Doctors may unknowingly undertreat women for stroke, neurologist says

Many physicians unaware of gender-based differences in stroke risks, treatments and outcomes are unknowingly undertreating women who need anticoagulation therapy out of undue concerns over frailty, according to Stacie Demel, assistant professor of neurology and rehabilitation medicine at the University of Cincinnati Medical Center in Ohio. "But men may be more likely to be placed on anticoagulants than women. But underuse of these medications in women may play a role in stroke incidence at age 80 and older.”

Experts to address link between chronic kidney disease and stroke

With increasing evidence of the relationship between chronic kidney disease, the brain and stroke, it's time clinicians "pay attention,” said Branko Huisa-Garte, MD, assistant professor of neurosciences at the University of California, San Diego. "It is time for researchers to be aware of this connection and look into it in far more detail than has ever been done.”

Huisa-Garte, who will moderate Friday's session. "Clinicians also need to be aware of the growing evidence of relationships between kidney disease and the brain in their patients. We all need to do a better job of seeing our patients as a whole, understanding that what happens in different parts of the kidney affects the brain and not look at just one organ in isolation.”

Chronic kidney disease is more than a risk factor for cardiovascular disease and stroke. Metabolic and vascular changes stemming from even the early stages of kidney disease

Debate honors tPA pioneer

If you could ask the namesake of the Justin A. Zivin Memorial Session about tPA versus TNK, he would probably say there’s no debate.

Justin would have looked at the biological rationale for using TNK, said Patrick Lyden, former fellow and long-time collaborator of Zivin, “and he would have said, ‘Listen, it works! Why aren’t we using it?’”

Lyden, MD, professor of neurology at Cedars-Sinai in Los Angeles, will moderate Friday's debate that pits FDA-approved rtPA (alteplase) against newcomer TNK (tenecteplase). Both are recombinant tissue plasminogen activators, with rtPA nearly identical to wild type tPA and TNK, a genetically modified mutant of the wild type.

Zivin, who died last year at age 71, wrote the seminal paper on tPA that demonstrated it was an effective thrombolytic for stroke using an animal model. The article, published in Science in 1985, also challenged the contemporary thinking that efficacy in stroke treatment equaled open arteries. Zivin’s model made neurological function the key outcome.

Before Justin's article, we fumbled about scoring open arteries and quantifying lesion volumes,” Lyden wrote in a tribute to Zivin. “The article provided the foundation for later successful human trials in thrombolysis.”

Years on, Zivin and Lyden showed that if you could ask the namesake of the Justin A. Zivin Memorial Session about tPA versus TNK, he would probably say there’s no debate.

You can also see the debate on Facebook: facebook.com/ahameetings

UPCOMING SESSION
Chronic Kidney Disease and Stroke
7:30 a.m. Friday
Kalakaua Ballroom A

Huisa-Garte

UPCOMING SESSION
Stroke in Women Throughout the Life Course: An International Perspective
7:30 a.m.-3 p.m. Thursday
Science & Technology Hall

Demel will co-moderate Friday’s session with Dawn O. Kleindorfer, MD, professor of neurology and director of the Comprehensive Stroke Center at the University of Cincinnati.

Presenters will discuss the latest findings on:
- Stroke in young women
- Peri-menopausal changes in stroke risk
- Stroke in post-menopausal women
- Effects of marital status on stroke

The article, published in Science in 1985, also challenged the contemporary thinking that efficacy in stroke treatment equaled open arteries. Zivin’s model made neurological function the key outcome.

Before Justin’s article, we fumbled about scoring open arteries and quantifying lesion volumes,” Lyden wrote in a tribute to Zivin. “The article provided the foundation for later successful human trials in thrombolysis.”

Years on, Zivin and Lyden showed that if you could ask the namesake of the Justin A. Zivin Memorial Session about tPA versus TNK, he would probably say there’s no debate.

You can also see the debate on Facebook: facebook.com/ahameetings
STROKE IS NEVER EXPECTED, BUT KNOWING HOW TO **REACT**, HAS THE POWER TO CHANGE LIVES.

**React** with Speed. **React** with Agility. **React** with Confidence.

Visit [medtronic.com/React](http://medtronic.com/React). To learn more stop by Medtronic Booth #529 at ISC.
Session to provide update of NIH programs investigating vascular contributions to cognitive impairment, dementia

Attendees at Friday's session will get an update on National Institutes of Health-funded clinical and applied research programs investigating vascular contributions to cognitive impairment and dementia.

Clinton B. Wright, MD, director of the Division of Clinical Research at the National Institute of Neurological Disorders and Stroke, and Claudia S. Moy, MD, program director of epidemiology and clinical studies in cognition at the NINDS, will co-moderate the session.

Six experts — exemplifying cooperation in investigating VCID among the NINDS; the National Heart, Lung, and Blood Institute; and the National Institute on Aging — will present during the session:

- Roderick Corriveau, PhD, neurodegeneration program director at NINDS, will highlight VCID and the national plan to address Alzheimer's disease and related dementias. He'll also update on MarkVCID, the consortium of U.S. academic medical centers working to identify and validate biomarkers in the small vessel diseases of the brain that produce VCID.

- Alifiya Kapasi, PhD, of Rush University in Chicago, will address VCID as part of typical multi-etiology clinical dementia. She has studied the impact of concomitant neurodegenerative and cerebrovascular pathologies as important factors in the development of Alzheimer's disease and other dementias. Rush is one of eight centers participating in MarkVCID.

- Angela Jefferson, PhD, professor of neurology and director of the Vanderbilt Memory and Alzheimer's Center at Vanderbilt University Medical Center in Nashville, will speak on risk and biomarkers for VCID.

- Nicolas Pajewski, PhD, associate professor of biostatistical sciences in the Wake Forest School of Medicine in Winston-Salem, North Carolina, will present results of SPRINT MIND, Systolic Blood Pressure Intervention Trial Memory and Cognition In Decreased Hypertension. The trial examined whether treating for a systolic blood pressure target of less than 120 mm Hg reduced the risk of developing dementia and/or MCI. An imaging substudy of the trial found that subjects who had intensive systolic blood pressure control had significantly less increase in cerebral white matter lesion volume.

- Lawrence J. Fine, MD, DrPH, branch chief of Clinical Applications and Prevention Branch, Division of Cardiovascular Sciences, will represent NHLBI programs. He will address epidemiological studies in VCID that include longitudinal, population-based cohort and clinical.

- Eliezer Masliah, MD, director of the Division of Neuroscience at NIA, will speak on clinical trials on VCID in Alzheimer's disease and related dementias.

Follow ISC 2019 on Twitter
Tweet your questions/comments or talk about what’s happening at ISC 2019. Use #ISC19.
Experts to argue reperfusion injury in debate

It can be a scary proposition—if your criteria aren’t good, even at short times, you will get a lot of hemorrhages and people may die.

Frank Ray Sharp, MD

Questions central to the debate include: What’s the injury? What mediates it? What are the consequences?

- Raymond A. Swanson, MD, professor and vice chair of neurology at the University of California in San Francisco, will argue that reperfusion injury is fiction.

- Prasad V. Katakam, MD, PhD, associate professor of pharmacology at Tulane University in New Orleans, will argue in favor of reperfusion.

The argument against reperfusion injury is that injury occurs whether you reperfuse the ischemic brain tissue or not.

“Either way, you’re going to generate a lot of free radicals that affect the blood brain barrier or open the barrier,” Sharp said.

The best evidence for reperfusion injury comes from the use of tPA and thrombectomy, with hemorrhage being the major complication of both, Sharp said.

“We think it occurs because once you clot a vessel and then you reopen it, the blood-brain barrier beyond is damaged and that allows blood to leak out into the tissue,” he said.

It’s a significant issue in the endovascular era, as the window for opening vessels has extended beyond the initial stroke.

“It can be a scary proposition — if your criteria aren’t good, even at short times, you will get a lot of hemorrhages and people may die,” Sharp said.

Another important point is that timing of treatment doesn’t determine injury; it’s the viability of the tissue.

Recent clinical trials have demonstrated good methods for estimating the amount of semi-viable brain.

“In patients where that penumbra is big enough, if you pull the clot out and do it technically well, they will do fine,” Sharp said.

“They don’t hemorrhage more than you would expect, and they do better than they would have otherwise done if you hadn’t done the procedure.”

Studies have demonstrated that drug treatment can prevent hemorrhage in animals. If administered early after reperfusion, they decrease the incidence of the hemorrhage.

“Some of those drugs act on proteases that open the barrier, some of those drugs act on reactive oxygen species,” Sharp said.

No matter what side of the reperfusion injury question, “interventional radiologists and neurocritical care specialists who attend the debate can expect to get a better idea about why people are going to get hemorrhages and why they’re not,” Sharp said.

---

Telehealth technology advancing stroke care globally

The growing spread of sophisticated audio and visual technologies means that this kind of innovation is possible in any part of the world where there is a cellphone signal or some other internet connection.

Emerging telehealth technology is advancing expert, personalized stroke care and treatment for patients across the globe, according to a neurologist.

“The growing spread of sophisticated audio and visual technologies means that this kind of innovation is possible in any part of the world where there is a cellphone signal or some other internet connection,” said Ramesh Madhavan, MD, DM, moderator of today’s AHA/ASA and World Stroke Organization Joint Symposium, “Stroke Telehealth: Controversies and Solutions.”

Ramesh Madhavan, MD, DM

Hocke

The AHA/ASA and World Stroke Organization Joint Symposium: “Stroke Telehealth: Controversies and Solutions”

UPCOMING SESSION: 8:45-10:15 a.m. Friday

Kalakaua Ballroom B

The future of stroke care looks IHE.

---

SUBMIT ISC 2020 AWARD NOMINATIONS

AHA members: Submit your nominations for the ISC 2020 Feinberg, Sherman, Willis and Research Mentor awards.

Nomination Period Opened: Feb. 6, 2019

Nomination Period Closes: June 26, 2019

Go to strokeconference.org/awardsandlectures for more information.
THE WAIT IS OVER FOR PATIENTS WITH LIFE-THREATENING BLEEDS

VISIT BOOTH #102
New study approaches may help close gap between translating research evidence into clinical practice

Novel study designs offer promise to reduce the gap between research evidence to clinical practice from decades to months, according to Janet Prvu Bettger, ScD.

Translating research into clinical practice is a complicated process that takes an average 17 years. But new approaches that combine clinical and translational efforts could help reduce time, said Bettger, who will co-moderate today’s session with Michael Phipps, MD, MHS, assistant professor of neurology at the University of Maryland School of Medicine in Baltimore.

The key, Bettger said, is conducting pragmatic research in learning health systems that helps providers adapt evidence-based strategies locally and learn from every patient.

“New study designs focusing on pragmatic research and implementation science are creating real-world evidence, so we’re not waiting 17 years to see the benefits reach our patients,” said Bettger, associate professor and co-director of the Clinical and Translational Institute Accelerator Program at Duke University in Durham, North Carolina. “We are shortening that 17-year gap by showing that it works today and using it with patients tomorrow.”

Clinical research should include not just what works, but why, when, where, how and for whom it works, she said.

In a hallmark learning health system, clinicians collect data to get immediate feedback and adjust treatment to achieve clinical goals that inform practice in real time instead of waiting to see what works.

“Health system research at the organizational level still allows us to deliver patient-centered care and treat every individual for who they are as a person,” Bettger said. “At the same time, we are able to use each patient’s data as part of a larger population. Using a set of performance measures, we are able to see what happens for one patient and see what happens as the entire population shifts toward better care that is more consistent. The goal is continuous learning and improvement to where every patient gets the right care.”

There’s not one set way to transform a conventional health system into a learning system, Bettger said. Each health system is different and at a different scale, from individual departments to multicenter networks. Effective transformation strategies consider organizational culture as well as the needs, aspirations and fears of different stakeholders.

Some organizations embark on a thoughtful, methodical, stepwise transition. This approach seems to be most effective for organizations resistant to change.

Other organizations prefer to change in one fell swoop.

“Both approaches have worked,” Bettger said. “It really depends on the administration, the culture and the infrastructure for how ready people are to say, ‘We can do this, we believe that using our data to move us forward is the right thing to do, and we are willing to learn as we go.’ ”

“We owe it to our patients and the stroke community to deliver the best care with the best evidence at all times. Creating learning health systems is an opportunity to move this trajectory forward faster.”

PATRICK LYDEN, MD

If we’re scrambling to find an ambulance to take that patient to the mothership, we need an ambulance with a critical care nurse, and that can take a long time to put all that together. But if we give TNK — boom! Drug is in.

“ ‘If we’re scrambling to find an ambulance to take that patient to the mothership, we need an ambulance with a critical care nurse, and that can take a long time to put all that together,’ Lyden said. “But if we give TNK — boom! Drug is in. ‘The patient can come by herself or be transported to primary or comprehensive stroke centers."

“ ‘It really depends on the administration, the culture and the infrastructure for how ready people are to say, ‘We can do this, we believe that using our data to move us forward is the right thing to do, and we are willing to learn as we go.’ ”

“What we owe it to our patients and the stroke community to deliver the best care with the best evidence at all times. Creating learning health systems is an opportunity to move this trajectory forward faster.”

PATRICK LYDEN, MD

ADDITIONAL READING


ISC 2020 AND NURSING SYMPOSIUM 2020 CALL FOR SCIENCE

Session Ideas
Suggested Session Submitter Opens: Feb. 11, 2019
Suggested Session Submitter Closes: March 11, 2019

Abstracts
Submission Opens: May 22, 2019
Submission Closes: Aug. 13, 2019

Late-Breaking Science and Ongoing Clinical Trials Abstracts
Submission Opens: Oct. 9, 2019
Submission Closes: Nov. 6, 2019

Submit abstracts and/or session ideas by visiting strokeconference.org/submissionscreen on the applicable date above. Start planning now for the International Stroke Conference 2020, Feb. 19-21, at the Los Angeles Convention Center.
Visit the Science & Technology Hall in Hall II to

**AMP UP**
your International Stroke Conference experience

**AHA/ASA HEADQUARTERS (BOOTH 451)**
Find the latest information on AHA/ASA initiatives.

**SIMULATION ZONE (BOOTH 209)**
Hands-on Interactive Learning in the Simulation Zone. Test your skill in diagnosing cerebrovascular pathologies, planning neuro-interventional treatments and performing endovascular procedures. Don’t miss the opportunity to use these state-of-the-art learning tools in the Science & Technology Hall, Booth 209.

- **Augmented Reality of ImmersiveView™ by ImmersiveTouch®**
  Take a “Fantastic Journey” and explore CT and MRI Imaging of “real” neurology patient scans with your fingertips. No longer limited to certain angles of view, clinicians can easily view the target anatomy, clearly and accurately, as if it were a real physical object in the palm of your hand.

- **The Mentice VIST® G5 Simulator**
  Challenge your endovascular procedural proficiency within a wide range of clinically based training scenarios. The simulator system-enhanced feedback provides learners with the information to improve safety and efficacy.

- **Sheehan Medical Introduces the World’s First Transcranial Doppler Simulator**
  See how this hands-on simulator trains without requiring constant faculty oversight. Immediate feedback is provided to trainees by Visual Guidance, originally developed for NASA. TCDSim™ takes the guesswork out of learning TCD.

**EXPERT THEATER (BOOTH 152)**
Enjoy complimentary lunch* while learning the latest advances in stroke practices, services and technologies.

**STROKE CENTRAL (BOOTH 152)**
Stroke Central
Stroke Central will feature a variety of scheduled programming and activities throughout the conference. The complete schedule can be found in the ISC 2019 Mobile Meeting Guide.

---

*Provided to attendees by the AHA/ASA. These events are not part of the official ISC 2019 as planned by the AHA Committee on International Stroke Programming.
Don’t miss these important late-breaking trials!

Thursday Main Event
10:30 a.m.-Noon
Thursday
Hall III
11 a.m.
MISTIE 3 Trial Results
Daniel F. Hanley, Johns Hopkins University, Baltimore, Maryland
11:12 a.m.
MISTIE III Surgical Results: Efficiency of Hemorrhage Removal Determines mRS
Amro Sarraj, University of Texas Health Science Center, Houston, Texas

Closing Main Event
10:30 a.m.-12:30 p.m.
Friday
Hall III
11:48 a.m.
Endovascular Thrombectomy Outcomes in Large Core on CT Are Strongly Associated With Perfusion Core Volume and Time: Implications From Two Large Cohorts for Future Trials
Amro Sarraj, University of Texas Health Science Center, Houston, Texas

11:53 a.m.
Extending the Thrombolytic Time Window to 9 Hours for Acute Ischemic Stroke Using Perfusion Imaging Selection – The Final Result
Henry Waj, Monash University, Clayton, Australia

12:05 p.m.
Intracerebral Hemorrhage Deferoxamine (IDEF) Trial: Main Results
Magdy H. Selim, Beth Israel Deaconess Medical Center, Boston, Massachusetts

12:17 p.m.
Tele-rehabilitation in the Home versus Therapy In-Clinic for Patients With Stroke
Steven C. Cramer, University of California Irvine, Irvine, California

2019 ISC Exhibitors
For more information about the 2019 ISC exhibitors, please refer to the AHA Mobile Meeting Guide App.

Hearty Humor

“So, that’s why they call you Mr. Big Shot!”
Science & Technology Hall (Hall II)

Expert Theater
Enjoy complimentary lunch while supplies last at the Expert Theater while learning about the latest advances in stroke practices, services, and technologies. Lunch provided by AHA. These events are not part of the official International Stroke Conference as planned by the AHA Committee on International Stroke Programming.

Stroke Central
Stroke Central will feature a variety of scheduled programming and activities throughout the conference. Look for the complete schedule in the AHA Mobile Meeting Guide App.

Expert Theater Schedule
Thursday, Feb. 7
12:10-12:40 p.m.
Personalized Medicine and Post-ESUS Risk Reduction Strategies
Speaker: Shadi Yaghi, MD, Assistant Professor of Neurology, Warren Alpert Medical School of Brown University, Rhode Island Hospital Stroke Center, Providence, Rhode Island
Supporter: Medtronic

Simulation Zone
The Simulation Zone provides hands-on interactive learning. Test your skill in diagnosing cerebrovascular pathologies, planning neuro-interventional treatments and performing endovascular procedures. Check the AHA Mobile Meeting Guide App for session information and times.

Augmented Reality of ImmersiveView by ImmersiveTouch. Take a “Fantastic Journey” and explore CT and MRI imaging of “real” neurology patient scans with your fingertips. No longer limited to certain angles of view, you can easily view the target anatomy, clearly and accurately, as if it were a real physical object, in the palm of your hand.

The Mentice VIST® G5 Simulator. Challenge your endovascular procedural proficiency within a wide range of clinically based training scenarios. The simulator system enhanced feedback provides learners with the information to improve safety and efficacy.

Sheehan Medical Introduces the World’s First Transcranial Doppler Simulator. See how this hands-on simulator trains without requiring constant faculty oversight. Immediate feedback is provided to trainees by Visual Guidance, originally developed for NASA. TCDSim™ takes the guesswork out of learning TCD.

The American Heart Association would like to thank the following supporters of ISC 2019:
• American Well (formerly Avizia)
• Biogen
• DWL USA Inc
• Genentech, A Member of The Roche Group
• Hawaii Convention Center / AEO Facilities
• Home Heart Beats, LLC
• Intermountain Healthcare
• InTouch Health
• Microvention
• Neural Analytics
• Neuropathics
• NeurOptics
• Neural Analytics
• SOC Telemed

AHA/ASA HeadQuarters
Learn more about AHA/ASA initiatives, education, membership and publications.

strokeconference.org
In Friday’s session, researchers will present their latest findings on:

- Epidemiology of chronic kidney disease and stroke
- Neuropathology of chronic kidney disease
- Chronic kidney disease and microvascular disease of the brain
- Evolving practices for stroke prevention and treatment in chronic kidney disease patients

The presentations will include both animal and human data. A lack of mechanistic detail linking kidney disease and stroke presents a challenge. Kidney disease can affect phosphate metabolism. High phosphate is linked to vascular calcification and endothelial dysfunction, potentially increasing the risk of stroke, Huisa-Garate said.

A high circulating phosphate level might be a novel risk factor for cerebral small vessel disease, possibly by impairing blood brain barrier structures. Kidney disease also induces hormonal changes that mimic the effects of aging throughout the body, including the brain and blood vessels, he said.

Patients with kidney disease appear to age more quickly than normal. Blood vessels lose their elasticity and become more rigid, which can boost blood pressure, damaging microvasculature in the brain and other organs.

Patients with chronic kidney disease also show signs of microinfarcts and small lesions throughout the brain. Cerebral tissue atrophies and the brain shrinks in size and mass. White matter in the brain seems particularly susceptible to small infarcts, lesions and shrinkage.

Stroke prevention and treatment in light of chronic kidney disease remains an open question. Hemodialysis doesn’t seem to halt or slow brain damage associated with kidney disease and may cause additional complications.

Research is limited on the effect of kidney transplantation halting or reversing damage in the brain and other organs resulting from chronic kidney disease, Huisa-Garate said.

FINDINGS can directly impact the structure and function of brain and other organs, he said. Chronic kidney disease can also directly cause microinfarcts and small lesions in the brain.

“We have long known that patients who have kidney disease are also more likely to have hypertension, diabetes, hypercholesterolemia and other conditions that affect the vessels in the brain,” said Huisa-Garate. “What we are learning now is that there are additional microvascular effects from kidney disease. There are patients who have stage 1 and stage 2 kidney disease who already have visible changes in their brains that put them at higher risk for stroke.”

Poster tours continue today

ISC 2019 offers two types of poster sessions: professor-led tours and one-on-one Q&A presentations.

10 Professor-Led Poster Tours: 5:30-6:30 p.m. today in Hall I

Expert moderators will lead the tours, which are organized by category and include a short presentation and Q&A with each of the poster authors in that section.

To participate, review the Poster Abstracts section of the Final Program on page 96 or view the Moderated Poster Sessions on the AHA Mobile Meeting Guide App. At 5:20 p.m., arrive at the numbered section sign for your selected section/category. Headsets will be available to listen to the presenters.

Regular Poster Sessions: 6:30-7:30 p.m. today in Hall I

Presenters will be at their posters for informal Q&As with attendees. The one-on-one posters aren’t part of the earlier Professor-Led Poster Tours. To see the posters featured in today’s Regular Poster Sessions, go to page 103 of the Poster Abstracts section of the Final Program or view the Poster Sessions on the AHA Mobile Meeting Guide App.

Posters also will be available for viewing in the Poster Hall (Hall II) 8 a.m.-7 p.m. today. Please see page 53 of the Final Program for the Poster Hall map.

Factors such as metabolic syndrome, hypertension, diabetes and obesity are more common in men, but the risk of stroke associated with each of these factors is greater for women for reasons that we don’t yet understand.

Stacie Demel, DO, PhD

The precise mechanisms aren’t understood. Hormonal changes seem a likely contributor, though they haven’t been identified as a direct cause of stroke, Demel said.

Regardless of age, men and women share many risk factors. But different risk factors have different effects in men and women.
Inform your clinical decisions with Reveal LINQ ICM’s proven 99.4% AF detection rate.*1

5-FOLD increase in ischemic stroke risk for AF patients2

67% decrease in AF patient stroke risk with oral anticoagulants3

30 DAYS OF CARDIAC MONITORING IS NOT ENOUGH

3 years AF detection you can rely on for up to 3 years4

88% of patients who had AF would have been missed if only monitored for 30 days5

References
4 based on Kaplan Meier estimates.
5 Reference the Reveal LINQ ™ ICM Clinician Manual for usage parameters.

Warnings/Precautions: Reveal LINQ LNQ11 Insertable Cardiac Monitor. Patients with the Reveal LINQ insertable cardiac monitor should avoid sources of diathermy, high sources of radiation, electrosurgical cautery, external defibrillation, lithotripsy, therapeutic ultrasound, and radiofrequency ablation to avoid electrical reset of the device, and/or inappropriate sensing as described in the Medical procedure and EMI precautions manual. MRI scans should be performed only in a specified MR environment under specified conditions as described in the Reveal LINQ MRI Technical Manual. Patient Assistant: Operation of the Patient Assistant near sources of electromagnetic interference, such as cellular phones, computer monitors, etc., may adversely affect the performance of this device. Potential Complications: Potential complications include, but are not limited to, device rejection phenomena (including local tissue reaction), device migration, infection, and erosion through the skin. See the device manual for detailed information regarding the implant procedure, indications, contraindications, warnings, precautions, and potential complications/adverse events. For further information, please call Medtronic at 1-800-328-2518 and/or consult the Medtronic website at medtronic.com.

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

Medtronic
710 Medtronic Parkway
Minneapolis, MN 55432-5804
USA

Toll-free in USA: 800.633.8766
Worldwide: +1.763.514.4000

medtronic.com
UC2019070015 EN ©2018 Medtronic
Minneapolis, MN. All Rights Reserved.
Printed in USA. 11/2018

Medtronic and the Medtronic logo are trademarks of Medtronic. ™ Third party brands are trademarks of their respective owners. All other brands are trademarks of a Medtronic company.
Now digitally enhanced, the latest edition of the AHA Journals’ Trend Watch is available online and includes content across the spectrum of cardiovascular and cerebrovascular disease. This issue of AHA Journals’ Trend Watch features a collection of top-trending articles published between April 2017 and March 2018, specifically those with high Altmetric scores. These articles—from across the entire AHA Journals’ portfolio—are generating buzz and have people talking on social media, in blogs, and in the news.

FREE ACCESS to 120 Full-Text Articles and 40+ Editorials

THE ISSUE IS ORGANIZED BY TOPIC TO MAKE FINDING RELEVANT CONTENT QUICK AND EASY!

- Heart Failure and Cardiomyopathies
- Cardiac Development, Structure, and Function
- Prevention Health and Wellness
- Epidemiology and Big Data
- Women and Special Populations
- Hypertension and Nephrology
- Dyslipidemia and Treatments
- Neuroscience and Stroke
- ATVB [Basic and Clinical]
- Electrophysiology and Arrhythmias
- Intervention
- Imaging and Nuclear Medicine
- Genetics and Genomics
- Critical and Emergency Care

www.ahajournals.org/trend-watch