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Building a regionalized stroke network

In early 2018, the American Heart Association/American Stroke Association unveiled guidelines that extend the treatment window for mechanical thrombectomy to 24 hours for some patients. This created a lifeline for many patients after an acute ischemic stroke (AIS). It also meant that health systems needed to identify which patients could benefit from the procedure without overloading stroke centers. At Atrium Health, we're meeting this challenge via a regionalized network that enables us to triage patients before they're sent to our thrombectomy-enabled interventional facilities.

Improved functional outcomes

The new guidelines were spurred by clinical trials that showed many patients keep brain tissue viable for much longer than previously thought, even when a large blood vessel is blocked. In the DEFUSE-3 trial, mechanical thrombectomy was performed in addition to standard therapy six to 16 hours after a patient was last known to be well, in patients with proximal middle-cerebral-artery or internal-carotid-artery occlusion and a region of tissue that was ischemic but not yet infarcted. The improvement in functional outcomes was so significant in many patients that the trial was stopped early.

This built on the DAWN trial, which showed similar results for mechanical thrombectomy up to 24 hours after AIS.

A "hub and spoke" model

The new guidelines encourage health systems to study new ways to triage stroke patients instead of sending them directly to an interventional stroke center. Atrium Health had started pursuing this goal even before the guidelines were released, by implementing a "hub and spoke" approach that capitalizes on our network's extensive satellite locations.

This regionalized approach starts with finding better ways for paramedics to evaluate stroke patients.

We are:

- Using telemedicine in Cabarrus County to help neurologists do FaceTime-like evaluations of patients in ambulances
- Partnering with Novant Health and our EMS provider on the first study of whether the FAST-ED screening tool is reproducible, accurate and effective

We also offer telestroke at 18 Atrium Health locations, enabling our neurology team to evaluate patients remotely and transfer them to one of our higher-level stroke centers when needed.

Expanding CT perfusion

If it has been more than six hours since a patient's stroke, clinical trials have shown that CT perfusion can determine how much brain tissue remains viable. Most health systems only offer CT perfusion at their interventional stroke centers. In 2017, we became one of the nation's first health systems to start deploying CT perfusion technology in many of our stroke network's spoke hospitals.

This means we can pinpoint which patients can benefit from mechanical thrombectomy without sending all patients to our interventional facilities.

Raising the bar

Since the latest guidelines were introduced in late January 2018, we've routed a growing number of patients to our interventional centers for mechanical thrombectomy procedures that would have fallen outside the old treatment window. Many of these patients arrive with profound neurological deficits and would have been permanently disabled before the new guidelines. Mechanical thrombectomy offers the opportunity to return many of them to a near-normal state before they go home.

We expect to perform significantly more mechanical thrombectomy procedures in the future and will keep refining our regionalized approach and publishing our results. Our hope is to become a model for other systems to follow, helping all of us raise the bar on stroke care – and helping many more patients get back to normal lives.

Learn More

To learn more about the stroke guideline updates, contact Dr. Asimos at Andrew.Asimos@AtriumHealth.org or Dr. Karamchandani at Rahul.Karamchandani@AtriumHealth.org.