

Half of Americans live more than an hour away from lifesaving stroke care

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When stroke strikes, choking off blood supply to the brain, every minute counts: Nearly 2 million neurons die each minute a stroke is left untreated, making it a race to recognize symptoms so that lifesaving "clot-busting" drugs can be administered. Forty-five percent of Americans - 135 million people -- are more than an hour away from primary stroke centers, the facilities that are best equipped to care for them if they are stricken by the condition, according to new research led by the University of Pennsylvania School of Medicine that will be presented February 24 at the American Stroke Association's International Stroke Conference in San Antonio.

Less than a quarter of U.S. residents can reach one of those facilities in less than a half hour. The authors say the identification of these gaps in access is an important step in cutting the deadly toll of stroke, which is the third leading cause of death and the leading cause of long-term disability in the United States. The study revealed one existing way to narrow these disparities: Using existing air ambulance resources to fly stroke patients to appropriate care would cut the number of Americans without 60-minute access to a primary stroke center by half.

"Our findings show that many people do not have timely access to the type of care that they would need to save their life or minimize damage from a stroke," says senior author Brendan G. Carr, MD, MS, an assistant professor of Emergency Medicine and Biostatistics and Epidemiology at Penn. "The challenge here is to think about how we can design a system that give everyone their best chance of survival."

Distance from primary stroke centers a key factor in how well patients fare. Currently, less than 10 percent of [ischemic stroke](#) patients - those with [blood clots](#) blocking blood flow to the brain -- receive tPA, the IV clot-dissolving drug that is proven to slash both the cognitive and physical disabilities associated with stroke. Typically, the drug must be given within three hours of symptom onset in order to be most effective. Unfortunately, precious time may be lost even before the patient decides to come to the hospital, since many patients fail to quickly recognize or act upon stroke symptoms - which can include weakness, strange sensations on one side of the body, confusion, difficulty speaking, visual problems and dizziness.

The new study results showed that overall, fewer than 1 in 4 Americans (22 percent) have access to a primary stroke center within 30 minutes, and just over half (55 percent) can reach one within an hour when ambulances are not permitted to cross state lines. Patients are most able to get to a primary stroke center by ground within 60 minutes if they live in the Northeast (64 percent), followed by the Midwest (61 percent). In the South and West portions of the country, just over half (52 percent and 51 percent) of patients can reach those advanced facilities within an hour. Five states had no in-state ground access to primary stroke centers within 60 minutes, and only in the District of Columbia could all residents reach such a facility in an hour. The addition of air ambulances, however, boosts access substantially: within a half hour, 26 percent of the population could reach a primary stroke center, and 79 percent could be transported to one within 60 minutes. The improvement found was most dramatic in the western U.S., where the number of patients transported within an hour would rise to 81 percent if helicopters were used.

The authors used data from the U.S. Census Bureau combined with an inventory of hospitals that have received certification as primary stroke centers by the hospital accrediting body known as The Joint

Commission, and they calculated driving times and ambulance dispatch and response times between each population "block group" and the nearest stroke center. They also obtained data showing the location of all helipad depots operated by air medical service providers across the United States and calculated similar dispatch and response times to illustrate how utilizing helicopters could speed access for more patients.

The goal of the new research, Carr says, was to think differently about how to deliver stroke care, perhaps by policy solutions such as allowing ambulances to cross state lines, or using helicopters to more rapidly transfer patients to stroke centers. No national system for acute care of stroke patients currently exists, unlike the regionalized system for transport of trauma patients - those who've had car crashes, suffered falls, or been stabbed or shot - to hospitals that meet specific care benchmarks, making it possible for 83 percent of the U.S. population to reach trauma care within an hour.

In addition to air transport of stroke patients to high-level facilities, the authors suggest that other, lower-cost solutions could also be employed to extend the net of optimal care to a greater number of patients across the nation. Among suggestions: the development of inter-hospital referral networks, using telemedical technology to connect smaller or rural hospitals with guidance from specialty physicians trained in stroke care, and offering incentives for the development of stroke centers in underserved areas.

"Strokes often strike without warning. We are all at risk, and the therapy is time-critical. Data like these brings us closer to taking a big step in the development of not only a more robust [stroke](#) system, but of an emergency care system that can serve anyone, no matter where they are in the country," Carr says. "Using technology, we hope to develop new ways to connect hospitals to each other so that instead of always delivering the patient to the doctor, we will be able to deliver the doctor

to the patient."

Provided by University of Pennsylvania School of Medicine

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