

MEDSTAR HEART & VASCULAR INSTITUTE

Capabilities

Performance

Outcomes

2021-2022



MedStar Health

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MEDSTAR HEART & VASCULAR INSTITUTE

Stats at a glance



506
TAVR procedures annually



2,631
PCI procedures annually



<1%
Carotid revascularization stroke rates



133
MitraClip procedures to date



2,210
Cardiac surgery procedures annually



58
Aortic root elective procedures annually



172
Mitral valve surgeries annually



198
CABG + AVR procedures annually



29
Heart transplantations in 2020



563
WATCHMAN® procedures to date



1,637
Cardiac ablations annually



TOP 5
VAD centers in U.S.



175+
Cardiovascular physicians



17,900
Cardiac MRI, CT, TEE, and TTE interpretations annually



175
Current research studies

Visit us at [MedStarHeartInstitute.org](https://www.MedStarHeartInstitute.org).

Throughout this report, we share our best available data. In many cases, due to the consequences of the COVID-19 pandemic, that data is from calendar year 2019.

Please submit any comments to charles.m.gill@medstar.net or jennifer.e.freas@medstar.net.

Some of the photos in this publication were taken prior to the COVID-19 pandemic. All patients and providers are expected to follow the current MedStar Health guidelines for safety including proper masking and physical distancing where appropriate. Learn more at [MedStarHealth.org/Safe](https://www.MedStarHealth.org/Safe).

Leading the evolution of cardiovascular care.

The true hallmarks of a world-class cardiovascular program are having extraordinary breadth and depth of knowledge extending across intersecting specialties, strengthened by an organization that supports those efforts resulting in superior clinical outcomes. I am pleased to present this MedStar Heart & Vascular Institute Capabilities Performance and Outcomes Report, in which I believe these attributes are demonstrated in abundance.

This report displays our continued dedication to increasing understanding of cardiovascular care across the wide geographic region that we serve. No matter the patient's point of entry, it is our promise that each will receive the same high-quality care. Additionally, our growing understanding of the connectivity between organ systems and disease states demands an approach that facilitates linkages that span traditional specialty lines, and our "systemness" connectivity promotes this kind of collaboration.

There has been no greater test of our system's personal and professional ability to adapt than the worldwide coronavirus pandemic. We quickly reinvented the way we interact with patients and with each other. Virtual patient appointments replaced in-person encounters whenever possible. Conferences turned virtual almost overnight. A robust digital campus was created for continuing education. All of this has been a nearly seamless transition and the experience and creativity will no doubt have an impact on how we deliver medical care—and continually educate ourselves—long after COVID-19 is no longer an immediate threat.

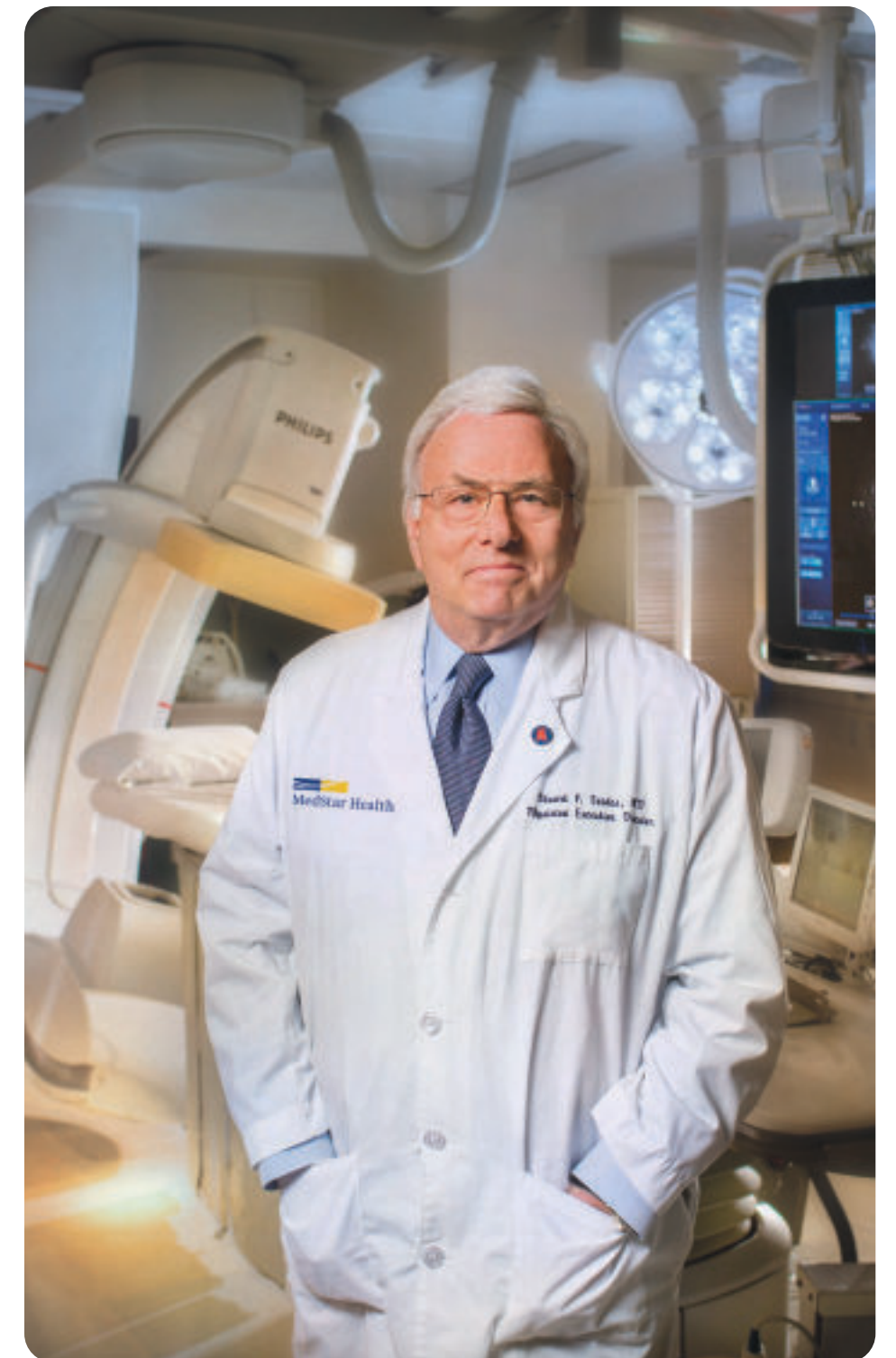
A great cardiovascular program is first and foremost built upon a contingent of superior clinicians who interact and collaborate freely with one another. Our success is the result of a talented multidisciplinary cadre of experts—outstanding leaders in their fields. I am delighted to welcome Abeel Mangi, MD, as the system chair of Cardiac Surgery. Dr. Mangi comes to us from his position as professor of surgery and surgical director of the Structural Heart and Cardiac Valve Program at Yale New Haven Health. He takes the helm of a cardiac surgery program that has set the standard in our region for nearly four decades.

Our groundbreaking research enterprise continues to grow exponentially, with dozens of clinical trials underway. Likewise, we continue to enrich physician training, including a recent expansion of our highly selective MedStar Georgetown University-Washington Hospital Center Cardiovascular Disease Fellowship Program, now one of the largest in the nation.

All that we do is singularly focused on improving the lives of our patients and the well-being of our community at large. I welcome your comments, feedback, and participation in our programs.



Stuart F. Seides, MD
Physician Executive Director
MedStar Heart & Vascular Institute





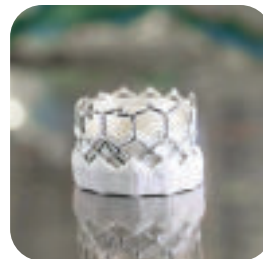
Baltimore region team



Washington, D.C. region team

Structural heart disease

Drawing from the collective expertise of cardiac surgeons, interventional cardiologists, cardiac imaging specialists, and others, we offer the widest range of treatment options and devices for patients with structural heart disease. Our multidisciplinary team analyzes each case to determine the optimal approach to achieving sustainable results. We manage the most challenging cases and often provide second opinions, as well as alternative options for interventions and devices.



Transcatheter aortic valve replacement (TAVR)

We have pioneered TAVR since its inception in 2007, serving as a clinical testing site for every advancement thereafter. We remain the largest program in the region offering TAVR for severe aortic stenosis and aortic regurgitation.

<.4%

TAVR mortality in-hospital

Compared to ACC Standard .9%

506

TAVR procedures

Mitral and tricuspid valve interventions

As leaders in aortic valve procedures, we continue to expand options available for patients with mitral and tricuspid valvular disease.



Clinical trial highlights

- **AltaValve™** is a transcatheter mitral valve replacement (TMVR) device that is delivered transeptally. As part of the ongoing, early feasibility study, we are evaluating its use for treatment of moderate-to-severe or severe mitral valve regurgitation in patients considered high risk for open surgery.
- We are the second highest enroller in the country for the SUMMIT trial, testing the safety and efficacy of the **Tendyne™** transcatheter mitral valve replacement system as an alternative to open-heart surgery.
- The **Intrepid™** TMVR system is a new option for patients with severe, symptomatic mitral regurgitation, currently under investigation in the APOLLO trial.
- **Transcatheter Mitral Cerclage Annuloplasty** involves a new technique and device that was developed in partnership with the National Institutes of Health. Patients with symptomatic severe mitral valve regurgitation are benefitting from this investigational percutaneous procedure to reduce regurgitation, prevent further annular dilation, and diminish symptoms.
- In the CLASP IID clinical trial, the **Edwards PASCAL™ transcatheter valve repair system** is being evaluated in patients with degenerative mitral regurgitation who are at prohibitive risk for open surgery.
- We are using the **CorMatrix®**, a novel tricuspid valve implanted surgically.
- The **TRILUMINATE study** offers a transcatheter clip repair for patients with moderate-to-severe tricuspid regurgitation.

Patient-centered TAVR process

In addition to the clear clinical advantages, our approach to TAVR centers around the patient experience. Through expedited workups, fewer trips to the hospital, and dramatically reduced wait times, the entire procedure can be coordinated and conducted on site, and often can be completed in under 24 hours. After the procedure, many patients are discharged home as early as one day post-procedure.



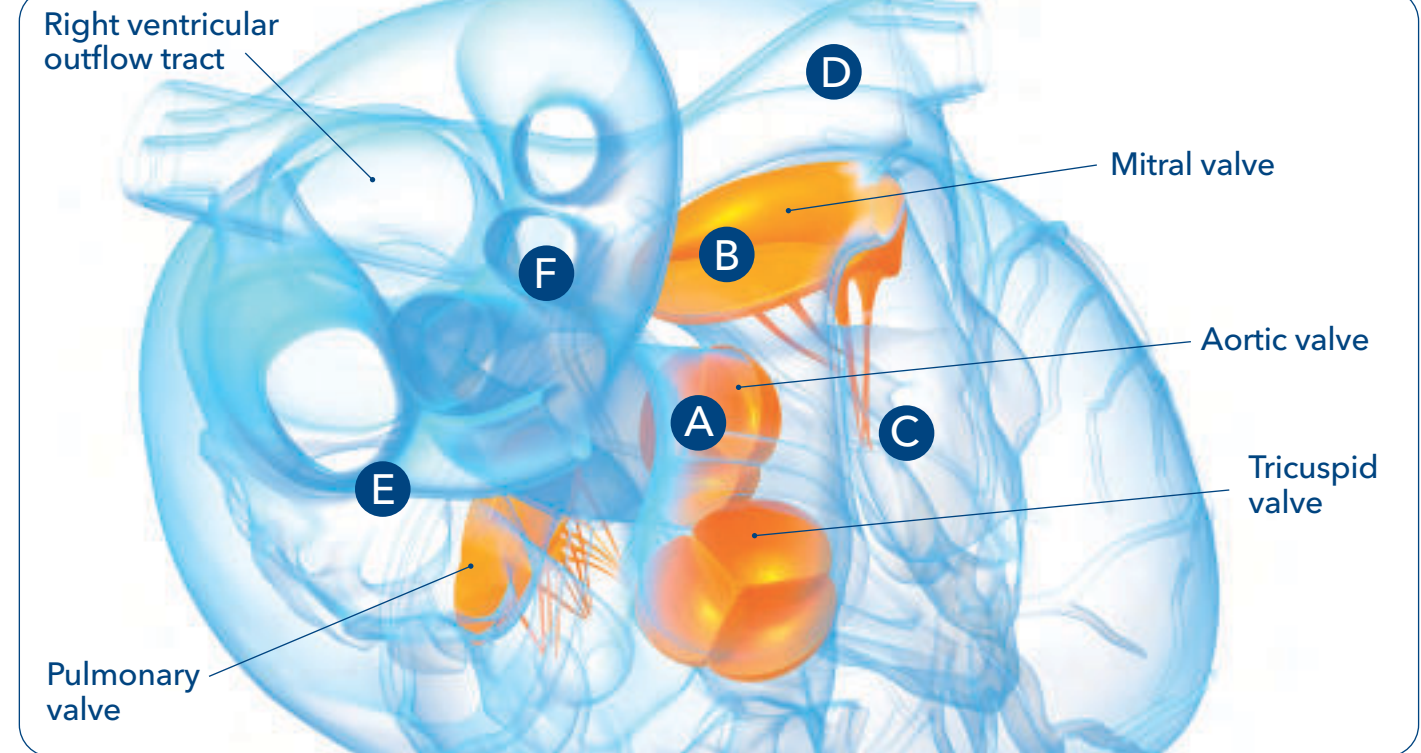
Expedited TAVR process

Initial referral to procedure

<2 Weeks



National average: 7 weeks



Comprehensive structural heart options

A. Aortic valve disease

- SAPIEN S3™ Ultra
- CoreValve®, Evolut™ PRO+
- Portico™ (trial)
- JenaValve for stenosis and regurgitation
- ACURATE neo2™ Aortic Valve System
- BASILICA

Para-valvular leak

- Amplatzer™ Vascular Plug

B. Mitral valve disease

- Intrepid™ Transcatheter Mitral Valve Replacement (TMVR) system
- Mitral Dock
- MitraClip™
- Tendyne™ transcatheter mitral valve replacement (TMVR) system
- ENCIRCLE trial for SAPIEN M3 System Transcatheter mitral valve replacement via transeptal access
- SAPIEN S3 for mitral annular calcification (MITRAL trial)
- Novel technique to prevent LVOT obstruction-LAMPOON Procedure
- AltaValve™ TMVR

C. Congenital heart defects

- ASD occluder
- VSD occluder
- PFO occluder for cryptogenic stroke

D. Stroke prevention and AFib

- WATCHMAN FLX™ device
- CHAMPION-AF (trial)
- AMPLATZER™ Amulet™ device (trial)
- PINNACLE FLX (trial)

E. Dysfunctional RVOT conduit/pulmonary valve

- SAPIEN™ 3
- Melody® Transcatheter Pulmonary Valve

F. Cerebral protection

- Sentinel®



Lowell F. Satler, MD
Medical Director
Cardiac Catheterization Lab
MedStar Washington
Hospital Center



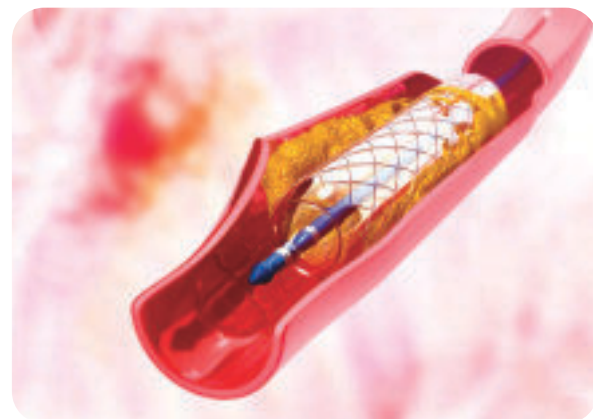
William O. Suddath, MD
Medical Director
Cardiac Catheterization Lab
MedStar Southern Maryland
Hospital Center



John C. Wang, MD
Medical Director
Cardiac Catheterization Lab
MedStar Union
Memorial Hospital

Interventional cardiology

The specialists in our cardiac catheterization labs see high volumes of patients, affording an elevated degree of experience and expertise to diagnose critical patients and treat complex cases.



2,631

Percutaneous coronary interventions (PCIs)

25-30%

Patients return home same day

7,860

Diagnostic catheterizations

133

MitraClips to date

56

PFO closures

Average primary PCI door-to-balloon time

61
minutes

National benchmark: 90 minutes
Source: ACC/AHA

92.5%

Success rate of PCIs for chronic total occlusions



Innovation highlights

Our extensive involvement in new research provides access to the latest available technologies, customized for our patients. Some key innovations include:

- **A NO-CAD clinic for INOCA (ischemia with no obstructive coronary artery disease).** The objective is thorough evaluation and treatment for this previously underserved and often undiagnosed population.
- **The Heart-Brain Team at MedStar Washington Hospital Center, a collaboration between neurologists and interventional cardiologists,** initially developed to determine if PFO closure is an optimal treatment for patients with stroke. Teams system-wide performed 56 PFO closures in 2019 and the volumes continue to grow.
- **Clinical use of our state-of-the-art cardiac imaging abilities,** such as fractional flow reserve derived from CT, to better evaluate and treat coronary anatomy and indeterminate stenoses. Read more about our imaging technology on page 28.
- **Early adaptation of the MitraClip™.** To date, we have performed 133 transcatheter mitral valve repairs using the MitraClip. Now that the technique has been approved for use in patients with symptomatic moderate-to-severe or severe mitral functional regurgitation, we continue to grow our volumes and offer it to this expanded pool of patients.



Leading the transradial approach

Throughout the system, our specialists select the site of catheter access—radial or femoral—depending on the specific device and the unique health status of each patient.

When appropriate, transradial cardiac catheterization provides less risk of bleeding, lower mortality, and increased comfort for the patient. Patients are often able to return home within hours of their procedure.

At MedStar Union Memorial Hospital, we use radial access for 90 percent of both diagnostic and interventional procedures, more than twice the average reported by the ACC. Patients recover in a dedicated lounge, with WiFi, iPads, and private areas to wait with their visitors.



Interventional cardiology physicians

Washington, D.C. region

Lowell F. Satler, MD
Ron Waksman, MD
Srinivas Addala, MD
Malik A. Al-Omari, MD
Itzik Ben-Dor, MD
Nelson L. Bernardo, MD
Eric S. Ginsberg, MD
Hayder Hashim, MD
Scott M. Katzen, MD
Venkatesh K. Raman, MD
Toby Rogers, MD
William O. Suddath, MD

Baltimore region

John C. Wang, MD
Antony G. Kaliyadan, MD
David B. Peichert, MD
Nauman Siddiqi, MD



Michael Fiocco, MD
Chief, Cardiac Surgery
MedStar Union
Memorial Hospital



Christian Shults, MD
Interim Chief, Cardiac Surgery
MedStar Washington
Hospital Center

Cardiac surgery

Our cardiac surgeons, in addition to producing some of the finest outcomes and strongest volumes in the country, are leaders in professional societies, research, and education.

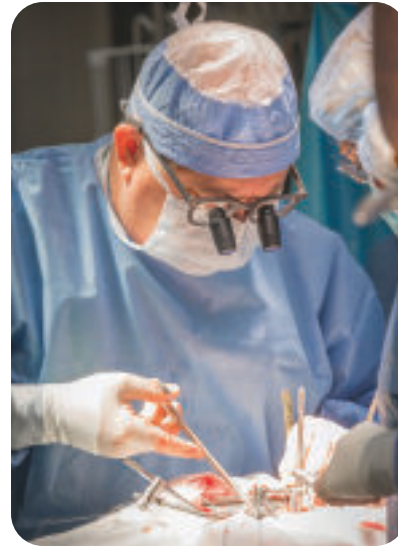
They collaborate with subspecialists across the cardiovascular spectrum, (aortic disease management, vascular surgery, electrophysiology, advanced heart failure, LVAD implantation, transplantation, interventional cardiology, and structural heart disease) nationally and internationally.



Key highlights

- We are among the **top 5 centers in the country for LVAD** implantation volumes.
- Our team performed **29 heart transplantations** in 2020, making us one of the busiest centers in the mid-Atlantic region.
- We are the second highest enroller in the country for the SUMMIT trial, testing the safety and efficacy of the **Tendyne™** transcatheter mitral valve replacement system as an alternative to open-heart surgery.
- The **Intrepid™** TMVR system is a new option for patients with severe, symptomatic mitral regurgitation, currently under investigation in the APOLLO trial.
- Together with vascular surgery, our **Aortic Disease Management program** accepts referrals for emergent, urgent, and elective evaluation and treatment of any routine or complex aortic disease. Read more on page 10.
- We perform combined endocardial and epicardial ablations and other **complex hybrid procedures**, including convergent procedures and a de novo thoracoscopic ablation for the treatment of inappropriate sinus tachycardia (IST) and postural orthostatic tachycardia syndrome (POTS).

Read more about these collaborations and others on the pages that follow.



MedStar Washington Hospital Center
awarded



Cardiac surgeons

Washington, D.C. region

Christian C. Shults, MD
Ammar S. Bafi, MD
Jeffrey E. Cohen, MD
Hiroto Kitahara, MD
Ezequiel J. Molina, MD

Baltimore region

Michael Fiocco, MD
Brian T. Bethea, MD
Ricardo O. Quarrie, MD

The Society of Thoracic Surgeons



Coronary Artery Bypass Grafting

Three stars represents the highest achievable metrics in the U.S.

MedStar Union Memorial Hospital awarded



Abeel A. Mangi, MD, named as new MedStar Health Chair of Cardiac Surgery.

Arriving this spring, Abeel A. Mangi, MD, will lead the cardiac surgery programs across MedStar Health. He most recently served as Surgical Director of the Structural Heart and Cardiac Valve Program for Yale New Haven Health, where he was also Managing Director of the Yale Cardiac Surgery Network, and the Director of System Integration and Quality.

He specializes in complex and re-operative cardiac surgery, aortic and mitral valve repair and replacement, transcatheter valve repair and replacement, and ascending aorta and aortic arch replacement.

Dr. Mangi earned his undergraduate and medical degrees from Brown University. After completing his residency in general surgery at the Massachusetts General Hospital/Harvard Medical School, he received a postdoctoral National Research Service Award fellowship from the National Institutes of Health and pursued award-winning stem cell research at Brigham and Women's Hospital. He completed his fellowship in cardiac surgery at Columbia University Medical Center prior to faculty appointments at the Cleveland Clinic, Temple University, and for the past ten years, Yale New Haven Health. He holds an MBA from the Sloan School of Management at the Massachusetts Institute of Technology.



2,210

Cardiac surgery
procedures

198

CABG + AVR
procedures

7.2%

CABG readmission rates

Compared to STS benchmark of 10.1%



172

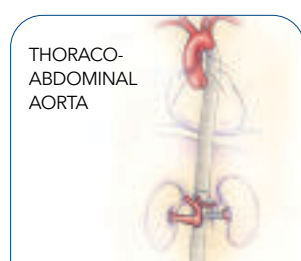
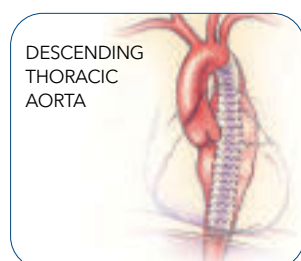
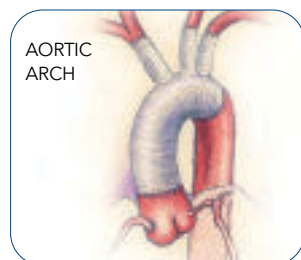
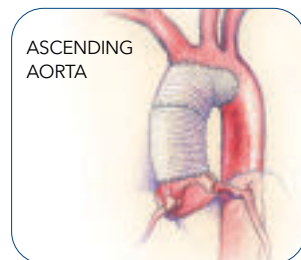
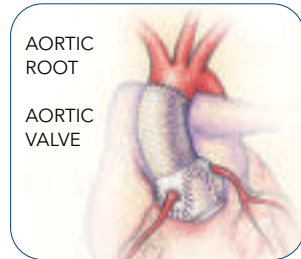
Mitral valve surgeries



2.2%

Mortality for mitral surgeries

Compared to STS average of 3.2%



Vascular surgeon Suzanne Kool, MD, cardiac surgeon Ricardo Quarrie, MD, and vascular surgeon Raghuv eer Vallabhaneni, MD

Aortic disease management

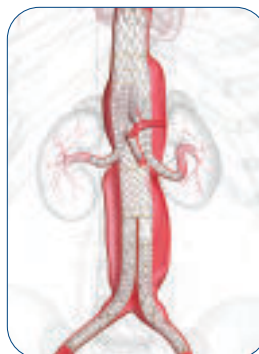
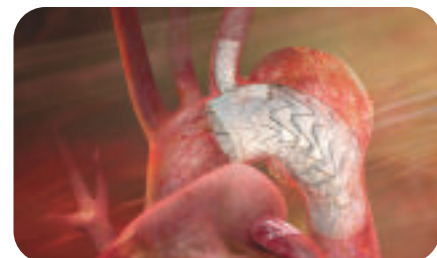
The aortic disease management program is one of the largest in the mid-Atlantic and our teams perform more aortic interventions than any other program in the region. We treat the most complex cases—including patients who have been denied care elsewhere—with the full spectrum of available options, including open, minimally invasive, and transcatheter approaches.

Patients benefit from a team that is truly multidisciplinary, led by cardiac and vascular surgeons. Together, they perform a collaborative assessment to determine the patient's least invasive, most effective, solution. Procedures take place in a hybrid operating room to allow for both open and endovascular approaches, as well as contemporaneous imaging.



Clinical trial highlights

• **GORE® TBE** Thoracic Branch Endoprosthesis (TBE Device) for the treatment of lesions of the aortic arch and descending thoracic aorta

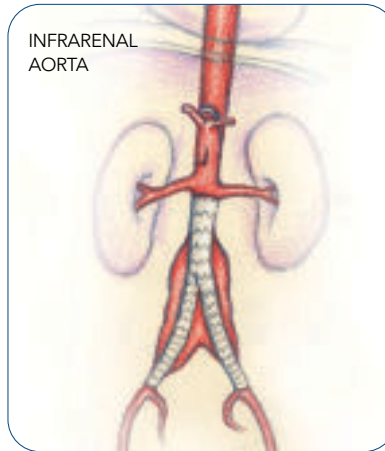


• **GORE® TAMBE** Thoracoabdominal Branch Endoprosthesis for the treatment of thoracoabdominal and pararenal aortic aneurysms



• **CHEVAS** pararenal aortic aneurysm repair using aortic sac management system by Endologix

• Physician-sponsored IDE for repair of juxtarenal, pararenal, and thoracoabdominal aortic aneurysms



0%

Mortality rate

Abdominal aortic aneurysm (AAA) elective infrarenal repair

0%

Mortality rate

Ascending aortic elective procedures

58

Aortic root elective procedures



Cardiac surgeon Christian Shults, MD, and vascular surgeon Javairiah Fatima, MD

Complex Aortic Centers

Located at MedStar Washington Hospital Center and MedStar Union Memorial Hospital, we offer 24/7 referral for emergent, urgent, and elective evaluation and treatment of complex aortic disease.

Complex referral cases may include:

- Aortic dissection
- Occlusion
- Intramural hematoma
- Aneurysm
- Penetrating ulcer
- Other aortic pathology

Our MedSTAR Transport service provides expedited air and ground access to care, regardless of patient location. We accept all transfers.

To refer a patient and arrange for a 24/7 transfer, call:

Washington, D.C. region: 800-824-6814 Baltimore region: 410-554-2332



Edward Y. Woo, MD
Director
Vascular Program
MedStar Health



23
Surgeons



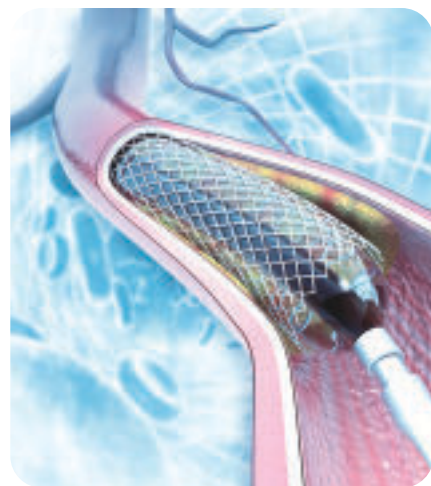
11
Hospitals



19
Locations

Vascular surgery

The MedStar Health vascular program is the largest in the region and among the most sophisticated in the nation. Our diverse team specializes in the diagnosis and treatment of all vascular disorders, from the common to the esoteric, from the merely uncomfortable to the life-threatening.



Peripheral arterial disease

PAD is managed at every stage, beginning with community screenings, to diagnosis in our noninvasive laboratories, through all varieties of therapy and intervention.



Clinical trial highlight

BEST-CLI: International study comparing optimal endovascular therapy to optimal surgical therapy in patients with peripheral arterial disease and associated with critical limb ischemia.

Carotid artery disease

Our expertise covers the spectrum of carotid disease, including treatment for stenosis, tumor, and aneurysm.



Innovation highlight

We are leading the region in the use of the novel **TransCarotid Artery Revascularization (TCAR)** procedure.



<1%

Carotid revascularization stroke rates



Aortic disease

We provide treatment for all aortic pathology including TEVARs for patients with thoracic aortic aneurysms and dissections, EVARs in patients with infrarenal abdominal aortic aneurysms, and fenestrated or branched endovascular repair (F/B-EVAR) in patients with more complex thoracoabdominal aortic aneurysms. Read more about our collaborations throughout the aorta on page 10.



Deep venous disease

We treat all forms of deep venous disease with open and endovascular techniques, including acute and chronic deep vein thrombosis, inferior vena cava occlusive disease, and retained IVC filter.



Innovation highlights

- We are **first in the world to use the ClotHunter™** thrombectomy catheter, which allows for more thorough removal of acute, subacute, and chronic clots with single-session treatment and reduced procedure times.
- We are the **only provider in the region to offer endovenectomy**, a minimally invasive technique combining open and endovascular surgery to treat deep vein post-thrombotic syndrome.



Clinical trial highlight

We are part of the ClotTriever Outcomes registry (CLOUT) for treatment of acute, subacute, and chronic lower extremity deep vein thrombosis using the **ClotTriever™ Thrombectomy System**.

Cosmetic and varicose veins

MedStar Health Vein Centers are convenient outpatient clinics dedicated to the treatment of venous disease, including cosmetic and functional. These boutique settings offer clients the comfort and luxury of a specialty clinic, paired with the expertise of vascular surgeons who provide comprehensive diagnostics and treatment in the event of a more serious underlying condition. Each center has an on site, accredited vascular lab, staffed with licensed technologists who can run tests for fast, same-day turnarounds. Services are now available at nine locations in Maryland, Virginia, and Washington, D.C.



Clinical trial highlight

Our participation in clinical trials affords patients the option of state-of-the-art therapies, such as the **VenaSeal™**, a non-thermal, non-tumescent, non-sclerosant closure system using adhesive to permanently close diseased veins.

Vascular access program

We provide the largest vascular hemodialysis access program in the mid-Atlantic region, an area with some of the highest rates of kidney disease in the United States. With a focus on reduced infection and long-term access, our team manages complex dialysis patients with an array of options to treat and manage percutaneous fistulae, AV fistulae, and bypass grafts. Our prevalent arteriovenous fistula rate is 70 percent, thereby reducing infection and lowering mortality. The Centers for Medicare & Medicaid Services national standard is 66 percent.



Innovation highlights

- We are the regional leader in **HeRO® graft placements** and have among the highest volumes in the country. We also serve as a regional proctor for this approach. This specialized graft is applicable for patients in whom access cannot be obtained through the standard route, due to blocked veins or previous stenosis.
- Using **Artegraft®, a bovine tissue graft**, we can obtain access for patients who have poor veins and are not candidates for the standard surgical procedure.
- In some cases, we use the **minimally invasive WAVELINQ™ EndoAVF System**, a technology for percutaneous fistula creation, avoiding surgical incisions.
- We specialize in **laparoscopic peritoneal catheter insertion**, allowing for the option of home dialysis.

2,500

Vascular access cases annually

Vascular surgeons

Washington, D.C. region

Edward Y. Woo, MD
 Steven D. Abramowitz, MD
 Cameron M. Akbari, MD
 Kevin A. Brown, MD
 Joshua A. Dearing, MD
 Javairiah Fatima, MD
 Arthur Flatau, III, MD
 Jesse P. Garcia, MD
 Faris Z. Hakki, MD
 John Harvey, MD
 Ayesha Hatch, MD
 Geetha Jeyabalan, MD
 Misaki M. Kiguchi, MD
 Lucy B. Kupersmith, MD
 Krystal C. Maloni, MD
 Mark O. Peeler, MD
 Kyle B. Reynolds, MD

Baltimore region

Raghuveer Vallabhaneni, MD
 Maggie W. Arnold, MD
 Jason A. Chin, MD
 Jason R. Crouner, MD
 Suzanne S. Kool, MD
 Stephen F. Stanziale, MD

Vascular program locations

District of Columbia

- MedStar Georgetown University Hospital**
 3800 Reservoir Rd., NW
 Pasquerilla Healthcare Center, 4th Fl.
 Washington, DC 20007
P 202-444-2255 **F** 877-376-2434
- MedStar Health at Lafayette Centre**
 1133 21st St., NW, 7th Fl.
 Washington, DC 20036
P 202-416-2000 **F** 202-416-2007
- MedStar Washington Hospital Center Center for Vascular Care**
 106 Irving St., NW
 Physicians Office Building North, Ste. 3150
 Washington, DC 20010
P 202-877-0275 **F** 202-877-0456

MedStar Washington Hospital Center-Vascular Access

106 Irving St., NW
 Physicians Office Building South, Ste. 419
 Washington, DC 20010
P 202-877-3100 **F** 202-877-6585

MedStar Washington Hospital Center Hakki Medical Association

106 Irving St., NW
 Physicians Office Building South, Ste. 408
 Washington, DC 20010
P 202-877-5007 **F** 949-437-2278

Maryland

- Annapolis*
- MedStar Health Cardiology Associates The Vascular Institute**
 2002 Medical Pkwy., Ste. 520
 Annapolis, MD 21401
P 410-571-8430 **F** 410-573-5981
- Baltimore*
- MedStar Franklin Square Medical Center**
 9101 Franklin Square Dr., Ste. 212
 Baltimore, MD 21237
P 443-777-1900 **F** 443-777-1901
 - MedStar Good Samaritan Hospital**
 5601 Loch Raven Blvd.
 Smyth Bldg., Ste. 303
 Baltimore, MD 21239
P 443-444-3431 **F** 443-444-3435

- MedStar Harbor Hospital**
 3001 S. Hanover St.
 Outpatient Center, Ste. 216
 Baltimore, MD 21225
P 443-444-3431 (scheduling)
P 410-350-3357 (call center, front desk)
F 443-444-3435
 - MedStar Union Memorial Hospital**
 3333 North Calvert St.
 Johnson Professional Building, Ste. 325
 Baltimore, MD 21218
P 410-554-2950 **F** 410-261-8226
- Bel Air*
- MedStar Health Bel Air Medical Campus**
 12 MedStar Blvd., Ste. 175
 Bel Air, MD 21015
P 443-777-1900 **F** 443-777-1901

- Bowie*
- MedStar Health Cardiology Associates**
 4175 North Hanson Ct., Ste 100
 Bowie, MD 20716
P 301-809-6880 or 410-741-1835
F 301-805-4233

- Charlotte Hall*
- MedStar Medical Group at Charlotte Hall**
 29955 Three Notch Rd., Ste. 201
 Charlotte Hall, MD 20622
P 240-434-4072 **F** 240-434-4022

- Chester*
- MedStar Health Cardiology Associates Kent Island**
 1630 Main St., Ste. 208
 Chester, MD 21619
P 410-643-3186 **F** 855-861-2080

- Chevy Chase*
- MedStar Health at Chevy Chase**
 5454 Wisconsin Ave., Ste. 1100
 Chevy Chase, MD 20815
P 301-215-9420 **F** 301-215-4499

- Clinton*
- MedStar Southern Maryland Hospital Center**
 7501 Surratts Rd., Ste. 208
 Clinton, MD 20735
P 301-877-7353 **F** 301-877-1240

- Hollywood*
- Shah Associates**
 24035 Three Notch Rd., 2nd Fl. Cardiology
 Hollywood, MD 20636
P 301-373-7720 **F** 301-373-6700

- Leonardtown*
- MedStar St. Mary's Hospital**
 25500 Point Lookout Rd.
 Outpatient Pavillion, Ste. 200
 Leonardtown, Md. 20650
P 240-434-4072 **F** 240-434-4022

- Olney*
- MedStar Montgomery Medical Center**
 18109 Prince Philip Dr., Ste. B-100
 Olney, MD 20832
P 301-774-8962 **F** 301-774-8963

- Pikesville*
- MedStar Health Vascular Surgery at Pikesville**
 1838 Greene Tree Rd., Ste. 245
 Pikesville, MD 21208
P 410-554-2950 **F** 410-261-8226

- Prince Frederick*
- MedStar Health at Prince Frederick**
 301 Steeple Chase Dr., Ste. 107
 Prince Frederick, MD 20678
P 410-535-7290 **F** 410-535-7291

Northern Virginia

- McLean*
- MedStar Health at McLean**
 6862 Elm St., Ste. 800
 McLean, VA 22101
P 703-288-7070, Option #5
F 866-990-5516





Zayd A. Eldadah, MD, PhD
Director
Cardiac Electrophysiology
MedStar Health



19
Electrocardiologists



23
Locations



Cardiac electrophysiology

The Section of Cardiac Electrophysiology (EP) aims to provide comprehensive, cutting-edge, personalized heart rhythm care for every single one of our patients, close to home and work. MedStar Health offers one of the largest and most geographically expansive EP service lines in the country, with 23 convenient locations in Maryland, Washington, D.C., and Virginia.

We manage the full spectrum of heart rhythm conditions and are the region's leading referral center, offering highly technical procedural care along with longitudinal outpatient management in concert with and in support of our referring physicians. High-volume experience and concentrated expertise, coupled with state-of-the-art technology, distinguish this program.



WATCHMAN™

MedStar Health pioneered development of the original WATCHMAN left atrial appendage occluder over 15 years ago and was the first institution in the region to implant it. Today, we are among the country's highest volume implantation programs for this device.

563 WATCHMAN procedures to date

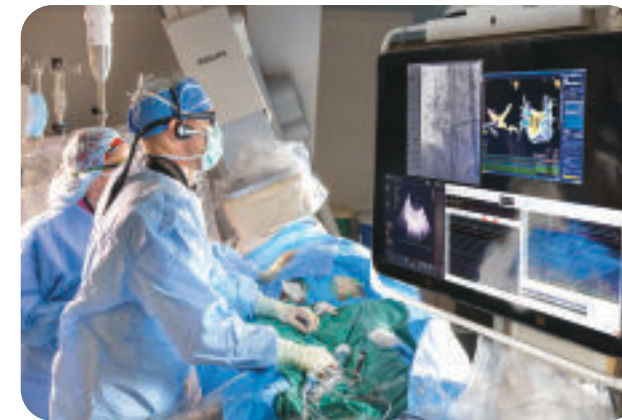
Cryoablation

Our cardiac electrophysiologists also contributed to the development of cryoballoon ablation for atrial fibrillation and continue to be among the country's highest-volume experts employing this technology.

1,637 Cardiac ablations



(l to r) Cardiac surgeon Christian Shults, MD, and electrophysiologist Athanasios Thomaidis, MD, collaborate on complex hybrid procedures.



Glenn Meininger, MD, director, cardiac electrophysiology, Baltimore region



(l to r) Sarfraz Durrani, MD, Manish Shah, MD, David Strouse, MD, and (below) Sung Lee, MD, are among a small and select group of physicians globally with high-volume experience with left atrial appendage occlusion systems.



Innovation highlights

- We collaborate with cardiac surgeons for combined endocardial and epicardial ablations and other complex hybrid procedures. Most recently, we were first in the region, and among only seven in the nation, to offer **thoracoscopic ablation** for the treatment of inappropriate sinus tachycardia (IST) and postural orthostatic tachycardia syndrome (POTS). This groundbreaking treatment offers a new option to patients who have exhausted other treatments for these historically underdiagnosed and often untreated conditions.
- Seth Worley, MD, (pictured below) an internationally recognized senior consultant, personally developed specialized tools and techniques to facilitate and optimize the success of transvenous left ventricular (LV) lead implantation. He has termed his methods, **Interventional Cardiac Resynchronization Therapy**, and he regularly treats patients from all over the world who have had prior unsuccessful attempt(s) at LV lead implantation.



Clinical trial highlights

- As an internationally recognized contributor to advances in the field, our team continues to play a critical role in the development of devices and approaches, including these recent highlights:
- Pioneering same-day discharge after catheter procedures as national principal investigator (PI) site for a multi-center study of the **VASCADE® vascular closure device**.
- Testing **novel multi-electrode radiofrequency balloon catheters** for the treatment of atrial fibrillation as one of the country's highest enrollers in the HELIOSTAR and STELLAR trials.
- Launching trials of **pulsed field ablation**, a next-generation therapy for AFib by electroporation. This novel technology enables pulmonary vein isolation with greater efficiency and selectivity, sharply reducing the potential for unintentional damage to surrounding tissue.
- Testing the effectiveness of the latest **left atrial appendage occlusion systems**, including the AMPLATZER™ Amulet™ and Coherex WaveCrest™.
- Enrolling patients as one of the world's select centers in the OPTIONS study, which compares left atrial appendage closure with the **WATCHMAN FLX™** as an alternative to anticoagulation following catheter ablation.
- Ongoing study of an **extravascular ICD system**, in which defibrillation therapy is delivered by a lead placed outside of the heart and veins.
- Harnessing our partnership with the Cleveland Clinic's Miller Family Heart, Vascular, and Thoracic Institute, we worked closely to **redesign the EP Labs** at MedStar Union Memorial Hospital, resolving issues including fluoroscopy software, surgical lighting, boom placement, and mapping equipment.



Cardiac electrophysiology physicians

Washington region

Zayd A. Eldadah, MD, PhD
 Walter L. Atiga, MD
 Sarfraz A. Durrani, MD
 Margaret B. Fischer, MD
 Michael S. Goldstein, MD
 Cyrus A. Hadadi, MD
 Sung W. Lee, MD
 Jay A. Mazel, MD
 Susan O. O'Donoghue, MD
 Edward V. Platia, MD
 Manish H. Shah, MD
 David A. Strouse, MD
 Athanasios Thomaidis, MD
 Allison C. Warren, MD
 Seth J. Worley, MD

Baltimore region

Glenn R. Meininger, MD
 Rafique Ahmed, MD
 Malick Islam, MD
 Sunjeet S. Sidhu, MD

Cardiac electrophysiology program locations

District of Columbia

- 1 MedStar Georgetown University Hospital**
 3800 Reservoir Rd., NW
 Pasquerilla Healthcare Center, 5th Fl.
 Washington, DC 20007
P 202-444-8843 **F** 877-303-1461
- 2 MedStar Health Cardiology Associates at Lafayette Centre**
 1133 21st St., NW, Ste. 700
 Washington, DC 20036
P 202-416-2000 **F** 202-416-2007
- 3 MedStar Washington Hospital Center**
 110 Irving St., NW, Ste. 5A-12
 Washington, DC 20010
P 202-877-7685 **F** 855-430-5304

MedStar Washington Hospital Center North Tower POB
 106 Irving St., NW
 Physicians Office Building North, Ste. 4800
 Washington, DC 20010
P 202-877-5800 **F** 202-877-5885

Maryland

- Annapolis*
- 4 MedStar Health Cardiology Associates**
 2002 Medical Pkwy., Ste. 500
 Annapolis, MD 21401
P 410-573-6480 **F** 410-573-9413
- Baltimore*
- 5 MedStar Franklin Square Medical Center**
 9105 Franklin Square Dr., Ste. 306
 Baltimore, MD 21237
P 410-544-6727 **F** 410-554-2044
 - 6 MedStar Good Samaritan Hospital**
 5601 Loch Raven Blvd., Ste. 206
 Baltimore, MD 21239
P 410-544-6727 **F** 410-554-2044
 - 7 MedStar Harbor Hospital**
 3001 S. Hanover St., Ste. 206
 Baltimore, MD 21225
P 410-544-6727 **F** 410-554-2044

- 8 MedStar Union Memorial Hospital**
 3333 North Calvert St.
 Johnson Professional Building, Ste. 650
 Baltimore, MD 21218
P 410-554-6727 **F** 410-554-2044

Cambridge

- 9 MedStar Health Electrophysiology**
 505 Byrne St.
 Cambridge, MD 21613
P 202-877-3205 **F** 855-430-5304

Chester

- 10 MedStar Health Cardiology Associates**
 1630 Main St., Ste. 208
 Chester, MD 21619
P 410-643-3186 **F** 410-643-4098

Clinton

- 11 MedStar Southern Maryland Hospital Center**
 7501 Surratts Rd., Ste. 304
 Clinton, MD 20735
P 301-877-5677 **F** 855-384-5344

Ellicott City

- 12 MedStar Health Electrophysiology Ellicott City**
 9501 Old Annapolis Rd., Ste. 308
 Ellicott City, MD 21163
P 410-554-6727 **F** 410-554-2044

Frederick

- 13 MedStar Health Electrophysiology Frederick**
 163 Thomas Johnson Dr., Ste. E
 Frederick, MD 21702
P 703-208-7257 - Drs. Atiga, Fischer
P 202-877-7685 - Drs. Eldadah, Shah
P 301-877-5677 - Dr. Lee
F 855.430.5304

Hagerstown

- 14 MedStar Health Electrophysiology Hagerstown**
 1733 Howell Rd.
 Hagerstown, MD 21740
P 703-208-7257 - Drs. Atiga, Fischer
P 301-877-5677 - Dr. Lee
P 202-877-7685 - Dr. O'Donoghue
F 855-374-5342

Hollywood

- 15 MedStar Health Electrophysiology Hollywood**
 24035 Three Notch Rd.
 Hollywood, MD 20636
P 301-877-5677 **F** 301-877-5680

Olney

- 16 MedStar Montgomery Medical Center**
 18109 Prince Philip Dr., Ste. 4100
 Olney, MD 20832
P 301-570-7404 **F** 301-570-7405

Waldorf

- 17 MedStar Health Electrophysiology Waldorf**
 10 St Patricks Dr.
 Waldorf, MD 20603
P 202-877-7685 **F** 855.430.5304

Wheaton

- 18 MedStar Health Electrophysiology Wheaton Urgent Care**
 11915 Georgia Ave.
 Wheaton, MD 20902
P 202-877-7685 - Dr. Eldadah
P 301-877-5677 - Dr. Lee
F 855-384-5344

Virginia

Fairfax

- 19 MedStar Health Electrophysiology Fairfax**
 3020 Hamaker Ct., Ste. 502
 Fairfax, VA 22031
P 202-877-7685 - Dr. Eldadah
P 703- 208-7257 - Drs. Durrani, Strouse, Fischer
F 855-374-5342

Lansdowne

- 20 MedStar Health Electrophysiology Lansdowne**
 44084 Riverside Pkwy., Ste. 150
 Lansdowne, VA 20176
P 202-877-7685 **F** 855.430.5304

Leesburg

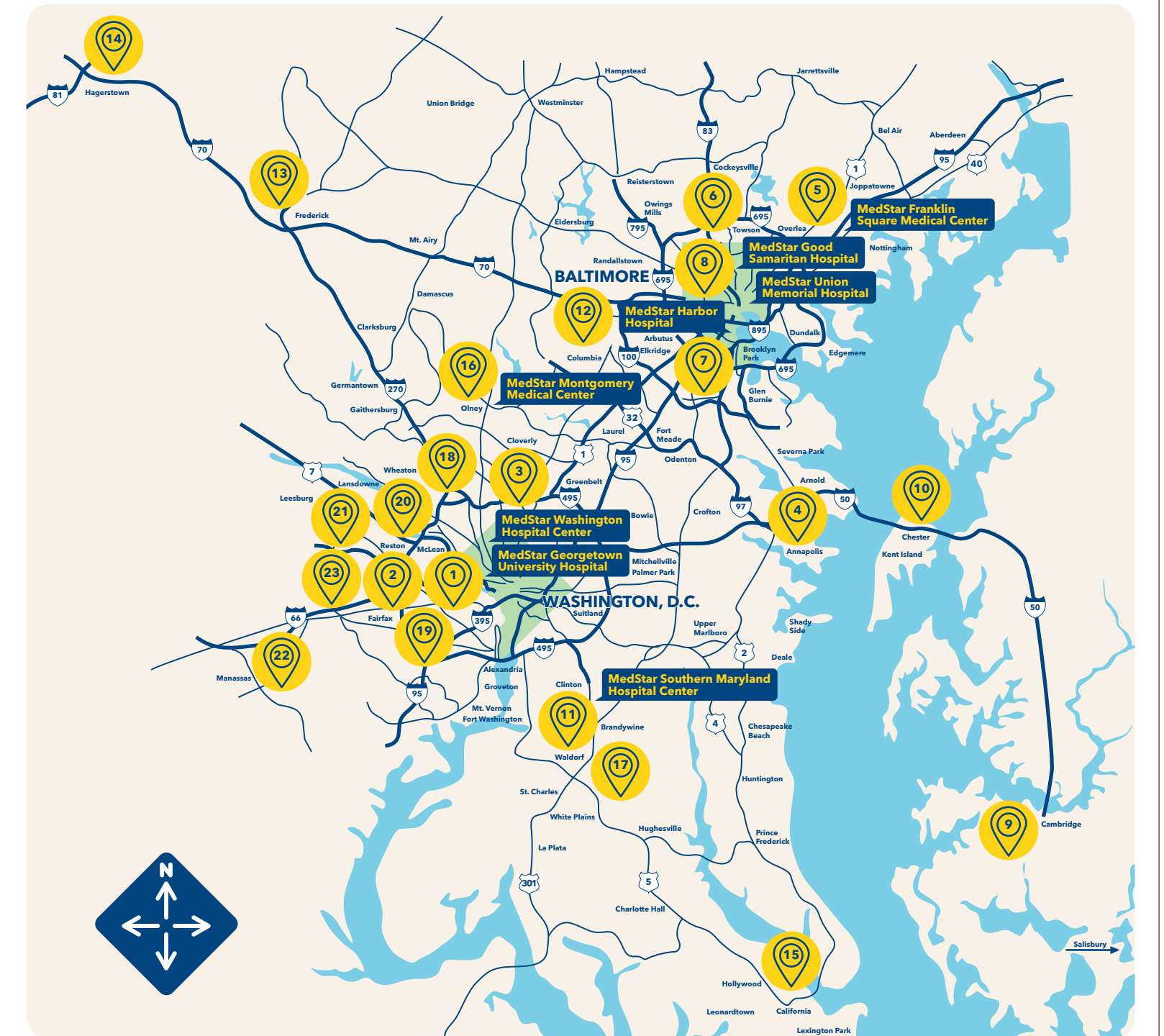
- 21 MedStar Health Electrophysiology Cornwall**
 224D Cornwall St.
 Ste. 306
 Leesburg, VA 20175
P 202-877-7685
F 855.430.5304

Manassas

- 22 MedStar Health Electrophysiology Manassas**
 8640 Sudley Rd., Ste. 302
 Manassas, VA 20110
P 703-208-7257
F 855-374-5342

Reston

- 23 MedStar Health Electrophysiology Reston**
 1830 Town Center Dr.
 Ste. 405
 Reston, VA 20190
P 703- 208-7257 - Dr. Atiga
F 855-374-5342
P 202-877-7685 - Dr. Shah
F 855.430.5304





Samer S. Najjar, MD
Director
Advanced Heart Failure
MedStar Health

Advanced heart failure

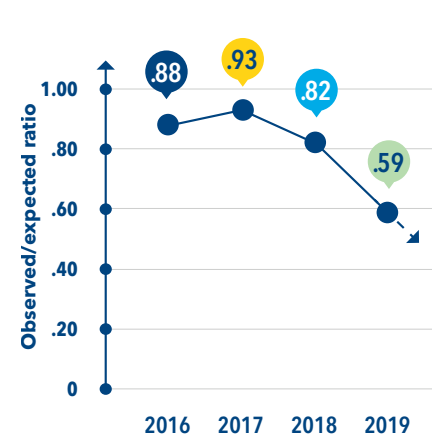
As the most comprehensive advanced heart failure program in the area, our multidisciplinary team provides regional coverage across hospitals and outpatient clinics, bringing sophisticated disease management closer to patients.

We offer advanced drug therapy, mechanical circulatory support, and heart transplantation—often for patients whose case complexity or advanced disease state precludes them from receiving care at other centers.

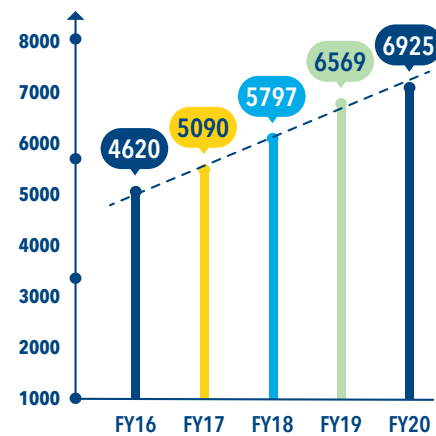
This program intersects with other subspecialties across our system. Our patients have access to:

- A dedicated cardiogenetics specialist (more on page 25)
- Pulmonary hypertension expertise (more on page 26)
- Early identification and diagnosis through specialized cardiopulmonary stress testing
- Delivery of home-based, intravenous, inotropic drugs, for patients with end-stage disease
- Palliative care planning, embedded with symptom management and family support

HEART FAILURE MORTALITY INDEX



CLINIC VOLUMES



George Ruiz, MD, Chief of Cardiology
MedStar Union Memorial Hospital, MedStar Good Samaritan Hospital,
and MedStar Harbor Hospital



Our multidisciplinary team meets weekly to discuss details of each patient's plan of care. More than 75 professionals participate, including:

- Cardiologists and cardiothoracic surgeons
- Intensivists
- Hospitalists
- Advanced practice providers
- VAD and transplant coordinators
- Nurse navigators
- Clinic and home health nurses
- Nutritionists
- Medical ethicists
- Palliative care specialists
- Social workers
- Physical and occupational therapists
- Pharmacists



Farooq Sheikh, MD
Program Director, Infiltrative Cardiomyopathy

Infiltrative cardiomyopathy

We are the region's premier program for diagnoses and management of all forms of infiltrative cardiomyopathy, including two of the most common and challenging forms: cardiac sarcoidosis and cardiac amyloidosis.



Clinical trial highlights

Innovative new medications and phase 3 clinical trials may now offer treatment options that can mean the difference between life and death for patients:

- In **HELIOS-B**, a worldwide, multicenter study, we are evaluating the efficacy and safety of Vutrisiran in patients with transthyretin amyloidosis with cardiomyopathy (ATTR amyloidosis with cardiomyopathy).
- In **CARDIO-TTRansform**, we are investigating the use of AKCEA-TTR-LRx (ION-682884) compared to a placebo in patients with transthyretin-mediated amyloid cardiomyopathy (ATTR-CM).



Sandeep Jani, MD (center)
Program Director, Hypertrophic Cardiomyopathy

Hypertrophic cardiomyopathy

Our hypertrophic cardiomyopathy clinic provides diagnoses and an individualized, long-term treatment plan for patients who require specialized care for this complex disease. The team includes imaging experts, electrophysiologists, interventional cardiologists, cardiac surgeons, and a cardiogenetics counselor.



Full range of therapies for heart failure patients



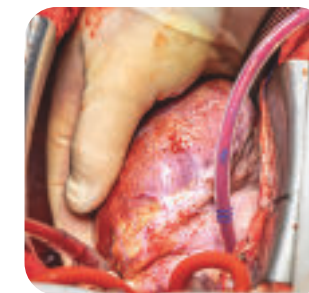
Prescription medications



Intravenous inotropic agents



Mechanical circulatory support



Heart transplantation

Advanced heart failure physicians

Washington, D.C. region

- Samer S. Najjar, MD
- Jennifer R. Brown, MD
- Mark R. Hofmeyer, MD
- Ajay Kadakkal, MD
- Hiroto Kitahara, MD
- Phillip H. Lam, MD
- Ezequiel J. Molina, MD
- Sriram Rao, MD
- Maria E. Rodrigo, MD
- Farooq H. Sheikh, MD

Baltimore region

- George Ruiz, MD
- Tolu A. Agunbiade, MD
- Sandeep M. Jani, MD
- Mrinalini Krishnan, MD
- W. David Xu, MD



Ezequiel J. Molina, MD
Surgical Director
VAD and Heart Transplantation

Ventricular assist devices

In 1988, we became one of the first centers in the world to implant a ventricular assist device (VAD). The program has grown continuously with multiple devices and superior survival rates for even the most critical, highly complex patients—those who are often denied treatment at other centers.



Innovation highlights

- **80% of implantations are currently performed through a minimally invasive technique.** Studies of this approach continue through participation in the SWIFT trial with the HeartMate 3 LVAS. The approach results in less bleeding and need for transfusions, shorter ICU and hospital stays, and possibly reduced risk of right ventricular failure.
- Our **VAD loner track** facilitates treatment for patients with minimal family support by providing the critical medical and social care needed.
- Through a robust **ECMO and Impella 5.0/5.5 program**, patients presenting with cardiogenic shock can be stabilized, opening the potential for durable VAD implantation after a period of acute mechanical circulatory support.
- Coming soon, we will explore **ways to reduce post-LVAD arrhythmias** through a collaboration with our electrophysiology colleagues.

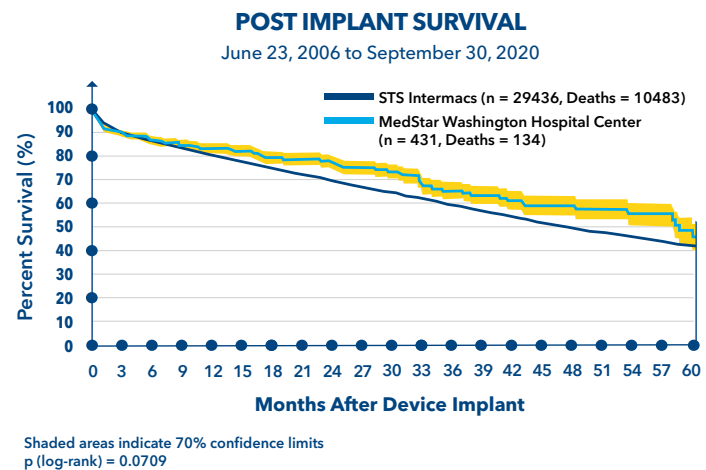
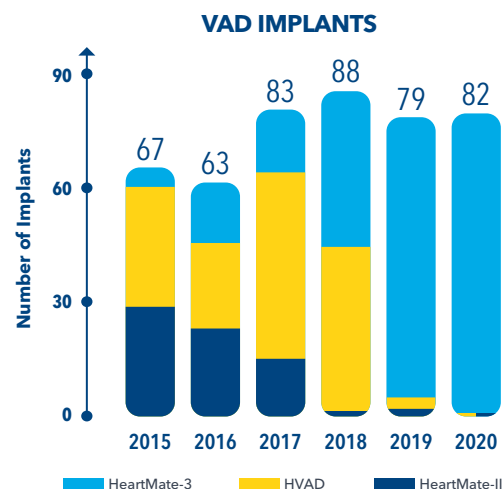


TOP 5

Among the top 5 centers with highest volumes of VAD implants in the country

700+

VADs implanted to date



Maria E. Rodrigo, MD
Medical Director
Heart Transplantation

Heart transplantation

Since performing the first heart transplantation in Washington, D.C., in 1987, we remain committed to expanding our program with the ultimate goal of offering this life-saving procedure to more patients.



Innovation highlights

- Through our use of the **Paragonix SherpaPak™ Cardiac Transport System**, the ischemic window of a donor heart may be extended without damage to the organ. This provides our patients with greater opportunities for transplantation by allowing retrieval of donor hearts from further distances.
- We are able to transplant hearts from **Hepatitis C positive donors** without an adverse impact on recipient outcomes. The expectation is that the number of transplantable hearts may increase by more than 15 percent per year.
- We are one of the five regional heart transplant programs participating in an NIH research project to evaluate **novel methods to non-invasively assess rejection** obviating the need for biopsy.

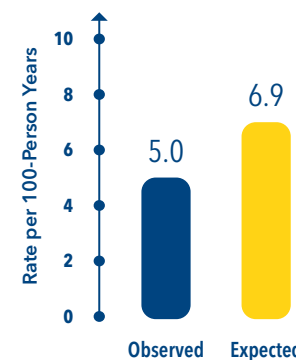


350+
Heart transplants since 1987

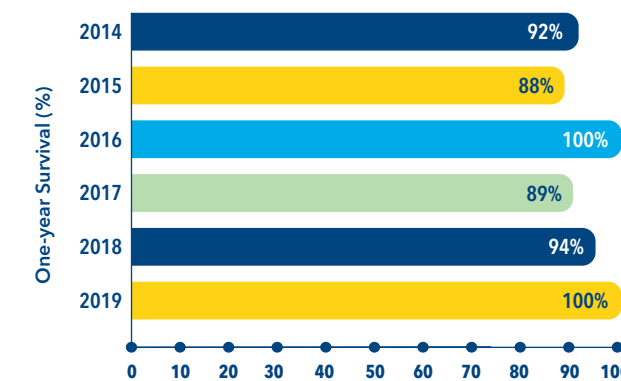


ADULT WAITING LIST MORTALITY RATES

January 2018 to December 2019



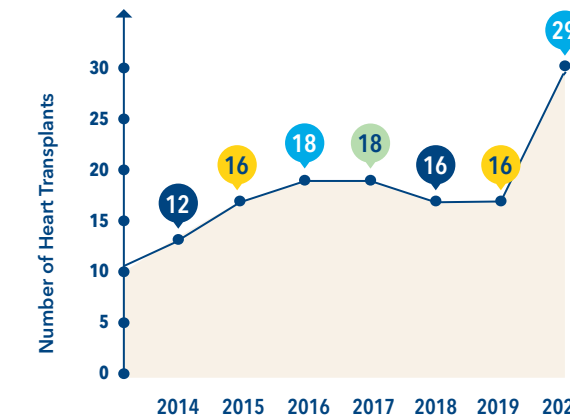
HEART TRANSPLANTATION ONE-YEAR SURVIVAL

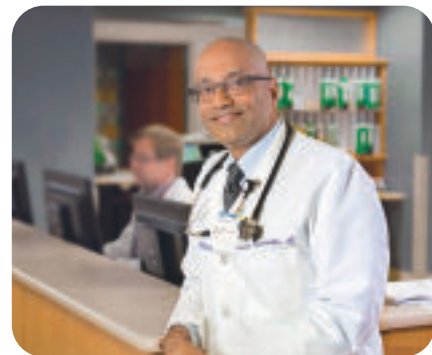


Record number of heart transplantations during onset of COVID-19 pandemic.

In the spring of 2020, as many hospitals had to limit cardiovascular surgeries, our team at MedStar Washington Hospital Center performed a record-breaking 13 heart transplantations between March and May. Extraordinary precautions were taken to minimize the risk of virus transmission among providers, recipients, and families.

HEART TRANSPLANTATION VOLUMES





Sriram Padmanabhan, MD
Chief, Cardiology
MedStar Franklin Square
Medical Center



George Ruiz, MD
Chief, Cardiology
MedStar Union Memorial Hospital
MedStar Good Samaritan Hospital
MedStar Harbor Hospital



William O. Suddath, MD
Chairman, Cardiology
MedStar Southern Maryland
Hospital Center



Allen J. Taylor, MD
Chairman, Cardiology
MedStar Washington Hospital Center
MedStar Georgetown University Hospital

Clinical cardiology and specialty programs

Across our acute care hospitals and advanced outpatient clinics, cardiologists deliver comprehensive, integrated care to our patients—whether for prevention and screenings, or complicated treatment of the very ill.

For more than 60 years, we have served as a major referral site locally, across the mid-Atlantic region, and the country. Our providers are embedded in each subspecialty detailed in this report, as well as the unique programs highlighted here.



Ana Barac, MD, PhD
Director, MedStar Health
Cardio-Oncology



Tolulope A. Agunbiade, MD
Director, Baltimore
Cardio-Oncology Program

Cardio-oncology

Cardio-oncology is a medical subspecialty dedicated to minimizing the effects of cardiovascular morbidity and mortality in people with cancer. Chemotherapy and radiation therapy, along with new cancer treatments, can contribute to a number of cardiovascular complications including heart failure, coronary artery disease, heart rhythm disorders, peripheral vascular disease, valvular heart disease, and more.

We are committed to supporting effective methods for fighting cancer while minimizing the impact on heart function. Our multi-site consultative practice can establish a comprehensive cardiovascular treatment plan before, during, and after a patient's cancer treatment.

From the program's initiation in 2012, we have been a national leader in this field, pioneering and participating in progressive research to develop new cardiovascular diagnostic and treatment protocols that are compatible with evolving oncologic approaches. Ana Barac, MD, PhD, director, served as the founding chair of the American College of Cardiology's new Cardio-Oncology Council from 2015 to 2019 and is the director of the ACC Live course on Advancing Cardiovascular Care in Oncology Patients. She also is an associate editor of the JACC: CardioOncology.

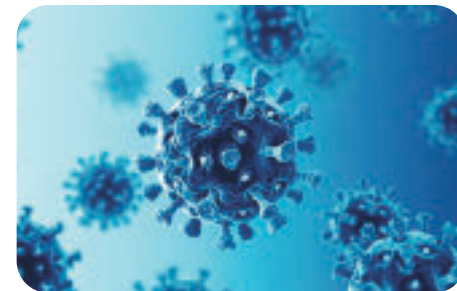
Washington, D.C. region: 202-360-6367; Baltimore region: 877-452-0725



Ambulatory cardiology practices

MedStar Health ambulatory services expands cardiovascular expertise to the outpatient setting throughout Maryland, Northern Virginia, and Washington, D.C. Our 89 providers are available at these sites, allowing for streamlined follow-up close to home.

- We integrate **telehealth**, remote monitoring programs, and regional image-sharing systems into our practices, further expanding convenience for patients.
- As part of our **Urgent Heart** program, patients can be triaged in the emergency department and receive rapid discharge with follow-up by a cardiologist within 24 hours, avoiding the delay associated with obtaining a specialist appointment.
- We are at the forefront of guideline creation in our **post-COVID recovery** program. Patients with a history of COVID-19 can receive cardiac screenings, multidisciplinary clearances for return-to-work, and rehabilitation to treat any unique and lingering effects of the disease.
- A core group of cardiologists are standardizing cardiovascular screening and treatment through the **women's heart health program**. Niche areas of care may include issues related to pregnancy, cancer treatment, and genetics. The team effectively transitions patients between inpatient and outpatient settings as appropriate.



Cardiogenetics

Our cardiogenetics practice offers genetic testing and counseling to patients and their family members. **Monisha Kisling**, our dedicated genetic counselor, works across cardiovascular subspecialties to provide early detection and insights into optimal treatment for patients, including particularly complicated diagnoses such as transthyretin amyloid, Long QT, hypertrophic cardiomyopathy, dilated cardiomyopathy, Brugada syndrome, and familial hypercholesterolemia.

For a consultation, please call 202-877-GENE (4363).



Robert A. Lager, MD
Chief, Ambulatory Services
Washington, D.C. region



George D. Bittar, MD
Chief, Ambulatory Services
Baltimore region





Ankit B. Shah, MD, Director, MedStar Sports & Performance Cardiology

Sports and Performance Cardiology

MedStar Sports & Performance Cardiology is one of the few formal programs in the nation to focus on heart disease in the athlete. Our director Ankit Shah, MD, is a graduate of the Massachusetts General Hospital sports cardiology fellowship program—the only one in the nation. With one foot firmly planted in cardiology and the other in sports medicine, his training ties the two disciplines tightly together.

The program focuses on:

- Preventing sudden, unexpected cardiovascular-related death among athletes
- Helping "weekend warriors" and professionals return to play after myocarditis, myocardial infarction, and other serious heart conditions
- Assisting top athletes enhance cardiovascular performance

We offer specialized cardiopulmonary exercise testing, which provides each athlete with personalized data and insight into potential conditions. Dr. Shah also works with professional teams such as the Baltimore Orioles, Baltimore Ravens, Washington Capitals, and USA Swimming, to help the athletes maximize their performance.

For a consultation, please call 410-554-2201.



Christopher F. Barnett, MD, Director, Pulmonary Hypertension Program
Director, Medical Cardiovascular Intensive Care Unit

Pulmonary hypertension

Despite major advances in our understanding of pulmonary hypertension (PH) and the availability of 14 FDA-approved medications to treat it, survival remains poor.

Our PH program offers comprehensive evaluation and diagnosis of all forms of PH, plus the full range of management options including the most advanced therapy—prostacyclin infusion.

We collaborate with other internationally recognized programs to provide access to lung transplantation and other specialized surgery applicable to treating chronic thromboembolic PH. Through our partnership with the National Institutes of Health PH program and participation in other clinical trials, we can offer unique therapy options to our patients. We work closely with the Pulmonary Hypertension Association to provide support to patients and their families in coping with this complex disease.

Washington, D.C. region: 202-877-2339

Baltimore region: 410-554-6550



The Good Health Center

The Good Health Center at MedStar Good Samaritan Hospital manages patients with heart failure through the myriad services in the outpatient setting. IV medications, same-visit lab work, coordination with interventional radiology and other imaging modalities, ultrafiltration, and amyloidosis workups are all offered at the Center. Also on site are cardiac and pulmonary rehab, a lymphedema clinic, a clinical pharmacist, dietitian, and mental health support.

The team manages patients quickly and temporarily, ad hoc, or for long-term, life-long care. We address economic and nutritional barriers, connect patients to mental health providers and support groups, help with transportation, and offer free membership to the on-site gym. We also set up home health services upon hospital discharge.

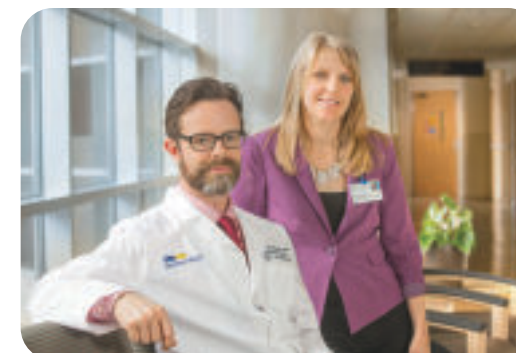
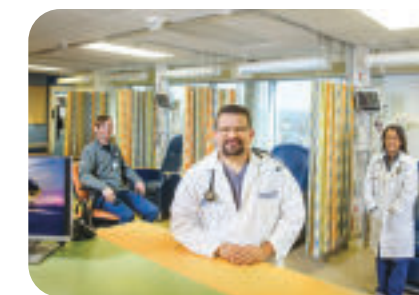
These services work together to improve patient health and quality of life, and reduce hospital readmissions and length of stay.

We accept referrals from any hospital system.

For more information, call 443-444-5993.

**6% 30-day
readmission rate**
to a MedStar Health hospital
Compared to 24% hospitals not using clinic

**5.2
day decrease**
in length of stay for hospitalizations



Palliative care

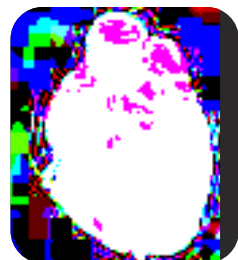
Palliative care specialists are always brought into the process of developing patient care plans when clinically appropriate. These specialists are embedded in our multidisciplinary teams to support patients and their families, and to co-manage goals for care and management of symptoms. This full integration of palliative care into heart failure treatment in particular, is an essential element of patient care. We are proud to have pioneered this personalized and holistic approach.



Cardiovascular imaging

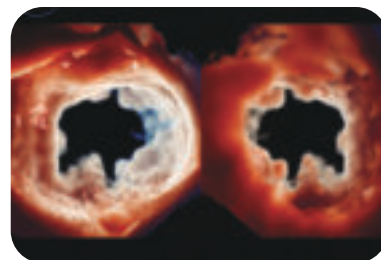
Medical and surgical specialists across MedStar Heart & Vascular Institute rely on cardiovascular imaging in the diagnosis and treatment of patients. Our patients also benefit from the use of sophisticated and appropriate images in determining their risks and improving their outcomes. Our long-term collaboration with researchers and clinicians from the National Institutes of Health further advances our capabilities.

If you have an image you'd like to discuss, you may upload it to [MedStarImageShare.com](https://www.medstarimageshare.com) or call **202-877-5975**.



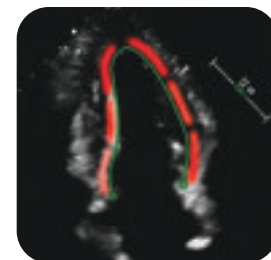
3,500

Cardiac MRI
and cardiac CT
images annually



1,200

Transesophageal
echocardiograms
(TEE) annually



13,200

Transthoracic
echocardiograms
(TTE) annually

Echocardiography in the cloud

Secure digital repositories house all echocardiogram data regardless of where patients undergo a test within MedStar Health. Their results will be available to our clinicians anywhere in their respective regions.

The technology enhances real-time collaboration among our cardiovascular specialists, and provides the free flow of information by putting studies and images in the hands of the most experienced readers, wherever they may be located.

Patients have the benefit of quicker turnaround times, flexible testing locations, and fewer test duplications.



New cardiovascular imaging options

Expanding upon previous imaging abilities, the new **Thome Advanced Cardiovascular Imaging Center** at MedStar Washington Hospital Center provides pioneering cardiac imaging technology. Baltimore-area patients may have their imaging completed at MedStar Union Memorial Hospital, and read at MedStar Washington, reducing their need to travel.

Siemens Dual Source CT scanner SOMATOM® Force

This state-of-the-art scanner provides:

- Higher temporal resolution at faster heart rates
- Significantly lower radiation dosing
- Reduced contrast dosing
- Intelligent automation
- More accurate scanning, especially in technically challenging cases

Siemens MAGNETOM® Sola 1.5T MRI

This new, recently approved scanner platform delivers de novo applications and elevates MRI capability, plus:

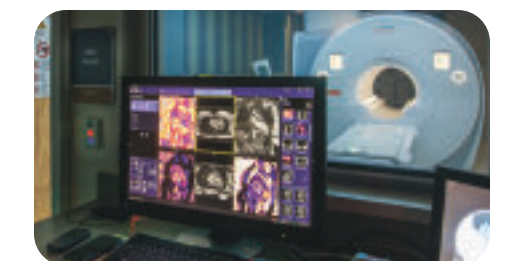
- Larger magnet bore for increased patient comfort
- Faster sequences to support improved imaging in technically challenging situations (e.g., arrhythmia)

- Advanced tissue characterization
- Expanded non-contrast and contrast technique for MR angiography
- Stronger collaboration with the NIH/NHLBI for advanced cardiac MRI

HeartFlow® FFRCT Analysis

New software offers visualization and physiologic evaluation of coronary stenoses, providing:

- More accurate evaluation of coronary anatomy and stenoses
- A reduction in unnecessary catheterization
- Greater operator perspective and planning prior to intervention



Cardiovascular critical care

In keeping with our overall mission, our cardiovascular critical care service continues to meet the increasingly complex needs of our patients. We provide post-operative care for those who have undergone surgical procedures, along with cardiac medical conditions and treatments.



Comprehensive services for high-acuity, complex patients

- 24/7 coverage by a multidisciplinary team of providers
- 80 beds for complex surgical and medical patients
- Rooms with ceiling-mounted booms carrying medical gases, and electric and data outlets allow ultimate flexibility and unrestricted access from all four sides of the bed
- Capability to provide temporary circulatory support, including veno-arterial (VA) ECMO, intra-aortic balloon, as well as temporary percutaneous ventricular assist devices (LVAD, RVAD, BiVAD, Impella)
- Recent expansion of CV critical care at MedStar Union Memorial Hospital increases its ability to provide sophisticated and holistic care for complex patients with multi-system organ dysfunction



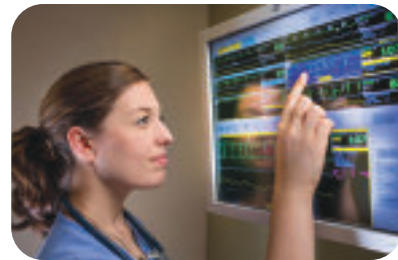
Multidisciplinary, specialized team

- Cardiac intensivists uniquely trained in both cardiology and critical care
- Physicians specialized in critical care medicine with primary board training in internal medicine, anesthesiology, surgery, and emergency medicine
- Advanced practice providers (APP), including nurse practitioners and physician assistants, specialized in the unique care of cardiac and vascular patients
- Nurses with specialized training in CVICU care



Holistic, family-focused care

- Interdisciplinary rounds are made with family members and all members of the care team, including physicians, APPs, nurses, and other clinicians
- 24/7 family visitation is encouraged
- Palliative care is fully integrated



In-house training and continuing education

- The care team undergoes a rigorous in-house training program that includes simulation training in high-acuity situations, such as emergency re-sternotomy and Cardiac Advanced Life Support, intra-aortic balloon pump placement, and transvenous pacemaker placement



80 Beds

for complex surgical and medical patients

Advanced practice providers

Our advanced practice providers (APPs) are an integral and growing group of cardiovascular specialists. They provide care throughout the system—in acute settings, outpatient sites, and ambulatory care locations. Thirty-five years ago, we were on the leading edge of APP utilization and we continue to support the expansion of their focus areas today.



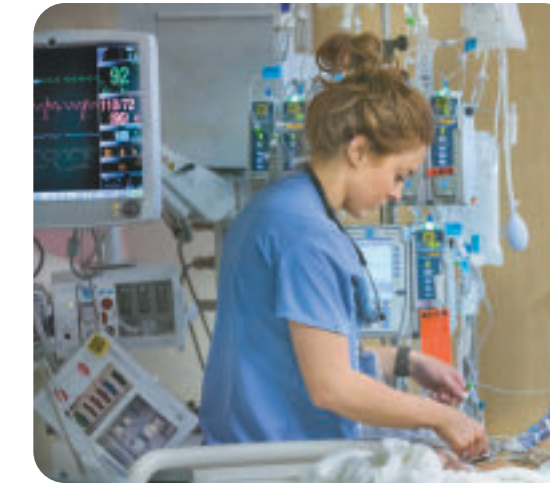
113 CV APPs

Cardiovascular APPs

Nursing

The high-acuity and case complexity of our patients requires sophisticated nursing expertise. Our nurses play a critical role throughout the patient journey, and are involved in niche medical and surgical therapies including:

- ECMO technology
- Medication titration
- Electrophysiology procedures
- Pulmonary hypertension therapies
- Short-stay TAVR and STEMI care
- Device monitoring, including the Impella 5.5
- COVID-19 treatment protocol



Education and certification highlights

Continuing education and advanced certifications are a major focus for our nursing teams. Some recent highlights include:

- The first acute care hospital in Washington, D.C. to receive the **Pathway to Excellence** designation from the American Nursing Credentialing Center
- Certification of our nursing residency program by the **Commission on Collegiate Nursing Education**
- **Certification of a high percentage of our CVICU nurses** by the American Association of Critical-Care Nurses



700+

Cardiovascular nurses



Cardiac hospitalists

Our hospitalists are dedicated to cardiovascular care and provide 24/7 coverage. This team manages care for patients of admitting cardiologists and may serve as a liaison to community physicians upon discharge. They are also involved in quality improvement initiatives across the inpatient service.



Cardiac anesthesiologists

Fellowship-trained anesthesiologists manage the unique challenges of cardiovascular patients. These patients often have multiple comorbidities and undergo complex, sophisticated procedures. This anesthesiology team provides critical pre-, intra-, and post-operative management.





Ron Waksman, MD
Director
Cardiovascular Research and Advanced Education



John C. Wang, MD
Scientific Director
Cardiovascular Research
Baltimore region

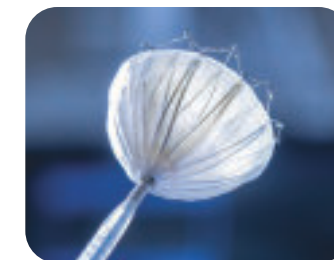
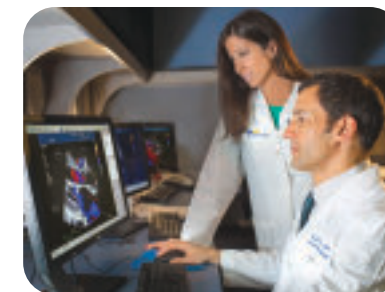
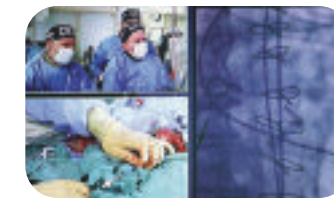
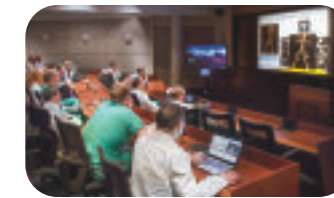


Research

We are committed to developing new technologies and strategies to advance clinical knowledge and provide optimal outcomes for all patients. Our research extends throughout MedStar Health, taking place at many of our hospital locations.

Ongoing collaboration with the National Institutes of Health, the U.S. Food and Drug Administration, the Centers for Medicare & Medicaid Services, and other leading institutions advances our participation in some of the world's most progressive cardiovascular investigations.

The MedStar Cardiovascular Research Network, part of MedStar Health Research Institute, is the infrastructure for clinical studies. Research is further enhanced by our state-of-the-art pre-clinical evaluation, cardiovascular core laboratories, and academic Clinical Research Organization (CRO). World-renowned investigators, basic and translational scientists, interventional cardiologists, research nurses, technicians, sonographers, and support staff comprise the network.



CRT: Cardiovascular Research Technologies

CRT, supported by and located on the campus of MedStar Washington Hospital Center, is designed to provide access to the world's leading clinicians and the latest research in order to improve practice and treatment outcomes.

- **CRTonline** provides exclusive interventional cardiology content to keep physicians up to date on the latest developments in the field. Visit [CRTonline.org](https://www.crtonline.org).
- **CRTmeeting** is one of the world's leading interventional cardiology conferences, attended by more than 3,000 cardiovascular specialists. At the 2020 meeting, the 24th annual, more than 1,300 presentations and 20 live cases from eight locations around the world were presented. Held each year in Washington, D.C., the conference serves as a forum for physicians and health-care professionals on new cardiovascular technology and interventional procedures in the field. Visit [CRTmeeting.org](https://www.crtmeeting.org).
- **CRTvirtual** is a weekly virtual conference on timely topics across the cardiovascular spectrum, including women in heart disease, valve and structural disease, and cardiovascular imaging and physiology. For more information or to register, see page 35 or visit [CRTvirtual.org](https://www.crtvirtual.org).
- **Cardiovascular Revascularization Medicine (CRM)** is the official journal of the CRT meeting and is an international, peer-reviewed journal that publishes original laboratory and clinical investigations related to revascularization therapies in cardiovascular medicine.



16
Scientific
leads



50
Investigators



85
Associates
and support
staff



115
Publications
annually in peer-
reviewed journals

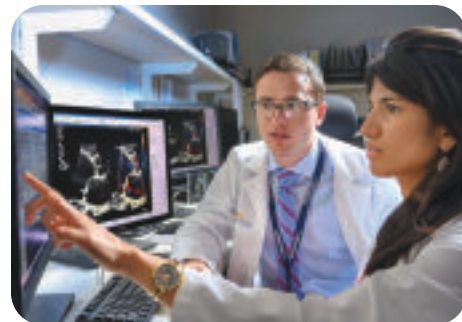


175
Current
ongoing
studies



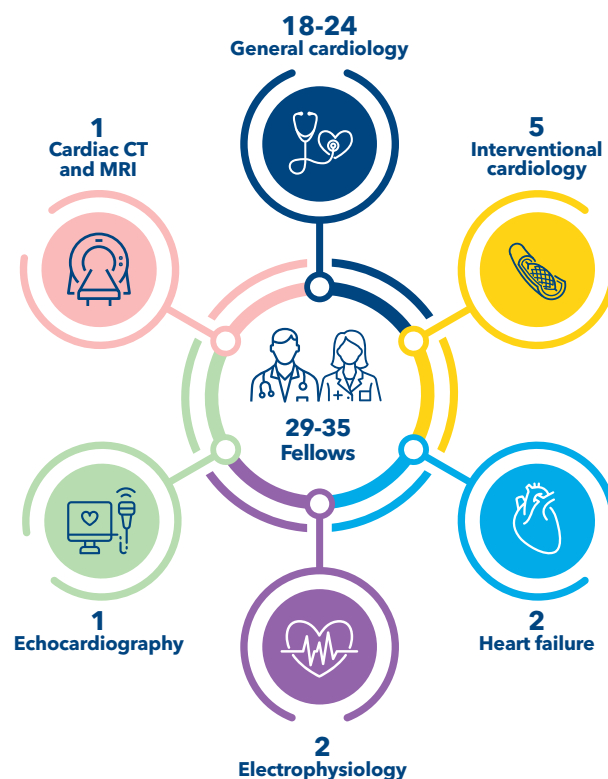
Graduate medical education

MedStar Health's graduate medical education program is one of the largest in the United States. Candidates have access to elite clinical programs and faculty, plus some of the most advanced technology and complex patients in the region. We are committed to a rich and rigorous learning environment for our cardiovascular fellows.



Subspecialty opportunities

Fellows have the opportunity to train in a variety of cardiovascular subspecialties:



Diverse experience

Fellows gain experience with a diverse population through rotations at:

- MedStar Washington Hospital Center
- MedStar Georgetown University Hospital
- Washington DC VA Medical Center
- Children's National Hospital



of our 2018/19 cardiovascular fellows give their programs the highest possible rating
*2019-2020 survey not available due to COVID-19



Research and innovation

Fellows are provided unique opportunities for involvement in research, clinical trials, and publication through our numerous ongoing studies, as well as those at partner programs, including the National Institutes of Health and Cleveland Clinic Heart, Vascular & Thoracic Institute.



Location in the nation's capital

Our location in Washington, D.C. allows fellows the opportunity for proximate involvement in healthcare advocacy and policy. For example, fellows have joined the American College of Cardiology in discussions with lawmakers on Capitol Hill about issues related to cardiovascular health.

Continuing medical education

Peer collaboration and continuing education are paramount. Our courses and conferences attract hundreds of weekly attendees from across the globe. We invite you to join us.



CRTvirtual

Virtual course

Saturdays, 8 a.m. to noon

Each session will include a deep dive into devices, clinical techniques, and research data, as well as case review and challenging issues in coronary, structural heart, and endovascular procedures.

Register at [CRTvirtual.org](https://www.crtvirtual.org).



DMV Cath Lab Case Review

Virtual course

Monthly, evenings

Colleagues from hospitals in D.C., Maryland, and Virginia (DMV) engage in thought-provoking discussion regarding interventional cardiology cases.

To request an invitation, please email lowell.f.satler@medstar.net.



Regularly scheduled series

Please visit [MedStar.Cloud-CME.com](https://www.MedStar.Cloud-CME.com) or call **202-780-1655** for information on all regularly scheduled series, including:

- Cardiac catheterization
- Cardiac surgery
- Cardiology
- Echocardiography
- Electrophysiology
- Cardio-oncology





The Nancy and Harold Zirkin Heart & Vascular Hospital

The Nancy and Harold Zirkin Heart & Vascular Hospital is a state-of-the-art facility on the campus of MedStar Washington Hospital Center. Serving as a cornerstone of MedStar Heart & Vascular Institute, it unites virtually the entire heart and vascular care team in one central location that drives more effective, streamlined care.

The Nancy and Harold Zirkin Heart & Vascular Hospital was named to recognize longtime Washingtonians Nancy and Harold Zirkin for their generosity and extraordinary philanthropic support. Their \$10 million leadership gift was the largest single contribution in the history of MedStar Health.

MedSTAR Transport

Our MedSTAR Transport service sets national standards for the care of critically ill or injured patients. The transfer center operates 24/7, covering the mid-Atlantic region with helicopters and critical-care ambulances.

Since its inaugural flight in 1983, MedSTAR Transport has been on the scene for the most dramatic and traumatic events to affect the national capital area, both natural and man-made.

Flights are staffed with a critical care nurse and paramedic, providing tertiary-level care in the air. Patients can be transported on multiple vasoactive medications, ECMO, IABP, LVAS, and pressure control ventilation. Nearly 50 percent of transports involve cardiovascular patients.



Cleveland Clinic alliance

Now in its ninth year, our clinical and research alliance with Cleveland Clinic's Miller Family Heart, Vascular & Thoracic Institute offers coordinated collaboration between two of the largest cardiovascular programs in the United States.

At the operational level, our clinicians work closely with quality and safety experts to implement quality improvement initiatives, evaluate treatment protocols, and validate and report outcomes. The alliance facilitates fluid communication between the scientists and clinicians at both Institutes, resulting in a collaborative approach to research. We share individual expertise and large and diverse patient populations in the pursuit of innovative cardiovascular therapies.



Mouin Abdallah, MD
Medical Director
Quality and Safety



Quality and safety

MedStar Heart & Vascular Institute has a dedicated quality and safety improvement department operated by approximately 20 physicians, nurses, and support staff. This team monitors more than 150 processes and outcomes metrics across the spectrum of care.

A comprehensive review of our quality metrics against internal goals and national benchmarks is performed monthly. In-depth analysis into each of our cardiovascular subspecialties and surgical departments occurs on a rotating basis.

Enhancing internal processes is our long-standing, collegial, and transparent relationship with Cleveland Clinic, which helps facilitate rapid-cycle quality improvements. The ability to learn from one another benefits patients and expedites dissemination of successful quality improvement interventions.

We publicly share our performance data with the following registries:

- STS/ACC TVT Registry
- STS
- ACC/NCDR (Cath/PCI; Chest Pain/MI; ICD)
- AHA Get With the Guidelines™
- AFib
- LAAO
- Vascular Quality Initiatives (VQI)
- INTERMACS



MedStar Health

MedStar Franklin Square Medical Center
MedStar Georgetown University Hospital
MedStar Good Samaritan Hospital
MedStar Harbor Hospital
MedStar Montgomery Medical Center
MedStar National Rehabilitation Hospital
MedStar Southern Maryland Hospital Center
MedStar St. Mary's Hospital
MedStar Union Memorial Hospital
MedStar Washington Hospital Center

MedStar Heart & Vascular Institute

110 Irving St., NW
Washington, DC 20010

MedStarHeartInstitute.org



MedStar Washington Hospital Center awarded