Expertise in stroke telemedicine leverages advanced technology with the art of medical decision-making garnered from clinical experience in acute stroke. The Pre-Hospital Acute Neurological Therapy and Optimization of Medical Care in Stroke (PHANTOM-S) investigators demonstrate the profound effect that specialized stroke prehospital triage may have on stroke care, much as stroke unit care changed the nature of stroke management many years ago. The group elegantly studied the role of a stroke ambulance, the Stroke Emergency Mobile (STEMO), equipped with a computed tomographic (CT) scanner, point-of-care laboratory testing, and specialized personnel, in the delivery of appropriate patients to stroke units based on this novel framework for prehospital care. They previously reported an increased rate of intravenous thrombolysis in patients with ischemic stroke and a reduced time to treatment using the STEMO. This previous groundbreaking work on prehospital thrombolysis awaits broader validation in analyses of long-term clinical outcomes and overall costs, yet such analyses focus on a relatively small fraction of potential patients triaged with telemedicine in the field. Perhaps more importantly than measuring time to thrombolysis of patients with ischemic stroke, in this recent article, they demonstrated the effect of such telemedicine expertise on patients with both ischemic and hemorrhagic stroke. STEMO lead to improved delivery of patients with ischemic stroke to hospitals with stroke units and patients with hemorrhagic stroke to hospitals with neurosurgery capabilities. Interestingly, they also demonstrated a trend to improved outcomes with higher rates of discharge to home after hospitalization. Their work underscores 3 key points or vital concepts in the future evolution of stroke care: the value of neurological expertise in managing various types of stroke that likely outweighs technological advancements; the integration of imaging as an extension of the clinical examination in real time; and understanding the collaterome or the endogenous neurovascular compensation that dramatically influences the course of patients from the earliest moments after stroke onset.

Telestroke, or the use of telemedicine in stroke care, has been implemented with a diverse array of technology that has evolved in recent years. The specific technology, such as the STEMO ambulance, has been the main focus of clinical research, whereas the value of neurological expertise in acute stroke has been relatively neglected. The art of vascular neurology cannot be reduced to a simple protocol or checklist, especially given the recognized complexity and heterogeneity of acute stroke. Telestroke thrombolysis, in most cases, is powered solely by the assurance of such expertise for a potentially devastating disorder from a remote location at a moment’s notice. Despite the retrospective focus on stroke diagnoses, telestroke experts must be adept in managing other neurological emergencies or disorders and discerning stroke mimics. The changing nature of healthcare delivery and focus on long-term clinical outcomes reinforces the need to provide such expertise at the earliest stages after onset of the incredibly dynamic effects of acute stroke. Current technology now enables vascular neurologists to extend their expertise and help improve stroke patient outcomes around the world at any time. Is a mobile CT ambulance such as STEMO necessary to provide such expertise? The PHANTOM-S investigators astutely note that numerous factors beyond the technology contribute to such expertise. The art of stroke telemedicine expertise is rooted in experience and neurological training, not just about an added year in cerebrovascular medicine. Similarly, the tertiary/quaternary care value of a comprehensive stroke center or stroke unit emanates from such neurological expertise.

The innovation of mobile CT in the PHANTOM-S study insinuates that imaging is the dominant component, rather than a confirmatory diagnostic tool predicated on the clinical aspects of a case. Noncontrast CT findings in a prehospital stroke study, however, largely serve to corroborate intracranial hemorrhage or depict subtle early ischemic changes. Symptom constellation and neurological examination features drive the interpretation of these findings in real-time clinical context, where the majority of noncontrast CT studies are likely unremarkable. Stroke experts have become most proficient and nimble in translating imaging into logical decisions on stroke management. Future telestroke paradigms will likely build on even more sophisticated imaging interpretation for rapid therapeutic decisions. Although the imaging criteria for intravenous thrombolysis are extremely rudimentary, the selection criteria are far more complex for endovascular therapy. After proclamation of positive trial results for thrombectomy, imaging may be necessary to reveal persistent arterial occlusion or substantial tissue at risk on multimodal CT or MRI. Telestroke models may, therefore, require synchronous clinical and imaging expertise to direct transfers from a local hospital to interventional center. Delivering such expertise will be important not...
Disclosures

None.

References


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Art of Expertise in Stroke Telemedicine: Imaging and the Collaterome
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