# Mobile Stroke Units Make Brain-Saving Treatment Faster

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The mobile stroke unit is a specialized ambulance equipped with a portable CT scanner.

It is among the most feared medical emergencies. What else but a stroke could make you think you'd rather have a heart attack? Sure, heart attacks are more fatal, but at least if you survive you can carry on more or less as before — without a dimming of the mind or the loss of key bodily functions.

With strokes there is no such assurance. Fully 40 percent of stroke survivors require some kind of special care, 25 percent experience significant cognitive decline, and an average of 17 percent will be discharged into long-term care. This is not the vantage from which to sit back and reflect on one's life accomplishments.

The comparison with heart attacks is not incidental. The vast majority of strokes — or "cerebrovascular accidents," to use the textbook term — are caused by a blockage in blood flow. Yet unlike a heart attack, for which there are dozens of immediate interventions, a stroke has proven infuriatingly difficult to treat. More than 1,000 drugs have been tested—mostly to no avail. The lack of progress has led researchers to explore offbeat solutions. Brain cooling, transcranial magnetic stimulation, lasers delivered through the nose. Drugs derived from peach pits and the venom of the Malayan pit viper. By the early '90s, doctors were no closer to finding a treatment for strokes than they had been 50 years prior. It was "diagnose and adios," as the saying went. Nothing to be done.

Stroke is a story of anguish and frustration. Although the Food and Drug Administration (FDA) has approved two treatments (a medicine, tPA, that can break up the clot in a minority of strokes and, in 2016, a surgical procedure to remove clots from a sufficiently large blood vessel), people are still dying by the thousands — 150,005 in 2019. This has led some people to look for other solutions. And in the past several years, a new approach to strokes has been gaining adherents all over the country. One day it might save your life.

In the makeshift headquarters of the UTHealth Mobile Stroke Unit Consortium on the 14th floor of an office building in downtown Houston.  The mobile stroke unit (MSU) is a specialized ambulance equipped with a portable CT scanner. Rather than take stroke patients to a hospital, the idea is to take the hospital to the patients. The onboard scanner allows the doctor to diagnose en route to the hospital, eliminating the transport time, which could be as much as 40 minutes.

With a stroke, those minutes matter. Currently, only 1.3 percent of eligible patients receive treatment in the first hour after having a stroke, and nearly 20 percent are treated between three and 4 and a half hours later.

Brain tissue dies fast. For every 30-minute delay the relative likelihood of surviving a stroke with no deficits decreases by 15 percent. By eliminating some of those minutes, MSUs could (in theory, anyway) save millions of brain cells — and perhaps thousands of lives.

The key is the CT scanner, a doughnut-shaped X-ray machine capable of rendering 3D images of the brain. The scanner determines the kind of stroke the patient is having — hemorrhagic or ischemic. An ischemic stroke is caused by a blood clot that cuts off blood flow to the brain. A hemorrhagic stroke — seven times less common but four times more deadly — is caused by an aneurysm or burst blood vessel. The difference matters, because tPA, the only drug available to treat strokes, works only for ischemic strokes. When given for a hemorrhagic stroke, it can be fatal.

Historically, CT scans were available only in hospitals. But with the MSU, scans can be done virtually anywhere.  The first U.S.-based MSU debuted in 2014, right in Houston. MSUs now are in 19 other U.S. citie.

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