

*Just the third in the country*

# UCHealth Mobile Stroke Unit Rolls into Colorado

*By Todd Neff*

University of Colorado Health has taken delivery of just the third mobile stroke diagnosis and treatment unit in the United States. Combining telemedicine, mobile CT scanning, and other technologies, the ambulance-like machine promises to speed the time to clot-busting treatment for patients up and down Colorado's Front Range and help pave the way for similar units around the country.



*An artist's rendering of the UCHealth Mobile Stroke Treatment Unit.*

While the vehicle won't be doing house calls until late summer or early fall, it's already hit the streets. Sean Jennings and James Glen drove it straight from Houston, Texas-based Frazer, Inc., which built the UCHealth Mobile Stroke Treatment Unit (MSTU) on a Dodge Ram 4500 chassis. Jennings and Glen got back to Poudre Valley Hospital at 3 a.m. on Friday, July 3, about 21 hours after they left Houston.

Jennings, Poudre Valley Hospital EMS's director for fleet maintenance, and Glen, an EMT at the hospital, are part of a team spanning Colorado Springs, metro Denver, and Fort Collins that has worked for months to make the MSTU a reality.

**Precious minutes.** Mobile stroke units bring hospital stroke-treatment diagnosis and treatment – in particular, clot-busting tissue plasminogen activator (tPA) – straight to patients. The

world's first mobile stroke unit, in Homburg, Germany, cut the time from the emergency call to tPA treatment from 73 minutes to 38 minutes. That 35-minute advantage over hospital-based treatment translates into tens of millions of preserved neurons per patient and, by extension, improved prospects for recovery.

William Jones, MD, medical director of the Stroke Program at University of Colorado Hospital, set the wheels in motion to bring an MSTU to Colorado. Jones, who championed the UCH telestroke program, which launched in July 2014, enlisted help from Kathy Deanda, RN, MSN, UCHealth's program director information technology, telehealth; and Steve Main, Poudre Valley Hospital's director of EMS. The three visited the nation's second mobile stroke unit at the Cleveland Clinic in late September.

Jones also talked with neurologist James Grotta, MD, director of stroke research at Memorial Hermann-Texas Medical Center in Houston, which deployed the first U.S. mobile stroke unit in early 2014. Grotta visited UCH in December 2014, and the roughly \$1 million UCHealth MSTU was approved by the UCHealth board of directors early this year. Frazer, which had built the UT Houston mobile stroke unit, was hired to construct the UCHealth machine.

Mobile stroke treatment has been made possible by a couple of key enabling technologies. One is the development of CT scanners small enough to fit into an ambulance-size vehicle. The second is the advance of telemedicine technology such as that used by the UCHealth telestroke program. Combining the two with other hardware familiar to ambulances has created what amounts to rolling emergency departments.

**Advancing science.** It must be staffed, of course. The UCHealth MSTU will roll with a stroke-trained clinical nurse specialist, a

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paramedic, and a CT tech/emergency medical technician. Jones and other stroke neurologists, many of whom are fellowship-trained, will connect via a telehealth robot, assessing the patient as well as CT scans and other data coming over cellular wireless network connections. If it's an ischemic stroke (that is, one that is caused by a blocked artery), the neurologist can give the go-ahead for administering tPA.

Their work will help patients now and in the future, Jones said. UCHealth is joining a [clinical trial](#) Grotta launched in May 2014 that aims to quantify the speed and effectiveness of mobile stroke treatment, as well as the units' cost-effectiveness. That sort of information will help communities elsewhere weigh whether or not to invest in mobile stroke units and help them learn how to deploy them effectively, Jones said.

Before the UCHealth MSTU picks up its first patient, there are many questions to answer. Where will it operate? Who will dispatch it? Who will staff it? What about the logistical, regulatory, legal, and information technology aspects of mobile stroke? Deanda is working on the answers with help from what she described as "a massive group of people" from across the system. Poudre Valley Hospital EMS has taken the lead on managing and developing the mechanical side of the machine, a logical choice, given the organization's 40-year history of providing emergency medical services.



*The Mobile Stroke Treatment Unit, taken June 26 at Frazer, Inc. in Houston. As of this writing, the converted Dodge Ram 4500 is awaiting branding in Fort Collins.*

The UCHealth MSTU was built with Colorado weather and geography in mind. Unlike the UT Houston version, it has four-wheel drive and also a leveling system that can flatten the unit's interior, even at grades of up to 10 percent. That's key for the efficient operation of the CT scanner, Jennings said. The MSTU

also has a LiquidSpring suspension system, which enables the rear of the truck to be dropped about a foot so operators can more easily load patients in the back and avoid lifting-related injuries, he said.

The irony is that the vehicle Jennings and his Poudre Valley Hospital EMS colleagues have worked to build (and drive from Houston) isn't slated for duty in northern Colorado anytime soon. Metro Denver and Colorado Springs have more stroke patients, so it makes sense to deploy it in those two locations, possibly alternating weeks. That's okay with Jennings.

"We're one team," he said. "We have the same goals. We're the EMS experts of UCHealth, and we're offering up our subject-matter expertise in any way that we can."

As of July 6, the MSTU was awaiting paint; otherwise, "the vehicle could do a scan today," Jennings said. The work now has to do with figuring out the details of the operation, both internally and with emergency managers throughout UCHealth's catchment area. If the details are complex, the big-picture is simple.

"First and foremost, the most important thing that we're going to be doing is delivering cutting-edge technology that I really believe will help the people in the communities we serve," Jones said. "Our patients are going to benefit from this."