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Welcome to Johns Hopkins

We are extremely pleased and honored by your interest in our cardiothoracic surgery training program and welcome you to our institution. Your accomplishments and endeavors to date are to be congratulated.

We at Johns Hopkins are committed to providing an outstanding educational experience. Our multidisciplinary team is dedicated to providing trainees with an outstanding education that will provide preparation for a successful and rewarding career in cardiothoracic surgery.

The Johns Hopkins Hospital has a distinguished history of advancements in the treatment of cardiothoracic diseases in adults and children beginning with the Blalock-Taussig shunt in 1944. Our cardiothoracic surgery program currently offers a full complement of surgical interventions—from time-honored surgeries, such as coronary artery bypass, valve replacement and congenital heart procedures, to new, groundbreaking therapies, including minimally invasive cardiac surgery, transcatheter valve replacements, off-pump coronary bypass, surgical ablation for atrial fibrillation, laser transmyocardial revascularization and robotic heart surgery. We offer comprehensive treatment for congestive heart failure, including surgical ventricular restoration procedures, cardiac transplantation and ventricular assist devices.

Finally, our program is an integral part of the Dana and Albert “Cubby” Broccoli Center for Aortic Diseases at Johns Hopkins, one of only a few centers in the world that provides comprehensive management and surgical repair of aortic diseases, with particular expertise in Marfan syndrome and Loeys-Dietz syndrome.

In general, for thoracic surgery, we have the highest surgical volumes in the state of Maryland and the surrounding areas, so the experience in thoracic malignancies, including that of lung, esophageal, mediastinal and pleura, will be unique. The techniques of video-assisted thoracic surgery...
Thoracoscopic surgery, robotics, lung reduction surgery and lung transplantation are fully integrated into the training program.

Our large clinical volume, consisting of many complex and complicated procedures in all areas, assures the best possible patient care from some of the most experienced and expertly skilled surgeons in the world. Our surgeons are committed to studying and evaluating new methods of surgical treatment and improving surgical outcomes through clinical and laboratory research. We hope this information is useful as you move on to the next phase of your surgical career.

**Mission**

Our mission is to provide the best patient care by fostering innovation, promoting education and encouraging scientific inquiry.

**Clinical Service Philosophy and Core Values**

Our motto is **WE CARE**—we are Conscientious, Accountable, Respectful and Engaged. We pride ourselves upon our:
- Surgical excellence
- Integrity
- Innovation and discovery
- Respect for the individual
- Fostering of leadership through education and research
The History of Johns Hopkins

The history of Johns Hopkins is a notable one. Johns Hopkins, a Baltimore merchant, died on Christmas Eve in 1873, leaving $7 million to be divided between a university and a hospital that would bear his name. Today, these interconnected institutions remain among the world’s greatest resources for higher education, research, patient care and public service.

The Johns Hopkins Hospital opened in 1889, followed four years later by the university’s school of medicine, revolutionizing medical practice, teaching and research in the United States. The hospital is now part of the Johns Hopkins Health System, which includes five other acute care hospitals and other integrated health care delivery components, with a network of primary and specialty care practices, outpatient care, long-term care and home care throughout Maryland.

The Johns Hopkins Hospital was ranked #3 and the Cardiology and Cardiac Surgery program was ranked #6 in the nation on the 2017-18 U.S. News and World Report Best Hospitals list. Johns Hopkins also ranks the highest in the nation in NIH funding for Research Project Grants.
HISTORICAL PERSPECTIVE:
THE WOMEN’S FUND COMMITTEE
AND THE FOUNDING OF THE
JOHNS HOPKINS UNIVERSITY
SCHOOL OF MEDICINE

The philanthropist, Mary Elizabeth Garrett (pictured), and her friends on the Women’s Fund Committee provided the financial support for the founding of the Johns Hopkins University School of Medicine in 1893. These forward looking women, not only contributed financially, but did so with rigorous stipulations, including that women be admitted to the school on equal terms as men, and that the school be a graduate institution with strict entrance requirements. The leadership of these women transformed not only the role of women in medicine, but also very quality of medical education in America.

Letter of Johns Hopkins to the Trustees

Baltimore, March 10, 1873


Gentlemen:

I have given you, in your capacity of Trustees, thirteen acres of land; situated in the city of Baltimore, and bounded by Wolfe, Monument, Broadway and Jefferson streets, upon which I desire you to erect a Hospital.

It will be necessary to devote the present year to the grading of the surface, to its proper drainage, to the laying out of the grounds, and to the most careful and deliberate choice of a plan for the erection and arrangement of the buildings.

It is my wish that the plan thus chosen shall be one which will permit symmetrical additions to the buildings which will be first constructed, in order that you may ultimately be able to receive four hundred patients; and that it shall provide for a Hospital, which shall, in construction and arrangement, compare favorably with any other institution of like character in this country or in Europe.

It will, therefore, be your duty to obtain the advice and assistance of those, at home and abroad, who have achieved the greatest success in the construction and management of Hospitals.

I cannot press this injunction too strongly upon you, because the usefulness of this charity will greatly depend upon the plan which you may adopt for the construction and arrangement of the buildings. It is my desire that you should complete this portion of your labor during the current year, and be in readiness to commence the building of the Hospital in the spring of 1874.

It will be our duty, hereafter, to provide for the erection, upon other ground, of suitable buildings for the reception, maintenance and education of orphan colored children.

I direct you to provide accommodation for three or four hundred children of this class; and you are also authorized to receive into this asylum, at your discretion, as belonging to such class, colored children who have lost one parent only, and, in exceptional cases, to receive colored children who are not orphans, but who may be in such circumstances as to require the aid of the charity.

I desire that you shall apply the yearly sum of twenty thousand dollars, or so much thereof as may be necessary of the revenue of the property which you will hereafter receive, to the maintenance of the Orphan’s Home intended for such children.

In order to enable you to carry my wishes into full effect, I will now and in each succeeding year during my life, until the Hospital buildings are fully completed, and in readiness to receive patients, place at your disposal the sum of one hundred thousand dollars.

In addition to the gift, already made to you, of the thirteen acres of Land in the city of Baltimore, upon which the Hospital will be built, I have dedicated to its support and to the payment of 5
the annual sum provided to be paid for the support of the Orphan's Home, property which you may
safely estimate as worth, today, two millions of dollars, and from which your corporation will certainly
receive a yearly revenue of one hundred and twenty thousand dollars; and which time and your dili-
gent care will make more largely productive.

If the Hospital and Orphan's Home are not built at my death, it will be your duty to apply the
income arising from the property so dedicated, to their completion. When they are built, the income
from that property will suffice for their maintenance.

The indigent sick of this city and its environs, without regard to sex, age, or color, who may require
surgical or medical treatment, and who can be received into the Hospital without peril to the other
inmates, and the poor of this city and State, of all races, who are stricken down by any casualty, shall
be received into the Hospital, without charge, for such periods of time and under such regulations as
you may prescribe. It shall be your duty to make such division of the sexes and patients among the
several wards of the Hospital as will best promote the actual usefulness of the charity.

You will also provide for the reception of a limited number of patients who are able to make com-
pen-sation for the room and attention they may require. The money received from such persons will
enable you to appropriate a larger sum for the relief of the sufferings of that class which I direct you
to admit free of charge; and you will thus be enabled to afford to strangers, and to those of your own
people who have no friends or relations to care for them in sickness, and who are not objects of char-
ity, the advantages of careful and skillful treatment. It will be your special duty to secure for the service
of the Hospital surgeons and physicians of the highest character and greatest skill.

I desire you to establish in connection with the Hospital a training school for female nurses. This
provision will secure the services of women competent to care for the sick in the Hospital wards, and
will enable you to benefit the whole community by supplying it with a class of trained and experienced
nurses.

I wish the large grounds surrounding the Hospital buildings to be properly enclosed by iron rail-
ings, and to be so laid out and planted with trees and flowers as to afford solace to the sick and be an
ornament to the section of the city in which the grounds are located.

I desire that you should in due season provide for a site and buildings, of such description and at
such distance from the city as your judgment shall approve, for the reception of convalescent patients.
You will be able in this way to hasten the recovery of the sick and to have always room in the main
Hospital buildings for other sick persons requiring immediate medical or surgical treatment.

It is my especial request that the influence of religion should be felt in and impressed upon the
whole management of the Hospital; but I desire, nevertheless, that the administration of the charity
shall be undisturbed by sectarian influence, discipline or control.

In all your arrangements in relation to this Hospital, you will bear constantly in mind that it is
my wish and purpose that the institution shall ultimately form a part of the Medical School of that
University for which I have made ample provision by my will.

I have felt it to be my duty to bring these subjects to your particular attention, knowing that you
will conform to the wishes which I thus definitely express.

In other particulars I leave your Board to the exercise of its discretion, believing that your good judg-
ment and experience in life will enable you to make this charity a substantial benefit to the community.

I am, very respectfully, your friend,

Johns Hopkins
The Johns Hopkins Medical Institution

The training experience includes opportunities for rotation at the following Locations.
The divisions of Cardiac Surgery and Thoracic Surgery offer a three-year training program following completion of a surgical residency. The first year as a junior cardiac surgery fellow is divided among adult cardiac, congenital cardiac and thoracic surgery. The second-year rotations encompass thoracic and adult cardiac surgery, which includes six months of training in VETT: ventricular assist device, extracorporeal membrane oxygenation, transplant and transcatheter device services. There are also opportunities for elective rotations based on resident interests. The third year of the residency is spent as a chief resident in adult cardiac surgery. Residents with a strong interest in thoracic surgery will have an opportunity to spend time on the thoracic service in the third year.

The Johns Hopkins Hospital has a long history of training academic surgeons in general and cardiothoracic surgery. Johns Hopkins cardiac surgery has been directed by leaders in the field, including Alfred Blalock, Vincent Gott, Bruce Reitz, William Baumgartner, Duke Cameron and Jennifer Lawton. The division strives to maintain this heritage by fostering clinical expertise, scientific inquiry and intellectual development—the essence of an academic surgeon. To accomplish this goal, the training program in cardiothoracic surgery provides a wealth of clinical and operative experience in a collegial atmosphere, a diverse house staff and faculty interested in teaching, and a wide variety of clinical and basic research experiences.
Cardiothoracic Surgery Residency Program Welcome

On behalf of the Johns Hopkins Department of Surgery, I want to welcome you to Baltimore during this very exciting time. The Johns Hopkins Hospital has had a distinguished history of advancements in the treatment of cardiovascular disease in adults and children since the time of Dr. Alfred Blalock and his extraordinary work in the 1940s and 50s. Since that time, the cardiovascular and thoracic surgery programs have achieved remarkable groundbreaking accomplishments in a number of areas. We hope you understand that the cardiothoracic surgery residency is a cornerstone of our tripartite mission: outstanding patient care, innovative research and exceptional education.

As the William Stewart Halsted Professor and director of the Department of Surgery, it gives me great pleasure to introduce all of you to this extraordinary institution. I also serve in a leadership role as program director of the residency program. We have been able to recruit outstanding faculty members who support our academic mission as we embark upon this “surgical renaissance.” We continue to honor the fantastic history of surgery at Johns Hopkins, but we also need to be forward thinking and innovative in the current environment—we must blaze a new trail for the future!

I invite you to learn as much as you can about the program in the coming days. Please share your feedback with us and your thoughts about our future. We look forward to answering your questions, as we are committed to creating one of the best cardiothoracic surgery training programs in the country.

Welcome again, and thank you for joining us.

William Stewart Halsted Professor and Director of the Department of Surgery
Surgeon-in-Chief, The Johns Hopkins Hospital
Baltimore, MD
Cardiothoracic Surgery Residency Program

Three-Year Program

Year 1: Congenital cardiac surgery (3 months)
           Thoracic surgery (3 months)
           Adult cardiac surgery (6 months)

Year 2: VETT: VAD/ECMO/Transplant/TVT (6 months)
           Thoracic surgery chief resident (6 months)

Year 3: Adult cardiac surgery chief resident (12 months)

• Progressive increase in responsibility
• Progressive increase in operative experience as primary surgeon
• Opportunities for clinical research
• Opportunities for elective clinical experience

Year 1  Cardiothoracic (Adult Cardiac/Thoracic/Congenital Cardiac)
       Patient care
       Operative experience
       Perioperative decision-making
       Consultative experience

Year 2  General Thoracic Chief
       Patient care
       Operative experience
       Perioperative decision-making
       Consultative experience

Cardiothoracic (VETT: VAD/ECMO/Transplant/TVT)
       Patient care
       Operative experience
       Perioperative decision-making
       Consultative experience

Year 3  Cardiothoracic (Adult Cardiac Surgery Chief Resident)
       Patient care
       Perioperative decision-making
       Overall charge of service
       Substantial operative experience
       Transplant responsibility
       Consultative experience
Cardiothoracic Surgery Residency Program

Education - Weekly

- Monday–Friday, 7 a.m., Cardiac Service Huddle
- Wednesday, General Thoracic Surgery Conferences
  - 7–8 a.m.: Teaching Conference
  - 8:30–9:30 a.m.: Thoracic Surgery Multidisciplinary Tumor Board
  - Noon–3 p.m.: Thoracic Malignancy Multidisciplinary Clinic at Johns Hopkins Bayview Medical Center (Johns Hopkins Bayview faculty members)
- Thursday, Cardiac Surgery Conferences
  - 7:30–8:30 a.m.: Cardiac Surgery Morbidity & Mortality Conference
  - 8:30–9:30 a.m.: Curricular Talks/Visiting Professor Lectureship, Wet Labs, Surgery Grand Rounds
- Friday, Cardiac Surgery Conferences
  - 7 a.m., Pediatric Cardiac Conference
  - 7:15–8:00 p.m.: Case Conference Multidisciplinary Discussion Next Week’s Cases
- Monday, Wednesday, Thursday (mornings) and Friday, General Thoracic Surgery Outpatient Clinic

Monthly/Quarterly
Cardiac Service Line Meeting Monday, 6:30 a.m. (monthly)
Monthly Pediatric Cardiac Morbidity and Mortality Conference
Monthly Cardiothoracic Journal Club
Quarterly: Maintenance of Certification (MOC) Orals

Annual
Blalock Visiting Professor—Cardiac Surgery
Evelyn Grollman-Glick Lectureship Visiting Professor—General Thoracic Surgery
Susan and Milton Miller Lecture—Cardiac and Vascular Surgery
Lynn Van Praag Lectures Series
Pediatric Cardiac Surgery Guest Lecture Series
Dana and Albert “Cubby” Broccoli Lecture
The Levi Watkins, Jr. M.D. Memorial Lectureship

Research
- Basic Research Performed by General Surgery Residents in Faculty-Funded Laboratories
- Clinical Reviews

Mentoring
- Program/Associate Program Directors
- Assigned Faculty Mentor

Vacation/Meeting Time Off

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
<tr>
<td>2 weeks for vacation</td>
<td>2 weeks for vacation</td>
<td>2 weeks for vacation/</td>
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<tr>
<td>1 national meeting</td>
<td>1 national meeting</td>
<td>employment search</td>
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<tr>
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<td>1 national meeting</td>
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Optional prep course for American Board of Thoracic Surgery examination
*Maternity or paternity leave as needed*
### Chief Resident Operative Experience

**Calendar Year 2017**

#### Congenital Heart
- Congenital Heart Disease Assistant: 77
- Congenital Heart Disease Primary Surgeon: 27

#### Adult Cardiac Experience
- Acquired Valvular Heart Disease: 100
- Myocardial Revascularization: 174
- Redo Sternotomy: 16
- Interventional Skills or Procedures: 44
- Conduit Dissection and Preparation: 42
- Aortic Procedures: 69
- Arrhythmia Surgery: 17
- Cardiopulmonary Bypass Setup and Pump Run: 27
- Circulatory Assist/Cardiac Transplant: 54

#### Adult General Thoracic
- Lung—Major Anatomic Resections: 26
- Lung—Major VATS/Robotic Anatomic Resections: 10
- Total Lung: 63
- Pleura—Major: 12
- Pleura—Minor: 15
- Total Pleura: 27
- Chest Wall and Diaphragm: 46
- Mediastinum: 8
- Tracheobronchial—Airway Surgery: 7
- Esophagus—Esophagectomy: 7
- Esophagus—Benign Major: 13
- Total Esophagus: 20

#### Minor Procedures
- Bronchoscopy—Simple: 78
- Bronchoscopy—Complex: 11
- Total Bronchoscopy: 89
- UGI—Endoscopy—Simple: 16
- UGI—Endoscopy—Complex: 12
- Total UGI—Endoscopy: 28
- Mediastinal Assessment: 0
- Mediastinal Assessment—Mediastinoscopy: 23
- Mediastinal Assessment—EBUS/FNA: 4
- Mediastinal Assessment—Chamberlain or Mediastinal Node Dissection: 20
- Total Mediastinal Assessment: 24

#### Other Experience
- Consultation Experience—New Patients: 55
- Consultation Experience—Follow-Up Patients: 34
- Total Consultation Experience: 89
- Multidisciplinary Patient Management Conferences: 82
- Thoracic Critical Care Case Management: 21
- Cardiac and Congenital Critical Care Case Management: 200
- Total Critical Care Case Management: 221
- Simulation: 42

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### Graduated Residents from 1965–2017

- Initial academic job: 61%
- Remained in academic medicine: 46%
- Chair/Chief: 43%
Specialty Areas

Cardiovascular Surgery
- Surgery for Marfan syndrome and Loey-Dietz syndrome
- Minimally invasive/robotic cardiac surgery
- On- and off-pump coronary artery bypass grafting
- Surgery for atrial fibrillation
- Surgery for advanced heart and lung disease
  - Heart transplant
  - Lung transplant
  - Left ventricular assist device for destination or bridge to transplant
  - Extracorporeal membrane oxygenation
- Adult congenital procedures
- High-risk congenital heart procedures
- Transcatheter valve implantation
- Valve-sparing aortic root procedures
- Endovascular and thoracic open aortic repair (collaboration with vascular surgery)
- Neurological outcomes research
- Cardiac surgery critical care research
- Clinical outcomes research

General Thoracic Surgery
- Minimally invasive/robotic surgery
- Geriatric surgery
- National clinical trials
- Translational genomics
- Biomarkers
- Outcomes research
- Database
  - Lung cancer
  - Esophagectomy
# Visiting Lecture Professorships

**The Alfred Blalock Lecture**

<table>
<thead>
<tr>
<th>Year</th>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>2017</td>
<td>Tirone David</td>
<td>Creativity in Surgery</td>
</tr>
<tr>
<td>2016</td>
<td>Sir Bruce Keogh</td>
<td>Medical Care for All: Lessons Learned from the NHS</td>
</tr>
<tr>
<td>2015</td>
<td>Dr. Martin Elliott</td>
<td>Managing Tracheal Stenosis in Children: From Repair to Replacement</td>
</tr>
<tr>
<td>2014</td>
<td>Dr. Hartzell Schaff</td>
<td>New Developments in Surgical Management of Hypertrophic Cardiomyopathy</td>
</tr>
<tr>
<td>2013</td>
<td>Dr. Bruce Lytle</td>
<td>How Coronary Artery Bypass Surgery Created the Modern World</td>
</tr>
<tr>
<td>2012</td>
<td>Dr. Joseph Coselli</td>
<td>Thoracoabdominal Aortic Aneurysm Repair—The Mentor’s Imprint</td>
</tr>
<tr>
<td>2011</td>
<td>Dr. Edward L. Bove</td>
<td>Innovation and Regulation—Can They Both Exist in Today’s Medical Environment?</td>
</tr>
<tr>
<td>2010</td>
<td>Dr. Craig R. Smith</td>
<td>Transcatheter Valve Implantation</td>
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<tr>
<td>2009</td>
<td>Dr. Randolph Chitwood, Jr.</td>
<td>Innovation in Surgery: Johns Hopkins, Duke and ECU</td>
</tr>
<tr>
<td>2008</td>
<td>Dr. D. Craig Miller</td>
<td>Valve-Sparing Aortic Root Replacement—Where Are We Heading and What about BAV and the Arch?</td>
</tr>
<tr>
<td>2007</td>
<td>Dr. Frederick A. Crawford</td>
<td>Does Cardiac Surgery Have a Future?</td>
</tr>
<tr>
<td>2006</td>
<td>Dr. Irving Kron</td>
<td>Surgery for Heart Failure</td>
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<tr>
<td>2005</td>
<td>Dr. Robert A. Guyton</td>
<td>Evidence-based Surgery: The Case for Coronary Artery Bypass</td>
</tr>
<tr>
<td>2004</td>
<td>Dr. Bruce A. Reitz</td>
<td>Continuing Progress in Heart and Lung Transplantation</td>
</tr>
<tr>
<td>2003</td>
<td>Dr. Timothy J. Gardner</td>
<td>The Evolution of Cardiac Surgery: What Would Dr. Blalock Do?</td>
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<tr>
<td>2002</td>
<td>Dr. Donald B. Doty</td>
<td>Explorers, Pioneers and the American Dream</td>
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<tr>
<td>2001</td>
<td>Dr. Randall B. Griepp</td>
<td>Surgery of the Aortic Arch</td>
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<tr>
<td>2000</td>
<td>Dr. Gordon F. Murray</td>
<td>OPCAB “The Beat Goes On”</td>
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<tr>
<td>1999</td>
<td>Dr. Alden H. Harken</td>
<td>Anyone Can Treat Cardiac Arrhythmias</td>
</tr>
<tr>
<td>1998</td>
<td>Dr. Mark B. Orringer</td>
<td>Evolution, Refinements and Experience with Transhiatal Esophagectomy</td>
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<tr>
<td>1997</td>
<td>Dr. Ronald C. Elkins</td>
<td>Congenital Aortic Valve Disease—Evolution of Surgical Management</td>
</tr>
<tr>
<td>1996</td>
<td>Dr. James L. Cox</td>
<td>Surgery for Atrial Fibrillation</td>
</tr>
<tr>
<td>1995</td>
<td>Dr. Frank C. Spencer</td>
<td>Experiences in 600 Patients with Reconstruction of the Mitral Valve for Mitral Insufficiency</td>
</tr>
<tr>
<td>1988</td>
<td>Dr. Aldo R. Castaneda</td>
<td>Early Surgical Correction of Congenital, Heart Defects a Therapeutic Leitmotif</td>
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<tr>
<td>1987</td>
<td>Dr. Denton A. Cooley</td>
<td>Thoracic Aortic Aneurysms: From Hopkins to Houston</td>
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<tr>
<td>1986</td>
<td>Dr. John W. Kirklin</td>
<td>The Movement of Cardiac Surgery Towards the Very Young</td>
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<tr>
<td>1985</td>
<td>Dr. David C. Sabiston, Jr.</td>
<td>The Diagnosis and Surgical Management of Chronic Pulmonary Embolism</td>
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<tr>
<td>1984</td>
<td>Dr. Dwight C. McGoon</td>
<td>The Dimensions of Cardiac Surgery</td>
</tr>
<tr>
<td>1983</td>
<td>Dr. Norman E. Shumway</td>
<td>Heart and Lung Transplantation</td>
</tr>
<tr>
<td>1982</td>
<td>Dr. Mark M. Ravitch</td>
<td>Progress in the Resection of Chest Wall Tumors and Some Reminiscences of Dr. Blalock</td>
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Evelyn Grollman-Glick Thoracic Surgery Lecture

<table>
<thead>
<tr>
<th>Year</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>2017</td>
<td>Dr. Douglas E. Wood</td>
<td>Lung Cancer Screening Guidelines, Policy Development and Access</td>
</tr>
<tr>
<td>2016</td>
<td>Dr. Thomas A. D’Amico</td>
<td>Thorascopic Lobectomy: Now and Beyond the First 20 Years</td>
</tr>
<tr>
<td>2015</td>
<td>Dr. Joseph Zwischenberger</td>
<td>Innovation Is Never Evidence Based</td>
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<tr>
<td>2014</td>
<td>Dr. Gail Darling</td>
<td>Esophageal Cancer: Evolution in Care</td>
</tr>
<tr>
<td>2013</td>
<td>Dr. James Luketich</td>
<td>Evolution of Minimally Invasive Esophagectomy</td>
</tr>
<tr>
<td>2012</td>
<td>Dr. Claude Deschamps</td>
<td>Esophagectomy: A Score Card</td>
</tr>
<tr>
<td>2011</td>
<td>Dr. Richard Feins</td>
<td>Deliberate Practice to Surgical Practice—The Training of the Elite Surgeon</td>
</tr>
<tr>
<td>2010</td>
<td>Dr. Mark Orringer</td>
<td>Transhiatal Esophagectomy—The Hopkins Connection</td>
</tr>
<tr>
<td>2009</td>
<td>Dr. Harold Urschel</td>
<td>Capricious Vagaries of Thoracic Outlet Syndrome</td>
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<tr>
<td>2008</td>
<td>Dr. Alex Patterson</td>
<td>Current Strategies in Lung Transplantation</td>
</tr>
<tr>
<td>2007</td>
<td>Dr. Harvey Pass</td>
<td>Mesothelioma: New Ideas to Combat a Controversial Killer</td>
</tr>
<tr>
<td>2006</td>
<td>Dr. Valerie Rusch</td>
<td>Evolving Management of Early-Stage Lung Cancers in the Era of Molecular Medicine</td>
</tr>
<tr>
<td>2005</td>
<td>Dr. Joe B. Putnam</td>
<td>An Academic Model for the 21st Century</td>
</tr>
<tr>
<td>2004</td>
<td>Dr. Jack Roth</td>
<td>Targeting Thoracic Cancers</td>
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Pediatric Cardiac Surgery Guest Lecture

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<thead>
<tr>
<th>Year</th>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>2017</td>
<td>Dr. Richard G. Ohye</td>
<td>Surgical Management of the Borderline Left Ventricle in Neonates and Infants</td>
</tr>
<tr>
<td>2016</td>
<td>Dr. Sunji Sano</td>
<td>The Norwood Procedure and Beyond: From the “Sano Modification” to Stem Cells</td>
</tr>
<tr>
<td>2015</td>
<td>Dr. Carl Backer</td>
<td>Vascular Rings: The Chicago Contribution</td>
</tr>
<tr>
<td>2014</td>
<td>Dr. Charles D. Fraser</td>
<td>CCHS Evolution Through 10,000 Surgeries</td>
</tr>
<tr>
<td>2013</td>
<td>Dr. John W. Brown</td>
<td>The Ross Procedure: Lessons Learned and Outcomes of 350+ Children and Adults</td>
</tr>
<tr>
<td>2012</td>
<td>Dr. Christopher Caldarone</td>
<td>New Treatments for Pulmonary Venous Stenosis and TAPVC</td>
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<td>2012</td>
<td>Dr. Bob Anderson</td>
<td>AVSDs and DORV</td>
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<td>2012</td>
<td>Dr. Marshall Jacobs</td>
<td>Anomalous Aortic Origin of a Coronary Artery: A Surgical Disease</td>
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<td>2012</td>
<td>Dr. Constantine Mavroudis</td>
<td>Fontan Conversion</td>
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<td>2011</td>
<td>Dr. Joseph A. Dearani</td>
<td>Ebstein’s Anomaly</td>
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<td>2011</td>
<td>Dr. Jeffrey Jacobs</td>
<td>Outcomes Analysis and Quality Improvement for the Treatment of Patients with Congenital Heart Disease</td>
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<td>2011</td>
<td>Dr. James Quintessenza</td>
<td>Surgical Strategies for Reconstruction of the Pulmonary Valve</td>
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<td>2011</td>
<td>Dr. Emile A. Bacha</td>
<td>Hybrid and Fetal Procedures in Congenital Heart Surgery</td>
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<td>2011</td>
<td>Dr. Giovanni Stellin</td>
<td>Transatrial-Transpulmonary Repair of Tetralogy of Fallot</td>
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<tr>
<td>2005</td>
<td>Dr. Martin Elliott</td>
<td>Advances in Neonatal Cardiac Surgery</td>
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<tr>
<td>2004</td>
<td>Dr. Leonard Bailey</td>
<td>Pediatric Heart Transplantation—The “Baby Fae” Legacy</td>
</tr>
</tbody>
</table>
Susan and Milton Miller Lecture

2017  Dr. Joseph L. Mills  Limb Threatening Ischemia and the Diabetic Foot Ulcer: Classification Driven Management
2016  Dr. John Elefteriades  Thoracic Aortic Aneurysms: Reading the Enemy’s Handbook
2015  Dr. Daniel G. Clair  Research Strategies for Practicing Vascular Surgeons
2014  Dr. Charles Fraser  CCHS Evolution through 10,000 Surgeries
2013  Dr. Vivian Gahtan  Thrombospondin-1 and Intimal Hyperplasia—A Role for Statins
2012  Dr. Keith Horvath  Innovations in Cardiac Surgery—From the Files of the NHLBI
2011  Dr. Richard Cambria  Thoracic/Thoracoabdominal Aortic Surgery: Perspectives and Progress with Spinal Cord Ischemia
2010  Dr. David Yuh  Can Technology Create Better Surgeons? Confessions of a Washed-Up Video Game Programmer

Lynn Van Praag Lecture

2017  Dr. Hitoshi Yokoyama  The Fukushima Disaster: Dealing Simultaneously with a Tsunami and Nuclear Meltdown
2016  Dr. Michael Mack  The Changing World of Valvular Heart Disease Treatment
2015  Dr. Robert H. Bartlett  Extracorporeal Life Support: Past, Present and Future
2014  Dr. David Fullerton  Perioperative Management of Pulmonary Hypertension
2013  Dr. Alden Harken  The Past, Present and Future of Cardiac Surgery
2012  Dr. Gerald Levy  Anticoagulation in Cardiac Surgery

Special Cardiac Surgery Guest Lecture

2017  Dr. Richard L. Prager  Evolution of Operative Therapy for Coronary Artery Disease
2015  Dr. Alfred Casale  Creating Value by Re-Engineering Health Care Delivery
2015  Dr. Vincent L. Gott  The Roles of Luck, Opportunity and Serendipity in Scientific Discovery: A Cardiac Surgeon Looks Back and to the Future
2013  Dr. Jonathan W. Haft  Temporary Circulatory Support for Cardiogenic Shock
2012  Dr. Nahush A. Mokadam  LVADs: Primary Therapy for Heart Failure
2010  Dr. Thierry Carrel  Innovative Prostheses for Aortic Valve and Root Replacements

Dana and Albert “Cubby” Broccoli Lecture in Aortic Disease

2017  Dr. Joseph Bavaria  Type A Dissection: New and Evolving Conceptual Adjustments to a Classically Inspired Operation
2016  Prof. Marjan Jahangiri  Functional Assessment of the Thoracic Aorta: The Future of Risk Prediction

The Levi Watkins, Jr. M.D. Memorial Lectureship

2015  Dr. Edward E. Cornwell  The Inaugural Annual Levi Watkins, Jr, MD Memorial Lectureship “Levi’s Legacy: The Inspiration to Address Outcomes Disparities In Trauma Care.”

Cardiothoracic Surgery Residency Program 2018 | 17
Resident Research Awards

The Hugh R. Sharp, Jr. Endowed Research Fellowship in Cardiac Surgery
Established by the Sharp Foundation to recognize an investigator in cardiac surgery at Johns Hopkins Medicine.
• David Caparrelli, M.D.
• Brian Bethea, M.D.
• Christopher Barreiro, M.D.
• Lois U. Nwakanma, M.D.
• J. Geoffrey Allen, M.D.
• Timothy George, M.D.
• Joshua Grimm, M.D.
• Todd Crawford, M.D.
• Xun Zhou, M.D.

The Irene Piccinini Investigator in Cardiac Surgery
Established by the Anthony Piccinini family to annually recognize an outstanding research trainee in cardiac surgery at the Johns Hopkins Medical Institution.
• Eric Peck, M.D.
• Jay Shade, M.D.
• Stephen Cattaneo, M.D.
• Torin Fitton, M.D.
• Jason Williams, M.D.
• Eric Weiss, M.D.
• George J. Arnaoutakis, M.D.
• Claude Beaty, M.D.
• J. Trent Magruder, M.D.
• Charlie Fraser, M.D.
International Alliances

Advancements in health care always come down to collaboration. Mr. Johns Hopkins realized this when he laid out his ambitious plan to integrate patient care with the best in medical education and research. More than a century later, Johns Hopkins Medicine continues to lead the industry in developing collaborative platforms for improving health care delivery around the world.

Through high-impact, mission-driven collaborations with leading health providers, governments and educational institutions around the world, Johns Hopkins Medicine International works hand in hand with the local collaborator to raise the standard of health care in a way that is customized to the local vision and the Johns Hopkins mission.

Johns Hopkins Cardiac Surgery directs the cardiac surgery program at the Johns Hopkins Aramco Healthcare.
## International Collaboration

<table>
<thead>
<tr>
<th>Country</th>
<th>Hospital/Institution</th>
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<tbody>
<tr>
<td>Italy</td>
<td>San Matteo Hospital</td>
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<tr>
<td>Saudi Arabia</td>
<td>Johns Hopkins Aramco Healthcare in Dhahran</td>
</tr>
<tr>
<td>South America</td>
<td>El Golf Hospital, San Borja Hospital, Aliada Cancer Center</td>
</tr>
<tr>
<td>Trinidad</td>
<td>Eric Williams Hospital</td>
</tr>
<tr>
<td>Turkey</td>
<td>Anadolu Medical Center</td>
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## International Outreach—Humanitarian Programs

<table>
<thead>
<tr>
<th>Country</th>
<th>Hospital/Institution</th>
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<tbody>
<tr>
<td>Cambodia</td>
<td>Jayavarman VII Children’s Hospital, Siem Reap</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Clinical collaboration with cardiologist Dr. Carlos Mas</td>
</tr>
<tr>
<td>Harbin, China</td>
<td>Harbin Children’s Hospital</td>
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<tr>
<td>Havana Cuba</td>
<td>William Soler Pediatric Hospital</td>
</tr>
<tr>
<td>Panama City</td>
<td>Children’s Hospital Panama, Punta Pacifica</td>
</tr>
<tr>
<td>Pavia and Padua, Italy</td>
<td>San Matteo Hospital</td>
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</table>

*Dr. Luca Vricella’s pediatric cardiac surgery team in Cambodia.*
# Johns Hopkins University School of Medicine Department of Surgery

**Robert Higgins, M.D.**  
Director of the Department of Surgery

<table>
<thead>
<tr>
<th>Division of Cardiac Surgery</th>
<th>Division of Thoracic Surgery</th>
</tr>
</thead>
</table>
| **Jennifer Lawton, M.D.**   | **Richard Battafarano, M.D., Ph.D.**  
Cardiac Surgeon-in-Chief  
Chief, Cardiac Surgery, Director, Cardiac Research Lab  
Regional Director, General Thoracic Surgery |
| **Chun (Dan) Choi, M.D.**   |  
Director of ECMO |
| **Narutoshi Hibino, M.D., Ph.D.**  
Pediatric Cardiac Surgeon |  
**Marc Sussman, M.D.**  
CVSICU Fellowship Director |
| **Ahmet Kilic, M.D.**       |  
Director Adult Heart Transplantation  
and Mechanical Circulatory Support |
| **Kaushik Mandal, M.B.B.S., M.D.**  
Cardiac Surgeon  
Robotic Cardiac Surgery  
Minimally Invasive Arrhythmia Program |  
**William Baumgartner, M.D.**  
Vice Dean for Clinical Affairs |
| **Stefano Schena, M.D.**    |  
Cardiac Surgeon |
| **Luca Vricella, M.D.**     |  
Director, Pediatric Cardiac Surgery  
Director, Pediatric Heart Transplant Program |
| **Kenton Zehr, M.D.**       |  
Cardiac Surgeon |
| **Adjunct Faculty**         |  
**Vincent Gott, M.D.**  
Professor of Emeritus |
| **Sunjay Kaushal, M.D.**    |  
Pediatric Surgeon |
| **Nevin Katz, M.D.**        |  
Adjunct Faculty |

# Additional Faculty

| **Errol Bush, M.D.**  
Surgical Director, Advanced Lung Disease and Lung Transplant Program |
| **Kaushik Mandal, M.B.B.S., M.D.**  
Cardiac Surgeon |
| **Stefano Schena, M.D.**  
Cardiac Surgeon |
| **Peter Greene, M.D.**  
Chief Medical Information Officer |
| **Luca Vricella, M.D.**  
Director, Pediatric Cardiac Surgery  
Director, Pediatric Heart Transplant Program |
| **Marshall Jacobs, M.D.**  
Director, Pediatric Outcomes Research |
| **Kenton Zehr, M.D.**  
Cardiac Surgeon |
| **Juan Sanchez, M.D.**  
Cardiac Faculty |
| **Vincent Gott, M.D.**  
Professor of Emeritus |

# Administrative

| **Nicolas Carmona**  
Division Administrator |
| **Nevin Katz, M.D.**  
Adjunct Faculty |

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**Cardiothoracic Surgery Residency Program 2018 | 21**
Richard J. Battafarano, M.D., Ph.D.
Associate Professor of Surgery
Chief of the Division of Thoracic Surgery
Regional Director of General Thoracic Surgery

Background
- Hahnemann University School of Medicine (1988)
- Memorial Sloan Kettering Cancer Center–New York Hospital Cardiothoracic Surgery Fellowship (1997–1999)
- Washington University in St. Louis, Assistant Professor (1999–2007)
- University of Maryland, Associate Professor (2007–2013)
- Johns Hopkins University Division of Thoracic Surgery (2013–present)

Clinical Interests
- Thymic tumors
- Mesothelioma
- Esophageal cancer
- Lung cancer

Research Interests
- Overexpression of survivin in esophageal cancer
- Biologic behavior of neuroendocrine lung cancers
- Effect of comorbidity and gender on survival in nonsmall cell lung cancer
**BIOSKETCH: Richard J. Battafarano, M.D., Ph.D.**

Richard J. Battafarano, M.D., Ph.D., completed his general surgical residency and his Ph.D. at the University of Minnesota in Minneapolis. He did his CT cardiothoracic surgery fellowship at Memorial Sloan-Kettering Cancer Center and New York Hospital. After serving as an Assistant Professor in the Division of Thoracic Surgery at Washington University in St. Louis and as an associate professor and chief of the Division of Thoracic Surgery at the University of Maryland, he moved to the Johns Hopkins University School of Medicine as associate professor and chief of the Division of Thoracic Surgery. He also serves as the regional director of general thoracic surgery for Johns Hopkins Medicine.

Battafarano conducts basic and translational research as it relates to lung and esophageal cancer. He has written over 40 peer-reviewed articles and a number of book chapters.

**Selected Publications: Richard J. Battafarano, M.D., Ph.D.**


William A. Baumgartner, M.D.
The Vincent L. Gott Professor
Vice Dean of Clinical Affairs
President, Clinical Practice Association
Senior Vice President, Office of Johns Hopkins Physicians

Background
- Xavier University (B.S. 1969)
- University of Kentucky Medical School (M.D. 1973)
- Stanford University Medical School, General Surgery (1973–1981)
- Stanford University Department of Cardiothoracic Surgery (1975–1978)
- The Johns Hopkins University, Cardiac Surgery (1982–present)

Clinical Interests
- Cardiac transplantation
- Health care reform

Research Interests
- Transplant organ preservation
- Neurological protection during cardiopulmonary bypass
- Simulation training and education

BIOSKETCH: William A. Baumgartner, M.D.

William A. Baumgartner, M.D., joined the Johns Hopkins Division of Cardiac Surgery in 1982. The following year, he reinitiated the Heart Transplant Program at The Johns Hopkins Hospital, which has grown into one of the leading centers in the surgical treatment of heart failure in the country. For 17 years, he led the division as the cardiac surgeon-in-charge. Today, he serves on the cardiac surgery faculty as the Vincent L. Gott Professor and director of the Surgical Research Laboratory.

Past president of the Society of Thoracic Surgeons and the International Society of Heart and Lung Transplantation, Baumgartner has held top posts in several other national and international professional organizations. He is currently the immediate past Executive Director of the American Board of Thoracic Surgery.

His early work focused on organ preservation for transplantation and determination of methods for the noninvasive diagnosis of rejection. He has since been involved in the field of neurological protection in cardiac surgery, for which he has had continuous National Institutes of Health support for 22 years. In 2002, he received the Javits Neuroscience Research Investigator Award from the National Institutes of Health. In 2003 and 2009, he received the Socrates Teacher of the Year Award from the Thoracic Surgery Residents Association. In 2007, he received the Distinguished Alumnus Award from the University of Kentucky Medical Alumni Association. In 2008, the Society of Thoracic Surgeons presented him with the Earl Bakken Scientific Achievement Award. In 2009, he received the Heritage Award from the Johns Hopkins University Alumni Association. In 2015, he received the Distinguished Service Award from the Society of Thoracic Surgeons.
Baumgartner is also the President of the Johns Hopkins Clinical Practice Association, which is a group practice of over 1,700 full-time faculty members who provide medical care to patients. In this role, he is responsible for planning, managing and coordinating the clinical and administrative activities of the association. In 2011, he was appointed senior vice president for the Office of Johns Hopkins Physicians. This office broadens the scope of responsibilities to include all employed and affiliated physicians within Johns Hopkins Medicine.

A graduate of Xavier University and of the University of Kentucky Medical School, Baumgartner received his surgical training at Stanford University Medical Center. His bibliography includes more than 385 journal articles, book chapters and books. He is married to Betsy Baumgartner and has three accomplished children.

**Selected Publications: William A. Baumgartner, M.D.**


Malcolm V. Brock, M.D.
Professor of Surgery and Oncology
Director, Thoracic Research Laboratory

Background

- Princeton University (B.A. 1985)
- Oxford University, Rhodes Scholarship (M.Litt. 1987)
- Johns Hopkins University School of Medicine (M.D. 1991)
- The Johns Hopkins University, Cardiothoracic Residency (1997–2001)
- Johns Hopkins University Division of Thoracic Surgery (2001–present)

Clinical Interest

- Surgical treatment of lung and esophageal malignancies
- Hyperhidrosis

Research Interests

- Translational application of DNA hypermethylation and epigenetic therapies
- Molecular profiling and molecular staging of thoracic malignancies
- Lung cancer and HIV
- Early detection of thoracic malignancies
- Biomarkers predicting chemosensitivity

BIOSKETCH: Malcolm V. Brock, M.D.

Malcolm Brock, M.D., focuses his research primarily on the translational applications of biomarkers, namely DNA methylation, to the clinic in lung and esophageal cancer. He has three major projects, all of which have received National Institutes of Health funding. The first project involves detecting occult lymph node metastases in stage 1 patients with node-negative disease. This method of DNA methylation seems to predict stage 1 patients that recur postoperatively after curative surgery. The second project involves the clinical detection of lung cancer in HIV patients. The laboratory has gathered the largest cohort in the world of those with HIV and lung cancer (over 100 patients). Since lung cancer in these individuals seems like a different disease than conventional lung cancer (earlier onset, more aggressive), he and his team are screening these patients with CT scans. In addition, He has a second protocol in which the screening of these patients will take place initially via molecular biomarkers in sputum and then by CT. The third project is based on determining predictive molecular markers for chemosensitivity in lung and esophageal cancer. He has a current observational study, J0388 in esophageal cancer, that is gathering pre-neoadjuvant tumor samples and serum for analysis by DNA methylation and proteomics.
**Selected Publications: Malcolm V. Brock, M.D.**


Stephen Broderick, M.D., M.P.H.S.
Assistant Professor of Surgery

Background

- Duke University (B.S. 1999)
- Georgetown University School of Medicine (M.D. 2003)
- New York Presbyterian Hospital Weill Cornell Medical Center Internship/Residency (PGY-I/II), General Surgery (2003–2004)
- Memorial Sloan Kettering Cancer Center, Thoracic Service Research Fellowship (2005–2007)
- New York Presbyterian Hospital Weill Cornell Medical Center Residency (PGYIII-V) (2007–2010)
- Washington University in St. Louis, Cardiothoracic Fellowship (2010–2012)
- Washington University School of Medicine (M.P.H.S. 2014)
- Johns Hopkins University Division of Thoracic Surgery (2016–Present)

Clinical Interests

- Achalasia
- Benign esophageal conditions
- Bronchoscopy
- Chest wall reconstruction
- Chest wall tumors
- Esophageal, lung cancer and thoracic surgery
- Lung cancer
- Lung nodules
- Paraesophageal hernia

Research Interests

- Improving outcomes for lung cancer patients
- Researching how treatments for early-stage lung cancer impact patients’ quality of life

BIOSKETCH: Stephen Broderick, M.D.

Stephen Broderick, M.D., is a thoracic surgeon and assistant professor of surgery at the Johns Hopkins University School of Medicine. His primary clinical practice is based at Sibley Memorial Hospital in Washington, D.C., and he also has privileges at The Johns Hopkins Hospital and Howard County General Hospital.

Before joining Johns Hopkins, Broderick was a thoracic surgeon at St Luke’s Hospital and Washington University School of Medicine in St. Louis. His clinical expertise includes surgery for lung cancer, esophageal cancer and other thoracic malignancies, as well as benign thoracic conditions. He has a particular interest in the coordinated delivery of multidisciplinary care for thoracic oncology patients. Broderick serves on the editorial board of the Journal of Thoracic and Cardiovascular Surgery and is a member of the Society of Thoracic Surgeons National Database Task Force.
Broderick received his medical degree from Georgetown University and completed his residency training in general surgery at NewYork-Presbyterian Hospital. During residency training, he studied the molecular biology of lung cancer as a research fellow at Memorial Sloan Kettering Cancer Center. Shortly after, he completed his fellowship training in thoracic surgery at Washington University in St. Louis.

Broderick's research interests are focused on improving outcomes for lung cancer patients. He is particularly interested in studying how various treatments for early-stage lung cancer impact patients’ quality of life.

**Selected Publications: Stephen Broderick, M.D.**


Errol L. Bush, M.D.
Assistant Professor of Surgery
Surgical Director, Advanced Lung Disease and Lung Transplant Program
Director, Ex Vivo Lung Perfusion Program

Background
• Emory University (B.S. 1999)
• Duke University School of Medicine (M.D. 2003)
• Duke University School of Medicine, Intern, Surgery (2003–2004)
• Duke University School of Medicine, Resident, Surgery (2004–2010)
• Duke University Medical Center, Fellow, Surgical Research (2005–2007)
• University California, San Francisco (2010–2013)
• Cardiothoracic Surgery, University California, San Francisco, Assistant Professor
• The Johns Hopkins University (2016–Present)

Clinical Interests
• Barrett’s esophagus
• Benign esophageal conditions
• Esophageal cancer
• Esophageal cancer, lung cancer, minimally invasive, minimally invasive thoracic, general vascular, thoracic, robotic and video-assisted thoracic surgery
• Esophageal disease
• Extracorporeal life support
• Extracorporeal membrane oxygenation
• Lung cancer
• Lung nodules
• Lung transplant
• Mesothelioma
• Minimally invasive esophagectomy
• Minimally Invasive Surgery, Minimally Invasive Thoracic Surgery, Robotic Surgery on the chest wall, lungs, esophagus and pleura
• Thoracic Surgery, Video Assisted Thoracic Surgery (VATS)

Research Interests
• Investigations of outcomes and health disparities related to lung cancer and transplantation

BIOSKETCH: Errol Bush, M.D.

Errol L. Bush, M.D., FACS, is a thoracic surgeon and surgical director of the Advanced Lung Disease and Lung Transplant Program for the Johns Hopkins Comprehensive Transplant Center. Bush comes to Johns Hopkins from the University of California, San Francisco Medical Center, where he was a cardiothoracic surgeon and assistant professor of surgery. He specializes...
in the treatment of acute and chronic thoracic surgical diseases, including those of routine, complex and end-stage nature.

Bush also serves as director of the Ex Vivo Lung Perfusion Program (EVLP) at Johns Hopkins. EVLP is a novel therapy utilized outside of the body to resuscitate previously unsuitable donor lungs, thereby creating more suitable lungs for transplantation and effectively increasing donor supply.

His clinical interests include surgical treatment of chronic and end-stage lung diseases, as well as benign and malignant diseases and lesions of the chest. He is skilled in minimally invasive operations, such as video-assisted thoracoscopic surgery, a type of thoracic surgery performed using a small video camera that is introduced into the patient’s chest via a scope to treat lung and esophageal cancers. Bush also has experience with extracorporeal membrane oxygenation, a technique of providing both cardiac and respiratory support oxygen to patients whose heart and lungs can no longer serve their function.

His research interests include investigations of outcomes and health disparities related to lung cancer, lung transplant and ECMO patients.

**Selected Publications: Errol Bush, M.D.**


Chun (Dan) W. Choi, M.D.
Assistant Professor of Surgery
Surgical director, Extracorporeal Membrane Oxygenation Program
Associate surgical director, mechanical circulatory support
Associate program director, cardiothoracic residency program

Background

- University of Washington (B.S. and B.A. 2002)
- New York Medical College (M.D. 2007)
- Rutgers-Robert Wood Johnson Medical School, Clinical Instructor (2012-2013)
- David Geffen School of Medicine at UCLA, Resident, Cardiac Surgery (2013-2015)
- Stanford University School of Medicine, Fellow, Cardiothoracic Transplant and Mechanical Circulatory Support (2015-2016)
- Stanford University School of Medicine, Clinical Instructor (2015-2016)
- Vanderbilt University School of Medicine, Assistant Professor (2016-2017)
- Johns Hopkins University Division of Cardiac Surgery (2017-present)

Clinical Interests

- Adult cardiac surgery
- Mechanical circulatory support
- Heart, lung and heart-lung transplant

Research Interests

- Clinical outcomes in heart failure surgery, right ventricular failure, mechanical circulatory assist devices and transplant
- Translational research, understanding hemodynamic effects on myocardial strain of retrograde non-pulsatile flow of peripheral ECMO, and studying effects of neuroprotective molecules in cardiac arrest
- Clinical trials to study efficacy of heparin versus bivalirudin on ECMO patients
- Multi-disciplinary collaboration to establish several proof of concept models for the next generation of mechanical circulatory devices

Email: cchoi40@jhmi.edu
BIOSKETCH: Chun (Dan) W. Choi, M.D.

Chun (Dan) W. Choi, M.D., joined the Johns Hopkins Division of Cardiac Surgery as an assistant professor in October 2017. Choi’s areas of clinical expertise include adult cardiac surgery, mechanical circulatory support, heart, lung, and heart-lung transplant surgery.

Prior to joining Johns Hopkins, Choi served as assistant professor of cardiac surgery and director of the Ex-Vivo Heart Perfusion Program at the Vanderbilt University School of Medicine. He earned his bachelor of science degree in biochemistry and bachelor of arts degree in psychology from University of Washington. He received his medical degree from New York Medical College and went on to complete general surgery residency at Robert Wood Johnson University Hospital and cardiothoracic surgery residency at Ronald Reagan UCLA Medical Center. Choi completed his cardiothoracic transplant and mechanical circulatory support fellowship at the Stanford University School of Medicine.

Choi is a member of several professional organizations including the Society of Thoracic Surgeons, Western Thoracic Surgical Association, the American Medical Association and Association of American Medical Colleges.

Choi’s research interests include clinical outcomes in heart failure surgery, right ventricular failure, mechanical circulatory assist devices, and transplant, as well as translation science studying the impact of ECMO on myocardial recovery and neuroprotection in cardiac arrest. He is also working with several collaborators across specialties and disciplines to test concepts for the next generation of mechanical circulatory devices.

Selected Publications: Chun (Dan) W. Choi, M.D.


Shudo Y, Choi CW, Woo YJ, Ha RV. A modified technique of Heart Ware ventricular assist device for bridge to recovery. European Journal of Cardiothoracic Surgery. 2017 Dec 1; 52:1223-1224


Vincent L. Gott, M.D.
Professor of Emeritus

Background
- University of Wichita (1949)
- Yale Medical School (M.D. 1953)
- University of Minnesota, General and Cardiothoracic Surgery (1953–1959)
- University of Minnesota Department of Surgery (1959–1960)
- University of Wisconsin Department of Surgery (1960–1965)
- Johns Hopkins University Division of Cardiac Surgery (1965–2009)

Clinical Interests
- Adult cardiac surgery
- Marfan syndrome

Research Interests
- Aortic surgery

BIOSKETCH: Vincent L. Gott, M.D.

Vincent Gott, M.D., was born in Wichita, Kansas in 1927. He attended Wichita University and graduated from Yale Medical School in 1953.

As an intern at the University of Minnesota Hospital in 1954, Gott observed firsthand C. Walton Lillehei’s first cross-circulation case. Gott worked as a research fellow in Lillehei’s laboratory during 1956 and 1957. During this time, the pacemaker, in combination with myocardial wire, was developed for use in children developing heart blockage following ventricular septal defect repair.

On completion of his residency training, Gott joined the faculty at the University of Wisconsin in Madison. While in Madison, Gott, with Ronald Daggett, professor of plastic engineering, developed a bileaflet prosthetic valve for clinical use. This valve had a carbon coating with heparin bonded to the surface.

Gott was appointed as cardiac surgeon-in-charge at Johns Hopkins in 1965. He remained in this position until 1982, when he was succeeded by Bruce Reitz. Gott remained active in clinical cardiac surgery until 1994.

Gott is past president of the American Society for Artificial Internal Organs and the Society of Thoracic Surgeons. His honors include the American Medical Association’s Hektoen Gold Medal and the Antoine Marfan Award from the National Marfan Foundation. He is an honorary member of the European Association for Cardio-Thoracic Surgery and the Japanese Association for Thoracic Surgery. In 1998, Gott gave the Ralph Alley lecture at the annual meeting of the Society of Thoracic Surgeons. In 2000, he gave the William Glenn Lecture at the annual meeting of the American Heart Association, and in 2001, he gave the John Gibbon Lecture at the annual meeting of the American College of Surgeons.

In 2005, Gott was selected by the Lillehei Heart Institute for a Lifetime Achievement Award during the 50th Anniversary of open heart surgery by cross-circulation at the University of Minnesota. (Eleven individuals were honored for “seminal contributions to the development of open heart surgery.”)
In January 2006, Gott received the Earl Bakken Scientific Achievement Award from the Society of Thoracic Surgeons, which is given “to recognize individuals who have made outstanding contributions that have enhanced the practice of cardiothoracic surgery.”

Gott is the author or co-author of more than 300 scientific publications related to cardiac surgery. Gott is most proud of his role in helping to train more than 60 cardiac surgeons at Johns Hopkins over the past 40 years. Two of his trainees, Mark Orringer and Timothy Gardner, are past presidents of the Society of Thoracic Surgeons and the American Association for Thoracic Surgery, respectively.

Selected Publications: Vincent L. Gott, M.D.


Peter S. Greene, M.D.
Chief Medical Information Officer
Associate Professor of Surgery
Associate Dean for Emerging Technologies

Background
• Harvard College (1981)
• Yale School of Medicine (M.D. 1985)
• The Johns Hopkins Hospital, General Surgery Residency (1985–1991)
• The Johns Hopkins Hospital, Cardiothoracic Surgery Fellowship (1991–1994)
• Johns Hopkins University Division of Cardiac Surgery (1994–present)

Interests
• Health care information technology
• Educational technologies
• Clinical outcomes research

BIOSKETCH: Peter S. Greene, M.D.

Peter Greene, M.D., joined the Johns Hopkins Division of Cardiac Surgery faculty in 1994 after completing his surgical residency training at Johns Hopkins. He is currently an Associate Professor of surgery and, in 2001, became Associate Dean for emerging technologies at the Johns Hopkins University School of Medicine.

Greene completed his undergraduate degree at Harvard University in 1981 and a medical degree from Yale School of Medicine in 1985. In the Division of Cardiac Surgery at Johns Hopkins, Greene performed adult cardiac surgery, including heart transplantation, valve surgery and the implantation of mechanical cardiac assist devices. His clinical interests were in mitral valve repair and cardiac assist devices.

Greene is also a leader in the field of informatics in cardiothoracic surgery. He has served as the chair of the Society of Thoracic Surgeons’ Information Technology Committee. He is the founder, executive editor and key architect of Cardiothoracic Surgery Network, the online community of 40 professional cardiothoracic surgery societies. He has more than 15 years of experience in information technology using a variety of medical applications in parallel to a clinical career. He had an important role in co-founding the MedBiquitous Consortium and serves as its executive director. Founded by Johns Hopkins Medicine and leading professional medical societies, MedBiquitous is an international nonprofit group of professional medical and health care associations, universities, and commercial and governmental organizations dedicated to advancing health care education through technology standards that promote professional competence, collaboration and better patient care.

Greene has over authored over 50 peer-reviewed articles and has an active career in advancing health care education with information technology.
In 2006, Greene was appointed chief medical information officer. In this role, he is involved in the implementation of a provider order entry and clinical documentation system throughout Johns Hopkins. As associate dean for emerging technologies, he has developed a single portal for clinical e-learning across Johns Hopkins Medicine.

**Selected Publications: Peter S. Greene, M.D.**


Narutoshi Hibino, M.D., Ph.D.  
Assistant Professor of Surgery

Background
- Ehime University School of Medicine (1997)
- Tokyo Women’s Medical University, Cardiac Surgery (Ph.D. 2005)
- Yale University, Postdoctoral Fellow (2007–2010)
- Children’s National Medical Center, Pediatric Cardiac Surgery Fellow (2010–2012)
- Nationwide Children’s Hospital, Pediatric Cardiac Surgery Fellow (2013)
- Johns Hopkins University Division of Cardiac Surgery (2015–present)

Clinical Interests
- Pediatric cardiac surgery
- Neonatal cardiac surgery
- Pediatric cardiac transplantation and mechanical assist device
- Adult congenital cardiac surgery

Research Interests
- Clinical outcomes in pediatric cardiac surgery
- Translational research of tissue engineering in cardiovascular surgery

BIOSKETCH: Narutoshi Hibino, M.D., Ph.D.

Narutoshi Hibino, M.D., Ph.D., graduated from Ehime University School of Medicine in 1997 and completed his training in cardiac surgery at Tokyo Women’s Medical University, where he also earned a Ph.D. in 2005. He was assistant professor of surgery there before moving to the United States, when he became a postdoctoral fellow at Yale University from 2007 to 2010, and then a fellow in pediatric cardiac surgery at Children’s National Medical Center from 2010 to 2012. In 2013, he was a fellow in pediatric cardiac surgery at Nationwide Children’s Hospital in Columbus, Ohio. He joined the faculty of the Johns Hopkins University Division of Cardiac Surgery as assistant professor in January 2015.

Hibino’s clinical and academic interests are in congenital cardiac surgery in children and adults. He is also an established, funded investigator in basic science and translational research, with particular interest and expertise in the field of tissue engineering.

Hibino has a wide range of experience treating patients with congenital heart disease. He has 15 years of subspecialty training in cardiac surgery that includes fellowships in both adult and pediatric cardiac surgery. He also works closely with the heart transplant and mechanical assist device teams. Hibino has an interest in translational research, particularly in applying the technology of tissue engineering into the cardiovascular field. He believes that bench-to-bedside research is fostering a new generation of medical innovations.

Hibino’s research interests involve healing the heart with patients’ own cells, growing vascular grafts and other items of repair through a process of tissue engineering. He has lectured nationwide on this topic. In a similar vein, Hibino’s philosophy of patient care is guided by evidence-based research and the belief that putting the patient first and providing an individualized care plan provide the best possible outcome.
**Selected Publications: Narutoshi Hibino, M.D., Ph.D.**


Robert Higgins, M.D.
Director of the Department of Surgery
Professor of Surgery

Background
• Dartmouth College (B.A. 1977–1981)
• Yale School of Medicine (M.D. 1981–1985)
• Hospitals of the University, General Surgery Resident (1985–1990)
• Yale School of Medicine, Cardiothoracic Surgery (1990–1993)
• Papworth Hospital, Senior Registrar in Transplantation (1993)
• Virginia Commonwealth University (Executive Program 2005)
• Association of American Medical Colleges, Fellow (2014–2015)
• Johns Hopkins University Department of Surgery, Professor and Director (2015–Present)

Clinical Interests
• Cardiothoracic surgery
• Heart transplantation
• Lung transplantation
• Minimally invasive cardiac and thoracic surgery
• Mechanical circulatory support

Research Interests
• The mechanism of cell injury in failing hearts
• Health policy
• Health economics
• Racial disparities in post-transplant outcomes
• Access to care
• Improving outcomes among heart failure and cardiac surgery patients

Robert Higgins, M.D., is the surgeon-in-chief of The Johns Hopkins Hospital. He is a leading authority in heart and lung transplantation, minimally invasive cardiac surgery, and mechanical circulatory support. His scientific interests are broad and far-ranging, including the mechanisms of cell injury in failing hearts, health economics and policy, racial disparities in post-transplant outcomes, access to care, and improving outcomes among heart failure and cardiac surgery patients. Higgins is also the William Stewart Halstead Professor and director of the Department of Surgery at the Johns Hopkins University School of Medicine.

Higgins came to Johns Hopkins from Ohio State University, where he was professor and chair of the Department of Surgery, as well as surgeon-in-chief and director of the Comprehensive Transplant Center at Wexner Medical Center. He began his surgical career as the director of heart and lung transplantation at Henry Ford Hospital. Under his leadership, the transplant team performed the first lung transplant in southeast Michigan. He went on to create a Medicare-approved lung transplant program in 1997 and a pediatric heart transplant program in collaboration with the Children’s Hospital of Michigan. Since then, he has served in numerous leadership positions, including chief of cardiac surgery at Richard M. Ross Heart Hospital in...
Columbus, Ohio; chair of cardiothoracic surgery at Rush University Medical Center in Chicago; and chair of cardiothoracic surgery at the Medical College of Virginia in Richmond.

Higgins obtained his bachelor’s degree from Dartmouth College and went on to earn his medical degree from the Yale School of Medicine, followed by a master’s degree in health services administration at Virginia Commonwealth University. He completed a residency in general surgery and served as chief resident at the University Hospitals of Pittsburgh. He was a Winchester Scholar and fellow in cardiothoracic surgery at Yale School of Medicine. Higgins served as a senior registrar in transplantation at the renowned Papworth Hospital, the U.K.’s largest cardiothoracic surgical program and its main heart-lung transplant center. He also served as a Major in the United States Army Reserve Medical Corps.

Higgins has held leadership positions at various organizations, including president of the United Network for Organ Sharing, president of the Society of Black Academic Surgeons, and president and founding member of the Association of Black Cardiovascular and Thoracic Surgeons. He has also been appointed to the Advisory Committee on Organ Transplantation by the Secretary of the Department of Health and Human Services. He has authored over 100 scientific articles and book chapters.

Selected Publications: Robert Higgins, M.D.


Marshall L. Jacobs, M.D.
Professor of Surgery
Director, Pediatric Cardiac Surgery Outcomes Research

Background
• Yale College (B.S. 1972)
• Harvard Medical School (M.D. 1976)
• Wessex Regional Cardiothoracic Center, Senior Registrar (1982)
• Boston Children’s Hospital, Cardiovascular Surgery Residency (1984)

Clinical Interests
• Pediatric and adult congenital heart surgery
• Heart transplantation
• Functionally univentricular heart (including hypoplastic left heart syndrome)
• Pediatric cardiac critical care

Research Interests
• Surgical databases and multi-institutional outcomes analysis
• Patient safety/quality of care
• Neurodevelopmental outcomes and protective strategies
• Management of single ventricle anomalies
• Pediatric heart transplantation

BIOSKETCH: Marshall L. Jacobs, M.D.

Marshall Jacobs, M.D., joined the faculty of the Department of Surgery at the Johns Hopkins University School of Medicine in May 2013. He has been a cardiovascular surgeon and clinical investigator for three decades, with special emphasis on congenital heart disease. In his role in the Division of Cardiac Surgery, he assists the surgeon-in-chief with respect to oversight of collaboration between the three pediatric cardiac surgery programs affiliated with Johns Hopkins Medicine and coordinates pediatric cardiac surgery outcomes research for them.

Jacobs’ early investigative work focused on basic cardiovascular physiology, including response to pressure and volume overload under conditions of normal and abnormal coronary perfusion. He was the principal investigator of National Institutes of Health-funded research that evaluated MRI and spectroscopy in the diagnosis of cardiac transplant rejection in a primate model. In the clinical realm, he participated in the development and evaluation of innovations in the surgical management of congenital heart malformations, including the staged reconstructive approach to functionally univentricular hearts.
His current concentration in outcomes research includes participation in the multi-institutional studies of the Congenital Heart Surgeons Society (CHSS). He served as chair of the Research Committee and most recently president of the CHSS (2014–2016). He is a member of the Workforce on National Databases of the Society of Thoracic Surgeons. The author of more than 250 peer-reviewed publications, Jacobs is as member of several editorial boards and is editor-in-chief of *World Journal for Pediatric and Congenital Heart Surgery*.

**Selected Publications: Marshall L. Jacobs, M.D.**


Ahmet Kilic, M.D.
Associate Professor of Surgery
Surgical director, Adult Heart Transplantation and Mechanical Circulatory Support

Background
- The Pennsylvania State University (B.S. 1998)
- The Medical College of Virginia-Virginia Commonwealth University (M.D. 2002)
- University of Maryland, Resident, General Surgery (2003-2004)
- University of Maryland, Fellow, Research (2004-2006)
- University of Maryland, Resident, General Surgery (2006-2009)
- University of Virginia, Resident, Cardiothoracic Surgery (2009-2011)
- The Ohio State University (2011-2017)
- Johns Hopkins University Division of Cardiac Surgery (2017-present)

Clinical Interests
- Cardiac surgery
- Heart transplantation
- Mechanical circulatory support

Research Interests
- Heart failure

Email: akilic2@jhmi.edu

BIOSKETCH: Ahmet Kilic, M.D.

Ahmet Kilic, M.D., joins the Johns Hopkins Division of Cardiac Surgery as an associate professor. Kilic’s areas of clinical expertise include cardiac surgery with a special interest in heart transplantation and mechanical circulatory support.

Prior to joining Johns Hopkins, Kilic served an associate professor of surgery at The Ohio State University Wexner Medical Center and was the director of the heart transplant and mechanical circulatory support programs. He was also the co-director of the advanced heart failure program as well as the vice-director of clinical and academic affairs in the division of cardiac surgery.

He completed his undergraduate degree at the Pennsylvania State University followed by his medical degree at the Medical College of Virginia. During his residency in general surgery at the University of Maryland, he took two dedicated years in the lab studying artificial organs and cardiopulmonary failure. He finished his cardiothoracic surgical training at the University of Virginia.
Although a recognized leader in the field of heart failure, Kilic’s expertise runs the spectrum of cardiovascular surgery. As a board-certified cardiothoracic surgeon, he performs all aspects of cardiac surgery including placement of ventricular assist devices, heart transplantation, coronary artery bypass grafting, valvular procedures including transcatheter aortic valve replacements and aortic surgery.

Kilic is an invested educator, having trained and mentored numerous medical students, surgical residents and cardiac surgery fellows. He previously served as the director of education for the cardiothoracic residency program at The Ohio State University. He was nominated for the national McGoon award for teaching and was the recipient of the inaugural Thomas Williams resident teaching award in cardiothoracic surgery at the Ohio State University Wexner Medical Center.

He is an active clinical investigator in the field of heart failure and has published numerous peer-reviewed journal articles, book chapters, abstracts and presented his findings in regional, national and international forums. He is on numerous institutional and national surgical committees and is a member of cardiothoracic surgical professional organizations. He is on the editorial board and review board of numerous journals and regularly lectures on the topic of heart failure.

**Selected Publications: Ahmet Kilic, M.D.**


Jennifer S. Lawton, M.D.

Professor of Surgery
Chief of the Division of Cardiac Surgery

Background

- Allegheny College (1988)
- Hahnemann University (1992)
- Medical College of Virginia General Surgery Residency (1992–1999)
- Pennsylvania State University, Milton S. Hershey Medical Center (1999–2001)
- Washington University, Professor of Surgery (2001–2016)
- The Johns Hopkins University, Professor of Surgery (2016–present)

Clinical Interests

- Adult cardiac surgery
- Valve surgery (including minimally invasive)
- Coronary artery bypass grafting on- and off-pump, all arterial revascularization
- Surgery for aortic dissection and ascending aneurysm

Research Interests

- Cardioprotective ATP-sensitive potassium channels
- Myocardial Protection
- Women and heart disease

BIOSKETCH: Jennifer S. Lawton, M.D.

Jennifer S. Lawton, M.D., is Professor of Surgery, cardiac surgeon-in-charge and chief of the Division of Cardiac Surgery at Johns Hopkins. Lawton received her bachelor’s degree from Allegheny College, where she was the recipient of several academic awards. She was awarded the medical degree from Hahnemann University, being elected to the Alpha Omega Alpha honorary society at that institution.

Lawton completed a residency in general surgery at the Medical College of Virginia (Virginia Commonwealth University) and a residency in cardiothoracic surgery at Pennsylvania State University Milton S. Hershey Medical Center. She was professor of surgery in the Division of Cardiothoracic Surgery at Washington University School of Medicine from 2001 to 2016. She joined the Division of Cardiac Surgery at Johns Hopkins in August 2016.

Lawton is certified by the American Board of Surgery and American Board of Thoracic Surgery. Lawton’s investigative interests include intraoperative myocardial protection (specifically, the use of ATP-sensitive potassium channel openers), myocyte response to stress, heart disease in women and treatment for aortic dissection. Her clinical interests parallel her investigative interests, in that she is involved in adult cardiac surgery, including coronary revascularization (on or off cardiopulmonary bypass), valvular heart disease and the surgical treatment of type A aortic dissection.

Lawton has authored more than 100 published scientific manuscripts and has made numerous presentations at national surgical meetings. She is a member of multiple national
organizations, including the American Surgical Association and the Society of Clinical Surgery, and she is a fellow of the American College of Surgeons and the American Heart Association. She serves on various committees of national organizations, including the American Association for Thoracic Surgery (Council, former membership committee chair, President and former program chair for the Cardiac Surgery Biology Club and others), the Society of Thoracic Surgeons (former chair of Looking to the Future Scholarship Committee and Taskforces), American Heart Association (chair and former vice chair of the CVSA Council, chair of Surgery Basic Science Grant Review Study Section, and others), the Southern Thoracic Surgical Association (former co-chair of the Postgraduate Committee and council member), and former President of Women in Thoracic Surgery. She is the vice chair of the Accreditation Council for Graduate Medical Education Residency Review Committee for Thoracic Surgery. She serves as a director of the American Board of Thoracic Surgery. She serves as deputy editor for the *Annals of Thoracic Surgery*, on the editorial board of the *Journal of Thoracic and Cardiovascular Surgery*, on the editorial board of *Innovations*, and as the editor of *Thoracic Surgery News*. She serves as a guest reviewer for multiple journals.

Lawton has reviewed grants for the American Heart Association and the National Institutes of Health. Her basic science laboratory has been funded via the Nina Starr Braunwald Career Development Award from the Thoracic Surgery Foundation for Research and Education, the American Heart Association, and the National Institutes of Health.

Selected Publications: Jennifer S. Lawton, M.D.


Barner HB, Bailey MS, Pasque MK, Moon MR, Damiano RJ, Lawton JS. Radial Artery Free and T Graft Patency over a 15 Year Period. *Circulation* 2012;126:S140–S144. PMID 2296594


Kaushik Mandal, M.B.B.S., M.D.
Assistant Professor of Surgery
Director, Robotic Cardiac and Minimally Invasive Arrhythmia Surgery Program

Background
• All India Institute of Medical Sciences, New Delhi (M.B.B.S. 1996, M.S. 1999)
• Royal College of Surgeons of Edinburgh (M.R.C.S. 2001)
• University of London (M.D. 2005)
• Intercollegiate Board of Cardiothoracic Surgery, UK (FRCS-CTh 2007)
• The Johns Hopkins Hospital, Cardiothoracic Surgery Fellowship (2008–2011)
• Johns Hopkins University Division of Cardiac Surgery (2011–present)

Clinical Interests
• Minimally invasive cardiac surgery
• Mitral valve repair
• Aortic surgery
• Surgical management of heart failure
• Robotic and minimally invasive cardiac surgery, arrhythmia surgery and valve repair

Research Interests
• Minimally invasive cardiac surgery
• Autonomic neuromodulation for treatment of arrhythmia, outcomes research
• Heat shock protein-mediated inflammation and stem cells in atherosclerosis
• Inflammation and atrial fibrillation

Anastacio MM, Kanter EM, Keith AD, Schuessler RB, Nichols CG, Lawton JS. Inhibition of Succinate Dehydrogenase by Diazoxide is Independent of the ATP-Sensitive Potassium Channel Subunit Sulfonylurea Type 1 Receptor. *J Am Coll Surg* 2013;216:1144–1149. PMID 23535164


BIOSKETCH: Kaushik Mandal, M.B.B.S., M.D.

Kaushik Mandal, M.B.B.S., M.D., is an Assistant Professor in the Division of Cardiac Surgery. He was a graduate of the All India Institute of Medical Sciences in New Delhi, India. He completed his general surgery training there and at the Royal College of Surgeons of Edinburgh. He began his academic cardiothoracic surgical training in the U.K., completing his doctoral research (M.D.) from the University of London and clinical cardiothoracic surgical training from Guy’s and St. Thomas’ Hospital, St. Mary’s Hospital, and St. George’s Hospital. The pursuit of excellence brought him to Johns Hopkins, and he chose to extend his training by another three years to further his clinical skills in the areas of minimally invasive cardiac surgery and cardiopulmonary transplantation. After completing a cardiothoracic surgical fellowship at Johns Hopkins, he joined the faculty of Johns Hopkins University School of Medicine in 2011.

Mandal’s clinical interests are adult cardiac surgery, especially minimally invasive cardiac surgery, mitral valve repair, aortic surgery and surgical management of heart failure.

His early investigative work focused on inflammation and autoimmunity in the pathogenesis of atrial fibrillation and atherosclerosis. More recently, it has shifted to clinical outcomes research in the field of heart failure surgery and mitral valve surgery.

Mandal has authored over 35 peer-reviewed articles and contributed numerous book chapters.

Selected Publications: Kaushik Mandal, M.D.


Juan A. Sanchez, M.D.
Associate Professor of Surgery
Faculty Proctor, Cardiac Surgery Simulation Laboratory
Associate Faculty, Armstrong Institute for Patient Safety and Quality

Background
- University of Miami, (B.S. 1980)
- University of Florida (M.D. 1984)
- Harvard University (M.P.A. 2001)
- Columbia University, Postdoctoral Research Fellowship (1989–1990)
- Yale-New Haven Hospital, Cardiothoracic Surgery Fellowship (1990–1993)
- University of Miami, Assistant Professor (1993–1995)
- University of Kentucky, Associate Professor (1995–2001)
- Bridgeport Hospital, Cardiothoracic Surgery Chief (2001–2007)
- University of Connecticut, Professor of Surgery (2007–2012)
- Saint Agnes Hospital, Director of GME and Chair of Surgery (2013–present)
- Johns Hopkins University School of Medicine, Associate Professor (2013–present)

Clinical Interests
- Adult cardiac surgery and transplantation

Research Interests
- Myocardial oxidative stress
- Patient Safety
- Health services research

BIOSKETCH: Juan A. Sanchez, M.D.

Juan Sanchez, M.D., is an associate professor of surgery at Johns Hopkins and associate faculty at the Armstrong Institute for Patient Safety and Quality.

He has authored over 100 peer-reviewed articles, books and book chapters, and serves on a number of national panels and study groups.

His research has revolved around the understanding of molecular mechanisms that protect the myocardium against oxidative stress and on preconditioning strategies, for which he holds several patents. Sanchez also has a strong interest in quality and patient safety in health care.

He is a former Malcolm Baldrige Quality Award Examiner and a Six Sigma Black Belt in quality improvement. He co-authored the scientific statement published by the American Heart Association on patient safety in the cardiac operating room. He has edited the patient safety issue of the Surgical Clinics of North America and is a contributing author on the American College of Surgeons’ Quality and Safety Manual. He is a founding member of the Patient Safety Committee for the National Board of Medical Examiners and is an instructor in the Patient Safety Course for second-year Johns Hopkins medical and nursing students.
Selected Publications: Juan A. Sanchez, M.D.


Stefano Schena, M.D., Ph.D.
Assistant Professor of Surgery

Background

- Liceo Scientifico Statale “E. Fermi” (B.S. 1989)
- University of Bari Medical School (M.D. 1996)
- University of Bari Medical School (Ph.D. 2005)
- University of Bari Medical School, Intern, Cardiovascular Surgery (1996-1997)
- University of Bari Medical School, Resident, Cardiovascular Surgery (1997-2001)
- University of Illinois, Resident, Surgery (2002-2006)
- Washington University/Barnes-Jewish Hospital, Fellow, Cardiothoracic Surgery (2006-2008)
- Washington University School of Medicine (2011-2017)
- Johns Hopkins University Division of Cardiac Surgery (2017-present)

Clinical Interests

- Adult cardiac surgery
- Endovascular treatment of thoracic aortic disease
- Surgical treatment of atrial arrhythmias
- Transcatheter valve therapy (TAVR, TMVR, etc)
- Total arterial myocardial revascularization

Research Interests

- Long-term outcome and quality of life following cardiac surgery in elderly patients
- Secondary effects following first and repeated exposure to heparin in cardiac surgery
- Surgical therapy of atrial fibrillation
- Novel technologies in structural heart valve therapy

Email: sschena1@jhmi.edu

BIOSKETCH: Stefano Schena, M.D., Ph.D.

Stefano Schena, M.D., Ph.D., joined the Johns Hopkins Division of Cardiac Surgery as an assistant professor of surgery in November 2017. Schena’s areas of clinical expertise include all aspects of adult cardiac, thoracic and vascular surgery. Schena’s areas of clinical expertise include all aspects of cardiac and vascular surgery. Additionally, his clinical interests include surgical treatment of atrial arrhythmias and transcatheter valve therapy (TAVR, TMVR, etc).

Prior to joining Johns Hopkins, Schena served as assistant professor of Surgery and Cardiothoracic surgery at Washington University. He earned his bachelor of science degree at Liceo
Scientifico Statale “E. Fermi” in Bari, Italy. He received his medical degree from the University of Bari Medical School, where he also obtained his doctor of philosophy degree. Schena completed a cardiovascular surgery residency at the University of Bari and a general surgery residency at the University of Illinois at Chicago. He completed his fellowship in cardiothoracic surgery at Washington University/Barnes-Jewish Hospital in St. Louis.

Schena is a member of various organizations, including the American Heart Association, the American Society of Transplantation, the American College of Surgeons, the American College of Cardiology, the International Society of Minimally Invasive Cardiothoracic Surgery and the Society of Thoracic Surgeons.

Schena’s research interests include long-term outcome and quality of life following cardiac surgery in elderly patients, secondary effects following first and repeated exposure of patients to heparin in cardiac surgery, novel technologies in structural heart valve therapy.

Selected Publications: Stefano Schena, M.D., Ph.D.


Marc S. Sussman, M.D.
Assistant Professor of Surgery
Intensivist, Cardiac Surgical Intensive Care Unit
CVSICU Fellowship Program Director

Background
- Massachusetts Institute of Technology (1979)
- Johns Hopkins University School of Medicine (M.D. 1984)
- NYU Medical Center, General Surgery Residency (1984–1991)
- NYU Medical Center, Cardiothoracic Surgery Fellowship (1991–1993)
- Johns Hopkins University Division of Cardiac Surgery (1993–2004)
- Johns Hopkins University Division of Thoracic Surgery (2004–2013)
- Johns Hopkins Hospital Cardiovascular Surgical ICU (2013–present)

Clinical Interests
- Cardiovascular intensive care

Research Interests
- Residency education
- Intensive care quality and outcomes

BIOSKETCH: Marc S. Sussman, M.D.

Marc Sussman, M.D., has been on staff at Johns Hopkins since 1993. He was born and raised in the suburbs of New York City. His undergraduate degree is from the Massachusetts Institute of Technology. He received his M.D. from the Johns Hopkins University School of Medicine in 1984. Sussman did both his general surgery and thoracic surgery training at NYU Medical Center. During his training, he spent two years in the laboratory of Gregory Bulkley at Johns Hopkins.

In 1993, Sussman joined the Johns Hopkins Division of Cardiac Surgery. In 2004, his clinical practice was located at Johns Hopkins Bayview Medical Center in general thoracic surgery. His research interests include geriatric oncology, minimally invasive surgery and outcomes research.

In 2013, Sussman joined the cardiovascular surgical intensivist team. In 2014, he became the director of the CVSICU fellowship program, where he oversees the curriculum of the cardiac critical care fellowship and leads the recruitment of new fellows and trainees. He has a deep commitment to education of residents, medical students, advanced care practitioners and nurses. His professional, caring and courteous manner serve as an example for us all.
Selected Publications: Marc S. Sussman, M.D.


Meguid RA; Hooker CM; Harris J; Xu Li; Westra WH; Sherwood JT; Sussman M; Cattaneo SM; Shin J; Cox S; Christensen J; Prints Y; Yuan N; Zhang J; Yang SC; Brock MV. Long-term survival outcomes by smoking status in surgical and nonsurgical patients with non-small cell lung cancer: comparing never smokers and current smokers. Chest. 2010;138(3):500–9.
Luca A. Vricella, M.D.
Professor of Surgery and Pediatrics
Director, Pediatric Cardiac Surgery
Director, Pediatric Heart Transplantation Program

Background
• Catholic University School of Medicine, Rome, Italy (M.D. 1991)
• George Washington University School of Medicine, Internship and General Surgery Residency (1992–1999)
• Loma Linda University Medical Center, Congenital Cardiac Surgery Research Fellowship (1996–1997)
• Stanford University School of Medicine, Cardiothoracic Surgery (1999–2002)
• Great Ormond Street Hospital for Sick Children, Congenital Cardiac Surgery Fellowship (2002–2003)
• Johns Hopkins University Division of Cardiac Surgery (2002–present)

Clinical Interests
• Pediatric cardiac surgery
• Neonatal cardiac surgery
• Pediatric cardiac transplantation
• Adult congenital cardiac surgery
• Aortic root surgery

Research Interests
• Clinical outcomes in pediatric cardiac surgery

BIOSKETCH: Luca A. Vricella, M.D.
Luca Vricella, M.D., was born in Rome, Italy, and graduated summa cum laude from the Catholic University of Rome Medical School in 1991. He then moved to the United States and completed training in general surgery at George Washington University School of Medicine, where he was elected Alpha Omega Alpha during his chief residency year. During this time, he developed a profound interest in the field of congenital cardiac surgery, and pursued a period of clinical and laboratory research training under the direction of Leonard Bailey with the division of pediatric cardiac surgery at Loma Linda University Medical Center. He then completed a cardiothoracic surgery fellowship at Stanford University and subsequently served as senior registrar in pediatric cardiac surgery at Great Ormond Street Hospital for Children in London. In 2003, he joined the surgical faculty at the Johns Hopkins University School of Medicine, where he is currently associate professor of surgery and pediatrics, and director of the Pediatric Cardiac Surgery and Heart Transplantation Program. He was recently inducted into the Miller-Coulson Academy of Clinical Excellence.

Vricella’s clinical and research interests revolve around the field of pediatric cardiac surgery, with emphasis on complex neonatal repair and care of adults with congenital heart disease. In light of his training and of his 14-year association with Duke Cameron, Vricella has also
developed a particular interest in aortic root surgery, with a focus on pediatric patients with connective tissue disorders.

Vricella is board certified in general and cardiothoracic surgery, with additional certification in congenital cardiac surgery. He is a Fellow of the American College of Surgeons and a member of the Society of Thoracic Surgeons. He is author and co-author of several articles and book chapters, and is one of the editors of the *Johns Hopkins Textbook of Cardiothoracic Surgery*.

**Selected Publications: Luca A. Vricella, M.D.**


Glenn J.R. Whitman, M.D.
Director, Cardiac Surgical Intensive Care Unit
Professor of Surgery

Background
- Harvard College (B.A. 1974)
- Lionel DeJersey Harvard Scholar, Cambridge University, England (1975)
- University of Pennsylvania School of Medicine (M.D. 1979)
- University of Colorado Health Science Center, General And Cardiac Surgery (1984–1988)
- University of Colorado Health Science Center, Cardiothoracic Surgery Chief, Denver VAH (1988–1990)
- The Medical College of Pennsylvania Hospital, Cardiac Surgery Chief (1990–1998)
- University of Maryland School of Medicine, Cardiac Surgery Chief (1998–2000)
- Temple University School of Medicine, Associate Hospital Director (2002–2007)
- Thomas Jefferson University Jefferson College of Medicine, CSICU Director (2007–2009)
- Johns Hopkins University Division of Cardiac Surgery, CSICU Director (2009–present)
- The Johns Hopkins Hospital, Director of Adult Heart Transplant Program (2011–2016)

Clinical Interests
- Critical care in cardiac surgery
- Quality improvement

BIOSKETCH: Glenn J.R. Whitman, M.D.

Glenn Whitman, M.D., joined the Johns Hopkins Division of Cardiac Surgery in 2009 as associate professor of surgery. His training began at the University of Pennsylvania, where he was a resident in surgery from 1979 to 1984. At that time, he followed Alden Harken to the University of Colorado, where he finished his general surgery training and then completed his training as a cardiothoracic surgeon. Thereafter, Whitman became an assistant professor at the University of Colorado and chief of cardiothoracic surgery at the Denver Veteran's Administration Hospital, where he remained for two years. In 1990, he returned to his home city of Philadelphia, where he became chief of cardiac surgery at the Medical College of Pennsylvania, formerly Women's Medical College, the first medical school in the United States to accept women. Whitman remained there for eight years before moving to the University of Maryland as chief of cardiac surgery. Unfortunately, in 2000, he had to withdraw from the active practice of cardiothoracic surgery due to arthritis. Since that time, Whitman has had a variety of roles in health care.

He has served as the director of transplantation and United Network for Organ Sharing representative at Temple University Hospital in Philadelphia, as well as its director of perioperative
services, managing preadmission testing, the operating room and the post-anesthesia care unit. In 2007, he left Temple for Thomas Jefferson Hospital to join Charles Yeo, taking over the responsibilities of running the cardiac surgery intensive care unit. In summer 2009, he was recruited by Duke Cameron to return to Baltimore to run the cardiac surgery intensive care unit and oversee the performance improvement/quality assurance program for cardiac surgery at Johns Hopkins.

Whitman’s initial research interests were in cardiac ischemia reperfusion injury and P31 nuclear magnetic resonance of cardiac bioenergetics, for which he received both National Institutes of Health and Department of Veterans Affairs funding. He has since become involved with quality outcomes, and has presented at the American College of Surgeons and the Society of Thoracic Surgeons on the difficulties associated with performance improvement and quality assurance in the field of health care, particularly in the ICU.

Selected Publications: Glenn J.R. Whitman, M.D.


Stephen C. Yang, M.D., F.A.C.S., F.C.C.P.

The Arthur B. and Patricia B. Modell Professor of Thoracic Surgery
Professor of Surgery and Oncology
Division of Thoracic Surgery
Associate Vice Chair, Faculty Education
Director, Thoracic Oncology Program

Background
• Duke University (B.A. Chemistry 1980)
• Medical College of Virginia (M.D., 1984)
• University of Texas Health Science Center at Houston, General Surgery Residency (1984–1987, 1990–1992)
• University of Texas MD Anderson Cancer Center, Thoracic Surgical Oncology Research Fellowship (1987–1990)
• Medical College of Virginia, Cardiothoracic Surgical Residency (1992–1994)
• Johns Hopkins University Division of Thoracic Surgery (1994–present)

Clinical Interests
• Lung cancer
• Esophageal cancer
• Mesothelioma
• Robotic thymectomy
• Video-assisted thoracic surgery/robotics
• Lung volume reduction surgery

Research Interests
• Development of molecular markers for lung cancer
• Molecular biology of mesothelioma
• Surgical education

BIOSKETCH: Stephen C. Yang, M.D., F.A.C.S., F.C.C.P.

Stephen Yang, M.D., is the Arthur B. and Patricia B. Modell Professor of Thoracic Surgery, the adjunct vice chair of faculty development and education for the Department of Surgery, professor of surgery and oncology, at Johns Hopkins. Yang is a graduate of Duke University in 1980 and recipient of a medical degree from the Medical College of Virginia in 1984. His training included a general surgical residency at the University of Texas Health Science Center at Houston, a three-year thoracic surgical research fellowship at the MD Anderson Cancer Center and a cardiothoracic surgical fellowship at the Medical College of Virginia. In 1994, he joined the faculty at Johns Hopkins.

He was the former director of the Adult and Pediatric Lung Transplantation Program from 1994 to 2003, the surgical clerkship and curriculum director from 2003 to 2012, and the chief
of thoracic surgery from 2001 to 2013. He was the 1996 William F. Rienhoff award winner for teaching and research at Johns Hopkins. He is an ardent supporter for medical students, being the only surgeon (among 20 initially chosen from the school of medicine) for the medical student Colleges Advisory Program. He is the faculty sponsor for the Surgery Interest Group and the Surgery Applicant Group, and the first faculty sponsor for the Asian Pacific American Medical Student Association (being the first Asian faculty member and full professor in the Department of Surgery). In 2008, he was awarded the Johns Hopkins Deans Faculty Award for Clinical Teaching, the highest teaching award at the institution. He also sits on the Senior Faculty Development Committee in the dean’s office and the Admissions Committee for the school of medicine.

Nationally, he was named the 2004 Medical College of Virginia Outstanding Alumnus. In 2008, he was named the Brooks-Lower Visiting Professor at the Medical College of Virginia, where he had trained. He was the 1997–99 American Association of Thoracic Surgery Glenn Morrow Research Scholar, the 2006 recipient of the Thoracic Surgery Directors Association Mentor Award and the 2006 Society of Thoracic Surgeons J. Maxwell Chamberlain Award for the best general thoracic surgery paper for that meeting. He serves on numerous national and international committees, including the task force chair on the Looking to the Future Residency and Medical Student Scholarships for the Society of Thoracic Surgeons, the council for the American Association for Thoracic Surgery, the executive council for the American College of Surgeons’ Medical Student Committee, executive council for the General Thoracic Surgical Club and the National Comprehensive Cancer Network. He was the former president of the Surgery Clerkship Directors Association from 2010 to 2012. In 2010, he was named to the Joint Council for Thoracic Surgical Education, where he chairs the Early Curriculum Committee and program director for the Educate the Educator national training program for academic cardiothoracic surgeons. His main focus is on the renovation of thoracic surgical education in the ever-changing paradigm of resident training. In 2014, he was elected as a director for the American Board of Thoracic Surgery. He serves as representative to other meetings and societies for the Thoracic Surgery Directors Association and the Residency Review Committee of the Accreditation Council for Graduate Medical Education.

He co-edited the book *Current Therapy in Thoracic and Cardiovascular Surgery*, currently preparing to print the second edition. *The Johns Hopkins Textbook of Cardiothoracic Surgery* textbook also was recently rolled out; he edited the general thoracic surgical section. He edited the esophageal surgical section in the second edition of *Atlas of Gastrointestinal Surgery* with John Cameron. He is the editor-in-chief of *The Early Diagnosis of Cancer* book series, *Practical Reviews in Chest Medicine*, and the e-journal *Current Surgical Reports*. In 2001, he and his lung transplant team were featured in the ABC series *24/7*, and his team followed in the 2008 sequel *Hopkins* to that series, focusing in on resident life and medical student teaching. This series as well as other experiences (such as the care of esophageal cancer) are still shown on the Discovery Channel and the BBC. His CV consists of over 150 peer-reviewed articles and 50 book chapters.

He currently serves as President of the International Chinese Society of Thoracic Surgeons, a constituency of over 800 members, until 2016. In addition to his leadership with the society, he is currently working with Johns Hopkins leadership to enhance surgical education and training in mainland China. Congruous with this project, he is involved with medical mission and medical tourism activities, bringing cancer screening programs to the underserved and those seeking health care in the U.S.

His laboratory research interests include using molecular techniques for lung cancer screening and predicting recurrence following surgical resection. His clinical practice and research
covers the breath of general thoracic surgery in pulmonary and esophageal surgery, video-assisted and robotics thoracic surgery, mediastinal and pleural diseases, lung volume reduction surgery for emphysema, and work in the areas of patient safety, geriatric thoracic surgery, and enhancing the educational paradigm for medical students, residents and junior faculty members.

He developed novel lung transplantation techniques with cadaveric lobar transplantation and robotic thymectomy approaches.

Behind every busy man there is a loving a supportive family. Though an empty nester now that his three children have sort a flown the coop, he lives with Marivic, his wife of 32 years, in Hunt Valley, Maryland, and enjoys playing lounge piano, country club tennis, *Chopped* cooking and ballroom dancing “with the stars.”

Selected Publications: Stephen C. Yang, M.D.


Kenton J. Zehr, M.D.
Associate Professor of Surgery
Assistant Director, Dana and Albert “Cubby” Broccoli Center for Aortic Diseases

Background
• Pennsylvania State University, Milton S. Hershey Medical School (M.D. 1978)
• The Johns Hopkins Hospital, General Surgery Residency (1989–1995)
• The Johns Hopkins Hospital, Cardiothoracic Surgery Fellowship (1995–1998)
• Mayo Clinic, Division of Cardiac Surgery (1998–2006)
• University of Pittsburgh Medical Center, Cardiac Surgery Chief (2006–2008)
• Perm Heart Institute, Perm, Russian Federation, Staff Surgeon, Education Director (2008)
• Scott & White Healthcare, Cardiothoracic Surgery Director (2009–2013)
• Johns Hopkins University Division of Cardiac Surgery (2014–present)

Clinical Interests
• Adult cardiac surgery
• Aortic surgery
• Aortic and mitral valve repair
• Mechanical assist for the failing heart and lungs (VAD therapy, ECMO)
• Surgical maze

Research Interests
• The inflammatory response to extracorporeal circuits
• Hypothermic circulatory arrest
• Device development

BIOSKETCH: Kenton J. Zehr, M.D.

Kenton Zehr, M.D., is a cardiovascular surgeon at The Johns Hopkins Hospital and associate professor of surgery. After his general and cardiothoracic surgical training at Johns Hopkins and a fellowship in aortic surgery and thoracic organ transplantation with Sir Magdi Yacoub at Harefield Hospital in London, he joined the faculty at Mayo Clinic. During his tenure there, he concentrated on clinical surgery. He also developed a keen interest in international education, and has lectured and operated extensively around the globe. Prior to returning to Johns Hopkins, he has held the positions of chief of cardiac surgery at the University of Pittsburgh Medical Center; senior staff surgeon and educational director at the Perm Heart Institute in Russia, where he holds an honorary professorship; and director of cardiothoracic surgery at Scott & White Healthcare in Temple, Texas.
Over his career, Zehr has developed his clinical interests in aortic root and aortic aneurysm surgery, repair techniques for the aortic and mitral valves, and mechanical assistance for the failing heart and lungs. He has been recognized for his teaching abilities, and awarded the Anthony L. Imbembo Surgical Residents Teaching Award from The Johns Hopkins Hospital and the Faculty Teaching Award from University of Pittsburgh Medical Center.

His early investigative work concentrated on study of the inflammatory response triggered by blood/synthetic surface interactions. It morphed into research aimed at ameliorating the inflammatory responses of hyperacute rejection and the neurological, pulmonary and cardiac sequelae of ischemia/reperfusion injury. Over the last decade, he has been primarily interested in device development related to cardiac surgery and holds patents for various devices.

Zehr is an author of over 115 publications and 11 book chapters covering nearly the entire gamut of acquired adult cardiac surgical diseases. He enjoys travel and new experiences. He has a wide range of interests outside of the operating room, including cultural anthropology, ornithology and Russian impressionism of the Leningrad School.

Selected Publications: Kenton J. Zehr, M.D.


Nick Carmona is the Cardiothoracic Surgery Division Administrator. Carmona comes from south Texas, where he graduated magna cum laude from the University of Texas–Pan American and graduated summa cum laude with honors with a master’s degree in health administration from Texas A&M University. Throughout his formal training, Carmona has worked alongside physicians, administrators, nurses, researchers and countless advanced care providers in various settings to improve health outcomes for their communities. Prior to his role in the division, Carmona was a fellow of health care administration with Johns Hopkins Medicine, where he worked on enterprisewide projects. A few of his efforts helped lead to strategies for implementing telemedicine across the Johns Hopkins system, improving employee health services and joint ventures, optimizing clinical processes for community hospitals and physician practices, and setting policies for quality metrics within our home care services. Carmona also served as interim division administrator for general pediatric surgery, where he helped supervise community business ventures and academic duties.
For generations, patients with the most complex heart problems have turned to Johns Hopkins physicians for help. Recognized worldwide, Johns Hopkins cardiologists and cardiac surgeons provide comprehensive care of the highest quality, ensuring that patients receive the most advanced treatments known to medicine.

The Johns Hopkins Heart and Vascular Institute is in the cardiovascular and critical care tower, which seamlessly integrates state-of-the-art diagnostic and therapeutic services. In this facility, patients experience personalized medical care in a high-tech environment while having the advantage of the research and education assets unique to Johns Hopkins. Specialists in every branch of cardiac care—cardiology, cardiac surgery, vascular medicine, radiology, pathology and critical care anesthesia—work collaboratively in a hospital setting designed to foster innovative treatments and accelerate the science of medicine.

At the Johns Hopkins Heart and Vascular Institute, cardiac specialists have the ability to swiftly translate laboratory discoveries into new treatments, with the ultimate goal of reducing morbidity and mortality due to heart disease, the leading cause of death in the United States and most developed countries.
One of the historical milestones of congenital cardiac surgery took place at The Johns Hopkins Hospital on Nov. 29, 1944. Up to that day, most infants and children with congenital heart disease (then called blue babies) had no hope for cure and died of their heart condition.

Dr. Alfred Blalock and the pediatric cardiac team at The Johns Hopkins Hospital first offered to these children the possibility of survival by creating what would be called the Blalock-Taussig shunt. After that first successful operation, hundreds of children traveled to Baltimore for the procedure. Over the ensuing decades, many more underwent ever more complex operations to correct anomalies that affect neonates to adults.

The Johns Hopkins tradition of surgical intervention for patients with congenital heart disease now spans over six decades and has evolved into a premier team that is capable of addressing all forms of congenital heart disease. The service performs over 250 congenital cardiac procedures per year in the greater context of a cardiac team that performs over 1,000 open-heart surgeries per year on patients referred by local, national and international physician networks.
These operations navigate the full spectrum of cardiac malformations, from premature patients to adults with congenital heart disease. Luca Vricella, director of pediatric cardiac surgery and director of pediatric cardiac transplantation, is board certified in cardiothoracic surgery and has specifically trained in congenital cardiac surgery, with particular interest in the area of neonatal cardiac surgery, surgical procedures in pediatric patients with connective tissue disorders and adult congenital cardiac surgery. Narutoshi Hibino is the Director of the Pediatric Cardiac Surgery Laboratory and has an NIH funded laboratory. The pediatric cardiac center at The Johns Hopkins Hospital has unparalleled experience in valve-sparing aortic root replacement in pediatric patients with Marfan syndrome. Complex operations addressing malformations, such as hypoplastic left heart syndrome, transposition of the great arteries and other extreme forms of neonatal pathology, are carried out in the setting of an academic facility committed to the care of the pediatric patient, the Johns Hopkins Children's Center. This collaborates with the adult cardiac surgical service so that older patients with heart disease benefit from the expertise of adult pathologists, pediatric cardiologists and cardiac surgeons who are well-rounded in the complicated field of congenital heart disease. It is anticipated that over the next decade, most pediatric cardiac units will see a proportion of at least 50 percent of their practice devoted to adults with congenital cardiac pathology. With additional expertise in implantable ventricular assist devices, extracorporeal membrane oxygenation and cardiopulmonary transplantation, the structure of the pediatric cardiac service at The Johns Hopkins Hospital is ideally structured to meet the challenge of this constantly growing patient population.

An experienced, multidisciplinary team of physicians and health care specialists completes the pediatric cardiac team at The Johns Hopkins Hospital. Pediatric cardiac surgeons and pediatric cardiologists work closely together in the preoperative evaluation of pediatric and adult cardiac patients with congenital heart disease. During the intra- and immediately postoperative phase, patients are carefully managed by surgeons, cardiologists, anesthesiologists and a world-class pediatric intensive care team, with expertise in patients with heart malformations. Being Johns Hopkins, a leading center in the training of future generations of cardiothoracic surgeons, residents are also deeply involved in the care of children with congenital heart disease, assisting in complex operative procedures and following these complex patients during the postoperative recovery phase.

The Pediatric Cardiac Service at The Johns Hopkins Hospital is integrated within the Johns Hopkins Heart and Vascular Institute and The Charlotte R. Bloomberg Children's Center. In this center, a tower devoted to the care of children has a dedicated ICU space, operating rooms and state-of-the art equipment exclusively available to patients with congenital heart disease.

### Minimally Invasive Cardiac Surgery

The Johns Hopkins Minimally Invasive Cardiac Surgical Program offers several operations using minimally invasive approaches:

- Mitral valve repair and replacement
- Aortic valve replacement
- Tricuspid valve repair or replacement
- Atrial septal defect/patent foramen ovale closure
- Biventricular epicardial pacing lead placement
- Surgical radiofrequency ablation for atrial fibrillation
- Coronary artery bypass surgery

The robotic cardiac surgery program at Johns Hopkins is currently led by Kaushik Mandal. He has performed and reported the world’s first robotically assisted partial atroventricular canal defect repair in a 46-year-old woman. He obtained his robotic training under the mentorship of Drs. David Yuh and Randolph Chitwood. Operations are performed using much less invasive incisions than those used with the standard sternotomy approach. Compared to standard open-chest cardiac surgery, these minimally invasive techniques involve less pain, fewer wound complications, shorter hospital stays, superior cosmesis and faster recovery times for patients.
Transcatheter Valve Program

The Transcatheter Valve program at Johns Hopkins began in July 2011. The program is jointly run by those in cardiology and cardiac surgery. The medical director of the program is Dr. Jon Resar.

The program currently implants the commercially available Medtronic CoreValve TAVR and the Edwards Sapien TAVR, and continues to participate in a variety of clinical trials as new technology for the aortic and mitral valve is developed. The program uses iliofemoral, subclavian, direct aortic and apical approaches to implant the devices. Patients are evaluated jointly by both teams and discussed at a weekly TAVR conference. The technical aspects of each procedure are jointly performed, with cardiology and surgery rotating between the various implanting positions.

Weekly block time has been allotted to accommodate this growing practice. Currently, there are two to four TAVRs performed weekly. Thus far, the program has performed over 600 cases with both commercial and research-based implants, with a referral volume of several new cases each week. Excellent outcomes have been experienced to date with limited morbidity.

The Dana and Albert “Cubby” Broccoli Center for Aortic Diseases

The Dana and Albert “Cubby” Broccoli Center for Aortic Diseases is world-renowned for its expertise and medical resources. It offers a unique multidisciplinary approach. As one of the few centers in the world that truly focuses on diseases of the aorta, the Broccoli Center brings together leading physicians and scientists in clinical and laboratory research at the nation’s best hospital. Outstanding collaboration and cooperation with internationally renowned expert Dr. Hal Dietz is a cornerstone of this center. This cohesive program provides a continuing opportunity to make key advances in the field of aortic diseases while offering the highest level of care and treatment available anywhere in the world.

The Broccoli Center treats a large number of patients with aortic diseases, from newborns to the elderly. With a Marfan clinic established in 1950 by Dr. Victor McKusick, The Johns Hopkins Hospital has the world’s longest experience with surgery for Marfan aortic disease. Our surgical teams include specialists in cardiac surgery, vascular surgery, radiology, anesthesia and neurological monitoring, assuring the best possible surgical outcomes and minimizing the risk of complications.
Johns Hopkins Comprehensive Marfan Center
The Johns Hopkins Comprehensive Marfan Center is an internationally recognized center for surgical management of patients with Marfan and non-Marfan disease. It offers a collaborative approach for treatment of all clinical manifestations of Marfan syndrome, with expertise in genetics, ophthalmology, orthopedics, vascular and cardiac operations.

Aortic Valve Repair
Aortic valve repair is a treatment option for preservation of the native valve in patients with aortic insufficiency. This technique is particularly useful in young patients with bicuspid valve disease and connective tissue disorders. This approach could avoid the drawbacks of tissue and mechanical valve prosthesis in patients with a longer life expectancy. Surgical techniques include aortic valve-sparing root replacement, subcommissural annuloplasty and leaflet reconstruction.
The Johns Hopkins University School of Medicine

Thoracic Endovascular Aortic Repair

Endovascular therapy is becoming an increasingly attractive option to treat higher-risk patients with various aortic pathologies. Hybrid open and endovascular procedures are expanding the scope of patients who can be treated. Currently, aneurysm, dissection and trauma can all be treated using endovascular options. This program has close collaboration with vascular surgery. The endovascular skill set will be critical to the cardiac surgeon of the future.

Cardiomyopathy and Heart Failure Program

The Johns Hopkins Cardiomyopathy and Heart Failure Program uses a multidisciplinary approach to the evaluation and management of patients with heart failure due to any cause. Important components of this team approach include social work, dietary counseling, physical rehabilitation, educational programs and support groups. Our goal is to empower patients to better care for themselves by improving compliance, patient understanding and family support.

The keystone to this program remains cutting-edge, individualized patient diagnosis and treatment provided by faculty members in conjunction with our nurse practitioners. Our patients range from those who are asymptomatic to those in desperate need of cardiac transplantation.

Mechanical Circulatory Support Program

The Johns Hopkins Hospital Mechanical Circulatory Support Program began in 1986 with success in improving the survival of many patients. The program offers a variety of ventricular assist devices. Each one is designed to address specific patient conditions. These devices are also used as destination therapy, a means of improving quality of life for end-stage heart failure patients who do not qualify for a heart transplant.

The team consists of highly trained and committed clinicians who are dedicated to providing patients with the best care available. The team includes cardiologists, cardiac surgeons, operating room clinicians, the cardiovascular surgical intensive care unit team, the cardiovascular progressive care unit team, physical therapists, occupational therapists, nurses, social workers, transport personnel and coordinators.

Our approach to caring for a patient with a ventricular assist device implant is different in many areas. We fully believe in developing a relationship with the patients and their families so that they may have a comfortable and trusting group of caregivers around them at all times. We remain active throughout the preoperative evaluation phase, during the surgery, while recovering from surgery in the hospital and after discharge while patients adjust to a new life at home with the new device.
Comprehensive Transplant Center

Heart Transplant Program
Established in 1983, the Johns Hopkins Heart Transplant Program developed an approach to treating congestive heart failure while reducing hospital admissions, improving the quality of life for patients and lowering mortality rates. Besides an aggressive medical approach, the program stresses intensive education and lifestyle counseling. Johns Hopkins is proactive in maintaining or stabilizing patients awaiting heart transplants and following them through the post-transplant process.

Lung Transplant Program
Since the time of its inception, the Johns Hopkins Lung Transplant Program has been the most active and aggressive program in the state, performing over 440 lung transplants. The program uses a team approach that includes surgeons, pulmonologists, immunogeneticists, advance practice nurses, pharmacists, physical therapy, respiratory therapists, social workers, nutritionists and psychologists. In addition to our clinical program, we have an active research program. Our mission is to improve the quality of life and outcomes in our lung transplant patients.

Cardiac Surgery:
A Leader in Excellence and Innovation

Johns Hopkins Highlights
The Johns Hopkins Hospital ranked #3 in the 2017–18 U.S. News and World Report Best Hospitals list.
- Performed the first successful “blue baby” operation in the world to correct congenital heart defects.
- Performed the world’s first human implantation of the automatic implantable defibrillator.
- Has world’s longest experience with surgery for Marfan aortic disease.
- Performed the first domino heart transplant procedure in the United States.

Johns Hopkins Firsts
The Johns Hopkins Hospital has been the first hospital in Maryland to perform the following specialized operations:
- Heart transplantation
- Heterotopic heart transplantation
- Heart-lung transplantation
- Bilateral lung transplantation
- Pediatric lung transplantation
- Lobar lung transplantation
- Ventricular assist device implantation
- Ventricular assist device implantation as destination therapy
- Adult extracorporeal membrane oxygenator implantation
- Robot-assisted cardiac operation
- Robotic thymectomy
- Robotic lobectomy
- Robotic partial AV canal defect repair
- Percutaneous valve replacement
History of Cardiac Surgery Research

Cardiac surgical research at The Johns Hopkins Hospital has a long and productive history. Since its inception in 1942 by Alfred Blalock and Vivien Thomas, investigators in the Cardiac Surgery Research Laboratory have set the standard for surgical research today. Areas of research include:

- Solutions to congenital cardiac defects, i.e., tetralogy of Fallot (blue baby)
- Early advances in cardiopulmonary bypass using the heart-lung machine to facilitate open-heart surgery
- Early prosthetic valve development with related coating and bonding studies
- Early development of the intra-aortic balloon pump
- Comparisons of anti-rejection medications in heart and heart-lung transplantation
- Heart and lung organ preservation techniques
- Effects of leukocyte filtration on cardiopulmonary bypass
- Techniques for safely extending hypothermic circulatory arrest and minimizing neurological injury
- Preventing spinal cord injury during aortic surgery
- Investigating the use of gene therapy to preserve the life of vein grafts
- Robotic cardiac surgery
- Surgical approaches to connective tissue disorders in Marfan syndrome and Loeys-Dietz syndrome
- Multicenter clinical trials of ventricular assist devices for bridge-to-transplant and bridge-to-destination therapy
- Understanding and improving the cardiac surgical care of elderly patients

Active Cardiac Surgery Clinical Research

2017

- Learning Predictors and Causes of Adverse Events in Cardiac Surgery
- Retrospective Review of Outcomes following Cardiac Surgical Procedures at Johns Hopkins Hospital
- Review of Outcomes after Aortic Dissection Repair
- A Novel Risk Score to Predict Dysphagia Following Cardiac Surgery Procedures
- A Novel Risk Score to Predict the Need for Nutrition Support After Cardiac Surgery.
- A Novel Risk Score to Predict New Atrial Fibrillation after Isolated CABG
- Trends, Clinical Outcomes and Cost Implications of Mitral Valve Repair Versus Replacement Concomitant with Aortic Valve Replacement
- Continuous Intraoperative Cefazolin Infusion May Reduce Surgical Site Infections During Cardiac Surgical Procedures: A Propensity-Matched Analysis
- Stroke Database Study—Review of Brain MRIs in Patients with Stroke After Cardiac Surgery
- Complications of CO2 insufflation during endoscopic vein harvesting.
- Complications After Cardiac Operations: All Are Not Created Equal
- Management of sickle cell disease in patients undergoing cardiac surgery.
- Renal ultrasound provides low utility in evaluating cardiac surgery associated acute kidney injury.
- Renal Failure After Cardiac Operations: Not All Acute Kidney Injury Is the Same.
- A pilot goal-directed perfusion initiative is associated with less acute kidney injury after cardiac surgery.
- Optimal blood pressure during cardiopulmonary bypass defined by cerebral autoregulation monitoring.
- Left atrial appendage occlusion for stroke prevention in patients with atrial fibrillation.
- Cardiac Sympathetic Denervation for Refractory Ventricular Arrhythmias.
- What Is the Role of Cardiac Sympathetic Denervation for Recurrent Ventricular Tachycardia?
- Surgical or Transcatheter Aortic-Valve Replacement in Intermediate-Risk Patients.
- Retrospective Analysis of Patients on Mechanical Circulatory Support Devices
• Shear Stress, Cell Trajectories, Thrombosis and Damage to Blood in Left Ventricular Assist Devices
• Application of Critical Care Survey for Standardization of Clinical Practice in Cardiac Surgery
• Tolerance of Early Extubation in Cardiac Surgery
• Nutrition Support Management in Cardiac Surgery
• Congenital Heart Surgeons’ Society (CHSS) Studies in Congenital Heart Disease
• Evaluation of Warfarin Therapy After the Fontan Procedure at a Large Children's Center
• Retrospective Review Evaluating Associations Between Nadir Oxygen Delivery (DO2) During Pediatric Cardiac Surgery and a Biomarker of Brain Injury to Determine a New Approach of Goal-Directed Perfusion to Protect Brain Injury During CPB
• Comparative Efficacy of iNO and Inhaled Epoprostenol in the Perioperative Management of Pulmonary Arterial Hypertension in pediatric Patients Following Cardiac Surgery
• Institution-wide Prospective, Inception Cohort Study of Individuals with Childhood-Onset Acute and Chronic Health Conditions (iPICS)
• Bivalirudin Use in Pediatric Patients
• Surgical Ligation of PDA in Preterm Infants is Safe and Efficacious
• Coronary Button Pseudaneurysm after VSRR in a child with LDS
• Correlation of Transfusion and Postoperative Infection in the STS Registry
• Correlation of Postoperative Bleeding and Platelet Count
• Less is More: A Statewide Analysis of the impact of blood transfusions on CAGB Outcomes
• Blood utilization in revision versus first-time cardiac surgery: an update in the era of patient blood management.
• Planned Versus Unplanned Reexplorations for Bleeding: A Comparison of Morbidity and Mortality.
• Predicting Readmissions in Cardiac Surgery
• Prediction Model for Unplanned Cardiac Surgery Intensive Care Unit (CSICU) Readmissions
• Biomarkers of Readmission and Mortality—Determining If Circulating Biomarker Levels Measured in Existing Pre- and Post-Blood Samples Predict 30-Day Readmission and/or Mortality in Children with Congenital Heart Disease
• Nanofiber Tissue-Engineered Vascular Graft Using 3-D Printing Technology
• Nanofiber Tissue-Engineered Vascular Grafts for Complex Shapes Using 3-D Printing Technology
• Patient-Specific Nanofiber Tissue Engineered Vascular Graft to Enhance the Available Treatments for Children Suffering from Congenital Heart Disease
• Creation of Human Cardiac Muscle from Induced Pluripotent Stem Cell Using Bio-3D Printer
• Novel Device for the Treatment of Heart Failure: Peristaltic Pump Created from Human-Induced Pluripotent Stem Cell Using Bio-3D Printer
• A Comprehensive Risk Score to Predict Prolonged Hospital Length of Stay After Heart Transplantation.
• Heart Transplantation and Bridge with Mechanical Circulatory Support in Cardiac Sarcoidosis: An Analysis of UNOS registry
• Impaired Renal Function Should Not be A barrier to Transplantation in Patients with Cystic Fibrosis
• Bilateral Cervical Sympathectomy: An emerging treatment option for stabilization of cardiomyopathy ass. Refract v tac
• The Paradoxical Relationship Between Donor Distance and Survival After Heart Transplantation.
• The Efficacy and Safety of Epidural-Based Analgesia in a Case Series of Patients Undergoing Lung Transplantation
• A Risk Score to Predict Renal Failure in Adult Patients Following Lung Transplantation
• Preoperative Performance Status Impacts Perioperative Morbidity and Mortality After Lung Transplantation
• Prolonged Ischemia Is Not Associated with Primary Graft Failure and Does Not Impact Survival Following Lung Transplantation
• Impaired Renal Function Should Not Be a Barrier to Transplantation in Patients With Cystic Fibrosis.
Cardiac Surgery Clinical Registries:

- Society of Thoracic Surgeons Adult Cardiac Surgery Database
- Society of Thoracic Surgeons Congenital Heart Surgery Database
- INTERMACS—Interagency Registry for Mechanically Assisted Circulatory Support
- PEDIMACS—Pediatric Registry for Mechanical Assisted Circulatory Support
- Extracorporeal Life Support Organization Registry
- Pediatric Cardiac Critical Care Consortium

Active Cardiac Surgery Clinical Trials

- Prospective Randomized On-X Valve Anticoagulation Clinical Trial (PROACT)
- Medtronic CoreValve: Low Risk Study
- Medtronic SURTAVI: Surgical Replacement and Transcatheter Aortic Valve Implantation (Follow-up Phase)
- CT Myocardial Extra-Cellular Volume Fraction Quantification in Patients Undergoing TAVR
- Delirium and Frailty Study in TAVR Patients
- Aortic Valve Operative Outcomes in Marfan Patients
- Use of Contegra Pulmonary Valved Conduit Designated as Humanitarian Use Device
- Allogenic Human Mesenchymal Stem Cell injection in patients with HLHS (ELPIS)
- L-citrulline utility for prevention of acute lung injury during CPB in Pediatric heart surgery
- Predictors of Development of A fib in type 2 MV Regurgitation
- Randomized Trial of the Neochord DS1000 System versus open Surgical Repair (ReChord Trial) - NCT02803957
- Steroids to Reduce Systemic Inflammation after neonatal heart surgery: Trial within a Registry (STRESS Trial)
- CHSS Congenital Heart Surgeons Society Studies in Congenital Heart Disease
- Biomarkers of Readmission and Mortality
- Institution-wide Prospective, Inception Cohort Study of Individuals with Childhood-Onset Acute and Chronic Health Conditions (iPICS)
- A Clinical Trial To Evaluate the Heartware Ventricular Assist System (ENDURANCE Trial)
- Supplementation of Early Enteral Feeds with Parenteral Nutrition after Cardiac Surgery
- Momentum 3 MC Study of MagLev Technology in Pts Undergoing MCS therapy with Heart mate
- International Trial to Evaluate Safety and Efficacy of Portable Organ Care System Lung System for Recruiting, Preserving, and Assessed Expanded Criteria for Lung Tx (EXPAND II Trial)
- Inhaled Vasodilators in Critical Care Settings
- COCAD Study—Longitudinal Study of Cognitive Outcomes in Patient with Coronary Artery Disease
- Continuous Cerebral Autoregulation Monitoring to Reduce Brain Injury from Cardiac Surgery
- Distinct forms of Hypoperfusion and Risk of Stroke in Cardiac Surgery Patients
- Pilot Study of the Feasibility of Multicenter NIRS Data Collection and Interventions for Desaturation in Cardiac Surgery
- An Intervention to Reduce Delirium After Cardiac Surgery
- Monitoring and Stratifying Patient Recovery after Cardiac Surgery Using Activity and Cerebral Autoregulation Monitoring
Cardiac Surgery Basic Science Research

• Canine Deep Hypothermic Circulatory Arrest Model
• Porcine Global Myocardiac Ischemia Model
• Canine Sympathetic Denervation Model
• 3D Printed Cardiac tissue
• 3D printed patient specific TEVG
• Nanofiber TEVG
• Textile/PGS small diameter TEVG
• Porcine Cardiac Arrest Model - Brain Protection

Cardiac Surgery Research Labs

Active Research

The scientific environment at The Johns Hopkins University is an extremely diverse and rich community. More than 50 state-of-the-art Core facilities are within walking distance of the Johns Hopkins University School of Medicine campus. The Cardiac Surgery Laboratory is located on the 12th floor of the Alfred Blalock Building of The Johns Hopkins Hospital. Johns Hopkins offers a rich and well-established environment that fosters development of clinician-researchers. There are innumerable opportunities for multidisciplinary intellectual interactions with other scientists on a daily basis.

Canine Model of Hypothermic Circulator Arrest

• We are investigating the novel application of nanoparticle-conjugated therapies to treat neurocognitive dysfunction following hypothermic circulatory arrest. We have demonstrated the ability of intravenously administered dendrimer nanoparticles to traverse the blood-brain barrier and localize to areas of injury within the brain. We will continue our experiments utilizing n-acetylcysteine and valproic acid to target the inflammatory and excitotoxic pathways.

Nanoparticle-Conjugated Therapies for Experimental Myocardial Ischemia-Reperfusion Injury

• We are building on our nanoparticle-based drug delivery vehicle to investigate the impact of various antioxidants in an established experimental rabbit model of myocardial infarction involving temporary ligation of the LAD for 30 minutes followed by reperfusion. We hope to demonstrate selective localization of dendrimer-conjugated therapeutic agents to injured myocardium with sequestration of free radicals, leading to improved myocardial function and attenuated histologic injury.

Ex Vivo Human Lung Reperfusion

• Human lung pairs are harvested and reperfused on an ex vivo circuit and treated with inhaled hydrogen sulfide gas. The lungs treated with hydrogen sulfide demonstrated improved oxygenation, decreased reactive oxygen species formation and an upregulation in the “safety pathways” associated with lung injury.
Ex Vivo Rabbit Lung Model

- The ex vivo platform has been used to investigate the possible benefits of nanoparticles (dendrimer) as drug delivery vehicles in lung injury following transplantation. The biodistribution profile demonstrated uptake of the dendrimer in the epithelium, endothelium and immune cells. The next iterations of this project include the use of dendrimer-dexamethasone and dendrimer-surfactant analogs.

Tissue Engineering Technology/Stem Cell Therapy/Clinical Imaging and 3-D Printing Technology in Cardiac Surgery

- A major source of morbidity and mortality arises from the use of synthetic biomaterials for various reconstructive cardiovascular operations. Tissue engineering technology offers a potential strategy for overcoming these complications by providing a biodegradable scaffold for the patient’s own cells to proliferate and provide physiologic functionality.
- The application of tissue engineering technology into the field of cardiovascular surgery is actively underway in Narutoshi Hibino’s laboratory. Hibino’s research has shed light on the mechanism of neotissue formation of tissue-engineered vascular grafts. His team also has been developing a new generation of tissue-engineered vascular grafts and valves through collaboration with bioengineering labs and industries.
- Recent progress in imaging technologies, such as ultrasound, CT and MRI, gives surgeons detailed, 3-D views of complex cardiac and vascular anatomy before surgery. Such technology offers significantly more utility with 3-D printing technology using proper biomaterials, which enables rapid, custom manufacturing. The lab has been working on the creation of patient-specific, tissue-engineered vascular grafts and valves constructed from preoperative 3-D images using a computer-aided design model and 3-D printing technology.
- The lab is developing a scaffold-free, multilayer, functional, engineered cardiac tissue created from cell spheroids consisting of iPS cell-derived cardiomyocytes, endothelial cells, pericytes and fibroblasts using a bio-3D printer. This will constitute a significant step toward a new generation of alternative stem cell treatment for heart failure.

Mitochondria Isolation, Genetically Altered Mouse Models: Myocyte Volume and Contractility, Langendorff, LAD Occlusion and Porcine Cardiopulmonary Bypass Model

- Jennifer Lawton’s laboratory focuses on the mechanism of action and location of action of the cardioprotective adenosine triphosphate-sensitive potassium channel and its exploitation for use in cardiac surgery. Multiple models facilitate these experiments.
Innovation and Discovery
Johns Hopkins Heart and Vascular Institute

Project: The Hopkins Heart

Mission:
The mission of the Hopkins Heart Initiative is to develop a replacement heart that can improve the function of, promote the regeneration of and, if necessary, completely replace a diseased heart.

• This artificial heart will generate blood flow that is continuously coordinated with the patient's physiological demands, operate in harmony with the circulatory system without inciting dot-inducing or other disruptions in the bloodstream, provide power through an energy source without infection-prone tethering lines, and be fully implantable with an individualized geometry and configuration.

• An intense collaboration of specialists devoted to this project will bring together a spectrum of disciplines spanning cardiology and cardiac surgery, hemodynamics, biomedical engineering, physics, control theory and materials science.

• Rigorous principles of systems design and development will enable and guide the discovery processes of the team to produce synergistic and goal-oriented innovations.

• The Johns Hopkins University will draw upon its unparalleled capacity for transdisciplinary research between engineering and medicine, complex systems development, and patient-centered clinical care to ensure success in this revolutionary mission.

Vision:
The Hopkins Heart Initiative will:

• Lead the team through an inclusive approach that draws from a spectrum of expertise in clinical, biological and engineering sciences.

• Systematically enable an inspired, radical discovery process.

• Unify the efforts of the diverse research participants by instilling a patient-centered mindset.

• Promote transdisciplinary collaboration by leveraging the Johns Hopkins tradition of excellence, integrity, respect and collegiality.

• Educate and engage the next generation of scientists and engineers in this medical and technological endeavor.

This is a 10-year program to develop a replacement organ to treat heart failure. The team was organized in April 2013, and a $100 million development campaign is underway.

The first Hopkins Heart Symposium was held on Feb. 8, 2014, featuring William DeVries as the keynote speaker.
Active Thoracic Surgery
Clinical and Translational Research Programs

2017

1. Investigational Optical Imaging of Gastrointestinal Tissue
2. International Trial to Evaluate the Safety and Effectiveness of Portable Organ Care System (OCS™) Lung System for Recruiting, Preserving and Assessing Expanded Criteria Donor Lungs for Transplantation (EXPAND II Trial)
3. Immunogenetic Determinates of Primary Graft Dysfunction in Lung Transplantation
4. Adjuvant Therapy for Positive Nodes after Induction Therapy and Resection of Esophageal Cancer
5. Tumor Collection for Establishment of Primary Lung Cancer Xenografts
6. Surgical Skills Training for Preclinical Medical Students
7. The Effect Correlation of Atmospheric Conditions on Spontaneous Pneumothorax Rates
8. MiraDry Treatment for Secondary Psychopathology in Focal Axillary Hyperhidrosis
9. Lung Cancer Database
10. Esophageal Cancer Database
11. Early Detection and Predicting Recurrence in Non-Small Cell Lung Cancer
12. Screening for Lung Cancer in the HIV Patient
13. Psychosocial Characterization and Surgical Treatment For Primary Hyperhidrosis

National Trials

1. Resectable small cell ca (proposed ACOSOG)
2. Geriatrics database (proposed ACOSOG/ECOG)
3. ACOSOG Sublobar resection with brachytherapy
4. ACOSOG RFA for lung tumors
5. Adjuvant epigenetic therapy in early non-small lung cancer (SPORE/Stand Up 2 Cancer)
6. Validation of epigenetic biomarkers of lung cancer recurrence (ACOSOG correlative study to Z0040, CALGB)
7. Testing epigenetic biomarkers of chemosensitivity in esophageal cancer (ACOSOG correlative study to Z4051)

International Trials

1. Validation of epigenetic biomarkers of lung cancer recurrence in Israel (FAMRI Israel-New York-Hopkins Collaborative)
2. Validation of epigenetic biomarkers of esophageal cancer recurrence in Japan
Department of Surgery Research Facilities

The Cardiac Surgery Research Laboratory is located in the Children’s Medical and Surgical Center at The Johns Hopkins Hospital on the East Baltimore campus in Maryland. The lab consists of two surgical suites—one for sterile, chronic procedures, and another for acute studies. The labs are equipped to do cardiopulmonary bypass procedures with continuous intensive care monitoring and data collection. The labs provide regularly scheduled wet labs for hands-on teaching for direct faculty members and resident.

Johns Hopkins’ Department of Surgery has opened a training laboratory for today’s surgeons to learn and perfect the minimally invasive techniques of tomorrow.
The Cardiac Surgery Skills Laboratory

The Cardiac Surgical Skills Laboratory was established in 2009 under the direction of our former chief of cardiac surgery, William Baumgartner, for the purpose of skills training for incoming and current cardiothoracic residents. It is adjacent to the Cardiac Surgery Research Laboratory. The lab incorporates state-of-the-art surgical models by the Chamberlain Group Inc., as well as porcine hearts and vein grafts for training on coronary artery anastomoses and aortic and venous cannulation. What is truly unique about the lab is Baumgartner, who generously dedicates time to training residents in the lab, giving trainees access to a master cardiac surgeon for instruction on basic and essential cardiac surgical techniques in a low-stress environment.

Skills taught with the Chamberlain models and porcine hearts include:
- Cardiac anatomy and anomalies
- Aortic and venous cannulation
- Coronary anastomosis
- Aortic valve replacement
- Mitral valve repair/replacement

CABG Heart
Realistic, soft, four-chambered, and highly detailed internal and exterior model with suturable native coronary sites for CABG training

Aortic Root Trainer
Detailed aortic root with valve plane and aortic sinuses reinforced for valve implantation training
Minimally Invasive Surgical Training Center

Known as the Johns Hopkins/United States Surgical Minimally Invasive Surgical Training Center, the facility features two laboratory training areas with a total of nine operating tables, a state-of-the-art conference room with seating for 35, locker rooms and office space. Robotic surgery may be performed in either suite. Faculty members and trainers standing at the conference room’s podium can view and discuss operations conducted in the next room. Telemedicine capabilities will allow lectures to be broadcast anywhere in the world and permit physicians to direct operations in distant locations.

The center was launched Feb. 6, 2002, with $3.5 million in funding from U.S. surgical and equipment donations from Stryker Communications and Steris Corp. It offers specialists at Johns Hopkins and elsewhere a place to practice minimally invasive surgeries on animate and inanimate models and mannequins. It also provides a venue for surgical and medical device companies to test new instruments.

Minimally Invasive Surgical Training Center Laboratory

The Minimally Invasive Surgical Training Center serves as a home base for continuing medical education courses for Johns Hopkins residents and faculty members.

The center occupies renovated space most famously inhabited in the 1940s by the late Johns Hopkins surgeon-in-chief, Alfred Blalock. Blalock spent hundreds of hours there, rehearsing the operation that was the first to successfully repair the hearts of “blue babies,” so named because their congenital heart defects left them blue from lack of oxygen.
Baltimore History

The Johns Hopkins Hospital is located in historical Baltimore, Maryland. Baltimore was settled in 1661. By 1729, the town was founded and named for the barons Baltimore, the British founders of the Maryland Colony. During the Revolutionary War, the Continental Congress met in Baltimore in 1777 while the British occupied Philadelphia. A significant battle in the War of 1812 was fought at Fort McHenry. Despite heavy shelling, the fort held, and the British evacuated the port. This inspired Francis Scott Key to write the "Star-Spangled Banner," later to become the national anthem. In 1827, the B&O (Baltimore and Ohio) Railroad became America’s first railroad. The city was occupied by Union troops during the Civil War. A large fire in 1904 destroyed much of the downtown section. There was much industrial growth during the first half of the 20th century. During the second half of the 20th century, urban development led to revitalizing the downtown and Inner Harbor areas. Harbor East, 12 square blocks of harbor-side restaurants, hotels, and boutiques is the new and evolving Baltimore neighborhood that is described as “redefining city life and expanding the notion of the urban experience”. Baltimore’s economy is also dependent on research and development, especially in the areas of aquaculture, pharmaceuticals, medical supplies and services. There are numerous federal research laboratories in the area.
Baltimore

Located in northern Maryland, this city is the major urban area in Maryland and its largest city. It is located less than 50 miles from Washington, D.C. It is also 100 miles from Philadelphia and 200 miles from New York City. The city's size is 81 square miles, and according to the last confirmed census number, the population in 2015 was 621,849 people. It is the 21st largest city in the U.S.A. The metro area is much larger as it includes nearby Washington, D.C. It is serviced by three major airports—Baltimore Washington/International Thurgood Marshall Airport, Dulles International Airport and Reagan National Airport. The major routes that go through Baltimore include I-70, I-83 and I-95.
Living in Baltimore

Baltimore is also fondly referred to as the Clipper City and Charm City. It is renowned for its soft-shell crabs. It is divided into numerous sections around the Inner Harbor. These include Federal Hill, Fell’s Point, Little Italy and Canton. All areas have restaurants and various nightlife activities. The city has over 4,000 acres dedicated to parks. There are many universities in the area. Museums include the Baltimore Museum of Art, the National Aquarium, the B&O Railroad Museum, the Baltimore Museum of Industry and the Maryland Science Center.

Baltimore Sports and Recreation

Baltimore is the perfect place for a sports fan. From world-champion professional players to top-notch college teams, Baltimore has an assortment of legends and teams to learn about, root for and watch. Take in an exciting game at one of the area’s leading universities; visit one of the incredible, state-of-the-art stadiums; or learn about hometown favorites, like Cal Ripkin, Babe Ruth and Johnny Unitas.

And for those interested in more than a spectatorship, you can golf, climb, jog, walk, skate and, of course, sail your way through Baltimore. Discover traditions such as jousting (Maryland’s official state sport) or duckpin bowling. Spring, summer, fall or winter, there is always a season for fun in Baltimore.

Baltimore Weather

Much like the rest of the mid-Atlantic region, Baltimore weather enjoys all four seasons. Average temperatures in the spring and fall are a mild 50 to 60 degrees. In winter, temperatures aren’t known to drop much lower than 30 degrees, but occasional snow is usual in January and February. What seems like a “big” snowstorm hits once every few years. Baltimore summers tend to be hot and humid, with average temperatures in the 80s and 90s. Because of Baltimore’s proximity to the Chesapeake Bay, its weather can change frequently. The city receives 43 inches of rain per year. Baltimore offers a “continental climate” with a “maritime influence.”
Summary of the CARDIOTHORACIC SURGERY Residency Program

WE CARE

- Excellent operative experience
- Commitment to education and training
- Opportunities for elective rotation based on resident interest
- Mentoring and sponsorship from world-renowned faculty members
- Excellent exposure to perioperative and postoperative decision-making
- Excellent exposure to quality initiatives and outcomes assessments
- Collegial atmosphere
- Outstanding preparation for a successful academic career
- Excellent tradition in medical and surgical training
- Dedication to innovation and surgical excellence
Useful Websites

**Johns Hopkins Hospital**
**Department of Surgery**
http://www.hopkinsmedicine.org/surgery

**Johns Hopkins Hospital**
**Division of Cardiac Surgery**
http://www.hopkinsmedicine.org/heart_vascular_institute/clinical_services/divisions/cardiac_surgery.html

**Johns Hopkins Hospital**
**Heart and Vascular Institute**
http://www.hopkinsmedicine.org/heart_vascular_institute/

**Johns Hopkins Hospital**
**Division of Thoracic Surgery**
http://www.hopkinsmedicine.org/surgery/div/thoracic.html

**Johns Hopkins Hospital Comprehensive Transplant Center**
http://www.hopkinsmedicine.org/transplant

**Johns Hopkins Kimmel Cancer Center**
http://www.hopkinsmedicine.org/kimmel_cancer_center/

**Johns Hopkins Medicine**
http://www.hopkinsmedicine.org

**The Johns Hopkins Hospital**
http://www.hopkinsmedicine.org/the_johns_hopkins_hospital/index.html

**City of Baltimore**
http://www.baltimorecity.gov

Resources

We participate in the National Resident Matching Program:
http://www.nrmp.org

For more information on our residency program, please contact:
ctresidency@jhmi.edu

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