INNOVATION. COLLABORATION. EDUCATION.
Message from the Chief of Cardiovascular and Thoracic Surgery

Innovation and collaboration thrive in a culture that nurtures creativity and provides surgeons with the tools they need to do complex work in a supportive environment. Collaboration is at the heart of everything we do as cardiothoracic surgeons, from providing superb clinical care, educating future surgeons, to translating research discoveries into practice.

Medicine and biomedical research are rapidly evolving here at the University of Kentucky medical center, where there are no fences or walls to separate scientists and physicians. This allows our surgeons to work closely with researchers and clinicians at the Saha Cardiovascular Research Center, UK’s Transplant Center, and at the Markey Cancer 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.

Much of our innovation evolves from clinical trials that offer our patients life-saving options, not widely available in the Commonwealth. An example is UK’s Transaortic Valve Replacement Program (TAVR), where surgeons work side-by-side with Gill Heart Institute cardiologists to replace valves using less-invasive surgical procedures so patients can heal faster and spend less time in hospital. Currently we have more than 25 sponsored and investigator-sponsored clinical research trials.

Our faculty is dedicated to the education and training of outstanding future cardiothoracic surgeons and we devote our time and energies every day to mentoring our residents and fellows, and including them in the creative process.

UK’s new ACGME-accredited integrated six-year training program is completed in less time than the current training paradigm. Having the entire residency devoted to what trainees will be doing the rest of their careers produces better-trained surgeons.

We know that collaboration and innovation are not ends to themselves, and our goal is to improve the lives of patients. As you will see in these pages, many of our CT surgeons are known for their expertise in heart surgeries, transplants, ventricular assist devices and thoracic procedures. Collaborating with primary care physicians and specialists across our region, we continually seek ways to provide the safest and the most appropriate care for all our patients.

Sibu P. Saha, MD, MBA
Professor of Surgery and Bioengineering
Chairman, Gill Heart Institute Director’s Council
Email: ssaha2@uky.edu
Phone: (859) 257-8250
WHAT WE DO

Cardiovascular Surgery Services
- Robotic (da Vinci) surgery
- Transcatheter Aortic Valve Replacement (TAVR)
- Minimally invasive approach to Left Atrial Appendage Exclusion procedure (LAA)
- Minimally invasive MAZE procedure for treatment of atrial fibrillation
- Endovascular procedures, including repair of aneurysms
- Complex, reoperative surgeries

General Thoracic Surgery Services
- Video-assisted lung surgery
- Robotic surgery for mediastinal tumor
- VAT-assisted esophageal surgery
- Navigational bronchoscopy
- Endobronchial Ultrasound Biopsy (EBUS) for staging of lung cancer

Heart Failure, Transplant & Mechanical Circulatory Support Services
- Multi-organ transplantation
- Ventricular assist devices
- Total Artificial Heart (TAH)
- Ambulatory Extra Corporeal Membrane Oxygenation (ECMO)
ADULT CARDIOVASCULAR SURGERY PROGRAM

Over the last 15 years, the scope and breadth of CT surgery has expanded exponentially. With it, our cardiovascular services continues to become more comprehensive and with a deeper level of expertise. Dr. Michael Sekela joined the faculty in March 2013. He brings 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 Dr. John C. Gurley, Dr. Hassan Reda performs the Transcatheter Aortic Valve Replacement (TAVR) procedure in UK’s hybrid operating room. The team performed its first TAVR procedure in Lexington in October 2012 and has since built one of the busiest programs in the region.

In close collaboration with accomplished vascular surgeon, Dr. David Minion, Dr. Saha helps some of the region’s critical patients in need of complicated aortic aneurysm repair.

Our faculty also provides CT surgery to underserved communities in eastern Kentucky. Surgeon Dr. Edward Setzer practices full time in Hazard, offering cardiothoracic surgery services at our affiliates so that patients can remain close to home for as much of their medical care as possible.

Dr. Theodore S. Wright provides expertise in the highly innovative and minimally invasive MAZE procedures for the treatment of atrial fibrillation. The video-assisted MAZE procedure includes creation of lines of conduction “block” (or scar tissue) that block the abnormal impulses that cause atrial fibrillation, enabling restoration of normal sinus rhythm.

This is accomplished using cryoablation (freezing) or radiofrequency energy. Video-assisted surgical ablation may also include exclusion of the left atrial appendage, the primary source of strokes in patients with atrial fibrillation.

ADULT CARDIAC SURGERY CASES, 2013

<table>
<thead>
<tr>
<th>CABG</th>
<th>VALVE</th>
<th>CABG/VALVE</th>
<th>TAVR</th>
<th>MAZE</th>
<th>AORTIC ANEURYSM</th>
<th>VASCULAR SURGERY</th>
<th>OTHER</th>
<th>ROBOTICALLY ASSISTED</th>
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<tr>
<td>119</td>
<td>78</td>
<td>45</td>
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<td>39</td>
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<td>55</td>
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</table>

1 MAZE – represents both concomitant and sole surgical management of AF
2 Robotically assisted cases includes both cardiac and thoracic service lines
Each year, our cardiovascular services continue to become more comprehensive and with a deeper level of expertise.
GENERAL THORACIC SURGERY

UK’s thoracic surgeons adopted minimally invasive techniques more than 20 years ago and today perform video-assisted and robotic surgery for lung, mediastinal, and esophageal diseases.

Our faculty collaborates with an integrated patient-centered care team that includes pulmonologists, medical and radiation oncologists, gastroenterologists and critical care medicine specialists. This includes seeing patients at the Markey Cancer Center, which recently became a National Cancer Institute-designated cancer treatment center, for the prevention, early diagnosis and treatment of diseases of the chest.

UK’s areas of expertise cover all aspects of pulmonary, tracheal, chest wall, mediastinal, esophageal, and upper abdominal surgery. To ensure the best possible outcomes, we offer patients a variety of treatment options:

- Surgical resection, including:
  - Minimally invasive (VATS) surgery
  - Robotic (da Vinci) assisted surgery
- Collaboration with plastic surgery and other specialists for complex reconstructions
- Interventional bronchoscopy and endoscopic palliation of airway and esophageal obstruction, including laser therapy, balloon dilation, and stenting
- Targeted radiotherapy
- Opportunities to participate in ongoing clinical trials

Our thoracic surgery program also provides care at several regional locations, such as Danville, Rockcastle, Flemingsburg and Paintsville, Ky.

TOTAL THORACIC SURGERY CASES, 2013

<table>
<thead>
<tr>
<th>LUNG RESECTIONS</th>
<th>VATS</th>
<th>MEDIASTINAL</th>
<th>ESOPHAGEAL/FOREGUT</th>
<th>OTHER</th>
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<tr>
<td>276</td>
<td>225</td>
<td>110</td>
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A native of Eastern Kentucky, Dr. Angela Mahan graduated from the University of Louisville School of Medicine and trained in Colorado before returning to UK to complete a CT surgery fellowship. When Dr. Mahan was offered a faculty position at UK, she says the choice was not only simple but heartfelt: “I wanted to come home to care for our people.”

TRANSPLANT AND MCS CASES, 2013

<table>
<thead>
<tr>
<th>HEART</th>
<th>HEART/LUNG</th>
<th>LUNG</th>
<th>VAD</th>
<th>ECMO</th>
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<tr>
<td>15</td>
<td>1</td>
<td>25</td>
<td>23</td>
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</table>
All the techniques and technology we use in the OR will never replace the human connection between a patient and his doctor.
HEART FAILURE, TRANSPLANT & MECHANICAL CIRCULATORY SUPPORT

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

Dr. Charles W. Hoopes, director of the UK Transplant Program, is nationally recognized for performing highly complex transplant procedures, artificial heart and lung transplantation, and pioneering the use of ambulatory extracorporeal membrane oxygenation (ECMO).

UK’s ECMO Program received the 2013 Excellence in Life Support Award from the Extracorporeal Life Support Organization (ELSO). UK’s Transplant Center is now a designated “Center of Excellence” in achieving high quality standards, using specialized equipment, following defined patient protocols, and for providing advanced education to ECMO staff.

UK also employs the full spectrum of mechanical devices to help heart failure patients. Temporary devices, such as the Impella 2.5 or 5.0 can be placed in patients in critical cardiogenic shock as a bridge to ventricular recovery.

For those with refractory heart failure, the HeartWare LVAD is used as a bridge to transplant; the HeartMate II LVAD may serve as a bridge or as destination therapy. Syncardia’s Total Artificial Heart is an option for patients with severe biventricular failure.

“

The use of ECMO, along with other specialized procedures, has proven to be a viable option for many adult patients with recoverable lung disease and for those awaiting transplantation.

”

UK is one of only a few centers in the United States to offer ambulatory ECMO, which uses an artificial lung device and provides cardiac/pulmonary support to patients whose heart/lungs are so severely damaged they can no longer function without assistance.

Ariana Sumner, 24, developed pregnancy-associated cardiomyopathy and heart failure in early 2013. ECMO (and a subsequent LVAD) allowed Ariana to survive and rehabilitated her until a donor heart became available. She received her transplant last fall and is now doing well.
Patients come to our transplant center for treatment not offered in their home state.
CARDBIOVASCULAR AND THORACIC SURGERY FACULTY

Victor Ferraris, MD, PhD
Tyler Gill Professor of Surgery
Fellowship in CT Surgery
Letterman Army Medical Center
San Francisco, CA
Clinical Expertise
General thoracic and vascular surgery
Research Interest
Hemostatic agents
Platelet function in lung cancer
Special Interest
Blood conservation and transfusion management

Charles W. Hoopes, MD
Jason Alexander Gill Professor of Surgery
Section Chief, Cardiopulmonary Transplant/VAD
Director, Center for Transplantation and Organ Failure (CTOF)
Fellowship in Thoracic Transplant Surgery
Duke University
Clinical Expertise
Surgical approaches to end-stage heart/lung disease, thoracic transplant (heart and lung),
Mechanical circulatory support (VAD/ECMO)
Research Interest
Myocardial structural modifications after ventricular assist device placement, artificial lung technologies, pulmonary biome, public health policy in solid organ transplant
Special Interest
Extracorporeal membrane oxygenation (ECMO) bridge to pulmonary transplant

Angela L. Mahan, MD
Assistant Professor of Surgery
Fellowship in CT Surgery
University of Kentucky
Clinical Expertise
General thoracic surgery
Minimally invasive surgery for lung and esophageal diseases
Research Interest
Process of care in lung cancer patients
Special Interest
Foregut surgery
Surgical education of medical students

Jeremiah T. Martin, MB, BCh
Assistant Professor of Surgery
Fellowship in CT Surgery
University of Kentucky
Fellowship in Lung Transplant and Minimally Invasive Thoracic Surgery
Duke University
Clinical Expertise
General thoracic surgery
Video-assisted thoracoscopic surgery
Research Interest
Intraoperative staging of lung cancer using ultrasound
Lobectomy versus sublobar resection of early-stage lung cancer
Special Interest
Expansion of services for early detection and therapy of lung and esophageal cancer through the Markey Cancer Center
Awards and Special Recognition
CCTS/MCC Young Investigator Award
Timothy W. Mullett, MD
Professor of Surgery
Program Director, Residency and Fellowship
Fellowship in CT Surgery
University of Florida
Clinical Expertise
General thoracic surgery
Minimally invasive surgery for lung and esophageal diseases
Research Interest
Spiration IBV valve system
Special Interest
Lung cancer screening
Kentucky Clinical Trials Network

Hassan Reda, MD
Associate Professor of Surgery
Fellowship in CT Surgery
University of Texas Medical Branch at Galveston (UTMB)
Clinical Expertise
Coronary artery revascularization (CABG)
Aortic and mitral valve surgery
Aortic aneurysm surgery
Minimally invasive valve surgery
Research Interest
Prevention of acute kidney injury in patients undergoing high-risk cardiac surgery
Special Interest
Transcatheter aortic valve replacement (TAVR)

Sibu P. Saha, MD, MBA
Professor of Surgery and Bioengineering
Chief, Division of Cardiovascular and Thoracic Surgery
Fellowship in CT Surgery
Medical University of South Carolina
Clinical Expertise
Thoracic and vascular surgery
Research Interest
Device therapy for resistant hypertension
Stem cell therapy for PAD
Hemostatic agents
Special Interest
Business of medicine
Surgical education
Student research and mentoring
Awards
Abraham Flexner Master Educator Award

Harish Seethamraju, MD
Associate Professor
Pulmonary and Critical Care Medicine
Fellowship in Pulmonary Medicine and Critical Care
Baylor College of Medicine
Clinical Expertise
Lung transplantation
End-stage lung disease management
Airway stents and management of complex airway lesions management
Diaphragmatic dysfunction
Research Interest
Pulmonary fibrosis and interstitial lung disease
Pulmonary hypertension
Acute lung injury
Special Interest
Pulmonary and critical care education of residents and fellows
CARDIOVASCULAR AND THORACIC SURGERY FACULTY

Michael Sekela, MD
Professor of Surgery
Fellowship in CT Surgery
University of Kentucky
Clinical Expertise
Reoperative/complex cardiac surgery
Transmyocardial revascularization
Research Interest
Regenerative medicine; stem cell therapy in conjunction with transmyocardial laser revascularization (TMLR)
Special Interest
Robotic mitral valve surgery

Edward R. Setser, MD
Assistant Professor of Surgery
Fellowship in CT Surgery
Brooke Army Medical Center, Fort Sam Houston, Texas
Clinical Expertise
Cardiothoracic and vascular surgery

Theodore S. Wright, MD
Assistant Professor of Surgery
Fellowship in CT Surgery
University of Wisconsin
Fellowship in Cardiopulmonary Transplant
University of California-San Francisco
Clinical Practice
Adult heart surgery
Atrial fibrillation
Research Focus
Minimally invasive surgical management of atrial fibrillation
Special Interest
MAZE procedure for the treatment of atrial fibrillation
Robotic mitral valve surgery
Awards and Special Recognition
Board President, Lexington Chapter of the American Heart Association

Roh Yanagida, MD
Assistant Professor of Surgery
Fellowship in CT Surgery
Cedars-Sinai Medical Center, Los Angeles
Fellowship in Heart/Lung Transplant and Mechanical Circulatory Support
Cedars-Sinai Medical Center
Clinical Expertise
Thoracic transplant and mechanical circulatory support
Research Interest
Ex-vivo lung perfusion
Cardiac regeneration therapy
Special Interest
Mechanical circulatory and respiratory support

To refer a patient to one of our surgeons, call: 1-800-888-5533
Joseph Zwischenberger, MD  
Johnston-Wright Professor and Chairman  
Department of Surgery

**Fellowship in CT Surgery**  
University of Michigan

**Fellowship in Extracorporeal Membrane Oxygenation/Critical Care**  
University of Michigan

**Clinical Expertise**  
General thoracic surgery

**Research Interest**  
Oxygenation and CO₂ removal during acute respiratory failure  
Extracorporeal circulation

**Special Interest**  
Surgical education  
Ambulatory ECMO

**Awards and Special Recognition**  
Holds two patents for medical devices; five additional medical device patents pending

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Cherry Ballard-Croft, PhD  
Assistant Professor

**Postdoctoral Fellow in Pharmacology**  
University of Texas Southwestern

**Research Fellow in Surgery**  
University of Texas Southwestern

**Research Interest**  
Mitogen-activated protein kinase (MAPK)  
Ischemia/reperfusion  
Heart and cavopulmonary support

**Special Interest**  
Systemic hyperthermia system for late-stage lung cancer treatment

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Dongfang Wang, MD, PhD  
Associate Professor

**Fellowship in CT Surgery**  
Union Hospital & Institute of Cardiovascular diseases of Tongji Medical University, Wuhan, PR China

**Research Fellow:**  
University of Texas Medical Branch

**Research Interest**  
Artificial lung  
Extracorporeal membrane oxygenation  
Ventricular assist devices

**Special Interest**  
Medical device research and development  
Respiratory failure: acute respiratory distress syndrome (ARDS)

**Awards and Special Recognition**  
Holds two patents for medical devices; five additional medical device patents pending

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Drs. Jay Zwischenberger and Dongfang Wang, invented the Avalon double lumen catheter, which led to wider adoption of ambulatory ECMO.
## CLINICAL TRIALS AND RESEARCH

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<td>CVRx</td>
<td>Rheos™ Pivotal Trial for resistant hypertension</td>
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<tr>
<td>Nycomed</td>
<td>A randomized, open label, parallel-group, multi-center trial to compare efficacy and safety of TachoSil® versus Surgicel® Original for the secondary hemostatic treatment of needle hole bleeding in vascular surgery</td>
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<td>Syncardia</td>
<td>SynCardia Freedom™ Driver system study</td>
<td>Hoopes</td>
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<tr>
<td>Syncardia</td>
<td>SynCardia temporary Total Artificial Heart (TAH-t) Postmarket Surveillance Study</td>
<td>Hoopes</td>
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<tr>
<td>Grifols</td>
<td>A prospective, single-blind, randomized, phase III study to evaluate the safety and efficacy of Fibrin Sealant Grifols (FS Grifols) as an adjunct to hemostasis during peripheral vascular surgery</td>
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<tr>
<td>Pluristem</td>
<td>A phase II, randomized, double-blind, multicenter, multinational, placebo-controlled, parallel-groups study to evaluate the safety and efficacy of intramuscular injections of allogeneic PLX-PAD cells for the treatment of subjects with intermittent claudication</td>
<td>Saha</td>
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<tr>
<td>Abbvie</td>
<td>Phase IIIB, randomized, double-blind, placebo-controlled, safety and efficacy trial of multiple dosing regimens of ABT-719 for the prevention of acute kidney injury in subjects undergoing high risk cardiac surgery</td>
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<td>Thoratec</td>
<td>CentriMag RVAS post-approval study</td>
<td>Hoopes</td>
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<td>Investigator</td>
<td>Comparison of operative risk scoring algorithms as applied to a local series of cardiothoracic surgery patients</td>
<td>Ferrarlis</td>
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<tr>
<td>Investigator</td>
<td>ECMO support compared to mechanical ventilation for acute respiratory failure: A pilot study</td>
<td>Hoopes</td>
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<td>Biologic commonalities associated with degeneration in function of cardiac skeletal and respiratory muscles in patients with heart failure</td>
<td>Hoopes</td>
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<td>Investigator</td>
<td>INTERMACS-VAD therapy database</td>
<td>Hoopes</td>
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<td>Investigator</td>
<td>Trends and practice in management of spontaneous pneumothorax: A single center experience</td>
<td>Saha</td>
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<td>Investigator</td>
<td>Ex-vivo lung perfusion (lung in the box) study</td>
<td>Hoopes</td>
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<td>Investigator</td>
<td>A comparison of post-operative thrombotic complication for on-pump versus off-pump CABG</td>
<td>Ferraris</td>
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<td>Investigator</td>
<td>Surgery for infective endocarditis, A retrospective review of outcomes</td>
<td>Ferraris</td>
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<td>Spiration iBV valve system-humanitarian use device</td>
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<td>A retrospective review of carotid endarterectomy in cardiothoracic surgery from 2002–September 2009</td>
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<td>Lobectomy/wedge resection for lung cancer: An outcomes analysis of 500 cases from 2002–2007</td>
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<td>Delayed sternal closure after left ventricular assist device implantation with vacuum assisted device: a retrospective review May 2008–October 2012</td>
<td>Yanagida</td>
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<td>Platelet function in early stage lung cancer: A pilot study</td>
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<td>Investigator</td>
<td>Cardiac tumors and surgical management: A retrospective review</td>
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<td>Gelfand/ Saha</td>
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<td>Saha/ Daugherty/ Saha</td>
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<tr>
<td>UK Center for Bioengineering</td>
<td>Diffuse optical assessment of peripheral arterial disease (PAD) and revascularization</td>
<td>Yu/Saha</td>
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</table>
UK’s CT Surgery Division continues to enhance and expand its reputation as a center for training, research, and education. Our trainees receive superb clinical training in an active academic medical center, the Lexington VA Medical Center, and UK’s Good Samaritan Hospital. Our faculty is committed to the education of medical students, as well as general surgery residents and CT surgery fellows. Additional surgery trainees, including PAs and APRNs, also rotate through our service.

For more than 40 years UK has trained CT surgery fellows from across the country. Our graduates have gone on to become board certified in cardiothoracic surgery, and are now gainfully employed in outstanding academic centers as well as in private practice.

In July of 2013, we enrolled Dr. Michael Bolanos from Duke University into our first integrated, six-year residency training program, which is directed by Timothy W. Mullet, MD. UK was among the first academic centers across the country to receive accreditation for its program from the American College of Graduate Medical Education.

The innovative I-6 program allows physicians to begin their CT surgery training immediately upon graduating from medical school, rather than after the traditional five years of general surgery training. This allows the trainee to learn the discipline in a comprehensive manner throughout their training. Time has been allotted so that the resident experiences rotations in endoscopy, trauma, cardiology, and cardiac imaging.

Our dedicated faculty mentor our fellows throughout their training experience, and expose them to a variety of cases so that they are competent in the depth and breadth of cardiothoracic procedures. In addition, our trainees develop excellent communication skills with patients and their families, and other health care professionals. We also school them in our multidisciplinary, team-based approach to optimize patient care. An additional aspect of their training is a robust and comprehensive schedule of teaching conferences that feature many nationally recognized speakers.

For more information about our program, contact Residency Program Coordinator, Hannah Pagan at hannah.pagan@uky.edu or call (859) 323-5057.
Our residents and fellows are exposed to the depth and breadth of CT surgery cases during their training.
Publications from this division represent our activities in both clinical and basic research.

**Ferraris VA.** Facts, opinions, & conclusions–aprotinin brings out all of these. *J Thorac Cardiovasc Surg.* 2013;145:240-42.


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