

Cardiovascular **Physician**

A clinical practice and research publication.

VOLUME 20 | NO 3 | FALL 2024

The expanding role of GLP-1 agonists in cardiovascular disease management.



Also inside:

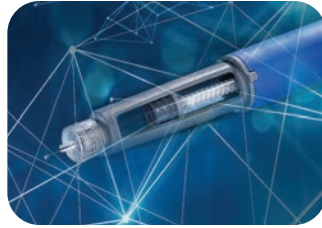
A new era in transthyretin cardiac amyloidosis therapy.

Advances in the field of hypertrophic cardiomyopathy.

Extravascular ICD system offers advantages for select patients.

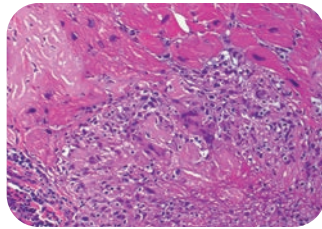


Table of contents.



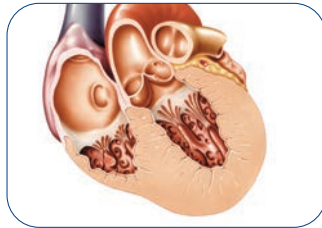
4

The expanding role of GLP-1 agonists in cardiovascular disease management.



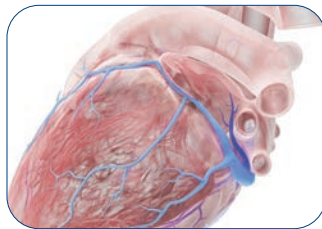
6

A new era in transthyretin cardiac amyloidosis therapy: Emerging and investigational treatments.



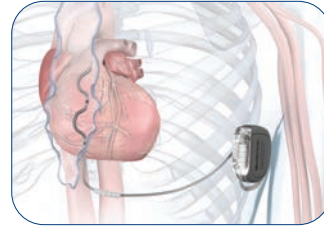
8

Advances in the field of hypertrophic cardiomyopathy: Updated exercise guidelines and emerging drug therapies.



10

Case Study: Vein of Marshall ethanol ablation resolves recurrent atypical atrial flutter.



12

Extracardiac ICD system offers advantages for select patients.



14

Comprehensive PCI services now available at MedStar Franklin Square Medical Center.



15

Welcome new medical staff.



18

News and notes.

Perspective from Stuart F. Seides, MD, physician executive director emeritus, MedStar Heart & Vascular Institute

Finding new passage through uncharted waters.

This fall, we celebrated the life of Dr. Paul Corso and his significant contributions to the field of cardiac surgery through the dedication of the newly renovated Cardiovascular Training and Education Center (CTEC) at MedStar Washington Hospital Center.

I had the pleasure of working very closely with Paul for decades, as our careers shared many parallel tracks. In those early years, we were navigating truly “uncharted waters.” When I think about what gave rise to the successes in our field there was the willingness to carefully seek previously “unexplored passages.” Cardiovascular physicians and surgeons at the time had to carefully balance what was known and what we were hoping to explore—never being reckless while always being thoughtful. These “responsible risks” paved the way for many of the innovations we discuss on the following pages. I applauded the new generation of pioneers who continue to carefully pull together what they know, and then “break the ice.”

Our cover story exemplifies this. GLP-1 agonists have been approved for use in the diabetic population for nearly 20 years, and now with an abundance of new research, we are learning that they are useful in managing numerous comorbidities and disease processes, including in our burgeoning population of patients with heart failure.

In similar ways, our management of transthyretin cardiac amyloidosis and hypertrophic cardiomyopathy have evolved significantly. In the not-so-distant past, it was all a bit of a “black box,” in that the disease mechanisms were not well understood, and we were focused on simply treating physiological consequences and the resultant symptoms. There was little clinical use in specifically classifying these cardiomyopathies. Now with a deeper and continuously evolving understanding of the underlying disease processes, we are forging ahead with a variety of novel ways to prolong the quality and longevity of patients’ lives. (Detailed on pages 6-9.)

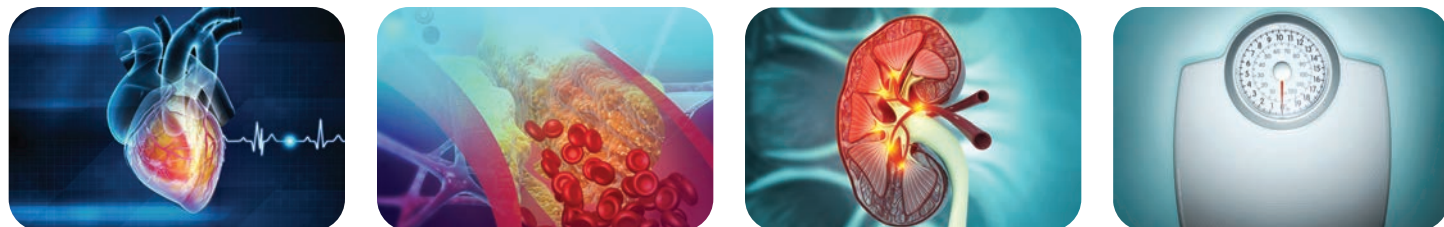
The case study on page 10 explores a curative ablation utilizing an anatomic approach with which many cardiologists may be unfamiliar: the Vein of Marshall. An understanding of the access it provides to the heart’s epicardial surface, when combined with our expertise in ablation, has allowed for a minimally invasive approach to treating recurrent atypical atrial flutter.

We’ve also seen development in our choices for preventing sudden cardiac death in a broader patient population. On pages 12-13 we share the next step in this long evolution: extracardiac ICD systems that can circumvent the issues surrounding intracardiac lead placement in selected patients.



As I reflect on the advances that we’ve helped to forge, a strong emphasis remains on our responsibility to disseminate and teach these new techniques and to mentor new providers. That is a key reason why the Paul J. Corso, MD, Cardiovascular Training and Education Center is so critical to us—it enhances opportunities to view the constant flow of new information into our field and discern its best use for the benefit of our patients. When the Center was originally built decades ago, it was state-of-the-art for the time. But now, the way we communicate through virtual meetings, live courses and demonstrations, rapid transmissions in and out of our institution—things we couldn’t imagine when the original was built—are now part of our everyday lives. The renovation of the center reflects the ways in which we share knowledge and chart fresh pathways in our practice of medicine—a fitting way to honor Paul Corso’s legacy.

The expanding role of GLP-1 agonists in cardiovascular disease management.



A wave of recent trial data has brought a promising new drug to the cardiologist's armamentarium. GLP-1 agonists are now used to manage obesity, diabetes, kidney disease, and most recently, aspects of cardiovascular disease.

"Providers have had access to this class of drugs for the past several years and have used it primarily because we recognize the significant overlap of these comorbidities and how much obesity is connected to the development and progression of cardiovascular disease," explains Advanced Heart Failure Specialist Richa Gupta, MD.

A third of the adult population has a BMI greater than 30. This classification of obesity has the strongest association for heart failure with preserved ejection fraction (HFpEF). Heart failure and obesity may increase the burden of symptoms, lead to more exertional limitations, and weaken ability to participate in activities of daily living.

"These drugs are truly practice-changing agents in all domains of heart failure, and recent clinical trial results have confirmed, and even added to, our understanding of the ways in which the drugs might benefit our patients," Dr. Gupta says.

She explains that, from a cardiovascular perspective, we now have data to support that the GLP-1 agonist semaglutide can:

- Reduce major adverse cardiac events (MACE) in patients with type 2 diabetes. (SUSTAIN™ 6, 2016)
- Reduce MACE in patients with atherosclerotic cardiovascular disease without diabetes. (SELECT, 2023)



- Reduce major adverse kidney outcomes and death from cardiovascular causes in patients with type 2 diabetes and chronic kidney disease. (FLOW, 2024)
- Improve symptoms, quality of life, and exercise capacity in patients with HFpEF, as well as decrease C-reactive protein (suggesting less inflammation) and NT-proBNP, regardless of baseline health status. (STEP-HFpEF, 2024)

"The data is strongest in its use for patients with HFpEF, and that is quite a breakthrough for this population," says Dr. Gupta. "There is limited GDMT for HFpEF, so it's amazing to have another drug for these patients for whom we otherwise didn't have much to offer."

Use of GLP-1 agonists for patients with heart failure with reduced ejection fraction (HFrEF) is still promising, but to date largely unstudied, so it comes with caveats.

"There are not yet trial data for the HFrEF population specifically," explains Dr. Gupta. "There are studies in process and we look forward to those results, but for now we still have to be somewhat careful with this group. The 2016 FIGHT trial of liraglutide in hospitalized HFrEF patients did not show favorable effects of liraglutide on the composite of death or rehospitalization for heart failure with nonsignificant signal for harm. The excess of clinical events was driven by worse outcomes in patients with NYHA III-to-IV heart failure. Usage thus requires caution and close monitoring. As heart failure clinicians, we will still use these agents in HFrEF, but we must use caution in the advanced HFrEF population and initiate

carefully only in patients that are compensated with low risk for arrhythmia. We vigilantly monitor creatinine and electrolytes for fluctuation during uptitration weeks to ensure the therapy is tolerated, and stay aware of arrhythmia burden."

She explains that in the stage D or advanced heart failure population, we will frequently employ these agents, with careful monitoring, in the following situations:

- For obese patients who need surgical therapy such as LVAD or transplant, the drug can lower perioperative risk or facilitate weight reduction below the BMI threshold for surgical candidacy.
- While there are no data yet, the drug may be helpful in reducing cardiac allograft vasculopathy (CAV) in transplant recipients. CAV is the primary reason why transplanted hearts fail with time. Since obesity and metabolic disorders are linked with CAV progression, GLP-1s may be beneficial.

"We continue to refer patients who require substantial weight loss to bariatric surgery, particularly when the situation is urgent, as bariatric surgery remains the most rapid way to lose the weight," explains Dr. Gupta. "But if the patient has time and is stable enough from a heart failure standpoint to work on lifestyle modification and weight loss with the drug, then this is another strategy we can implement."

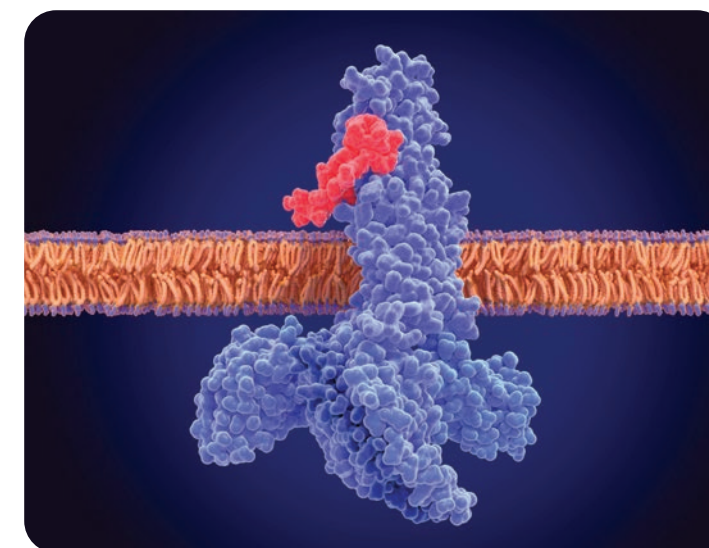
Overall, Dr. Gupta concludes, the field is seeing very positive, patient-centric outcomes.

"We know that losing weight greatly improves quality of life and our patients are much happier. With recent data showing significant signals for reduction in major cardiac events in certain populations, we have reason to be optimistic about the potential future impact of this class of drugs."

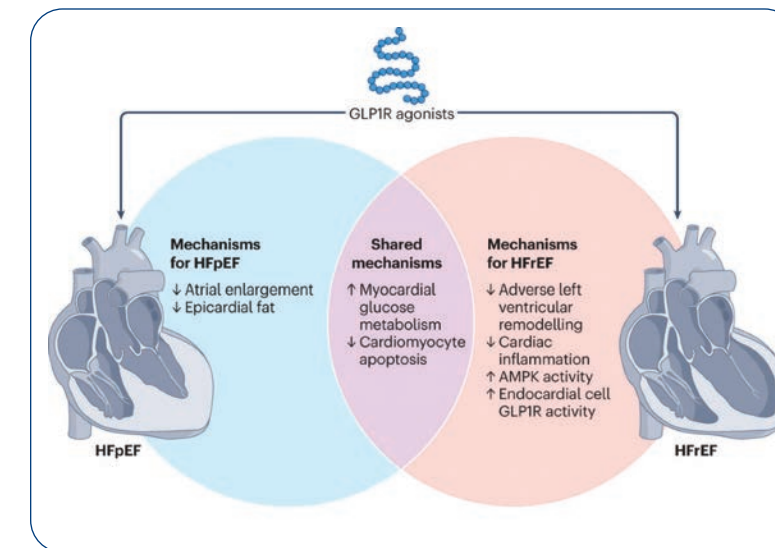


Advanced Heart Failure Specialist Richa Gupta, MD

To schedule a consult with Dr. Gupta, please call 202-877-4698.



A glucagon-like peptide-1 (GLP-1) receptor (blue) binding to a semaglutide molecule (red), forming an activated complex. Semaglutide is a GLP-1 receptor agonist, a type of drug that mimics the function of natural GLP-1 hormones. These medications work by binding to GLP-1 receptors throughout the body and stimulating insulin secretion, inhibiting glucagon secretion, and slowing down gastric emptying.



Ussher, J.R., Drucker, D.J. Glucagon-like peptide 1 receptor agonists: cardiovascular benefits and mechanisms of action. Nat Rev Cardiol 20, 463-474 (2023). <https://doi.org/10.1038/s41569-023-00849-3>

A new era in transthyretin cardiac amyloidosis therapy:

Dr. Farooq Sheikh discusses emerging and investigational treatments.



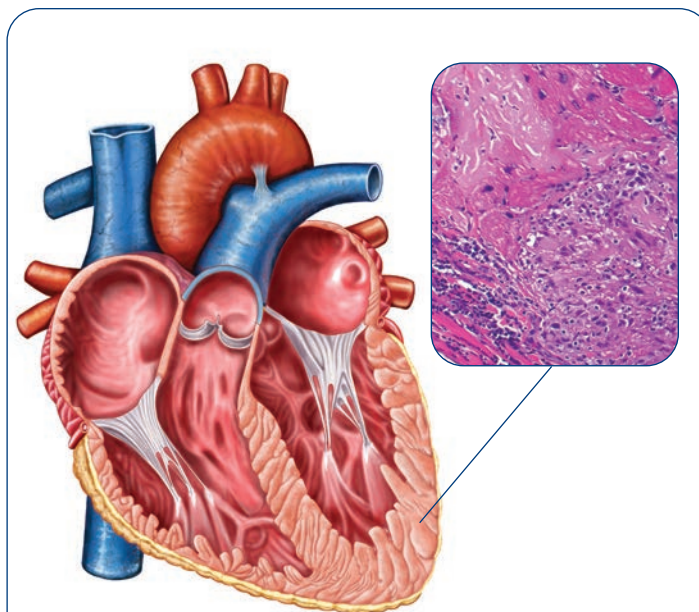
“After decades of very few options to offer patients with transthyretin cardiac amyloidosis (ATTR-CA), we have reached a point of inflection,” says Farooq Sheikh, MD, medical director of Advanced Heart Failure in the Washington, D.C. region and system director of Infiltrative Cardiomyopathy. “Given recent published data and the launch of several clinical trials, we are on the verge of having multiple therapies that can make a significant, positive impact on the longevity and quality of the lives of patients.”

Indeed, ATTR-CA is not as rare as it was once believed to be. An estimated 200-to-300 thousand Americans are living with this type of infiltrative cardiomyopathy. Abnormal structural changes in the normal transthyretin (TTR) protein—caused by aging or a hereditary gene substitution resulting in the misfolding of TTR protein—can result in amyloid deposits in the myocardium leading to restrictive cardiomyopathy and heart failure. Historically, ATTR-CA was underdiagnosed, lacked effective treatment, and was frequently fatal.

Now, the prognosis is much more optimistic. With the recent utilization of technetium pyrophosphate (PYP) imaging technology, as well as increased clinician awareness, patients are being diagnosed earlier in the disease process. In addition, there is one FDA-approved treatment for ATTR-CA, Tafamidis, which has been shown to reduce the risk of death and cardiovascular hospitalization while improving quality of life (ATTR-ACT study published in the *New England Journal of Medicine* in 2018).

“An incredible amount of innovation and discovery were necessary to get to this point,” Dr. Sheikh explains. “The work began with clinical and basic scientific breakthroughs. Then the advent of diagnostic strategies helped to identify patients (and those at risk of disease), which, coupled with the

identification of favorable treatment (Tafamidis), showed us that this disease is treatable. Significant biopharmaceutical investment, scientific research, and tremendous advocacy have paved the way.”



Abnormal structural changes in the normal transthyretin (TTR) protein—caused by aging or a hereditary gene substitution resulting in the misfolding of TTR protein—can result in amyloid deposits in the myocardium and lead to restrictive cardiomyopathy and heart failure.

Now, there is a new run of clinical trials underway that have the potential to further improve the clinical status and lives of patients. Dr. Sheikh and the Infiltrative Cardiomyopathy team are participating in these studies.

Promising new drugs.

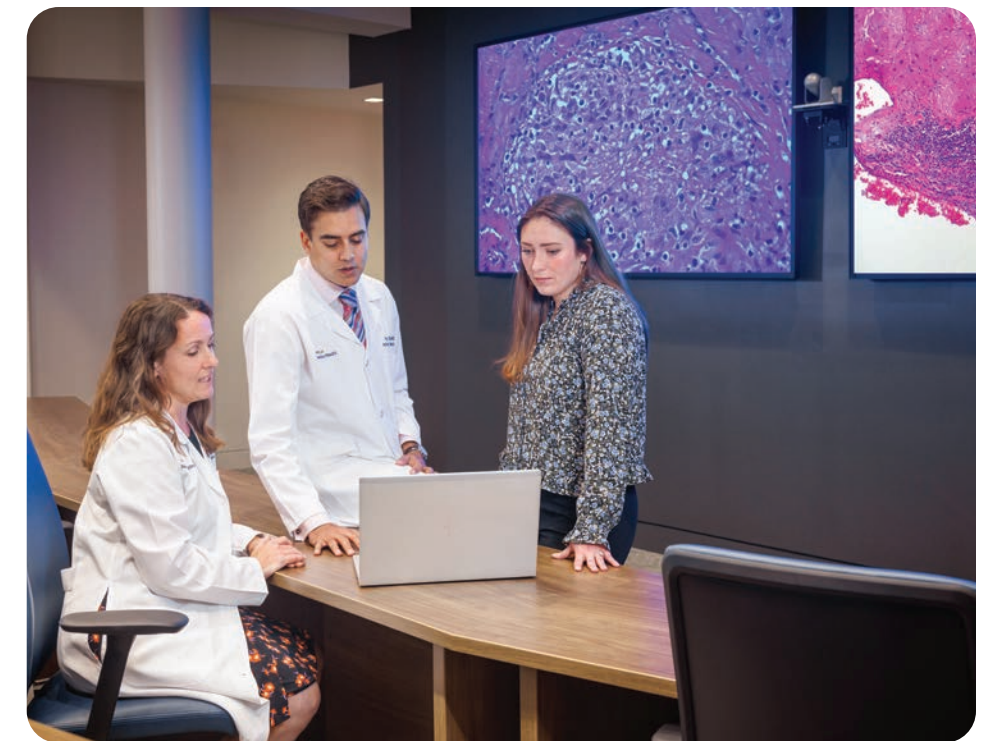
First, there are two medications soon to be under FDA review after their positive phase 3 clinical trial results.

Acoramidis, a second-generation TTR stabilizer (same category as Tafamidis) studied in the ATTRIBUTE-CM trial, will soon be reviewed by the FDA for approval. Another drug, Vutrisiran, a small interfering RNA therapeutic intended to reduce amyloid deposits (already FDA-approved to treat hereditary TTR polyneuropathy) by preventing the production of the TTR protein was evaluated in the HELIOS-B trial. Our Infiltrative Cardiomyopathy Program enrolled the first patient in the world in this trial which demonstrated that Vutrisiran could reduce mortality and adverse cardiovascular events while preserving quality of life in ATTR-CA patients. FDA review is pending. If approved, Vutrisiran would be the first TTR silencing agent available for patients. Another agent in this category of drug therapy, Eplontersen, is currently being evaluated in the Cardio-TTRansform trial.

Beyond these promising new drugs, there are active clinical trials underway to address alternative pathways involved in ATTR-CA disease development.

Gene-editing therapy.

In May, we enrolled the first U.S. patient in the gene-editing trial, MAGNITUDE. This international, phase 3 study is evaluating the medication NTLA-2001, which uses the gene-editing system CRISPR/Cas9 to find and disable the TTR gene in the liver, where most TTR protein is produced. NTLA-2001 is the first investigational CRISPR therapy to be administered intravenously to edit genes inside the human body. Interim Phase 1 and 2 clinical trial data showed consistent and long-lasting TTR protein reduction. NTLA-2001 is given as a one-time intravenous infusion.



Farooq Sheikh, MD, medical director of Advanced Heart Failure in the Washington, D.C. region and director of Infiltrative Cardiomyopathy, (center) with nurse practitioner Rachel Barish (left), and nurse navigator Madison Radenhausen (right)

Targeted depleting agent.

Finally, there is much excitement related to the initiation of the DepleTTR-CM study for which we are enrolling patients. This trial is investigating the safety and efficacy of the depleting agent ALXN-2220 in actively targeting and removing amyloid deposits. Patients receive infusions of either ALXN-2220 or a placebo and are monitored and assessed over a period of several years.

“With the confluence of these studies and emerging new treatment options superimposed onto the reality that patients are living longer, there is lot of hope for our amyloidosis community,” says Dr. Sheikh. “Our team is passionate about continuing to improve the lives of patients—in our region and beyond—and are committed to the ongoing exploration of new and improved avenues of treatment.”

For more information on any of the trials discussed, please contact hellina.t.birru@medstar.net or megan.a.fuller@medstar.net.



Advances in the field of hypertrophic cardiomyopathy:

Updated exercise guidelines and emerging drug therapies.

Significant progress has been made in recent years regarding our understanding of hypertrophic cardiomyopathy (HCM), leading to increased awareness of the condition and advances in the management and prevention of complications.

“Although it is a condition we have known about for more than five decades, we have relied on the same protocols for diagnosing and treating HCM for quite some time,” explains Patrick Bering, MD, a clinical cardiologist and medical director of the Hypertrophic Cardiomyopathy program at MedStar Washington Hospital Center. “But there have been some exciting developments in the field that are shifting how we approach the care of individuals with HCM, particularly in terms of targeted therapies aimed at various forms and features of the condition.”

In fact, these developments led to the release earlier this year of updated clinical practice guidelines for the management of patients with HCM by the American Heart Association and the American College of Cardiology, with the support of several other professional societies. The 2024 guidelines provide some revised recommendations for the most effective treatment pathways, as explained below.

Importance of multidisciplinary care.

“While HCM is a common cardiovascular disorder, it is also incredibly complex, with symptoms varying dramatically from patient to patient often requiring collaboration among many subspecialists to ensure the best outcomes,” notes Sandeep Jani, MD, medical director of the Hypertrophic Cardiomyopathy and Advanced Heart Failure programs in the Baltimore region. “The updated guidelines reinforce the

need for patients with HCM to be referred to multidisciplinary centers such as ours to receive the most optimal care.”

Recognized benefits of physical activity for some.

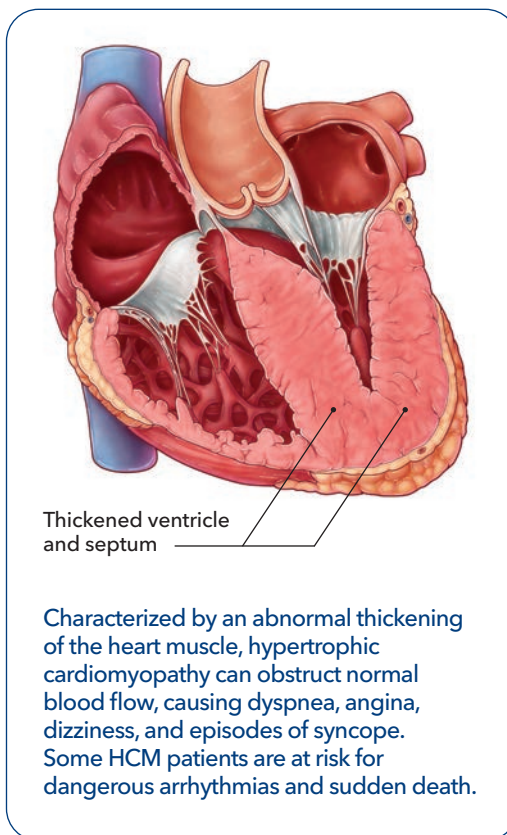
In addition, the updated guidelines address a change in the way physical activity should be approached for HCM patients. “Previously, many patients were advised that they shouldn’t exercise,” says Dr. Bering. “But physical activity is universally recognized as key to good health. So, patients with HCM are now encouraged to discuss regular physical activity with their cardiologist as part of a healthy lifestyle. The amount, however, depends on the patient, and any exercise plan should be developed in concert with a specialist in HCM. In certain circumstances, even vigorous activity may be realistic if a patient is low risk and has adequate risk acceptance.”

Use of cardiac myosin inhibitors.

The guidelines also give a class I recommendation for the use of cardiac myosin inhibitors in patients with symptomatic obstructive HCM who are not responding to or tolerating first-line therapies, such as beta blockers or nondihydropyridine calcium channel blockers. Approximately two-thirds of patients with HCM have obstructive HCM, where the thickening of the cardiac muscle leads to left ventricular outflow tract obstruction.

“The approval of mavacamten in 2022, the first FDA-approved class of medication to target the thickening of the heart muscle instead of the

symptoms, is one of the reasons it was important for these guidelines to be updated,” Dr. Jani explains. “Prior to cardiac myosin inhibitors, medical therapy was often ineffective in alleviating symptoms of obstruction and patients either



Patrick Bering, MD, medical director of the Hypertrophic Cardiomyopathy program at MedStar Washington Hospital Center

had to live with them or undergo invasive septal reduction therapies. With cardiac myosin inhibitors, more patients get symptomatic benefit and fewer need invasive procedures.”

He notes that patients prescribed the medication must be enrolled in the risk evaluation and mitigation strategy (REMS) program, which requires frequent echocardiographic assessment. “It’s a tradeoff that needs to be considered. That is why it’s important to discuss with the patient if the likelihood of symptoms improvement is worth the investment in time to enroll in REMS.”

On the horizon.

While the use of cardiac myosin inhibitors is not addressed in the guidelines for the treatment of symptomatic nonobstructive HCM, where blood flow is not affected but the heart muscle is thickened, trials are underway.

In fact, both Dr. Jani and Dr. Bering are site principal investigators in a clinical trial underway currently to study the effects of aficamten—a next-in-class cardiac myosin inhibitor—on quality of life, exercise capacity, and clinical outcome in patients with symptomatic nonobstructive HCM. Called the ACACIA-HCM trial, it is a phase 3, multi-center, randomized, double-blind trial to evaluate the efficacy and safety of aficamten compared to placebo.

“ACACIA-HCM builds on encouraging findings from previous trials, which demonstrated that treatment with aficamten resulted in statistically significant improvement in symptoms such as shortness of breath and in cardiac biomarkers in patients with symptomatic obstructive HCM. The current trial



Sandeep Jani, MD, medical director of the Hypertrophic Cardiomyopathy and Advanced Heart Failure programs in the Baltimore region

is taking this research another step further by assessing the impact of aficamten on symptoms and quality of life and other measures of disease burden, including exercise capacity, functional class, cardiac structure and function in patients

with nonobstructive HCM. Currently, there is no treatment to improve symptoms for these patients,” says Dr. Jani.

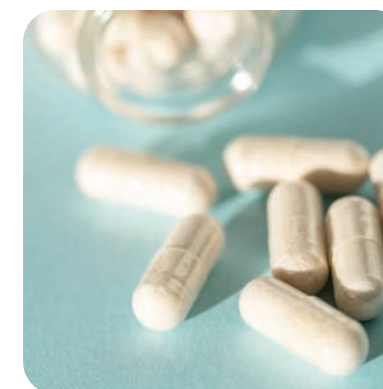
“Trials conducted to date, as well as several in progress, have proven the mechanism and efficacy of cardiac myosin inhibitors in individuals with HCM, which is very exciting. This represents a bright new era in the targeted management of the disease,” he adds.

“HCM affects approximately one in every 500 individuals and every patient experiences the condition in their own way. It’s a multispecialty cardiac condition that may require the expertise of many clinicians including HCM and advanced heart failure cardiologists, cardiac imaging specialists, cardiac electrophysiologists, interventional cardiologists, cardiac surgeons, and clinical geneticists. Having that infrastructure is an important part of providing care for patients with HCM and that is what MedStar Heart & Vascular Institute offers.” Dr. Bering says.

“We’re seeing more evidence that patients with HCM can live normal lives with proper care and management. These updated guidelines equip clinicians with

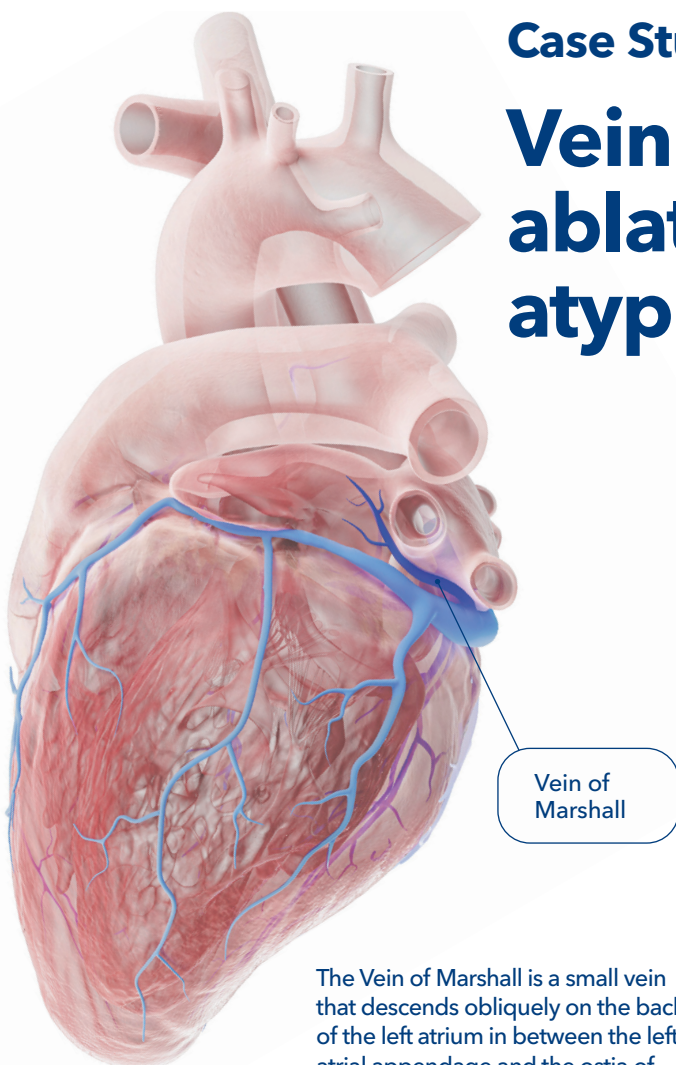
the latest recommendations for ensuring the best outcomes for each patient.”

For information on our HCM specialty care, please call 202-877-2183 (Washington, D.C.) or 410-554-6550 (Baltimore).



Case Study:

Vein of Marshall ethanol ablation resolves recurrent atypical atrial flutter.



The Vein of Marshall is a small vein that descends obliquely on the back of the left atrium in between the left atrial appendage and the ostia of the left pulmonary veins and ends in the coronary sinus. As it is an embryonic remnant, it may not be found in all anatomies.

Vernon Troxell was baffled, and so were his physicians.

The 77-year-old military veteran and former carpenter was undergoing treatment for a kidney infection when he experienced a sudden arrhythmia. It was a familiar sensation for Troxell, having twice undergone ablations for atrial fibrillation and atrial flutter over the past 20 years. His physicians immediately took steps to restore his normal heart rhythm, but the condition persisted.

Troxell would spend two weeks in his hospital's ICU before he was finally stabilized and allowed to go home. His recovery was slow, however, as he continued to experience extreme fatigue and dyspnea. Even climbing a flight of steps was a challenge.

"I have always received great care [at my regular hospital], but this incident was really unusual," Troxell says. "I knew I needed to see a good heart specialist."

A referral from Troxell's hospital physicians brought him to MedStar Health Cardiac Electrophysiologist Apostolos Tsimploulis, MD, associate director of the Complex Arrhythmias and Innovations Program. Reviewing the case history and electrocardiogram data, Dr. Tsimploulis suspected that Troxell had developed atypical atrial flutter, which occurs in the left atrium rather than the right, and therefore is more complicated to treat.

"With electroanatomic mapping and diagnostic electrophysiologic maneuvers, I confirmed the presence of a mitral atrial flutter," Dr. Tsimploulis says, adding that it was also understandable why the outside hospital physicians found it so difficult to correct the condition.

"Atrial fibrillation ablation has a success rate of 60-to-80 percent, depending on the type," Dr. Tsimploulis explains. "If there's recurrence of an arrhythmia after an ablation, in many times it presents as an atypical flutter, which is common in patients with prior ablations."

Despite applying extensive radiofrequency ablation from the endocardium, he adds, "Mr. Troxell's arrhythmia could not terminate because one part of the circuit was involving the epicardium."

Dr. Tsimploulis ruled out medication as a treatment option, citing their uncertain effectiveness in arrhythmias of this type. "Most of them have significant side effects as well," he adds.

Instead, Dr. Tsimploulis performed a Vein of Marshall ethanol ablation, a highly specialized procedure in which a catheter and a small balloon are inserted directly into the 1- to 2-mm diameter vein located along the epicardial surface. Inflating the balloon occludes the vein, allowing specific targeting of ethanol injection without damaging healthy tissue.



"Injecting ethanol on this tiny vein enabled us to ablate this part of the circuit, which we could not reach by applying radiofrequency ablation energy from the endocardium," Dr. Tsimploulis says. "The procedure typically lasts no more than 30 to 60 minutes, depending on the anatomy, and has the same recovery as an atrial fibrillation ablation."

As Dr. Tsimploulis expected, the Vein of Marshall ethanol ablation immediately terminated the atypical mitral atrial flutter. Troxell noticed the difference quickly.

"I felt great right away," he says. "My energy is back, and I'm now able to do everything I could before all this happened."

Troxell reports an excellent experience with Dr. Tsimploulis and his team.

"From the start, he was positive about solving the problem," Troxell says. "He let me know what was going on, from describing the procedure to what would happen afterward. I felt very confident that we were going to figure this out."

Troxell was so impressed with his experience that he encouraged his sister to consult Dr. Tsimploulis about her atrial fibrillation issues—even though she lives in Pennsylvania.

Dr. Tsimploulis says that MedStar Health is one of the few hospital systems in the country with the expertise to perform a Vein of Marshall ethanol ablation, which is ideally the best way to treat atypical mitral atrial flutter with epicardial extension of the circuit, particularly since the procedure can be combined with atrial fibrillation ablation if necessary.

"We have a lot of unique experience with procedures involving the coronary sinus such as this one, as many of us were trained by our Senior Consultant Seth Worley, MD, an internationally recognized expert in cardiac resynchronization therapy," he says.

Dr. Tsimploulis and his colleagues are also studying ways to refine Vein of Marshall ethanol ablations, developing a technique that will reduce patients' exposure to fluoroscopy, the use of contrast agents, and procedure time.

"We're the first program in the region to use a new technology called pulsed field ablation that eventually may be useful in treating atypical atrial flutters and similar arrhythmias," he adds.

To make a referral to Dr. Tsimploulis, please call 202-877-7685.



**Cardiac Electrophysiologist
Apostolos Tsimploulis, MD**



Patient Vernon Troxell

(left) Electroanatomic map of the atypical mitral atrial flutter; (right) Fluoroscopic view of balloon occlusion of the Vein of Marshall

Extravascular ICD system for treating ventricular arrhythmia offers advantages for select patients.

Patients at risk of life-threatening arrhythmias now have a new monitoring and treatment option following the recent federal approval of the Aurora EV-ICD™ (extravascular implantable cardioverter defibrillator) System.

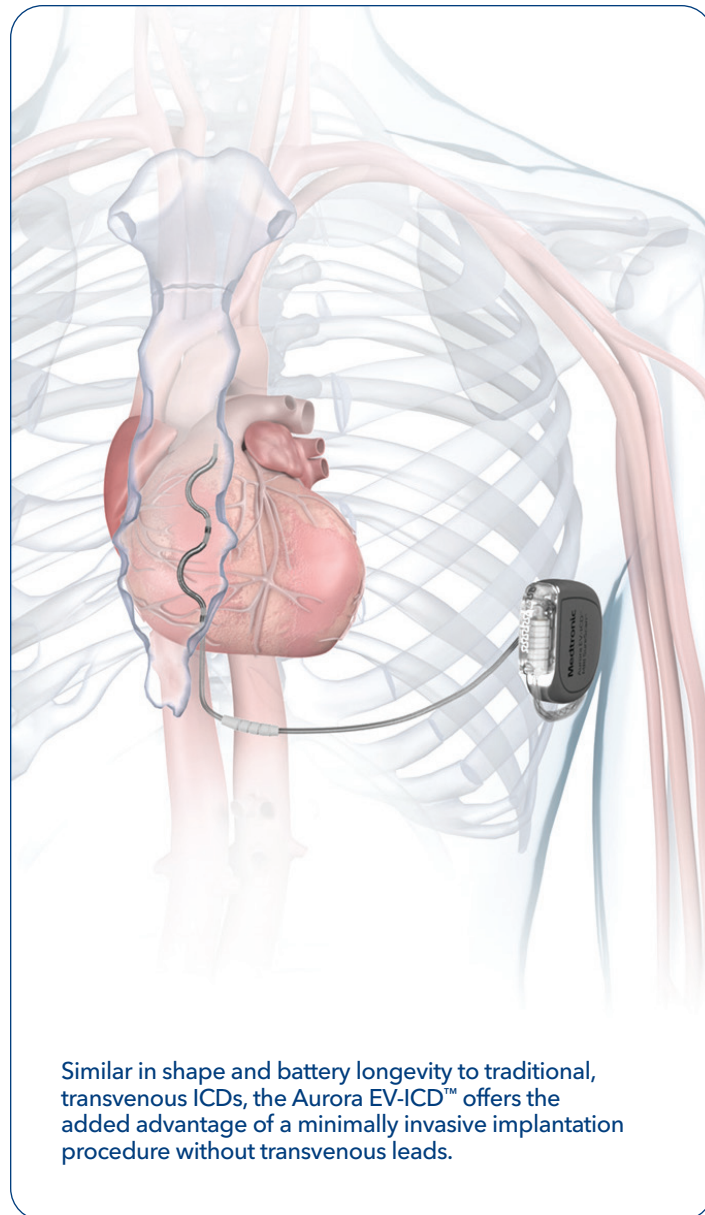
This system is designed for patients who have experienced or are at significant risk of developing life-threatening ventricular arrhythmias, and who have neither had a prior sternotomy nor require chronic bradycardia pacing.

Similar in shape and longevity to traditional, transvenous ICDs, the EV-ICD offers the added advantage of a minimally invasive implantation procedure, preserving the vasculature and reducing the potential for vascular injury.

“The device is simpler to implant, typically placed in the left axilla, below the armpit, with the defibrillator lead placed under the sternum,” says Cardiac Electrophysiologist Athanasios Thomaides, MD, at MedStar Washington Hospital Center. “Along with helping avoid typical complications associated with transvenous leads, the device and procedure reduce the risk of device-related systemic infection—a significant advantage for patients who are immunocompromised or may be undergoing dialysis and other treatments.”

The EV-ICD also has some advantages over the subcutaneous ICD:

- It provides pause-prevention pacing.
- It has considerably longer-lasting battery life, of approximately 11 years—comparable to standard transvenous batteries—in comparison to the subcutaneous ICD that lasts about seven.
- It is half the size of the subcutaneous ICD, which means less discomfort for the patient in the left axillary area, especially when laying on their left side.
- It provides anti-tachycardia pacing (ATP) that may significantly reduce the numbers of shocks for some patients, which can be both physically and emotionally taxing.



Cardiac Electrophysiologist Athanasios Thomaides, MD

“The EV-ICD can be custom-programmed to match a patient’s specific condition and therapy needs,” he explains, emphasizing that the system’s ability to immediately deliver appropriate ATP until the arrhythmia is terminated is a key advantage. “Seventy percent of VT episodes were successfully terminated with ATP, substantially reducing the amount of shock therapy delivered.” In addition, Dr. Thomaides says, the device is MRI-compatible and can be easily serviced should replacement of the defibrillator lead become necessary.

Our program was among the more than 40 global sites that participated in clinical trials for the EV-ICD between October 2019 and September 2021. Nearly 300 patients were implanted with the device, which proved successful in terminating ventricular arrhythmias in 98.7% of cases.

“Being part of the trials enabled us to immediately offer the device to eligible patients as soon as FDA approval was granted,” Dr. Thomaides says, noting that the device’s high success rate and overall effectiveness is a testament to the rapid evolution of both transvenous and extravascular ICD technology over the past several decades.

Glenn Meininger, director of Cardiac Electrophysiology in the Baltimore region, implants the EV-ICDs at MedStar Union Memorial Hospital.



Cardiac Electrophysiologist Glenn Meininger, MD

“Adding this new therapy to our armamentarium further allows us to customize options for our patients, providing improved satisfaction and outcomes,” says Dr. Meininger. “As with all new devices, we carefully consider which is the best approach for each particular case.”

According to the FDA, the EV-ICD system should not be used in patients with persistent ventricular tachycardia (VT) or ventricular fibrillation (VF), or if their primary disorder is chronic atrial tachyarrhythmia with no concurrent VT or VF. The device also is not recommended if symptomatic bradycardia or tachyarrhythmias with transient or reversible causes exist.

Real-world performance and safety data continues to be collected in the Enlighten global post-approval registry using a prospective, non-randomized, observational, multicenter study that is expected to last five years and enroll approximately 1,000 patients.

We are honored to provide a consult for your patient. To reach our cardiac electrophysiology team, please call either 202-877-7685 (Washington, D.C. area) or 410-554-6727 (Baltimore area).

Comprehensive PCI services now available at MedStar Franklin Square Medical Center.



John Wang, MD, chief of the Cardiac Catheterization Laboratory at MedStar Union Memorial Hospital and MedStar Franklin Square Medical Center, performs the first elective PCI case at MedStar Franklin Square Medical Center

The percutaneous coronary intervention (PCI) program offered at MedStar Union Memorial Hospital has expanded to MedStar Franklin Square Medical Center, making it possible for patients there to receive the comprehensive care they need without having to transfer to another facility or travel far from home.

While MedStar Franklin Square has long performed emergent PCI procedures, the team is now approved to provide *elective* PCI procedures. This development comes at a particularly beneficial time. The population of the region surrounding the hospital continues to grow, and so too has the need for more comprehensive cardiovascular services.

“Through this expansion, we are now able to offer patients at MedStar Franklin Square access to the highest level of care provided by the same experienced, high-volume specialists who perform these procedures at MedStar Union Memorial, one of the premier heart centers in the region,” explains John Wang, MD, chief of the Cardiac Catheterization Laboratory at both hospitals and scientific director for Cardiovascular Research in the Baltimore region.

“In essence, we have created one interventional cardiology program with two locations led by a team of highly skilled interventionalists who rotate through both sites.” The program is identical at both hospitals with the same capabilities and protocols in place, ensuring continuity of care.

To accommodate the program at MedStar Franklin Square, a new Cardiac Catheterization Laboratory, equipped with state-of-the-art technology was built, and the existing lab was updated for overflow procedures. A contiguous prep and recovery unit was also constructed that includes 12 patient bays, a central nursing station, a family waiting room, a radial recovery lounge, and additional support spaces.

Dr. Wang notes that MedStar Franklin Square is now averaging over 300 PCI procedures per year and continuing to grow, versus the approximately 100 when it only offered emergent PCIs. In addition, 90 percent of the PCI procedures are performed radially compared to a national average of 59 percent.

“One of the reasons we were able to ramp up so quickly, is the fact that we were already doing emergent PCIs, so we did not have to build from scratch,” he adds. “With the improvements we have made and the team we have in place, the patient experience is far better. Patients and their physicians can be assured of receiving the highest quality of care for the most complex of procedures, close to home.”

To refer a patient, please call the Heartline: 410-554-2332.



Welcome **new medical staff.**



Edward Y.H. Chan, MD, is the Chief of Thoracic Surgery at MedStar Washington Hospital Center and MedStar Georgetown University Hospital. Dr. Chan is board certified in general and thoracic surgery. He treats patients for lung cancer, esophageal cancer, benign esophageal diseases (such as acid reflux/hiatal hernia and achalasia), and mediastinal tumors. Dr. Chan is a highly experienced specialist in minimally invasive procedures, such as robotic surgery, EBUS, navigational bronchoscopy, and esophageal stenting, as well as lung transplantation. Passionate about preventative cancer care, he promotes and encourages eligible patients to be screened for lung cancer. Prior to his appointment at MedStar Health, Dr. Chan was an Associate Professor of Surgery and Cardiothoracic Surgery at Weill Cornell Medical College. During his clinical practice at the Houston Methodist Hospital Department of Surgery, he was Program Director of the American College of Surgeons AEI simulation and education fellowship and Associate Program Director of the General Surgery residency program.

Education and training:

- **Fellowship:** Research, Cardiothoracic Surgery, Columbia University Medical Center, New York, New York
- **Residencies:**
 - Cardiothoracic Surgery, University of Washington, Seattle, Washington
 - General Surgery, Mount Sinai School of Medicine, New York, New York
- **Medical School:** University of Texas Medical Branch, Galveston, Texas



John Conte, MD, is a cardiac surgeon at MedStar Union Memorial Hospital with over 30 years of experience. He is known for his expertise in treating aortic, coronary artery, and valvular disease, often performing complex and re-operative surgery. A pioneer in his field, Dr. Conte was the first in Pennsylvania to use the HAART aortic valve ring. He contributed to an early body of research that led to artificial heart and heart pump technology. Dedicated to advancing knowledge and improving outcomes, Dr. Conte was integral in founding the Maryland Cardiac Surgery Quality Initiative (MCSQI) and served as its first president. His professional career began at the University of Maryland in 1995. Later, he spent 20 years at Johns Hopkins Hospital before assuming the role of Chair of Cardiothoracic Surgery and Vice Chair of the Geisinger Heart Institute in 2020. Throughout his long career, Dr. Conte has belonged to and held leadership positions in all the major cardiological society organizations.

Education and training:

- **Fellowships:**
 - Cardiovascular Research, MedStar Georgetown University Hospital, Washington, DC
 - ECMO (Extracorporeal Membrane Oxygenation), MedStar Georgetown University Hospital, Washington, DC
- **Residencies:**
 - General Surgery, MedStar Georgetown University Hospital, Washington, DC
 - Cardiothoracic Surgery, Stanford University Medical Center, Stanford, California
- **Medical School:** Georgetown University School of Medicine, Washington, DC



Charles A. German, MD, is the Director of Preventive Cardiology at MedStar Georgetown University Hospital. He is board certified in internal medicine and cardiovascular medicine. Dr. German works with patients to identify, address, and ultimately lower their risk of cardiovascular events. He helps patients manage their high cholesterol,

hypertension, and cardiometabolic disease through personalized diet and exercise plans or medications. As an expert in risk assessment, Dr. German begins every visit with a comprehensive evaluation of a patient's risk factors to fully understand each individual's unique circumstances. This includes novel biomarkers, blood testing, and cardiovascular imaging. He then collaborates with them to develop a practical treatment plan, including lifestyle changes, medication, or other therapies.

Education and training:

- **Fellowship:** Cardiology, Wake Forest School of Medicine, Winston-Salem, North Carolina
- **Residency:** University of Alabama at Birmingham, Birmingham, Alabama
- **Medical School:** University of Texas Medical Branch, Galveston, Texas



Jonathan R. Gower, MD, is a highly experienced cardiothoracic surgeon at MedStar Washington Hospital Center. He offers the entire array of adult cardiac surgeries, including valve replacement, coronary artery bypass, and advanced heart failure therapies. Dr. Gower's approach is based on open and transparent patient communication

and education. He prepares patients for their procedures by thoroughly discussing potential risks and outcomes, ensuring they understand what to expect and can make informed decisions.

Education and training:

- **Fellowship:** Advanced Heart Failure in Cardiothoracic Surgery, New York Presbyterian Columbia University Medical Center, New York, New York
- **Residencies:**
 - Cardiothoracic Surgery, New York Presbyterian Weill Cornell, New York, New York
 - General Surgery, Naval Medical Center San Diego, San Diego, California
- **Medical School:** Uniformed Services University of the Health Sciences, Bethesda, Maryland



Rajiv A. Kabadi, MD, is the Director of Cardiac Rhythm Management Devices. As a cardiac electrophysiologist, he practices in Baltimore, Southern Maryland, and Northern Virginia. He is board certified in cardiovascular disease, echocardiography, and internal medicine. His particular areas of focus and specialized experience include the use

of multimodal, state-of-the-art technologies to treat complex arrhythmias such as atrial fibrillation, physiologic cardiac pacing that mimics the heart's natural conduction system, and hybrid, multi-disciplinary approaches to treat supraventricular and ventricular arrhythmias. When working with patients, Dr. Kabadi is dedicated to clear, respectful communication, ensuring that patients and families fully understand the diagnosis as well as the personalized treatment plan.

Education and training:

- **Fellowships:**
 - Clinical Cardiac Electrophysiology, Georgetown University/MedStar Washington Hospital Center, Washington, DC
 - Cardiovascular Disease, Virginia Commonwealth University Health System, Richmond, Virginia
- **Residency:** Thomas Jefferson University Hospital, Philadelphia, Pennsylvania
- **Medical School:** New York Medical College, Valhalla, New York



Willie Liang, MD, is a board-eligible vascular surgeon at MedStar Union Memorial Hospital and MedStar Harbor Hospital who treats the spectrum of vascular disease including abdominal aortic aneurysm, peripheral artery disease, carotid artery disease, peripheral venous disease, and aortic dissection. Dr. Liang is dedicated to providing the best care

possible to his patients using minimally invasive endovascular procedures as well as standard open surgeries. He is particularly interested in minimally invasive procedures that are tailored to each person's unique anatomy and allow for quick recovery and less time in the hospital. In addition, he hopes to expand options for treating complex aortic aneurysm.

Education and training:

- **Fellowship:** Vascular Surgery, University of Maryland Medical Center, Baltimore, Maryland
- **Residency:** General Surgery, Sinai Hospital, Baltimore, Maryland
- **Medical School:** Howard University College of Medicine, Washington, DC



Abhinav Sood, MD, is an interventional cardiologist at MedStar Union Memorial Hospital and MedStar Franklin Square Medical Center. Dr. Sood is board certified in interventional cardiology, echocardiography, nuclear medicine, cardiovascular disease, and internal medicine. He specializes in the minimally

invasive treatment of complex coronary artery disease, chronic total occlusions, atrial fibrillation, and valvular heart diseases. He also specializes in performing left atrial appendage occlusion. He is particularly interested in treating cryptogenic strokes and preventing their recurrence, especially in otherwise young healthy adults.

Education and training:

- **Fellowships:**
 - Structural Heart Disease/CHIP, Ascension Borgess/ Michigan State University Kalamazoo, Michigan
 - Interventional Cardiology, Ascension Borgess/ Michigan State University, Kalamazoo, Michigan
 - Cardiovascular Medicine, Mount Sinai Beth Israel New York, New York
- **Residency:** Cleveland Clinic, Cleveland, Ohio
- **Medical School:** Dayanand Medical College, Ludhiana, Punjab, India



Ramarao Vunnam, MD, is a cardiologist at MedStar Franklin Square Medical Center, and is board-certified in internal medicine and trained in noninvasive cardiology, echocardiography, and nuclear medicine. Dr. Vunnam treats patients with cardiovascular conditions and diseases, including heart rhythm disorders, coronary artery

disease, and heart failure. He firmly supports a patient-centric approach, treating the patient as a whole person and not merely as a condition. Additionally, he strongly emphasizes educating patients about preventing cardiovascular disease by modifying risk factors and making practical lifestyle changes. A crucial part of his practice is ensuring good communication with patients and their families.

Education and training:

- **Fellowship:** Cardiovascular Disease, University of Nebraska Medical Center, Omaha, Nebraska
- **Residency:** University of Maryland Medical System, Baltimore, Maryland
- **Medical School:** Mahadevappa Rampure Medical College, Rajiv Gandhi University of Health Sciences, Karnataka, India

The Paul J. Corso, MD, Cardiovascular Training and Education Center opens at MedStar Washington Hospital Center.



Training medical residents is a critically important part of our mission to provide patients with the highest quality and safest care. We are pleased to announce that this long-standing tradition as a teaching hospital continues with a completely renovated, state-of-the-art education center, newly named to honor the legacy of Paul J. Corso, MD, a pioneering heart surgeon and our former chief of cardiac surgery, who died in 2019.



The Center—long known as “CTEC”—was made possible in part through the generosity of the Corso family. It represents our commitment to advancing care through education. It is an important investment in our position as the region’s leader and one of the country’s premier hospitals for cardiovascular care.

Honoring Dr. Corso at the ribbon-cutting ceremony were his wife, Karen (center left); MedStar Health President and CEO Kenneth A. Samet (center right); MedStar Washington Hospital Center President Gregory J. Argyros, MD, (right); Physician Executive Director of Cardiac Surgery at MedStar Health and Chairman of Cardiac Surgery at MedStar Washington Hospital Center Thomas MacGillivray, MD, (left); and many associates and guests.



MedStar Washington among nation's highest ranked cardiovascular centers.

MedStar Washington Hospital Center has again been recognized by U.S. News & World Report as one of the top hospitals for cardiology and heart and vascular surgery in the country. Our program is ranked No. 38 nationwide in the 2024-2025 rankings, and remains the only recognized heart and vascular program of its kind in the Washington, D.C. region for more than 10 years.

MedStar Union Memorial Hospital is the first in Maryland to acquire radiation protection system for cardiac cath lab.

A novel protection system, Rampart IC, is now being used in the cardiac catheterization lab at MedStar Union Memorial Hospital. This new technology protects interventionalists from the risks of radiation exposure, as well as potential orthopedic injuries from wearing heavy lead. With Rampart, the weight of the protection is transferred to a lead-infused, mobile, acrylic barrier that stands between the clinician and the radiation source. Used in conjunction with drapes below the operating table, the clinicians have total body protection from radiation scatter from head to shins, putting the exposure risk at zero. By contrast, clinical personnel wearing the standard heavy apron, vest, and thyroid shield, achieve only 60 percent body protection because their heads and legs are still vulnerable.



When John Wang, MD, director of Interventional Cardiology (pictured above), learned of the Rampart IC, he recognized its importance. With the support of other physicians, he made a philanthropic donation to purchase the system.

“With all the innovations in our field of interventional cardiology over the last half century, one thing that had not advanced until now has been our radiation safety measures,” says Dr. Wang. “Thanks to generous support, we now have a wonderful improvement that will benefit our team, as well as the next generation of interventional cardiologists.”



Cardiovascular Physician is a publication of MedStar Health. It is a forum to share clinical, research, and teaching information in cardiology, cardiac surgery, and vascular care.



Please submit any comments to Managing Editor Karoline Hutson, at karoline.m.hutson@medstar.net.

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