



Telestroke

Connecting Patients to Quality Treatment

OVERVIEW

Stroke is the nation's No. 5 killer and a leading cause of serious long-term disability, with nearly 800,000 strokes and over 150,000 deaths occurring per year.^{1,2} About 75 percent of the total hospitalizations for stroke occur among adults age 65 and older.³ While stroke death rates have declined by at least seven percent across all racial and ethnic groups, Black people are more likely to die from stroke than other racial/ethnic groups.² By 2035, stroke-related costs are expected to be \$81.1 billion for non-Hispanic White people, \$32.2 billion for non-Hispanic Black people, and \$16.0 billion for Hispanic people.²

As these statistics demonstrate, the social and economic impact of stroke is devastating. Significant barriers prevent or slow treatment for a large number of patients with stroke, including long travel times to stroke center hospitals, patients not arriving at the hospital within the treatment window, and the lack of availability of stroke specialists who can evaluate the patient and determine if he or she is a candidate for treatment.⁴ The consequences for lack of timely identification and treatment of stroke can be deadly. Case in point, stroke mortality is higher for rural patients compared to patients in urban areas.⁵

The good news is that timely access to the latest therapies through expanded use of telestroke can greatly improve the quality of care and reduce disability from stroke, including in underserved regions.⁶ **Telestroke** provides an urgent and compelling alternative to having a stroke neurologist present at the bedside for treatment of acute strokes.

TELESTROKE DEFINED

Telestroke is the use of interactive video-conferencing in the delivery of acute stroke care.⁷ Specialists are provided with timely data to assist clinicians at the bedside in stroke-related decision-making for patients presenting at distant facilities that do not have a stroke neurologist available around the clock.

TELESTROKE AND tPA

Tissue Plasminogen Activator (tPA) (alteplase) is a clot-busting drug that helps reverse disability from the most common type of stroke if given within the first 3 to 4-1/2 hours of symptom onset. The faster a patient receives treatment for stroke, the better the chances for recovery with minimal or no disability. A 2021 study found that patients with a "door-to-needle" time of less than 60 minutes had a 38% risk reduction in 30-day mortality, a 29% risk reduction in 1-year mortality, and a 24% risk reduction in 2-year mortality; they were more likely to be ambulatory at discharge.⁸

However, not all Americans have equal access to certified stroke centers; research suggests seniors, American Indians, rural residents, and low-income individuals must travel greater distances to obtain certified stroke care.⁹ Further, a 2019 study found only about 37 percent of stroke patients arrived at the hospital within 3-1/2 hours of symptom onset which suggests these patients may not receive tPA until they are beyond the critical 4-1/2 hour threshold.¹⁰ Additionally, the demand for neurologists exceeds the supply, and this gap is projected to worsen, meaning that even emergency departments in urban and suburban areas may not have stroke neurologists readily available.¹¹ Telestroke can help fill the void.

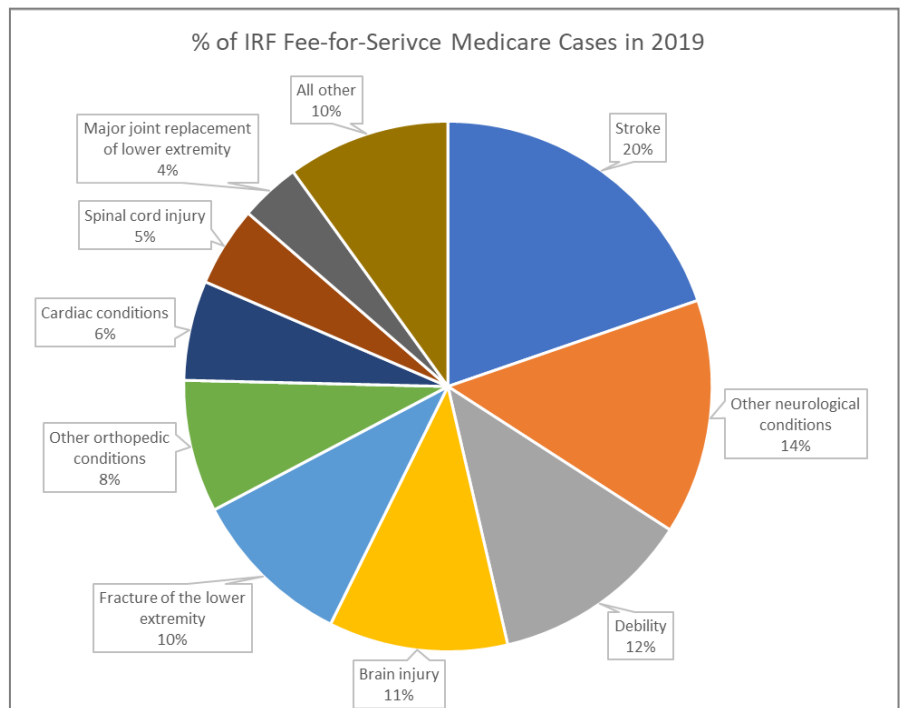
TELESTROKE: CONNECTING THE EVIDENCE

Telestroke programs are supported by evidence-based research. According to research, telestroke networks lead to the following benefits:

- Telestroke hospitals reported lower 30-day mortality and improved health outcomes compared to hospitals without telestroke services.¹²
- Telestroke has also proven effective in improving the quality of care in rural areas. One recent study of health outcomes after stroke in rural and super rural areas found that telestroke use was associated with a 10.1% increase in utilization of tPA.¹³
- Telestroke can increase tPA administration in community hospitals by 55%.¹⁴
- Telestroke can reduce the geographic and racial disparities in stroke treatment.^{15,16}
- Telestroke networks can contribute to advancing science by improving recruitment into stroke clinical trials.¹⁷
- Telestroke patients report significantly higher levels of satisfaction and quality of care when compared to non-telestroke patients¹⁸

TELESTROKE SAVES MONEY

Finally, telestroke can save Medicare and Medicaid money by reducing stroke-related disability and the need for costly inpatient rehabilitation and nursing home care. As of 2019, stroke is currently the leading cause of Medicare admissions to inpatient rehabilitation facilities (IRFs), accounting for nearly 20 percent of all such admissions.¹⁹ Research has shown that telestroke networks can save hospitals over \$350,000 per year and \$2,227 per patient in nursing home costs, after accounting for the increased costs of setting up and maintaining the network and providing tPA.^{20,21}



Source: MedPAC analysis of Inpatient Rehabilitation Facility–Patient Assessment Instruments from CMS

THE AHA ADVOCATES

The American Stroke Association, a division of the American Heart Association, urges policymakers to support the following policy recommendations for telestroke:²²

- Ensure that a coverage mandate for telestroke exists in all states, requiring third-party payers to offer specific, evidence-based telehealth interventions as covered services.
- Ensure that all properly trained providers are deemed eligible providers for telestroke interventions without restricted networks that would limit reimbursement by the provider. mechanisms for streamlining licensure for physicians providing telestroke consultations across state lines by state medical boards.

- Encourage the development of streamlined, simpler, less expensive technology platforms that allow interoperability between electronic record systems and keeps the patient burden and costs for healthcare systems as low as possible.

¹ Murphy SL et al. Mortality in the United States, 2020. NCHS Data Brief, no 427. Hyattsville, MD: National Center for Health Statistics. 2021. DOI: <https://dx.doi.org/10.15620/cdc:112079>

² Tsao, CW et al. heart disease and Stroke Statistics—2022 Update: A Report From the American Heart Association. *Circulation*. 2022; CIR0000000000001052. doi: 10.1161/CIR.0000000000001052. Epub ahead of print.

³ Yousufuddin M, Young N. Aging and ischemic stroke. *Aging* (Albany NY). 2019;11(9):2542-2544. doi:10.18632/aging.101931

⁴ Jauch EC, et al. Recommendations for regional stroke destination plans in rural, suburban, and urban communities from the prehospital stroke system of care consensus conference: a consensus statement from the American Academy of Neurology, American Heart Association/American Stroke Association, American Society of Neuroradiology, National Association of EMS Physicians, National Association of State EMS Officials, Society of NeuroInterventional Surgery, and Society of Vascular and Interventional Neurology: Endorsed by the Neurocritical Care Society. *Stroke*. 2021 52(5), e133-e152.

⁵ Hammond G, Luke AA, Elson L, Towfighi A, Joynt Maddox KE. Urban-rural inequities in acute stroke care and in-hospital mortality. *Stroke*. 2020;51(7):2131-2138. doi:10.1161/strokeaha.120.029318

⁶ Zhang D, Wang G, Zhu W, Thapa JR, Switzer JA, Hess DC, Smith ML, Ritchey, MD. Expansion of telestroke services improves quality of care provided in super rural areas. *Health Affairs*, 2018; 37(12), 2005-2013.

⁷ Demaerschalk BM, Berg J, Chong BW, et al. American Telemedicine Association: Telestroke Guidelines. *Telemed J E Health*. 2017;23(5):376-389. doi:10.1089/tmj.2017.0006

⁸ Bhatt NR, Backster A, Ido MS, et al. Impact of Intravenous Alteplase Door-to-Needle Times on 2-Year Mortality in Patients With Acute Ischemic Stroke. *Front Neurol*. 2021; 12:747185. doi:10.3389/fneur.2021.747185

⁹ Yu C, Blaine T, Panagos P, Kansagra A. Demographic disparities in proximity to certified stroke care in the United States. *Stroke*. 2021;52(8):2571-2579. doi:<https://doi.org/10.1161/STROKEAHA.121.034493>

¹⁰ Trent SA, Morse EA, Ginde AA, Havranek EP, Haukoos JS. Barriers to Prompt Presentation to Emergency Departments in Colorado after Onset of Stroke Symptoms. *West J Emerg Med*. 2019;20(2):237-243.

¹¹ Hasan TF, Turnbull MT, Vatz KA, Robinson MT, Mauricio EA, Freeman WD. Burnout and attrition: Expanding the gender gap in neurology? *Neurology*. 2019; 93 (23): 1002-1008. doi:10.1212/WNL.0000000000008583

¹² Wilcock AD, Schwamm LH, Zubizarreta JR, Zachrisson KS, Uscher-Pines L, Richard JV, Mehrotra A. Reperfusion Treatment and Stroke Outcomes in Hospitals With Telestroke Capacity. *JAMA Neurol*. 2021 May 1;78(5):527-535. doi: 10.1001/jamaneurol.2021.0023.

¹³ Zhang D, Wang G, Zhu W, et al. Expansion of telestroke services improves quality of care provided in Super Rural Areas. *Health Affairs*. 2018;37(12):2005-2013. doi:10.1377/hlthaff.2018.05089

¹⁴ Chalouhi N, et al. Rosenwasser R, Tjoumakaris S. Intravenous tissue plasminogen activator administration in community hospitals facilitated by telestroke service. *Neurosurgery*. 2013; 73:667-671.

¹⁵ Moskowitz, A, et al. Emergency physician and stroke specialist beliefs and expectations regarding telestroke. *Stroke*. 2010 41: 805-809.

¹⁶ Lysterly, MJ., et al. The effects of telemedicine on racial and ethnic disparities in access to acute stroke care. *J Telemed Telecare*. 2015.

¹⁷ Switzer, JA., et al. A telestroke network enhances recruitment into acute stroke clinical trials. *Stroke*. 2010.41.3: 566-569.

¹⁸ Wechsler LR, Demaerschalk BM, Schwamm LH, et al. Telemedicine quality and outcomes in stroke: A scientific statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2017;48(1). doi:10.1161/str.0000000000000114

¹⁹ Medicare Payment Advisory Commission. Report to the Congress: Medicare Payment Policy. March 2016.

²⁰ Switzer JA, et al. Cost-effectiveness of hub-and-spoke telestroke networks for the management of acute ischemic stroke from the hospitals' perspectives. *Circ Cardiovasc Qual Outcomes*. 2013; 6:18-26. doi: 10.1161/

²¹ Demaerschalk BM, et al. Cost utility of hub-and-spoke telestroke networks from societal perspective. *Am J Manag Care*. 2013; 19:976-85.

²² Schwamm LH, Chumbler N, Brown E, et al. Recommendations for the implementation of telehealth in cardiovascular and stroke care: a policy statement from the American Heart Association. *Circulation*, 2017;135(7): e24-e44.