American Stroke Association
International Stroke Conference
February 6-8 | Honolulu, Hawaii | strokeconference.org

STROKE NEWS

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THURSDAY | FEBRUARY 7, 2019

INSIDE 2019 ISC EXHIBITORS AND MAP PAGES 8-9

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, DO, PhD.


Demel

"When you find AFib, you typically put that person on anticoagulation to reduce stroke risk," said 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."

Science & Technology Hall hours
8:30 a.m.-3 p.m. Thursday

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

UPCOMING SESSION

Stroke in Women Throughout the Life Course: An International Perspective
7-8:30 a.m. Friday
Room 315

Atrial fibrillation is an important risk factor for stroke, especially in older adults. But the risk of stroke associated with AFib is significantly higher in women than in men.

see WOMEN, page 10

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-Garate, 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," said Huisa-Garate, 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."


Huisa-Garate

> "It is time for researchers to be aware of this connection and look into it in far more detail than has ever been done."
> Branko Huisa-Garte, MD

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

see KIDNEY, page 10

UPCOMING SESSION

Chronic Kidney Disease and Stroke
7-8:30 a.m. Friday
Kalakaua Ballroom A

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.


Zivin

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 TNK was effective in the same animal model.

see DEBATE, page 6

UPCOMING SESSION

The Justin A. Zivin Memorial Session: The Tried and Tested vs. the New Kid on the Block: The tPA vs. TNK Debate
8:45-10:15 a.m. Friday
Kalakaua Ballroom C

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.

Wright

UPCOMING SESSION

NIH Clinical and Applied Research Programs in Vascular Contributions to Cognitive Impairment and Dementia (VCID) (Joint Government Agency Session)
8:45-10:15 a.m. Friday
Room 316 BC

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. ■

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Experts to argue reperfusion injury in debate

New insights will be offered on an old subject during Friday's reperfusion injury debate.

Reperfusion injury was observed as far back as 1935. But the concept that restoring blood flow can damage tissue in hearts, brains or transplanted organs remains controversial.


Sharp

For most neurologists, reperfusion injury means ischemic tissue is worse off when reperfused than it would have been had the blood flow not been restored, said Frank Ray Sharp, MD, professor of neurology at the MIND Institute at the University of California-Davis in Sacramento.

Sharp will co-moderate the debate with Rajiv R. Ratan, MD, PhD, executive director of Burke Neurological Institute at Weill Cornell Medicine in White Plains, New York.

> "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. ■

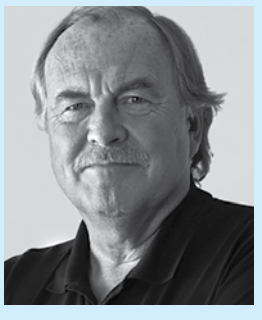
UPCOMING SESSION
Reperfusion Injury: Fact or Fiction? (Debate)
7-8:30 a.m. Friday
Room 316 BC

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"
> Ramesh Madhaven, MD, DM

Emerging telehealth technology is advancing expert, personalized stroke 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."


Hacke

Werner Hacke, MD, PhD, DDSc, honorary president of the European Stroke Organization and senior professor of neurology at Universität Heidelberg in Germany, will co-moderate the symposium that includes stroke telehealth practitioners from the United States, Brazil, Canada and Europe.

Madhavan, an adult neurology specialist at St. Joseph Mercy Oakland Neurology in Pontiac, Michigan, said stroke telehealth is a growing focus in multiple settings:

- In more developed areas, the technology can bring a consulting stroke specialist into the ambulance via cellphone or tablet.
- In less-populated areas, the same technologies can bring stroke experts to local medical centers that might not otherwise have access to specialized care.
- Phone-based stroke consultations can bring specialized pre- and post-hospital care and rehabilitation to community health centers or even into patients' homes.

Stroke telehealth, or teleneurology, includes videoconferencing for remote and direct patient care. Depending on the location, internet bandwidth and local technology, consults might be real-time, interactive discussions involving the patient and a local physician. If the bandwidth isn't sufficient to support real-time conversation, a store-and-forward model might be more appropriate, with data obtained, recorded and stored for review later.

Mobile health is also emerging, Madhavan said. Applications on smartphones and other personal devices can collect health information, provide personal health guidance and facilitate interactions with remote providers. The phone connects to an authenticated server to move data via a web portal or an electronic health record.

Multiple technology companies moving into telehealth can securely display, transmit and process various video and image formats and use videoconferencing to examine and evaluate stroke patients in real time. But bad connectivity that leads to poor audio or video can make it difficult to assess movement disorders.

"We also want to bring out some of the challenges practitioners are facing in providing teleneurology care," Madhavan said. "There are always questions about how providers are being reimbursed, the legal aspects of telehealth and just gaining acceptance in the wider stroke community. What is clear is that telehealth is growing as mobile technology expands and matures. That is a huge potential that we can tap to expand and improve stroke care almost anywhere in the world." ■

UPCOMING SESSION
AHA/ASA and World Stroke Organization Joint Symposium: "Stroke Telehealth: Controversies and Solutions"
8:45-10:15 a.m. Friday
Kalakaua Ballroom B

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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.


Bettger

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."

UPCOMING SESSION

Translating Evidence into Practice: Organizational, Behavioral and Community-Based Interventions and Future Directions in Learning Health Systems
4:15-5:15 p.m. Thursday
Kalakaua Ballroom A

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." ■

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/submitscience** on the applicable date above. Start planning now for the International Stroke Conference 2020, Feb. 19-21, at the Los Angeles Convention Center.

ISC 2019 ABSTRACT CATEGORIES

- Acute Endovascular Treatment
- Acute Neuroimaging
- Acute Nonendovascular Treatment
- Aneurysm
- Basic and Preclinical Neuroscience of Stroke Recovery
- Cerebral Large Artery Disease
- Clinical Rehabilitation and Recovery
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- Health Services, Quality Improvement and Patient-Centered Outcomes
- In-hospital Treatment
- Intracerebral Hemorrhage
- Nursing
- Pediatric Stroke
- Preventive Strategies
- SAH and Other Neurocritical Management
- Vascular Biology in Health and Disease
- Vascular Cognitive Impairment
- Vascular Malformations

DEBATE

continued from page 1

On the side of staying with tried and true rtPA — for now — will be:

- **James C. Grotta, MD**, director of stroke research at Memorial Hermann-Texas Medical Center in Houston
- **Christopher A. Lewandowski, MD,** a specialist in emergency medicine at Henry Ford Health System in Detroit

Those arguing that TNK is ready for prime time will be:

- **Mark Parsons, MD,** director of neurology at Royal Melbourne Hospital in Victoria, Australia
- **Shelagh B. Coutts, MD,** associate professor of neurology at the University of Calgary in Canada

Lyden said TNK can be recommended because it:

- Binds more avidly to the clot than rtPA because it was engineered to be fibrin-specific.
- Has a longer half-life and is easier to administer.
- Can be given in a single push, while rtPA requires a bolus followed by an hour-long infusion, attended by a bedside nurse. This is a huge advantage for patients needing to be transported to primary or comprehensive stroke centers.

> "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."
> 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," Lyden said. "But if we give TNK — boom! Drug is in. The patient can come by basic life support transport without any delay."

The debate is timely as centers are being recruited for TIMELESS, a large phase III trial of TNK versus rtPA.


Lyden

"There is an argument that we should skip the study and just go right to regulatory approval," Lyden said. "We hope the audience at this debate will see this is a critical study, that they volunteer to be in the study, they send patients to be in the study and get the study done as quickly as possible."

While Zivin would have supported speeding TNK along to market, he would have relished the debate, Lyden said. ■

ADDITIONAL READING

Check out Justin Zivin's *TPA for Stroke: The Story of a Controversial Drug* (2011. Oxford University Press). Co-written with science writer John Galbraith Simmons, this balanced and thoroughly researched book details the science and politics of testing tPA in stroke patients.

American Stroke Association.
International Stroke Conference

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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.

Please check the ISC 2019 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, 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.*

SCIENCE & TECHNOLOGY HALL HOURS | **Wednesday, Feb 6:** 8:30 a.m. – 3 p.m. | **Thursday, Feb 7:** 8:30 a.m. – 3 p.m.

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
Daniel F. Hanley, Johns Hopkins School of Medicine, Baltimore, Maryland

11:24 a.m.
Main Results of the Enhanced Control of Hypertension and Thrombolysis Stroke Study (enchanted) of the Early Intensive Blood Pressure Control After thrombolysis
Craig Anderson, The George Institute for Global Health, UNSW, Sydney, Australia

11:36 a.m.
Andexanet Alfa for Treatment of Factor Xa Inhibitor-related Acute Major Bleeding
Truman John Milling Jr., Seton Dell Medical School Stroke Institute, Austin, Texas

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
Amrou Sarraj, University of Texas Health Science Center, Houston, Texas

Closing Main Event

10:30 a.m.-12:30 p.m. Friday

Hall III

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

12:05
Intracerebral Hemorrhage Deferoxamine (iDEF) Trial: Main Results
Magdy H. Selim, Beth Israel Deaconess Medical Center, Boston, Massachussetts

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

Hearty Humor by Jonny Hawkins

"So, *that's* why they call you Mr. Big Shot!"

2019 ISC Exhibitors

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

CLAIM YOUR CME/CE CREDITS

You have two ways to complete your conference evaluation and claim your CME/CE credits for ISC 2019, pre-conference symposia and/or nursing symposium:

1. Go to the Communication Center in Registration in the Main Lobby, Level 1, in front of Hall II of the Hawaii Convention Center.
2. Visit **learn.heart.org** from any computer with internet connection.

CME/CE credit will not be available to claim for ISC 2019 after ***Aug. 8, 2019.***

International attendees may obtain an attendance verification form at one of the self-service terminals in Registration in the Main Lobby, Level 1, in front of Hall II of the Hawaii Convention Center.

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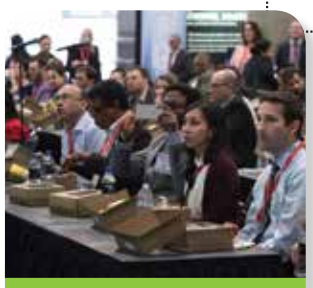
Science & Technology Hall (Hall II)



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.

AHA/ASA HeadQuarters

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

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

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- Cerenovus
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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.
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KIDNEY

continued from page 1

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."

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 circulatory 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. ■

Poster tours, sessions 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. ■

Professor-Led Poster Tours
5:30-6:30 p.m.
Posters TMP1-TMP120

1. Acute Endovascular Treatment Moderated Poster Tour II
2. Acute Nonendovascular Treatment Moderated Poster Tour
3. Basic and Preclinical Neuroscience of Stroke Recovery Moderated Poster Tour
4. Clinical Rehabilitation and Recovery Moderated Poster Tour
5. Community/Risk Factors Moderated Poster Tour II
6. Emergency Care/Systems Moderated Poster Tour
7. Health Services, Quality Improvement and Patient-Centered Outcomes Moderated Poster Tour II
8. In-hospital Treatment and Preventive Strategies Moderated Poster Tour
9. Vascular Biology in Health and Disease and Vascular Malformations Moderated Poster Tour
10. Vascular Cognitive Impairment Moderated Poster Tour

Regular Poster Sessions
6:30-7 p.m.
Posters TP1-TP589
These posters are not included in the 5:30 p.m. Professor-Led Poster Tours.

- Acute Endovascular Treatment Posters II
- Acute Neuroimaging Posters II
- Acute Nonendovascular Treatment Posters II
- Basic and Preclinical Neuroscience of Stroke Recovery Posters II
- Cerebral Large Artery Disease Posters II
- Clinical Rehabilitation and Recovery Posters II
- Community/Risk Factors Posters II
- Diagnosis of Stroke Etiology Posters II
- Emergency Care/Systems Posters II
- Experimental Mechanisms and Models Posters II
- Health Services, Quality Improvement and Patient-Centered Outcomes Posters II
- In-hospital Treatment Posters II
- Intracerebral Hemorrhage Posters II
- Nursing Posters II
- Ongoing Clinical Trials Posters II
- Pediatric Stroke Posters II
- Preventive Strategies Posters II
- SAH and Other Neurocritical Management Posters II
- Vascular Cognitive Impairment Posters II
- Vascular Malformations Posters II

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

WOMEN

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Several risk factors are unique to women throughout the lifespan, Demel said. They include endogenous hormonal differences, issues related to pregnancy, hormonal birth control and hormone replacement therapy.

Pregnancy is an important factor that's not often acknowledged, Demel said. Women who have gestational hypertension or gestational diabetes, among other problems, are also much more likely to develop chronic forms of these same conditions later in life.

"We should be asking questions of our women patients about having had these conditions during pregnancy," Demel said. "If they did, they should be screened much more aggressively because these gestational issues can come back as increased risk for stroke."

> "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

Men dominate stroke events at younger ages, but the incidence among women increase during the peri- and post-menopausal years. By age 80, women account for a majority of strokes, primarily driven by differences in lifespan.

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. ■

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[1] Sanders P, Pürerfellner H, Pokushalov E, et al. Performance of a new atrial fibrillation detection algorithm in a miniaturized insertable cardiac monitor: Results from the Reveal LINQ Usability Study. *Heart Rhythm*. July 2016;13(7):1425-1430.

[2] Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation: a major contributor to stroke in the elderly. The Framingham Study. *Arch Intern Med*. September 1987;147(9):1561-1564.

[3] Stroke Prevention in Atrial Fibrillation Study. Final results. *Circulation*. August 1991;84(2):527-539.

[4] Reference the Reveal LINQ™ ICM Clinician Manual for usage parameters.

[5] Sanna T, Diener HC, Passman RS, et al. Cryptogenic stroke and underlying atrial fibrillation. *N Engl J Med*. June 26, 2014;370(26):2478-2486.

Brief Statement: Reveal LINQ™ LNQ11 Insertable Cardiac Monitor and Patient Assistant Indications: Reveal LINQ LNQ11 Insertable Cardiac Monitor. The Reveal LINQ insertable cardiac monitor is an implantable patient-activated and automatically-activated monitoring system that records subcutaneous ECG and is indicated in the following cases ▪ Patients with clinical syndromes or situations at increased risk of cardiac arrhythmias ▪ Patients who experience transient symptoms such as dizziness, palpitation, syncope, and chest pain, that may suggest a cardiac arrhythmia. This device has not been specifically tested for pediatric use. **Patient Assistant:** The Patient Assistant is intended for unsupervised patient use away from a hospital or clinic. The Patient Assistant activates the data management feature in the Reveal™ insertable cardiac monitor to initiate recording of cardiac event data in the implanted device memory. **Contraindications:** There are no known contraindications for the implant of the Reveal LINQ insertable cardiac monitor. However, the patient's particular medical condition may dictate whether or not a subcutaneous, chronically implanted device can be tolerated.

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.

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