

Johns Hopkins University
School of Medicine

CARDIOTHORACIC SURGERY



2023 Residency Program

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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, and robotic 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 thoracoscopic surgery, robotics, lung reduction

Leadership



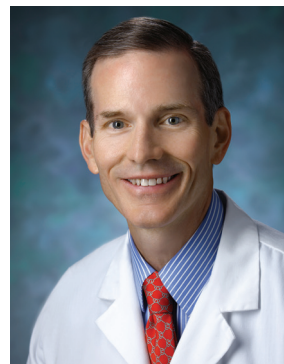
Andrew Cameron, M.D., Ph.D.
Director, Department of Surgery



James Gammie, M.D.
Cardiac Surgeon-in-Chief,
Johns Hopkins Health System
Co-director, Heart & Vascular Institute



Jennifer Lawton, M.D.
Chief, Cardiac Surgery



Richard Battafarano, M.D., Ph.D.
Chief, Thoracic Surgery



Ahmet Kilic, M.D.
Program Director,
Cardiothoracic Surgery Residency



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:

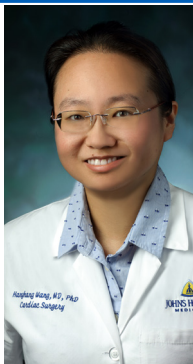
- Surgical excellence
- Integrity
- Innovation and discovery
- Respect for the individual
- Fostering of leadership through education and research

Cardiothoracic Surgery Fellows

Year 3



Byron Tompkins, M.D.

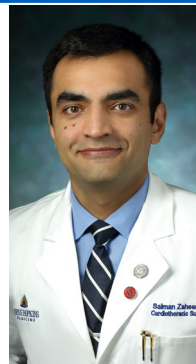


Hanghang Wang, M.D., Ph.D.

Year 2

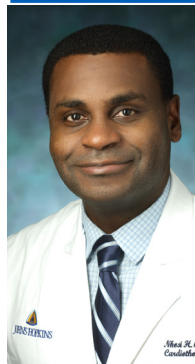


Thaniyyah Ahmad, M.D.



Salman Zaheer, M.D.

Year 1

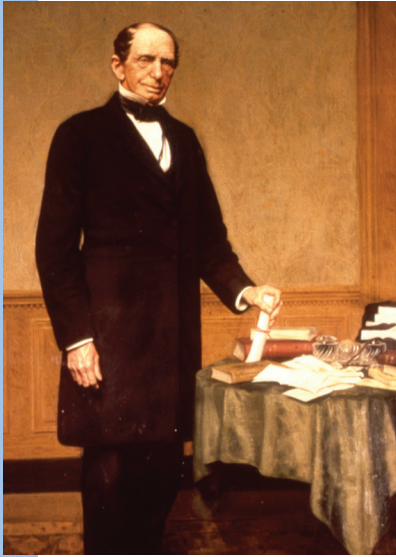


Nkosi Alvarez, M.D.



Deven Patel, M.D.

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 #4 and the Cardiology and Cardiac Surgery program was ranked #16 in the nation on the 2021-22 *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.



Letter of Johns Hopkins to the Trustees

Baltimore, March 10, 1873

To: Francis T. King, President, and John W. Garrett, Hon. George W. Dobbin, Galloway Cheston, Thomas M. Smith, William Hopkins, Richard M. Janney, Joseph Merrefield, Francis White, Lewis N. Hopkins, Alan P. Smith, and Charles J. M. Gwinn, Trustees of "The Johns Hopkins Hospital."

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

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.

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 diligent 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 compensation 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 charity, 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 railings, 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 judgment 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

Johns Hopkins Medicine

The training experience includes opportunities for rotation at the following locations.



▲ East Baltimore Medical Campus



▲ The Johns Hopkins Hospital



▲ Sidney Kimmel Comprehensive Cancer Center, Weinberg Pavilion



▲ Johns Hopkins Children's Center
Baltimore, Maryland



▼ Suburban Hospital
Bethesda, Maryland

CARDIOTHORACIC SURGERY

Residency Program

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, TAVR 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 structural heart service. 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 congenital or thoracic surgery will have an opportunity to spend time on the respective 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

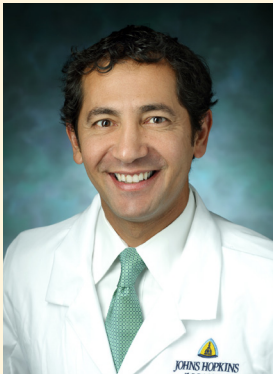
On behalf of the Johns Hopkins Cardiothoracic Surgery Residency Program, I want to welcome you to Baltimore (virtually) during this very exciting time in your personal journey. The Johns Hopkins Hospital has played a central role in the development and advancements in the treatment of cardiovascular and thoracic disease both in adults and children. From Dr. Alfred Blalock's extraordinary work in the 1940s and 50s to the first implantation of a defibrillator device to medical illustration, the cardiovascular and thoracic surgery programs have achieved remarkable groundbreaking accomplishments in numerous areas. The cornerstone of these accomplishments has been and remains the cardiothoracic surgery residency program. Although it is part of our tripartite mission: outstanding patient care, innovative research and exceptional education – it is the crown jewel of our program.

As the program director for the cardiothoracic surgery residency, it gives me great pride to introduce you to our world renowned institution and training program. We have no shortage of surgical faculty who not only excel in the clinical and research arenas but that have a true passion for surgical education. As we continue to honor Hopkins' illustrious past, we will continue to push the frontiers and limits for the future. I invite you to learn as much as you can about our institution and program over the upcoming days and feel free to ask any questions. We welcome feedback and your thoughts on how to make the Johns Hopkins Cardiothoracic Surgery Program the best in the country.

Welcome again, and thank you for joining us.

Ahmet Kilic, M.D.

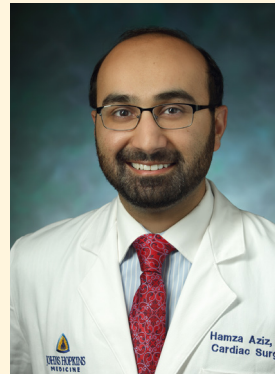
Surgical Director, Heart Transplantation and Mechanical Circulatory Support
Program Director



Ahmet Kilic, M.D.
Program Director



Stephen Broderick, M.D.
Associate Program
Director



Hamza Aziz, M.D.
Associate Program
Director

Cardiothoracic Surgery Residency Program

Three-Year Program

- Year 1:** Congenital cardiac surgery
Thoracic surgery
Adult cardiac surgery, TAVR
- Year 2:** VETT: VAD/ECMO/Transplant/TVT
Thoracic surgery chief resident
- Year 3:** Adult cardiac surgery chief resident

- **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/TAVR)**

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, 4–5 p.m., Pediatric Case Conference
- 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
 - 7:15–8:00 p.m.: Case Conference Multidisciplinary Discussion Next Week's Cases
- Monday, Wednesday, Thursday (mornings) and Friday, General Thoracic Surgery Outpatient Clinic

Monthly/Quarterly/Biannual

Cardiac Service Line Meeting Monday, 6:30 a.m. (monthly)
Monthly Pediatric Cardiac Morbidity and Mortality Conference
Monthly Cardiothoracic Journal Club
Quarterly: Combined Morbidity and Mortality Conference with Cardiac Anesthesia
Quarterly: Combined Morbidity and Mortality Conference with Cardiology
Biannual: 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 Lecture Series—Cardiac Surgery
Pediatric Cardiac Surgery Guest Lecture Series
Dana and Albert “Cubby” Broccoli Lecture in Aortic Diseases
The Levi Watkins, Jr. M.D. Memorial Lectureship--Department of Surgery
Cardiac Special Lecture--Cardiac Surgery

Research

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

Mentoring

- Program/Associate Program Directors
- Assigned Faculty Mentor

Vacation/Meeting Time Off

Year 1

2 weeks for vacation
1 national meeting

Year 2

2 weeks for vacation
1 national meeting

Year 3

2 weeks for vacation/
employment search
1 national meeting

Optional prep course for American Board of Thoracic Surgery examination

Maternity or paternity leave as needed

Chief Resident Operative Experience

Calendar Year 2022

	Total		Total
Congenital Heart			
Congenital Heart Disease Assistant	14	Minor Procedures	
Congenital Heart Disease Primary Surgeon	15	Bronchoscopy - Simple	41
Adult Cardiac Experience			
Acquired Valvular Heart Disease	81	Bronchoscopy - Complex	10
Myocardial Revascularization	155	Total Bronchoscopy	51
Re Do Stenotomy	14	UGI - Endoscopy - Simple	34
Interventional Skills or Procedures	66	UGI - Endoscopy - Complex	11
Conduit Dissection and Preperation	6	Total UGI - Endoscopy	45
Aortic Procedures	16	Mediastinal Assessment	0
Arrhythmia Surgery	13	Mediastinal Assessment - Mediastinoscopy	10
Cardiopulmonary Bypass set up and pump run	5	Mediastinal Assessment - EBUS/FNA	5
Circulatory Assist/Cardiac Transplant	45	Mediastinal Assessment - Chamberlain or	
Adult General Thoracic			
Lung - Major Anatomic Resections	84	Mediastinal Node Dissection	21
Lung - Major VATS/Roboti Anatomic Resections	52	Total Mediastinal Assessment	36
Lung Biopsy/Wedge Resection	43	Other Experience	
Total Lung	127	Consultation Experience - New Patient	55
Pleura - Major	17	Consultation Experience - Follow-Up Patients	28
Pleura - Minor	14	Total Consultation Experience	83
Total Pleura	38	Multidisciplinary Patient Management Conference	23
Chest Wall and Diaphragm	29	Thoracic Critical Care Case Management	20
Mediastinum	19	Cardiac and Congenital Critical Care Case Management	20
Tracheobronchial - Airway Surgery	5	Total Critical Care Case Management	40
Esophagus - Esophagectomy	33	Simulation	23
Esophagus - Benign Major	16		
Total Esophagus	49		

Graduated Residents from 1965–2021

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

Specialty Areas

Cardiovascular Surgery

- Surgery for Marfan syndrome and Loeys-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

2022	Dr. Bartley P. Griffith	35th Annual Alfred Blalock Lecture
2021	Dr. Danielle Gottlieb Sen	The Next Curve: A Tale of Innovation
2020	Dr. Bret Mettler	Congenital Heart Surgery: Honoring our Legacy, Building our Future
2019	Professor Sir Magdi Yacoub	Cyanotic Heart Disease, An Evolutionary Tale
2018	Dr. David Fullerton	Is Aortic Stenosis a Curable Disease
2017	Dr. Tirone David	Creativity in Surgery
2016	Sir Bruce Keogh	Medical Care for All: Lessons Learned from the NHS
2015	Dr. Martin Elliott	Managing Tracheal Stenosis in Children: From Repair to Replacement
2014	Dr. Hartzell Schaff	New Developments in Surgical Management of Hypertrophic Cardiomyopathy
2013	Dr. Bruce Lytle	How Coronary Artery Bypass Surgery Created the Modern World
2012	Dr. Joseph Coselli	Thoracoabdominal Aortic Aneurysm Repair—The Mentor’s Imprint
2011	Dr. Edward L. Bove	Innovation and Regulation—Can They Both Exist in Today’s Medical Environment?
2010	Dr. Craig R. Smith	Transcatheter Valve Implantation
2009	Dr. Randolph Chitwood, Jr.	Innovation in Surgery: Johns Hopkins, Duke and ECU
2008	Dr. D. Craig Miller	Valve-Sparing Aortic Root Replacement—Where Are We Heading and What about BAV and the Arch?
2007	Dr. Frederick A. Crawford	Does Cardiac Surgery Have a Future?
2006	Dr. Irving Kron	Surgery for Heart Failure
2005	Dr. Robert A. Guyton	Evidence-based Surgery: The Case for Coronary Artery Bypass
2004	Dr. Bruce A. Reitz	Continuing Progress in Heart and Lung Transplantation
2003	Dr. Timothy J. Gardner	The Evolution of Cardiac Surgery: What Would Dr. Blalock Do?
2002	Dr. Donald B. Doty	Explorers, Pioneers and the American Dream
2001	Dr. Randall B. Griepp	Surgery of the Aortic Arch
2000	Dr. Gordon F. Murray	OPCAB “The Beat Goes On”
1999	Dr. Alden H. Harken	Anyone Can Treat Cardiac Arrhythmias
1998	Dr. Mark B. Orringer	Evolution, Refinements and Experience with Transhiatal Esophagectomy
1997	Dr. Ronald C. Elkins	Congenital Aortic Valve Disease-Evolution of Surgical Management
1996	Dr. James L. Cox	Surgery for Atrial Fibrillation
1995	Dr. Frank C. Spencer	Experiences in 600 Patients with Reconstruction of the Mitral Valve for Mitral Insufficiency
1988	Dr. Aldo R. Castaneda	Early Surgical Correction of Congenital, Heart Defects a Therapeutic Leitmotif
1987	Dr. Denton A. Cooley	Thoracic Aortic Aneurysms: From Hopkins to Houston
1986	Dr. John W. Kirklin	The Movement of Cardiac Surgery Towards the Very Young
1985	Dr. David C. Sabiston, Jr.	The Diagnosis and Surgical Management of Chronic Pulmonary Embolism
1984	Dr. Dwight C. McGoon	The Dimensions of Cardiac Surgery
1983	Dr. Norman E. Shumway	Heart and Lung Transplantation
1982	Dr. Mark M. Ravitch	Progress in the Resection of Chest Wall Tumors and Some Reminiscences of Dr. Blalock

Evelyn Grollman-Glick Thoracic Surgery Lecture

2022	Dr. Yolanda L. Colson	“Well, Well, Well ... Here We Are!”
2019	David R. Jones, M.D.	Moving Beyond TNM: Can Tumor Genomics Help Predict Recurrence Following Complete Resection of Lung Adenocarcinoma?
2018	Dr. Edward Verrier	The Elite Athlete: The Master Surgeon
2017	Dr. Douglas E. Wood	Lung Cancer Screening Guidelines, Policy Development and Access
2016	Dr. Thomas A. D’Amico	Thorascopic Lobectomy: Now and Beyond the First 20 Years
2015	Dr. Joseph Zwischenberger	Innovation Is Never Evidence Based
2014	Dr. Gail Darling	Esophageal Cancer: Evolution in Care
2013	Dr. James Luketich	Evolution of Minimally Invasive Esophagectomy
2012	Dr. Claude Deschamps	Esophagectomy: A Score Card
2011	Dr. Richard Feins	Deliberate Practice to Surgical Practice—The Training of the Elite Surgeon
2010	Dr. Mark Orringer	Transhiatal Esophagectomy—The Hopkins Connection
2009	Dr. Harold Urschel	Capricious Vagaries of Thoracic Outlet Syndrome
2008	Dr. Alex Patterson	Current Strategies in Lung Transplantation
2007	Dr. Harvey Pass	Mesothelioma: New Ideas to Combat a Controversial Killer
2006	Dr. Valerie Rusch	Evolving Management of Early-Stage Lung Cancers in the Era of Molecular Medicine
2005	Dr. Joe B. Putnam	An Academic Model for the 21st Century
2004	Dr. Jack Roth	Targeting Thoracic Cancers

Pediatric Cardiac Surgery Guest Lecture

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

Susan and Milton Miller Lecture

2022	Dr. Marshall Jacobs	Personal Commitment to Innovation and Improvement in Pediatric and Congenital Heart Surgery: Lessons I've Learned from a Friend
2021	Dr. James Gammie	Innovations in Cardiac Surgery
2020	Dr. Timothy R. Graham	500 Years of Surgery And A Persistent Problem "Let's Remove It"
2019	Dr. Marc L. Schermerhorn	Two Decades of EVAR: Lessons Learned From Medicare
2018	Dr. Todd K. Rosengart	Initiating Academic Productivity: Push and Pull
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

2022	Dr. Awori Hayanga	Challenging the Status Quo
2021	Dr. Allen Kachalia	Transparency at Hopkins
2019	Dr. Rakesh C. Arora	Resuscitation After Cardiac Surgery—The Rules Have Changed
2018	Dr. Mary Beth Brady and Dr. Rani K. Hasan	Transcatheter Aortic Valve Replacement Transforming Teams to Transform Treatment
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

2021	Dr. Ahmet Kilic	A Change of Heart: The Surgeons' Perspective of Heart Failure
2020	Dr. Charles Lowenstein	Cardiovascular Complications of COVID-19: Clots, Clues, Cures
2019	Dr. Ralph J. Damiano Jr.	Surgical Treatment of Atrial Fibrillation: Current State of the Art
2018	Dr. Kenton J. Zehr	What Can a Global Positioning System Tell Us About Permanent Atrial Fibrillation? What Does it Mean for Cardiac Surgery?
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

2022	Dr. Ed Chen	Professional Growth, Leadership and the Pursuit of Excellence in Academic/Aortic Surgery
2021	Dr. Tom Gleason	Bicuspid Aortic Valve-associated Aortopathy: Insights from the Clinic to the Laboratory Back
2020	Dr. Elena MacFarlane	Mechanistic Basis for Regional Predisposition to Aneurysm
2019	Dr. Thoralf M. Sundt, III	The fault, dear Brutus, is not in our stars, But in ourselves: Randomized trials in cardiac surgery
2018	Dr. Scott Le Maire	Are We Causing Aortic Catastrophes with Antibiotics?
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

2022	Dr. Alejandro Garcia	Surgical Excellence: Making the Case for Diversity
2021	Dr. Fabian Johnston	When We Rise: A Brief History of the Black Surgeon in America
2020	Dr. Robert Higgins	Deja Vu: Reflections on a Legacy of Diversity and Inclusion
2019	Dr. Robert Higgins	Paving It Forward & Giving It Back
2018	Dr. George C. Hill	Masters of Surgical Techniques: Levi Watkins, Jr. MD and Vivien Thomas Their Distinguished Journeys of Service
2017	Dr. Selwyn M. Vickers	The 3rd Annual Levi Watkins, Jr, MD Memorial Lectureship “Levi Watkins A Life Committed to Facing Challenges: Lessons for us Today.”
2016	Dr. Levi Watkins	The 2nd Annual Levi Watkins Jr, MD Memorial Lectureship “Surgeon Innovator, Agent of Change, Statesman, Colleague, and Friend.”
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.”

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.
- Karen Velez, M.D.
- Eric Etchill, M.D.
- Kathleen Clement, 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 Shake, 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.
- Charles Fraser, M.D.
- Cecillia Lui, M.D.
- Katherine Giuliano, M.D.
- Hannah Rando, M.D.

The Martin and Vera Kohn Fellow in Cardiac Surgery

Established through gifts from Mrs. Kohn and her estate, in gratitude for the lifelong care Mr. Kohn received at Johns Hopkins.

- Karen Velez, M.D.
- Xun Zhou, M.D.
- Matthew Acton, M.D.

The Joyce Koons Family Research Fellow

Established by Joyce Koons and family in 2005 to support research in the Division of Cardiac Surgery in perpetuity.

- Alejandro Suarez Pierre, M.D.

Johns Hopkins University School of Medicine Department of Surgery

Andrew Cameron, M.D., Ph.D.

Chief, Department of Surgery

Division of Cardiac Surgery		Division of Thoracic Surgery		
<p>James Gammie, M.D., Co-Director, Heart and Vascular Institute Cardiac Surgeon-in-Chief, Johns Hopkins Health System</p> <p>Jennifer Lawton, M.D. Chief, Cardiac Surgery</p>		<p>Richard Battafarano, M.D., Ph.D. Chief, Thoracic Surgery</p>		
Cardiac Surgeons	CV Surgical ICU	Cardiothoracic Surgery Residency Program Leadership		
Hamza Aziz, M.D. Cardiac Surgeon	Glenn Whitman, M.D. Director, CVSICU	Ahmet Kilic, M.D. Program Director, Cardiothoracic Surgery Residency		
Fayyaz Hashmi, M.D. Cardiac Surgeon	Marc Sussman, M.D. CVSICU Fellowship Director	Stephen Broderick, M.D. Associate Program Director	Hamza Aziz, M.D. Associate Program Director	
Ahmet Kilic, M.D. Director, Adult Heart Transplantation	Additional Faculty	Thoracic Surgeons		
Thomas Matthew, M.D. Director, Johns Hopkins Cardiothoracic Surgery at Suburban Hospital	William Baumgartner, M.D. Professor Emeritus	Malcolm Brock, M.D. Director, Thoracic Research Lab	Stephen Broderick, M.D. Thoracic Surgeon	Errol Bush, M.D. Surgical Director, Advanced Lung Disease and Lung Transplant Program
Michael Robich, M.D. Surgical Director of Structural Heart Disease	Peter Greene, M.D. Chief Medical Information Officer	Jinny Ha, M.D. Thoracic Surgeon	Stephen Yang, M.D. Thoracic Surgeon Director, Thoracic Oncology	
	Marshall Jacobs, M.D. Director, Pediatric Outcomes Research			
Congenital Heart Surgeons				
Bret Mettler, M.D. Director, Pediatric Cardiac Surgery				
Danielle Gottlieb Sen, M.D. Director, Pediatric Cardiac Surgery Research				
Adjunct Faculty	Joint Appointment Faculty			
Nevin Katz, M.D.	Niv Ad, M.D.	Sung-Min Cho, D.O. Research Director, Adult ECMO	Michael Grant, M.D. Medical Director, Cardiovascular Surgical ICU	Bo Kim, M.D. Medical Director, ECMO
		Thomas Metkus Jr, M.D. Cardiologist		

CARDIOTHORACIC SURGERY

Faculty



Hamza Aziz, M.D.

Assistant Professor of Surgery

Background

- Duke University (B.A. 2004)
- Duke University Graduate School (M.D. 2010)
- Intern, General Surgery, Duke University Medical Center / Internship – General Surgery (2010-2011)
- Daland Research Fellow, Institute Genetic Medicine, JHMI; Mentor: Dr. Hal Dietz (2012-2013)
- APS Fellow, Institute Genetic Medicine, JHMI; Mentor: Dr. Hal Dietz (2013-2014)
- Duke University Medical Center / Resident – General Surgery (2012-2016)
- Chief Resident, General Surgery, Duke University Medical Center / Chief Resident – General Surgery (2016-2017)
- Duke University School of Medicine / Residency - General Surgery (2017)
- Johns Hopkins University School of Medicine / Fellowship - Cardiac Surgery (2020)
- Johns Hopkins Division of Cardiac Surgery (2020 – present)

Clinical Interests

- General cardiac surgery
- Heart bypass operations
- Repair of aneurysmal aortic dilation
- Valve repair or replacements
- Transcatheter aortic valve replacement (TAVR)

Research Interests

- Genetic causes of abnormal valve development and aortic aneurysm formation

BIOSKETCH: Hamza Aziz, M.D.

Hamza Aziz is a cardiac surgeon within the Division of Cardiac Surgery and an assistant professor within the Johns Hopkins University School of Medicine. His clinical expertise includes general cardiac surgery and transcatheter aortic valve replacement (TAVR). Aziz earned his medical degree from Duke University School of Medicine, where he also completed a general surgery residency and served as the chief resident from 2016-2017. He completed a cardiothoracic surgery fellowship at The Johns Hopkins Hospital 2017-2020.

Selected Publications: Hamza Aziz, M.D.

Original Research [OR]

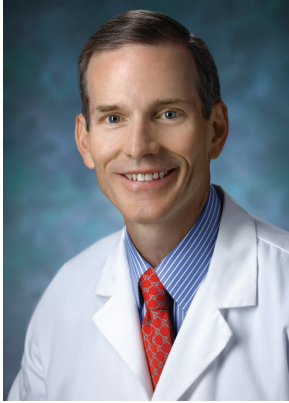
1. Cowen, L. E., S. D. Singh, J. R. Kohler, C. Collins, A. K. Zaas, W. A. Schell, H. Aziz, E. Mylonakis, J. R. Perfect, L. Whitesell and S. Lindquist. "Harnessing Hsp90 Function as a Powerful, Broadly Effective Therapeutic Strategy for Fungal Infectious Disease." *Proc Natl Acad Sci U S A* 106, no. 8 (2009): 2818-23.
2. Zaas, A. K.*, H. Aziz*, J. Lucas, J. R. Perfect and G. S. Ginsburg. "Blood Gene Expression Signatures Predict Invasive Candidiasis." *Sci Transl Med* 2, no. 21 (2010): 21ra17. *co-first authors
3. Habashi, J. P., J. J. Doyle, T. M. Holm, H. Aziz, F. Schoenhoff, D. Bedja, Y. Chen, A. N. Modiri, D. P. Judge and H. C. Dietz. "Angiotensin II Type 2 Receptor Signaling Attenuates Aortic Aneurysm in Mice through Erk Antagonism." *Science* 332, no. 6027 (2011): 361-5.
4. Gould, R. A., R. Sinha, H. Aziz, R. Rouf, H. C. Dietz, 3rd, D. P. Judge and J. Butcher. "Multi-Scale Biomechanical Remodeling in Aging and Genetic Mutant Murine Mitral Valve Leaflets: Insights into Marfan Syndrome." *PLoS One* 7, no. 9 (2012): e44639.
5. Hanna, J. M., N. D. Andersen, H. Aziz, A. A. Shah, R. L. McCann and G. C. Hughes. "Results with Selective Preoperative Lumbar Drain Placement for Thoracic Endovascular Aortic Repair." *Ann Thorac Surg* 95, no. 6 (2013): 1968-74; discussion 1974-5.
6. Adam, M. A., L. M. Lee, J. Kim, M. Sheno, M. Mallipeddi, H. Aziz, S. Stinnett, Z. Sun, C. R. Mantyh and J. K. Thacker. "Alvimopan Provides Additional Improvement in Outcomes and Cost Savings in Enhanced Recovery Colorectal Surgery." *Ann Surg*, (2015).
7. Aziz, H., P. K. Marcom and E. S. Hwang. "Implications of Her2-Targeted Therapy on Extent of Surgery for Early-Stage Breast Cancer." *Ann Surg Oncol* 22, no. 5 (2015): 1404-5.
8. Jaquiss, R.D., Aziz, H. Is Four Stage Management the Future of Univentricular Hearts? Destination Therapy in the Young. *Semin Thorac Cardiovasc Surg Pediatr Card Surg* (2016).
9. Gould, R.A.*, Aziz, H.*, ... Dietz, HC. Robo4 variants predispose to bicuspid aortic valve and thoracic aortic aneurysm. *Nature Genetics* (2019). * co-first authors

Review Articles [RA]

1. Aziz, H., A. Zaas and G. S. Ginsburg. "Peripheral Blood Gene Expression Profiling for Cardiovascular Disease Assessment." *Genomic Med* 1, no. 3-4 (2007): 105-12.

Case Reports [CR]

1. Speicher, P. J., S. D. Bhattacharya, H. Aziz and K. M. Baerman. "Septic Thrombophlebitis of the Superior Mesenteric Vein: An Unusual Complication of Appendicitis." *Am Surg* 79, no. 1 (2013): E31-2.
2. Bennett, C. L., H. Aziz, E. Sparks, T. Shah, M. Yoder, G. MacCarrick and H. C. Dietz. "Massive Hemoptysis in Loey's-Dietz Syndrome." *Am J Med Genet A*, (2015).
3. Aziz, H, Scheri R, Baker J, Hwang ES (2015) Use of Radioactive Seed to Localize Axillary Lymph Node in Breast Cancer. *Surgery Curr Res* 5:236. doi: 10.4172/2161-1076.1000236



Richard J. Battafarano, M.D., Ph.D.

Associate Professor of Surgery
Chief of the Division of Thoracic Surgery

Background

- Hahnemann University School of Medicine (1988)
- University of Minnesota Hospital and Clinics General Surgery Residency (1989–1997)
- 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

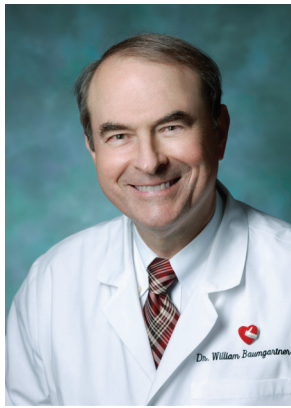
BIOSKETCH: Richard J. Battafarano, M.D., Ph.D.

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.

Dr. Battafarano conducts basic and translational research as it relates to lung and esophageal cancer and has written over 40 peer-reviewed articles and a number of invited commentaries and book chapters. He has a specific interest in developing and implementing tri-modality therapy protocols in the care of patients with thoracic malignancies that minimize peri-operative morbidity while optimizing oncologic outcomes.

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

- Shah SP, Xu T, Hooker CM, Hulbert A, **Battafarano RJ**, Brock MV, Mungo B, Molena D, Yang SC. Why are patients being readmitted after surgery for esophageal cancer? *J Thorac Cardiovasc Surg* 2015;149:1384-91.
- Mungo B, Molena D, Stem M, Yang SC, **Battafarano RJ**, Brock MV, Lidor AO. Does neoadjuvant therapy for esophageal cancer increase postoperative morbidity or mortality? *Dis Esophagus* 2015;28:644-51.
- Mungo B, Zogg CK, Hooker CM, Yang SC, **Battafarano RJ**, Brock MV, Molena D. Does obesity affect the outcomes of pulmonary resections for lung cancer? A National Surgical Quality Improvement Program analysis. *Surgery* 2015;157:792-800.
- Moore, JM, Hooker CM, Molena, D, Mungo, B, Brock, MV, **Battafarano, RJ**, Yang, SC. Complex Esophageal Reconstruction Procedures Have Acceptable Outcomes Compared With Routine Esophagectomy. *Ann Thorac Surg* 2016;102:215-22.
- Kim GJ, Koshy M, Hanlon AL, Horiba MN, Edelman MJ, Burrows WM, **Battafarano RJ**, Suntharalingam M. The Benefit of Chemotherapy in Esophageal Cancer Patients With Residual Disease After Trimodality Therapy. *Am J Clin Oncol* 2016;39:136-41.
- Mungo B, Hooker CM, Ho JS, Yang SC, **Battafarano RJ**, Brock MV, Molena D. Robotic Versus Thoracoscopic Resection for Lung Cancer: Early Results of a New Robotic Program. *J Laparoendosc Adv Surg Tech* 2016;26:243-8.
- Forde PM, Chaft JE, Smith KN, Anagnostou V, Cottrell TR, Hellman MD, Zahurak M, Yang SC, Jones Dr, Broderick S, **Battafarano RJ**, Velez MJ, Rekhtman N, Olah Z, Naidoo J, Marrone KA, Verde F, Guo H, Zhang J, Caushi JX, Chan HY, Sidhom JW, Scharpf RB, White J, Gabrielson E, Wang H, Rosner GL, Rusch V, Wolchok JD, Merghoub T, Taube JM, Veculescu VE, Topalian SL, Brahmer JR, Pardoll DM. Neoadjuvant PD-1 Blockade in Resectable Lung Cancer. *N Engl J Med* 2018; 378:1976-86.



William A. Baumgartner, M.D.

Professional Emeritus

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
- Physician Burnout (Joy in Medicine)

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 Distinguished Service Professor.

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 was the former 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. From 2011 to 2018, he was the 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 390 journal articles, book chapters and books. He is married to Betsy Baumgartner and has three accomplished children.

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

- Ono M, Brown C, Lee JK, Gottesman RF, Kraut M, Black J, Shah A, Cameron DE, **Baumgartner WA**, Hogue CW. Cerebral Blood Flow Autoregulation Is Preserved After Hypothermic Circulatory Arrest. *Ann Thorac Surg*. 2013;96(6):2045-53. PMID: 24446562
- Mishra MK, Beaty CA, Lesniak WG, Kambhampati SP, Zhang F, Wilson MA, Blue ME, Troncoso JC, Kannan S, Johnston MV, **Baumgartner WA**, Kannan RM. Dendrimer Brain Uptake and Targeted Therapy for Brain Injury in a Large Animal Model of Hypothermic Circulatory Arrest. *ACS Nano*. 2014 Feb 5. PMID: 24499315
- Haggerty KA, Beaty CA, George TJ, Arnaoutakis GJ, **Baumgartner WA**. Increased Exposure Improves Recruitment: Early Results of a Program Designed to Attract Medical Students Into Surgical Careers. *Ann Thorac Surg*. 2014 Apr 8. pii: S0003-4975(14) 00364-6. doi: 10.1016/j.athoracsur.2014.02.029. PMID: 24725839
- Blue ME, Wilson MA, Beaty CA, George TJ, Arnaoutakis GJ, Haggerty KA, Jones M, Brawn J, Manmohan S, Lange MS, Johnston MV, **Baumgartner WA**, Troncoso JC. Brain Injury in Canine Models of Cardiac Surgery. *J Neuropathol Exp Neurol*. 2014 Dec, Vol. 73 No. 12, pp 1134-1143.
- Baumgartner WA**. 50th Anniversary Perspective on Lower RR, Dong E, Shumway NE. Suppression of Rejection Crises in the Cardiac Homograft. *Ann Thorac Surg* 1965;1:645-9. *Ann Thorac Surg* 2015; 99:1497-8.
- Grimm JC, Magruder JT, Wilson MA, Blue ME, Crawford TC, Troncoso JC, Zhang F, Kannan S, Sciortino CM, Johnston MV, Kannan RM, **Baumgartner WA**. Nanotechnology Approaches to Targeting Inflammation and Excitotoxicity in a Canine Model of Hypothermic Circulatory Arrest-Induced Brain Injury. *Ann Thorac Surg*. 2016 May 3. pii: S0003-4975(16)00262-9. doi: 10.1016/j.athoracsur.2016.02.077. [Epub ahead of print] PMID:27154161. Key words: Nanotechnology, inflammation and excitotoxicity, canine model, hypothermic circulatory arrest brain injury.
- Kogon B, Karamlou T, **Baumgartner WA**, Merrill W, Backer C. Congenital cardiac surgery fellowship training: A status update. *J Thorac Cardiovasc Surg*. 2016 Jun;151(6):1488-95. doi: 10.1016/j.jtcvs.2016.02.039. Epub 2016 Feb 24. PMID: 27002229. Key words: congenital cardiac surgery fellowship training.
- Zhang F, Trent Magruder J, Lin YA, Crawford TC, Grimm JC, Sciortino CM, Wilson MA, Blue ME, Kannan S, Johnston MV, **Baumgartner WA**, Kannan RM. Generation-6 hydroxyl PAMAM dendrimers improve CNS penetration from intravenous administration in a large animal brain injury model. *Control Release*. 2017 Jan 27. pii: S0168-3659(16)30796-9. doi: 10.1016/j.conrel.2017.01.032. [Epub ahead of print] PMID: 28137632 [PubMed - as supplied by publisher]
- Berkowitz SA, Brown P, Brotman DJ, Deutschendorf A, Dunbar L, Everett A, Hickman D, Howell E, Purnell L, Sylvester C, Zollinger R, Bellantoni M, Durso SC, Lyketsos C, Rothman P; J-CHiP Program. Case Study: Johns Hopkins Community Health Partnership: A model for transformation. *Healthc (Amst)*. 2016 Dec;4(4):264-270. doi: 10.1016/j.hjdsi.2016.09.001. PMID: 27693204 [PubMed - in process] (William A. Baumgartner is one of 44 collaborators)
- Magruder JT, Fraser CD, Grimm JC, Crawford TC, Beaty CA, Suarez-Pierre A, Hayes RL, Johnston MV, **Baumgartner WA**. Correlating Oxygen Delivery During Cardiopulmonary Bypass With The Neurological Injury Biomarker Ubiquitin C-Terminal Hydrolase L1 (UCH-L1). *J Cardiothorac Vasc Anesth* 2018 Jun 11. pii: S1053-0770(18)30354-9. doi: 10.1053/j.jvca.2018.05.021. [Epub ahead of print] PMID: 29903683 [PubMed - as supplied by publisher]



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, General Surgery Residency (1991–1997)
- 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.

- Meguid RA, Hooker CM, Harris J, Xu L, 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.
- Brock MV**, Hooker CM, Engels EA, Moore RD, Gillison ML, Alberg AJ, Keruly JC, Yang SC, Heitmiller RF, Baylin SB, Herman JG, Brahmer JR. Delayed diagnosis and elevated mortality in an urban population with HIV and lung cancer: implications for patient care. *J Acquir Immune Defic Syndr*. 2006 Sept;43(1):47–55.
- Brock MV**, Hooker CM, Yung R, Guo M, Han Y, Ames SE, Chang D, Yang SC, Mason D, Sussman M, Baylin SB, Herman JG: Can we improve the cytologic examination of malignant pleural effusions using molecular analysis? *Ann Thorac Surg*. 2005 Oct;80(4):1241–7.
- Brock MV**, Hooker CM, Syphard JE, Westra W, Xu L, Alberg AJ, Mason D, Baylin SB, Herman JG, Yung RC, Brahmer J, Rudin CM, Ettinger DS, Yang SC: Surgical resection of limited disease small cell lung cancer in the new era of platinum chemotherapy: Its time has come. *J Thorac Cardiovasc Surg*. 2005 Jan;129(1):64–72.
- Guo M, Akiyama Y, House MG, Hooker CM, Heath E, Gabrielson E, Yang SC, Han Y, Baylin SB, Herman JG, **Brock MV**. Hypermethylation of the GATA genes in lung cancer. *Clin Cancer Res*. 2004 Dec 1;10(23):7917–24.
- Guo M, House MG, Hooker C, Han Y, Heath E, Gabrielson E, Yang SC, Baylin SB, Herman JG, **Brock MV**. Promoter hypermethylation of resected bronchial margins: a field defect of changes? *Clin Cancer Res*. 2004 Aug 1;10(15):5131–6.
- Brock MV**, Alberg AJ, Hooker CM, Kammer AL, Xu L, Roig CM, Yang SC. Risk of subsequent primary neoplasms developing in lung cancer patients with prior malignancies. *J Thorac Cardiovasc Surg*. 2004 Apr; 127(4):1119–25.
- Brock MV**, Kim MP, Hooker CM, Alberg AJ, Jordan MM, Roig CM, Xu L, Yang SC. Pulmonary resection in octogenarians with stage I nonsmall cell lung cancer: a 22-year experience. *Ann Thorac Surg*. 2004 Jan; 77(1):271–7.
- House MG, Guo M, Efron DT, Lillemoe KD, Cameron JL, Syphard JE, Hooker CM, Abraham SC, Montgomery EA, Herman JG, **Brock MV**. Tumor suppressor gene hypermethylation as a predictor of gastric stromal tumor behavior. *J Gastrointest Surg*. 2003 Dec;7(8):1004–14.
- Brock MV**, Gou M, Akiyama Y, Muller A, Wu TT, Montgomery E, Deasel M, Germonpre P, Rubinson L, Heitmiller RF, Yang SC, Forastiere AA, Baylin SB, Herman JG: Prognostic importance of promoter hypermethylation of multiple genes in esophageal adenocarcinoma. *Clin Cancer Res*. 2003 Aug 1; 9(8):2912–9.
-



Stephen Broderick, M.D., M.P.H.S.

Assistant Professor of Surgery
Associate Program Director

Background

- Duke University (B.S. 1999)
- Georgetown University School of Medicine (M.D. 2003)
- New York Presbyterian Hospital Weill Cornell Medical Center Internship/Residency (PGYI-II), General Surgery (2003–2004)
- Memorial Sloan Kettering Cancer Center, Thoracic Service Research Fellowship (2005–2007)
- New York-Presbyterian 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

- Lung Cancer
- Esophageal Cancer
- Benign Esophageal Conditions
- Paraesophageal Hernia
- Lung Cancer Screening
- Chest Wall Tumors
- Chest Wall Reconstruction

Research Interests

- Neoadjuvant applications of immunotherapy in thoracic oncology
- Lung Cancer Surgery Quality Assurance/Improvement
- Esophageal Cancer Surgery Quality Assurance/Improvement
- Improving Quality of Life
- Outcomes for patients with early stage lung cancer

BIOSKETCH: Stephen Broderick, M.D., M.P.H.S.

Stephen R. Broderick, M.D. M.P.H.S. is a thoracic surgeon and assistant professor of surgery at the Johns Hopkins University School of Medicine. In addition to his work at JHH he leads the thoracic surgery program in the Johns Hopkins National Capital Region.

Before joining Johns Hopkins, Dr. Broderick was a thoracic surgeon at St. Luke's Hospital and Washington University in St. Louis School of Medicine. His clinical expertise includes surgery for lung cancer, esophageal cancer and other thoracic malignancies as well as benign esophageal and 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.

Dr. Broderick received his medical degree from Georgetown University and completed his residency training in general surgery at New York Presbyterian Hospital – Weill Cornell Medical Center. During residency training he studied the molecular underpinnings of lung adenocarcinoma at Memorial Sloan Kettering Cancer Center. He then completed cardiothoracic fellowship training in the thoracic track at Washington University in St. Louis.

Dr. Broderick's research interests are focused on neoadjuvant applications of immunotherapy in thoracic oncology patients as well as quality assurance/improvement in thoracic surgical oncology.

Selected Publications: Stephen Broderick, M.D., M.P.H.S.

Forde PM, Chaft JE, Smith KN, Anagnostou V, Cottrell TR, Hellmann MD, Zahurak M, Yang SC, Jones DR, **Broderick S**, Battafarano RJ, Velez MJ, Rekhtman N, Olah Z, Naidoo J, Marrone KA, Verde F, Guo H, Zhang J, Caushi JX, Chan HY, Sidhom JW, Scharpf RB, White J, Gabrielson E, Wang H, Rosner GL, Rusch V, Wolchok JD, Merghoub T, Taube JM, Velculescu VE, Topalian SL, Brahmer JR, Pardoll DM. Neoadjuvant PD-1 blockade in resectable lung cancer. *N Engl J Med* 2018; 378(21):1976-1986.

Bott MJ, Yang SC, Park BJ, Adusumilli PS, Rusch VW, Isbell JM, Downey RJ, Brahmer JR, Battafarano R, Bush E, Chaft J, Forde PM, Jones DR, **Broderick SR**. Initial results of pulmonary resection after neoadjuvant nivolumab in patients with resectable non-small cell lung cancer. *J Thorac Cardiovasc Surg* 2019; 158(1):269-276.

Broderick SR, Bott M. Invited Expert Opinion - Neoadjuvant immunotherapy in patients with resectable non-small cell lung cancer. *J Thorac Cardiovasc Surg* 2019;158(5):1471-74.

Broderick SR, Grau-Sepulveda M, Kosinski A, Kurlansky P, Shahian D, Jacobs J, Becker S, DeCamp M, Seder C, Brown LM, Burfiend W, Magee M, Grogan E, Raymond D, Puri V, Chang A, Kozower B. The Society of Thoracic Surgeons composite score rating for pulmonary resection for lung cancer. *Ann Thor Surg* 2019; [Epub ahead of print].

Semenkovich TR, Subramanian M, Yan Y, Hofstetter WL, Correa AM, Cassivi SD, Inra ML, Stiles BM, Altorki NK, Chang AC, Brescia AA, Darling GE, Allison F, Broderick SR, Etchill EW, Fernandez FG, Chihara RK, Litle VR, Monoz-Largacha JA, Kozower BD, Puri V, Meyers BF. Adjuvant therapy for node positive esophageal cancer after induction and surgery: A multisite study. *Ann Thorac Surg* 2019; 108(3):828-836. Brescia AA, **Broderick SR**, Crabtree TD, Puri V, Musick JF, Bell JM, Kreisel D, Krupnick AS, Patterson GA, Meyers BF. Adjuvant therapy for positive nodes after induction therapy and resection of esophageal cancer. *Ann Thor Surg* 2016;100(1):200–210

Broderick SR, Patel AP, Crabtree TD, Bell JM, Morgansztern D, Robinson CG, Kreisel D, Krupnick AS, Patterson GA, Meyers BF, Puri V. Pneumonectomy for clinical stage IIIA non-small cell lung cancer: the effect of neoadjuvant therapy. *Ann Thor Surg* 2016; 101(2):451–8 Puri V, Patel AP, Crabtree TD, Bell JM, **Broderick SR**, Kreisel D, Krupnick AS, Patterson GA, Meyers BF. Unexpected readmission after lung cancer surgery: a benign event? *J Thorac Cardiovasc Surg.* 2015; 150(6):1496- 1505

Samson P, Robinson CG, Bradley J, Lee A, **Broderick S**, Kreisel D, Krupnick AS, Patterson GA, Puri V, Meyers BF, Crabtree T. The national surgical quality improvement program risk calculator does not adequately stratify risk for patients with clinical stage I non-small cell lung cancer. *J Thorac Cardiovasc Surg* 2015; (epub ahead of print).

Puri V, Crabtree T, Bell JM, **Broderick SR**, Morgansztern D, Colditz GA, Kreisel D, Krupnick AS, Patterson GA, Meyers BF, Patel A, Robinson CG. Treatment outcomes in stage I lung cancer: a comparison of surgery and stereotactic body radiation therapy (SBRT). *J Thorac Oncol* 2015;10(12)1776–84



Errol L. Bush, M.D.

Associate Professor of Surgery
Surgical Director, Advanced Lung Disease and
Lung Transplant Program
Director, ExVivo 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 came 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.

- Singer JP, Diamond JM, Gries CJ, McDonnough J, Blanc PD, Shab R, Dean MY, Hersh B, Wolters PJ, Tokman S, Arcasoy SM, Ramphal K, Greenland JR, Smith N, Heffernan P, Shab L, Shrestha P, Golden JA, Blumenthal N, Huang D, Sonett J, Hays S, Oyster M, Katz PP, Robbins H, Brown M, Leard LE, Kukreja J, Bacchetta M, **Bush EL**, D'Ovidio F, Rushefski M, Raza K, Christie JD, Lederer DJ. Frailty Phenotypes, Disability, and Outcomes in Adult Candidates for Lung Transplantation. *Am J Respiratory Critical Care Med.* 12-15 PMID: 26258797 •
- Tokman S, Hayes SR, Leard LE, **Bush EL**, Kukreja J, Kleinhenz ME, Golden JA, Singer JP. Prolonged Barium Impaction in Two Lung Transplantation Recipients with Systemic Sclerosis: Case Report. 2015 Dec; 47(10):2965-7 PMID: 26707322
- Magruder JT, Crawford TC, Grimm JC, Kim B, Shah AS, **Bush EL**, Higgins RS, Merlo CA, Risk Factors for De Novo Malignancy Following Lung Transplantation. *AM J Transplant* 2017 Jan 17. PMID: 27321167
- Magruder JT, Shah AS, Crawford TC, Grimm JC, Kim B, Orens J, **Bush EL**, Higgins RS, Merlo CA. Simulated Regionalization of Heart and Lung Transplantation in the United States. *AM J Transplant* 2017 February 17. PMID: 27618731
- Crawford T, Grimm JC, Magruder JT, Ha J, Sciortino CM, Kim BS, **Bush EL**, Conte JV, Higgins RS, Shah AS, Merlo CA, Lung Transplant Mortality is Improving in Recipients with a Lung Allocation Score in the Upper Quartile. *Ann Thoracic Surg*; 2017 May; PMID: 28223052
- Crawford T, Grimm JC, Magruder JT, Ha J, Suarez-Pierre A, Zhou X, Broderick SR, Orens JB, **Bush EL**, Higgins RS, Shah AS, Merlo CA, Impaired Renal Function Should Not Be a Barrier to Transplantation in Patients With Cystic Fibrosis. *Ann Thoracic Surg*; 2017 Oct; 104(4): 1231-1236. PMID: 28822537.
- Crawford T, Magruder J, Grimm J, Johnston L, Santhanam L, Stephens R, Berkowitz D, Shah A, Damico R, Hassoun P, Kim B, **Bush EL**. Imatinib Is Protective Against Ischemia-Reperfusion Injury In An Ex Vivo Rabbit Model of Lung Injury. *Ann Thoracic Surg*. 2017 Dec 27. PMID: 29289364
- Aboagye JK, Hayanga JWA, Lau BD, **Bush EL**, Shaffer DL, Hobson DB, Kraus PS, Streiff MB, Haut ER, D'Cuhna J. Venous thromboembolism in patients hospitalized for lung transplantation. *Ann Thoracic Surg*. 2018 Apr; 105(4): 1071-1076. PMID: 29394995
- Crawford T, Zhou X, Magruder J, Lui C, Terasaki Y, Higgins R, Broderick S, **Bush EL**. Traumatically Brain-Injured Donors and the Impact on Lung Transplant Survival. *Ann Thoracic Surg*. 2018 May 3. PMID: 29730351

- Crawford TC, Lui C, Magruder JT, Ha JS, Higgins RS, Merlo CA, Kim BS, **Bush EL**. 5-Year Mortality Hazard is Reduced in 3 chronic obstructive pulmonary disease patients receiving double-versus single-lung transplants. *J Surg Res*. 2018 Jun 2. PMID:29871764
- Hsu J1, Krishnan A1, Lin CT2, Shah PD2, Broderick SR1, Higgins RSD1, Merlo CA3, Bush EL4. Sarcopenia of the Psoas Muscles Is Associated With Poor Outcomes Following Lung Transplantation. *Ann Thorac Surg*. 2019 Apr;107(4):1082-1088. doi: 10.1016/j.athoracsur.2018.10.006. Epub 2018 Nov 14
- Oyetunji S, Merlo C, Alshaikh H, Crawford T, Ha J, Maredia H, Hooker C, Brock M, Higgins R, **Bush EL**. Racial Disparities in Referral for lung transplant Evaluation among Patients with Cystic Fibrosis. *JHLT* 2017.
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James S. Gammie, M.D.

The James T. Dresher, Sr. Professor of Cardiac Surgery
Surgical Lead and Co-Director, Johns Hopkins Heart and Vascular
Institute
Cardiac Surgeon-in-Chief, Johns Hopkins Health System

Background

- Brown University
- Resident in General Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA
- Fellow, Division of Cardiothoracic Surgery, University of Pittsburgh Medical Center
- Assistant Professor of Cardiothoracic Surgery, Director of Cardiac Transplantation, University of Massachusetts Medical Center, Worcester, MA (1999-2002)
- Assistant Professor of Surgery, University of Maryland School of Medicine, Baltimore, MD (2002-2006)
- Associate Professor of Surgery, University of Maryland School of Medicine, Baltimore, MD (2006-2012)
- Professor and Chief, Division of Cardiac Surgery, University of Maryland School of Medicine, Baltimore, MD (2012-2021)
- Surgical Lead and Co-Director, Johns Hopkins Heart and Vascular Institute Cardiac Surgeon-in-Chief, Johns Hopkins Health System (2021-present)

Clinical Interests

- Mitral and tricuspid valve surgery
- Adult cardiac surgery

Research Interests

- Medical device development
- Novel operative therapies for secondary mitral regurgitation
- Outcomes research (Steering Committee, Cardiothoracic Surgery Trials Network (CTSN))

BIOSKETCH: James S. Gammie, M.D.

James S. Gammie is the James T. Dresher, Sr. Professor of Cardiac Surgery, and serves as the surgical lead and co-director of the Johns Hopkins Heart and Vascular Institute and the Cardiac Surgeon-in-Chief, Johns Hopkins Health System. Gammie received his bachelor's degree from Brown University. He completed a residency in general surgery and a fellowship in cardiothoracic surgery at the University of Pittsburgh Medical Center. He served as Director of Cardiac Transplantation at the University of Massachusetts Medical Center, Worcester, MA from 1999 to 2002. In 2002, he joined the University of Maryland School of Medicine in Baltimore, MD as an assistant professor, where he promoted in rank to associate professor in 2006. In 2012, Gammie once more promoted in rank to Professor and Chief of the Division of Cardiac Surgery at the University of Maryland School of Medicine where he remained until 2021. In 2021 he joined the Johns Hopkins Heart and Vascular Institute as the Surgical Lead and Co-Director, and the Cardiac Surgeon-in-Chief of the Johns Hopkins Health System.

Dr. Gammie's clinical and research efforts are focused on decreasing the mortality and morbidity of heart valve disease. He is actively involved in the advancement of therapeutic treatment options for patients with valve disease through his publication efforts (>200 peer reviewed journal articles), prior service as chair of the Access and Publications Committee for the Society of Thoracic Surgeons National Cardiac Database, and in his role as a site principal investigator and on the steering committee of the Cardiothoracic Surgery Trials Network (CTSN). Because of Dr. Gammie's clinical experience in both mitral valve repair and replacement, he has a unique perspective in to the adequacy of existing mitral valve treatment strategies and believes that the development of novel treatments to address underserved groups, such as those patients with rheumatic mitral valve disease, will be extremely beneficial. The Gammie laboratory uses large animal and ex-vivo models of mitral valve disease to test and refine devices and novel operative techniques for the treatment of heart valve disease. We have developed a novel transcatheter transseptal puncture device which is expected to enter clinical use in late 2021, established a novel operative therapy for secondary mitral regurgitation and moved that into the clinic, and created and refined a device that enables minimally invasive beating-heart image-guided mitral valve repair that is undergoing evaluation in a 40-center US trial. Dr. Gammie has founded 4 medical device companies, including HARPOON Medical and Protaryx Medical. He has over 20 issued patents. He has trained more than 30 surgeons.

Selected Publications: James S. Gammie, M.D.

Gammie JS, Chu MWA, Falk V, Overbey JR, Moskowitz AJ, Gillinov M, Mack MJ, Voisine P, Krane M, Yerokun B, Bowdish ME, Conradi L, Bolling SF, Miller MA, Taddei-Peters WC, Jeffries NO, Parides MK, Weisel R, Jessup M, Rose EA, Mullen JC, Raymond S, Moquete EG, O'Sullivan K, Marks ME, Iribarne A, Beyersdorf F, Borger MA, Geirsson A, Bagiella E, Hung J, Gelijns AC, O'Gara PT, Ailawadi G; CTSN Investigators. *N Engl J Med*. 2021 Nov 13. doi: 10.1056/NEJMoa2115961. Online ahead of print. PMID: 34767705

Pasrija C, Tran D, Ghoreishi M, Kotloff E, Yim D, Finkel J, Holmes SD, Na D, Devlin S, Koenigsberg F, Dawood M, Quinn R, Griffith BP, **Gammie JS**. Degenerative Mitral Valve Repair Simplified: An Evolution to Universal Artificial Cordal Repair. *Ann Thorac Surg*. 2020 Aug;110(2):464-473. doi: 10.1016/j.athoracsur.2019.10.068. Epub 2019 Dec 18. PMID: 31863753

Pasrija C, Quinn RW, Bernstein D, Tran D, Alkhatib H, Rice M, Morales D, Shah A, Ghoreishi M, Strauss ER, Henderson R, D'Ambra MN, **Gammie JS**. Mitral Valve Translocation: A Novel Operation for the Treatment of Secondary Mitral Regurgitation. *Ann Thorac Surg*. 2021 Dec;112(6):1954-1961. doi: 10.1016/j.athoracsur.2021.07.043. Epub 2021 Aug 19. PMID: 34419436

Gammie JS, Chikwe J, Badhwar V, Thibault DP, Vemulapalli S, Thourani VH, Gillinov M, Adams

- DH, Rankin JS, Ghoreishi M, Wang A, Ailawadi G, Jacobs JP, Suri RM, Bolling SF, Foster NW, Quinn RW. Isolated Mitral Valve Surgery: The Society of Thoracic Surgeons Adult Cardiac Surgery Database Analysis. *Ann Thorac Surg.* 2018 Sep;106(3):716-727. doi: 10.1016/j.athoracsur.2018.03.086. Epub 2018 Jul 19. PMID: 30032907
- Gammie JS**, Grayburn PA, Quinn RW, Hung J, Holmes SD. Quantitating Mitral Regurgitation in Clinical Trials: The Need for a Uniform Approach. *Ann Thorac Surg.* 2021 Apr 7:S0003-4975(21)00652-4. doi: 10.1016/j.athoracsur.2021.03.073. Online ahead of print. PMID: 33838121
- Gammie JS**, Bartus K, Gackowski A, Szymanski P, Bilewska A, Kusmierczyk M, Kapelak B, Rzuclido-Resil J, Duncan A, Yadav R, Livesey S, Diprose P, Gerosa G, D'Onofrio A, Pittarello D, Denti P, La Canna G, De Bonis M, Alfieri O, Hung J, Kolsut P, D'Ambra MN. Safety and performance of a novel transventricular beating heart mitral valve repair system: 1-year outcomes. *Eur J Cardiothorac Surg.* 2021 Jan 4;59(1):199-206. doi: 10.1093/ejcts/ezaa256. PMID: 33038223
- Quinn RW, Vesely MR, Dawood M, Benitez M, Holmes SD, **Gammie JS**. Transseptal Puncture Learning Curve for Transcatheter Edge-to-Edge Mitral Valve Repair. *Innovations (Phila).* 2021 May-Jun;16(3):288-292. doi: 10.1177/1556984521992403. Epub 2021 Feb 11. PMID: 33570438
- Salenger R, Etchill EW, Ad N, Matthew T, Alejo D, Whitman G, Lawton JS, Lau CL, Gammie CF, **Gammie JS**. The Surge After the Surge: Cardiac Surgery Post-COVID-19. *Ann Thorac Surg.* 2020 Dec;110(6):2020-2025. doi: 10.1016/j.athoracsur.2020.04.018. Epub 2020 May 4. PMID: 32376350
- Brown JM, Hajjar-Nejad MJ, Dominique G, Gillespie M, Siddiqi I, Romine H, Odonkor P, Dawood M, **Gammie JS**. A Failed Cardiac Surgery Program in an Underserved Minority Population County Reimagined: The Power of Partnership. *J Am Heart Assoc.* 2020 Dec;9(23):e018230. doi: 10.1161/JAHA.120.018230. Epub 2020 Nov 20. PMID: 33213254
- Quinn RW, Pasrija C, Bernstein DA, Holmes SD, **Gammie JS**. Mitral Valve Translocation: Optimization of Patch Geometry in an Ex Vivo Model of Secondary Mitral Regurgitation. *J Cardiovasc Transl Res.* 2021 Nov 15. doi: 10.1007/s12265-021-10182-0



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.

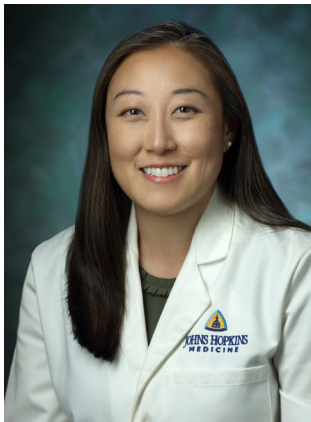
Greene is also a leader in the field of informatics in cardiothoracic surgery. He has served as the chair of the Society of Thoracic Surgeons' Information Technology Committee. He is the founder, executive editor and key architect of Cardiothoracic Surgery Network, the online community of 40 professional 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.

- Greene PS.** Information Technology, In: *Evidence-Based Surgery*, Gordon TA, Cameron JL (eds), BC Decker, Inc., Hamilton, Ontario, 2000.
- Greene PS,** Baumgartner WA. Cardiac Surgery, In: *Evidence-Based Surgery*, Gordon TA and Cameron JL (eds), BC Decker, Inc., Hamilton, Ontario, 2000.
- Baumgartner WA, **Greene PS.** Developing the academic thoracic surgeon: teaching surgery. *J Thorac Cardiovasc Surg.* 119:S22–5, 2000.
- Cattaneo SM, **Greene PS.** Mechanical circulatory assistance prior to heart transplantation, In: *Heart and Lung Transplantation, Second Edition*, W.B. Saunders, Philadelphia, PA, p. 120–129, 2001.
- Pae WE, Kormos RL, **Greene PS,** Sapirstein W. Database: relevant or not. *Ann Thorac Surg.* 71:204S–209S, 2001.
- Gott VL, Cameron DE, Alejo DE, **Greene PS,** Shake JG, Caparrelli DJ, Dietz HC. Aortic root replacement in 271 Marfan patients: a 24-year experience. *Ann Thorac Surg.* 73:438–43, 2002.
- Hersh W, Bhupatiraju RT, **Greene PS,** Smothers V, Cohen C. A standards-based approach for facilitating discovery of learning objects at the point of care. *AMIA Annu Symp Proc.* 979, 2005.
- Hersh W, Bhupatiraju RT, **Greene PS,** Smothers V, Cohen C. Adopting e-learning standards in health care: competency based learning in the medical informatics domain. *AMIA Annu Symp Proc.* 2006:334–8.
- Bhupatiraju RT, Hersh WR, Smothers V, Fordis M, **Greene PS.** The MERG Suite: Tools for discovering competencies and associated learning resources. *Source Code Biol Med.* 2008 May 14;3:7.
- Ellaway RH, Graves L, **Greene PS.** Medical education in an electronic health record-mediated world. *Med Teach.* 2013 Apr;35(4):282–6.
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Jinny S. Ha, M.D.

Assistant Professor of Surgery

Background

- University of Virginia School of Medicine 2008
- University of Maryland Medical Center, General Surgery Resident (2008-2015)
- Johns Hopkins Hospital, Cardiac Surgery Fellow (2015-2018)

Clinical Interests

- Lung cancer
- Esophageal cancer
- Robotic surgery
- Lung transplantation

Research Interests

- Utilization of robotic techniques in thoracic surgery
- Clinical outcomes research in esophageal cancer and lung transplantation
- Surgical education

BIOSKETCH: Jinny S. Ha, M.D

Jinny S. Ha M.D. completed her general surgery residency at the University of Maryland Medical Center. She finished her cardiothoracic surgery fellowship at Johns Hopkins Hospital and has stayed as Assistant Professor in the Division of Thoracic Surgery. Her areas of interest include minimally invasive techniques/robotic surgery for thoracic procedures, surgical education and lung transplantation.

Selected Publications: Jinny Ha, M.D.

- Barth RN, Rodriguez ED, Munding GS, Nam A, **Ha J**, Hui-Chou HG, Jones LS, Panda A, Shipley ST, Drachenberg CB, Kukuruga D, and Bartlett ST. Vascularized bone marrow-based immunosuppression inhibits rejection of vascularized composite allografts in nonhuman primates. *Am J Transplant.* 2011;11(7):1407-1416
- Brazio PS, Munivenkatappa RB, Bojovic B, **Ha J**, Brown EN, Hess AS, Bartlett ST, Rodriguez ED, Barth RN. Regulatory T cells are not predictive of outcomes in a nonhuman primate model of vascularized composite allotransplantation. *Transplantation.* 2013;96(3):267-73
- Crawford TC, Grimm JC, Magruder JT, **Ha J**, Sciortino CM, Kim BS, Bush EL, Conte JV, Higgins RS, Shah AS, Merlo CA. Lung Transplant Mortality is improving in Recipients with a Lung allocation score in the upper quartile. *Ann Thorac Surg.* 2017;103(3):1607-13



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)
- Massachusetts General Hospital, Internship and Surgery Residency (1976–1981), Fellowship in Cardiovascular Research (1978–1979), Cardiothoracic Surgery Residency (1983)
- 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 over three decades, with special emphasis on congenital heart disease. As Director of Pediatric Cardiac Surgery Outcomes Research at Johns Hopkins, he works with medical students, residents and fellows on clinical investigations, and helps to coordinate data management, quality assessment, quality improvement initiatives and clinical trials related to the care of patients with congenital heart disease.

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 as president of the CHSS (2014–2016). He has served as chair of

the Society of Thoracic Surgeons Congenital Heart Surgery Database Task Force, and currently chairs the STS Congenital Heart Surgery Access and Publications Committee.. The author of more than 300 peer-reviewed publications, Jacobs is as member of several editorial boards and is editor-in-chief of the *World Journal for Pediatric and Congenital Heart Surgery*.

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

- Jacobs ML**, Rychik J, Rome J, Apostolopoulou S, Pizarro C, Murphy JD, Norwood WI: Early Reduction of the Volume Work of the Single Ventricle: The Hemi-Fontan. Operation. *Ann Thorac Surg*. 1996; 62: 456-462.
- Jacobs ML**, Buckley MJ, Liberthson RL: Combined Rastelli and Atrial Switch Procedure: A 10-Year Follow-Up. *Ann Thorac Surg*. 1999; 68:570-1.
- Jacobs ML**. The Fontan operation, thromboembolism, and anticoagulation: a reappraisal of the single bullet theory. *J Thorac Cardiovasc Surg*. 2005 Mar; 129(3):491-5.
- Jacobs ML**, Pelletier GJ, Pourmoghadam KK, Mesia GI, Madan N, Stern H, Schwartz R, Murphy JD.: Protocols associated with no mortality in 100 consecutive Fontan procedures. *Eur J Cardiothoracic Surg*. 2008; 33(4): 626-32.
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- Hirsch JC, **Jacobs ML**, Andropoulos D, Austin EH, Jacobs JP, Licht DJ, Pigula F, Tweddell JS, Gaynor JW. Protecting the infant brain during cardiac surgery: a systematic review. *Ann Thorac Surg*. 2012 Oct;94(4):1365-73.
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Ahmet Kilic, M.D.

Associate Professor of Surgery
Program Director, Cardiothoracic Surgery Residency Program
Surgical Director, Adult Heart Transplantation

Background

- The Pennsylvania State University (B.S. 1998)
- The Medical College of Virginia-Virginia Commonwealth University (M.D. 2002)
- University of Maryland, Intern, General Surgery (2002-2003)
- 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

BIOSKETCH: Ahmet Kilic, M.D.

Ahmet Kilic, M.D., joined the Johns Hopkins Division of Cardiac Surgery as an associate professor in 2017. 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 as 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.

- Kilic A**, Nolan TDC, Li T, Yankey GK, Prastein DJ, Cheng G, Jarvik RK, Wu Z, Griffith BP. Early In-Vivo Experience with the Pediatric Jarvik 2000 Heart. *American Society for Artificial Internal Organs Journal* 2007, May; 53(3): 374-378.
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- Kilic A**, Emani S, Sai-Sudhakar CB, Higgins RSD, Whitson BA. Donor selection in heart transplantation. *Journal of Thoracic Disease* 2014 Aug;6(8):1097-104. doi: 10.3978/j.issn.2072-1439.2014.03.23. PMID: 25132976.
- Kilic A**, Higgins R, Whitson B, Kilic A. Racial disparities in outcomes of adult heart transplantation. *Circulation* 2015 Mar 10;131(10):882-9. doi:10.1161/CIRCULATIONAHA.114.011676. Epub 2015 Feb 11. PMID: 25673669.
- Kilic A**, Sultan IS, Arnaoutakis GJ, Higgins RS, Kilic A. The Assessment of thoracic endografting operative mortality (ATOM) risk score: Development and Validation in 2,000 Patients. *Annals of Thoracic Surgery* 2015 Sep;100(3):860-7. Doi: 10.1016/j.athoracsurg.2015.01.040 Epub 2015 Jul 26. PMID: 26219690.
- Kilic A**. How to develop a niche: Focus on adult cardiac surgery. *The Journal of Thoracic and Cardiovascular Surgery* 2015 Sep 18. Pii: S0022-5223(15)01721-3. Doi: 10.1016/j.jtcvs.2015.09.029. [Epub ahead of print]. PMID: 26478233.
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- study. *The Journal of Heart and Lung Transplantation* 2016 Nov 16. Pii: S1053-2498(16)30344-8. Doi: 10.1016/j.healun.2016.10.001 [Epub ahead of print]. PMID: 27865732.
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- Kilic A**, Shukrallah BN, Kilic A, Whitson BA. Initiation and management of adult veno-arterial extracorporeal life support. *Annals of Translational Medicine* 2017 Feb;5(4):67. Doi: 10.21037/atm.2016.10.05. PMID: 28275612
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Jennifer S. Lawton, M.D.

Professor of Surgery
Chief of the Division of Cardiac Surgery
Director, Cardiac Surgery Research Laboratory

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, Richard B. Darnall 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 the Richard B. Darnall 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 tenured 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 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.

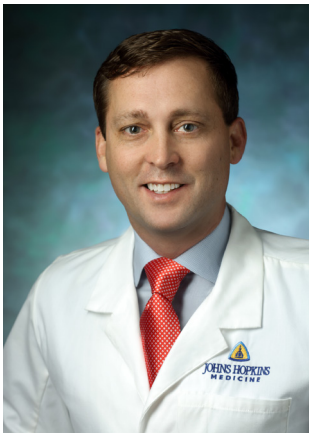
Lawton has authored more than 100 published scientific manuscripts and has made numerous presentations at national surgical meetings. She is a member of multiple national organizations, including the American Surgical Association and the Society of Clinical Surgery, and she is a fellow of the American 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, former 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 former 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*, and on the editorial board of the *Journal of Thoracic and Cardiovascular Surgery*. 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.

- Mizutani S, Prasad SM, Sellitto AD, Schuessler RB, Damiano RJ, Jr., **Lawton JS**. Myocyte Volume and Function in Response to Osmotic Stress: Observations in the Presence of an Adenosine Triphosphate-Sensitive Potassium Channel Opener. *Circulation* 2005;112(9 Suppl):1219–23. PMID 16159820
- Lawton JS**, Barner HB, Bailey MS, Moazami N, Pasque MK, Moon MR, Damiano RJ, Jr. Radial Artery Grafts in Women: Utilization and Results. *Ann Thorac Surg* 2005; 80(2):559–63. PMID 16039204
- Prasad SM, Al-Dadah AS, Byrd GD, Flagg TP, Gomes J, Damiano RJ, Nichols CG, **Lawton JS**. Role of the Sarcolemmal Adenosine Triphosphate-Sensitive Potassium Channel in Hyperkalemic Cardioplegia-Induced Myocyte Swelling and Reduced Contractility. *Ann Thorac Surg* 2006; 81(1):148–53. PMID 16368354
- Lawton JS**, Moazami N, Pasque MK, Moon MR, Damiano RJ Jr. Early Stenosis of Medtronic Mosaic Porcine Valves in the Aortic Position. *J Thorac Cardiovasc Surg* 2009; 137(6):1556–7. PMID: 19464483
- Sellitto AD, Maffit SK, Al-Dadah AS, Zhang H, Schuessler RB, Nichols CG, **Lawton JS**. Diazoxide Maintenance of Myocyte Volume and Contractility During Stress: Evidence for a Non-Sarcolemmal K_{ATP} Channel Location. *J Thorac Cardiovasc Surg* 2010;140(5):1153–9. PMID: 20804990
- 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
- Maffit SK, Sellitto AD, Al-Dadah AS, Schuessler RB, Damiano RJ Jr, MD, **Lawton JS**. Diazoxide Maintains Human Myocyte Volume Homeostasis During Stress. *J Am Heart Assoc* 2012; 1(2). doi:pii:jah3-e000778.10.1161/JAHA.112.000778. PMID 23130119
- Anastacio MM, Kanter EM, Makepeace C, Keith AS, Zhang H, Schuessler RB, Nichols CG, **Lawton JS**. The Relationship Between Mitochondrial Matrix Volume and Cellular Volume In Response to Stress and the Role of the Adenosine Triphosphate Sensitive Potassium Channel. *Circulation* 2013;128:S130–S135. PMID 24030396

- 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
- Lawton JS**, Liu J, Kulshrestha K, Moon MR, Damiano RJ, Maniar H, Pasque MK. The Impact of Surgical Strategy on Survival Following Repair of Type A Aortic Dissection. *J Thorac Cardiovasc Surg* 2015; 150:294–301. PMID 26005060
- Henn MC, Janjua MB, Kanter EM, Makepeace CM, Schuessler RB, Nichols CG, **Lawton JS**. Adenosine Triphosphate—Sensitive Potassium Channel Kir Subunits Implicated in Cardioprotection by Diazoxide. *JAHA* 2015; 4(8). Pii: E002016. doi: 10.1161/JAHA.115.002016. PMID 26304939
- Henn MC, Janjua MB, Zhang H, Kanter EM, Makepeace CM, Schuessler RB, Nichols CG, **Lawton JS**. Cardiac Expressed Gain-of-Function of ATP—Sensitive Potassium Channel Subunit Kir6.1 is Associated with Increased Tolerance to Myocyte Stress. *J Surg Res* August 2016; 206:460–465. PMID 278843
- Makepeace CM, Suarez-Pierre A, Kanter EM, Schuessler RB, Nichols CG, **Lawton JS**. Superior diastolic function with KATP channel opener diazoxide in a novel mouse Langendorff model. *J Surg Res*. 2018 Jul;227:186-193. doi: 10.1016/j.jss.2018.02.024. Epub 2018 Mar 22. PMID: 29804852
- Lawton JS**, Moon MR, Liu J, Koerner DJ, Kulshrestha K, Damiano RJ Jr, Maniar H, Itoh A, Balsara KR, Masood FM, Melby SJ, Pasque MK. The profound impact of combined severe acidosis and malperfusion on operative mortality in the surgical treatment of type A aortic dissection. *J Thorac Cardiovasc Surg*. 2018 Mar;155(3):897-904. doi: 10.1016/j.jtcvs.2017.11.002. Epub 2017 Nov 7. PMID: 29249502
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Bret Mettler, M.D.

Associate Professor of Surgery
Director, Pediatric Cardiac Surgery

Background

- University of Texas Health Sciences Center and Wilford Hall Medical Center Resident (2000)
- University of South Dakota (M.D. 2000)
- Boston Children's Hospital / Research Fellow (2003)
- University of Michigan Medical Center Resident (2005)
- University of Virginia Medical Center Resident (2007)
- Boston Children's Hospital Resident (2009)

Clinical Interests

- Pediatric cardiac surgery
- Pediatric heart transplant
- Congenital heart diseases
- Thoracic surgery

Research Interests

- Translational clinical research pediatric heart and diagnostic studies.
- CSF production and volume changes after a cavopulmonary anastomosis.
- Translational model of mass spectroscopic protein expression in normal and semilunar valves with congenital heart disease.
- Pediatric translational clinical research.

BIOSKETCH: Bret Mettler, M.D.

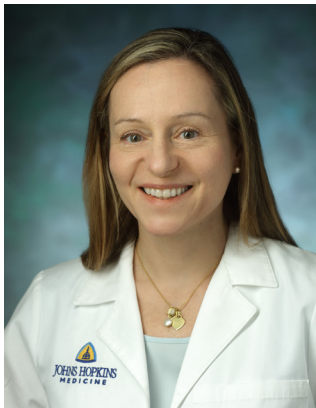
Bret Mettler, M.D., joined Johns Hopkins as director of pediatric cardiac surgery and co-director of the Blalock–Taussig–Thomas Pediatric and Congenital Heart Center in January 2020.

Dr. Mettler came to Johns Hopkins from Vanderbilt University Medical Center, where he served as the director of pediatric cardiac transplantation and mechanical support since 2010. A native of South Dakota, where he was a magna cum laude undergraduate and medical student at the University of South Dakota, Dr. Mettler has had extensive and impressive surgical training at leading centers throughout the country. He completed his surgical residency training at the University of Texas at San Antonio and the University of Michigan. He completed a research fellowship in cardiac tissue engineering at Boston Children's Hospital, followed by a cardiothoracic surgical residency at the University of Virginia and a congenital cardiac surgery fellowship at Boston Children's Hospital, Harvard Medical School.

Dr. Mettler has distinguished himself as a gifted and accomplished pediatric and congenital heart surgeon. He has also held numerous academic and leadership appointments in national associations including the Joint Council on Thoracic Surgery Education, the Society of Thoracic Surgeons, the Thoracic Surgery Directors Association and the Thoracic Surgery Residents Association, of which he was president.

Selected Publications: Bret Mettler, M.D.

- Menachem JN, Schlendorf KH, Mazurek JA, Bichell DP, Brinkley DM, Frischhertz BP, **Mettler BA**, Shah AS, Zalawadiya S, Book W, Lindenfeld J. "Advanced Heart Failure in Adults With Congenital Heart Disease." *JACC Heart Fail.* 2019 Dec 3. pii: S2213-1779(19)30729-2. doi: 10.1016/j.jchf.2019.08.012.
- Diaz I, Thurm C, Hall M, Auerbach S, Bearl DW, Dodd DA, **Mettler BA**, Smith AH, Fuchs DC, Godown J. "Disorders of Adjustment, Mood, and Anxiety in Children and Adolescents Undergoing Heart Transplantation and the Association of Ventricular Assist Device Support." *J Pediatr.* 2019 Nov 12. pii: S0022-3476(19)31350-2. doi: 10.1016/j.jpeds.2019.10.022.
- Weiner JG, Chew JD, Doyle TP, **Mettler BA**, Frischhertz BP, Janssen DR, Nicholson GT. "Left main coronary artery stent placement in a 7.0 kg infant with Williams Syndrome." *J Struct Heart Dis.* 2018 Dec;4(6):246-250. doi: 10.12945/j.jshd.2019.001.18.
- Godown J, Bearl DW, Thurm C, Hall M, Feingold B, Soslow JH, **Mettler BA**, Smith AH, Profita EL, Singh TP, Dodd DA. "Extracorporeal membrane oxygenation use in the first 24 hours following pediatric heart transplantation: Incidence, risk factors, and outcomes." *Pediatr Transplant.* 2019 Jun;23(4):e13414. doi: 10.1111/petr.13414. Epub 2019 Apr 11.
- Godown J, Thurm C, Hall M, Dodd DA, Feingold B, Soslow JH, **Mettler BA**, Smith AH, Bearl DW, Schumacher KR. Center Variation in Hospital Costs for Pediatric Heart Transplantation: The Relationship Between Cost and Outcomes. *Pediatr Cardiol.* 2019 Feb;40(2):357-365. doi: 10.1007/s00246-018-2011-8. Epub 2018 Oct 20.



Danielle Gottlieb Sen, M.D., M.P.H., M.S.

Assistant Professor of Surgery

Director, Pediatric Cardiac Surgery Research

Background

- State University of New York at Binghamton (B.A. 1991)
- Health and Medical Sciences, University of California Berkeley (M.S. 2000)
- International Clinical/Epidemiology Research, Stanford University (Dr. David Katzenstein) and Harare, Zimbabwe (Dr. Mary Bassett) (1998-2000)
- University of California San Francisco School of Medicine (M.D. 2002)
- Harvard School of Public Health (M.P.H. 2007)
- Laboratory Research Fellowship, Dr. John Mayer, Boston Children's Hospital, Harvard Medical School (2005-2009)
- Laboratory Research Fellowship, Dr. Jonathan and Christine Seidman, Harvard Medical School (2011)
- Massachusetts General Hospital / Residency - General Surgery (2011)
- New York-Presbyterian/Columbia University Irving Medical Center / Residency - Thoracic Surgery (2013)
- New York-Presbyterian Morgan Stanley Children's Hospital / Fellowship - Congenital Cardiac Surgery (2014)
- Boston Children's Hospital / Fellowship - Congenital Cardiac Surgery (2015)
- Assistant Professor of Surgery, LSU Health Sciences Center and Pediatric Cardiovascular Surgeon, Children's Hospital New Orleans (2015-2020)
- Instructor of Surgery, Pediatric Cardiac Surgery, Vanderbilt Monroe Carell Children's Hospital (2017-2020)
- Assistant Professor of Surgery, Johns Hopkins University School of Medicine (2020-present)

Clinical Interests

- Pediatric cardiac surgery
- Congenital heart disease

Research Interests

- Cardiac and somatic growth in patients with congenital heart disease
- Single ventricle congenital heart disease
- Left side obstructive lesions

BIOSKETCH: Danielle Gottlieb Sen, M.D., M.P.H., M.S.

Danielle Gottlieb Sen, M.D., M.P.H., M.S., is a pediatric and congenital cardiac surgeon and assistant professor of surgery at the Johns Hopkins School of Medicine. Her expertise includes surgical palliation and treatment of infants, children and adults with congenital heart disease. Her research is organized around the critical issue of cardiac and somatic growth in patients with congenital heart disease..

Selected Publications: Danielle Gottlieb Sen, M.D., M.P.H., M.S.

Anderson BR, Kumar SR, **Gottlieb Sen D**, Liava'a MH, Hill KD, Jacobs JP et al., "The congenital heart technical skill study: rationale and design." *World J Pediatr Congenit Heart Surg* 2019; 10(2):137-144.

Gottlieb Sen D, Halu A, Gorham J, Razzaque MA, Seidman J, Seidman C, Aikawa E. "Characterizing the Transcriptional Signature of Growth in Late Fetal Aortic Valve Development". *Annals of Thoracic Surgery* 2018;106(6):1834-1840.

Angel PM, Baldwin HS, **Gottlieb Sen D**, Su YR, Mayer JE, Bichell D, Drake RR. "Advances in MALDI imaging mass spectrometry of proteins in cardiac tissue, including the heart valve." *Biochem Biophys Acta* 2017;1865 (7): 927-935.

Matte GS, Connor KR, Toutenel NA, **Gottlieb D**, Fynn-Thompson F. "A modified EXIT-to-ECMO with optional reservoir circuit for use during an EXIT procedure requiring thoracic surgery." *J Extra Corpor Technol* 2016;48(1):35-38.

Sen DG, Najjar M, Yilmaz B, Levasseur SM, Kalessan B, Quaegebeur JM, Bacha EA. "Aiming to preserve pulmonary valve function in tetralogy of Fallot repair: comparing a new approach to traditional management." *Pediatr Cardiol* 2016: 37(5):818-25.



Michael P. Robich, M.D., M.P.H.

Assistant Professor of Surgery
Surgical Director of Structural Heart Disease and Director of
Cardiac Surgery Quality Improvement

Background

- Ohio University (B.S 1998)
- Tulane University (MS 1999)
- Wright State University School of Medicine (MD 2005)
- Beth Israel Deaconess Medical Center, Resident Surgery (2005-2012)
- Cleveland Clinic, Cardiothoracic Surgery Fellowship (2012-2015)

Clinical Interests

- Hypertrophic Cardiomyopathy
- Valvular Heart Disease

Research Interests

- Myocardial repair in the setting of chronic myocardial ischemia and systemic metabolic diseases.
- Comparative effectiveness research

BIOSKETCH: Michael P. Robich, M.D., M.P.H.

Michael P. Robich, M.D., M.P.H., is an Assistant Professor of Surgery, the Surgical Director of Structural Heart Disease and the Director of Cardiac Surgery Quality Improvement. With over 10 years of experience, Dr. Robich joins Johns Hopkins from Tufts University Medical Center. At Tufts, Dr. Robich focused on the surgical and interventional treatment of valvular heart disease as Surgical Director of the multidisciplinary structural heart team. Dr. Robich has extensive experience in the surgical treatment of hypertrophic cardiomyopathy and served as the Associate Surgical Director of the Hypertrophic Cardiomyopathy Center at Tufts. In addition, Dr. Robich served as Associate Director of the thoracic surgery residency program.

Dr. Robich earned his Bachelor of Science Degree from Ohio University, his Master of Science in Public Health with a concentration in Tropical Medicine from Tulane University, and his Medical Degree from Wright State University School of Medicine.

He completed general surgery residency at the Beth Israel Deaconess Medical Center and cardiothoracic surgery residency at the Cleveland Clinic. Dr. Robich has interests in clinical and translational research and has been funded by the American Heart Association to study myocardial repair in the setting of chronic myocardial ischemia and systemic metabolic diseases. He has studied comparative effectiveness of different revascularization strategies for early coronary artery disease using the Northern New England Database.

Selected Publications: Michael P. Robich, M.D., M.P.H.

de Kay JT, Carver J, Shevenell B, Kosta AM, Tsibulnikov S, Certo E, Sawyer DB, Ryzhov S, **Robich MP**.

Decreased expression of ErbB2 on left ventricular epicardial cells in patients with diabetes mellitus. *Cell Signal*. 2022 Aug;96:110360.

Robich MP, Leavitt BJ, Ryan TJ Jr, Westbrook BM, Malenka DJ, Gelb DJ, Ross CS, Wiseman A, Magnus P, Huang YL, DiScipio AW, Iribarne A; Northern New England Cardiovascular Disease Study Group. Comparative effectiveness of revascularization strategies for early coronary artery disease: A multicenter analysis. *J Thorac Cardiovasc Surg*. 2022 Feb;163(2):645-656.

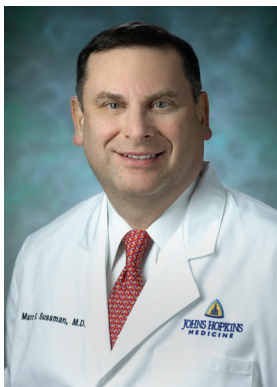
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Marc S. Sussman, M.D.

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, 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.

- Post W S; Goldschmidt-Clermont P J; Wilhide C C; Heldman A W; **Sussman M S**; Ouyang P; Milliken E E; Issa J P. Methylation of the estrogen receptor gene is associated with aging and atherosclerosis in the cardiovascular system. *Cardiovascular research*. 1999;43(4):985–91.
- Chang PP, **Sussman MS**, Conte JV, Grega MA, Schulman SP, Gerstenblith G, Wang NY, Capriotti A, Weiss JL. Postoperative ventricular function and cardiac enzymes after on-pump versus off-pump CABG surgery. *Am J Cardiol*. 2002 May 1;89(9):1107–10.
- Chong T, Alejo DE, Greene PS, Redmond JM, **Sussman MS**, Baumgartner WA, Cameron DE. Cardiac valve replacement in human immunodeficiency virus-infected patients. *Ann Thorac Surg*. 2003 Aug;76(2):478–80; discussion 480–1.
- Bethea BT, Salazar JD, Grega MA, Doty JR, Fitton TP, Alejo DE, Borowicz LM Jr, Gott VL, **Sussman MS**, Baumgartner WA. Determining the utility of temporary pacing wires after coronary artery bypass surgery. *Ann Thorac Surg*. 2005 Jan;79(1):104–7.
- Demmy TL, Nwogu CE, **Sussman MS**. Triangular retractor facilitates minimally invasive lobectomy. *J Thorac Cardiovasc Surg*. 2005 Jun;129(6):1454–5.
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- Roseborough GS, Murphy KP, Barker PB, **Sussman M**. Correction of symptomatic cerebral malperfusion due to acute type I aortic dissection by transcarotid stenting of the innominate and carotid arteries. *J Vasc Surg*. 2006 Nov;44(5):1091–6.
- Sciortino CM, Mundinger GS, Kuwayama DP, Yang SC, **Sussman MS**. Case report: treatment of severe subcutaneous emphysema with a negative pressure wound therapy dressing. *Eplasty*. 2009;9:e1. Epub 2009 Jan 7.
- Meguid RA, Hooker CM, Taylor JT, Kleinberg LR, Cattaneo SM, **Sussman MS**, Yang SC, Heitmiller RF, Forastierre AA, Brock MV. Recurrence after neoadjuvant chemoradiation and surgery for esophageal cancer: does the pattern of recurrence differ for patients with complete response and those with partial or no response? *J Thorac Cardiovasc Surg*. 2009 Dec;138(6):1309–17.
- 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.
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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 Pennsylvania, General Surgery Residency (1979–1984)
- 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.

Whitman GJR, Chance B, Bode H, Maris J, Haselgrove J, Kelley R, Clark BJ, and Harken AH.

Diagnosis and therapeutic evaluation of a pediatric case of cardiomyopathy using phosphorus-31 nuclear magnetic resonance spectroscopy. *J Amer Coll Cardiol.* 5:745–749, 1985.

Whitman GJR and Harken AH. Nuclear magnetic resonance and cardiovascular surgery. *Surg Clin NA.* 65:497–508, 1985.

Whitman GJR, Keival RS, Brown JM, Grosso MA, Harken AH. Optimal hypothermic preservation of arrested myocardium in isolated perfused rabbit hearts: A P31 NMR study. *Surgery.* 105:100–108, 1989.

Fullerton DA, Kirson LE, St Cyr JA, Kinnard T, **Whitman GJR**. The influence of (H+) versus pCO₂ on pulmonary vascular resistance following cardiac surgery. *J Thorac & Cardiovasc Surg.* 106(3): 528–26, 1993.

Crestanello JA, Kamelgard J, Lingle D, Mortensen SA, Rhode M, **Whitman GJR**. Elucidation of a tripartite mechanism underlying the improvement in cardiac tolerance to ischemia by coenzyme Q10 pretreatment. *J Thorac & Cardiovasc Surg.* 111:444–450, 1996.

Whitman GJR, Hart JC, Crestanello JA, Hayden A, Spooner TH. Uniform safety of beating heart surgery using the octopus tissue stabilizing system. *J Card Surg.* 14:323, 1999.

Whitman G, Cowell V, Parris K, McCullough P, Howard T, Gaughan J, Karavite D, Kennedy M, McNerney, Rose C Prophylactic antibiotic utilization: hardwiring of physician behavior, not education, leads to compliance. *J Am Coll Surg.* 2008;207:88–94.

Murphy M, Whitman I, Moxey L, Campfield A, Haddad M, **Whitman G**. Intense Implementation of a Strict Insulin Infusion Protocol Does Not Guarantee Postoperative Glycemic Control. The Surgical Forum, October 2009.

Whitman GJR and DiSesa VJ: Coronary artery disease and ventricular aneurysms. In: Greenfield LJ, Mulholland MW, Oldham KT, and Zelenock GB (eds), *Surgery: Scientific Principles and Practice*, 2nd Edition Philadelphia: J.B. Lippincott, 1997, pp. 1534–1550.

Gupta D., **Whitman GJR**: Acquired cardiac disorders. In *Modern Surgical Care: Physiological Foundations* 3rd Edition. Miller TA, Rowlands BJ (eds). St. Louis: Quality Medical Publications, 2006



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
- Esophageal Cancer Survivorship

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

Stephen Yang, M.D. received his BA from Duke University and MD from the Medical College of Virginia. His training included a general surgical at the University of Texas Health Science in Houston, a thoracic surgical research fellowship at the M. D. Anderson Cancer Center, and a cardiothoracic surgical fellowship at the Medical College of Virginia. In 1994, he joined the faculty at Johns Hopkins and currently is Professor of Surgery and of Medical Oncology. In 2001, he was installed as the first *Arthur B. and Patricia B. Modell Endowed Chair in Thoracic Surgery*.

He currently serves as Vice-Chair of Faculty Development and Education for the Department of Surgery, and Associate Director of the Cardiothoracic Surgery Residency. He was the former Director of the adult and pediatric lung transplant program, and Surgery Clerkship Director. Among his numerous teaching, research and clinical service awards, he received the 1996 William

F. Rienhoff Award for teaching and research at Johns Hopkins, the 1997 AATS Andrew Morrow Research Scholar, the 2004 Medical College of Virginia Outstanding Alumnus Award, the 2006 Thoracic Surgery Directors Association research mentor award, the 2006 Society of Thoracic Surgeons J. Maxwell Chamberlain Award, the 2008 Johns Hopkins Dean's Award as Clinical Teacher of the Year in the School of Medicine, the 2017 Southern Thoracic Surgical Association Urschel-Mavroudis Spirit Award, and the 2018 Medical School Graduation Marshall and recently elected into The Distinguished Teaching Society in the Johns Hopkins School of Medicine.

At Johns Hopkins, he currently serves on the Dean's Committees for Postgraduate Affairs, Medical School Admissions, Senior Faculty Development, and the Institute for Educational Excellence. He holds a number of national committee leadership positions in the American Association of Thoracic Surgeons, American College of Surgeons, Association for Surgical Education, General Thoracic Surgical Club, Society of Thoracic Surgeons, and Southern Thoracic Surgical Association. His clinical interests include all aspects of general thoracic surgery, with specific emphases in lung and esophageal cancer biology/survivorship, and robotics surgery; and he also researches in the areas of patient safety/outcomes, geriatric thoracic surgery and enhancing the educational paradigm for medical students, residents and junior faculty. He had developed novel lung transplantation techniques with cadaveric lobar transplantation, and robotic thymectomy approaches.

He was the former President of the International Chinese Society of Thoracic Surgeons (ICSTS), a constituency of over 800 members. In addition to his leadership role with the ICSTS, he is working with Johns Hopkins leadership in enhancing 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. In 2015, he was elected to the Board of Directors for the American Board of Thoracic Surgeons (the first Asian American in its 70 year history), and serves as Chair of the Maintenance of Certification Committee and Editor-in-Chief for the next edition of SESATS XIII. He was Vice-Chair of the Committee to develop the cardiothoracic surgery Milestones for the ACGME, and currently the 2018 Program Chair in Thoracic Surgery for the upcoming American Association of Thoracic Surgeons. He was named Chair for the Faculty Development Committee for the Thoracic Surgery Directors Association, and Chair-Elect for the Medical Student Education Committee for the American College of Surgeons.

He serves as editor of the textbooks *Current Therapy in Thoracic and Cardiovascular Surgery* (currently in preparation for the 2nd edition), *The Johns Hopkins Manual of Cardiothoracic Surgery*, *The Early Diagnosis of Cancer book series*, *Practical Reviews of Chest Medicine*, and formerly the eJournal *Current Surgery Reports*. He also serves on many journal review boards, and the current education section editor for the *Journal of Thoracic and Cardiovascular Surgery*. 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 160 peer reviewed articles and 50 book chapters.

Behind every busy man there is a loving and supportive family. Though an empty nester now that his three children have flown the coop (but still on the payroll), he lives with Marivic his wife of 34 year in Hunt Valley, MD, and enjoys playing lounge piano music, country club tennis, "Chopped" cooking, taking care of his grandpuppy Parker, and ballroom dancing, having won the 2017 **Dancing with the Hopkins Stars** competition for both top fundraiser for the United Way and best dance routine

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

- Yang SC**, Owen-Schaub L, Mendiguren-Rodriguez A, Grimm EA, Hong WK, and Roth JA (1990) Combination immunotherapy for non-small cell lung cancer: results using interleukin-2 and tumor necrosis factor-alpha. *J Thor CV Surg.* 99:8–13
- Wain JC, Kaiser LR, Johnstone DW, **Yang SC**, Wright CD, Friedberg J, Feins RH, Heitmiller RF, Mathisen DJ, Selwyn M. Randomized, Contolled Trial of a Novel Synthetic Surgical Sealant in Preventing Air leaks after Lung Resection. *Ann Thor Surg.* 2001; 71:1623–9.
- Ahrendt S, **Yang SC**, Sidransky D, Wu L, Roig C, Russell P, Westra W, Jen J, Brock M, Heitmiller R. Molecular Assessment of Pathologic Staging in Patients with Resected Stage I Non-Small Cell Lung Cancer—Preliminary Results of a Prospective Study. *J Thor Cardiovasc Surg.* 2002; 123:466–73.
- Ahrendt SA, Hu Y, Buta M, McDermot M, Bonet N, **Yang SC**, Wu I, Sidransky D. p53 Mutations Predict Poor Survival in Stage I Lung Cancer—Results of a Prospective Study. *J Natl Cancer Inst.* 2003; 95: 961–70.
- Brock MV, Kim MP, Hooker CM, Alberg AJ, Jordan MM, Roig CM, Xu L, **Yang SC**. Pulmonary resection in octogenarians with stage I nonsmall cell lung cancer: a 22-year experience. *Ann Thorac Surg.* 2004 Jan; 77: 271–7.
- Brock M., Alberg A, Hooker C, Kammer A, Xu L, Roig C, **Yang S**. Risk of Subsequent Primary Neoplasms Developing in Lung Cancer Patients with Prior Malignancies. *J Thor Cardiovasc Surg.* 2004;127:1119–25.
- Fitton TP, Bethea BT, Borja MC, Yuh DD, **Yang SC**, Orens JB, Conte JV. Pulmonary resection following lung transplantation. *Ann Thorac Surg.* 2003 Nov; 76(5): 1680–5.
- Brock MV, Kim M, Alberg A, Roig C, Jordan M, **Yang SC**. A 20 year experience in pulmonary resection for octogenarians. *Ann Thorac Surg.* 2004;77(1):271–7.
- Gott VL, Patel ND, **Yang SC**, Baumgartner WA. Attracting outstanding students (premedical and medical) to a career in cardiothoracic surgery. *Ann Thorac Surg.* 2006 Jul;82(1):1–3.
- Meguid RA, Brooks MS., Chang DC, Sherwood JT, Brock MV, **Yang SC**. Are Surgical Outcomes for Lung Cancer Resections Improved at Teaching Hospitals? *Ann Thor Surgery.* 2008 Mar;85(3):1015–24; discussion 1024–5.
- Molena D, **Yang SC**. Surgical management of end-stage achalasia. *Semin Thorac Cardiovasc Surg.* 2012 Spring;24(1):19–26.
- Vaporciyan A, **Yang SC**, Baker C, Fann JI, Verrier ED. Cardiothoracic Surgery Resident Training: Past, Present and Future. *J Thorac Cardiovasc Surg.* 2013;146(4):759–67
- Trehan K, Kemp C, and **Yang SC**. A Modern Day Review of Simulation in Cardiothoracic Surgery. *J Thorac Cardiovasc Surg.* 2014 Jan;147(1):18–24.e2
- Trehan K, Zhou X, **Yang SC**. Is Medical Student Interest in Cardiothoracic Surgery Maintained After Receiving Scholarship Awards? *Ann Thorac Surg.* 2015 Sep;100(3):926–9; discussion 930–1
- Shah SP, Xu T, Hooker CM, Hulbert A, Battafarano RJ, Brock MV, Mungo B, Molena D, **Yang SC**. Why are patients being readmitted after surgery for esophageal cancer? *J Thorac Cardiovasc Surg.* 2015 May;149(5):1384–9; discussion 1389–91
- Brock MV, Hooker CM, Ota-Machida E, Han Y, Gu M, Ames S, Glöckner S, Piantadosi S, Gabrielson E, Pridham G, Pelosky D, Belinsky SA, **Yang SC**, Baylin SB, Herman JG. DNA methylation markers and early recurrence in stage I lung cancer. *New Eng J Med.* 358: 1118–28
- Moore JM, Hooker CM, Molena D, Mungo B, Brock MV, Battafarano RJ, **Yang SC**. Complex Esophageal Reconstruction Procedures Have Acceptable Outcomes Compared With Routine Esophagectomy. *Ann Thorac Surg.* 2016 May 21. pii: S0003–4975(16)00223-X
- Yang SC**, Vaporciyan AA, Mark JR, DaRosa DA, Stritter FT, Sullivan ME, Verrier EE. The Joint Council on Thoracic Surgery Education (JCTSE) “Educate the Educator” Faculty Development Course: Analysis of the First Five Years. *Ann Thor Surg* (in press)
- Brock MV, Hooker CM, Ota-Machida E, Han Y, Gu M, Ames S, Glöckner S, Piantadosi S, Gabrielson E, Pridham G, Pelosky D, Belinsky SA, **Yang SC**, Baylin SB, Herman JG. DNA methylation markers and early recurrence in stage I lung cancer. *New Eng J Med.* 358: 1118–28.

JOHNS HOPKINS **Heart** **and Vascular** Institute

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.



Pediatric and Congenital Cardiac Service

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.



Dr. Alfred Blalock
Chief of the Department of
Surgery at The Johns Hopkins
Hospital (1941–1964)

**The First “Blue Baby”
Operation (The
Blalock-Taussig shunt)**
Dr. Blalock is seen to
the left side of the
patient. Assisting him
is his then-intern, Denton
Cooley. Vivien Thomas
is pictured behind
Blalock.



These operations navigate the full spectrum of cardiac malformations, from premature patients to adults with congenital heart disease. 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.

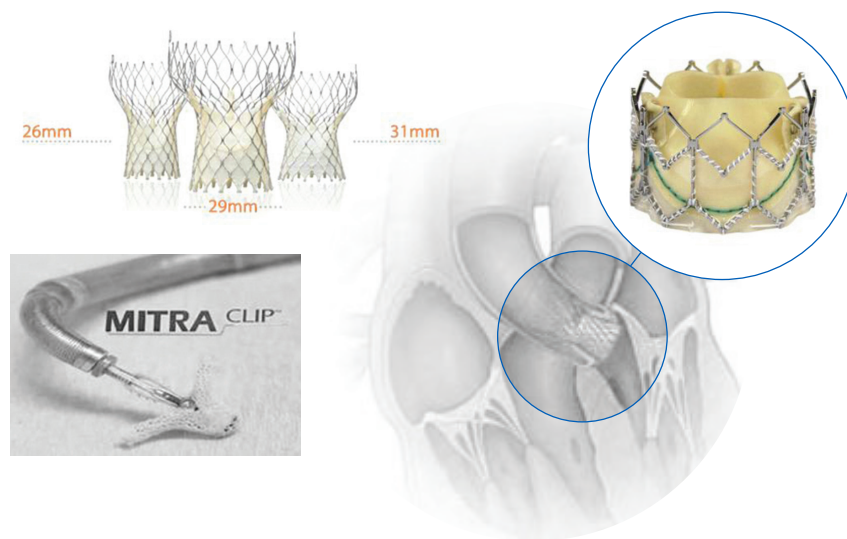
An experienced, multidisciplinary team of physicians and health care specialists completes the pediatric cardiac team at The Johns Hopkins Hospital. Pediatric cardiac surgeons and pediatric cardiologists work closely together in the preoperative evaluation of pediatric and adult cardiac patients with 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 Blalock-Taussig-Thomas Pediatric and Congenital Heart Center at The Johns Hopkins Hospital is integrated within the Johns Hopkins Heart and Vascular Institute and the Johns Hopkins Children's Center. The Johns Hopkins Children's Center is located in the state-of-the-art Charlotte R. Bloomberg Children's Center building, 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.

Transcatheter Valve Program

The Transcatheter Valve program at Johns Hopkins began in July 2011. The program has just surpassed the 1,000th TAVR procedure. 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 ileofemoral, 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.



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

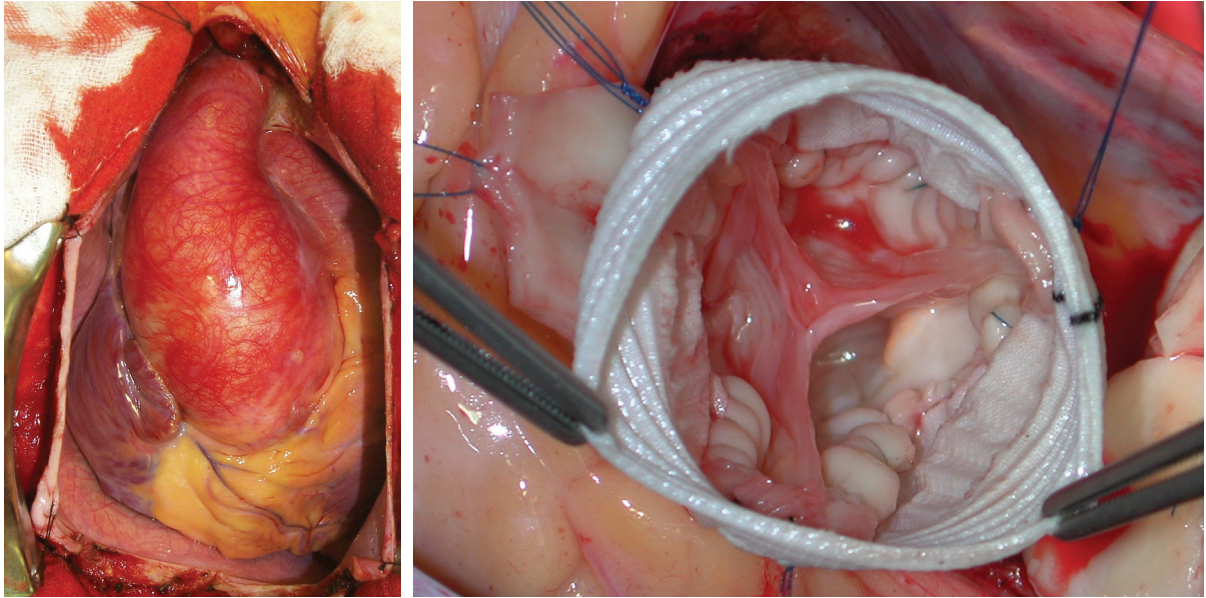
The Dana and Albert “Cubby” Broccoli Center for Aortic Diseases is world-renowned for its expertise and medical resources. It offers a unique multidisciplinary approach. As one of the few centers in the world that truly focuses on diseases of the aorta, the Broccoli Center brings together leading physicians 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

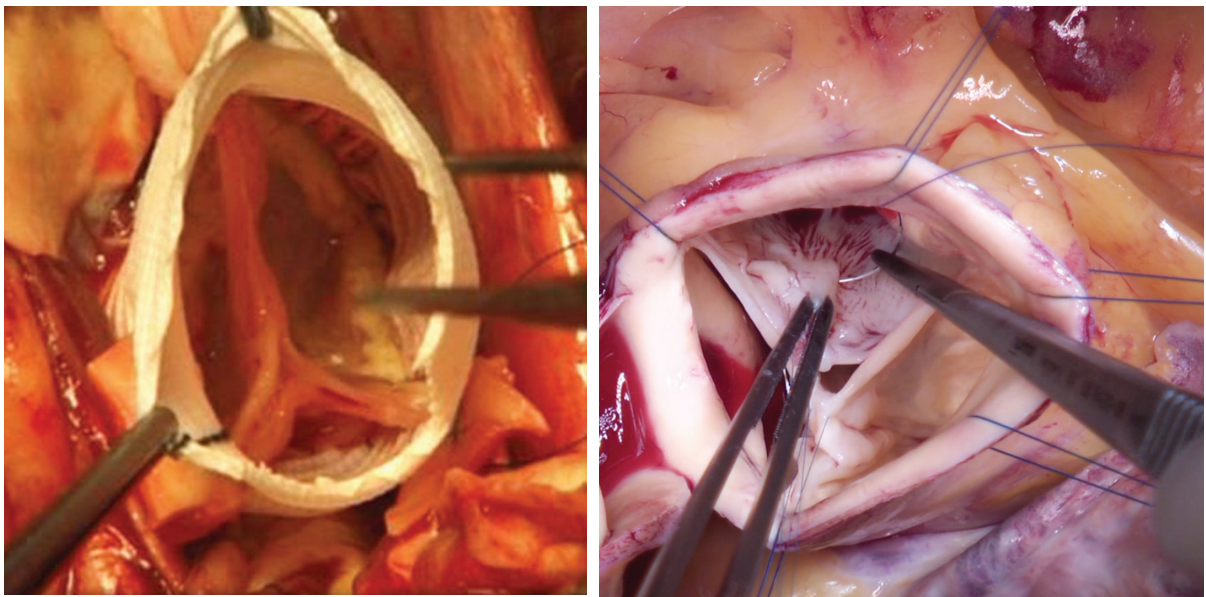
The Johns Hopkins Comprehensive Marfan Center is an internationally recognized center for surgical management of patients with Marfan and non-Marfan disease.

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.





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. Johns Hopkins surgeon Vincent Gott performed the first heart transplant in Maryland in 1968.

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 450 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.

Johns Hopkins faculty are active in research to advance the fields, including hepatitis C transplantation and use of ex vivo perfusion in heart and lung transplant.

Cardiac Surgery: A Leader in Excellence and Innovation

Johns Hopkins Highlights

The Johns Hopkins Hospital ranked #4 in the 2021–22 *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

2023

A. Investigator Initiated Clinical Research

a. Adult Cardiac Surgery

- i. Modeling the Marfan Ascending Aorta from CT/MRI Data
- ii. Prospective Evaluation of Adequacy of Outpatient Opioid Prescribing In Cardiac Surgery Patients
- iii. Prospective Follow up of Patients with Mitral Valve Translocation for Functional Mitral Regurgitation
- iv. Plasma Biomarkers in Patients with Receiving Extracorporeal Membrane Oxygenation
- v. Safe MRI *
- vi. Urinary Biomarkers of Renal Injury During Bypass *

2020

A. Investigator Initiated Clinical Research

a. Adult Cardiac Surgery

- i. Urinary Biomarkers of Renal Injury During Bypass
- ii. Evaluation of Changes in Blood Flow Patterns of Patients with Bicuspid Aortic Valve Stenosis Undergoing Transcatheter Aortic Valve Replacement (TAVR): In Vivo, Real-Time Echocardiographic Study of Particles Turbulence Shifting and Computational-Model Analysis of Ascending Aortic Changes
- iii. Prospective Evaluation of Adequacy of Outpatient Opioid Prescribing In Cardiac Surgery Patients
- iv. Non-Invasive Neuromonitoring and Prognostication of Patients with Disorders of Consciousness on ECMO
- v. Modeling the Marfan Ascending Aorta from CT/MRI Data

- b. Pediatric Cardiac Surgery
 - i. The Effect of Post-Operative Telemedicine Wound Appointments on Patient Cost, Satisfaction, and Compliance
 - ii. Minimally Invasive Metabolic Monitoring Using Doubly Labelled Water 2H218O
 - iii. Identification of Physiological Patterns and Characteristic of Impending Cardiac Arrest in Hospitalized Congenital Heart Disease Patients
 - iv. Predictive Algorithms for Combined Adverse Outcome Endpoints in Infants with Congenital Heart Disease
 - v. Genetics of Aortic Coarctation

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 (PC4)
- Pediatric Heart Transplant Study (PHTS)
- Neurocritical Database for ECMO patients
- Database for Nutrition after Cardiothoracic Surgery
- PCHSS Congenital Heart Surgeons Society Studies in Congenital Heart Disease
- OVID-19 Critical Care Consortium / ECMOCARD
- International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC)

Active Cardiac Surgery Clinical Trials

- A Clinical Trial To Evaluate the Heartware Ventricular Assist System (ENDURANCE Trial)
- Anticoagulation for New-Onset Post-Operative Atrial Fibrillation after CABG (PACeS)*
- Aortic Valve Operative Outcomes in Marfan Patients
- A prospective, multi-center trial to evaluate the safety and effectiveness of beating heart mitral valve repair with the HARPOON™ System (RESTORE)
- A prospective, randomized, active (warfarin) controlled, parallel-arm clinical trial to determine if patients with an On-X aortic valve can be maintained safely and effectively on the factor Xa inhibitor apixaban (PROACT Xa)
- Clinical Research Study Title: Randomized Controlled Trial Comparing Dimethyl Sulfoxide Cryopreserved Platelets to Liquid Stored Platelets in Patients Undergoing Cardiopulmonary Bypass Surgery (CRYPTICS)*
- Edwards EVOQUE Transcatheter Tricuspid Valve Replacement: Pivotal Clinical Investigation of Safety and Clinical Efficacy using a Novel Device (TRISCEND II) *
- Edwards PASCAL Transcatheter Valve Repair System Pivotal Clinical Trial (CLASP II TR): A Prospective, Multicenter, Randomized, Controlled Pivotal Trial to Evaluate the Safety and Effectiveness of Transcatheter Tricuspid Valve Repair with the Edwards PASCAL Transcatheter Valve Repair System and Optimal Medical Therapy (OMT) Compared to OMT Alone in Patients with Tricuspid Regurgitation *

- Percutaneous or Surgical Repair In Mitral Prolapse And Regurgitation for >65 Year-olds (PRIMARY)*
- Prospective Randomized On-X Valve Anticoagulation Clinical Trial (PROACT)
- Randomized Trial of the Neochord DS1000 System versus open Surgical Repair (ReChord Trial) -NCT02803957
- VAD Destination Therapy Post Approval Study

Cardiac Surgery Basic Science Research

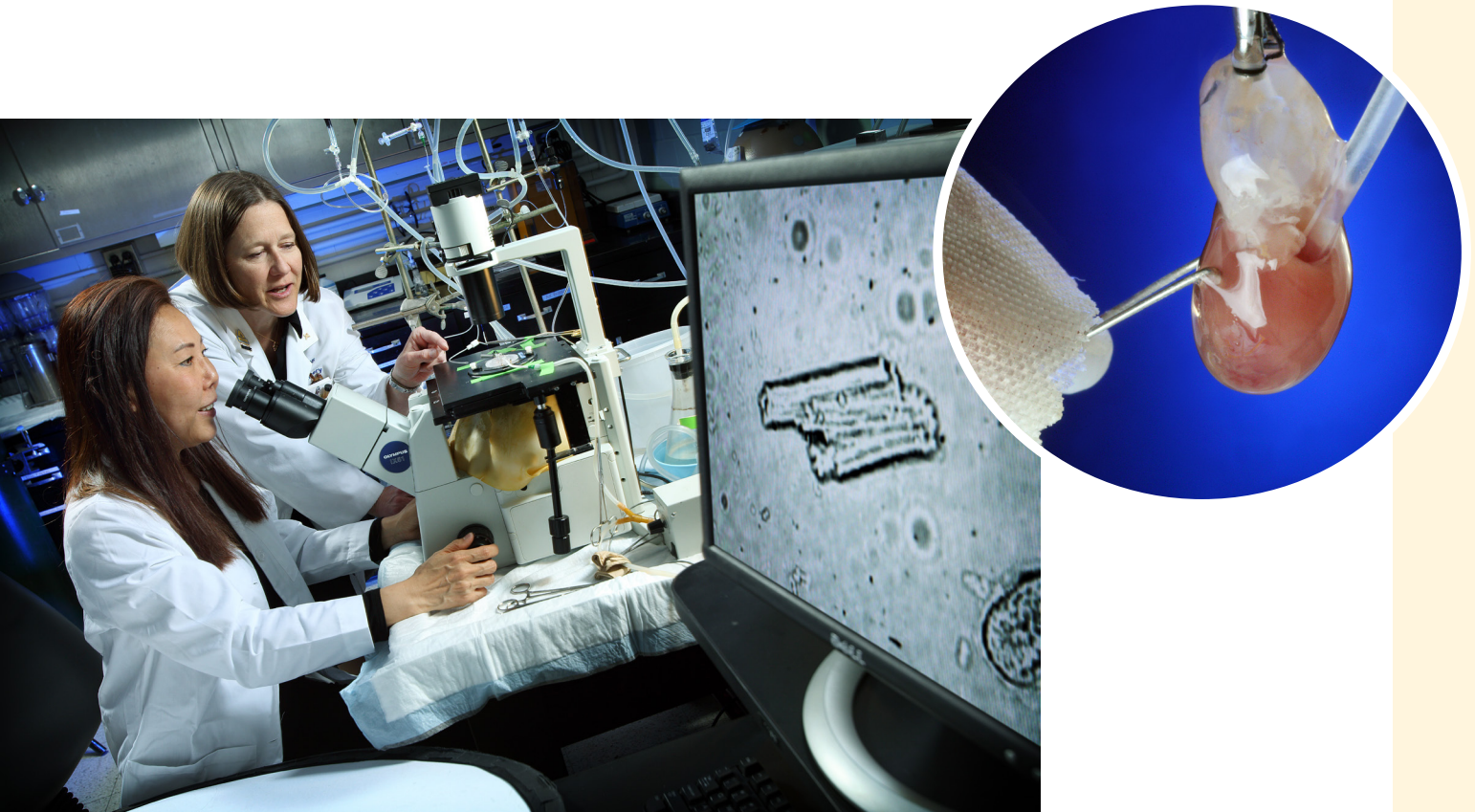
- Canine Deep Hypothermic Circulatory Arrest Model
- Porcine Global Myocardial Ischemia Model
- Porcine Cardiac Arrest Model - Brain Protection
- Porcine Model: ECMO and ECPR
- Porcine Model of Cerebral Blood Flow

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 Circulatory 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.



Cerebral Blood Flow, Cerebrovascular Autoregulation, and Neurologic Outcomes in a Swine Model of Extracorporeal Cardiopulmonary Resuscitation (ECPR)

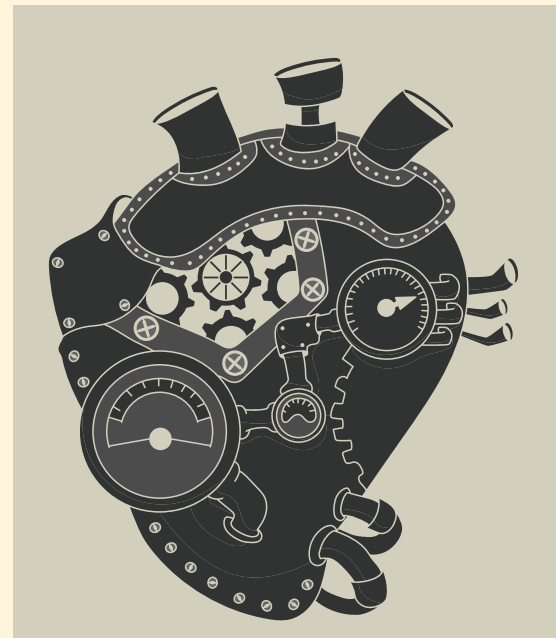
- Sung-Min Cho's study focuses on autoregulation of cerebral blood flow in porcine ECMO models to better understand the impact of cardiac arrest patients who are resuscitated with ECMO. Autoregulation in small animals have been shown to be a strong prognostic indicator of function neurologic outcomes. Currently, there is a paucity of knowledge in understanding neuro-autoregulation under non-pulsatile conditions as rendered by ECMO support and its impact on autoregulation itself and clinical outcomes.

Swine Model of Neurologic Complications while being Supported on Extracorporeal Membrane Oxygenation (ECMO)

- We are investigating the continuous flow on circulation on the brain and hemodynamic effects of ECMO.

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, hemo- and fluid dynamics, 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

2021

1. Robotic sympathectomy for recurrent ventricular arrhythmias
2. Evaluating Weekend Effect in Lung Transplantation
3. Nutritional Risk Index: A Predictive Metric for Mortality Following Lung Transplant
4. Geographic Differences in Dissemination of Minimally Invasive Pulmonary Lobectomy
5. Variability in Institutional LOS post-Lung Transplantation
6. Pneumonectomy outcomes
7. Educational research and training innovation in cardiothoracic surgery: A year in review
8. Immunogenetic Determinant of Primary Graft Dysfunction in Lung Transplantation
9. A Retrospective study of factors contributing to clinical outcomes in Lung Transplant Recipients
10. Examining the effect of prehab nutrition on sarcopenia in Lung Transplant Recipients

Institutional Trials

1. J06115 - Early Detection and Predicting Recurrence in Non Small Cell Lung Cancer PI: Malcolm Brock; Department of Surgery – Active
2. J1414 - Neoadjuvant Anti-PD-1 Antibody, Nivolumab, in Resectable Non-Small Cell Lung Cancer PI: Patrick Forde; Department of Oncology – Active
3. J17137 – Analysis of protein signature of tumor tissue for the early detection of cancers PI: Qing Kay Li; Department of Pathology – Surgical Pathology – Active
4. J0672 - Molecular Basis of Barrett's-Associated Carcinogenesis PI: Stephen Meltzer; Department of Medicine – Gastroenterology & Hepatology – Active
5. J15172 – LUNG CancerREgistry: An Open Registry to Measure the Impact of Adding RNA Expression Testing (myPlan Lung Cancer) on Referral Decisions and to Assess Disease-free Survival with Long-term Follow-up in Newly Diagnosed Early Stage Lung Adenocarcinoma Patients PI: Malcolm Brock; Department of Surgery - Active
6. J1668 – A Randomized, Multicenter, Double Blind, Phase III Study of Nivolumab or Placebo in Subjects with Resected Lower Esophageal, or Gastroesophageal Junction Cancer (CheckMate 577: CHECKpoint pathway and nivolumab clinical Trial Evaluation 577) PI: Ronan Kelly; Department of Oncology – Active
7. J1714 – Phase IB trial of induction nivolumab/ipilimumab prior to concurrent chemoradiation plus nivolumab in patients with operable stage II/III esophageal/gastroesophageal junction cancer PI: Ronan Kelly; Department of Oncology – Active
8. J1758 – Pharmacy-Driven Smoking Cessation Pilot Program within a Multidisciplinary Cancer Clinic for Thoracic Malignancies PI: Catherine Burdalski; Bayview Department of Oncology – Active

9. J1826 – Studying the Pathologic and Immunologic Response after Ablative Radiation in Stage I Non-Small Cell Lung Cancers (SPARC) PI: Khinh Ranh Voong; Department of Radiation Oncology & Molecular Radiation Science – Active
10. Z1762 – Investigational Optical Imaging of Gastrointestinal Tissue PI: Richard Battafarano; Department of Surgery – Active
11. J1668 – A Randomized, Multicenter, Double Blind, Phase III Study of Nivolumab or Placebo in Subjects with Resected Lower Esophageal, or Gastroesophageal Junction Cancer (CheckMate 577: CHECKpoint pathway and nivolumab clinical Trial Evaluation 577) PI: Ronan Kelly; Department of Oncology – Active
12. J1772 – Neoadjuvant Immunoradiation for Stage IIIA Resectable Non-Small Cell Lung Cancer PI: Jarushka Naidoo; Department of Oncology - Active

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. TOP Registry: The Organ Care System (OCS™) Lung Thoracic Organ Perfusion (TOP) Post Approval Study (PAS) Registry
2. Increasing Lung Transplant Availability Using Normothermic Ex Vivo Lung Perfusion (EVLP) at a Dedicated EVLP Facility
3. Validation of epigenetic biomarkers of lung cancer recurrence in Israel (FAMRI Israel-New York-Hopkins Collaborative)
4. Validation of epigenetic biomarkers of esophageal cancer recurrence in Japan
5. International Trial to Evaluate Safety and Efficacy of Portable Organ Care System Lung System EXPAND II
6. Evaluation of the Efficacy and Safety of PTC299 in Hospitalized Subjects with COVID-19 (FITE19)

Brock Lab

Collaborations - Multiple collaborations with Departments of Oncology, Biostatistics, Pathology, Medicine, and Molecular and Comparative Pathobiology.

Research Programs

A. Oncology

1. Biomarkers – active program in evaluating molecular predictors of early detection of lung cancer and disease recurrence. Particularly interested in combining these molecular predictors with “omics” and big data to exploit patterns and changes in radiological images and pathological specimens that have profound impact on clinical outcome but are invisible to the naked eye of a clinician.
2. Epigenetic Therapy – active program to evaluate the use of epigenetic therapy as an adjuvant treatment to decrease the likelihood of cancer recurrence after surgery.
3. Biobank Collection – the lab maintains a large prospective bank of early lung cancer specimens with blood sputa and clinical follow-up.
4. Lung Cancer and Disaster Medicine – joint grant program with the Department of Molecular and Comparative Pathobiology to investigate the impact of stress on lung cancer tumorigenesis.

B. Non-Oncology

1. Thoracic Dysautonomia – funded study to evaluate the genetic basis of hyperhidrosis.
2. Clinical Trial – funded to investigate the use of supplements and off label uses of medications for symptoms of dysautonomia in thoracic patients.



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 in Baltimore, 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 by faculty members to residents.

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



Cardiac Surgery Research Laboratory



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.



Minimally Invasive Surgical Training Center

The Johns Hopkins Minimally Invasive Surgery Training and Innovation Center (MISTIC) is a cutting-edge simulation center that strives to improve patient care through collaboration with a group of highly trained physicians, surgeons and technicians. The Center's learner-centered approach to medical education coupled with traditional teaching styles, enables experiential learning for students, physicians and community populations.

The facility, formerly the lab space of Dr. Alfred Blalock and Vivien Thomas, L.L.D. in The Johns Hopkins Hospital, has remained a surgical training and laboratory space for decades. In 2002, the space was renovated and re-dedicated as the Minimally Invasive Surgery Training and Innovation Center. The space is over 8900 square feet and provides numerous resources for surgery and other specialties.



Included in MISTIC's simulation rooms are over 12 state-of-the-art robotic surgery systems. These robots allow physicians to simulate advanced procedures and learn how to perform them under real life conditions. This simulation facility at The Johns Hopkins Hospital is unique as this training is offered at few hospitals around the country.

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 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.



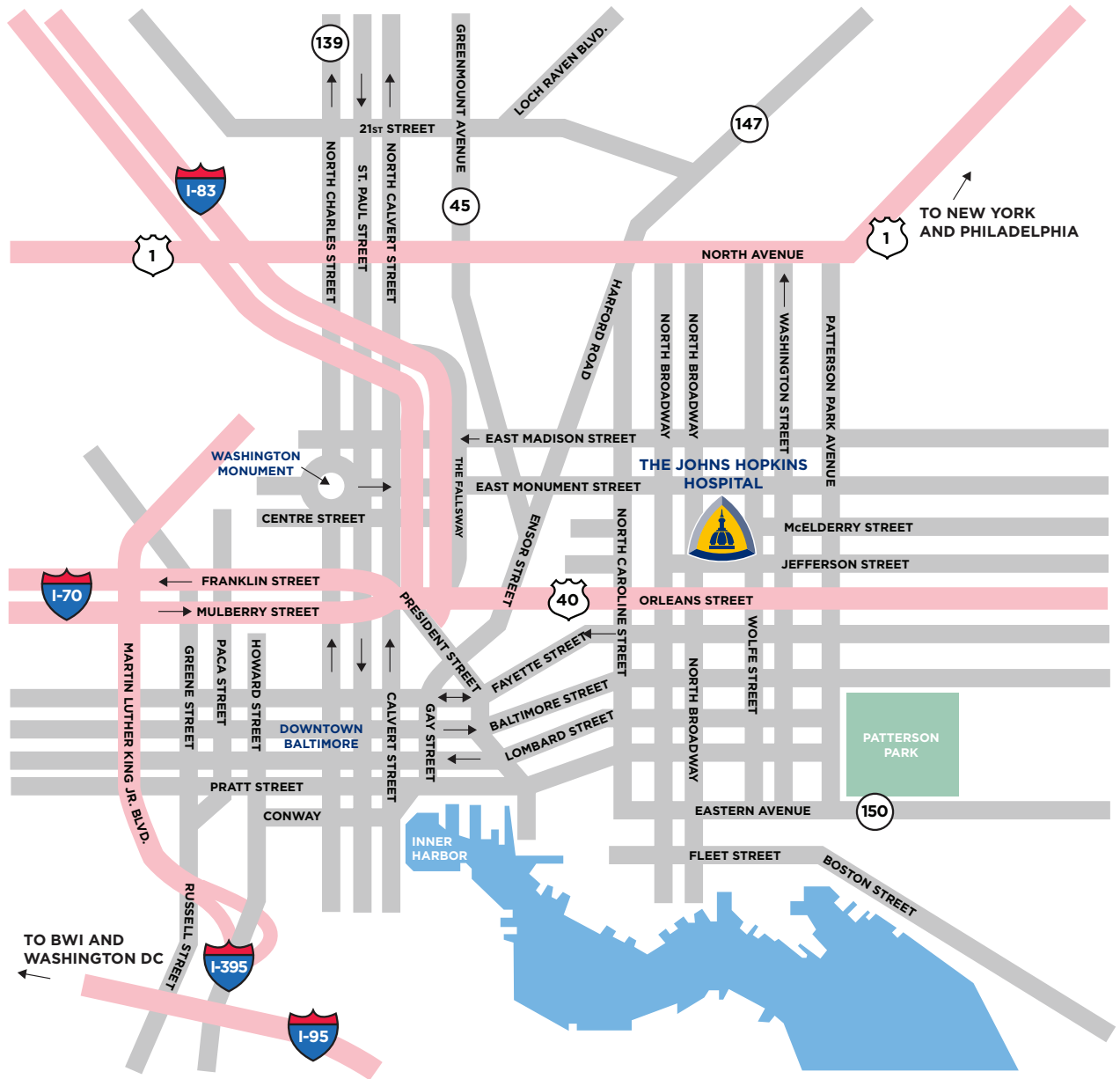
▲ **Aerial View of Fort McHenry**

Photo credit: Visit Baltimore

▼ **Baltimore Inner Harbor**

Photo credit: zrfphoto





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 2020 was 585,708 people. It is the 31st 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.



Photo credit: Visit Baltimore

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.



Photo credit: Visit 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

[hopkinsmedicine.org/cardiac-surgery](http://www.hopkinsmedicine.org/cardiac-surgery)

Johns Hopkins Hospital Heart and Vascular Institute

<http://www.hopkinsmedicine.org/heart>

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>

The Blalock-Taussig-Thomas Pediatric and Congenital Heart Center

<http://www.hopkinschildrens.org/heart>

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

The Johns Hopkins University School of Medicine

Johns Hopkins Division of Cardiac Surgery

The Johns Hopkins Hospital

1800 Orleans St.

Zayed Tower 7107

Baltimore, MD 21287

Phone: 410-955-2800

Fax: 410-955-3809

Johns Hopkins Division of Thoracic Surgery

The Johns Hopkins Hospital

600 N. Wolfe St.

Blalock 240

Baltimore, MD 21287

Phone: 410-614-3891

Fax: 410-614-9428

