



 **WVU** Heart & Vascular
Institute

Letter from our Executive Chair

On behalf of more than 300 physicians, advanced practice providers, and scientists, together with 1,600 dedicated nurses, perfusionists, technologists, and staff, who comprise the WVU Heart and Vascular Institute, it is my privilege to highlight the exceptional accomplishments and continued innovations delivered by our team to the people of West Virginia, the surrounding region, and the nation.

These achievements exemplify why J.W. Ruby Memorial Hospital continues to be recognized as the number one hospital in West Virginia by *U.S. News & World Report*, and why the WVU Heart and Vascular Institute remains acknowledged as the state's leading heart program. Our outcomes, access, and commitment and evidence-based care reflect a culture grounded in excellence, evidence, and impact.

Our faculty in Morgantown are the foundation of the region's premier quaternary academic referral center, delivering nationally recognized care across advanced cardiology; cardiac, thoracic, and vascular surgery; complex valve and structural heart therapy; robotic and minimally invasive surgery; extracorporeal membrane oxygenation; and heart transplantation. Equally important, our success is amplified by the outstanding contributions of physicians and care teams across our expanding system of hospitals, who provide consistently high-quality, patient-centered care close to home whenever possible.

The WVU Heart and Vascular Institute serves all 55 counties of West Virginia and neighboring states through our integrated academic medical center, 25 hospitals, and 32 clinical sites across a five-state region. Through this coordinated network, our teams ensure timely access to specialized quaternary service, merely a phone call away, while maintaining seamless continuity of care across the system.

Within this report, you will find a comprehensive overview of our clinical programs, research initiatives, educational mission, and quality outcomes. Our nationally recognized experts stand ready to deliver the most advanced, evidence-based cardiovascular care, distinguished by a deeply personal commitment to the people and communities we serve.

**Vinay Badhwar,
MD, FACS, FACC**

Executive Chair,
WVU Heart and
Vascular Institute



Setting the standard for excellence

The WVU Heart & Vascular Institute is transforming cardiovascular care with groundbreaking procedures and cutting-edge techniques.

Our advancements set new standards, improve outcomes, and inspire medical innovation worldwide.

WVUMedicine.org/Heart

West Virginia's Highest Rated Heart Program*



*According to the U.S. News & World Report Hospital Data Insights

Society of Thoracic Surgeons (STS)

Advanced Heart Valve Program rated in the top 3 percent for quality in the nation

Vinay Badhwar, MD, elected President

U.S. News & World Report

Recognized as High Performing in:

- Abdominal Aortic Aneurysm Repair
- Aortic Valve Surgery
- Heart Arrhythmia
- Heart Attack
- Heart Bypass Surgery
- Heart Failure
- Lung Cancer Surgery
- Pacemaker Implantation
- Transcatheter Aortic Valve Replacement

Intersocietal Accreditation Commission (IAC)

- Recognized for 21 years of echocardiology accreditation

American Heart Association's Get With The Guidelines®

- Heart Failure Gold Plus
- Stroke Gold Plus
- Resuscitation Target Survival

Society for Vascular Surgery Quality Initiative

- Carotid Care Quality Champion

Extracorporeal Life Support Organization (ELSO)

- Platinum Level Center of Excellence in Life Support

523,946

**Total
Patient
Visits
in 2025**

10,198

*Cath Lab
Interventions*

1,596

*Open Heart
Procedures*

490,023

*Cardiovascular Diagnostic
Studies Performed*

2,371

*Thoracic
Operations*

5,451

*Vascular
Operations*

1,584

*Electrophysiology
Procedures*

1,055

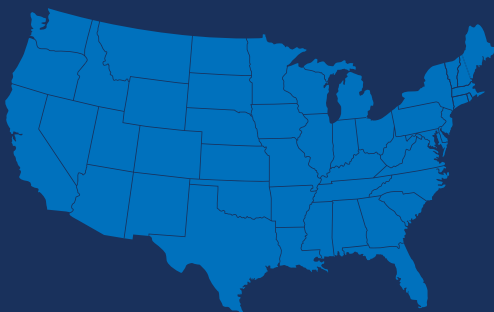
*Cardiac
MRIs*

5,497

*Cardiac CT
Studies*

164

*Cardiac
PET*



Trusted by Patients Across the Nation — and Around the Globe

Our patients come from all over the world and nearly every state to be seen by the world-class physicians who call the WVU Heart and Vascular Institute home.

Cardiology

The WVU Heart and Vascular Institute Department of Cardiology is West Virginia's most comprehensive cardiovascular program, delivering world-class cardiac care across both urban and rural populations.

We offer the full spectrum of cardiovascular subspecialties ranging from preventive cardiology and advanced imaging to complex interventional procedures, electrophysiology, heart transplantation, and mechanical circulatory support. Our Department is unified by a singular mission: to bring cutting-edge cardiovascular medicine close to home.



Leading Cardiovascular Care

Geographic barriers and limited access to specialized care have historically been a hurdle to providing care to distant communities, but we are tackling this challenge head on.

Our faculty and advanced practice providers travel regularly to community hospitals throughout the state, performing procedures, conducting consultations, and building sustainable partnerships with local physicians. We have established heart failure clinics and electrophysiology services in regional centers from Wheeling to Princeton, ensuring that patients can access expert subspecialty care without having to travel hundreds of miles.

Transforming Access to Care Through Technology



Artificial Intelligence & Advanced Imaging: Cardiac imaging algorithms allow us early and precise disease detection.



Remote Monitoring Platforms: Thousands of patients with implanted cardiac devices are continuously monitored by our specialist teams, enabling rapid intervention when needed.



Telemedicine Expansion: Subspecialty expertise is delivered via secure video visits, reducing the travel burden on patients.



Collaborative Networks: Digital connectivity allows community cardiologists to consult with our subspecialists in real time, enhancing local decision-making and expediting transfers.

We not only treat patients; we build lasting relationships with the physicians, hospitals, and communities, creating a sustainable ecosystem of cardiovascular excellence that will serve the region for generations to come.



We're committed to delivering comprehensive cardiovascular care across our rural and urban communities, combining the most advanced imaging and prevention strategies with a deep dedication to serving the people of West Virginia.



George G. Sokos, DO, FACC

*Abnash C. Jain Professor and Chair
Department of Cardiology*



The region's mountainous landscape and socioeconomic barriers, limit access to specialized care. Through an expansive, integrated network, world-class care is accessible to patients across the state, even our most distant neighbors.

Noninvasive Cardiology & Cardiovascular Imaging

Early detection and prevention are the basis of effective cardiovascular care. Our Noninvasive Cardiology Program combines state-of-the-art diagnostic imaging with comprehensive preventive services to identify and manage disease before it progresses. Through specialized preventive clinics and advanced imaging modalities, including cardiac CT, MRI, nuclear cardiology, and echocardiography, we deliver personalized strategies that reduce risk and improve outcomes.



Preventive Cardiology

Lipid Clinic: Multidisciplinary management of complex cholesterol disorders

Cardiometabolic Clinic: Integrated care for heart disease, diabetes, and metabolic disorders

Women's Cardiovascular Health: Cardio-obstetrics, preventive care, and risk assessment

Advanced Cardiac Imaging

- Nuclear cardiology with PET imaging
- Specialized imaging for amyloidosis, sarcoidosis, and vascular inflammation
- Advanced echocardiography with strain and 3D imaging
- 320-row cardiac CT with plaque analysis and CT-FFR
- Cardiac MRI with 4D flow analysis

Advanced Heart Failure & Cardiomyopathy Programs

Heart failure is a leading cause of hospitalization in West Virginia. The WVU Advanced Heart Failure Program serves as the only comprehensive center for advanced therapies, including mechanical support and heart transplantation, in West Virginia. Our multidisciplinary team delivers coordinated, patient-centered care across the entire disease spectrum.



2025 Expansion:

- Launched system-wide Heart Failure Care Redesign Initiative
- Established dedicated clinics in Wheeling, Martinsburg, Charleston, Bridgeport, Parkersburg, and Princeton

Services:

- Heart transplantation
- Mechanical circulatory support (temporary and durable LVAD)
- National clinical trial access
- Remote monitoring (pacemakers, defibrillators, pulmonary artery sensors)
- Specialized cardiac amyloidosis and sarcoidosis programs
- Home inotropic therapy

Specialized Services

Cardiogenic Shock – West Virginia’s only comprehensive shock program providing 24/7 rapid intervention through:

- Integrated multidisciplinary team (heart failure, critical care, interventional cardiology, cardiac surgery)
- Advanced mechanical support, including ECMO and durable ventricular assist devices
- Single-call consultation system for expedited lifesaving treatment with around-the-clock availability

Hypertrophic Cardiomyopathy (HCM) – Our program provides comprehensive specialized care for this complex inherited cardiac condition through:

- Advanced cardiovascular imaging (echocardiography, cardiac MRI, and CT) for precise diagnosis and risk stratification
- State-of-the-art medical and surgical management, including novel therapies

Pulmonary Hypertension – The program continues to expand its capabilities to meet growing demand for specialized pulmonary vascular care across our region. Our multidisciplinary team delivers individualized, evidence-based care through:

- Comprehensive diagnostic services, including advanced hemodynamic assessment and exercise right heart catheterization
- Full range of FDA-approved therapies, including combination oral and parenteral prostacyclin formulations
- Access to cutting-edge clinical trials and investigational therapies

Cardio-Oncology – West Virginia’s only program dedicated to cardiovascular complications of cancer therapy. Through close collaboration with the WVU Cancer Institute, our expanded team of dedicated cardio-oncology physicians provides:

- Cardiovascular monitoring and management throughout cancer treatment
- Advanced diagnostics to prevent and treat therapy-related cardiac complications

Structural Heart & Interventional Cardiology Programs

We deliver the region's most advanced catheter-based cardiovascular therapies. Our teams specialize in minimally invasive treatments for complex valve disease, coronary artery disease, and structural cardiac abnormalities, which offer access to cutting-edge alternatives to traditional treatments.

Delivering high-volume catheter-based interventions with international recognition for excellence.

Services

- Transcatheter valve procedures (TAVR, LAAO, M-TEER, T-TEER, TMVR, TTVR)
- Paravalvular leak closure
- Adult congenital heart defect repair
- Robotic aortic valve surgery (world-leading expertise)

Interventional Cardiology Program

Advanced coronary and vascular therapies with cutting-edge technology

Key Capabilities

- Drug-eluting balloons for in-stent restenosis
- Renal artery denervation for resistant hypertension
- Laser atherectomy and high-precision imaging
- Chronic total occlusion expertise

“The WVU Heart and Vascular Institute Interventional Cardiology and Structural Programs continue to provide the most comprehensive care available. From access to novel clinical trials to the latest technology available, we are proud to deliver nation-leading care to every citizen of West Virginia and the surrounding multi-state region.”



Ramesh Daggubati, MD

Vice-Chair, Department of Cardiology and Chief of Interventional Cardiology Services



We have it right: we are focused on quality and comprehensiveness. This is why we are active in defining the future of the craft, as well as in training the next generation.



David Schwartzman, MD

Chief of Cardiac Electrophysiology



Cardiac Electrophysiology Program

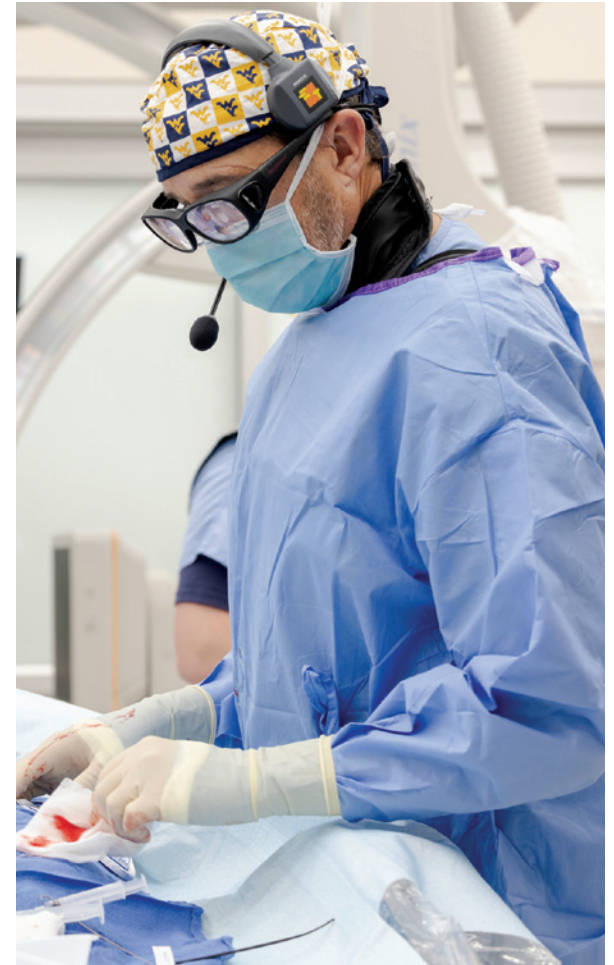
Abnormal heart rhythms can lead to stroke, heart failure, and sudden cardiac death if left untreated. The Cardiac Electrophysiology Program is West Virginia's largest heart rhythm center, providing comprehensive care from medical management to advanced catheter ablation and device implantation. Our team combines the latest technologies with deep clinical expertise to diagnose and treat even the most complex arrhythmias, with procedure sites across the state ensuring access close to home.

Center for Atrial Fibrillation

Comprehensive treatment, including pharmacologic therapy, state-of-the-art catheter ablation with pulsed field technology, and robotic Cox Maze surgery

Comprehensive Services

- Ablation (SVT, atrial fibrillation, ventricular tachycardia)
- Pulse Field Ablation (PFA)
- Advanced device implantation (transvenous, subcutaneous, extravascular ICDs)
- Leadless pacemaker technologies
- Cardiac resynchronization therapy with physiologic pacing
- Complex lead extraction



We train cardiac electrophysiologists within highly sought after resident and fellowship training programs. Collaborations within HVI, including the Structural Heart and Cardiac Surgery teams, permit us to offer a uniquely comprehensive portfolio.

Expansion

As part of our commitment to delivering world-class cardiac care, we have expanded access to advanced cardiovascular services statewide, bringing specialized care closer to patients in their home communities.

Extended the structural heart program to Charleston (Thomas Memorial) and Parkersburg (Camden Clark)

Expanded electrophysiology services to Charleston, Parkersburg, and Princeton Community Hospital

Deployed cardiac CT imaging across multiple system sites to support earlier detection in underserved regions

Established heart failure clinics in Princeton, Bridgeport (United Hospital Center), and Charleston as part of the system-wide Heart Failure Care Redesign Initiative



National and International Recognition

WVU Medicine ranks among national leaders in clinical trial enrollment, bringing cutting-edge therapies to West Virginia communities.

International Cardio-Oncology Society Gold Center of Excellence—West Virginia’s only dedicated program

American Heart Association Get with the Guidelines Gold Plus Award for heart failure care excellence



Dr. Ramesh Daggubati serves on SCAI International Committee and JSCAI Editorial Board



Dr. George G. Sokos elected West Virginia Chapter ACC Governor April 2025, member of ACC Health Equity Committee and Leader of Rural Health Work Group for ACC



Dr. Alison L. Bailey serves as Editor in Chief of ACCEL and is the Treasurer for the American Society of Preventive Cardiology

Comprehensive Advanced Care

West Virginia’s only Comprehensive Advanced Heart Failure Center with Joint Commission-accredited durable LVAD program and CMS-certified Heart Transplant program

Largest cardiac electrophysiology experience and highest procedural throughput in the state

Only center in West Virginia offering both oral and intravenous pulmonary arterial hypertension therapies

Dedicated Chronic Total Occlusion (CTO) program for complex coronary artery disease

Cardiac Surgery

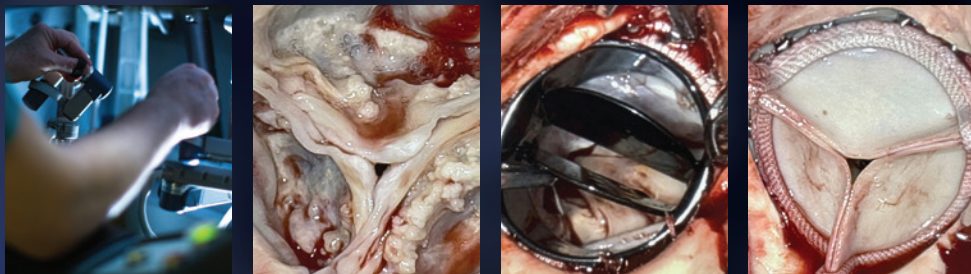
The Division of Cardiac Surgery in the Department of Cardiovascular and Thoracic Surgery is recognized as the best in West Virginia and one of the top 50 programs in the nation. We provide the highest quality and most advanced cardiac surgical therapies available.



Advancing Robotic Cardiac Surgery on the Global Stage

Our Robotic Cardiac Surgery Program is recognized as a world leader by the Society of Thoracic Surgeons and the American Association for Thoracic Surgery. We have become the premier destination for advanced techniques and robotic innovation, assisting several programs across the United States and around the world.

At the WVU Heart and Vascular Institute, our surgeons developed and launched robotic aortic valve replacement (RAVR) in 2020 and perform it routinely. We remain the most experienced RAVR program in the world. Currently, we offer robotic cardiac options to address disease in multiple valves, as well as several concomitant operations involving surgical ablation of atrial fibrillation and CABG.



In November, the third WVU International RAVR Symposium was hosted in Morgantown, which welcomed attendees from 20 states and nine countries. Over two days, participants engaged in interactive sessions and discussions centered on advancing robotic aortic valve replacement and its role in multidisciplinary cardiac care. The event provided a rare opportunity for attendees to observe complex robotic procedures in real time and exchange ideas at the forefront of surgical innovation.



Advancing Minimally Invasive Heart Care

YouTube

As part of our ongoing commitment to advancing robotic heart valve procedures, we launched the YouTube series “*Advancing in Robotic Heart Surgery*.” The series serves as a comprehensive educational resource for surgeons, cardiologists, and multidisciplinary heart teams worldwide.

To learn more or watch the series, visit [YouTube.com/@DrBadhwar](https://www.youtube.com/@DrBadhwar).

State-Wide Expansion in Cardiac Surgery

In 2025, the Division of Cardiac Surgery expanded services in Charleston, performing the first valve replacement procedures and robotic-assisted coronary revascularization at Thomas Hospitals. Extending world-class care to patients in the southern part of the state under the leadership of **Dr. Nestor Dans** and **Dr. Nathan Kister**. **Dr. Jonathan Afoke** helped to further expand cardiac surgery services at Camden Clark Medical Center in Parkersburg.



A Regional Leader

The Division of Cardiac Surgery has accomplished many state firsts for West Virginia, such as heart transplantation, LVAD, and robotic surgery, and several other advanced cardiac operations, including:

- Complex valvular reconstruction of regurgitant lesions, mitral valve repair, tricuspid valve repair, and primary aortic valve repair facilitated by geometric ring annuloplasty and root remodeling
- Mitral valve repair and tricuspid valve repair involving complex reconstruction and robotic approaches to valve repair
- Surgical treatment of atrial fibrillation, featuring the world's best long-term results with the robotic biatrial Cox-Maze operation
- Novel robotic aortic valve replacement using biological and mechanical prostheses

- Complex aortic aneurysm repair, hybrid arch reconstruction, debranching, and frozen elephant trunk therapy
- Coronary artery bypass grafting (CABG), including a robotic minimally invasive approach
- Surgical myectomy for hypertrophic cardiomyopathy, including a robotic approach
- Orthotopic heart transplantation
- Mechanical circulatory support, veno-arterial ECMO, right ventricular support, and LVAD devices

Academic Impact

We excel academically, with more than 200 peer-reviewed publications in top-tier journals over the past three years, including the *New England Journal of Medicine*, *Lancet*, *Journal of the American Medical Association*, *Circulation*, *Journal of the American College of Cardiology*, *Journal of Thoracic and Cardiovascular Surgery*, and *Annals of Thoracic Surgery*.

We are the only center in the region that provides access to several novel NIH clinical trials in cardiovascular disease as the leading institution of the Cardiothoracic Trials Network. The network is supported through a grant from the National Heart, Lung, and Blood Institute. These trials evaluate differences between transcatheter and surgical repair of mitral insufficiency, optimal anticoagulation for postoperative atrial fibrillation, and novel devices to minimize the risk of stroke.



The NEW ENGLAND
JOURNAL of MEDICINE



THE LANCET

Circulation



JACC

THE ANNALS
of
THORACIC
SURGERY



Cardiothoracic Surgery Fellowship Program

Following the launch of the fellowship program eight years ago, we successfully match our top candidates from across the nation each year. The fellows are offered a multitude of exceptional technical and academic opportunities, and each one has presented innovative research at the Society of Thoracic Surgeons and American Association for Thoracic Surgery annual meetings and has subsequently advanced to excellent cardiothoracic faculty positions around the United States.



Nationally Trusted Leadership

The WVU Heart and Vascular Institute's national impact and vision extend beyond West Virginia. **Dr. Vinay Badhwar**, executive chair of the WVU Heart and Vascular Institute and chair of the Department of Cardiovascular and Thoracic Surgery, has been elected to the position of president of the Society of Thoracic Surgeons and assumed the role of the prestigious organization in January 2026.

The STS is the world's largest cardiothoracic surgery organization with 8,100 members in 110 countries. It is recognized by providers, hospitals, and governments as the leading authority on quality outcome reporting.

Pediatric Cardiothoracic Surgery

The Division of Pediatric Cardiothoracic Surgery in the Department of Cardiovascular and Thoracic Surgery and the WVU Medicine Golisano Children's Heart Center provide comprehensive, lifelong treatment for patients with congenital heart disease. Our program offers world-class care from birth through adulthood.

Comprehensive care for our children

Our comprehensive team of esteemed heart specialists has content expertise and experience to manage even the most serious conditions. By uniting the Children's Heart Center and the WVU Heart and Vascular Institute, we use advanced technology and expertise to diagnose and treat heart conditions early—supporting patients from childhood through adulthood.

In 2025, the hospital was renamed in honor of a transformational gift from Tom Golisano and became part of the Golisano Children's Alliance, a national network of children's hospitals collaborating to share best practices and strengthen pediatric care.



Modern pediatric heart treatments are safer and more effective than ever and are all comprehensively available at the WVU Medicine Golisano Children's Heart Center.

Subspecialty Programs

Advanced pediatric and neonatal cardiac surgery: The Division has a comprehensive approach to the correction of complex congenital anomalies and serves as a referral destination for these children.

Cardiac electrophysiology: Our pediatric electrophysiologists diagnose and ablate arrhythmias and offer electrocardiogram (EKG) interpretation, Holter monitoring, and pacemaker placement and management.

Cardiac imaging: We offer the latest noninvasive procedures to diagnose heart problems, including fetal echocardiograms, cardiac CT, and cardiac MRI.

Cardiogenetic services: Our Cardiogenetic Clinic serves children and families with hereditary heart conditions, including inherited arrhythmias. Family history and genetics help customize care for our patients, especially for complex cardiothoracic surgery.

Our Cardiac Intensive Care Unit (CICU) supports children recovering from heart surgery or serious heart-related illness. Staffed by doctors, critical care nurse practitioners, and physician assistants, we offer the most advanced care available, including extracorporeal membrane oxygenation (ECMO) for children who need cardiac or respiratory support for life-threatening conditions.

Single ventricle care: We offer highly specialized care for babies born with single ventricle heart defects, such as hypoplastic left heart syndrome (HLHS). Children with these abnormalities often undergo a series of heart surgeries and require critical care between procedures. Our home interstage monitoring program and follow-up clinic help us provide comprehensive care for these fragile patients after discharge.

Adult congenital heart disease (ACHD): Our ACHD specialists care for adults born with heart defects who need lifelong follow-up care to maintain their heart health.

Cardiac catheterization: Our interventional cardiologists use catheters to diagnose and treat heart problems without surgery. This includes transcatheter/minimally invasive valve replacement, patent ductus arteriosus (PDA) occlusion, and complex interventions on single ventricle patients.

West Virginia's first and only:

Pediatric cardiac surgery program

Pediatric ECMO program, designated a Silver Level Center by the Extracorporeal Life Support Organization (ELSO)

West Virginia's only:

Pediatric cardiac catheterization laboratory

Pediatric electrophysiology laboratory

Pediatric cardiac intensive care unit (CICU)

Showcasing Research Worldwide



Christopher Mascio, MD, and **Dhaval Chauhan, MD,** presented cutting-edge research at international meetings in 2025, including:

- “*Center Volume Is Not Associated With Failure To Rescue in Pediatric Cardiac Surgery*” (The Society of Thoracic Surgeons 2025 Annual Meeting – Los Angeles, CA)
- “*Discussant For The James S. Tweddell Memorial Paper in Congenital Surgery*” (The Society of Thoracic Surgeons 2025 Annual Meeting – Los Angeles, CA)
- “*The Ross Procedure: A great Operation For The Right Patient*” (The Society of Thoracic Surgeons 2025 Annual Meeting – Los Angeles, CA)
- “*CHSD Audit*” (The Society of Thoracic Surgeons – Advances in Quality & Outcomes 2025 Annual Meeting – San Antonio, TX)

Thoracic Surgery

The Division of Thoracic Surgery in the Department of Cardiovascular and Thoracic Surgery is a national leader, serving West Virginia and five neighboring states. Care is delivered through WVU Medicine hospital-based programs in Parkersburg, Martinsburg, Wheeling, Charleston, and Bridgeport. At Morgantown's Ruby Memorial, the main quaternary hospital, our thoracic surgeons perform the most comprehensive and contemporary surgical procedures.

Contemporary Surgical Procedures

Our team of thoracic surgeons treats patients with a wide array of diseases of the chest wall, lungs, and upper gastrointestinal system (esophagus and stomach). We use the most advanced technology and the latest surgical techniques in minimally invasive bronchoscopic, robotic, and video-assisted thoracoscopic platforms.

The Division has continued to grow steadily to 11 thoracic surgeons across the state performing more than 2,200 thoracic cases annually in six different WVU centers. In addition to Ruby Memorial, robotic thoracic surgery is now routinely offered at our satellite centers of Camden Clark Medical Center in Parkersburg, Wheeling Hospital, United Hospital Center in Bridgeport, and Berkeley Medical Center in Martinsburg, with plans to expand to Thomas Memorial in Charleston.

From an academic perspective, the Division continues to provide leading contributions and publications for the annual meetings and journals of the Society of Thoracic Surgeons (STS), the American Association of Thoracic Surgeons (AATS), the Southern Thoracic Surgery Association (STSA), the European Association for Cardio-Thoracic Surgery (EACTS), and the European Society of Thoracic Surgeons (ESTS). The faculty also serve in a wide range of national and international leadership roles in the STS, EACTS, and AATS.



Centers of Excellence

Robotic Thoracic Surgery Program	Our physicians have the region's most experience performing robotic procedures with a structured program that provides patients with easy access to the latest care and expert surgeons.
Lung Cancer Program	We focus on early detection, minimally invasive lung-sparing surgery, and advanced treatment for all stages of lung cancer. Our nation-leading program combines expert surgery with radiation, chemotherapy, immunotherapy, and SBRT through a fully integrated, multidisciplinary team.
Esophageal Cancer Program	Our program treats both adenocarcinoma and squamous cell carcinoma of the esophagus using advanced minimally invasive techniques, including robotic, laparoscopic, thoracoscopic, and endoscopic approaches, for curative and palliative care. We partner closely with Medical and Radiation Oncology to deliver leading multidisciplinary care, with surgical outcomes ranked among the nation's best by the Society of Thoracic Surgeons.
Center for Benign Esophageal Disease	We collaborate with our Gastroenterology and Hepatology Division to provide innovative therapies that include endoscopy, high-resolution manometry, impedance testing, endoscopic ultrasound, esophagography, and BRAVO™ capsule technologies to improve the precision of our procedures. We have the busiest minimally invasive hiatal hernia and anti-reflux program in the region.
Center for Advanced Airway Disease	In addition to conventional modalities of rigid and flexible bronchoscopy, we offer multiple advanced minimally invasive options for patients with complicated airway disease. Our team uses a blend of innovative techniques, such as ION Robotic navigation, cone beam localization, ablative therapy, cryotherapy, photodynamic therapy, endobronchial stenting, endobronchial valves, tracheal resection and reconstruction, and extracorporeal support, to treat various conditions, such as tracheal stenosis, endobronchial tumors, tracheomalacia, and bronchial strictures.
Center for Advanced Lung Failure	We offer a multidisciplinary approach comprising pulmonologists, pulmonary rehabilitation specialists, and thoracic surgeons to offer minimally invasive options to advanced emphysema. The options include endobronchial valve therapy and robotic lung volume reduction surgery. For those with acute severe respiratory failure, we can rapidly deploy extracorporeal support (ECMO).

The regional leader in thoracic surgery volume and procedures

The largest thoracic surgeon group and the growth of advanced robotic thoracic procedures in the region

Our Esophageal Cancer Program is recognized by the STS as a top 3-star performer for surgical outcomes



LUNG CANCER SURGERY

Our Lung Surgery Program is recognized by *U.S. News & World Report*

Lung Cancer Screening Program

The Division of Thoracic Surgery and Division of Pulmonary Medicine collaborate with the WVU Cancer Institute's mobile lung cancer screening unit, LUCAS, a 48-foot mobile unit with low-dose CT lung screening technology that travels to West Virginia's most rural counties. The program was recently highlighted in the *New York Times* for its successful screening outreach into a rural, high-risk population.



Vascular and Endovascular Surgery

This Division of Vascular and Endovascular Surgery offers the full spectrum of open and endovascular surgical procedures at five WVU Medicine hospitals – J.W. Ruby Memorial Hospital in Morgantown, Berkeley Medical Center in Martinsburg, Camden Clark Medical Center in Parkersburg, Wheeling Hospital, and Thomas Memorial in Charleston.

Complex Aorta Care

Complex aortic surgery care is delivered through a multidisciplinary approach involving teamwork between cardiac and vascular providers. The expertise offers the ability to care for a comprehensive array of aortic pathologies, including complex aortic dissections, aneurysms, and aortic infections.

We perform both traditional open aortic procedures as well as advanced endovascular techniques using commercially available fenestrated and branched stent grafts. We are at the forefront of aorta technology, including the new GORE Excluder Thoracoabdominal Branch Endoprosthesis (TAMBE). This device received FDA approval in January 2024 and represents a minimally invasive alternative to open repair of thoracoabdominal aorta disease. Our Division is an active participant in the GORE Thoracic Branch Endograft (TBE) Device Project, and, in conjunction with the Division of Cardiac Surgery, we are proud to help launch the pivotal ARISE II trial – Evaluation of the Ascending Stent Graft device in the Treatment of Lesions of the Ascending Aorta. With these innovations, we lead the state in minimally invasive repair options from the aortic valve in the chest to the distal aorta within the abdomen.



Limb Salvage Advancements

LimFlow therapy, a procedure approved by the Food and Drug Administration in 2023, permanently bypasses vessels that are typically difficult to reconstruct, using the patient's veins as a conduit to better perfuse tissue in the foot. The Vascular Division is excited to offer this revolutionary technology, as this technique offers limb salvage to patients who have no option except amputation.

Noninvasive Vascular Lab Services

Our IAC-accredited Noninvasive Vascular Laboratory continues to grow, performing more than 26,000 studies annually at the Heart and Vascular Institute in Morgantown alone. Our award-winning Heart and Vascular Imaging Service has maintained IAC accreditation for over 20 consecutive years, reflecting a longstanding commitment to high-quality, safe vascular testing since 2003.

Vascular and Endovascular Fellowship

We have successfully matched top candidates from across the nation each year and provide our fellows with outstanding technical and academic opportunities. These include hands-on simulation labs with cadaver dissection, educational morbidity and mortality conferences, journal clubs and case conferences, mock oral examinations to prepare fellows for the American Board of Surgery Vascular Certification Board Examination, and opportunities to present research at national meetings, including the Society for Vascular Surgery (SVS) Vascular Annual Meeting.

Additional Services

Open and endovascular reconstruction for aneurysmal occlusive aortoiliac disease

Open and endovascular reconstruction for peripheral arterial disease/limb salvage

Complex aortic repair, including fenestrated endovascular aneurysm repair

Carotid reconstruction, including endarterectomy

Trans-carotid artery revascularization and percutaneous transfemoral intervention for carotid occlusive disease

Minimally invasive venous intervention for symptomatic venous disease

Goreã thoracic branch endoprosthesis to treat patients with aortic dissection

The Society of Vascular Surgery (SVS) Foundation named us its Vascular Innovation Partner (VIP) of the Month for July 2025, honoring institutions making significant contributions to vascular surgery



We earned the SVS VQI three-star designation for the seventh consecutive year. This award recognizes excellence in:

- Long-term patient follow-up reporting
- Physician attendance at quality meetings
- Ongoing quality improvement initiatives
- Active registry participation



The Division achieved the distinction of Carotid Care Quality Champion by SVS VQI

Academic work recognized at state and national levels, including, *“Reducing Length of Stay Following Carotid Interventions”*

National Excellence & Leadership Delivered with a Personal Touch

This is why patients and physicians from across our state, surrounding regions, and from other countries look to the WVU Heart and Vascular Institute for its expertise.

Cardiovascular Critical Care

The Division of Cardiovascular Critical Care in the Department of Cardiovascular and Thoracic Surgery plays a vital role in providing the most advanced and quaternary level of support to the sickest patients in the region. The Cardiovascular Intensive Care Unit (CVICU) is a 28-bed, high-acuity unit staffed 24/7 by a highly skilled, multi-disciplinary team led by in-house faculty intensivists.

Our team includes highly trained, board-certified critical care specialists from anesthesiology, internal medicine, nephrology, pulmonary medicine, and cardiothoracic surgery, with added expertise in cardiovascular critical care. The faculty are recognized for delivering high-quality, patient- and family-centered care and support the Cardiovascular and Thoracic Surgery, Vascular Surgery, Cardiology, and ECMO programs.

As the most advanced unit in WVU Medicine, the CVICU delivers comprehensive care including, mechanical ventilation, continuous renal replacement therapy, ventricular support devices, and ECMO, for patients with complex cardiac, respiratory, and critical illnesses, as well as postoperative and post-transplant needs. The Division is committed to the highest standards of care and continuously evaluates and adopts innovative technologies and approaches. Advanced sonography, biomarkers, computer-assisted monitoring, cardiac and pulmonary support, high-fidelity simulation, and telemedicine are among the tools integrated into routine practice to support Ruby Memorial Hospital and hospitals across the Health System.

The Division engages in interdisciplinary clinical and translational research and education in partnership with the WVU Critical Care and Trauma Institute, the WVU School of Medicine, and institutions nationwide. It provides comprehensive training for residents and fellows through clinical experiences, lectures, conferences, and didactic sessions, supported by a robust schedule of weekly conferences and monthly Critical Care Grand Rounds featuring local and national faculty.

The faculty hold leadership roles in professional societies and contribute to national meetings and educational initiatives. The Division is deeply engaged in research, with broad participation in clinical trials, investigator-initiated, and translational studies. Current projects explore the impacts of nutrition, artificial intelligence, sleep, and targeted therapies in critical illness. The Division also maintains robust quality and research databases, is developing a tissue repository for biomarker discovery, and has secured grant funding from multiple sources in recognition of its strong commitment to science.



ECMO Program



In 2025, the WVU ECMO Program was awarded Platinum Level Center of Excellence status from the Extracorporeal Life Support Organization (ELSO), a distinction achieved by fewer than 4 percent of ECMO programs worldwide, placing us among the top academic ECMO centers globally. This honor reflects the highest standards in quality, patient

safety, and clinical outcomes, underscoring our commitment to innovation and excellence in extracorporeal support.

Achieving this status is predicated on rigorous benchmarks in clinical outcomes, education, research, and quality improvement. WVU leads the world in each of these areas through pioneering practices, advanced simulation training, and multidisciplinary collaboration. Our philosophy of “Cannulate, Extubate, Ambulate,” focusing on early extubation and mobilization of ECMO patients was recognized nationally this year through an invitation to conduct a Masterclass in ECMO care at the Association of Academic Thoracic Surgery (AATS) 105th annual meeting in Seattle in April.

The WVU ECMO program remains at the forefront of research, contributing numerous peer-reviewed publications that inform best practices and shape the future of ECMO care and have been published in the *Annals of Thoracic Surgery* and the *Journal of Cardiothoracic and Vascular Surgery*. One of the key initiatives has been a focus on longitudinal follow-up and optimizing recovery after severe illness. We strive to improve long-term outcomes for patients and families through our Survivorship Program that meets virtually every quarter and is moderated by trained psychologists to address the post-ECMO emotional and psychological needs in a holistic fashion.

As the only comprehensive ECMO program in West Virginia, we remain committed to providing the highest level of care to people across the state. Our ECMO Air Response Transport Team plays a critical role in this mission, ensuring that advanced life-saving support is available even in the most remote areas. This specialized team, comprised of highly trained surgeons, perfusionists, nurses, and ECMO specialists, operates a fully equipped aircraft with a portable ECMO system. Ready 24/7, the team can mobilize quickly and reach patients within a 119-nautical-mile range, bringing world-class care directly to those who need it, no matter where they are in West Virginia.

Our mission extends beyond patient care to education and workforce development. In collaboration with the WVU School of Nursing, we deliver advanced ECMO education through the N470 course for senior nursing students, introducing future nurses to the fundamentals of extracorporeal support. These sessions provide hands-on learning and simulation-based training, helping prepare the next generation of critical care leaders.

The WVU ECMO Program continues to set the standard for excellence through clinical innovation, academic partnership, and national leadership, all in service to the people of West Virginia and beyond.



Academic Leadership and Research

The Division of Research forms the foundation for scientific inquiry and enterprise for the WVU Heart and Vascular Institute. Our multidisciplinary administrative team spans the specialties of Cardiology, Cardiac Surgery, Thoracic Surgery, Vascular Surgery, and Cardiovascular Critical Care.



Academic Leaders

Among our distinguished faculty, we maintain robust extramural funding, extensive industry sponsorship, and a highly experienced platform upon which clinical trials are funded, staffed, and conducted. The Division of Research is recognized as a top Center of Excellence within the University. We recently initiated a Research Fellowship drawn from current residents that seeks to create a pipeline of physician-scientists who receive broad exposure to basic science methods and simultaneously pursue a master's degree in clinical investigation.

To date, we have collectively published over 700 scientific peer-reviewed manuscripts in the past seven years and continue to contribute at the highest impact level. We have received various accolades, including top awards and distinguished presentations at the annual meetings of The Society of Thoracic Surgeons, Southern Thoracic Surgical Association, the American Association of Thoracic Surgery, the American College of Cardiology, the Society of Vascular Surgery, and the American College of Critical Care Medicine.

“Within the ranks of a multi-stakeholder matrix, we have developed a strong emphasis on mentorship in the scientific method and exposure to advanced data analytics and created an interface with health economics and health policy with a widening intersection with several schools and faculties within West Virginia University through our Center for Innovation.”



J.W. Awori Hayanga, MD, MPH

Director of Research

Research

Our profile has continued to expand with leadership contributions to the National Heart, Lung, and Blood Institute-sponsored Cardiothoracic Surgical Trials Network (CTSN). Furthermore, **Dr. Vinay Badhwar** was appointed vice chair of the CTSN, and in this role, we provide thought leadership in national academic medicine and surgery.

The HVI continues to be a top enroller in multiple NIH and industry-sponsored trials, as well as a major innovator in the scientific development of cardiovascular medicine. The investment in innovation and commitment to research has afforded HVI faculty continued global prominence.

Current trials being conducted at WVU HVI:

CTSN STRIVE IC-SARI	▶ ARISE II	Impella ECP
CTSN EMPRO	CONTEMP-ICD	PROACTIVE II
CONFORMAL	Magical ISR	CTSN PRIMARY
SPYRAL AFFIRM	ENVISION	CTSN PACeS
BACKBEAT	EXCLUDER GORE	

▶ **ARISE II Trial**

The ARISE II trial is designed to evaluate the safety and effectiveness of the GORE® Ascending Stent Graft for the treatment of lesions involving the ascending aorta and aortic arch.

Our Vascular and Endovascular Surgery Division, in close collaboration with the Division of Cardiac Surgery, are active participants in the GORE® Thoracic Branch Endograft (TBE) Device Project, reflecting our ongoing commitment to advancing minimally invasive aortic therapies.



GORE® Ascending Stent Graft

Caution - Investigational device. Limited by Federal (or United States) law to investigational use.



Lawrence Wei, MD, serves as the principal investigator on the ARISE II trial.

Active Trials

Our experts drive innovation through ongoing clinical trials and studies.

For a complete list of all active clinical trials, visit WVUMedicine.org/HVITrials or scan the code to learn more.



Care Beyond Boundaries

The WVU Heart & Vascular Institute's Regional Network Ensures Access for Every Patient.

Our network of specialists extends across the region, connecting a diverse group of hospitals, clinics, and providers. This collaborative community of experts ensures that patients, no matter where they are located, have access to world-renowned leaders in the specialty care they require.

To view a comprehensive and up-to-date list of our services and locations, visit WVUMedicine.org/Heart/Locations.



WVU HVI Flagship Hospital



WVU Heart & Vascular Institute at J.W. Ruby Memorial Hospital

Morgantown, WV

WVU HVI Regional Hubs

Our regional hubs provide seamless access to the full range of WVU Heart & Vascular Institute surgical and care services, ensuring top-quality care, no matter your location.



Berkeley Medical Center

Martinsburg, WV



Camden Clark Medical Center

Parkersburg, WV



Thomas Hospitals

South Charleston, WV



United Hospital Center

Bridgeport, WV



Wheeling Hospital

Wheeling, WV



Locations

Alongside our flagship hospital in Morgantown and regional hubs offering a full spectrum of WVU HVI services, our specialists and physicians are consistently available at hospitals and clinics across the region, bringing expert care directly to the communities we serve.

West Virginia

Buckhannon
+ **St. Joseph's Hospital**

Charleston
+ **HVI Maccorkle**

Elkins
+ **HVI Elkins**

Fairmont
+ **Fairmont Medical Center**

Gassaway
+ **Braxton County Memorial Hospital**

Glen Dale
+ **Reynolds Memorial Hospital**

Keyser
+ **Potomac Valley Hospital**
+ **Outpatient Physicians Clinic of Potomac Valley Hospital**

New Martinsville
+ **HVI New Martinsville**

Petersburg
+ **Grant Memorial Hospital**

Princeton
+ **Princeton Community Hospital**

Ranson
+ **Jefferson Medical Center**

Summersville
+ **Summersville Regional Medical Center**

Wheeling
+ **Wheeling Clinic**

Maryland

Hagerstown
+ **HVI Hagerstown**

Oakland
+ **HVI Oakland Clinic**

Ohio

Barnesville
+ **Barnesville Hospital**

Cadiz
+ **Harrison Community Hospital**

Martins Ferry
+ **HVI Martins Ferry**

St. Clairsville
+ **HVI St. Clairsville**

Pennsylvania

Connellsville
+ **HVI Connellsville**

Uniontown
+ **Uniontown Hospital**

Waynesburg
+ **Waynesburg Outpatient Center**

Virginia

Winchester
+ **HVI Winchester**

To speak to a physician or to transfer a patient, call the Medical Access & Referral System (MARS) by calling 1-800-WVA-MARS.



Leadership

Guided by our mission, our leadership ensures we provide the best possible heart, lung, and vascular care for our patients, improve the well-being of the diverse communities we serve, and continue to advance research and education.



Vinay Badhwar, MD
Executive Chair



George Sokos, DO
Cardiology



Ramesh Daggubati, MD
Cardiology



Jason Lamb, MD
Thoracic Surgery



Pamela Zimmerman, MD
Vascular Surgery



Paul McCarthy, MD
**Cardiovascular
Critical Care**



Christopher Mascio,
MD **Pediatric
Cardiothoracic
Surgery**



J.W. Awori
Hayanga, MD, MPH
**Vice Chair Faculty
and Clinical Affairs**



Frank Briggs,
PharmD, MPH
Vice President



Chris Coffield,
MBA, RT(R)(CV)(VI)
**Assistant Vice
President**



Jennifer Gerdes,
RN, BSN, MBA
**Assistant Vice
President**



Ashley Jackson,
RN, MBA
**Assistant Vice
President**



Gannon Flowers,
MBA
**Assistant Vice
President**



The WVU Heart & Vascular Institute is a Signature Program of WVU Medicine, the state's largest and most comprehensive academic health system. WVU Medicine includes a robust network of hospitals, clinics, and providers dedicated to delivering high-quality care, advancing medical education, and leading research that improves health outcomes across West Virginia and the surrounding region.


[WVUMedicine.org](https://www.wvu.edu/medicine)



 **WVU** Heart & Vascular
Institute

Learn more
WVUMedicine.org/Heart

Schedule an appointment
Call 855-WVU-CARE

 Follow the WVU Heart and Vascular Institute
on LinkedIn to stay up to date on what makes us
the state's leader in heart care.