Early Transfer of Stroke Patients to Comprehensive Stroke Centers

David and Goliath

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More than a thousand years ago on a battlefield in ancient Palestine, a shepherd boy (David) defeated a mighty fully armored warrior (Goliath) with a stone and a sling. Comprehensive Stroke Centers (CSC), the Goliath of stroke care, are typically high-volume, more experienced, and more resourced compared with conventional Stroke Units (SU) at community hospitals—David’s. Although the benefits from early evaluation and care of stroke patients not candidates for reperfusion therapy are undisputable, their routines transfer to a giant and busy CSC from a small but skilled SU is controversial.

Dr Sheth is the Goliath’s manager. He considers that our patient is at high risk for early clinical complications and that triaging such patients to a CSC that has the expertise and resources to manage the anticipated complications is essential. In contrast, Dr Langhorne argues that the best management for our patient is to admit him to a well run SU in the local community, despite the overwhelming superiority of CSC. This SU would need to have adequate number of skilled staff who is able to manage the common problems and complications in an acute stroke patient and the capacity for rapid transfer to a CSC if the patient’s condition was to deteriorate.

The battle begins and David hits Goliath’s face first: There is no evidence that an ambulance transfer improves stroke recovery, and it may be even harmful. Immediate acute stroke care at admitting SU is critical to increased chance of survival and regaining some independence. Goliath responds: This is true if the patient is managed in a properly run, well staffed and skilled SU, such a SU requires the corresponding accreditation and auditable quality measures. However, the number of such SU at community hospitals is scarce in many countries and mainly concentrated in urban areas.

Let us assume that our patient is initially admitted to a well run SU. Should our patient be immediately transferred to a CSC to be safe in case of future clinical deterioration or should the patient be closely monitored and only transferred to a CSC when complications arise? Goliath grabs David by the neck: Severe stroke patients are at risk of clinical deterioration and developing a malignant MCA infarction. In this setting, clinical deterioration and decreased level of consciousness are ominous and late signs that may require intubation, which further delays the emergent transfer to a CSC and increases the risk of poor outcome. David responds: But systematic transfer of unselected moderate and severe stroke patients for DWI evaluation is inefficient and unjustified. Therefore, prompt identification of patients at risk of clinical deterioration by the use of standardized protocols for transferring patients to CSCs is necessary. Beside stroke severity, the decision of transferring should take into account other factors, including distance between the SU and the CSC, transfer modality, patient stability, baseline imaging findings, and other patient’s characteristics. Our patient is at risk of clinical worsening and would benefit from a multidisciplinary evaluation, close clinical monitoring, advanced imaging monitoring, and 24/7 critical care and stroke neurology to ensure rapid response and intervention after the occurrence of a major complication. The presence of severe ipsilateral carotid stenosis in our patient confers further risk of clinical deterioration or stroke recurrence. Although an eventual carotid revascularization would not be per se an indication for emergent transfer, early surgical or endovascular referral and evaluation is needed.

Goliath seems to be on his way to take revenge for his past defeat in Philistine, but David has hidden 1 last stone in his sling: Telemedicine. Stroke patients can be evaluated within a telestroke network to enable the delivery of specific stroke therapies that require advanced multispecialty expertise and avoid unnecessary transfers. Telestroke networks can overcome geographic barriers to acute stroke care.
and enhance stroke diagnosis, providing expert clinical and imaging monitoring in the SU from the CSC, which may further improve the selection and timing of patient’s transfer. Telestroke networks have become widespread and represent an expanding model of stroke care, particularly in rural and small hospitals.

Afterall, the answer to the question of whether systematic early transfer of acute stroke patients to CSCs is necessary remains debatable because several patient- and system-related factors come into play. In addition to the clinical scenario, goals of care, and comfort level and expertise of the local SU, Stroke pathways and systems of care may vary widely depending on local, regional, and geographical variations in organizational structure, health system, and reimbursement policies.

**Disclosures**

None.

**References**


**KEY WORDS:** stroke • transfer
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Stroke. 2014;45:3752-3753; originally published online November 11, 2014;
doi: 10.1161/STROKEAHA.114.006999
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
http://stroke.ahajournals.org/content/45/12/3752

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