Photo: UCLA

Hospital on wheels brings immediate care to stroke patients

STORY HIGHLIGHTS

The UCLA Health Mobile Stroke Unit enables rapid delivery of brain-saving medications to stroke patients who might otherwise face debilitating delays in treatment.

The unit consists of an ambulance equipped with CT scanning technology along with a highly trained team able to perform diagnostic testing and initiate appropriate treatment.

UCLA Health has launched the first mobile stroke unit on the West Coast, enabling rapid delivery of brain-saving medications to stroke patients who might otherwise face debilitating delays in treatment. The unit consists of an ambulance equipped with CT scanning technology along with highly trained personnel who respond to calls involving patients suspected of having a stroke. The team is able to perform diagnostic testing and initiate appropriate treatment before transporting the patient to the hospital for further care.

The UCLA Health Mobile Stroke Unit (MSU) was launched in September 2017, responding to select 911 calls in Santa Monica in coordination with the Santa Monica Fire Department. In January 2018, the unit began a partnership with Los Angeles County that will ultimately involve collaborations with multiple fire departments to expand the number of patients who are covered by the service.

Roughly every 40 seconds, someone in the United States will have a stroke, and one person every four minutes will die as a result. During the stroke's acute phase, each moment without treatment can lead to the death of additional brain cells. "In most strokes there is either a lack of blood flow to tissue in the brain or bleeding into the tissue in the brain. In either case, getting treatment to the patient fast improves the outcome," says May Nour, MD, PhD, medical director of the UCLA Arline and Henry Gluck Stroke Rescue Program. "This program brings the first minutes of emergency treatment to the patient in the field rather than waiting until the patient arrives at the hospital."

"Time is brain in acute stroke — every minute counts," adds Jeffrey Saver, MD, director of the

UCLA Comprehensive Stroke Center. The MSU brings "the hospital to the patient in order to save as much brain as possible."

The mobile unit doesn't replace treatment in the hospital; rather, it expedites care by starting care in the field. Within its jurisdiction, the MSU, along with ambulance paramedics, responds to calls made over the 911 dispatch system for patients who have symptoms indicative of a possible stroke. If the patient is deemed not to have suffered a stroke, the regular ambulance provides usual care. If a stroke is determined to be likely, the mobile unit takes over the case.

Patients undergo CT scanning in the unit and the team can give blood tests to determine whether a stroke is occurring, along with the type of stroke. If the patient is having ischemic blockage, the clot-dissolving drug tPA can be administered; for a hemorrhagic stroke, immediate treatment typically involves reducing any anticlotting medicines the patient is taking and quickly bringing blood pressure under control. Patients are then transported to the most appropriate stroke-receiving hospital. Those who have blockage of a major artery and may not benefit from tPA, for example, are taken to a center where surgical thrombectomy can be performed to open the artery.

In the initial phase of the pilot program, the MSU includes a neurologist specializing in stroke treatment. As the program expands, a neurologist will oversee the care via a live video and voice connection from Ronald Reagan UCLA Medical Center, communicating with a neurocritical care nurse, a CT technologist and a paramedic in the unit.

The MSU is equipped with a mobile CT scanner and a mobile blood-testing laboratory. "The images we have been getting from the CT scans have been very high resolution and rapidly acquired, which allows for confident decisions to be made in the field," Dr. Saver says.

The idea of an ambulance equipped with a CT scanner has been a dream for the field of stroke neurology dating back 30 years, Dr. Saver notes. Even before the advent of the clot-busting drug tPA, it was known that any treatment for stroke would need to be initiated quickly to be most effective. It also was clear that the treatment would be different depending on the type of a stroke — be it a blockage, in which the goal is to dissolve clots to restore blood flow, or a bleed, in which clotting is desirable — and that accurate diagnosis would require brain imaging. The development of a CT scanner lightweight enough to be positioned on a moving platform allowed for the dream's fulfillment. In 2011, the first such unit began running in Germany, and in 2014 Houston became the first city in the U.S. to run a mobile stroke unit. Approximately a dozen cities have followed suit.

By initiating treatment with time-dependent, proven therapies earlier, the mobile stroke unit is sure to improve outcomes, Dr. Nour says. In addition, the unit will ultimately allow for the testing of new therapies in the hyper-acute time frame when they have the best chance to work, making it an ideal platform for future research. "It makes sense that if we're giving medications that dissolve clots or reverse the bleeding into tissue of the brain faster, clinical outcomes will be better," Dr. Nour says. "The question is, will this be cost-effective? We know that the morbidity and mortality related to stroke are very high, which has a big drain on the medical system, so we think it will be."

To find out, the UCLA unit is serving as the West Coast anchor for the first national demonstration project to gather data on the degree of improved patient outcomes and cost-effectiveness with accelerated field treatment. Positive results from the three-year study could lead the federal Centers for Medicare and Medicaid Services and other insurers to reimburse emergency medical service and hospital systems for mobile stroke clinical activities.

The availability of faster treatment underscores the importance of educating older patients and their loved ones about the signs of a stroke and the need to report it immediately, Dr. Nour notes. The acronym FAST — face drooping, arm weakness, speech difficulty, time to call 911 — is commonly used, but other signs are also important, she explains, including sudden-onset weakness, numbness, changes in vision and acute difficulty with balance.

For more information about the UCLA Health Mobile Stroke Unit, go to:
uclahealth.org/mobile-stroke

Photo: Getty Images

The UCLA Health Mobile Stroke Unit brings the first minutes of emergency treatment to the patient in the field rather than waiting until the patient arrives at the hospital.