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Time is Brain: Why Regional Stroke Networks Are the Key to Thrombectomy Access

By Michelle Luffey

Mechanical thrombectomy has transformed the treatment landscape for large vessel occlusion (LVO) strokes, which account for nearly 30% of all ischemic strokes[1]. These strokes are among the most devastating, often resulting in severe disability or death if not treated promptly. Despite the proven efficacy of thrombectomy, access to this life-saving intervention remains uneven across the United States. While guidelines from the American Heart Association and American Stroke Association expanded the treatment window to 24 hours in 2019, many patients still do not receive timely care due to systemic limitations in stroke center availability and transfer delays[3].

The data tells a compelling story. In 2023, claims data from Definitive Healthcare reported over 810,000 strokes in the US. With 85% classified as ischemic that equates to approximately 688,500 ischemic strokes. Research suggests that between 20% and 40% of these are caused by large vessel occlusions[1], meaning somewhere between 137,000 and 275,000 patients could have benefited from thrombectomy. Yet only a little over 70,000 thrombectomy procedures were performed. While not every LVO patient is eligible for thrombectomy, the gap between potential and actual treatment is far too wide. This is not due to a lack of clinical evidence as thrombectomy nearly doubles the chance of a patient returning to independence compared to medical therapy alone[2] but rather a lack of access.

The hub-and-spoke model, where patients are transferred from primary stroke centers to comprehensive centers, remains the dominant structure in many regions. However, this model is increasingly being challenged by research showing that transfer delays significantly impact outcomes. A 2023 study published in JAMA analyzed over 108,000 stroke transfers and found that the median door-in-door-out (DIDO) time was 174 minutes, far exceeding the recommended 120-minute benchmark. Only 27% of patients were transferred within the optimal window. These delays are critical. Every 30-minute delay in treatment reduces the likelihood of a good outcome by 15%[4]. Patients taken directly to thrombectomy-capable centers consistently show better outcomes than those who are transferred.

Expanding access to thrombectomy-capable centers has a measurable impact. A 2024 cohort study involving 2.8 million patients found that adding a stroke center within a 30-minute drive of a community led to a 39-percentage point increase in stroke center admissions, a 0.48 percentage point increase in thrombolysis, and a 0.5-percentage point reduction in one-year mortality. These improvements were most pronounced in underserved areas, reinforcing the need for targeted expansion[5].

One health system that exemplifies a well-executed regional stroke care model is AdventHealth Central Florida. Instead of relying on a single downtown comprehensive stroke center, AdventHealth implemented a stroke destination plan that strategically placed comprehensive stroke centers throughout the region. This decentralized approach was tailored to the population density and healthcare infrastructure of each area, ensuring that patients—whether in rural, suburban, or urban communities—had timely access to advanced stroke care.

In rural areas with fewer than 50,000 residents and limited medical resources, the system ensured access to a comprehensive stroke center within 60 minutes. Suburban communities, typically adjacent to urban cores, were served by a mix of community hospitals and comprehensive centers with transport times ranging from 30 to 60 minutes. Urban populations had access to one or more comprehensive centers within 30 minutes. This model was made possible through close collaboration with EMS agencies, stroke advisory groups, and accrediting organizations such as The Joint Commission and DNV.

AdventHealth further strengthened its stroke system by aligning EMS protocols to prioritize direct transport to comprehensive stroke centers when clinically appropriate, even bypassing primary stroke centers when necessary. Centralized stroke leadership and governance ensure consistency in care delivery across all sites, while continuous performance monitoring and outcomes data drive ongoing quality improvement.

This matrixed, regionally distributed system has significantly improved access to mechanical thrombectomy and reduced treatment delays. It has also resulted in the lowest 30-day ischemic stroke mortality rate in the state of Florida among CMS patients and the sixth lowest in the country out of 4790 hospitals. It offers a compelling blueprint for other health systems seeking to move beyond the traditional hub-and-spoke model. AdventHealth's success demonstrates that with strategic planning, collaboration, and sustained investment, it is possible to build a stroke network that meets the needs of diverse populations and improves outcomes across an entire region.

Health systems across the country should take note. Expanding thrombectomy-capable or comprehensive stroke centers, especially in high-volume areas currently

lacking MT capability, could give 23 million more Americans timely access to this life-saving treatment[1]. Implementing state-mandated bypass laws that direct EMS providers to take suspected LVO patients directly to thrombectomy-capable centers is another critical step. Hospitals must also monitor and improve DIDO times, aiming for transfers within 90 minutes as recommended by the "Get With the Guidelines" program[3].

Many hospitals with existing percutaneous coronary intervention (PCI) programs are well-positioned to add neurointerventional services. Shared interventional space and staffing models can reduce startup costs and improve operational efficiency. As stroke incidence is expected to rise with the aging Baby Boomer population, now is the time for hospitals to prepare. By 2030, all Boomers will be over 65, increasing the population at highest risk for stroke[1].
Mechanical thrombectomy is the most effective treatment for LVO strokes, yet access remains limited. The evidence is clear: direct access to thrombectomy-capable centers improves outcomes and saves lives. Hospitals and health systems must act now to expand services, especially in underserved regions. The time to build is now—because time is brain.

References

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