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Comprehensive Stroke Center at Crouse Health: **SPEED SAVES LIVES**



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SPEED SAVES LIVES

Comprehensive Stroke Center at Crouse Health Outpaces Targets for Stroke Rescue Treatments and Improves Patient Outcomes



(from left to right) David Padalino, MD-Medical Director, CMP Neurosciences, Elena Gabriel, Radiologic Technologist Team Leader, Jorge Eller, MD, Bri Tonzi, Radiologic Technologist, Evan Belanger, DNP - Director of Neurosciences, Intensive Care, Kaitlyn LaChance MSN, RN, Jason Phelps BSN, RN, SCRN Clinical Supervisor, Alex Maksymiw, Radiologic Technologist, Patrick Ogar, Radiologic Technologist, Angela Horan, RN Julia Galipeau, Radiologic Technologist

By Becca Taurisano

In the United States, someone has a stroke every 40 seconds. Stroke is a sudden interruption in blood flow to the brain caused either by a blocked blood vessel (ischemic stroke) or a burst blood vessel (hemorrhagic stroke). Even a decade ago, there was not much that could be done to help stroke patients, but now stroke is a potentially treatable condition, allowing stroke teams to reverse symptoms, preventing disability and death. By utilizing stroke rescue therapies like intravenous thrombolytics and mechanical thrombectomies, the stroke care team at Crouse Health's Comprehensive Stroke Center is

preserving brain function and saving lives with the fastest response times in the region. "Crouse continues to maintain the highest level of stroke program quality, for which it has achieved national recognition," said Crouse President and CEO Seth Kronenberg, MD. "We consistently achieve extraordinary outcomes by actively seeking the engagement of our high-caliber medical team and staff, all of whom are dedicated to the Neurosciences service line and the overall patient experience."

There is a saying in the field of Neurosciences: Time is Brain. "Stroke

care is perhaps the most time-sensitive field of medicine there is," said Jorge Eller, MD, Crouse Health Neurosurgery. "The quicker people are connected to a health system that is used to dealing with strokes, the quicker they can get proper medical attention and hopefully recover with very few deficits." The advances that have occurred in the field of stroke care in recent years are impactful. "Due to improvements in technology, interventional techniques, and equipment as well as increased awareness, the morbidity of stroke has begun reducing," said Raghu Ramaswamy, MBBS, Crouse Health Neurology. "I



Elena Gabriel, Radiologic Technologist Team Leader, Jason Phelps BSN, RN Clinical Supervisor, Evan Belanger, DNP - Director of Neurosciences, Intensive Care, Jorge Eller, MD

“Crouse continues to maintain the highest level of stroke program quality, for which it has achieved national recognition,”

Seth Kronenberg, MD.
Crouse President and CEO

have seen many of my patients who were carried into Crouse after having a stroke, walk back into my clinic a few weeks or months later.”

Recognizing the symptoms of stroke can be challenging, but the most important cues to look for can be summed up with the acronym FAST: Face - facial drooping or asymmetry; Arm - arm weakness, especially on one side; Speech - difficulty speaking or understanding speech; and Time - note the onset of symptoms and seek emergency help immediately. If a patient experiences any of these symptoms, they should not wait to see if they feel better or sleep it off, but should immediately call 9-1-1. By keeping blood pressure under control, taking blood thinners for atrial fibrillation or hypercoagulable issues, not smoking, and maintaining a healthy lifestyle through diet and exercise, people can prevent strokes, but genetics can play a part as well.

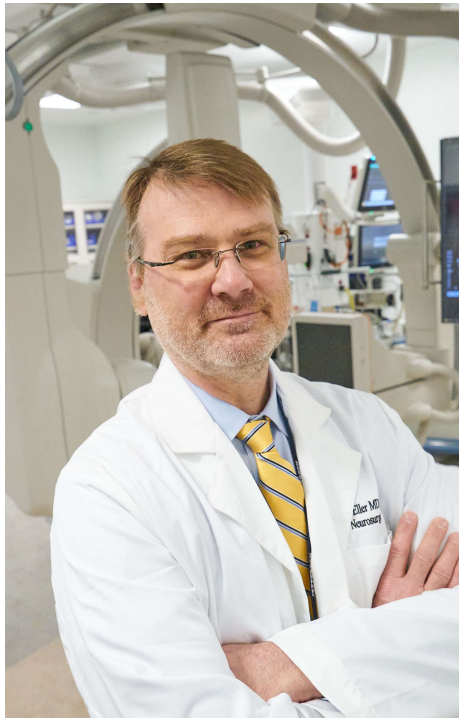
When an individual arrives at Crouse Health’s Emergency Department

as a stroke patient, a stroke alert is activated and the entire stroke team is notified. Obtaining brain imaging is the first step. A CT Scan is completed to essentially rule out the possibility of a brain hemorrhage. Once that has been ruled out, CT angiogram and CT perfusion are the gold standard imaging modalities to determine what parts of the brain are potentially affected by an ischemic stroke and how much brain tissue is salvageable. When a stroke occurs, there is a part of the brain that is irreversibly damaged called the ischemic core. The area around the core where the blood supply is compromised but has not yet caused death of tissue is called the penumbra. The bigger the area of penumbra, the more successful a stroke rescue effort could potentially be.

“An ischemic stroke is essentially a permanent central nervous injury that results in a loss of some brain function,” said David Padalino, MD, Director of Neurosurgery Education



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Jorge Eller, MD

for Crouse Neurosciences. The mission of the stroke care team is to limit the damage as much as possible. At Crouse Health, a neuroscience advanced practice provider is on site around the clock so that patients are seen within minutes of arrival. The provider can begin prepping the patient if it is determined that they are a candidate for one or both kinds of stroke rescue therapies offered at Crouse Health: intravenous thrombolytics or mechanical thrombectomy.

Intravenous Thrombolytics or “Clot-Busters”

According to Sami Abdul Malak, MD, Chief of Neurology at Crouse Health, the advent of intravenous (IV) thrombolytics or “clot-busting” medications (tPA or TNK) in the mid-1990s was revolutionary in the treatment of ischemic stroke in restoring blood flow to the penumbra. “The purpose of the thrombolytic is to try to dissolve the clot and open the vessel that has been occluded, which leads to the part of the brain that has been damaged,” said Dr. Malak.

Not everyone is a candidate for IV thrombolytics, however. If more than

“All of these fields have to work together like instruments in an orchestra,” said Dr. Eller. “It is a very concerted effort that has to happen continuously and we have to continue to perform at that pace time and time again.”

4.5 hours have passed since they were last at their baseline function, a patient may not be a candidate for IV thrombolytic. Brain bleeding seen on the initial CT scan, a patient’s history of bleeding, being on blood thinners, or a large area of irreversible damage or core are all contraindications for administering thrombolytics.

Mechanical Thrombectomy

Mechanical thrombectomy is the other stroke rescue treatment available at Crouse Health. “2014 to 2015 was the beginning of a revolution in acute ischemic stroke care where these stent retrievers were absolute game changers and we started to see the benefit,” said Dr. Padalino. During a mechanical thrombectomy, the stent retriever is deployed using a microcatheter and the stent drags the clot out, or combined with aspiration, suctions the clot out, allowing blood to flow to the affected area.

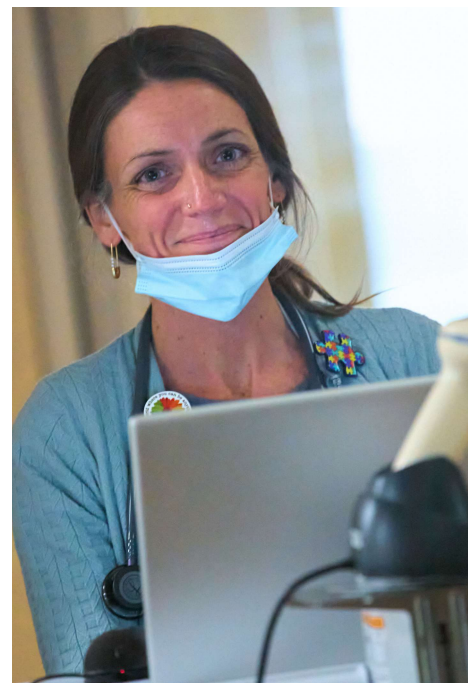
It is not a procedure for everyone, but in patients who do qualify, they can see tremendous improvements in brain function. “As the technology gets better, we keep pushing the boundary for better and better results,” said Dr. Eller. “Patients who successfully undergo this procedure have a better outcome than they would have otherwise, and the faster we can do it, the more likely the patient will recover.”

One unique approach at Crouse is their use of conscious sedation to perform the procedure, which Dr. Padalino encountered while in medical school at the University of Buffalo. “The idea of doing a mechanical thrombectomy

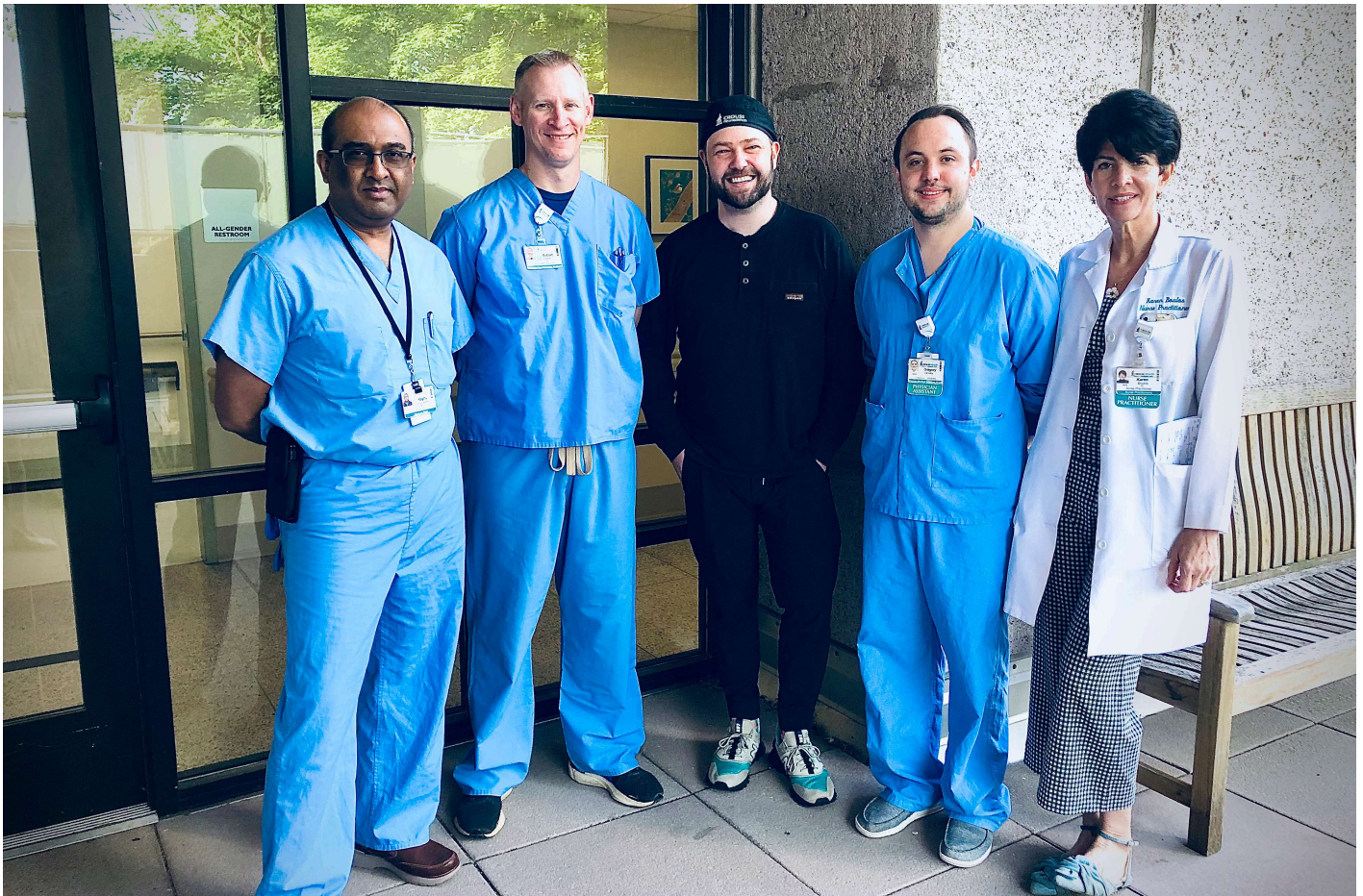
under conscious sedation is still a relatively rare thing,” Dr. Padalino said. “Other hospitals routinely do this under general anesthesia, which creates extra steps in the process, without significantly better results.”

Meeting and Exceeding Time Targets

Crouse Health has been a primary stroke center since 2007; in 2018, Crouse was designated a Comprehensive Stroke Center by internationally-recognized healthcare accrediting body DNV-GL and in 2019, a Comprehensive New York State Stroke Center by New York State Department of Health, providing a full-range of rescue therapies to treat any kind of stroke. Oksana Kaskov, RN, BSN, Stroke Program Administrator, ensures that the program continues to meet targets set by the American Heart



Erin Barclay RN, CCRN, SCRNI



From Left to Right- Dr. Raghu Ramaswamy, Rob Sawyer, PA, Jameson Crumb, PA, Greg Verwey, PA, Karen Boulos, NP

Association's Get with the Guidelines, which recognizes hospitals that are achieving various performance metrics for stroke care.

Crouse Health's Comprehensive Stroke Center has received the highest possible award for its speed in delivering stroke rescue therapies in both 2021 and 2022: Get With The Guidelines®-Stroke Gold Plus with Target: Stroke Honor Roll Elite Plus with Advanced Therapy with Target: Type 2 Diabetes Honor Roll. For IV thrombolytic, the guideline is 30 minutes for administering thrombolytic 50% of the time. According to 2022 data, Crouse Health is administering IV thrombolytic as fast as 18 minutes from patient's arrival.

For mechanical thrombectomy, the guideline is for the stent retriever to touch the clot (called Door-to-First Pass) within 90 minutes of the patient's arrival, 50% of the time. In 2022, Crouse

Health overshot that goal and was able to perform the procedure within 90 minutes, 72.2% of the time. For the first quarter of 2023, they achieved this 94% of the time. The median time for mechanical thrombectomy at Crouse Health is currently 66 minutes.

"We looked at our entire process and determined what we needed so we could achieve these targets from Get with the Guidelines," said Kaskov. "Right now the process is extremely efficient, but we are constantly looking for opportunities where we could shave time."

Saving Time with Technology

The stroke care team utilizes the latest technology available to ensure they are delivering care quickly and efficiently. Using a communication system with ingrained artificial intelligence software, information is transmitted to the entire team in an expedient manner. "It is an

amazingly good communication tool where we can talk to the entire team in one message," said Dr. Padalino. "You can have coordinated discussions where everyone is looped in and it saves time." Dr. Malak agrees. "By using this system, all attending physicians can get the imaging and decide on the management together. It is a collaborative, team effort," he said.

Crouse Health's two hybrid operating rooms (ORs) also help save time when it comes to stroke care, allowing for providers to perform an open surgery, if necessary. "When you access a blood vessel on an emergency basis, you can get persistent bleeding at the access site. If vascular surgery is required, you do not have to move the patient to another room, wasting time and risking infection," said Dr. Padalino. "You can do an interventional case, an operating room case, and a hybrid of the two." All of the necessary equipment

is located in the hybrid ORs including surgical procedures, general anesthesia, and ultrasound. “It has everything we need,” said Dr. Eller. “We are providing comprehensive treatment in those rooms.”

A Well-Orchestrated Team

Caring for stroke patients takes a village. The team is made up of several departments including: Emergency Medical Technicians who are the first-responders on the scene of a stroke, Emergency Department providers quickly assessing and imaging patients in a chaotic setting, Neurology providers making the decision to give IV thrombolytics and/or to pursue advanced imaging, Neurosurgery providers determining if a patient is a candidate for mechanical thrombectomy, Registered Nurses and Surgical Technicians who prepare for and assist with procedures, and post-operative care like Rehabilitation, Physical Therapy, Occupational Therapy, and Speech Therapy. “All of these fields have to work together like instruments in an orchestra,” said Dr. Eller. “It is a very concerted effort that has to happen continuously, and we have to continue

to perform at that pace time and time again.”

Providing the Best Care for the Community

Stroke is one of the leading causes of disability and death worldwide. Having access to a Comprehensive Stroke Center is a tremendous benefit for Central New Yorkers. “We have a significant opportunity to impact a large population with this effort,” said Dr. Padalino. “The senior leadership at Crouse has done everything possible to keep this program going so we can continue to provide the best care for the community.” Providing comprehensive stroke care takes a significant investment in people, equipment, and resources and Crouse Health’s commitment to this program has not wavered even in the face of the global demands facing the healthcare industry. “The Comprehensive Stroke Center designation is evidence of Crouse Health’s commitment to serve the community,” said Dr. Eller. “Central New Yorkers can be very proud to have this program here.” ■

The Crouse Health Comprehensive Stroke Center Core Stroke Team:

Stroke Medical Director and Chief of Neurology - Sami Abdul-Malak, MD
 Stroke Program Administrator - Oksana Kaskov BSN, RN
 Director of Neurosciences, Intensive Care - Evan H. Belanger, DNP
 Clinical Director, CMP Neurosciences - Jameson Crumb, PA
 Medical Director, CMP Neurosciences - David Padalino, MD
 Chief Medical Officer and Medical Director, ICU - David Landsberg, MD
 Medical Director, Hospitalist - James Leyhane, MD
 Medical Director, ED - David Mason, MD
 ED Physician and EMS Representative - Michael Jorolemon, MD
 Jorge Eller, MD
 Raghu Ramaswamy, MBBS
 Hassan Elnour, MD - Medical Director of Neurophysiology and Epilepsy



David Padalino, MD and Jorge Eller, MD