



At the heart of better care.

Fast Is Not Enough

How to improve stroke diagnosis and care
with integrated delivery models

Many of our nation's EDs are not equipped to deliver rapid neurological assessment with accuracy.

Read on to learn about innovative solutions to quickly assess and treat stroke patients that also create efficiencies and improve patient outcomes.

The Challenge Faced by Emergency Departments

More patients with neurologic issues are visiting the emergency department (ED) today than ever before. As our patient population ages and grows, stroke is now the leading cause of long-term disability and the fifth-most-common cause of death in the United States.

Given the increasing number of patients and the rising costs, it's imperative that administrators have access to ways to effectively integrate acute neurologic care into existing EDs.

The neurology community widely understands the "time is brain" concept today. The public embraces it with the common stroke mnemonic **FAST**, which encourages people to respond immediately to stroke symptoms of **f**acial drooping, **a**rm weakness, and **s**peech difficulties. If these signs are present, then it's **t**ime to call emergency services.

Greater public awareness around **FAST** can decrease the time to treatment for stroke patients, leading to significantly improved long-term clinical outcomes. Because patients who arrive at the ED within three hours of their first stroke symptoms often have less disability three months later than those who received delayed care, time is of the essence.ⁱ

Shortage of Neurologists



Every **forty seconds**, someone in the United States has a stroke



Despite greater patient awareness of symptoms and faster methods for treating stroke patients, the step in-between these two — *the timely and accurate diagnosis when a patient presents in the ED* — has not improved at the same rate. Here are two main reasons why:

Our ED patient population is growing:

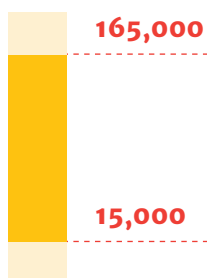
- Over the past few decades, the number of EDs has decreased while the number of ED visits has simultaneously increased ⁱⁱ
- Only 32 percent of EDs see patients in fewer than 15 minutes ⁱⁱⁱ
- The mean wait time in U.S. EDs increased 25 percent over the past decade, from 46.5 minutes to 58.1 minutes ^{iv}

Hospitals nationwide are facing a shortage of neurologists:

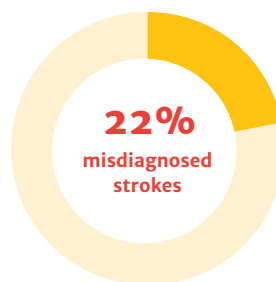
- A major factor is the lack of community neurologists practicing in acute care settings and providing ED services
- Some hospitals in underserved areas cannot afford to offer stroke services. Instead, ED patients are diverted, which often leads to poorer outcomes for the patient and revenue loss for the hospital
- It's estimated that while the supply of U.S. neurologists may grow by 11 percent between 2013 and 2025, demand for services will grow by 16 percent ⁱ

Misdiagnosis is happening too often

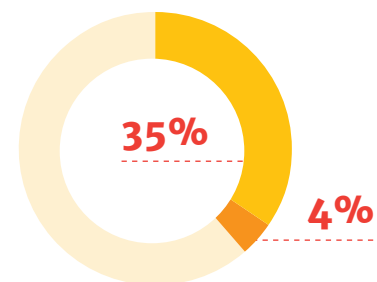
Stroke is challenging to diagnose in the ED setting. Stroke is misdiagnosed as other conditions, and other conditions are misdiagnosed as stroke.



Between **15,000** and **165,000** stroke cases are **misdiagnosed** each year ^{vii}



A recent study of **465 stroke patients** at two hospitals (one academic, one rural) found the EDs initially **misdiagnosed 22 percent** of ischemic strokes ^{vi}



Studies suggest that doctors miss **35 percent** of strokes when patients complain of dizziness compared to **4 percent** when patients complain about weakness in one side of the body ^{viii}

The Impact to Neurology Care Delivery

Addressing the need for acute neurologic care can help hospitals improve the quality of care while also improving provider satisfaction, producing better patient outcomes, and reducing the cost of care.

The impact of care delays and misdiagnoses for both the patient and the hospital is significant:

- Misdiagnosed strokes result in worse outcomes for the patient and place a financial burden on the hospital:
 - Patients' risk for readmission doubles within 60 days ^{ix}
 - Longer hospital stays (5 days vs. 3 days, $p < 0.0001$) ^x
- Misdiagnosis in general accounts for an estimated 40,000 to 80,000 preventable deaths each year, costing hospitals nearly \$400,000 per claim, according to a recent analysis published in BMJ Quality and Safety ^{xi}



Hospitals that **lack a robust neurology program lose money** to patient transfers and incur quality program penalties.

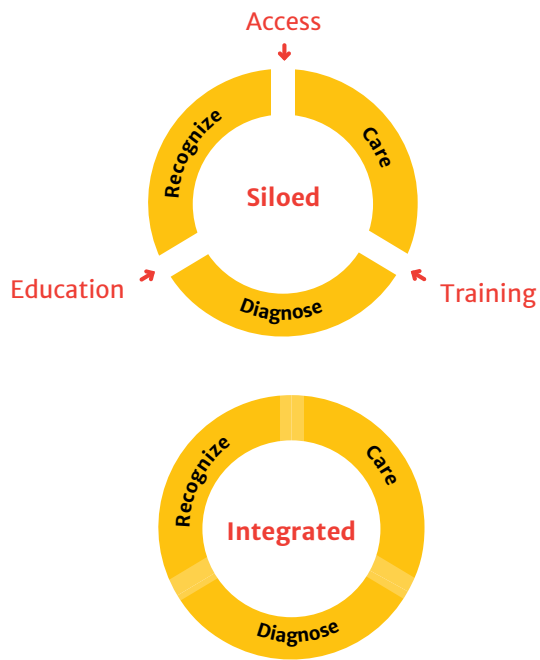
“Acute neurological conditions such as stroke are difficult and costly to treat. We’re creating a tightly coordinated and streamlined effort that will lead to better clinical and financial outcomes for patients and the hospital.”

— Yafa Minazad, DO

Vituity’s Vice President of Operations, Acute Neurology

A Transformative Solution

A lack of access, education, and training creates a gap in care. ED teams know precisely what steps to follow when dealing with non-neurological emergencies. But, all too often, the same is not true with acute neurologic emergencies. Unfortunately, most ED personnel are not sufficiently trained to accurately recognize, diagnose and care for all types of neurological disorders. In addition, the process for treating these patients can be siloed rather than clinically integrated across hospital departments.



By integrating neurologists into the ED through teleneurology and neurohospitalist programs, we can ensure that acute care teams have access to experts trained in the latest stroke processes and protocols. These models align providers to deliver higher-quality care in a more collaborative, efficient way across different hospital departments, information systems, and care teams. This helps EDs to achieve more accurate diagnoses and transform the healthcare experience of one of the most serious and life-threatening conditions.

Teleneurology/Telestroke

Given the barriers to full-time neurological coverage in the ED, many departments partner with teleneurology services. Through this scalable service, rather than be directed to a general pool of neurologists, a hospital has access to a dedicated panel of physicians who can align to the hospital's needs based on its ED workflow. The hospital can then provide a broader range of services to patients who otherwise might be diverted, while gaining an economical solution to provide the best possible treatment to their patient population. This includes access to board-certified stroke experts via two-way video conferencing in a flexible and on-demand manner.

Telestroke has risen in popularity in response to an increase in stroke patients and the relative decrease in the number of available vascular neurologists ("stroke doctors") trained in evaluating and treating acute stroke. In addition to being able to expand a facilities' neurological services, telestroke's ability to provide immediate care can greatly reduce a stroke patient's risk of experiencing major impairment. Telestroke programs can ensure a designated team of vascular neurologists is available to hospitals.

Neurohospitalists

More and more hospitals are turning to neurohospitalists in response to a shortage of local neurologists and the need to treat patients with acute neurological problems more quickly.

On-call neurologists can take as long as 30 minutes to respond to neurological emergencies. In the case of stroke patients, this can mean the difference between maintaining neurological function and major impairment or death. Neurohospitalists resolve this issue by providing immediate patient care either in person or through a telemedicine platform.

The hospital benefits by offering dedicated neurology expertise and the ability to deliver coverage for inpatients. This is especially important to achieve Primary Stroke Center Certification.

A neurohospitalist, whether on-site or via telehealth, supports the seamless coordination of services between specialists and inpatient and ICU departments. This in-hospital presence provides the opportunity for integration with the full clinical care team. It also supports the development of treatment plans with the inpatient care team (internists, specialists, therapists, etc.). In these ways, neurohospitalists help to improve efficiency of patient throughput and move the dial to higher reliability and accountability with a focus on “what’s best for the patient.”^{xxiii}

The benefits of acute teleneurology/telestroke services include:

- Timely virtual neurology consultations; response time of < 5 minutes for stroke patients



- Remote patient interviewing and examination capabilities
- Review of neurological imaging and other ancillary testing
- Determination of eligibility for thrombolytic (tPA) therapy and need for neurointerventional procedures

- 24-7-365 access to neurologists with knowledge of latest stroke guidelines
- Dedicated panel of physicians for each location
- Effective integration with facility medical staff
- Leadership for stroke and acute neurology programs

The benefits of neurohospitalist services include:

- Customized services for each client, providing virtual and/or onsite support for patients



- Daily ED and inpatient consultation and rounding by neurohospitalist-led team
- Patient progress notes and order entry into EHR
- Consistent utilization of stroke order sets required for Joint Commission stroke center certification
- Review of neurological imaging studies and other ancillary testing
- Participation with palliative care teams
- Increased patient satisfaction by giving patients and their loved ones access to the best clinical experts with the most experience, who oversee their stroke recovery with compassion

Integration Leads to Transformation

Integration of acute neurologic care in our communities and EDs is only just beginning. Community awareness due to **FAST** is a great start – it means patients experiencing a neurologic crisis have a better chance of being identified by coworkers, friends and family. Ensuring EDs have access to neurology experts is the other key piece of the equation.

Opportunity exists to use innovative approaches to provide ED staff with access to expert clinical services, formalized training and systems of support by better integrating neurologists into the care continuum through teleneurology and neurohospitalist programs. Providers can transform the healthcare experience of a growing segment of the patient population, and one for which timely and accurate diagnoses is a critical factor in successful outcomes.

“Marrying neurohospitalist and telemedicine work is one of the best ways to provide services to underserved populations.”

— Arbi Ohanian, MD
Vituity's Vice President, Neurology

About Vituity

As a physician-led and -owned Partnership, Vituity places clinical expertise and patient outcomes at the center of our practice. Our acute focus and compassion are the driving forces that have positioned us at the heart of better care for nearly 50 years.

Our 3,500 doctors and clinicians at 300 practice locations across the country serve over 6.4 million patients annually. Our Core services include emergency medicine, acute psychiatry, acute neurology, hospital medicine, critical care, anesthesiology, telehealth, and outpatient medicine.

Our team provides customized care that allows your hospital to expand its neurological expertise. Vituity's panel of board-certified and board-eligible neurologists uses innovative approaches to improve cost efficiency and deliver best-practice patient care.

Visit our website for more information on our solutions:

[Vituity.com](https://www.vituity.com)

To contact one of our experts to learn how we can help you, email:

Solutions@vituity.com

ⁱ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3776531/>

ⁱ Fang J, Keenan NL, Ayala C, Dai S, Merritt R, Denny CH. Awareness of stroke warning symptoms—13 states and the District of Columbia, 2005. *MMWR* 2008;57:481–5.

ⁱⁱ Fewer Emergency Rooms Available as Need Rises. <https://www.nytimes.com/2011/05/18/health/18hospital.html>

ⁱⁱⁱ Trends in Emergency Department Visits for Ischemic Stroke and Transient Ischemic Attack: United States, 2001–2011. U.S. Centers for Disease Control and Prevention. March 2015. <https://www.cdc.gov/nchs/data/data-briefs/db194.htm>

^{iv} Wait Time for Treatment in Hospital Emergency Departments. CDC August 2012. <https://www.cdc.gov/nchs/products/databriefs/db102.htm>

^v Hand PJ1, Kwan J, Lindley RI, Dennis MS, Wardlaw JM. Distinguishing between stroke and mimic at the bedside: the brain attack study. *Stroke*. 2006;37(3):769–775

^{vi} Missed Ischemic Stroke Diagnosis in the Emergency Department by Emergency Medicine and Neurology Services, *Stroke*. <http://stroke.ahajournals.org/content/strokeaha/early/2016/02/04/STROKEAHA.115.010613.full.pdf>

^{vii} <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5361750/>

^{viii} Emergency Docs More Likely To Miss Signs Of Stroke In The Young. <http://www.npr.org/sections/health-shots/2014/04/05/299200133/emergency-docs-more-likely-to-miss-signs-of-stroke-in-the-young>

^{ix} Missed Ischemic Stroke Diagnosis in the Emergency Department by Emergency Medicine and Neurology Services, *Stroke*. <http://stroke.ahajournals.org/content/strokeaha/early/2016/02/04/STROKEAHA.115.010613.full.pdf>

^x Continuing Medical Education Activity in Academic Emergency Medicine. *Academic Emergency Medicine*. September 2016. <http://onlinelibrary.wiley.com/doi/10.1111/acem.13029/pdf>

^{xi} <http://qualitysafety.bmj.com/content/early/2013/03/27/bmjqs-2012-001550>



2100 Powell Street, Suite 400
Emeryville, CA 94608
(800) 476-1504
vituity.com

© 2019 CEP America, LLC. Vituity® is a registered trademark of CEP America, LLC.