

How UAB Medicine addressed the neurologist shortage in the stroke belt through a state-wide telestroke program

Situation

The University of Alabama at Birmingham (UAB) Medicine, an academic health center located in Birmingham, Alabama, is the only certified Comprehensive Stroke Center in the state. Alabama has the second highest stroke mortality rate in the country. Combined with a severe shortage of vascular neurologists (especially in rural hospitals), it becomes increasingly difficult to effectively and efficiently treat stroke patients in rural communities. Often, this means transferring stroke patients to UAB Medicine, further delaying critical care.

Solution

Utilizing American Well's technology, UAB Medicine partnered with rural hospitals throughout Alabama to deliver telestroke services to critical patients. The health system worked with local hospitals to develop telestroke workflows designed to quickly and effectively treat stroke patients.

Success

Through its telestroke program, UAB Medicine has been able to drastically expand the reach of its vascular neurologists into rural communities across Alabama and neighboring states. Through the telestroke program, UAB Medicine has:

- Conducted more than 430 telestroke consultations
- Expanded telestroke care to 10 rural hospitals
- An average time-to-evaluation of six minutes
- Administered tPA 11.6% of the time via telestroke

CONDUCTED**430+**Telestroke consults
since launch**EXPANDED TELESTROKE
CARE INTO****10** **RURAL HOSPITALS****AVERAGE
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Background

The University of Alabama at Birmingham (UAB) Medicine is an academic health center located in Birmingham, Alabama. As a national leader in patient care, UAB Medicine conducts 1.5 million medical clinic visits annually.

UAB Medicine is the only certified Comprehensive Stroke Center in the state; a designation that means the health system can treat complex strokes at any time of the day due to staff, infrastructure and equipment. As the only Comprehensive Stroke Center, UAB Medicine is not only tasked with caring for stroke patients across Alabama, but also neighboring states including Florida, Mississippi, Georgia and Tennessee.

The perfect storm for a comprehensive telestroke program

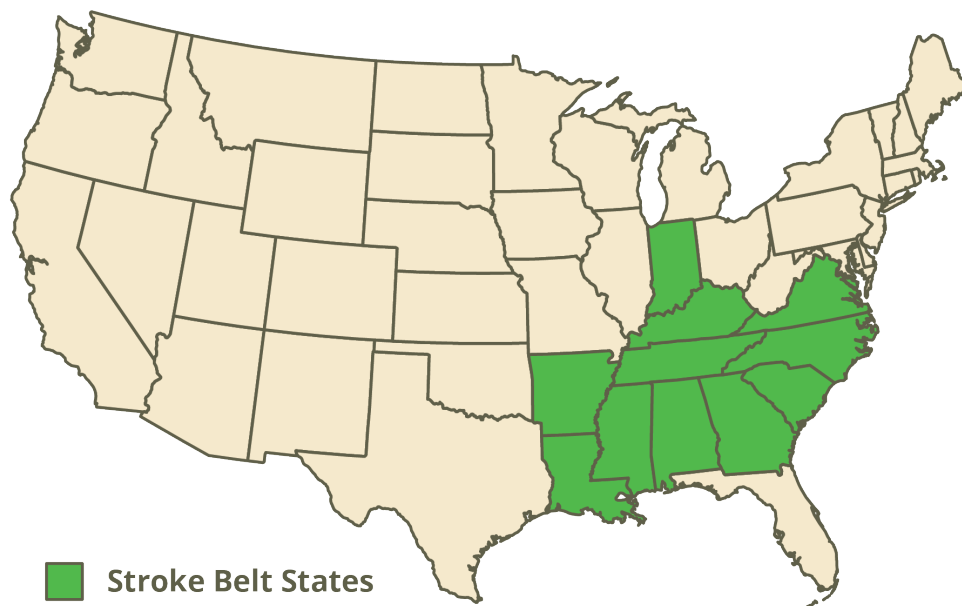
Because UAB Medicine has the top stroke resources and expertise in the region, it is solely responsible for caring for the most complex stroke patients. There are many factors at play when treating complex strokes, especially for UAB Medicine, including:

A large rural population: UAB Medicine is in one of the state's few large cities—Birmingham. While there are urban areas throughout the state, much of the area remains rural. In fact, there are rural areas in all 67 counties throughout Alabama, even those counties which are urban in population.¹ Because stroke treatment time has a profound impact on patient outcomes, rural areas present critical access issues, especially when rural hospitals do not have the expertise or resources for stroke care. “Alabama is in large part rural, and that’s part of the challenge and part of the promise of telehealth,” says Dr. Toby Groten, a leading stroke neurologist and the director of UAB Medicine’s Comprehensive Stroke Center.

High prevalence of stroke: Alabama is located in the “stroke belt,” which is an 11-state area of the United States where the risk of stroke is 34% higher than other areas of the country.² Alabama has the second highest stroke mortality rate in the country,³ and stroke is the 4th leading cause of death in the state, as well as the leading cause of long-term disability.⁴ This high prevalence of stroke in the state makes it even more critical that patients have quick access to stroke experts.

Urbanized areas in Alabama and neighboring states¹





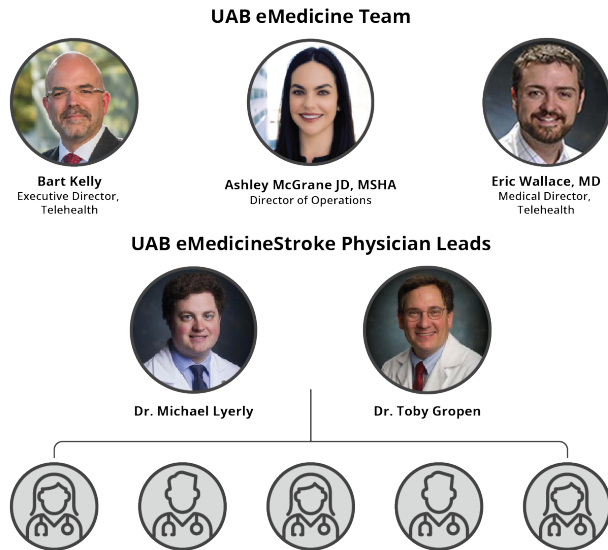
Shortage of vascular neurologists: Vascular neurologists specialize in the treatment of strokes. While all neurologists have experience in managing stroke, vascular neurologists have additional subspecialty training that focuses on the latest techniques in stroke care. Vascular neurologists are in high demand and short supply. In the next five years, it's estimated that only roughly 600 new vascular neurologists will enter the workforce, while the same number of active vascular neurologists will be retiring.⁵ This is alarming, as it's estimated that there are 795,000 strokes each year.⁶ In the case of UAB Medicine, many rural hospitals in Alabama lack even general neurologists, which causes rural stroke patients to be transferred to UAB Medicine in Birmingham, essentially delaying critical care needed to better patient outcomes.

These three factors influenced UAB Medicine's decision to develop a robust telestroke program to extend its expertise throughout the state, especially to rural areas. "Telestroke takes what we have in this country—which is a shortage of vascular neurologists—and allows us to extend our expertise to places that would not normally have it," says Dr. Gropen.

Implementing a state-wide telestroke program

UAB Medicine's telehealth department, UAB eMedicine, is responsible for all telehealth initiatives across the health system and spearheaded the telestroke program implementation. The telestroke team structure includes the three core members of the UAB eMedicine team, two lead vascular neurologists, and five additional UAB vascular neurologists.

UAB TELESTROKE TEAM STRUCTURE



The UAB eMedicine team leads the telestroke strategy and implementation, while the seven UAB Medicine vascular neurologists staff the telestroke platform and provide remote, on-demand care to stroke patients.

Telehealth technology utilized by UAB

UAB Medicine selected American Well as its telehealth partner, and utilizes American Well's C210 and C750 carts for its telestroke program. UAB Medicine uses these telemedicine carts due to their:

- Small footprint
- Enhanced Wi-Fi
- High-definition pan-tilt-zoom camera
- Remote fleet monitoring

The remote fleet monitoring functionality was particularly helpful to UAB Medicine, as it allowed them to have a bird's eye view of all their carts in the field. Through this functionality, UAB Medicine can see which carts are online, if a camera has been disconnected, if a cart has been unplugged, and they can also do a remote reset if necessary.

Today, UAB Medicine has deployed 13 American Well telemedicine care points within emergency departments and intensive care units throughout the state.

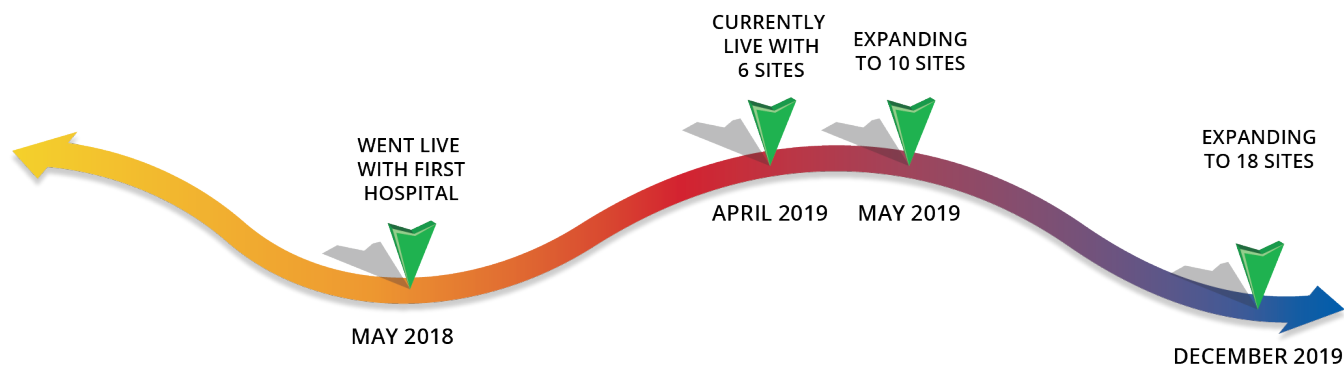
American Well Telemedicine Carts



Establishing telestroke relationships with collaborating hospitals

To build a state-wide telemedicine telestroke program, UAB Medicine formed partnerships with hospitals throughout the state. “Building relationships with collaborating hospitals is very important, especially in our state since it’s very rural,” says Ashley McGrane, JD, MSHA, director of operations for UAB eMedicine. As a state-funded institution, it was important that the health system expand on existing relationships with affiliated hospitals within the state, and that the program be a collaboration between UAB Medicine and the hospital sites.

In May 2018, UAB Medicine went live with its first hospital, and by May 2019 it had expanded into ten sites (two internal UAB sites and eight external hospitals). For each new site, the UAB eMedicine team discusses how the site can incorporate telestroke into the existing hospital workflow. “This is a very tailored program,” says McGrane “We really want to promote collaboration through our sites.”



After the relationship is established, telestroke implementation begins and normally takes between four to six weeks. Implementation includes:

- **Initial site visit:** During the initial site visit, the UAB eMedicine team discusses the telehealth program benefits and expectations. The team also covers telemedicine credentialing by proxy, which is how UAB Medicine credentials their physicians providing care at external sites.
- **UAB tech team site visit:** After the initial site visit, UAB Medicine’s IT team visits the hospital to assess its network infrastructure and capabilities along with the local hospital’s IT team. During this visit, the two teams also discuss integrations for connecting the hospital’s CT images with the American Well platform. “If there are any issues with their network infrastructure our team will work with them on any necessary upgrades,” says McGrane. “We try to do the IT team visit well ahead of the go-live so there will be no issues.”
- **Weekly workflow calls:** Beginning immediately after the initial site visit, the UAB eMedicine team has weekly workflow calls with the hospital’s leadership, nursing staff and emergency department physician representatives. During these calls, both teams discuss:
 - Current emergency department setup and workflow
 - How walk-in strokes are currently handled within the ED
 - Steps needed to implement telestroke workflow in ED
 - New ED workflow with telestroke incorporated
- **Cart delivery and setup:** UAB Medicine delivers and sets up the American Well carts at each local hospital, ensuring the carts are ready for use.

- **Onsite education:** The week of launch, the UAB eMedicine team performs on-site training and education. The training takes three days, and walks the nursing staff through American Well's equipment, platform and clinical workflow. The team also holds on-site stroke education with one of UAB's lead vascular neurologists. The UAB physician goes on site and works with the ED physicians and nurses, showing them how to do an NIH stroke scale exam via video.
- **Mock visits:** Before launching telestroke at a hospital, UAB Medicine and the hospital holds mock stroke cases on the platform, which allows them to make sure the CT images are coming through for the visit.

Physician buy-in and staffing structure

At the inception of the program, UAB Medicine utilized a mixed staffing model of both internal and external providers to staff the telestroke program. Through this mixed model, UAB Medicine providers were covering roughly 50% of the telestroke consults. Today, UAB Medicine vascular neurologists cover 95% of telestroke cases. "We find it's important to have our own vascular neurologists conducting the telestroke consults," says McGrane. "Many of these patients will be transferred to UAB Medicine, and we want to maintain that continuity of care."

Neurologists are the second-most likely specialists to be using telehealth—second only to psychiatrists.⁷ "Many vascular neurology training programs incorporate telemedicine training into the programs, so most have at least some experience with telestroke and are comfortable with the process," says Dr. Gropen. "We also enjoy it. Vascular neurologists like recommending thrombolytics or coordinating care for patients—that's why we are in the field. It's very gratifying for us to do it." UAB Medicine has had very little issue recruiting vascular neurologists to participate in the telestroke program, and currently has seven physicians staffing the program.

Emergency department physicians also don't have much hesitation to telestroke. "ED physicians appreciate the support of a vascular neurologists when making difficult decisions," says Dr. Gropen. In addition to ED physicians, neurologists in the local community also benefit from a telestroke program. "Acute stroke cases disrupt a neurologist's practice, and telestroke takes this off their plate," says Dr. Gropen.

Because treating stroke is a time-sensitive and critical process, it's important to staff the telestroke program accordingly. "UAB Medicine requires that a dedicated vascular neurologist be available via telehealth, therefore they're not being pulled into the clinic, or also covering the ED," says Dr. Gropen. "Telestroke really has to be considered a separate rotation or a separate clinical activity."

Clinical considerations

Through its implementation of telestroke in rural sites, UAB Medicine has uncovered important clinical considerations, including:



Involving the ER staff early. "A successful telestroke program is about relationships and they need to be part of that process," says Dr. Gropen. UAB involves the ER staff in discussions about the workflow, and they also ensure that the ER team views telestroke as something that helps them make decisions and something that respects their time.



The nursing staff is critical. The nurses are performing the NIH stroke scale, which is an important part of the telestroke evaluation. Their buy-in, training and continued enthusiasm are important and will drive the program's success.



Telestroke as a choreographed event. “Just like any other code, stroke codes are choreographed events and you need to have protocol-based decisions and assigned roles in the process,” says Dr. Gropen. Simulations and mock codes are helpful in refining the telestroke process.



There is always room for improvement. UAB Medicine subjects its telestroke program to the same process of quality improvement as it does stroke codes in the emergency department. “Look at how the different aspects of that protocol are working, and look at ways to tweak it to deliver care in a more refined and faster way,” says Gropen.

Creating a comprehensive care model

For rural sites, UAB Medicine found it essential to establish a comprehensive care model. “Telestroke is moving away from a single question of ‘should tPA be given or not,’” says Dr. Gropen. “It’s a very important question, but it’s only one question. We view our role in a larger way.” UAB vascular neurologists provide additional expertise, including whether the patient needs to be transferred for a thrombectomy, needs blood pressure control, anti-thrombotic treatment, or additional evaluations. “This care needs to be tailored because some sites are capable of taking care of a patient with a little help,” says Dr. Gropen. “We want to provide care recommendations for patients who will continue to stay at that hospital, and then other times people will need to be transferred. We need to look at this in a comprehensive and tailored way to the specific patient and site.”

Another aspect of UAB Medicine’s comprehensive care model is incorporating emergency neurology consults. “We happen to be a stroke neurology group, but it quickly became apparent that you also have to have general neurology services for many sites,” says Dr. Gropen. “We want to make sure that if a patient isn’t having an acute stroke, they are able to receive treatment for a neurological emergency.” In addition, UAB Medicine also utilizes telemedicine to provide follow-up care for patients at remote sites, such as reviewing imaging and providing additional recommendations about secondary stroke prevention.

UAB Medicine telestroke results

Since launching its first telestroke site in May 2018, UAB Medicine has conducted over 430 consults. Its vascular neurologists have advised remote sites to administer tPA in nearly 11.6% of consults, which is higher than the national average tPA administration rate of 3.8%.⁸

UAB Medicine can provide telestroke evaluations within six minutes. That means that it only takes six minutes from the time a nurse submits a case in the American Well platform to the time the vascular neurologist is on video seeing the patient. “We have found that this has been very easy to do since our neurologists are on call and this is their only responsibility,” says Dr. Gropen.

The UAB eMedicine team continues to improve how they are measuring the success of their telestroke program, and actively monitors the stroke volumes per remote site.

“We’ve seen stroke volume vary, and when that happens we touch base with the external site to see if they feel they’ve had a drop in strokes,” says McGrane. “We also reach out to EMS because we found that when we implement telestroke, if we include EMS in that process, they will be more apt to bring patients to these sites.” Ambulances are typically used to taking stroke patients to certain sites, so it takes some reeducation to let them know that there are more options within the state.



UAB Medicine can provide telestroke evaluations within six minutes of receiving a request.

Looking ahead: Scaling the telestroke network

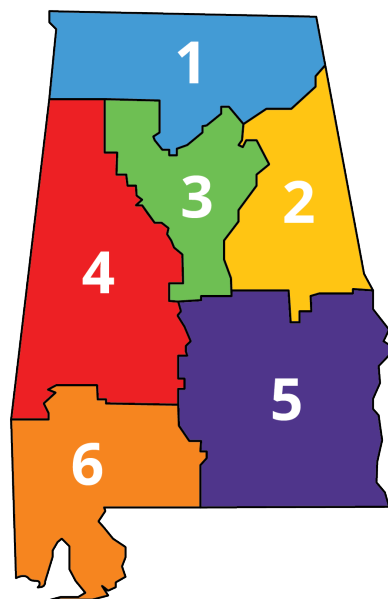
After the initial setup of its state-wide telestroke program, UAB Medicine is ready to scale the network. The health system is working with the Alabama Department of Public Health to provide a more integrated approach to early stroke care. “This critically involves EMS,” says Dr. Gropen. “They need to be able to assess and triage in the field based on severity, meaning patients who have a milder stroke go to the closest stroke center, while patients with a more severe stroke are transported to a center capable of a mechanical thrombectomy.”

To integrate the pre-hospital piece, UAB Medicine plans to utilize a state-wide trauma communications center to coordinate stroke care. This communications center would help EMS crew members remember the NIH scale and guide them through it, as well as provide them with an up-to-date destination based on current hospital capacity.

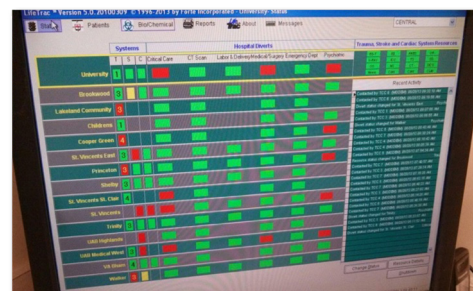
There are currently six EMS regions in Alabama, each with some level of access to stroke care. The idea is to direct EMS to the right center depending on stroke severity, as well as current hospital capacity. The communication system shows a list of hospital for trauma, stroke and cardiac, with red signifying there is no capacity and green signifying there is capacity. This provides EMS members with a real-time mechanism for determining which centers are available to care for patients.

“Where telemedicine comes in, is when they can see telestroke consults in progress and have them help coordinate the transfer from a hospital to a higher level of care if needed,” says Dr. Gropen. “It may even be possible to have them involved in a pre-hospital telestroke consult. Telestroke is an enabling technology that can help coordinate care in the field and in the hospital, ultimately getting patients to where they need to be.”

Stroke centers within EMS regions in Alabama



State-wide communications system would help guide EMS to best site of care



SOURCES

- 1: Alabama Rural Health Association
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- 3: Centers for Disease Control and Prevention, Stroke Mortality by State, 2017.
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- 5: Society for Vascular Surgery, The National Shortage of Vascular Surgeons, 2018.
- 6: American Heart Association Statistics Committee and Stroke Statistics Subcommittee, Heart disease and stroke statistics—2016 update.
- 7: American Well, Telehealth Index: 2019 Physician Survey
- 8: American Heart Association, Many stroke patients do not receive life-saving therapy, 2017.