Seamless Integrated Stroke Telemedicine Systems of Care
A Potential Solution for Acute Stroke Care Delivery Delays and Inefficiencies

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Although there still remains some work to be performed refining the operations of regional stroke networks designed to maximize intravenous thrombolysis eligibility and administration for patients with acute ischemic stroke,1 Prabhakaran et al2 have embarked on necessary research exploring the next level of sophistication—early determination of eligibility for endovascular therapies and the interhospital communication, which is required. Delay in hospital-to-hospital transfer is a common reason that patients with acute ischemic stroke are excluded from interventional therapy. The authors concluded that the likelihood of receiving intra-arterial treatment decreased rapidly in response to an increased transfer time. They propose that specific goals for transfer time be considered in future quality standards for comprehensive stroke centers and for the hub and spoke networks organized around them.

Prabhakaran et al3 remind readers of recent favorable advances in emergency stroke medicine, including an extended intravenous thrombolysis window and intra-arterial therapies that may allow more patients to be considered for revascularization treatment up to 8 hours from stroke symptom onset. The authors describe the current complexity of stroke systems of care with hub and spoke networks including acute stroke-capable community hospitals, primary stroke centers, and comprehensive stroke centers. The authors have identified communication and facilitation of rapid hospital-to-hospital transfers, when indicated, as critical factors.

The authors lament that inefficiencies and delays in hospital-to-hospital transfer are common reasons that patients with acute ischemic stroke are excluded from interventional therapy. The inefficiencies, poor communication, and resultant transfer delays can arise during any 1 or multiple steps in any acute stroke alert encounter with: emergency medical services dispatch, on scene, field assessment, triage, departure, en route, determination of destination, advance communication of estimated time of arrival to emergency departments, preliminary assessments and neurovascular imaging, with criteria-based determination of a need for transfer to a higher level of care, communication to vascular neurology, endovascular surgical neuroradiology, neurosurgery, and neurocritical care providers at receiving primary stroke centers and/or comprehensive stroke centers, with bed procurement, administration, transmission of medical records and neuroimaging results, contacting ground or air ambulance flight crews, transportation and traffic patterns, receiving hospital internal stroke alert activations, preparation of neuroangiography suite or operating room and their personnel and technical staff, and acquisition of patient or surrogate consent.

As for trauma emergencies and disaster management, telemedicine can provide the tools necessary to facilitate seamless integrated stroke systems of care. Prehospital telemedicine, telemedicine-enabled ground and air ambulances, and interhospital telemedicine communication, and practices already exist in trauma, emergency, and disaster management systems and networks.3–7 Imagine the optimal and timely patient-centered emergency stroke care that could be delivered if a virtual stroke team were intimately involved in the assessment, determination of needs, and coordination of care from as early as the 911 call and emergency medical services field assessment in a remote location to definitive intra-arterial treatment delivery at a comprehensive stroke center. Seamless integrated stroke telemedicine systems of care will adopt technology and virtual stroke teams whenever necessary and feasible to overcome distance, time, geography, and the urban–rural stroke personnel and resource disparities that exist.

Fortunately, the American Stroke Association has recently commissioned the development of guidelines to address interactions within stroke systems of care, including the incorporation of telemedicine. The recommendations that result will undoubtedly help to steer new and existing regional stroke networks closer to what we conceptualize as optimal.

Disclosures

None.

References

4. Graschew G, Roelofs TA, Rakowsky S, Schlag PM. Interactive video communication and medical telepresence and their role in trauma, emergencies, and disaster management. In: Latifi R, ed. Telemedicine for...


**Key Words:** acute stroke ■ emergency medical services ■ emergency medicine ■ interventional neuroradiology ■ stroke care ■ stroke delivery ■ stroke units ■ telemedicine ■ thrombolysis
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Stroke. 2011;42:1507-1508; originally published online April 28, 2011; doi: 10.1161/STROKEAHA.111.617779

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