STROKE MATTERS

Fall/Winter 2025

Minnesota Stroke Association

TIME is BRAIN

and

An Interview with Dr. Sheth

Minnesota Brain Injury Alliance
Minnesota Stroke Association
2277 Highway 36 West, Suite 200
Roseville, MN 55113-3830

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Letter from the Chief Executive Officer

By David King

Minnesota Stroke Association

Dear *Stroke Matters* readers,

It is with both pride and more than a little disbelief that I share the news: in 2026 I will be stepping down as CEO of the Minnesota Stroke Association.

When I started with the Minnesota Brain Injury Alliance in 2008, I had no idea that in two years I would be taking on the leadership of an additional organization, but I can say that the 2010 merger of our two communities changed me for the better.

That merger allowed us to unite our missions and build a stronger, more complete source of support for Minnesotans affected by stroke and brain injury. It expanded the knowledge and outlook of our staff and opened new doors to outreach and collaboration. It remains one of the decisions I am proudest to have overseen.

But now, after 17 years, it's time to hand this pen (and, more importantly, my office key) to my friend and partner-in-all-things-brain-related, Bradley Donaldson. Brad has been here even longer than I have; he started in 1999, as one of five staff members, and he's been waiting patiently ever since for me to get out of the way. So without further ado, I'll let him take it from here.

– David King

Thank you, David. (And, to be honest, I made a copy of your office key years ago.)

I am deeply honored to step into the role of CEO. When I joined the Alliance in March 1999, I was the fifth staff member in a tiny office in St. Anthony Main. Today, I get to work alongside more than 80 colleagues whose dedication continues to inspire me. Over the years I've served under three leaders – Tom Gode, Ardis Sandstrom, and David King – and if I've learned anything from them, it's that this work is never dull, always meaningful, and best done with an eye on the people we serve.

What excites me most is carrying forward our mission for the stroke and brain injury communities. Of course, the challenges will be many, but so will the victories. Twenty-six years of experience has taught me that we will always keep finding new ways to serve, to advocate, and even rise in the face of adversity.

I look forward to taking the next steps of this journey with all of you (though I can't promise I'll be as eloquent as David. He's always been the wordsmith).

–Bradley Donaldson

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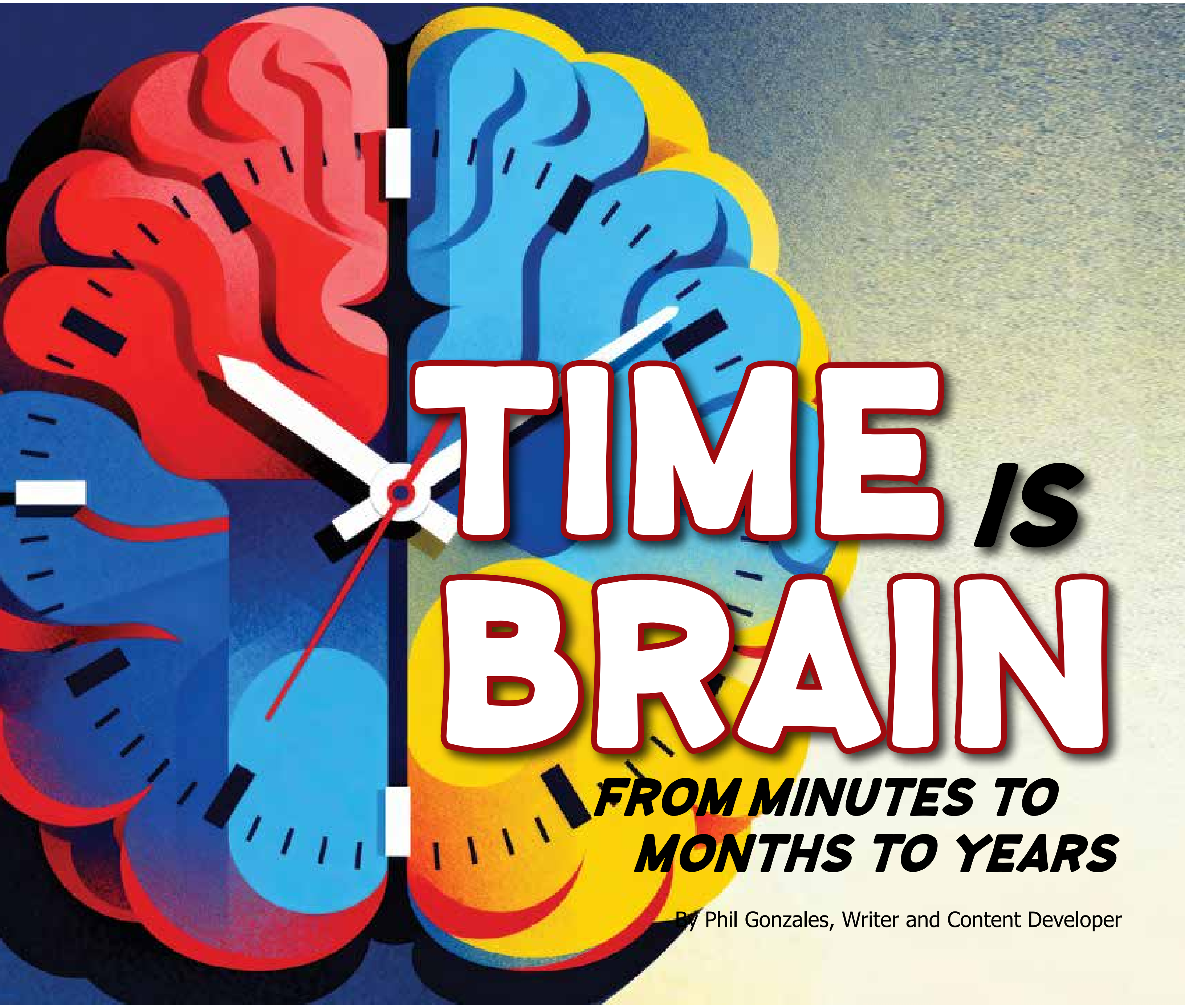

TIME IS BRAIN

FROM MINUTES TO MONTHS TO YEARS

By Phil Gonzales, Writer and Content Developer

In the past, stroke survival and recovery has felt like a roll of the dice. Whether you'd be diagnosed on time, receive appropriate treatment in a timely manner, or have access to specialized rehabilitation was a matter of chance, circumstance, and geography. It was a gamble where the stakes were immense.

Following the onset of a stroke, human brain cells deteriorate and die at the staggering rate of 1.9 million per minute. This rapid deterioration is why, in stroke literature and public health messaging, the phrase "Time is Brain" crops up so often. This isn't just a slogan; it's the reality of stroke care. Each passing minute literally equals brain loss. Each passing minute compounds recovery time. The sooner a stroke is recognized and treated, the better the chances of preserving brain health.

Thankfully, stroke research is constantly closing the time gap between onset and intervention. Recent advances in diagnostics, treatments, and rehabilitation have quantifiably improved the outlook for stroke survivors. We also have developed tools to improve recovery not just in the first few hours, but months and even years later. Together, these advances have created a roadmap for modern stroke care and largely taken luck out of the equation, transforming a gamble into a process designed to bring a greater degree of control and certainty to stroke outcomes.

1–24
The First Hour to Twenty-Four Hours

The FAST or BE-FAST scales are vital pre-hospital tools that help a person experiencing a stroke, as well as bystanders and emergency responders, identify symptoms: facial droop, arm weakness, speech difficulty? Time to call emergency services. Mobile Stroke Units (MSUs), essentially ambulances equipped with portable CT scanners and telemedicine links, can confirm diagnosis in the field and even begin treatment. Studies show MSUs can reduce transfer times by 25 percent and double the rate of timely clot-busting treatment, particularly in rural areas where distance to hospitals is often a factor.

Rapid Hospital Assessment

On arrival at the hospital, patients typically undergo a non-contrast CT scan to rule out bleeding, followed by CT angiography or perfusion imaging to assess blood flow and tissue viability. Specialized AI models, trained on thousands of brain scans, now help speed this process by automatically identifying blocked vessels and estimating how much brain tissue can still be saved and reducing transfer rates by up to 102 minutes.

Blood-based biomarkers are emerging as powerful tools to complement imaging. This is a game-changer because brain scans can sometimes be delayed. For example, a test for a protein called GFAP can quickly tell doctors if the stroke is caused by a burst blood vessel (a hemorrhagic stroke). This is critical because if there's no bleeding, they can safely give powerful clot-busting drugs to treat a clot-based stroke (an ischemic stroke).

Another test for a protein called BNP can point to a heart-related cause, like atrial fibrillation or irregular heartbeat. This helps doctors choose the right medication, like long-term anticoagulants, to prevent future strokes.

Expanding Treatment Windows

For decades, the only drug that could treat a clot-based stroke was alteplase, which had to be given within 4.5 hours of stroke onset and as an injection followed by an hour of intravenous infusion. Now, a faster, easier option is available: tenecteplase (sometimes seen by its commercial name, TNKase), a single, 5-second injection that's been proven just as effective and closes the window between administering medication and beginning therapy.

For the most serious strokes, doctors can now perform mechanical thrombectomy, a procedure that physically removes large clots from the brain's arteries. Thanks to advanced imaging, this is possible even up to 24 hours after a stroke starts. This technology helps doctors identify at-risk brain tissue in the "ischemic penumbra" that can still be saved, which is a game-changer for people who arrive at the hospital after the initial treatment window.

Protecting the Brain

While thrombectomy and clot-busting drugs focus on reopening arteries, new research is also exploring how to protect the brain from a stroke's damaging effects.

A drug called CIRARA has shown remarkable results in clinical trials, dramatically cutting the death rate from large strokes from 31 to just 5.6 percent. Another drug, Sanbexin, works by fighting damage and reducing inflammation to protect brain cells. Early research is also showing promise for other experimental drugs, such as P2X4 receptor inhibitors, that work by calming a specific part of the brain's immune response that can cause additional harm after a stroke.

Early Rehabilitation

In the days and weeks following a stroke, the brain is most receptive to forming new connections. This is a critical and sensitive window of opportunity. So, within 24 hours of treatment, rehabilitation begins.

Early rehabilitation helps to maximize plasticity to help healthy parts of the brain take over the functions of damaged areas. Also, without early therapy, patients might not use their affected limbs. The brain then "learns" to stop using those pathways, making it much harder to regain function later on. Early therapies help prevent this "Learned Non-Use". Finally, early mobility can prevent problems like blood clots, muscle atrophy, and joint stiffness. In short, early rehabilitation is a race against time to harness the brain's natural healing ability before that critical window of opportunity closes.

All of these advancements, from pre-hospital diagnosis to new therapies, are part of a coordinated effort to save as much of the brain as possible. The goal is to move beyond the traditional limits of time and treatment, replacing the uncertainty of the past with a rapid, effective system of care.

WEEKS to MONTHS

Intensive Recovery

Intensive Rehabilitation

From one week to three months after a stroke, the intensity of therapy significantly increases. During this period, rehabilitation programs become more personalized, often involving hundreds of daily repetitions of specific functional movements. This intense practice helps the brain re-establish the neural pathways needed to restore mobility and coordination.

To enhance patient engagement and speed up recovery, new technologies are being studied. Virtual reality can immerse patients in simulated environments, making repetitive exercises more engaging. Brain-computer interfaces (BCIs) offer a promising new frontier by allowing patients to use their thoughts to control a computer or a robotic arm, directly stimulating brain activity and improving motor function.

This kind of advanced research is happening at specialized neurorehabilitation labs at institutions like the University of Southern California and Washington University School of Medicine, where doctors, physical therapists, and engineers are working together on the future of stroke recovery.

Expanding Access to Rehab

For the 1.5 million Minnesotans living in rural areas, access to this vital care is a major challenge. Rural residents have higher rates of stroke and often face longer distances to specialized rehabilitation centers. To address this, new technologies like telerehabilitation are being used. Research conducted at Minneapolis Veterans Affairs Health Care System, has explored the feasibility of using telerehabilitation to deliver services like, physical therapy to older adults in the state. This allows patients to receive therapy remotely via video, helping them restore function and prevent long-term disability regardless of their location. The Minnesota Department of Health also recognizes the value of telehealth, which includes telerehabilitation, and a recent MDH study found that it continues to be a beneficial tool for increasing access to care, particularly for those in Greater Minnesota.

LONG-TERM

Recovery

Even years after a stroke, recovery is possible. For decades, it was widely believed that most gains in function stopped after a few months, hitting a "recovery plateau." Today, we know this is a myth. The brain's ability to rewire and retrain itself continues throughout a person's life, meaning that with ongoing therapy and dedicated practice, a patient can continue to see improvement.

Beyond traditional therapies, new and experimental treatments are also driving a new era of long-term recovery. One of the most notable device-based breakthroughs is the Vivistim Paired VNS™ System, an FDA-approved implant that stimulates the vagus nerve during therapy. This stimulation sends a signal to the brain that can boost the release of brain-healing chemicals. When this happens at the same time a patient is doing a physical therapy exercise, it helps the brain create and strengthen the new neural connections needed to regain function in a damaged arm or hand. In clinical studies, patients using Vivistim doubled their recovery of hand and arm function compared to therapy alone.

Mesenchymal stem cell (MSC) therapy represents another frontier in recovery. When infused into the body, these special cells can release healing proteins that help repair the brain. In early clinical trials, MSC therapy has shown promise, leading to significant improvements in patients' motor skills and ability to perform daily activities. While these technologies are still being refined, they offer hope for a future of more robust stroke recovery.

EQUITY AND Access

Unfortunately, not everyone has equal access to these cutting-edge advancements. Geographic location, in particular, creates significant challenges. Rural and underserved areas often lack the specialized staff and equipment of major medical centers, contributing to higher stroke mortality rates compared to urban areas.

Bridging the Gap

To combat these disparities, healthcare systems are using new strategies to extend advanced care to remote communities. As mentioned earlier Mobile Stroke Units (MSUs) bring a CT scanner and a stroke team directly to the patient's location, allowing for rapid diagnosis and treatment even before they reach a hospital. Tele-stroke programs use video-conferencing to connect rural emergency departments with stroke specialists at a distant medical center. This enables a neurologist to remotely assess a patient's scans and symptoms, helping local doctors make time-sensitive decisions about clot-busting drugs or transfers.

"Hub-and-spoke" hospital networks formalize this process. The "hub", a large, specialized stroke center, partners with "spokes", smaller, local hospitals. If a patient at a spoke hospital needs a more advanced procedure, like a mechanical thrombectomy, they can be quickly transferred to the hub. Studies show these integrated systems can increase access to thrombectomy by as much as 40 percent in some regions and have significantly narrowed treatment gaps between urban and rural populations.

INTO THE Future

Stroke care is no longer a gamble or a race against a few hours. With modern tools, we can improve outcomes from the first minute to many years post-stroke. The integration of acute, rehabilitative, and regenerative therapies offers hope for fuller recovery, provided we ensure these innovations reach every patient who needs them.

That's precisely what the Minnesota Stroke Association is committed to doing. Through our Resource Facilitation program, we help bridge the gap by connecting patients and families with the therapies, support groups, and resources they need to continue their recovery journey, regardless of where they live. SM

For more information about the Minnesota Stroke Association and our services, visit strokemn.org or call 763-553-0088.

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Life and Hope After Stroke

Minnesota woman shares her inspiring story of stroke rehabilitation, recovery

On August 10, 2024, Mindy Tosel-Waddell knew something just wasn't right. She and her husband had been with friends who'd been exposed to COVID recently, so she assumed the dizziness and heaviness in her chest was either a flu bug or another virus. But when she ended up on the floor from her lack of balance, she decided she needed to go to the hospital.

Mindy says she remembers fainting while being admitted to the ER and remembers being told she needed to have emergency heart surgery, but she remembers little more after that until she woke up nearly a month later in the hospital.

Mindy had experienced a sudden coronary artery dissection, which caused a very serious kind of heart attack that occurs when an artery wall suddenly tears. During her open heart surgery, Mindy experienced several strokes and seizures, which caused severe damage to her brain. Her medical team put her into an induced coma. The situation was grim. So grim that the family was faced with the decision to take her off of life support and was working on pulling together her obituary.

"I'm basically a miracle," Mindy says.

When she finally awoke in early September, Mindy says it was "like a ball of yarn kept unraveling." She learned about her strokes and learned that she would have a long road to recovery before her. She was transferred to an inpatient rehabilitation facility, where she received intensive occupational, physical and speech therapy to "hit the ground running" with her stroke recovery.

Stroke can happen to anyone, at any age. But there is life – and hope – after stroke. Rehabilitation can build strength, capability and confidence. It can also help someone who experiences a stroke continue daily activities, despite the effects of their stroke.

There are more than 7 million stroke survivors living in the U.S. today. But not all strokes – and not all stroke survivors – are the same. Finding the right rehabilitation plan is vital to recovery after stroke. The American Stroke Association has developed standards to help rehabilitation facilities provide consistent, high-quality care for individuals as they recover from stroke.

Facilities that have agreed to participate in the Association's post-acute stroke standards program agree to follow the Association's treatment guidelines and have made a commitment to providing care that is based on standards aligned with

Rehabilitation is key to recovery after stroke. It helps you relearn or change how you live.

Choosing the Right Setting

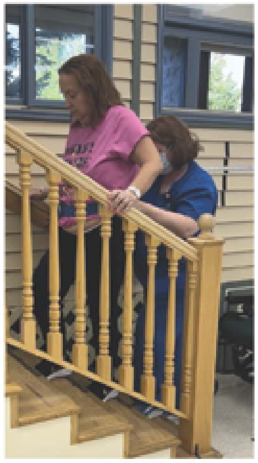
You can rehab at:

- Inpatient rehabilitation facility
- Skilled nursing facility
- Long-term care facility
- Long-term acute care hospital
- Home-based or outpatient care

Your needs determine which type(s) are best for you. The American Heart Association and American Stroke Association recommends inpatient rehabilitation facility care if you can tolerate at least three hours each day of stroke rehabilitation.

Stroke Rehab Should Include:

- Training to improve mobility and ability to do daily tasks
- Individually tailored post-stroke exercise program
- Access to cognitive/engagement activities (books, games, computer)
- Speech therapy, if stroke caused difficulty speaking
- Eye exercises, if stroke caused loss of vision
- Balance training for those with poor balance or fall risk



American Stroke Association science and vetted by stroke rehabilitation experts.

Mindy's rehabilitation included stays at two Courage Kenny inpatient rehabilitation facilities and was customized to her individual needs. According to Mindy, the program was very disciplined and included back-to-back rehabilitation sessions throughout the day, with the goal of maximizing her recovery in the first 6 months after her stroke.

"I had to learn how to get dressed, how to eat, how to be mobile and walk," Mindy says.

In addition, therapists spent time helping her husband learn more about his new role as her caregiver and what needed to happen to ensure Mindy's home was ready for her to return, including installing ramps in the house to make it easier for her to get around.

Mindy turned 55 in early September and celebrated one year of recovery after her heart attack and strokes. She says that today she is about 85-90% back to being herself. She credits the village behind her, including her family and close friends and the specialists involved in her rehabilitation, for helping her recover. She also is an active participant in several stroke support groups that she attends with her husband.

"They helped me so much," she says. "Sometimes when I miss the stroke support group, I feel almost lost. I need that as a little kick – you hear other stories of what other caregivers and survivors have gone through. It's a time of sharing and it boosts you a little bit."

Congratulations to the following Minnesota facilities who have joined the American Heart Association and American Stroke Association's post-acute stroke care initiative.

These providers have agreed to follow the Association's treatment guidelines and have made a commitment to providing care that is based on standards aligned with American Stroke Association science and vetted by stroke rehabilitation experts:

- Appleton Area Health (Appleton)
- CentraCare-St. Cloud Hospital (St. Cloud)
- Community Memorial Hospital Association (Cloquet)
- Courage Kenny Rehabilitation Institute (St. Paul)
- Courage Kenny Rehabilitation Associates (Minneapolis)
- Courage Kenny Rehabilitation Institute TRP (Golden Valley)
- Glencoe Regional Health Services (Glencoe)
- Glenfields Living with Care (Glencoe)
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Imagine a Minnesota where everyone understands the impact stroke can have – not only on individuals but on families, friends, and communities.

A Minnesota where every person affected by stroke has access to the resources they need to rebuild their lives, step by step.

A Minnesota where everyone recognizes the intrinsic value of all people living with stroke.

This is the vision the Minnesota Stroke Association works toward every day; but we can't do it without you.

The Minnesota Stroke Association has expanded its services to reach more Minnesotans than ever before. Through online resources, remote support, and innovative educational tools, we've made sure that no matter where someone lives or what challenges they face, they have access to the care, knowledge and guidance they need. But we still have a long way to go, and your involvement is crucial to keeping these life-changing services accessible and available to those who need them.

As demand for our services increases, so do the costs of maintaining and expanding these vital resources. We are determined to continue being there for every Minnesotan affected by stroke – but we need your help to make that happen.

A gift of $50, $100, $250, or whatever feels meaningful to you can make a world of difference. Your contribution ensures that our advocacy efforts, educational programs, and volunteer training continue to reach communities across the state. With your support, we can empower individuals to navigate the challenges of stroke recovery with confidence.

Now is the time to take action.

Your generosity today helps us build a future where no one faces stroke alone. Please donate to the Minnesota Stroke Association at strokenm.org/donate, or scan the code above or call 763-553-0088.

Your support truly changes lives.

An Interview with Dr. Sheth

This year's Statewide Stroke Conference welcomes Dr. Kevin N. Sheth, Director of the Yale Center for Brain & Mind Health and Vice Chair for Clinical and Translational Research at Yale School of Medicine. A leading voice in stroke and neurocritical care, Dr. Sheth is dedicated to bridging the gap between groundbreaking research and day-to-day patient care. His keynote and breakout sessions will explore both the science and humanity of treating brain hemorrhage, with an emphasis on prevention, recovery, and long-term quality of life.

We sat down with Dr. Sheth ahead of the conference to hear his insights on brain hemorrhage care, recovery, and what the future holds for stroke treatment.

This interview has been edited for length and clarity.

By Phil Gonzales, Writer and Content Developer

Q: What excites you most about speaking to Minnesota's stroke care community right now?

Dr. Sheth: First of all, I'm really looking forward to being there. I feel honored to deliver the keynote. I know members of the community and colleagues in Minnesota, and from what I've seen, even as something of an outsider, it's such a vibrant, multidisciplinary group. Everyone is really committed to tackling one of the leading causes of morbidity and mortality in the U.S. and the world.

As important as stroke is as an individual and public health problem, there are things happening right now that could genuinely change the trajectory for patients in the future. That's exciting. And if you look just a layer deeper, one of the topics I've been asked to talk about is brain hemorrhage.

We often divide strokes into ischemic and hemorrhagic. Ischemic strokes, caused by a clot blocking blood flow, make up about 80 to 85 percent of cases. But hemorrhagic strokes, or brain hemorrhage, are the other 15 percent. That still translates to over 100,000 people every year in the U.S. And brain hemorrhage is the deadliest form of stroke, with the highest mortality rate. For decades, even for neurologists, there was a very nihilistic, almost fatalistic view of what could be done.

That's been changing. Over the past 10 to 15 years, we've seen improvements thanks to organized systems of care, comprehensive stroke centers, better prevention, and advances in treatments like surgery and blood pressure management. Stroke is still a top-five cause of death in the U.S., but if we want to keep making gains, we have to address brain hemorrhage. We're finally starting to make a dent, and I think we're on the edge of doing more.

Q: You've described brain hemorrhage as both a challenge and an opportunity. What do you mean by that?

Dr. Sheth: I would say there are two big opportunities.

The first is this shift from nihilism to treatment. And I don't mean false hope, but real hope; hope that's backed by science and emerging evidence. That's an exciting place to be.

The second opportunity applies not just to brain hemorrhage, but to stroke in general. Think about what happens when someone comes to the hospital with a stroke. Beforehand, they may have had medical challenges like high blood pressure, diet issues, and other risk factors. But once they're admitted, the stadium lights are suddenly all on them. There are doctors, nurses, therapists, the entire system focused on them in that moment.

Then they leave the hospital. The lights go off. They go back into the same environment that wasn't great in the first place, only now they're dealing with the added disability of a stroke. So you can imagine two different roads: either they slip back into the same risk-filled situation, or we use that moment as a reset, extend the support, and help them move in a new direction.

So in a half-cheeky way, having a stroke can be an opportunity. It's a chance to rally support, to rethink care, and to prevent further damage. The question is: do the patient, their family, and the medical community seize that opportunity, or do we let it slip away?

Q: How do you balance aggressive medical management with supporting survivors' hope and quality of life?

Dr. Sheth: First, it begins with mindset. If you don't believe things can get better, they won't. Remember that phrase, "where there's life, there's hope." Not false hope, but true hope.

Second, we need to face the stigma of disability head-on. Surviving a brain hemorrhage almost always means living with disability. And yet, motivated by empathy, the medical community often pulls back. We think, let's give them space, they have a lot going on. But that's exactly the moment we should be leaning in.

That means making it easier to come back to the clinic, expanding telehealth and digital tools, and taking risk factors seriously. High blood pressure, diet, physical activity--these aren't "small" concerns after a hemorrhage, they're even more important than before.

Right now, too many survivors fall into what I call a black hole. Neurologists step back, primary care or cardiology is supposed to pick up the risk factors, but coordination breaks down. And patients fall through the cracks. What we need is someone playing quarterback, owning those risk factors, coordinating care, and making life just a little easier for patients and families.

The science shows this improves outcomes. We can look at this as glass half empty or half full. It is both. But it doesn't have to be fatalistic. It depends on what we choose to do as communities.

Q: Looking ahead, what gives you the most optimism about the future of stroke care?

Dr. Sheth: Two things. One is the American Heart Association's Hemorrhagic Stroke Initiative [see sidebar]. For decades they've been leaders in stroke broadly, but only in the past five to ten years have they really invested in brain hemorrhage. We thought a couple hundred hospitals might sign up. Within a year, it was closer to 700. And it wasn't just neurologists, it was whole teams: emergency physicians, nurses, therapists. That interdisciplinary response has been remarkable.

The second is the energy of young researchers and clinicians. The brightest minds, neurologists, neurosurgeons, emergency physicians, are choosing this field because they see the chance to make a real difference. Their passion inspires me and gives me great optimism.

Q: If you could leave our readers with one message about the future of stroke care, what would it be?

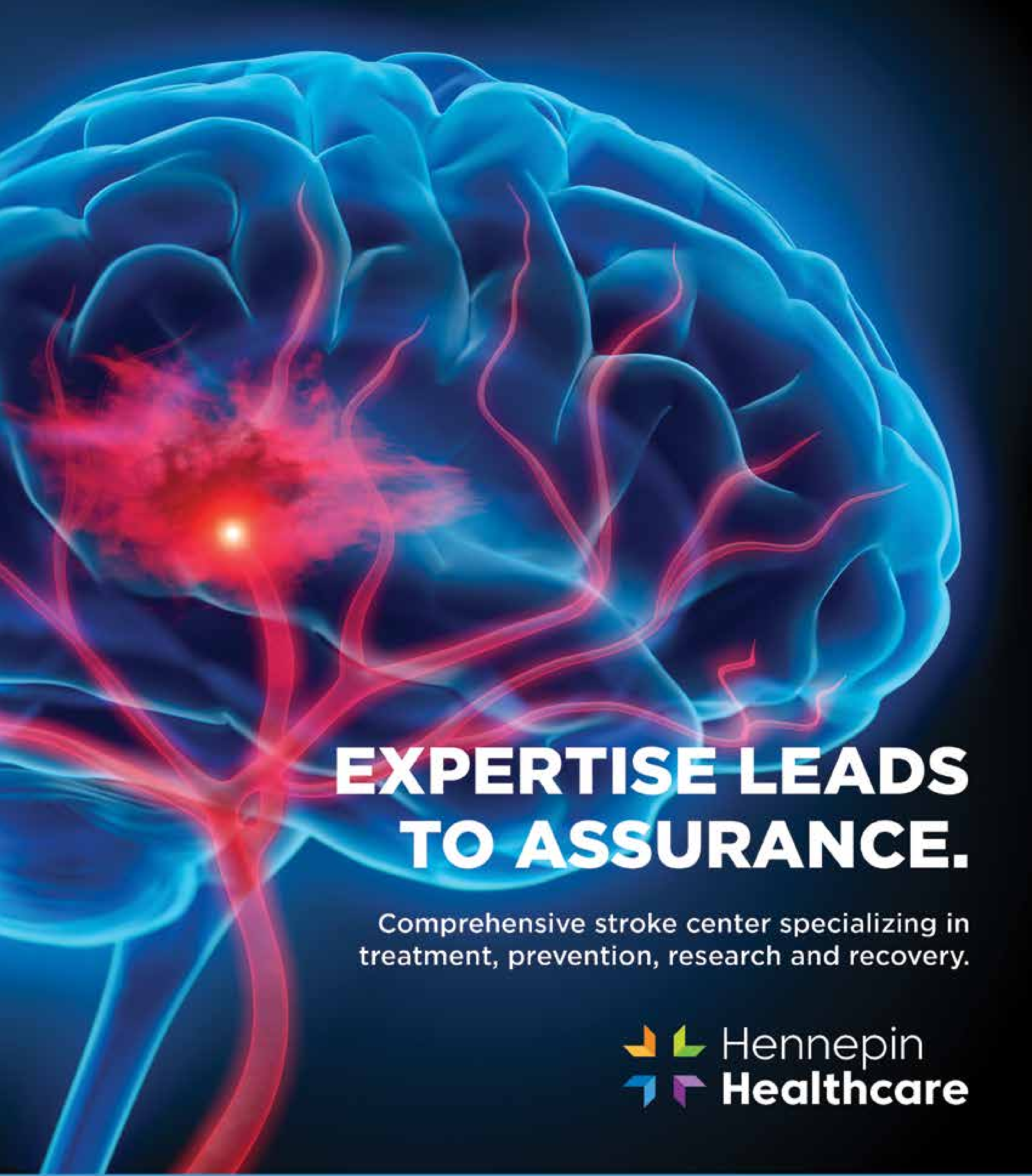
Dr. Sheth: That it's not fatalistic, it's deterministic. Outcomes depend on what we do: how we coordinate care, how we support survivors, and how our communities respond. There's real reason for hope. SM

AHA's Hemorrhagic Stroke Initiative

The American Heart Association is expanding its focus on intracerebral hemorrhage (ICH), the deadliest type of stroke. In 2023, it added an ICH measure set to its Get With The Guidelines–Stroke program, allowing hospitals to track and improve ICH care at no cost. ***Over 300 hospitals enrolled within the first week.***

Looking ahead, a new national surgical initiative (2025–2027) will engage 15 hospitals in testing minimally invasive techniques to improve recovery. Together, these efforts signal growing national momentum to change outcomes in hemorrhagic stroke care.

For more information, visit https://www.heart.org/en/professional/quality-improvement/hemorrhagic-stroke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Acknowledgements of donations received April 1 through September 30, 2025

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UPCOMING EVENTS 2025/26

STROKE CONFERENCE

November 6, 2025

Heritage Center of Brooklyn Center

BRAIN INJURY ANNUAL CONFERENCE

April 23, 2026

Heritage Center, Brooklyn Center

STRIDES FOR STROKES

May 16, 2026

Duluth, Saint Cloud, and Twin Cities

Visit these websites for more information on the above events.

Minnesota Brain Injury Alliance braininjurymn.org/events

Minnesota Stroke Association strokemn.org/events