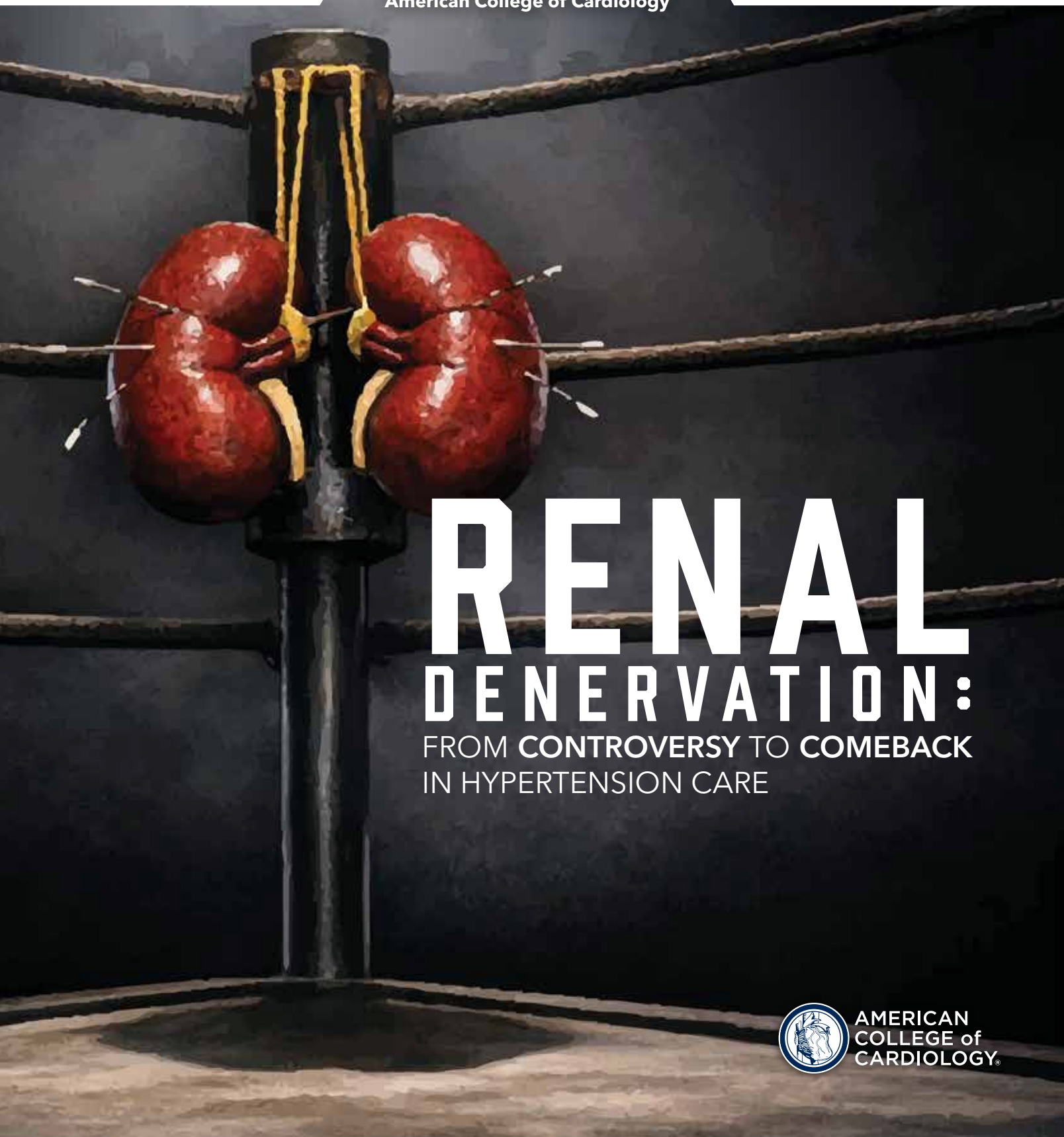
CARDIOLOGY

APRIL 2026

A Member Publication of the
American College of Cardiology

VOL. 55 | NUMBER 3



RENAL DENERVATION:
FROM **CONTROVERSY** TO **COMEBACK** IN HYPERTENSION CARE

AMERICAN COLLEGE of CARDIOLOGY®

1. Böhm M, Kario K, Kandzari DE, et al. Efficacy of catheter-based renal denervation in the absence of antihypertensive medications (SPYRAL HTN-OFF MED Pivotal): a multicentre, randomized, sham-controlled trial. *Lancet.* May 2, 2020;395(10234):1444–1451.
2. Kandzari DE, Townsend RR, Kario K, et al. Safety and Efficacy of Renal Denervation in Patients Taking Antihypertensive Medications. *J Am Coll Cardiol*. November 7, 2023;82(19):1809–1823.
3. Mafoud F, et al. Outcomes following radiofrequency renal denervation according to antihypertensive medications: subgroup analysis of the Global SYMPLICITY Registry DEFINE. EuroPCR 2023.
4. Mahfoud F, Kandzari DE, Kario K, et al. Long-term efficacy and safety of renal denervation in the presence of antihypertensive drugs (SPYRAL HTN-ON MED): a randomised, sham-controlled trial. *Lancet*. April 9, 2022;399(10234):1401–1410.

Indications
The Symplicity Spyral™ renal denervation system is indicated to reduce blood pressure as an adjunctive treatment in patients with hypertension in whom lifestyle modifications and antihypertensive medications do not adequately control blood pressure.

Contraindications
The Symplicity Spyral system is contraindicated in patients with any of the following conditions: • Renal artery diameter < 3 mm or > 8 mm • Renal artery fibromuscular dysplasia (FMD) • Stented renal artery (< 3 months prior to RDN procedure) • Renal artery aneurysm • Renal artery diameter stenosis > 50% • Pregnancy • Presence of abnormal kidney (or secreting adrenal) tumor • Iliac/femoral artery stenosis precluding insertion of the catheter.

Warnings and Precautions
A thorough understanding of the technical principles, clinical applications, and risks associated with vascular access techniques and percutaneous transluminal catheterization in renal arteries is necessary before using this device.
The safety and efficacy of the Symplicity Spyral system has not been established in patients with isolated systolic hypertension or in patients with prior renal artery interventions including renal stents, renal angioplasty, or prior renal denervation. The Symplicity Spyral system has not yet been studied in patients who are breastfeeding, under the age of 18, or with secondary hypertension. • Avoid treatment with the Symplicity Spyral™ catheter within 5 mm of any diseased area or stent. • Implantable pacemakers (IPGs) and implantable cardioverter defibrillators (ICDs) or other active implants may be adversely affected by RF ablation. Refer to the implantable device's *Instructions for Use*. • The patient's heart rate may drop during the ablation procedure. • Proper pain medication should be administered at least 10 min before ablating renal nerves.

Potential Adverse Events
Potential adverse events associated with use of the renal denervation device or the interventional procedures include, but are not limited to, the following conditions: • Allergic reaction to contrast • Arterial damage, including injury from energy application, dissection, or perforation • Arterial spasm or stenosis • Arterio-enteric fistula • AV fistula • Bleeding • Blood clots or embolism • Bruising • Cardiopulmonary arrest • Complications associated with medications commonly utilized during the procedure, such as narcotics, anxiolytics, or other pain or anti-vasospasm medications • Death • Deep vein thrombosis • Edema • Electrolyte imbalance • Heart rhythm disturbances, including bradycardia • Hematoma • Hematoma – retroperitoneal • Hematuria • Hypertension • Hypotension (may cause end organ hypoperfusion) • Infection • Kidney damage including renal failure or perforation • Myocardial infarction • Nausea or vomiting • Pain or discomfort • Peripheral ischemia • Pulmonary embolism • Proteinuria • Pseudoaneurysm • Radiocontrast nephropathy • Renal artery aneurysm • Skin burns from failure of the dispersive electrode pad • Stroke • Other potential adverse events that are unforeseen at this time.

Please reference appropriate product *Instructions for Use* and *User Manual* for more information regarding indications, contraindications, warnings, precautions, and potential adverse events.

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician.

For further information, please call and/or consult Medtronic at 800-633-8766 or the Medtronic website at medtronic.com.

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GAIN PROCEDURAL TREATMENT INSIGHTS ON PATIENTS WITH HYPERTENSION

Renal denervation is reshaping treatment possibilities for patients with uncontrolled or treatment-resistant hypertension. Widespread adoption, however, requires trusted, consistent, real-world insights. The new **NCDR Renal Denervation Module** provides a national framework for capturing:

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- Safety and efficacy outcomes
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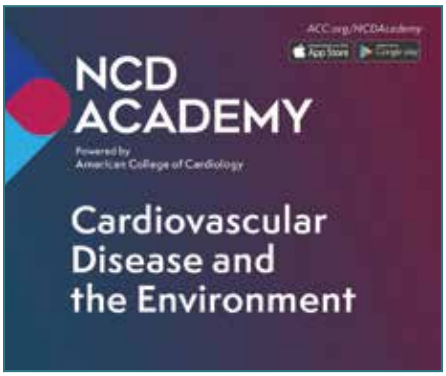
Launching This Summer

Visit
CVQuality.ACC.org
to stay updated on new Renal Denervation Module announcements.

Listen Now: *ACC Cardiology Hour* From ACC.26

Join **Valentin Fuster, MD, PhD, MACC**, as he leads the ACC *Cardiology Hour* discussion with leading experts about the top late-breaking science released during ACC.26. Don't miss key takeaways and expert analysis on the practice implications from Fuster and **Andrea M. Russo, MD, FACC**, **Martin B. Leon, MD, FACC**, **Javed Butler, MD, FACC**, and **Vinod H. Thourani, MD, FACC**.

Scan the QR code to view this video roundtable!



How the Environment Shapes Heart Health

ACC's NCD Academy has launched a new free course on **Cardiovascular Disease and the Environment**, examining how climate change, air pollution and other environmental factors impact cardiovascular health.

Through dynamic content and actionable tools, learners gain the skills to incorporate environmental considerations into everyday cardiovascular care. In alignment with a recent joint-society statement on environmental threats to cardiovascular health, the course reviews the latest evidence linking environmental exposures to cardiovascular disease risk and offers practical strategies for prevention, patient education and advocacy.

Scan the QR code to access the course, available in English, Spanish and Chinese. Visit ***ACC.org/NCDAcademy*** to access all the courses.

Advanced CV Risk Detection in the Critical Decades

A recent Heart House Roundtable challenged the traditional focus on short-term risk and reframed prevention through the lens of lifetime cardiovascular benefit. Participants examined how earlier, more precise detection of cardiovascular risk can be achieved by integrating emerging diagnostics, advanced imaging, genomics, biomarkers, refined risk stratification tools, psychosocial determinants and predictive analytics into routine clinical care.

Scan the QR code to learn more about ACC's new **PRIME-Heart Initiative** and to download Key Takeaways from the Roundtable.

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WHAT'S INSIDE

Proven, Practical, Patient-First: Turning Research Into Results

This issue brings together a set of stories united by a central theme familiar to every cardiologist: how *high-quality evidence* becomes *high-value care*. From prevention in childhood to advanced interventions for complex disease, each story in these pages reflects a different point along the continuum of heart health – yet all focus on turning research into meaningful, practical action.

Our cover story about renal denervation for resistant hypertension illustrates the long arc of innovation. After years of careful evaluation, iterative refinement and scientific debate, it now stands on firm clinical footing with durable efficacy, a strong safety record and guideline inclusion. Its journey highlights how persistence and rigorous science can ultimately reshape practice.

Evidence shows that the stage for developing heart disease is often set early in life. It is time for prevention to move to a new frontier – helping children, families and communities build heart-healthy habits from the very beginning. Our feature explores this strategy, the foundation of the Fuster Prevention Forum, which will provide structured training and evidence-based educational materials with proven success in primordial prevention to the first cohort of "Fuster Fellows."

Speaking of earlier in life, this month's Number Check spotlights the newly released ACC/AHA Guideline on the Management of Dyslipidemia, offering a concise look at key messages from this comprehensive "one-stop shop" document. One of the top takeaways – early screening starting as early as 9 years old.

Also in this issue, dive into some of the new science from ACC.26 in *JACC* in a Flash and in Prioritizing Health and look to next month's issue for even more key takeaways from the meeting.

For patients with tricuspid regurgitation, transcatheter valve intervention has emerged as a promising treatment option for select patients. But what do the limited data say for whom and when? Turn to page 28 to learn more in Cutting-Edge Structural Interventions. Plus, don't miss features highlighting the efforts of ACC Chapters over the last year to advance the ACC's Mission and read how ACC Accreditation Services helped one health system achieve quality improvement and meet national benchmarks across eight sites.

We hope this issue informs your practice and sparks new conversations within your teams and institutions. As always, we welcome your thoughts at *CardiologyEditor@acc.org*.

Peter C. Block
MD, FACC

John Gordon Harold
MD, MACC

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The American College of Cardiology (ACC) is a global leader dedicated to transforming cardiovascular care and improving heart health for all. For more than 75 years, the ACC has empowered a community of over 60,000 cardiovascular professionals across more than 140 countries with cutting-edge education and advocacy, rigorous professional credentials, and trusted clinical guidance. From its world-class *JACC* Journals and NCDR registries to its Accreditation Services, global network of Chapters and Sections, and CardioSmart patient initiatives, the College is committed to creating a world where science, knowledge and innovation optimize patient care and outcomes. Learn more at *www.ACC.org* or connect on social media using @ACCinTouch.

Cardiology (ISSN: 2165-3674) is published ten times a year by the American College of Cardiology, 2400 N Street NW, Washington, DC, 20037-1153. Periodical postage at Washington, DC, and additional mailing offices.

POSTMASTER: Send address changes to American College of Cardiology, 2400 N Street NW, Washington, DC, 20037-1153.

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NOW AVAILABLE: AI Prompt Generation Guide For Health Care Professionals

Artificial intelligence (AI) is transforming how diseases are diagnosed, treated and managed. In health care, AI prompt generation serves as a critical bridge between clinical expertise and AI capabilities, ultimately helping clinicians improve care delivery.

The latest chapter in the ACC and MedAxiom Care Transformation Initiative, *AI Prompt Generation Guide For Clinicians*, examines the principles and practices of prompt generation, offering practical strategies to apply AI tools to patient care, workflow optimization and innovative problem-solving. ■

Scan the QR code to download the guide.

**Looking for more on AI? Visit ACC's AI Resource Center (ACC.org/AI) for additional tools, including the new AI-Enabled Clinician Podcast.*

Veradigm Discontinues Practice-Based Registries

Veradigm has discontinued its Practice-Based Registries (the Cardiology Registry and the Metabolic Registry), timed with the end of the 2025 Merit based Incentive Payment System (MIPS) submission period on or around March 31.

Practices that wish to continue using a Qualified Registry for MIPS reporting and quality improvement will need to select and engage a new Centers for Medicare & Medicaid Services (CMS)-approved Qualified Registry for the 2026 performance year.

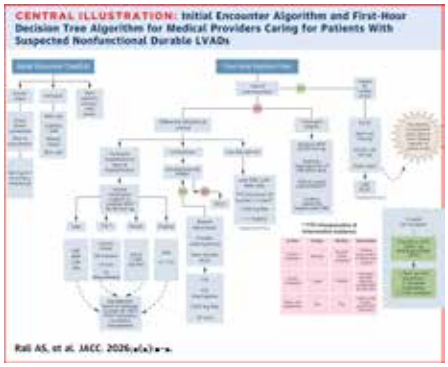
Polaris, offered through the MRO Corporation, is a potential option beginning with the 2026 program year. Selection of a registry provider remains entirely at the discretion of each practice. For more information on Qualified Registries, **scan the QR code** to access the CMS website. ■

ACC Member Sections Highlight **Growing Need For dLVAD-Related Emergency Management Resources**

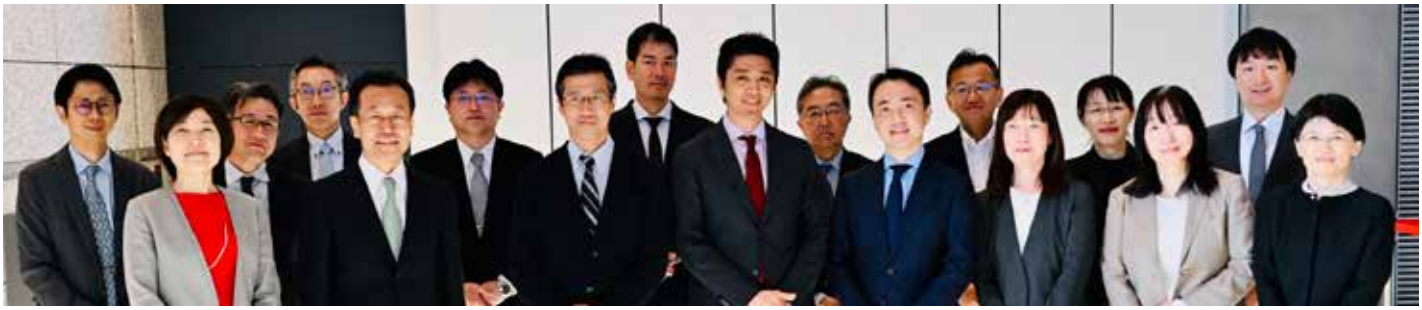
With the population of stage D heart failure patients supported with durable left ventricular assist devices (dLVAD) rapidly expanding, a *JACC* State-of-the-Art Review article written on behalf of ACC's Critical Care Cardiology and Advanced Heart Failure and Transplantation Member Sections provides a comprehensive overview of support and management of dLVAD-related emergencies.

Designed to serve as a rapid-response guide for clinicians who encounter emergencies in patients with dLVADs, the review by **Aniket Rali, MD, FACC**, et al., discusses the basic components of dLVADs, different types of dLVAD emergencies, diagnostic workup and multidisciplinary medical management, and more.

"Emergencies related to dLVADs are often complex and uniquely tied to device properties and mechanical constraints," write Rali and colleagues. "Hence, facility in the prompt diagnosis and management of common dLVAD-related emergencies is paramount for clinicians across acute care, cardiovascular care, and critical care settings."



Scan the QR code to access the paper in *JACC*. ■



ACC Convenes Focus Group **in Japan on Aortic Stenosis**

ACC convened an interactive focus group around aortic stenosis in Tokyo, Japan, last month, as part of its continued commitment to global collaboration and region-specific engagement. Co-chaired by **Tsuyoshi Kaneko, MD, FACC**, **Mitsuaki Sawano, MD, PhD, FACC**, and **Junya Ako, MD, PhD, FACC**, and co-hosted by the ACC, the Japanese College of Cardiology and the Japanese Circulation Society, in partnership with MedAxiom, the program brought together cardiovascular leaders and experts from throughout the country to exchange perspectives on optimal approaches to screening and diagnosis. A formal report capturing key discussion themes and insights is planned for later this year. ■

Navigating Change Together: Inside the ACC Leadership Forum

The ACC's 2026 Leadership Forum kicked off with an orientation at Heart House last month, bringing together incoming College leaders for the first in-person gathering of its kind since 2020. Re-envisioned through more than a year of work by ACC members and staff, the program is designed to ensure both new and returning leaders are equipped to guide the College and advance its Mission.

The initial orientation event provided a comprehensive overview of ACC leadership, including governance structures, committees, advocacy priorities and scientific programming. Through interactive sessions and discussions, participants explored how the College operates and how leaders can effectively contribute across its many initiatives.

Programming also focused on the challenges facing today's leaders. A keynote on change management and small-group conversations examined organizational and cultural transformation, while participants discussed strategies for leading through complexity and uncertainty. The Forum concluded with a candid dialogue on navigating generational differences and workplace conflict, reinforcing the skills needed to lead collaboratively across the College.

Additional Leadership Forum activities will take place virtually and in person over the course of the year. ■

MESA: Ultraprocessed Foods Increase Risk of ASCVD, Especially in Blacks

Consuming ultraprocessed foods (UPFs) was associated with an increased risk for atherosclerotic cardiovascular disease (ASCVD), and a higher risk among Black Americans, according to findings from the multiethnic MESA study presented during ACC.26 and published in *JACC: Advances*.

Researchers examined whether associations between UPFs and ASCVD differed by race/ethnicity, sex or socioeconomic status among 6,531 adults without known heart disease. Of the participants, 52% were women, 39% were White, 27% Black, 22% Hispanic and 12% Chinese.

Using food questionnaires, researchers assessed each participant's daily intake of UPFs based on the NOVA classification system. Participants in the highest quintile for UPF intake consumed 9.3 servings of such foods per day on average, while participants in the lowest quintile averaged 1.1 servings per day. Compared with the lowest quintile, participants in the highest quintile were 67% more likely to die from coronary heart disease or stroke or to experience a nonfatal heart attack, stroke or resuscitated cardiac arrest.

Researchers also observed the risk of ASCVD events increased by more than 5% with each additional serving. Stratified by race, the increased risk for ASCVD events per every serving of UPF was 6.1% for Black Americans vs. 3.2% for non-Black Americans.

"These findings contribute to the growing body of evidence linking UPF intake with adverse cardiometabolic health outcomes and underscore the need for targeted public health interventions and dietary guidelines aimed at reducing UPF consumption, particularly in vulnerable populations," write **Amier Haidar, MD**, et al.

In an accompanying editorial comment, **Kim Allan Williams Sr., MD, MACC**, says the "stronger UPF-ASCVD associations among Black Americans" highlights the urgency of structural solutions including the transparent front-of-packaging labels that provide "concise, biologically meaningful information at the point of purchase."' ■

Haidar A, Rikhi R, Watson KE, et al. *JACC Adv.* 2026;March 17. doi:102516.

Palliative Care in CV Disease: Core Training Competencies

Despite being critical to comprehensive cardiovascular care, many clinicians report being unprepared when it comes to providing palliative care. In an effort to close this gap, a national modified Delphi consensus study, presented at ACC.26 in New Orleans and simultaneously published in *JACC: Advances*, identifies a core set of 14 palliative care competencies for cardiovascular trainees.

A panel of 120 experts in cardiovascular disease, palliative care and medical education participated in a series of surveys to evaluate a list of 35 potential competencies and gain consensus on a core set. From the surveys, 14 competencies were ultimately deemed as "core," spanning six domains covering needs assessment; prognostic awareness; patient-centered treatment recommendations; physical, psychosocial and spiritual symptoms; when to consult specialty palliative care; and end-of-life care. A separate set of 14 competencies were identified as "desirable."

"Standardized education that prepares fellows to address the [palliative care] needs of patients and their families throughout their care is essential," write **Sarah Godfrey, MD, MPH, FACC**, et al. She and colleagues note the competencies "should prompt future study" and highlight the development of COCATS 5 as an opportunity to "standardize the incorporation of these essential skills into the expectations for [cardiovascular disease] fellowship training programs." ■

Godfrey S, Pawlow PC, Chuzi S, et al. *JACC Adv* 2026;4:102514.

Scan the QR code to access ACC's free on-demand Palliative Care for the Cardiovascular Clinician course.

JACC JOURNALS AT ACC.26

Watch this space next month for more ACC.26 science featured in *JACC* Journals. In the meantime, **scan the QR code** for the complete list of ACC.26 simultaneous publications.

GPS-CAD: Cardiac CT Study to Define CAD in Diverse Populations

Current pretest probability (PTP) tools for identifying patients at risk for coronary artery disease (CAD) were largely developed in White Western populations and have limited utility in Asian and other non-Western regions, where CAD deaths are projected to rise sharply by 2050. To address this gap, investigators have launched the Global Pretest Probability Study of CAD (GPS-CAD), a large international effort to examine how race, ethnicity and environment relate to three CAD phenotypes.

The design and rationale for the retrospective, cross-sectional study of more than 60,000 patients referred for CT for suspected CAD was presented at ACC.26 and published in *JACC: Asia*. With enrollment spanning 19 countries across six continents and a target of 100,000 participants, the study aims to support development of a more globally relevant PTP tool by characterizing CAD phenotypes across diverse populations and geographies.

"GPS CAD is a remarkable international collaboration powered by **Lohendran Baskaran, MBBS, BS, FACC**, at Duke NUS in Singapore," says co author and past ACC president **Pamela S. Douglas, MD, MACC**. "By using CCTA to provide detailed information on the anatomy of CAD in different countries and among people identifying with different races and ethnicities, it will substantially enlarge our understanding of the differences – and similarities – of the #1 killer worldwide." ■

Baskaran L, Selva JJ, Mantri AVI, Douglas PS, et al. *JACC Asia* 2026;March 28.

Healthy Versions of Low-Carb, Low-Fat Diets Tied to Better CV, Metabolic Health

The quality of a low-carbohydrate or low-fat diet may matter more to reduce heart disease risk than the amount of carbohydrates or fat consumed, according to a study published in *JACC*.

Zhiyuan Wu, PhD, et al., analyzed data from 198,473 participants across three large-scale cohort studies and participants were followed for a combined total of more than 5.2 million person-years, during which 20,033 cases of coronary heart disease (CHD) were documented.

Overall findings showed that versions of both diets emphasizing macronutrients from healthy foods were associated with a lower risk of CHD, while versions high in refined carbohydrates and animal products were linked to higher risk and adverse metabolic profiles.

"These results suggest that healthy low-carbohydrate and low-fat diets may share common biological pathways that improve cardiovascular health," Wu said. "Focusing on overall diet quality may offer flexibility for individuals to choose eating patterns that align with their preferences while still supporting heart health." ■

Wu Z, Liu B, Wang X, et al. *JACC*. 2026;Feb. 11: doi: 10.1016/j.jacc.2025.12.038.

HOT OFF THE PRESSES: New Clinical Guideline For Managing Dyslipidemia

The new ACC/AHA Guideline on the Management of Dyslipidemia offers a comprehensive "one-stop shop" for addressing the evaluation, management and monitoring of individuals with dyslipidemias, including high blood cholesterol, hypertriglyceridemia and elevated lipoprotein(a). The new guideline replaces the 2018 ACC/AHA Guideline on the Management of Blood Cholesterol. ■

Scan the QR code to read and/or cite the full guideline published in *JACC*.

45

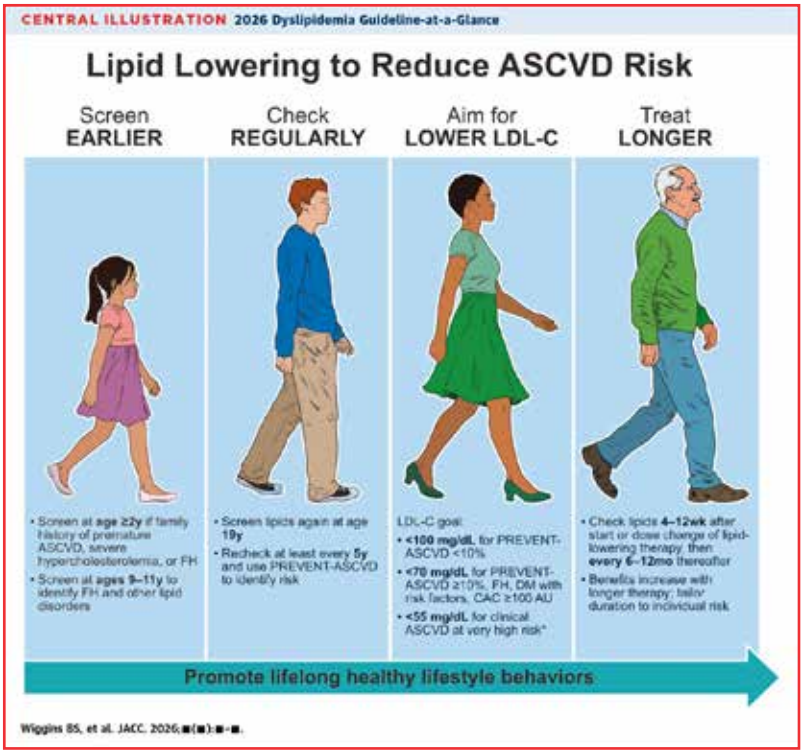
The age at which the elective use of a noncontrast coronary artery calcium scan is recommended for women with borderline or intermediate 10-year risk of heart attack or stroke. The recommended age for men is over 40.

≥2 years

The age when screening is recommended if there is a family history of premature ASCVD, severe hypercholesterolemia or familial hypercholesterolemia (FH). Otherwise, screening is recommended at ages 9-11 to identify FH and other lipid disorders, and again at age 19.

4-12 weeks

When to check lipids after the start or dose change of lipid-lowering therapy.



<100 mg/dL

The LDL-C goal for individuals at borderline or intermediate risk. A target of <70 mg/dL is recommended for those at high risk. For patients with clinical ASCVD at very high risk, a target of <55 mg/dL is recommended.

<55 mg/dL

The more intensive LDL-C lowering target where patients without a prior MI or stroke experienced significant cardiovascular benefits, based on findings from VESALIUS-CV released last November. In an editorial explaining how the pace of science is sometimes faster than guideline timelines, the 2026 Dyslipidemia Guideline chairs write that future updates to this guideline should include a single pathway of care for all patients with ASCVD. **Scan the QR code** to read the editorial.

3% to <5%

The 10-year PREVENT-ASCVD risk estimate when LDL-lowering therapy is reasonable in adults for primary prevention of ASCVD. It is also recommended for those with an intermediate 10-year PREVENT ASCVD risk of 5% to <10% following a clinician-patient discussion.

ACC.26 Science Making Consumer Headlines

ACC.26 findings aren't just resonating within the cardiology community – they're reaching patients and the wider public too. Here's a look at some of the standout studies making headlines in major consumer news outlets.

More Screen Time, More CV Risk: Young adults who reported spending six or more hours a day on screens outside of school or work had higher levels of systolic blood pressure (+18 mm Hg), LDL-C (+28 mg/dL) and BMI than those with more limited time – suggesting screen time as an emerging risk factor for heart disease. The finding was independent of physical activity and remained after adjusting for age, sex and baseline clinical characteristics. Additionally, high screen time plus low physical activity had an even greater adverse impact. Based on questionnaires completed by 382 adults about 35 years old living in Pakistan, researchers found higher screen time was also associated with a higher rate of smoking and vaping.

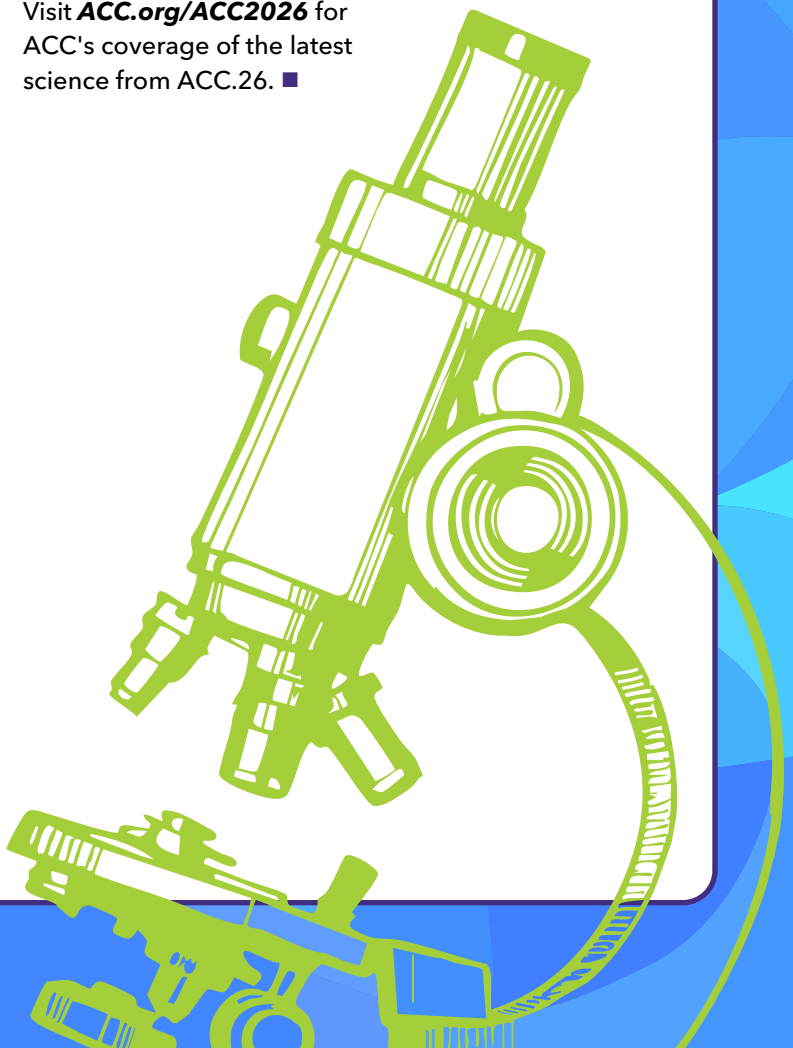
Alcohol and CV Risk: A study of some 340,000 British adults found that high alcohol intake increased the risk of death from any cause and heart disease, by 24% and 14%, compared to never or occasional drinkers. But, at low and moderate levels of intake, differences in risk emerged by type of alcohol, with a 9% higher risk of cardiovascular death with spirits, beer and cider while the same level of wine consumption was associated with a 21% lower risk of death. Researchers said the study provides a more comprehensive and nuanced picture of the health impacts of alcohol intake.

Shingles Vaccine Reduces Cardiac Events: Adults over age 50 with ASCVD who had a shingles vaccine, vs. no vaccine, were 46% less likely to suffer any major adverse cardiac event and 66% less likely to die from any cause. Their risk of a heart attack was 32% lower and risk of a stroke or heart failure was 25% lower. Noting the study of 246,822 U.S. adults focused on the first year after vaccination, researchers said the lifetime impacts may differ, with a previous study suggesting cardioprotective effects may last up to eight years.

Sharp Rise in HBP-Related Deaths in Women: A fourfold increase in hypertension-related deaths, from 1.1 to 4.8/100,000 deaths, was found over the last two decades among women aged 25 to 44 years; some 29,000 died. Rates differed by region, highest in the South, followed by the Midwest, Northeast and West (3.8, 2.8, 2.2 and 1.9/100,000, respectively).

Vascular Aging and Dementia: Measures of vascular health derived from routine blood pressure readings may help identify adults at increased risk for dementia. Two analyses from SPRINT showed that pulse pressure-heart rate index independently predicted risk of dementia among adults >50 years, with each unit increase associated with a 76% higher risk, and that persistently elevated or rapidly increasing estimated pulse wave velocity was associated with a greater likelihood of developing dementia.

Visit ***ACC.org/ACC2026*** for ACC's coverage of the latest science from ACC.26. ■



Moving Upstream: Why the Next Frontier of CV Prevention Begins in Childhood

For years, efforts to address cardiovascular disease have focused primarily on pharmaceuticals and medical procedures – statins, antihypertensives, catheterizations, stents and other devices. But what if we could reduce the need for many of those interventions by helping people build heart-healthy habits early in life, long before disease takes hold?

That's the strategy behind the ACC's Fuster Prevention Forum, named after **Valentin Fuster, MD, PhD, MACC**, one of the world's leading cardiovascular prevention researchers and a longtime advocate of early-childhood interventions. During this three-year program, which kicks off in June 2026, the first cohort of 50 "Fuster Fellows" will participate in structured training and receive evidence-based educational materials with demonstrated success in primordial prevention. Once completed, these trained experts will return to their communities equipped with curriculum materials, digital content and practical toolkits to implement change.

Even preventive cardiology has historically focused on managing existing risk factors, such as elevated cholesterol or blood pressure (BP), rather than preventing their emergence, says **Pamela B. Morris, MD, FACC**, Forum co-chair.

"We are typically taking care of the tip of the pyramid," says Forum co-chair and former ACC President **Edward T.A. Fry, MD, MACC**. "The base of the pyramid is where we really need to be intervening."

Addressing cardiovascular disease earlier could dramatically reduce both disease burden and health care costs, according to several studies published over the last 10 to 15 years.

For instance, in one study, infancy-onset dietary counseling from seven months to 20 years, with follow-up at 26 years, led to sustained benefits in all markers of cardiovascular risk compared to a control group.[1]

Another study found that individuals exposed to lower sugar intake during fetal development and early childhood had significantly lower rates of cardiovascular disease decades later, including reduced risk of heart failure, stroke and cardiovascular death.[2]

Recognizing the contribution of systolic BP and non–HDL-C to coronary heart disease (CHD) at a population level, other findings suggest a substantial effect with primordial prevention by lowering systolic BP to <130 mm Hg or lowering LDL-C by 30%, leading to an expected lowering of baseline 10-year CHD risk of 10.7% to 7.0% and 8.0% respectively (with absolute risk reductions of 3.7% and 2.7% respectively).[3]

Primordial prevention makes economic sense, as well.

Statements from the ACC and American Heart Association note that primordial prevention is a sound investment for the U.S. health care system.[4] One study found that employees younger than 30 years old with good cardiovascular health had annual health care costs about $4,000 less than those with a poor cardiovascular health profile.[5]

However, less than 5% of total U.S. health care spending is allocated for preventive programs.[6]

"We spend twice as much as other industrialized countries and achieve worse outcomes because we focus on fixing the car after it's broken down rather than providing preventive maintenance," says Fry.

The need for primordial prevention is also driven by demographic and resource factors.

"We are in a health care workforce crisis," Fry says. "We simply will not have enough clinicians to treat the growing population with cardiovascular disease." Even advances in technology, including artificial intelligence (AI), will not fully close this gap. "Irrespective of what AI does, you're still going to need hands-on people," says Fry.

The Fuster Forum would mitigate some of the workforce issues by adopting a distributed, community-

> You teach the children, you teach the parents, and it becomes part of communities. This is about creating sustainable programs that keep the process going.
>
> Pamela B. Morris, MD, FACC

> As cardiologists and physicians, we have a responsibility to prevent the disease we are trained and incentivized to treat.
>
> Edward T.A. Fry, MD, MACC

based approach rather than relying solely on centralized health care, with the goal of creating a cascading effect. "You teach the children, you teach the parents, and it becomes part of communities," says Morris. "This is about creating sustainable programs that keep the process going."

Morris adds that early interest in the program is a sign the College is on the right track. "The program had far more enrollees than we had space. That is the first metric of success," she says. "It is even more important, given this is a passion-based activity and these are volunteers."

Going forward, future cohorts of 100 clinicians are planned. "As cardiologists and physicians, we have a responsibility to prevent the disease we are trained and incentivized to treat," says Fry. "At its core, primordial prevention means preventing cardiovascular risk factors before they ever develop. Heart disease starts in childhood and it's time to intervene at its earliest beginnings." ■

References available with the online version of this article at ACC.org/Cardiology.

PRIMORDIAL PREVENTION

Pathology, cohort and intervention studies confirm that atherosclerosis starts in childhood and is influenced by both genetic susceptibility and modifiable lifetime exposures.[7-9] In addition, adverse conditions during pregnancy and early childhood such as poor maternal nutrition, gestational diabetes or physical inactivity may also program higher cardiometabolic risk in children, supporting a focus on antenatal and perinatal prevention.[10]

It's also important to note that childhood behaviors and risk factors track into adult life. Elevated BP, dyslipidemia, obesity and smoking in youth are associated with greater carotid intima-media thickness and coronary calcification in adulthood, markers of early atherosclerosis.[7,9]

Policy statements and reviews from major cardiovascular organizations, including the ACC, conclude that cardiovascular disease is largely preventable or mitigated through a combination of primordial and primary prevention, and that investments in early-life lifestyle and policy measures yield large societal returns by reducing future health care costs and improving productivity.[9,11-13] ■

Scan the QR code to explore the *JACC* Stats infographics highligthing key statics and insights from its recent report of cardiovascular disease in the U.S.

Scan the QR code to access the ACC Clinical Guidance Hub for ACC guidelines along with clinician and patient resources.

A Conversation With **Valentin Fuster**

***Valentin Fuster, MD, PhD, MACC**, has spent part of his investigational career studying how early-life interventions might change the trajectory of cardiovascular disease. In this Q&A, he discusses the science behind primordial prevention; why cardiologists should lead prevention efforts; and how educating children and families could reshape cardiovascular health for future generations.*

Why is primordial prevention so critical to reducing cardiovascular disease?

The reason is biological. In childhood, the brain has receptors that capture what you tell a child. As people grow older, those receptors increase in number and become interconnected, which makes concepts much more complex. In children, the connections are few, so whatever you tell a child is stored much more simply and stays for life.

The question we asked was whether this biological concept could be used to promote health – by conveying to children that health should be a priority in their lives. We have now worked with about 50,000 children around the world in randomized studies of early intervention programs; hopefully what we capture will stay for life.

Some might argue that prevention in childhood should fall to pediatricians or primary care physicians. Why do you think this is the job of cardiologists?

I'm not saying pediatricians or other health professionals shouldn't be involved. In the future, they certainly will. But cardiologists deal with cardiovascular disease, the number one cause of death in the U.S., every day, so we should set the example for prevention. If cardiologists take the lead, the health system can eventually capture the model and expand it through pediatricians, nurses and other professionals.

The Fuster Forum takes a broader approach than many traditional prevention programs. How and why is it different?

It's different in two important ways. First, we are dealing with children. Second, we involve the family – sometimes even grandparents. When the whole family participates, the impact is much stronger.

Another innovation is engaging communities. We encourage cardiologists to participate in schools their children or grandchildren attend; to speak in community settings such as churches and others, and to engage families in clinic waiting areas with educational content and opportunities to participate in prevention programs. This approach allows us to connect with entire families rather than just individual patients.

Why do you believe society is ready now for this kind of prevention movement?

There is a growing trend toward prevention that did not exist before. In the past, the main concern was mortality – how long people lived. Now life expectancy has increased, and people are asking not just 'How long can I live?' but 'How well can I live?' That shift toward quality of life naturally leads to greater interest in prevention.

Prevention has been a theme throughout your career. How did this become your life's work?

I began by trying to understand heart attacks. My early work focused on platelets circulating in the blood and we found that platelets stick to vessel walls that contain cholesterol.

Over time, I realized that human behavior plays a key role in that process. My research moved from basic science to understanding behavior and risk factors.

I first worked on prevention in adults. Later I realized that if we really want to make a difference, we must start earlier – with children.

If these initiatives succeed, how might cardiovascular disease look different in 20 or 30 years?

I don't think the world will completely change; in terms of personal responsibility vs. the world of consumption. But I believe the balance will move more toward responsibility and prevention. If we educate children and families about health, even moving the pendulum a little can make a difference. We may not change everything, but contributing even an inch toward prevention can have a meaningful impact for future generations.

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Moments That Mattered: Christopher Kramer On His Whirlwind Year As ACC President

Busy. Exhilarating. Challenging. These are the three words that **Christopher Kramer, MD, FACC**, says best describes his past year as ACC president. As he prepares to pass the presidential chain to the College's next president, **Roxana Mehran, MD, FACC**, *Cardiology* asked Kramer about some of his favorite moments, greatest accomplishments and advice for the future.

What would you say were the biggest two to three accomplishments over the past year?

My two biggest accomplishments included:
1. Helping to shepherd the College further into the AI era with the creation of an AI implementation Task Force and the beginning of a relationship with Open Evidence.
2. Advocacy! The College showed strength in the face of an onslaught of issues raised by the current administration.

Do you have any favorite moments?

Testifying before the Health Subcommittee of the House Appropriations Committee and meeting with the GOP Doctors Caucus regarding Advocacy issues were huge highlights. Also, witnessing the excitement of new FACC's becoming part of the ACC family as part of our first-ever Convocation ceremonies during ACC Latin America, ACC Asia and ACC Middle East was exhilarating.

Was there anything surprising or unexpected that occurred?

The sheer volume of travel and meetings was incredible. The surprising part to me was that I seemed to handle it well over the course of the year.

Any lessons learned throughout your presidential year?

I gained an appreciation of how incredibly capable the ACC staff are and how committed they are to the College and member well-being. I also learned how to survive and even conquer jet lag (well, almost…).

Any advice or words of wisdom for future ACC presidents?

My presidency year has been a whirlwind, filled with wonderful moments with an incredibly talented and committed Board of Trustees and Presidential team, as well as foundational meetings with international partners around the globe. My advice for future presidents:

- Know that the year will be busier than you can imagine.
- Get ready for the email onslaught.
- Make sure that you have adequate coverage for your day job.
- Rely on your board members and the rest of the Presidential Team.

You traveled a lot! What was your favorite place to visit in the U.S.? Favorite international?

My favorite U.S. visits were Chapter meetings of course. The ACC Georgia Chapter was my favorite – they have tremendous attendance including extended families, camaraderie, a beautiful setting and a great meeting to boot. My favorite international visit was a day trip to the "Edge of the World," the equivalent of the Saudi Grand Canyon, not that far from Riyadh. A shout out to incoming ACC Vice President **Hani Najm, MD, FACC**, for arranging the adventure.

Hopes for the College going forward? Any potential challenges and/or opportunities you see on the horizon?

Physician payment remains a constant challenge and ACC's Advocacy Team does an excellent job staying ahead of the game and identifying issues as they arise. Future opportunities with AI offer tremendous hope, as well as challenges, and my hope is that the College can harness these to offer new products that bring tremendous member value. ■

RENAL DENERVATION: FROM CONTROVERSY TO COMEBACK IN HYPERTENSION CARE

Few therapies in cardiovascular medicine have traveled a path as turbulent as renal denervation. Once hailed as a breakthrough for uncontrolled hypertension, the field was abruptly shaken by neutral findings from SYMPLICITY HTN-3. What followed was not the end of the story – but a recalibration. A decade later, renal denervation has reemerged with stronger evidence, refined technique and renewed clinical relevance.

The Early Enthusiasm Around Renal Denervation

The advent of a percutaneous approach to "denervate" the renal sympathetic system initially sparked broad enthusiasm. The appeal was intuitive – interrupt renal sympathetic signaling, and blood pressure (BP) would fall. Early prospective studies appeared to meet this expectation, reporting striking reductions in BP.

In the first-in-human proof-of-principle study, SYMPLICITY HTN-1, office systolic BP (SBP) decreased by 14 mm Hg at one month after radiofrequency-based renal denervation, with the reduction reaching 27 mm Hg at 12 months.[1] The subsequent randomized trial, SYMPLICITY HTN-2, demonstrated an even more dramatic effect at six months, with a 32 mm Hg reduction in office SBP in the denervation group vs. no change in the control group (medical therapy alone).[2]

A Turning Point: Lessons From SYMPLICITY HTN-3

Following early enthusiasm, renal denervation entered a period of critical reassessment, with investigators aiming to distinguish potential placebo effects from the true physiologic impact of the procedure.

SYMPLICITY HTN-3, the first sham-controlled randomized clinical trial evaluating radiofrequency-based renal denervation, enrolled 535 patients with uncontrolled hypertension across 88 sites in the U.S.[3] At six months, office SBP fell by 14.1 mm Hg in the denervation group – but also by an unexpectedly large 11.7 mm Hg in the sham-control group. As a result, the trial did not meet the prespecified 5 mm Hg superiority margin of renal denervation over the sham procedure. This neutral finding tempered the field's early enthusiasm for percutaneous modulation of the renal sympathetic system.

However, subsequent reviews of the trial's design and conduct identified several important limitations, providing critical lessons for future evaluation of the device. Changes in background antihypertensive medications before the primary endpoint assessment occurred in up to 40% of participants, confounding the

randomized comparison. Ablation was limited to the main renal arteries, despite emerging evidence of high sympathetic nerve density in distal branches and accessory arteries. Office BP – less precise and reliable than ambulatory measurements – was used as the primary endpoint measure. Finally, the older-generation single-electrode catheter could not ensure uniform ablation of renal arteries.

Rebuilding the Evidence Base With Next-Generation Trials

The lessons learned from SYMPLICITY HTN-3 led to a fundamental reshaping of subsequent trial design. Background antihypertensive medications were more strictly controlled, and trials were conducted separately in off-medication and on-medication cohorts. The procedure became more standardized, with greater emphasis on complete ablation extending to distal branches and accessory arteries. Ambulatory BP replaced office measurements as the primary endpoint. Meanwhile, iterative advances in catheter technology enabled more uniform and circumferential energy delivery.

What followed was renewed confidence in the efficacy of renal denervation – this time supported by more rigorous evidence. In the SPYRAL trial program evaluating the radiofrequency-based Symplicity Spyral system (Medtronic), sham-adjusted reductions in 24-hour ambulatory SBP were consistently observed across both off- and on-medication cohorts: 5.0 mm Hg at three months in OFF MED pilot trial,[4] 3.9 mm Hg at three months in OFF MED pivotal trial,[5] and 7.4 mm Hg at six months in ON MED pilot trial.[6] Similar reductions were also reported with other radiofrequency-based renal denervation systems.[7,8]

The evidence was also extended beyond the radiofrequency-based systems to include the ultrasound-based Paradise system (ReCor Medical). In the off-medication trials RADIANCE-HTN SOLO and RADIANCE II, sham-adjusted reductions in daytime ambulatory SBP reached 6.3 mm Hg at two months,[9,10] while RADIANCE-HTN TRIO demonstrated a 4.5 mm Hg reduction at two months in an on-medication cohort.[11]

Deepening the Evidence: Durability and Safety

As the evidence base for renal denervation matured, attention shifted from short-term efficacy to questions of durability. The accumulating data from randomized trials and real-world registries offered a reassuring answer: BP reductions were maintained, and in most cases amplified, over longer follow-up.

For instance, in SYMPLICITY HTN-3, the sham-adjusted reduction in office SBP reached 22.1 mm Hg at three years;[12] in SPYRAL HTN-ON MED, reductions in 24-hour ambulatory SBP were 10.0 mm Hg at 36 months in the pilot cohort[13] and 5.7 mm Hg at 24 months in the full cohort[14] – each exceeding the magnitude observed at six months. BP reductions were also sustained through 36 months in RADIANCE-HTN SOLO and RADIANCE-HTN TRIO.[15,16]

Real-world registries echoed these findings: BP declined most steeply within the first three to six months, then continued to fall more gradually over time – an effect that, in some cohorts, has extended to nearly a decade.[17,18]

Renal denervation has also demonstrated a favorable safety profile. The incidence of adverse events – including vascular complications, renal artery stenosis, hypertensive crisis or emergency, stroke and all-cause death – was generally less than 1% through primary endpoint assessment,[19] with no additional safety concerns emerging during longer-term follow-up.[17,20]

Incorporation Into Contemporary Hypertension Care

Based on the totality of the evidence, the U.S. Food and Drug Administration (FDA) approved the Paradise (ReCor Medical) and Symplicity Spyral (Medtronic) renal denervation systems in November 2023. This regulatory milestone marked an important inflection point, formally introducing renal denervation into contemporary clinical practice.

Regulatory approval, however, did not immediately translate into widespread adoption. The primary barrier was the absence of insurer reimbursement. Unlike certain device-based therapies that can be performed adjunctively during routine procedures (e.g., intravascular lithotripsy or drug-coated balloons), renal denervation is a standalone intervention and therefore depends on dedicated coverage pathways. The National Coverage Determination (NCD) issued by the U.S. Centers for Medicare & Medicaid Services (CMS) in October 2025 substantially reduced this barrier to real-world adoption. Since then, several private insurers

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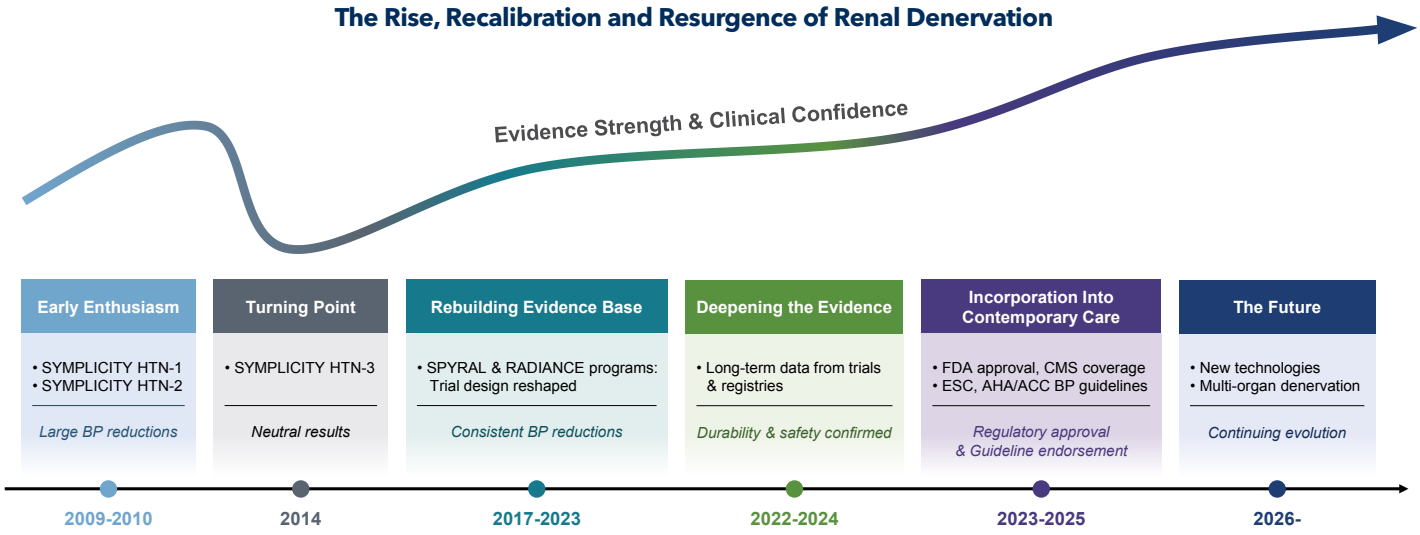
Scan the QR code to learn more and participate in the NCDR Renal Denervation Module.



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followed with coverage decisions, facilitating more consistent access across health systems.

International guidelines have also endorsed renal denervation as an adjunctive therapy for BP control, with the 2023 European Society of Hypertension, 2024 European Society of Cardiology, and 2025 ACC/AHA BP guidelines providing recommendations for its use in patients with resistant or uncontrolled hypertension.

Beyond the Comeback: The Future of Renal Denervation

Renal denervation continues to evolve, with new systems employing alternative ablative mechanisms now under investigation. An intravascular ultrasound-based system (TIVUS, SoniVie) is currently being tested in a sham-controlled trial, while an alcohol-mediated system (Peregrine, Ablative Solutions) has already demonstrated efficacy in two randomized trials,[21,22] with a separate pivotal trial underway (NCT07083765).

A multi-organ denervation approach – targeting both the common hepatic and renal sympathetic systems – is also emerging. Early clinical data suggest that this strategy may yield reductions in both 24-hour ambulatory BP and glycated hemoglobin (HbA1c),[23] raising the possibility of broader and more profound cardiometabolic benefits. The ongoing SPYRAL GEMINI pilot study (NCT06907147) is further evaluating this approach in both off-medication and on-medication cohorts to better define its efficacy and safety.

Beyond ongoing device innovation, the next phase of evidence generation will increasingly rely on real-world data and prospective registries. Recently, the ACC announced a partnership with Beth Israel Deaconess Medical Center's Smith Center for Outcomes Research to develop a quality registry aimed at evaluating short- and long-term efficacy and safety of renal denervation in a broad, unselected U.S. patient population. Such efforts will be critical to translating trial evidence into everyday practice and further refining the role of renal denervation in contemporary hypertension care.

From Controversy to Clinical Relevance

The story of renal denervation highlights the importance of rigorous evaluation, iterative refinement and persistence in innovation. With durable efficacy, reassuring safety, regulatory approval and guideline incorporation, the therapy has entered a new phase of clinical relevance. As research continues and implementation expands, the focus now turns to defining its optimal role within contemporary hypertension care. ■

References available with the online version of this article at ACC.org/Cardiology.

This article was authored by **Hyeok-Hee Lee, MD, PhD**, research fellow in Advanced Hypertension and Vascular Medicine at Beth Israel Deaconess Medical Center (BIDMC), and **Eric A. Secemsky, MD, RPVI, MSc, FACC**, director of Vascular Intervention at BIDMC and section head of Interventional Cardiology and Vascular Research at the Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology at BIDMC, and associate professor of medicine at Harvard Medical School, all in Boston.

Renal Denervation Education on *ACC.org*

Dig deeper into the evidence from the trials of renal denervation and implications for clinical practice along with a procedural video of radiofrequency ablation and patient case quizzes. It's all part of ACC's self-paced online course, *Overcoming Challenges in Hypertension Management*, designed to help clinicians across the spectrum create individualized treatment plans for all patients including those with complex hypertension.

Scan the QR code to start learning.

Resistant Hypertension and RDN: What the Guideline Says

What are the recommendations for RDN and the supporting evidence in the 2025 ACC/AHA High Blood Pressure Guideline? Read Section 5.6 along with a pathway for its diagnosis, evaluation and treatment in Figure 8 and patient selection criteria in Table 25. Visit ***JACC.org*** to download the full document.

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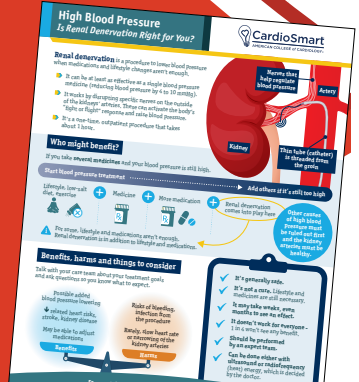
What Patients Should Know About Renal Denervation

For patients with resistant hypertension, the current ACC/AHA High Blood Pressure Guideline recommends shared decision-making. CardioSmart's renal denervation infographic explains the treatment and what to expect, and highlights its benefits, harms and key considerations – all supporting meaningful decision-making conversations with patients.

Scan the QR code to download the free infographic today!



State of the States 2025: ACC Chapters Advancing CV Care Through Education, Advocacy and Connection

In 2025, ACC Chapters across the U.S. demonstrated the power of grassroots leadership in advancing cardiovascular care. Through record-breaking educational meetings, landmark advocacy victories, innovative equity initiatives and expanded professional development, Chapters strengthened ACC's role as the professional home for cardiovascular clinicians while delivering measurable impact for patients and communities. Collectively, these accomplishments aligned squarely with ACC's strategic pillars of relevance, actionable knowledge, equity, value and sustainable growth.

Delivering Actionable Knowledge and Education

Education, outside of annual meetings, was also a cornerstone of Chapter activity in 2025, with a clear emphasis on accessibility, innovation and multidisciplinary collaboration. **Alabama** launched a free monthly virtual CME series, extending education beyond its traditional in-person meetings and bringing section-focused expertise directly to members statewide. **Florida** leveraged its electrophysiology leadership to host virtual grand rounds that attracted more than 100 participants per session, while **Connecticut's** new CIED (Cardiac Implantable Electronic Device) education section combined in-person symposia with monthly journal clubs and case conferences – also driving membership growth.

Many Chapters expanded hands-on and specialty education. **California's** inaugural "CAL Shock" symposium united multidisciplinary teams to improve cardiogenic shock care, while **Kansas** debuted a FIT Imaging Bootcamp alongside its cardiovascular symposium. **Washington** hosted its first Technology Summit, convening cardiologists with leaders from Google, Microsoft, NASA and digital health startups to explore artificial intelligence and clinical innovation – an example of Chapters shaping the future of care delivery.

International and cross-regional collaboration also enriched educational offerings. **Maryland** completed the first cohort of its Developing International Leadership Program with the German Cardiac Society, and **Virginia** deepened its partnership with the British Cardiovascular Society through leadership training, joint scientific sessions and early-career exchanges. ■

Strengthening ACC as the Professional Home

Chapters in 2025 prioritized connection, inclusion and professional identity, bringing members together across geography, discipline and career stage. Annual meetings continue to serve as primary forums for building and sustaining state and/or regional networks, with many reaching record attendance and renewed energy. Chapters in **Georgia**, **Nebraska**, **Puerto Rico**, **Texas**, **Washington**, **West Virginia** and **Wisconsin** reported their largest or most successful meetings to date, reflecting local demand for in-person engagement and high-quality education.

Several Chapters reimagined how they convene members. **Iowa** rotated its annual meeting to a third geographic location in three years to broaden access, while **South Dakota** launched its first-ever state chapter meeting, laying a foundation for future growth. **Puerto Rico** transformed its scientific meeting through immersive, case-based learning and advanced audiovisual design, drawing nearly 300 participants and positioning the chapter as the island's leading cardiovascular professional home.

Chapters also expanded affinity-based engagement. Women in Cardiology (WIC) and Fellows in Training (FIT) programming flourished, from **Rhode Island's** WIC mentorship reception to **Ohio's** innovative "Recruiting Tomorrow's Female Cardiologists" event, which introduced students and residents to cardiology through hands-on experiences and mentorship. **Michigan's** Division Chiefs Open Forum created a new statewide platform for physician leaders to collaborate on shared challenges, reinforcing the chapter's convening role at the system level. ■

Advocacy Wins With Statewide Impact

State-level advocacy was a defining success of 2025. **Illinois** secured landmark legislation mandating insurance coverage for peripheral artery disease screening, while **Indiana** celebrated the passage of a significant tobacco tax increase and elimination of physician noncompete clauses. **Nevada** advanced its "Smart Heart Law," strengthening AED access and emergency preparedness in schools and athletic settings.

Chapters such as **Massachusetts**, **South Carolina**, **New Jersey**, **Oregon** and **Wisconsin** demonstrated strong grassroots engagement through legislative conferences, lobby days and practice visits – positioning ACC Chapters as trusted, evidence-based voices for cardiovascular policy. ■

Advancing Quality, Equity and Value in Cardiovascular Care

Chapters made significant strides in advancing equitable, high-value care through targeted programs and community-focused initiatives. **Alaska** expanded hands-only CPR training to Arctic communities through a Health Equity Committee partnership, while **North Carolina** funded a project to expand echocardiography access for underserved populations. **Tennessee** and **Hawaii** secured grants to improve peripheral artery disease education and congenital heart disease care pathways, respectively.

Public-facing education also gained momentum. **Kentucky's** WIC-led social media campaign amplified women's heart health messages throughout American Heart Month, and **Washington, DC**, hosted hands-on nutrition and cooking classes for cardiovascular fellows, reinforcing lifestyle medicine as a core competency. ■

Sustaining and Growing the Organization

Investment in long-term sustainability through leadership development, financial stewardship and expanded programming was also at the heart of Chapter accomplishments in the last year. **Louisiana** launched a new grant funding program to support trainees and community initiatives, while **Montana** successfully navigated a leadership transition. Chapters like **Missouri** and **Minnesota** strengthened ongoing engagement through newsletters, journal clubs and section development, ensuring continuity beyond flagship events. ■

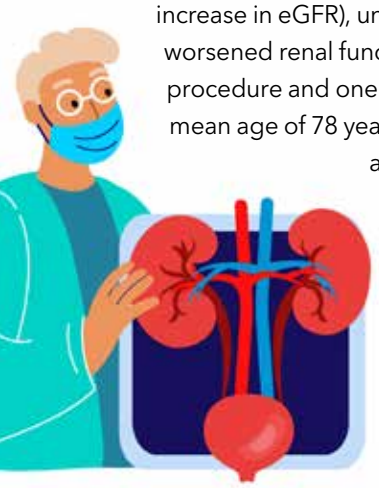
Looking to 2026

Taken together, ACC Chapters in 2025 exemplified the impact of local leadership aligned with national strategy, continuing to advance education, equity, advocacy and community in service of better cardiovascular care for all. Looking ahead to 2026, ACC Chapters will continue to play a vital role as laboratories for action – implementing and testing tangible solutions that strengthen evidence-based care, advocating for policies that protect clinicians and preserve patient access, and translating national strategy into meaningful local impact. As the College advances its Mission, Vision and major strategic initiatives, Chapters remain essential partners in turning priorities into progress on the ground. ■

Renal Function Change and Survival Post Mitral TEER

In patients who underwent mitral transcatheter edge-to-edge repair (M-TEER), a >10% change in estimated glomerular filtration rate (eGFR) was associated with differences in survival at one year, according to a study using data from the STS/ACC TVT Registry published in *Structural Heart*.

Among 48,472 patients undergoing M-TEER between 2013 and 2022, **Parth N. Patel, MD**, et al., evaluated the association between improved renal function (≥10% increase in eGFR), unchanged renal function and worsened renal function (≥10% decrease in eGFR) post procedure and one-year survival. Participants had a mean age of 78 years, 86% were White and 46% female, and their mean baseline eGFR was 57.7 ± 21.7 ml/min/1.73 m^2.



Overall, post M-TEER, renal function improved in 16% of patients and worsened in 14% of patients. Looking at one-year mortality, improved renal function was associated with a decreased risk (adjusted hazard ratio 0.77; p<0.001) while worsened renal function saw an increased risk (adjusted hazard ratio 2.85; p<0.001), compared with no change in kidney function.

A strong association was seen between worsened kidney function and several patient factors including cardiogenic shock within 24 hours, age >80 years, Black race, diabetes, heart failure within two weeks and female sex. "Patients presenting with cardiogenic shock in the 24 hours before the procedure were at greatest risk for a decrease in eGFR following [M-TEER]," write the authors. "Improvements in eGFR were more likely to be seen in patients with higher hemoglobin levels at baseline."

"In patients who experienced worsened renal function, we observed that the procedure was more likely to be complicated by major or life-threatening bleeding, cardiac arrest, cardiac perforation, or unplanning cardiac or vascular surgical interventions," add the authors. ■

Patel PN, Hulme OL, Allard-Ratick M, et al. *Structural Heart*. 2025;10(3):100747. doi:10.1016/j.shj.2025.100747

GLP-1s Reduce HF Hospitalizations vs. DPP-4s, Comparable to SGLT-2s

In patients with type 2 diabetes (T2D), the risk of hospitalization for heart failure (HHF) was significantly lower with GLP-1s than DPP-4 inhibitors while it was similar compared with SGLT-2 inhibitors, according to results from real-world emulation trials published in *Circulation*.

Using population data in patients with T2D in Sweden, **Yang Xu, PhD**, et al., conducted two emulation trials: GLP-1s vs. DDP-4 inhibitors and GLP-1s vs. SGLT-2 inhibitors.

When comparing GLP-1s vs. DDP-4 inhibitors, among 32,979 patients with T2D (median age 64 years, 40% women), the weighted incidence rate was 12.1 vs. 15.8 events/1,000 person-years, respectively, and the three-year absolute HHF risk was 3.43% vs. 4.30% (weighted hazard ratio [HR] 0.77).

In the comparison of GLP-1s vs. SGLT-2 inhibitors, among 30,104 patients, the weighted incidence rate was 12.8 vs. 12.6 events/1,000 person-years and three-year absolute HHF risk was 3.56% vs. 3.33% (weighted HR 1.02), respectively.

The absolute risk difference was largest among patients with a higher predicted risk of HF at baseline. Findings were consistent across most subgroups, between single agents and in per-protocol analyses.

Positive control outcome analyses found three-year absolute risks for major adverse cardiovascular events were 5.49% vs. 6.31% with GLP-1s vs. DDP-4 inhibitors (weighted HR 0.85) and 4.88% vs. 4.91% with GLP-1s vs. SGLT-2 inhibitors (weighted HR, 0.98).

Noting that roughly 90% of participants did not have HF, the authors write their "findings suggest that GLP-1RAs could be used to reduce the risk of HHF in patients with T2D, regardless of [HF] history. ■

Xu Y, Huang T, Zhang Y, et al. *Circulation*. 2026;Feb 24. i: 10.1161/CIRCULATIONAHA.125.075157.

Third-Trimester Pregnancy Biomarkers and Greater CV Risk

Higher concentrations of the pregnancy-specific biomarker soluble fms-like tyrosine kinase-1 (sFlt-1) and the cardiovascular-specific biomarker high-sensitivity cardiac troponin I (hs-cTnI) in the third trimester were independently associated with subsequent cardiovascular disease, according to research published in *JAMA Cardiology*, suggesting that pregnancy may be a unique and important opportunity for cardiovascular risk assessment.

In a study of Denmark's Odense Child Cohort, a population-registry of all pregnancies reaching at least 22 weeks in southern Denmark from 2010-2013, **Lucas Bacmeister, MD**, et al., focused on 2,056 women without preexisting cardiovascular disease who had biomarker data at either week 12 or week 29 of their pregnancy. Their median age was 30 years and median prepregnancy BMI was 23.4; 62% were nulliparous and 16% had adverse pregnancy outcomes, including fetal growth restriction, preterm delivery and stillbirth.

Results found that 28 women (1.4%) had developed cardiovascular disease over a median follow-up of 12 years. Maternal age, hypertensive disorders of pregnancy (HDP) and third-trimester concentrations of sFlt-1 and hs-cTnI were independently associated with higher long-term risk, while earlier pregnancy biomarkers were not.

A combined model of age and sFlt-1 at week 29 improved discrimination for cardiovascular disease vs. age alone, whereas a combination of age, systolic blood pressure and non–HDL-C did not. These results were consistent in women without prior births, hypertension or HDPs. ■

Scan the QR code for *JACC's* special issue devoted to women's cardiovascular health.

Bacmeister L, Glintborg D, Kjer-Moller J-J, et al. *JAMA Cardiol.* 2026;Feb. 18. doi:10.1001/jamacardio.2025.5595

Differential Impact of ADT Drugs in Prostate Cancer on Coronary Plaque

In men with localized prostate cancer (PCa) treated with radiation and androgen-deprivation therapy (ADT), treatment with the gonadotropin-releasing hormone (GnRH) leuprolide, vs. relugolix, was associated with a significant 12-month increase in coronary artery plaque volume, according to a brief report of the REVELUTION trial published in *JAMA*.

The open-label trial, conducted at four centers affiliated with a single academic institution, included 62 men (mean age 69 years, 56% on statins) with nonmetastatic PCa naive to ADT undergoing pelvic radiotherapy plus ADT for ≥six months. Patients were assigned 1:1 to leuprolide acetate (22.5 mg injection every three months) or relugolix (120 mg once daily after a single loading dose of 360 mg).

For the primary endpoint of change in coronary artery total plaque volume (TPV), measured by coronary CT angiography at baseline and 12 months after starting ADT, results showed that compared with relugolix, there was a significantly greater increase in TPV (estimated difference +68.9 mm^3) with leuprolide. Also, for the secondary endpoint of change in coronary artery noncalcified plaque volume, there was a significantly greater increase with leuprolide (+64.5 mm^3). Both were after adjustment for baseline age, plaque volume and statin use. No significant between-group differences were seen at 12 months for calcified plaque volume and low-attenuation plaque volume.

In what they believe is the "first clinical trial to identify a biological basis for [cardiovascular] risk differences observed between ADT drug pathways in men with PCa," **Sagar A. Patel, MD, MSc**, et al., write their results "support the hypothesis that [cardiovascular] risk from ADT may be driven by accelerated coronary atherosclerosis, which is more prominent with GnRH agonist therapy." ■

Patel SA, Yadalam AK, van Assen M, et al. *JAMA*. 2026;Feb. 18. doi: 10.1001/jamacardio.2025.5586

ACC Accreditation Services: **Guiding Health Systems to QI Success**

Working across health care disciplines, departments and facilities is essential for system-wide success in cardiovascular quality improvement (QI), and **Elizabeth A. Maiorana, MBA, MSN, RN**, vice president for the cardiovascular service line at Hackensack Meridian Health (HMH) Network in New Jersey, has spent her career coordinating care teams to achieve this vision.

Under her leadership, eight HMH sites have earned multiple accreditations from ACC Accreditation Services – seven achieving HeartCARE Center designation. From meeting national benchmarks for door-to-balloon times to protecting cath lab staff from radiation exposure, accreditation efforts supported by NCDR data have led to measurable improvements in patient care, clinician safety and the organization's outcomes.

"It's critical to be able to demonstrate the value and worth of what we're doing," says Maiorana. "Right now, everyone is focused on readmissions, length of stay, discharge to home and when to implement evidence-based best practices."

At its core, ACC Accreditation Services brings together health care professionals across disciplines to identify gaps, promote efficiency and advance guideline-driven care.

"Cardiology, emergency medicine, hospital medicine, administration and nursing all come together to formulate these tools to lead accreditation," says ACC Accreditation Oversight Committee Chair **Steven B. Deitelzweig, MD, MMM, FACC**. "Whether that's in the cath lab or congestive heart failure or chest pain, it's a deliverable product that really pays dividends."

> **"Cardiology, emergency medicine, hospital medicine, administration and nursing all come together to formulate these tools to lead accreditation...it's a deliverable product that really pays dividends.**
>
> Steven B. Deitelzweig, MD, MMM, FACC

An Accreditation Game Changer

This year marks 10 years since the ACC and Society of Cardiovascular Patient Care (SCPC) joined forces to establish ACC Accreditation Services, combining SCPC's accreditation expertise with the ACC's registries, quality initiatives and educational resources.

"The accreditation process has really grown and evolved from the time SCPC was running the process," says **Deepak L. Bhatt, MD, MPH, MBA, FACC**, chair of the ACC Accreditation Services Nominating Committee. "We are now in more hospitals, we've expanded the scope of what accreditation can offer, and we've expanded collaborations with other organizations such as MedAxiom and NCDR, providing a menu of services from which to choose for different hospitals and health care systems."

> **Over the past decade, our accreditation programs have helped hospitals identify opportunities for improvement and forge a path forward, moving us closer to our ultimate goal of a world where science, knowledge and innovation optimize patient care.**
>
> ACC CEO Cathleen C. Gates

Maiorana describes the merger as a "game changer," aligning accreditation requirements with the latest standards for data collection and care delivery from the national societies.

With metric benchmarks and accreditation best practices coming from the College, Maiorana says there is enhanced credibility behind her team's QI initiatives – especially among physicians.

"As the standards change from our national society, so do the guidelines related to what's happening in our accreditations, and that is now consistent with what our physician providers need to achieve," she says.

This alignment ensures everyone understands the actions required to achieve high-quality patient care, a goal the ACC and its accredited facilities continue to aspire toward.

"Over the past decade, our accreditation programs have helped hospitals identify opportunities for improvement and forge a path forward, moving us closer to our ultimate goal of a world where science, knowledge and innovation optimize patient care," says ACC CEO **Cathleen C. Gates**.

APNs as "The Glue"

Maiorana considers advanced practice nurses (APNs) key to accreditation success. "The APN is the glue that unifies the multidisciplinary team, breaking down silos and fostering a culture of high reliability," she says.

In their hybrid clinical and administrative roles, APNs connect with clinical teams, quality and data teams, hospital leadership and administrative departments, creating a unified system.

With her model, APNs support care across all the academic hubs, procedural centers and community hospitals in the HMH system, reporting directly to executive cardiovascular leadership. This structure allows for faster decision-making, system-wide influence and greater accountability.

They also have a real-time clinical impact, reviewing patient cases daily to ensure evidence-based care before discharge. Their work at the bedside prevents downstream quality issues and improves care outcomes.

Collaboration Leads to Excellence

According to Maiorana, her APNs "share absolutely everything during the accreditation process," collaborating at the system level to elevate performance across campuses.

This partnership involves multiple internal stakeholders, including physician champions and their in-house registry team led by **Jeanne Jacobus, MSN, RN**, and extends beyond HMH to include NCDR registry staff and ACC Accreditation Review Specialists.

"Our success is a direct result of their collaboration with us, their spirit and their dedication to every single team member and our executive leadership services line right down to the front lines," says **Jennifer A. Heck-Kanellidis, DNP, APN**, a cardiovascular transformational care nurse practitioner at HMH.

HMH's wealth of quality knowledge helps newer additions to the system reach their full potential in providing quality care. Maiorana and Heck-Kanellidis played key roles in supporting the cath lab at their newer Raritan Bay campus through the accreditation process.

"It goes beyond just sharing information," Maiorana says. "You really become almost like a proctor to help them. You're involved in those meetings until they get on their own feet to have their own multidisciplinary team meetings."

> **You have to understand the culture of every one of the facilities within your network because they are unique and different, but it's also important they work together.**
>
> Elizabeth A. Maiorana, MBA, MSN, RN

After establishing that structure and sharing best practices, she notes how rewarding it is to watch these programs grow. Each campus contributes insights back into the system, strengthening the organization's overall performance.

"You have to understand the culture of every one of the facilities within your network because they are unique and different, but it's also important they work together," says Maiorana. ■

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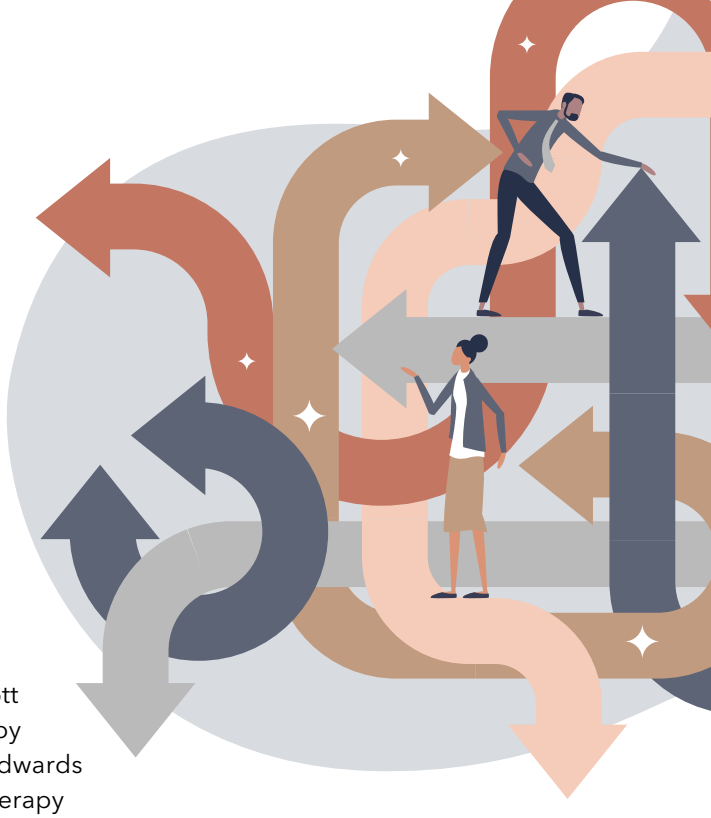
Tricuspid Regurgitation: When Is Intervention Indicated?



Management of tricuspid regurgitation (TR) largely depends on the etiology, which falls under three categories: 1) primary TR (due to anatomic abnormalities of the tricuspid valve (TV); 2) secondary TR (mostly due to left-sided pathology producing pulmonary hypertension [PH] and right ventricular [RV] dysfunction); and 3) right-sided cardiac implantable electronic device (CIED)-related TR (e.g., transvenous pacemakers).[1-3] Primary TR accounts for only about 10% of TR with secondary TR and CIED-related TR accounting for the rest.[1-3]

First steps in management of TR should address the underlying causes of heart failure symptoms.[4] For patients presenting with mild to moderate TR, an appropriate diuretic regimen for volume management may achieve symptom resolution. However, there are many patients with persistent severe TR despite these measures and TV intervention should be considered when patients remain symptomatic or develop evidence of RV dysfunction or dilation.[1-3]

Tricuspid intervention for TR has historically been confined to surgical approaches. Isolated TV surgery is associated with high rates of in-hospital mortality.[1,2] While new risk models have provided more clarity on appropriate patient selection for TV surgery, transcatheter tricuspid valve interventions (TTVI) have emerged to provide additional treatment options for patients with severe TR.[1-5]

The most common percutaneous devices involve either tricuspid transcatheter edge-to-edge repair (T-TEER) or transcatheter tricuspid valve replacement (TTVR).[6-14]

What the Evidence Says

Two pivotal trials, TRILUMINATE and TRISCEND II, respectively, compared T-TEER using Triclip (Abbott Vascular) to medical therapy and TTVR using Evoque (Edwards Lifesciences) to medical therapy in patients with symptomatic severe TR.[10,11] While neither trial demonstrated a mortality benefit, these two trials showed that both T-TEER and TTVR were associated with a reduction in TR, reduction of symptoms and improvement in quality of life compared to medical therapy alone.

It should be noted that the patients enrolled in these trials were carefully selected. More specifically, they had TV anatomy suitable to T-TEER or TTVR and were not being considered for TV surgery because of their high surgical risk.[10,11]

Furthermore, these patients did not have severe left ventricular (LV) dysfunction, severe PH (pulmonary artery systolic pressures >70 mm Hg), severe RV dysfunction, TV stenosis, additional valve dysfunction requiring intervention, or prior tricuspid interventions (TV replacements or repair) that would interfere with placement of the T-TEER or TTVR device.

Additionally, TTVI trials excluded end-stage renal disease (ESRD) patients, an important demographic given the prevalence of TR in these patients. Altogether, there are no trials to date suggesting that patients with any of these exclusion criteria will benefit from T-TEER or TTVR.

Valve-in-valve and valve-in-ring TTVRs have been studied, but this typically involves off-label use of Sapien 3 (Edwards Lifesciences) valves or Melody (Medtronic) valves as opposed to Triclip or Evoque devices.[15]

While patients with CIED leads frequently undergo TTVI, the presence of CIED leads requires careful consideration as the CIED lead may be causing CIED-related TR that potentially can improve with repositioning or lead extraction. However, these CIED lead interventions could themselves damage the tricuspid valve.[2,3,16,17] All of these clinical points need to be considered when considering TTVI (**Figure 1**).

Procedure Selection

Once a decision has been made to pursue TTVI, a choice between T-TEER and TTVR should be made. T-TEER does not reduce TR severity as much as TTVR and has more anatomic restrictions including the presence of large TV coaptation gaps (>10

Figure. Management and Intervention Considerations For Severe Tricuspid Regurgitation

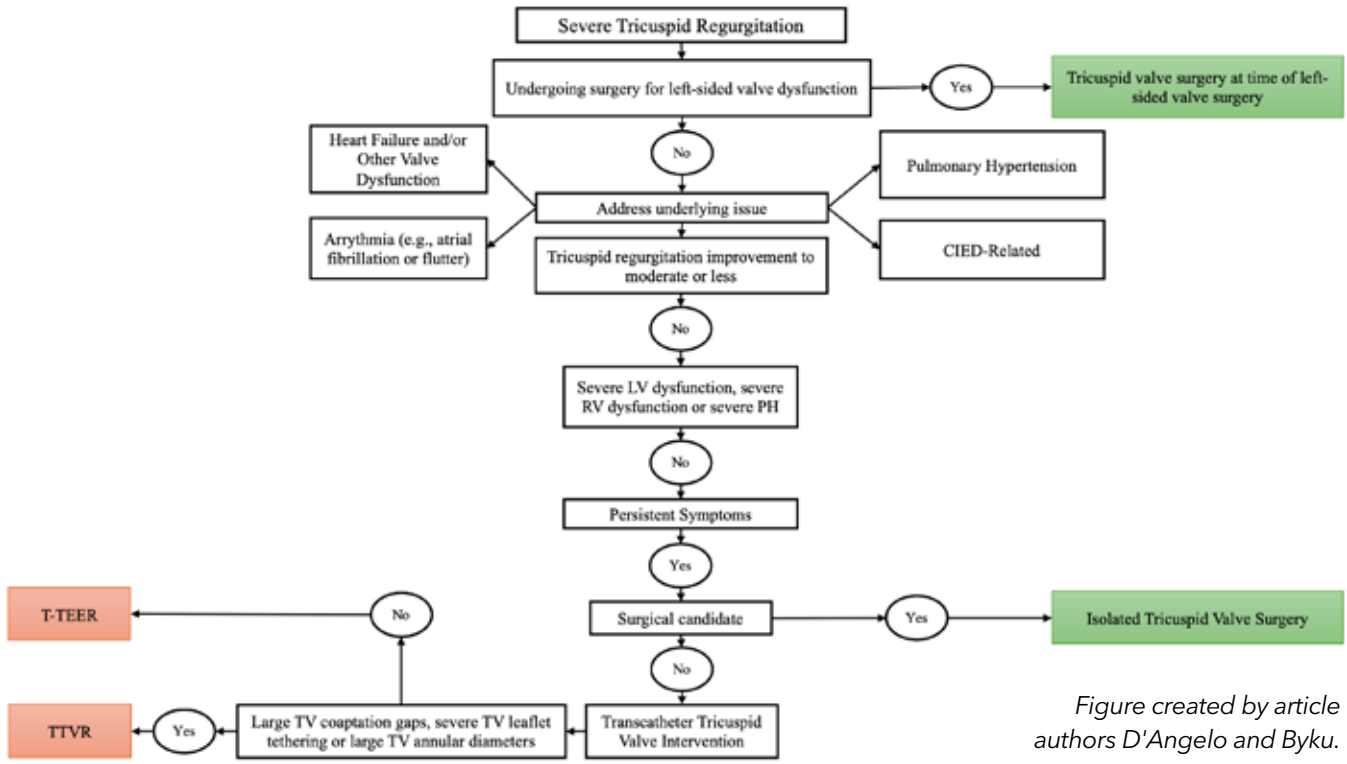


Figure created by article authors D'Angelo and Byku.

mm), severe TV leaflet tethering and large TV annular diameters. However, TTVR's more complete resolution of TR may cause worsening right-sided heart failure in some patients and the more modest TR reduction seen with T-TEER may be better tolerated in those with some degree of RV dysfunction.

Furthermore, T-TEER is a simpler procedure with a lower adverse event rate including less bleeding, less interaction with existing CIEDs and fewer conduction abnormalities necessitating permanent pacemaker placement.[2,3,18] In patients with preexisting CIEDs, TTVR is considered more favorable in the setting of CIED-related TR. However, TTVR may cause lead jailing and T-TEER may be more favorable when the CIED leads are far away from the main TR jet location.[3] In light of all this, TTVI planning in the setting of CIED leads should involve a multidisciplinary team involving the structural interventionalist, structural imagers and electrophysiologists.[15] In addition, TTVR requires preprocedure CT scanning and postprocedure anticoagulation, which is less desirable in patients with preexisting kidney dysfunction and higher risks of bleeding, respectively.[2,3,18]

TTVI has emerged as a promising treatment option for select patients with symptomatic severe TR, but there remains limited data on TTVI within important patient cohorts. Commercial liberalization of the Evoque and Triclip devices will hopefully provide more answers, and further studies are needed to better identify which patients will benefit the most from TTVI. For now, a multidisciplinary approach will continue to be at the center of decision making. ■

References available with the online version of this article at ACC.org/Cardiology.

This article was authored by **John D'Angelo, MD**, and **Isida Byku, MD, FACC**, from the Division of Cardiology, Emory Structural Heart and Valve Center, Emory University Hospital Midtown in Atlanta, GA.

Failure to Act on Cardiac Event Monitor Findings Increases Risk of Death

Failure to diagnose and address cardiac event monitor findings significantly contributed to morbidity and mortality, based on an analysis of closed cardiology malpractice claims by The Doctors Company. In this case, poor documentation, lack of follow-up, delay in addressing findings, patient nonadherence, communication issues and lack of intervention before discharge contributed to the poor patient outcome, highlighting the importance of immediate intervention and follow-up care.

Allegation and Background

The cardiologist's failure to properly diagnose and address the significant events captured on a cardiac event monitor over time contributed to the patient's death.

A patient with a history of hypertension, peripheral artery disease and femoral/iliac artery stents was scheduled for elective surgery. A preoperative electrocardiogram (ECG) revealed a bifascicular block and first-degree atrioventricular (AV) block, which was communicated to the surgeon and documented in the electronic health record (EHR). During surgery, the patient experienced a third-degree heart block that required medication intervention to stabilize.

A cardiologist was consulted postoperatively and noted progression to a third-degree heart block. The cardiologist ordered a transthoracic echocardiogram (TTE) and a cardiac event monitor (EM). Before the TTE result was available, the patient was discharged home with instructions to follow up in the clinic in two weeks. The TTE result read by the cardiologist after discharge revealed an ejection fraction (EF) of 25-29% and a moderately sized right atrial mass. The cardiologist planned to discuss these results with the patient at the next appointment but did not document this.

The EM recorded multiple auto-triggered events, including many instances of ventricular tachycardia (VT), occurrences of second-degree type 2 heart block, a high volume of premature atrial contractions and premature ventricular contractions (PVCs), with a PVC burden of 2%. The patient presented for the cardiology clinic appointment but left before being seen due to long wait times. The appointment was rescheduled for three months later (first available time).

The clinic uploaded the EM findings three weeks later, but the cardiologist did not overread the results until six weeks later, revealing a type 2 block with multiple episodes of nonsustained VT and several episodes of 2:1 AV block. However, the cardiologist's staff left a voice message advising the patient that there were no new changes on the EM and to keep the scheduled appointment.

Before the appointment, the patient was found unresponsive, having suffered a STEMI with severe hypoxic-ischemic encephalopathy. Cardiac catheterization revealed triple-vessel disease with 85-90% stenosis in three to four major vessels. The patient passed away a few days later.

Commentary

Several factors contributed to this fatal outcome:

- The preoperative ECG suggested a bifascicular block and first-degree AV block, requiring prompt evaluation and care.
- The TTE results were not acknowledged or documented. The reduced EF may have led to one or more urgent procedures.
- The EM recorded significant cardiac events, but the results were not reviewed until six weeks later. The serious findings needed to be escalated to the cardiologist as soon as they were detected. The voicemail from staff regarding benign EM findings was inappropriate.
- Multiple members of the care team missed multiple opportunities to recognize and act upon the patient's urgent clinical condition.
- The patient left a follow-up appointment due to long wait times, and a three-month wait for a rescheduled appointment demonstrated a lack of clear communication regarding the urgency of follow-up care.

Patient Safety Considerations

Potential clinic systems or process improvements include:

- **Improve documentation and follow-up:** Review and document all test results before patient discharge. Documenting the clinical rationale for actions taken or not taken based on the results serves as communication among practitioners while also supporting and defending treatment decisions.
- **Timely review and act on critical findings:** Execute signed agreements with EM vendors to systematically identify and communicate EM "red alert" rhythms

for immediate review by the practice. Review system implementation quarterly to ensure proper function and documentation of the alert and actions taken.

- **Build redundancy in communication:** Create structured communication pathways to ensure team members are alerted when results, messages and appointments are not timely acted on.
- **Enhance patient communication and appointment management:** Improve the consistency of communication with patients regarding the urgency of follow-up care and appointments. Adjust scheduling to reduce waiting times to prevent patients from leaving appointments without being seen. Include practitioner review of all missed appointments without immediate reappointment to determine which patients require follow-up within a designated time frame.
- **Increase care coordination:** Establish a robust system for monitoring patients after discharge and ensure timely follow up on test results and appointments. Leverage the capabilities of your EHR and any fully vetted AI tools used in your practice to close the loop on these care opportunities.
- **Provide training:** Educate practitioners and staff on documentation, reviewing critical findings, patient communication and care team coordination. See the Agency for Healthcare Research and Quality's TeamSTEPPS® program (*AHRQ.gov/teamstepps*). ■

This article was authored by **Robert Morton, MAS, CPPS**, assistant vice president, Patient Safety and Risk Management, The Doctors Company.
The author appreciates the article review by **Nicole L. Lohr, MD, PhD, FACC**, and **Cathie Biga, MSN, MACC**.

The guidelines suggested here are not rules, do not constitute legal advice, and do not ensure a successful outcome. The ultimate decision regarding the appropriateness of any treatment must be made by each healthcare provider considering the circumstances of the individual situation and in accordance with the laws of the jurisdiction in which the care is rendered.

Medtronic Clinician Update on New Evolut Valve Data Reinforces Need For Patient Dialogue

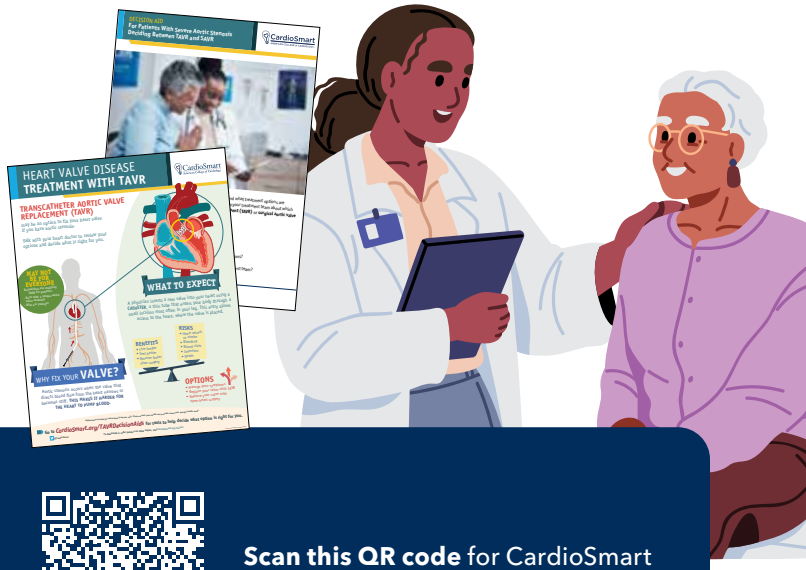
New long-term data from the Evolut Low Risk trial published in *JACC* underscore how emerging science and evidence continue to shape patient-centered care in structural heart disease – an approach central to the ACC's Vision of using science, knowledge and innovation to optimize patient care and outcomes. As a result of the new data, Medtronic has issued a clinician letter and accompanying web resources, reinforcing the importance of informed, ongoing dialogue between clinicians and patients as treatment decisions evolve over time.

While overall six-year follow-up data on reintervention rates associated with CoreValve, Evolut R and Evolut PRO transcatheter heart valves showed low-risk patients with aortic stenosis experienced no significant differences in all-cause mortality or disabling stroke after undergoing either surgical aortic valve replacement or TAVR, investigators saw higher reintervention rates among patients assigned to TAVR compared with surgery – a difference largely driven by increased rates of aortic regurgitation. Specifically, 5.5% of patients in the TAVR cohort required reintervention vs. 3.3% in the surgery group. Further increases in the incidence of reintervention among those in the TAVR group (9.8%) vs. surgery (6%) were observed in an additional analysis of available seven-year data.

According to the Medtronic letter, the recent Evolut Low Risk publication "supports existing patient management recommendations and underscores the importance of adhering to current Instructions for Use (IFU)." The following patient management recommendations are also included:

- Physicians treating patients with a transcatheter bioprosthetic heart valve should adhere to guideline-directed follow-up, including routine surveillance with annual echocardiograms.
- When implanting the Evolut valves, it is very important to follow implantation best practices and current IFU on balloon post-dilation.

"The latest Evolut Low Risk findings and subsequent letter are an important reminder to engage with patients – both current and future – about their care," says ACC Chief Medical Officer **Richard J. Kovacs, MD, MACC**. "The ACC encourages all clinicians who care for patients with heart valve disease to review the Medtronic letter and related materials and to engage in open conversations about valve type, long-term surveillance, and potential implications for ongoing care. These shared decision-making discussions can help to ensure that treatment plans align with patient expectations while supporting long-term health and peace of mind." ■



Scan this QR code to access Medronic's letter to clinicians.

Scan this QR code for CardioSmart shared decision-making tools.

Scan this QR code to access Medtronic's web resources.

Scan this QR code for the full six-year Evolut Low Risk Trial results in *JACC*.

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