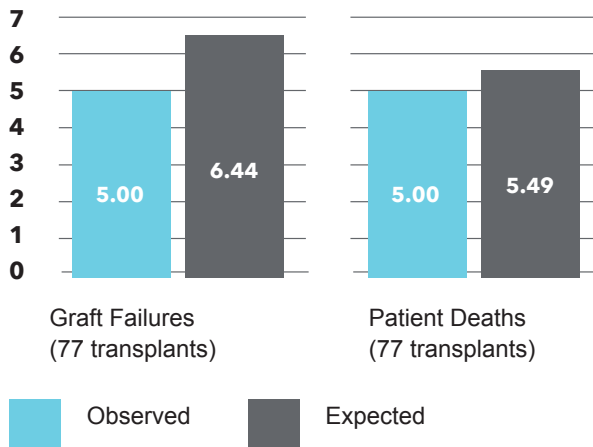
Months after device implant	Intermacs	UK
1	96%	100%
3	91.5%	89.5%
6	88.4%	83.5%
12	83.1%	75.9%

Intermacs Quality Assurance  
Quarterly Report (2017 Q1)

## CARDIOMEMS

To better monitor pulmonary artery pressure, cardiologists at the UK Gill Heart & Vascular Institute are the first in Kentucky to adopt a new diagnostic device, the CardioMEMS™ Heart Failure System. The CardioMEMS™ Heart Failure System uses a miniaturized wireless monitoring sensor that is implanted in the pulmonary artery during a minimally invasive procedure. The system allows patients to transmit pulmonary artery pressure data from their homes to clinicians at GHVI, allowing for personalized and proactive management to reduce the likelihood of hospitalization.

## FIRST-YEAR ADULT GRAFT AND PATIENT SURVIVAL



## 2016 TRANSPLANT SURVIVAL RATES

Estimated probability of our patients surviving with a functioning graft at 1 and 3 year:

1 YEAR

**92.9%**

– the U.S. average for hospitals is **90.8%**

3 YEARS

**90.6%**

– the U.S. average for hospitals is **84.4%**

## ECMO OVERALL OUTCOMES

	Total Patients	Survived ECLS	Survived to DC or Transfer
Cardiac	118	(70) 59%	(49) 42%
ECPR	35	(7) 20%	(4) 11%

# HEART FAILURE, TRANSPLANT AND MCS



## ADVANCED HEART FAILURE AND TRANSPLANT FACULTY



**Michael Sekela, MD**  
Surgical Director, Cardiac Transplantation  
Professor of Surgery

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



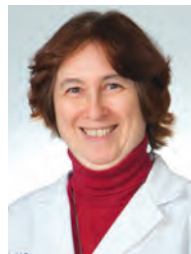
**Navin Rajagopalan, MD**  
Associate Professor of Medicine  
Director, Advanced Heart Failure Program  
Medical Director, Cardiac Transplantation

- Cardiomyopathy
- Heart failure
- Heart transplantation
- Pulmonary hypertension



**Meenakshi Bhalla, MD**  
Director, Preventive Cardiology

- Mechanical circulatory support
- Preventive cardiology
- Pulmonary hypertension
- Women's heart health

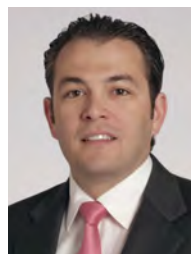


**Maya Guglin, MD**  
Professor of Medicine  
Medical Director, Ventricular Assist Devices and Mechanical Circulatory Support

- Heart failure



**Andrew Kolodziej, MD**  
Assistant Professor of Medicine



**Alexis Shafii, MD**  
Surgical Director, Lung Transplantation  
Associate Professor of Surgery

- Adult cardiac surgery
- Heart and lung transplantation
- Mechanical Circulatory Support

FACULTY PICTURED ELSEWHERE

**Paul Anaya, MD, PhD**  
**David Booth, MD**  
**Kenneth Campbell, PhD**



## COLLABORATION CREATES INNOVATIVE ECMO TRANSPORT PROGRAM



UK HealthCare has been using ECMO to treat patients and offers an innovative, coordinated program to assist surrounding hospitals. 2016 data from Vizient ranks UK HealthCare No. 10 in adult ECMO patient volume, treating more patients than such centers as Cleveland Clinic, Mayo Clinic and Johns Hopkins. Michael Sekela, MD, surgical director of the UK Gill Heart & Vascular Institute, receives requests for help from hospitals all over the area, so he recognized the need for a more formal model to support smaller hospitals and the patients they serve.

“There is a large unserved need, as many institutions do not have the infrastructure in place to embrace this service,” he said. “We have the skills and the resources, and we already serve large swaths of regional and rural hospitals in and adjacent to Kentucky.”

For more than a year, the team worked on a blueprint for transferring ECMO patients safely to UK. The plan had to support multiple scenarios (hospitals that offered ECMO but could not support a patient long-term and that did not offer ECMO but had a patient who needed it). Any patient transport needed the space and equipment to accommodate a highly skilled team of EMTs, paramedics, critical care nurses trained in ECMO, perfusionists and sometimes a surgeon.

UK is the only center in Kentucky offering adult ECMO transport – in fact, you’d have to travel more than three hours in any direction – as far east as Charlottesville, as far north as Indianapolis, as far west as Nashville – to find another center with the same service. Sekela credits the team’s methodical approach to transport issues and meticulous planning and training for the service’s fantastic success.



## RELEVANT PUBLICATIONS

Sousa M, Monohan G, **Rajagopalan N**, Grigorian A, **Guglin M**. Heart Transplantation in Cardiac Amyloidosis. *Heart Failure Reviews*. 2017. 22(3): 317-327.

Omar HR, Charnigo R, **Guglin M**. Prognostic Significance of Discharge Hyponatremia in Heart Failure Patients with Normal Admission Sodium (from the ESCAPE Trial). *The American Journal of Cardiology*. 2017. In Press.

Omar HR, **Guglin M**. The Longitudinal Relationship between Six-minute Walk Test and Cardiopulmonary Exercise Testing, and Association with Symptoms in Systolic Heart Failure: Analysis from the ESCAPE Trial. *European Journal of Internal Medicine*. 2017. 40: e26-e28.

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## CLINICAL TRIALS

Lisinopril or Coreg CR(r) in Reducing Side Effects in Women with Breast Cancer Receiving Trastuzumab

Primary Investigator:  
**Maya Guglin, MD, PhD**

Sildenafil HF Sildenafil in Heart Failure with Reactive Pulmonary Hypertension

Primary Investigator:  
**Maya Guglin, MD, PhD**

Outcomes AlloMap Registry (OAR) Study and Donor-Derived Cell-Free DNA - Outcomes AlloMap Registry Sub-Study: Utility of Donor-Derived Cell-Free DNA in Association with Gene-Expression Profiling (AlloMap) in Heart Transplant Recipients (D-OAR)

Primary Investigator:  
**Navin Rajagopalan, MD**

MOMENTUM 3 CAP: Multi-Center Study of MagLev Technology in Patients Undergoing MCS Therapy with HeartMate 3™ (Continued Access Protocol)

Primary Investigator:  
**Maya Guglin, MD, PhD**

COMMANDER HF (Janssen) – A Randomized, Double-blind, Event-driven, Multicenter Study Comparing the Efficacy and Safety of Rivaroxaban with Placebo for Reducing the Risk of Death, Myocardial Infarction or Stroke in Subjects with Heart Failure and Significant Coronary Artery Disease Following an Episode of Decompensated Heart Failure

Primary Investigator:  
**Navin Rajagopalan, MD**

Outcomes AlloMap Registry Study (OAR) (CareDx)

Primary Investigator:  
**Navin Rajagopalan, MD**

Utility of Donor-Derived Cell-free DNA in Associate with Gene-Expression Profiling (AlloMap) in Heart Transplant Recipients (D-OAR). (CareDx)

Primary Investigator:  
**Navin Rajagopalan, MD**

INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support)

Primary Investigator:  
**Maya Guglin, MD, PhD**

CardioMEMSTM HF System Post Approval Study

Primary Investigator:  
**Maya Guglin, MD, PhD**

Anticoagulation Management in Patients with LVAD Undergoing Invasive Surgeries or Procedures

Primary Investigator:  
**Maya Guglin, MD, PhD**



# INTERVENTIONAL SERVICES

## HEART ATTACK EMERGENCY CARE

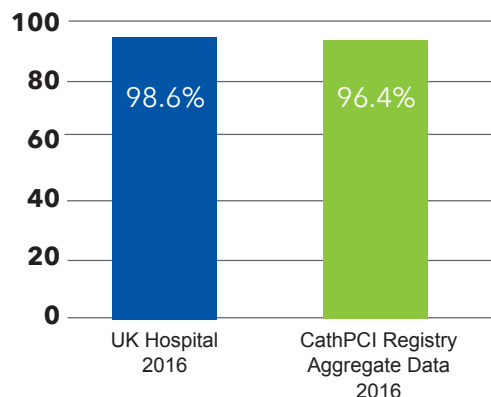
The interventional cardiology training program at UK was one of the first-ever established in the U.S. Operating in four, state-of-the-art catheterization laboratories situated in 20,000 square feet on the second floor of the Gill building, our team of cardiologists, nurses, pharmacists and technicians employ sophisticated technologies for complex cases safely and with exceptional outcomes. That is why we were the first hospital in the region to allow EMS to bring patients experiencing heart attack symptoms directly to our cardiac catheterization lab, bypassing the emergency room and reducing treatment time.

## 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. Approximately 80 percent of our diagnostic cases and 46.34 percent of our interventional coronary procedures are performed via the radial approach, which allows for greater patient comfort during the procedure and earlier ambulation after the procedure.

### Measure No. 1: Discharge Medications

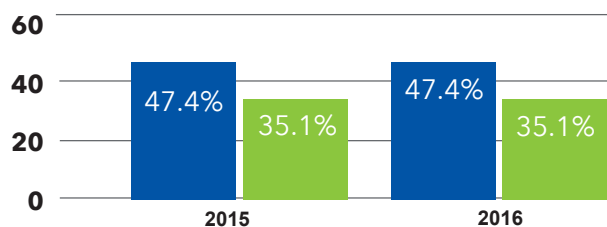
Higher is better



CathPCI Registry 2016 = 1656 participating hospitals

### Measure No. 2: Radial Access for PCI

Higher is better

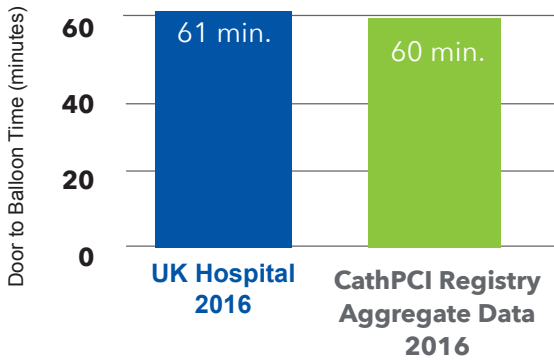


■ UK GHI ■ National

# INTERVENTIONAL SERVICES

## Measure No. 3: Median Time to Primary PCI (D2B)

Lower is better



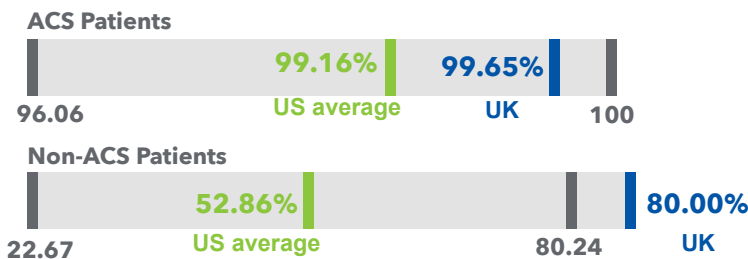
## Measure No. 4: Overall PCI Risk-Adjusted Mortality

Better →



## Measure No. 5: Appropriateness of PCI Procedures in 2016

Better →



## 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 GHVI 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 extracranial 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.

### ACUTE MYOCARDIAL INFARCTION CARE

#### Aspirin at discharge

UK HealthCare	100%
KY hospitals	99.1%
US hospitals	100%

#### Percutaneous coronary intervention (PCI) within 90 minutes of arrival

UK HealthCare	93.1%
KY hospitals	97.7%
US hospitals	97.2%

#### Prescription for a statin at discharge

UK HealthCare	99%
KY hospitals	99.8%
US hospitals	97.5%

*KY hospitals* = average of 18 KY hospitals

*US hospitals* = average of 1000 US hospitals

# INTERVENTIONAL SERVICES

## INTERVENTIONAL CARDIOLOGY FACULTY



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



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



**Vikas Bhalla, MBBS**  
Assistant Professor of Medicine  
• Coronary interventions  
• Care of complex and hospitalized patients



**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



**Andrew Leventhal, MD, PhD**  
Director, Adult Congenital Heart Disease  
Assistant Professor of Medicine  
• Adult congenital heart disease  
• Structural heart program  
• Cardiac catheterization



**Adrian Messerli, MD**  
Associate Professor of Medicine  
Director, Cardiac Catheterization  
Laboratories  
• Coronary interventions  
• Peripheral vascular interventions



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



**Khaled M. Ziada, MD**  
Gill Foundation Professor of Interventional  
Cardiology  
Director, Clinical Operations  
• Coronary and peripheral interventions  
• Transcatheter valve procedures  
• Carotid interventions



## RELEVANT PUBLICATIONS

- George B, Voelkel A, Kotter J, **Leventhal A, Gurley J**. A Novel Approach to Percutaneous Removal of Large Tricuspid Valve Vegetations using Suction Filtration and Venovenous Bypass: A single Center Experience. Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Interventions. 2017. In Press.
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## CLINICAL TRIALS

AMPLATZER Amulet Left Atrial Appendage Occluder Randomized Controlled Trial (St. Jude Medical)

Primary Investigator: **John Gurley, MD**

HeartMate PHP™: Supporting Patients Undergoing High-Risk PCI Using a High-Flow Percutaneous Left Ventricular Support Device (SHIELD II)

Primary Investigator: **John Gurley, MD**

GORE HELEX Septal Occluder and Antiplatelet Medical Management for Reduction of Recurrent Stroke or Imaging-Confirmed TIA in Patients Foramen Ovale (PFO) (the REDUCE Study)

Primary Investigator: **John Gurley, MD**

ALLSTAR Allogeneic Heart Stem Cells to Achieve Myocardial Regeneration in patients with ischemic heart failure - See more at: <http://ukhealthcare.uky.edu/gill/for-professionals/#tabsToAccordion2>

Primary Investigator: **Ahmed Abdel-Latif, MD PhD**

DREAM HF Efficacy and Safety Study of Allogeneic stem cells in Patients with Chronic Heart Failure Due to Left Ventricular Systolic Dysfunction of Either Ischemic or Nonischemic Etiology

Primary Investigator: **Ahmed Abdel-Latif, MD PhD**

Closure of Muscular Ventricular Septal Defects with the Amplatzer Muscular VSD Occluder--Post Approval Study (Muscular VPA)

Co-Primary Investigator: **Ahmed Abdel-Latif, MD PhD**

Opus Registry

Primary Investigator: **David C. Booth, MD**

International Study of Comparative Health Effectiveness with Medical and Invasive Approaches (ISCHEMIA)

Primary Investigator: **David C. Booth, MD**

COMPASSION S3: COngenital Multicenter trial of Pulmonic valve dysfunction Studying the SAPIEN 3 interventional THV

Primary Investigator: **Andrew Leventhal, MD, PhD**

Emanate: A Phase IV Trial to Assess the Effectiveness of Apixaban Compared with Usual Care Anticoagulation in Subjects with Non-Valvular Atrial Fibrillation Undergoing Cardioversion

Primary Investigator: **Adrian Messerli, MD**

TWILIGHT Study: Ticagrelor with Aspirin or Alone in High-Risk Patients After Coronary Intervention

Primary Investigator: **David Molietero, MD**

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

Primary Investigator: **Khaled M. Ziada, MD**

Voyager--Rivaroxaban following lower extremity revascularization for symptomatic PAD

Primary Investigator: **Khaled M. Ziada, MD**

Renal Denervation in Patients with Uncontrolled Hypertension - Symplicity HTN-3 Trial

Primary Investigator: **Khaled M. Ziada, MD**

Fractional Flow Reserve versus Angiography for Multivessel Evaluation (FAME) 3 Trial: A Comparison of Fractional Flow Reserve-Guided Percutaneous Coronary Intervention and Coronary Artery Bypass Graft Surgery in Patients with Multivessel Coronary Artery Disease

Primary Investigator: **Khaled Ziada, MD (UK); Ahmed Abdel-Latif, MD, PhD (VA)**

Glagov Open Label Extension Study

Primary Investigator: **Khaled M. Ziada, MD**

DIVA Drug-Eluting Stents vs. Bare Metal Stents in Saphenous Vein Graft Angioplasty

Primary Investigator: **Khaled M. Ziada, MD**

SPYRAL HTN-OFF MED: Global Clinical Study of Renal Denervation with the Symplicity Spyral™ multi-electrode renal denervation system in Patients with Uncontrolled Hypertension in the Absence of Antihypertensive Medications

Primary Investigator: **Khaled M. Ziada, MD**

SPYRAL HTN-ON MED: Global Clinical Study of Renal Denervation with the Symplicity Spyral™ i multi-electrode renal denervation system in Patients with Uncontrolled Hypertension on Standard Medical Therapy

Primary Investigator: **Khaled M. Ziada, MD**

# INTERVENTIONAL SERVICES

## STRUCTURAL & VALVULAR HEART DISEASE

GHVI has pioneered the development of transcatheter heart valve interventions for more than 25 years. Since performing the first balloon aortic valvuloplasty in 1984, our physicians have expanded the range of catheter-based repair to mitral, pulmonic and prosthetic valve diseases. With the addition of transcatheter aortic valve replacement (TAVR) in 2012, the Gill Heart & Vascular Institute continues to offer the most complete and most experienced transcatheter valve program in the region. Led by interventional cardiologist John Gurley, MD, the heart valve team includes cardiologists, cardiac surgeons, advanced imaging specialists, cardiac anesthesiologists, nurse practitioners and care coordinators. The team performs TAVR and other minimally invasive heart valve procedures in a state-of-the-art hybrid operating suite.

Our program provides expert diagnosis and treatment by cardiologists and surgeons and encompasses a large outpatient and inpatient service that treats all forms of valvular heart disease, both before and after repair. Based on the most recent cardiovascular research, our experts employ the latest tools and techniques for diagnosis and repair of diseased heart valves, and we offer new and less-invasive therapies for valvular disease. Highlights of the valve program include:

- Personalized care that incorporates the latest practice guidelines while respecting a patient's individual needs and preferences.
- A multidisciplinary heart valve team that brings together cardiologists, surgeons, imaging experts and other specialists.
- The most modern and best-equipped hybrid operating facilities in the region.
- The most experienced and most complete transcatheter valve program in the region.
- A commitment to innovation in valvular heart disease – making the latest transcatheter techniques and minimally invasive surgical procedures available to our patients.
- A commitment to excellence that leads to superior results and high patient satisfaction.

## PARTICIPATING FACULTY

**John Gurley, MD (TAVR Director)**  
**Adrian Messerli, MD**  
**Michael Sekela, MD**  
**Khaled Ziada, MD**  
**Andrew Leventhal, MD, PhD**  
**Theodore Wright, MD**

## RELEVANT PUBLICATIONS

George B, Voelkel A, Kotter J, **Leventhal A, Gurley J**. A Novel Approach to Percutaneous Removal of Large Tricuspid Valve Vegetations using Suction Filtration and Venovenous Bypass: A single Center Experience. *Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Interventions*. 2017. In Press.

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# INTERVENTIONAL SERVICES

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**Ziada KM**, Abdel-Latif A, Charnigo R, Moliterno DJ. Safety of an Abbreviated Duration of Dual Antiplatelet Therapy ( $\leq 6$  months) Following Second-generation Drug-eluting Stents for Coronary Artery Disease: A Systematic Review and Meta-analysis of Randomized Trials. *Catheterization and Cardiovascular Interventions: Official Journal of the Society for Cardiac Angiography & Interventions*. 2016. 87(4): 722-732.

Lolay GA, Burchett A, **Ziada KM**. Pneumomediastinum and ST-Segment Elevation. *The American Journal of Cardiology*. 2016. 118(10): 1603-1604.

## CLINICAL TRIALS

COMPASSION S3: COngenital Multicenter trial of Pulmonic vAlve dysfunction Studying the SAPIEN 3 interventional THV

Primary Investigator:  
**Andrew Leventhal, MD, PhD**

AMPLATZER Amulet Left Atrial Appendage Occluder Randomized Controlled Trial (St. Jude Medical)

Primary Investigator:  
**John Gurley, MD**





## ELECTROPHYSIOLOGY AND HEART RHYTHM

The Gill Heart & Vascular Institute's Heart Rhythm Program brings together a team of certified electrophysiologists, surgeons, cardiologists and anesthesiologists for the management and treatment of cardiac rhythm disorders. Leading the team is UK electrophysiologist Samy-Claude Elayi, MD. Our services include implantation of MRI-compatible pacemakers, 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 skilled team utilizes the latest technology to perform procedures leading to the development of treatment therapies with high success and low complication rates.

### AREAS OF INTEREST IN ELECTROPHYSIOLOGY

#### **Sudden cardiac death (SCD) post myocardial infarction (MI)**

ICDs are an effective method to reduce SCD in various cardiac conditions. However, SCD is high the first 90 days post-MI. The wearable external cardiac defibrillator (VEST) has some advantages over ICD and has been evaluated in 2,400 patients in the VEST trial. Through the eight-year multisite study, Gill enrolled over 60 randomized post-MI patients with EF<35%. Our published research details the root cause as to why ICD did not reduce SCD after a MI. This trial will certainly impact our therapeutic options.

#### **Interaction between ICD/pacemakers and ablation catheters.**

More patients undergo pacemakers/implants as well as ablation for atrial and ventricular arrhythmias. We tested the consequences of ablation in vitro on pacemaker lead and ICD integrity. Based on these results, we developed an algorithm now used for patients with pacemakers and ICDs who are undergoing catheter ablation.

#### **Complications of pacemaker and ICD implantations**

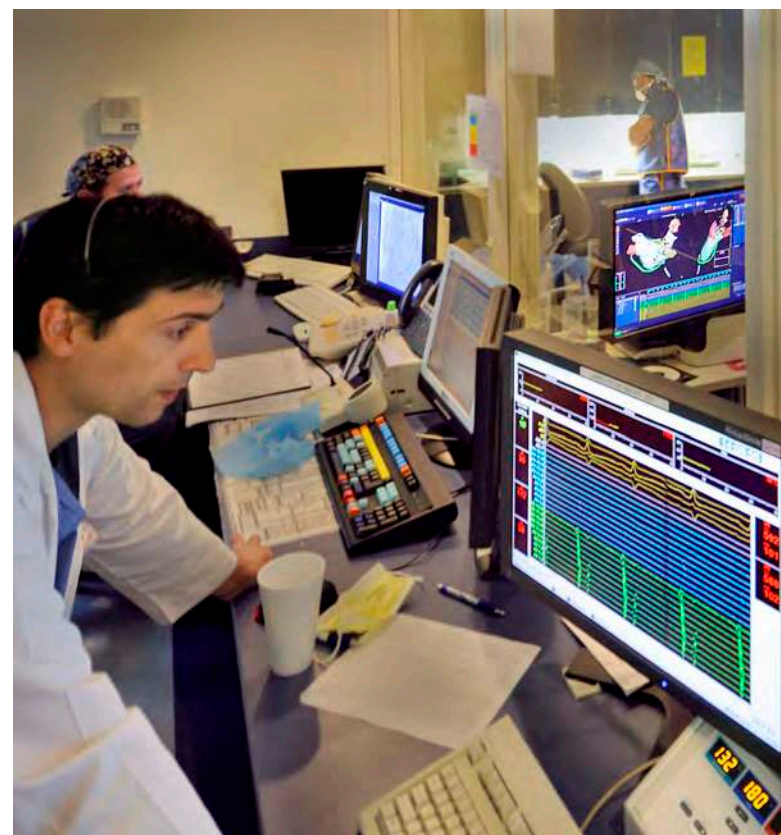
Pneumothorax (PTX) is still a relatively common complication associated with increased morbidity and

length of stay. We looked at our UK/VA experience with PTX and found that a first-rib approach leads to a lower risk of PTX.

#### **Custom treatments for atrial fibrillation leads**

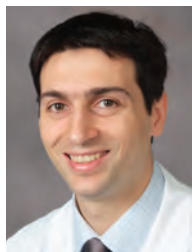
Treating a rhythm disturbance is highly complex. Research has shown catheter ablation to be superior to medical therapy in preventing AF episodes and improving quality of life and heart function for patients. For patients whose AF cannot be managed through medications or catheter-based ablation, CT surgeon Dr. Theodore S. Wright provides expertise in the innovative and minimally invasive video-assisted MAZE procedures.

MAZE includes creation of lines of conduction that block the abnormal impulses that cause AF, enabling restoration of normal sinus rhythm. In collaboration with interventionalist Dr. John C. Gurley, the procedure may also include the exclusion of the left atrial appendage, the primary source of strokes in patients with AF. The team is experienced in and offers both LARIAT and Atra Clip for appendage occlusion.



# ELECTROPHYSIOLOGY

## ELECTROPHYSIOLOGY FACULTY



**Sammy-Claude Elayi, MD**  
Professor  
Director, EP Laboratory  
• Atrial fibrillation management  
• Hybrid ablation therapies



**Yousef Darrat, MD**  
Assistant Professor  
• Device-based therapy  
• Atrial fibrillation management  
• Supraventricular arrhythmia ablation

Not pictured

**Aaron B Hesselson, MD, BSEE, FACC, FHRS**  
Director, Heart Rhythm Program and  
Electrophysiology Services

## RELEVANT PUBLICATIONS

Salih M, Smer A, Charnigo R, Ayan M, **Darrat Y**, Traina M, Morales G, Di Blasé L, Natale A, **Elayi CS**. Colchicine for Prevention of Post-Cardiac Procedure Atrial Fibrillation: Meta-analysis of Randomized Control Trials. International Journal of Cardiology. 2017. In Press.

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**Darrat Y**, Morales G, **Elayi CS**. The Effects of catheter Ablation on Permanent Pacemakers and Implantable Cardiac Defibrillators. Journal of Innovation in Cardiac Rhythm Management. 2017.8(3):2630-2635.

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**Darrat Y**, Morales G., Waespe K, Gurley J, **Elayi CS**. Snaring of the Right Ventricular Lead during Cavotricuspid Isthmus Ablation. Clinical Case Report. 5(3): 312-314.

**Elayi CS**, Charnigo RJ, Heron PM, Lee BK, Olgin JE. Primary Prevention of Sudden Cardiac Death Early Post-Myocardial Infarction: Root Cause Analysis for Implantable Cardioverter-Defibrillator Failure and Currently Available Options. Circulation. Arrhythmia and Electrophysiology. 2017: 10(6).

**Darrat, YH**, Shah J, **Elayi CS**, Morales GX, Naditch-Brûlé L, Brette S, Taniou C, Kowey PR, Schwartz PJ, Regional Lack of Consistency in the Management of Atrial Fibrillation (from the RECORD-AF Trial). The American Journal of Cardiology. 2017. 119(1): 47-51.

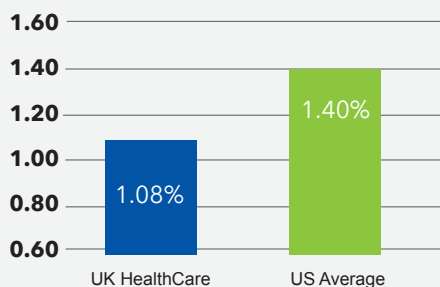
## 2016 IMPLANTABLE CARDIOVERTER- DEFIBRILLATOR (ICD) REGISTRY DATA

# 100%

of our patients received ICD in 2016 for class I or II guideline indications – the U.S. average for hospitals is **92.4%**.

### Complications after ICD placement

lower is better



# 93.4%

of our ICD patients received the appropriate medications on discharge – the U.S. average is **84.7%**.

## RELEVANT PUBLICATIONS

Kim SM, Virgadamo S, Gurley J, **Elayi CS**. Use of Cardioplegia to Guide Alcohol Ablation for Incessant Ventricular Tachycardia. *Pacing and Clinical Electrophysiology: PACE*. 2017. 40(2): 213-216.

Kim SM, George B, Alcivar-Franco D, Campbell CL, Charnigo R, Delisle B, Hundley J, **Darrat Y**, Morales G, **Elayi CS**, Bailey AL. QT Prolongation is Associated with Increased Mortality in End Stage Liver Disease. *World Journal of Cardiology*. 2017. 9(4): 347-354.

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or Pulmonary Vein Isolation Combined with either Scar Homogenization or Trigger Ablation. *Europace European Pacing, Arrhythmias, and Cardiac Electrophysiology: Journal of the Working Groups on Cardiac Pacing, Arrhythmias, and Cardiac Cellular Electrophysiology of the European Society of Cardiology*. 2016.

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## CLINICAL TRIALS

The Gill Heart & Vascular 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.

**VEST/VEST Registry Non-invasive wearable automatic defibrillator vest will reduce mortality in first 90 days post MI in pts w/ LV dysfunction (≤35%)**

**Primary Investigator:**  
**Samy-Claude Elayi, MD**

**Enhance CRT: CRT Implant Strategy using the longest electrical delay for non-LBB patients; randomized, post-market pilot study**

**Primary Investigator:**  
**Yousef Darrat, MD**

**smartADHERE - Smartphones to Improve Rivaroxaban ADHEREnce in Atrial Fibrillation.**

**Primary Investigator:**  
**Yousef Darrat, MD**

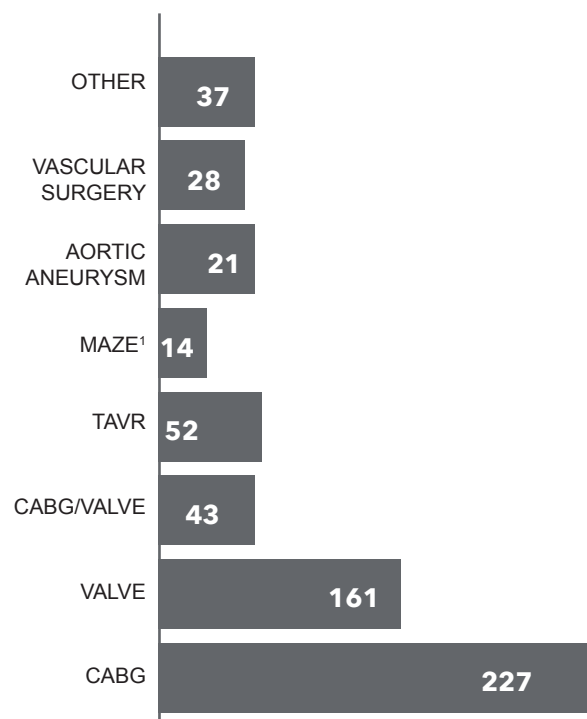


# CARDIAC SURGERY

## CARDIOTHORACIC SURGERY

At UK, surgeons collaborate with researchers and clinicians at the Markey Cancer Center, the UK Transplant Center and 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. As UK HealthCare has grown, the scope and breadth of CT surgery has expanded exponentially and our cardiovascular services are more comprehensive, with a higher level of expertise. Michael Sekela, MD, continues to bring his extensive skill and experience in complex cardiac surgery, reoperative procedures, and innovative valve surgeries such as robotic mitral valve repair. In partnership with interventional cardiologist John C. Gurley, MD, Michael Sekela, MD, and Hassan Reda, MD, initiated the MitraClip program. The MitraClip therapy is the first percutaneous mitral valve repair therapy available, providing an option for select patients with significant symptomatic degenerative mitral valve disease. Our faculty also provides CT surgery to underserved communities in Eastern Kentucky. Our collaboration with Appalachian Regional Healthcare continues to expand as we enhance clinical services and educational opportunities to clinicians in the region. James Shoptaw, MD, 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.

**Adult Cardiac Surgery Cases, 2016**



<sup>1</sup> MAZE – represents both concomitant and sole surgical management of AF

# CARDIAC SURGERY

## CARDIOTHORACIC SURGERY FACULTY



**Sibu 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



**Maher Baz, MD**

Professor of Surgery and Medicine

- Lung transplantation
- Mechanisms and Treatment
- Frailty and outcomes after transplantation



**Victor A. Ferraris, MD, PhD**

Tyler Gill Professor of Surgery

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



**Jonathan Kiev, MD, KACS**

Associate Professor of Surgery



**Angela L. Mahan, MD**

Assistant Professor of Surgery

- Thoracic oncology
- Minimally invasive thoracic surgery
- Foregut surgery



**Jordan Miller, DO**

Assistant Professor of Surgery

- Minimally invasive surgery for lung, esophagus and foregut
- Advanced endoscopy



**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



**James Quintessenza, MD**

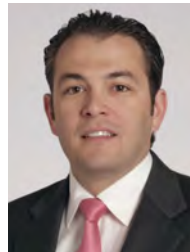
Professor of Surgery  
Chief, Pediatric Cardiothoracic Surgery



**Michael Sekela, MD**

Surgical Director, Cardiac Transplantation  
Professor of Surgery

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



**Alexis Shafii, MD**

Surgical Director, Lung Transplantation  
Associate Professor of Surgery

- Adult cardiac surgery
- Heart and lung transplantation
- Mechanical circulatory support

# CARDIAC SURGERY

## CARDIOTHORACIC SURGERY FACULTY



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

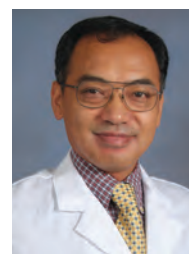


**Joseph B. Zwischenberger, MD**  
Johnston-Wright Professor  
and Chairman  
Surgeon-in-Chief, UK HealthCare  
• Acute respiratory failure  
• Esophageal cancer  
• Lung cancer

## 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

## RELEVANT PUBLICATIONS

Rodgers-Fischl PM, Martin JT, **Saha SP**. Video-Assisted Thoracoscopic versus Open Lobectomy: Costs and Outcomes. *Southern Medical Journal* 2017. 110(3): 229-233.

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Meyerson SL, Sternbach JM, **Zwischenberger JB**, Bender EM. The Effect of Gender on Resident Autonomy in the Operating room. *Journal of surgical education*. 2017. In Press.

**Saha SP**, Whyne TF, J. Coenzyme Q-10 in Human Health: Supporting Evidence? *Southern Medical Journal*. 2016. 109(1): 17-21.

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**Ferraris VA**, Harris JW, Martin JT, **Saha SP**, Endean ED. Impact of Residents on Surgical Outcomes in High-Complexity Procedures. *Journal of the American College of Surgeons*. 2016. 222(4): 545-555.

**Ferraris VA**, **Sekela ME**. Missing the Forest for the Trees: The World around us and Surgical Treatment of Endocarditis. *The Journal of Thoracic and Cardiovascular Surgery*. 2016.152(3): 677-680.

**Ferraris VA**. Increased understanding leads to increased complexity: Molecular mechanisms of pulmonary arterial hypertension. *The Journal of Thoracic and Cardiovascular Surgery*. 2016. 152(4): 1188-1190.

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Edwards FH, **Ferraris VA**, Kurlansky PA, Lobdell KW, He X, O'Brien SM, Furnary AP, Rankin JS, Vassileva CM, Fazzalari FL, Magee MJ, Badhwar V, Xian Y, Jacobs JP, Wyler von Ballmoos MC, Shahian DM. Failure to Rescue Rates After Coronary Artery Bypass Grafting: An Analysis From The Society of Thoracic Surgeons Adult Cardiac Surgery Database. *The Annals of Thoracic Surgery*. 2016. 102(2): 458-64.

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## CLINICAL TRIALS

An Early Feasibility Study of Perfusion-Induced Hyperthermia for Metastatic Non-Small Cell Lung Carcinoma (Exatherm).

Primary Investigator: **Jon Kiev, MD**

Effectiveness and Safety of CELSTAT as an adjunct to Hemostasis for Tissue Bleeding in CT, General and Vascular Surgery (Baxter).

Primary Investigator: **Victor M. Ferraris, MD PhD**

Vascular Outcomes study of ASA along with rivaroxaban in Endovascular or surgical limb Revascularization for PAD (Bayer).

Primary Investigator: **Sibu Saha, MD, MBA**

An International, Multicenter Randomized, Double-blind, Placebo-controlled Phase 3 Trial Investigating the Efficacy and Safety of Rivaroxaban to Reduce the Risk of Major Thrombotic Vascular Events in Patients With Symptomatic Peripheral Artery Disease

Primary Investigator: **Sibu Saha, MD, MBA**

Intramyocardial Application of Stem Cells in Combination with Transmyocardial Laser Revascularization (TMLR).

Primary Investigator: **Michael Sekela, MD**

Barostim neo@Legacy System – HUD #13-0307.

Primary Investigator: **Sibu Saha, MD, MBA**

Platelet Function in Early Stage Lung Cancer- A Pilot Study.

Primary Investigator: **Victor M. Ferraris, MD PhD**

Spiration IBV Valve System-Humanitarian Use Device.

Primary Investigator: **Timothy W. Mullett, MD**

INTERMACS-VAD Therapy Database.

Primary Investigator: **Paul B. Tessmann, MD PharmD**

Cardiothoracic Resident and Fellow Operative Autonomy.

Primary Investigator: **Angela L. Mahan, MD**

The Impact of Blood Transfusion in Blunt and Penetrating Trauma.

Primary Investigator: **Victor M. Ferraris, MD PhD**

Amplatzer Septal Occluder.

Primary Investigator: **Sibu Saha, MD, MBA**

Blood Loss after Tracheostomy in Patients Supported on Extracorporeal Membrane Oxygenation.

Primary Investigator: **Alexis Shafii, MD**



# VASCULAR SURGERY



## VASCULAR AND ENDOVASCULAR SURGERY

The UK HealthCare Vascular & Endovascular Surgery team offers a comprehensive array of treatment plans that varies from conservative management of the causes and risk factors of vascular disease to complex open and endovascular approaches. The types of vascular problems addressed include, but are not limited to: thoracic and abdominal aneurysms, carotid disease, renal artery disease, and lower extremity arterial insufficiency. Led by Eric D. Endean, MD, the division's faculty have authored chapters in surgical textbooks and journal publications and have invented surgical techniques that are considered leading 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 complex cases in the region. UK houses an advanced and nationally

certified vascular laboratory dedicated to vascular ultrasound and imaging tests. Together with state-of-the-art computerized tomography and MRI technology, our vascular imaging capabilities enable physicians to diagnosis and determine the severity of vascular disease before any invasive procedure is undertaken. Active research comprises the development of endovascular techniques, acute mesenteric ischemia, vascular surgery outcomes and treatment of aortic aneurysms. They are joined by basic and translational investigators who have international recognition 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. The UK Vascular Surgery Vein Institute, located at UK Good Samaritan Hospital, provides comprehensive management of venous disorders. A Wound Care Clinic is also offered at Good Samaritan Hospital.



# VASCULAR SURGERY

## VASCULAR AND ENDOVASCULAR SURGERY FACULTY



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

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



**Joseph L. Bobadilla, MD**  
Assistant Professor of Vascular Surgery  
Medical Director of General Surgery Clinics

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



**Amy Lipscomb, MD**  
Associate Professor of Vascular Surgery

- Medical Director of Wound Clinic
- Endovascular and open aortic aneurysm repair
- Peripheral artery occlusive disease
- Carotid artery disease
- Complex wound management



**David J. Minion, MD**  
Professor of Vascular Surgery  
Director of the Vascular Surgery Fellowship Program

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



**Nathan Orr, MD**  
Assistant Professor of Vascular Surgery

- Carotid artery disease
- Abdominal aortic aneurysms and dissections
- Mesenteric ischemia
- Peripheral artery disease and critical limb ischemia
- Dialysis access
- Venous disease



**Mary Sheppard, MD**  
Assistant Professor of Family and Community Medicine

- Aortic aneurysms
- Genetics
- Vascular medicine



**Eleftherios S. Xenos, MD, PhD**  
Associate Professor of Vascular Surgery  
Associate Chief Medical Director  
Medical Director of Patient Safety  
Medical Director of Vascular Laboratory

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

Not pictured  
**Samual Tyagi, MD**

## RELEVANT PUBLICATIONS

**Bobadilla JL**, Roe CS, Estes P, Lackey J, Steltenkamp CL. Leveraging Electronic Health Record Implementation to Facilitate Clinical and Operational Quality Improvement in an Ambulatory Surgical Clinic. *The Journal of ambulatory care management*. 2017. 40(1): 9-16.

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**Orr NT**, Winkler MA, **Xenos ES**. Type IIIb Endoleak Associated With an Infected Thoracoabdominal Endograft. *Innovations (Philadelphia, Pa.)*. 2016. 11(5): 367-369.

**Lu H**, **Sheppard M**, **Daugherty A**. Calcification in atherosclerotic lesions. *Current Opinion in Lipidology*. 2016. 27(5): 543-544.

**Sheppard M**, Rateri DL, **Daugherty A**. miRs, miRs in the Wall, Who Is the Most Causative of Them All? *Journal of the American College of Cardiology*. 2016. 67(25): 2978-2980.

**Sheppard MB**, **Daugherty A**, **Lu H**. Insights into Ascending Aortic Aneurysm Pathogenesis using in Vivo and Ex Vivo Imaging Systems in angiotensin II-infused Mice. *Journal of Thoracic Disease*. 2016. 8(8): E822-824.

# CARDIOVASCULAR RESEARCH

Working in partnership with the Gill Heart & Vascular 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 translate research discoveries to medical therapies more quickly.

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 most recent fiscal year, the Saha CVRC totaled \$5.4 million in extramural funding, 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 50 papers in the past year and presented at numerous national and international conferences.

## GOALS OF THE UK SAHA CARDIOVASCULAR RESEARCH CENTER

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

## UPCOMING NATIONAL CONFERENCE CHAIRS

**Nancy R. Webb, PhD, FAHA**, Conference Chair: Arteriosclerosis, Thrombosis and Vascular Biology Peripheral Vascular Disease (ATVB – PVD) 2018 and 2019 and second year as Co-Chair 2017

**Sidney “Wally” Whiteheart, PhD**, Chair-elect: Hemostasis Gordon Research Conference 2018

**Susan Smyth, MD, PhD**, Chair-elect: Lysophospholipids in Health and Disease FASEB Conference 2017



# CARDIOVASCULAR RESEARCH



“In an academic health center, research and clinical success are synergistic and interdependent. A strategic collaboration between the clinical and the academic enterprises will enhance the success of both beyond what would occur with an investment of either alone.”

-Bowman, MA, et al. 2007

## CARDIOVASCULAR RESEARCH DAY

The Cardiovascular Research Day brings together students and scientists to present the latest research developments in cardiovascular health. Scientific topics include lipid metabolism, cardiometabolic diseases, atherosclerosis and thrombosis.

Keynote speakers are selected on the basis of providing information beyond the scope of cardiovascular sciences. This year, John Charles, PhD chief scientist of the NASA Human Research Program at the Johnson Space Center will be the distinguished alumni Speaker. Calum MacRae, MD, PhD, of Harvard Medical and Steven Houser, PhD, of Temple University School of Medicine will also be presenting.

The National 2017 South East Lipid Research Conference (SELRC) will be held in conjunction with Cardiovascular Research Day. This event will be a great opportunity for cross-participation between physicians, clinicians and basic scientists with interests in lipids, lipoproteins and cardiovascular disease.



**November 2-4, 2017**

21c Musem Hotel  
Lexington, Kentucky

*Held in conjunction with*  
University of Kentucky Cardiovascular Research Day



## THE GILL HEART & VASCULAR INSTITUTE RESEARCH AWARD

This prestigious award recognizes an early-stage career investigator within five years of first faculty appointment whose innovative work and creativity has impacted cardiovascular research and/or advancements in clinical care.

This year's award recipient for the GHVI Translational Award for Early Stage Career Investigators is Kiran Musunuru, MD, PhD, MPH. Dr. Musunuru is an associate professor of cardiovascular medicine and genetics at the Perelman School of Medicine at the University of Pennsylvania.

Dr. Musunuru has emerged as a national leader in the area of cardiovascular genetics, functional genomics and stem cell biology. Dr. Musunuru has led the charge to identify and dissect new genes involved in the pathogenesis of myocardial infarction and is regarded as the authority on genome editing in cardiology.



## RELEVANT PUBLICATIONS

- Daugherty A**, Tall AR, Daemen MJAP, Falk E, Fisher EA, García-Cardena G, Lusis AJ, Owens AP 3rd, Rosenfeld ME, Virmani R. Recommendation on Design, Execution, and Reporting of Animal Atherosclerosis Studies: A Scientific Statement from the American Heart Association. *Arteriosclerosis Thrombosis and Vascular Biology*. 2017. In Press.
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- Howatt DA, Dajee M, Xie X, Moorlegghen J, Rateri DL, Balakrishnan A, Da Cunha V, Johns DG, Gutstein DE, **Daugherty A**, **Lu H**. Relaxin and Matrix Metalloproteinase-9 in Angiotensin II-Induced Abdominal Aortic Aneurysms. *Circulation Journal: official journal of the Japanese Circulation Society*. 2017. 81(6): 888-890.
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- Hayek SS, Klyachkin Y, Asfour A, Ghasemzadeh N, Awad M, Hesaroiieh I, Ahmed H, Gray B, Kim J, Waller EK, Quyyumi AA., **Abdel-Latif AK**. Bioactive Lipids and Circulating Progenitor Cells in Patients with Cardiovascular Disease. *Stem Cells Translational Medicine*. 2017. 6(3): 731-735.
- Pumphrey AL, Ye S, Yang Z, Simkin J, Gensel J.C, **Abdel-Latif A**, Vandsburger MH. Cardiac Chemical Exchange Saturation Transfer MR Imaging Tracking of Cell Survival or Rejection in Mouse Models of Cell Therapy. *Radiology*. 2017. 282(1): 131-138.
- Adamiak M, Abdelbaset-Ismail A, Moore JB, 4<sup>th</sup>. Zhao J, **Abdel-Latif A**, Wysoczynski M, Ratajczak MZ. Inducible Nitric Oxide Synthase (iNOS) is a Novel Negative Regulator of Hematopoietic Stem/Progenitor Cell Trafficking. *Stem Cell Reviews*. 2017. 13(1): 92-103.
- Quyyumi AA, Vasquez A, Kereiakes DJ, Klapholz M, Schaer GL, **Abdel-Latif A**, Frohwein S, Henry TD, Schatz RA, Dib N, Toma C, Davidson CJ, Barsness GW, Shavelle DM, Cohen M, Poole J, Moss T, Hyde P, Kanakaraj AM, Druker V, Chung A, Junge C, Preti RA, Smith RL., Mazzo DJ, Pecora A, Losordo DW. PreSERVE-AMI: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial of Intracoronary Administration of Autologous CD34+ Cells in Patients With Left Ventricular Dysfunction Post STEMI. *Circulation Research*. 2017. 120(2): 324-331.
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- Adamiak M, Abdelbaset-Ismail A, Suszynska M, **Abdel-Latif A**, Ratajczak J, Ratajczak MZ. Novel Evidence that the Mannan-binding Lectin Pathway of Complement Activation Plays a Pivotal Role in Triggering Mobilization of Hematopoietic Stem/Progenitor Cells by Activation of both the Complement and Coagulation Cascades. *Leukemia*. 2017. 31(1): 262-265.
- Brewster J, Sexton T, Dhaliwal G, **Charnigo R**, Morales G, Parrott K, Darrat Y, Gurley J, **Smyth S**, Elayi CS. Acute Effects of Implantable Cardioverter-Defibrillator Shocks on Biomarkers of Myocardial Injury, Apoptosis, Heart Failure, and Systemic Inflammation. *Pacing and Clinical Electrophysiology: PACE*. 2017. 40(4): 344-352.
- Sinner GJ, Gupta VA, Seratnahaei A, **Charnigo RJ**, Darrat YH, Elayi SC, **Leung SW**, Sorrell VL. Atrioventricular Dyssynchrony from Empiric Device Settings is Common in Cardiac Resynchronization Therapy and Adversely Impacts Left Ventricular Morphology and Function. *Echocardiography (Mount Kisco, N.Y.)*. 2017. 34(4): 496-503.



## RELEVANT PUBLICATIONS

- Omar HR, **Charnigo R**, Guglin M. Prognostic Significance of Discharge Hyponatremia in Heart Failure Patients with Normal Admission Sodium (from the ESCAPE Trial). *The American Journal of Cardiology*. 2017. In Press.
- Kido K, George B, **Charnigo RJ**, Macaulay TE, Brouse SD, Guglin M. Chronological Changes and Correlates of Loop Diuretic Dose in Left Ventricular Assist Device Patients. *ASAIO Journal (American Society for Artificial Internal Organs: 1992)*. 2017. In Press.
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# CARDIOVASCULAR RESEARCH



## FACULTY



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Professor of Medicine and  
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Director, Saha Cardiovascular  
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Associate Professor  
Medicine



**Frederick C. de Beer, MD**  
Professor  
Medicine



**Marcielle de Beer, PhD**  
Associate Professor  
Physiology



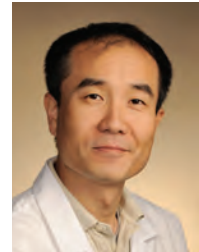
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Professor  
Biostatistics



**Zhenheng Guo, PhD**  
Associate Professor  
Medicine



**Victoria L. King, PhD**  
Assistant Professor  
Medicine



**Sangderk Lee, PhD**  
Assistant Professor  
Pharmacology and Nutritional  
Sciences



**Steve Leung, MD**  
Assistant Professor  
Medicine



**Zhenyu Li, MD, PhD**  
Associate Professor  
Medicine



**Hong Lu, MD, PhD**  
Associate Professor  
Medicine



**Andrew J. Morris, PhD**  
Professor  
Medicine  
Pharmacology and  
Nutritional Sciences

# CARDIOVASCULAR RESEARCH

## FACULTY



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Assistant Professor  
Medicine



**Mary Sheppard, MD**  
Assistant Professor of Family  
and Community Medicine



**Preetha Shridas, PhD**  
Assistant Professor  
Medicine



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



**Venkat Subramanian, PhD**  
Assistant Professor  
Medicine



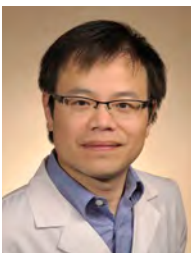
**Lisa R. Tannock, MD**  
Professor of Medicine  
Chief, Division of  
Endocrinology



**Ryan Temel, PhD**  
Assistant Professor  
Pharmacology and  
Nutritional Science



**Nancy Webb, PhD**  
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Molecular Pharmacology,  
Division Director,  
Nutritional Sciences



**Binggang Xiang, PhD**  
Assistant Professor  
Medicine



## CARDIOVASCULAR EDUCATION

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 UK Good Samaritan Hospital. The program is geared toward assuring an exceptional educational experience that prepares fellows to provide high-quality medical care in whatever area they ultimately pursue. The fellowship provides:

- Dedicated didactic lecture series covering the core curriculum of cardiovascular diseases.
- Specialized lecture series that complements 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 healthcare professionals.
- Team-based approach within a multifaceted healthcare system to optimize patient care.
- 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.

“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

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General  
Cardiology  
Fellows

3

Interventional  
Cardiology  
Fellows

2

Fellows In  
Research  
Training

1

Advanced CV  
Imaging Fellows

1

Cardiac  
Electrophysiology  
Fellow

1

Advanced Heart  
Failure Fellow

## FELLOWS PUBLICATIONS

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Morales G, Darrat YH, Lellouche N, **Kim SM,** Butt M, Bidwell K, Lippert W, **Ogunbayo G,** Hamon D, Di Biase L, Natale A, **Parrott K,** Elayi CS. Use of Adenosine to Shorten the Post Ablation Waiting Period for Cavotricuspid Isthmus-dependent Atrial Flutter. *Journal of Cardiovascular Electrophysiology.* 2017. In Press.

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# CARDIOVASCULAR EDUCATION

## CARDIOVASCULAR FELLOWS



**Talal Alnabelsi, MBChB**



**Karam Ayoub, MBBS**



**Francis Benn, MD**



**Andrew Boerkircher, DO**



**Bruce Bradley, MBChB**



**Christian Deutsch, MD**



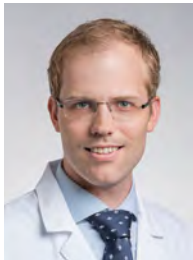
**Yared Hailemariam, MD**



**Dustin Hillerson, MD**



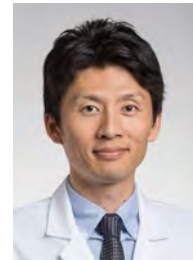
**Patrick Hurley, DO**



**Michael Jesinger, MD**



**Nathan Kusterer, MD**



**Naoki Misumida, MD**



**Andin Mullis, MD**



**Gbolahan Ogunbayo, MBChB**



**Suartcha Prueksaritanond, MD**



**Joshua Rutland, MD**



# CARDIOVASCULAR EDUCATION

## CARDIOVASCULAR FELLOWS



**Julie Shelton, DO**  
Cardiology



**Gregory Sinner, MD**



**Jean Touchan, MD**

## INTERVENTIONAL CARDIOVASCULAR FELLOWS



**Bennet George, MD**  
Interventional Cardiology



**Sun Moon Kim, MD**



**Ryan Wilson, MD**

## IMAGING FELLOW



**Amornpol Anuwatworn, MD**  
Imaging

## ELECTROPHYSIOLOGY FELLOW



**Kevin Parrot, MD**

## HEART FAILURE FELLOW



**Kenneth Dulnuan, MD**  
Heart Failure

# CARDIOVASCULAR EDUCATION

## CARDIOTHORACIC SURGERY FELLOWS



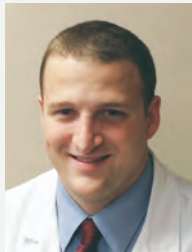
Michael Bolanos, MD – PGY4



Tessa Cartwright, MD PGY6



Erinn Ogburn, MD - PGY 2



Tyler Gunn, MD – PGY3



Hetal Patel, MD – PGY7

Not pictured  
Peter Rodgers, MD PGY2  
Sean Johnson, MD PGY6  
Rebecca Phillip MD, PGY1





# REMEMBERING NANCY C. FLOWERS, MD

In a world that found women pursuing degrees so uncommon that it was newsworthy, an article appeared in Nancy Carolyn Flowers hometown newspaper when she graduated from the University of Tennessee School of Medicine in 1958, titled, “Former City Resident Now is a ‘Lady Doctor.’”

Flowers had always wanted to pursue a degree in medicine, but her parents didn’t support her aspirations. Her dream of becoming a doctor undiminished, she enrolled at the UT School of Medicine and paid for it by working as a physical therapist. There were only two females in her graduating class. After graduation, she completed an internship in Roanoke and a residency at Beckley, before returning to UT as a fellow in cardiology and cardiac electrophysiology. It was there that she met Dr. Leo G. Horan, a professor of medicine, whom she would marry. “Cardiology benefited from the union of these two great minds; the rest of us

benefited from their love for one another,” reflected their daughter, C. Paige LoPour.

During her academic career, Dr. Flowers authored more than 180 publications and received a lifetime achievement award from UT. She became the first female president of the Association of University Cardiologists.

“More importantly, she was an extraordinary wife, mother and friend. She lived her life full of joy and did everything with grace, kindness, compassion, and a sense of humor,” LoPour said.

Nancy and Leo became faculty members at the UK College of Medicine in 2005. They were involved in teaching and running the heart station at Gill Heart & Vascular Institute. Even into their golden years, Nancy and Leo weren’t ready to leave cardiology. In 2009, they moved to New Mexico, where they remotely read EKGs, allowing them to stay involved and continue to make an impact on the lives of Kentuckians.

“Whenever we had a challenging EKG to interpret, we’d just wait until Nancy or Leo read it, because then we would know the answer,” said Dr. Susan Smyth, director of the Gill Heart & Vascular Institute.

On March 15, 2017, Dr. Nancy Flowers passed from this life, but she left behind a strong legacy. Her family hopes her memory will continue to inspire cardiologists and drive breakthroughs in research through establishing the **Dr. Nancy C. Flowers and Dr. Leo G. Horan Lectureship Series in Cardiology** and the **Dr. Nancy C. Flowers Professorship in Cardiology**.

“We want to provide an opportunity for brilliant minds to hear from experienced speakers, who will inspire the next generation of cardiologists,” LoPour said. “We are so glad that Mom’s spirit will live on and continue to teach and inspire.”

In 2017, 59 years after the “Lady Doctor” graduated from medical school, she continues to impact the world!





## GILL HEART & VASCULAR INSTITUTE

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# HOW YOU CAN HELP

M8-0109

**Only through private support, can we fully realize our potential** as a state of the art, comprehensive academic cardiovascular center. Despite being the number one cardiovascular service line in Central Kentucky, more work must be done as we tackle Kentucky's number one public health crisis in the Commonwealth: cardiovascular disease.

By using an integrated and comprehensive treatment approach, our patients have improved outcomes, while maintaining a strong sense of self and balance even in the most trying of times. Heart and vascular disease touches all of us, and

only through a tireless pursuit of innovation can we unlock the answers to treating the human condition—at its heart.

For more information about investment opportunities at the Gill Heart and Vascular Institute, its services, and ongoing needs, please contact:

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