The Alabama Telestroke Network

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Presenter Disclosure Information

Toby Gropen, MD, FAHA
The Alabama Telestroke Network

FINANCIAL DISCLOSURE:
None

UNLABELED/UNAPPROVED USES DISCLOSURE:
None

AGENDA

- The Rationale and Evidence for Telestroke
- The ideal Telestroke Program within the stroke system of care
- Telestroke models
- What is the Alabama Telestroke Network?
VASCULAR NEUROLOGIST SHORTAGE

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2008</th>
<th>2009</th>
<th>2011</th>
<th>2012 (as per April 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total examinees</td>
<td>226</td>
<td>150</td>
<td>343</td>
<td>296</td>
<td>165</td>
<td>56</td>
</tr>
<tr>
<td>Grandfathering track</td>
<td>131</td>
<td>84</td>
<td>200</td>
<td>200</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Non-ACGME fellowship track</td>
<td>102</td>
<td>56</td>
<td>92</td>
<td>33</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>ACGME fellowship track</td>
<td>5</td>
<td>3</td>
<td>45</td>
<td>37</td>
<td>140</td>
<td>50</td>
</tr>
<tr>
<td>Repeat examinees</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>16</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Total certified</td>
<td>240</td>
<td>139</td>
<td>325</td>
<td>264</td>
<td>147</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Total Vascular Neurologists=1115
717 strokes per VN per year

Leira, E.C., et al., 2013

ACCESS TO STROKE CENTERS IN THE NORTHEAST

Gropen et al., 2009

ACCESS TO EMERGENCY CARE AND T-PA IN RURAL ARIZONA

Miley, M. L., et al., 2009

2-4% of rural stroke patients received t-PA vs. 18% in urban areas
TELEPHONE THROMBOLYSIS
- Treatment with telephone consultation increased the number of patients treated with tPA at the referral stroke center by 72%.
- However, the reported patient outcomes were poorer.

Frey et al., 2005

TELEPHONE VERSUS TELESTROKE: STROKE DOC TRIAL IN CALIFORNIA
- 234 patients were prospectively evaluated.
- Randomized to telemedicine or telephone consultation.
- Mean NIHSS score was 8.5, 11, 4.8, 7, telemedicine, 7.5, 7, 0.7, 6.7 telephone, p = 0.018.
- The primary outcome measure was whether the rt-PA decision was appropriate, or determined using a rigorous, multi-stage, blinded adjudication process.
- Correct treatment decision was made more often in telemedicine.

Mean duration of consultations with telemedicine was longer.

Meyer, et al., 2008; Capampangan, 2009

TELESTROKE IN RURAL GEORGIA

Switzer et al., 2009
**Survey of U.S. Telestroke in 2009**

In 65.5% of hubs, >80% of spoke sites were rural.
In 51.7% of hubs, >80% of spokes were small hospitals.

**Telestroke versus In-Person Evaluation**

- Telestroke patients vs. patients treated at hub by the same vascular neurologists
- No difference in functional outcome at 90 days (mRS)

**Stroke Patient Triage: A Two-Tiered Approach**

Primary stage: at the level of EMS
Secondary stage: inter-facility transfer
PSC ELVO PROTOCOL STUDY

- Retrospective cohort study
- 14 regional PSCs instructed on the use of a protocol for stroke patients with LAMS ≥ 4
  - ED physician does LAMS on potential stroke patients immediately upon their arrival to the PSC
  - For stroke patients with LAMS ≥ 4, the CSC is notified immediately and CSC critical care transport team is dispatched
  - At PSC, CTA is performed concurrently with noncontract CT of the brain and within 30 minutes of arrival and imaging data is shared with the CSC using a cloud-based platform
  - All patients with confirmed ELVO are directly transported to the CSC angiography suite

McTaggart et al., 2017

PSC ELVO PROTOCOL

McTaggart et al., 2017
### KEY TIME INTERVALS FOR A PARTIALLY VS FULLY EXECUTED PSC ELVO PROTOCOL

DIDO was reduced from a median time of 104 minutes (95% CI, 82-112 minutes) to a median time of 64 minutes (95% CI, 51-71 minutes) ($P < .001$).

McTaggart et al., 2017

### THE IDEAL TELSTROKE PROGRAM WITHIN THE STROKE SYSTEM OF CARE

- Provides high-quality, reliable, full-time vascular neurology consultation that is easily accessed
- Facilitates access to timely acute therapies
  - T-PA
  - Mechanical thrombectomy
  - Neurosurgical and neurocritical care expertise
- Facilitates appropriate and rapid triage based on patient needs, hospital capacity, and travel time
  - Nonstroke patients who do not require transfer for stroke center services
  - Stroke patients who may be managed without transfer
  - Patients who require transfer for PSC or CSC services
- Is integrated in the stroke system with
  - the prehospital EMS
  - the interfacility transfer process
  - Receiving facilities/providers in the event of secondary triage
- Minimizes DIDO for patients who need a higher level of care

### HUB AND SPOKE

<table>
<thead>
<tr>
<th>Potential Advantages</th>
<th>Potential Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready ability to establish relationships</td>
<td>Limited supply of Vascular Neurologists at smaller hubs</td>
</tr>
<tr>
<td>Clearly defined destination for advanced stroke care</td>
<td>Limited services beyond the hub catchment area</td>
</tr>
<tr>
<td>Continuity of care</td>
<td>Transfer decisions may be unduly influenced by the spoke-hub relationship</td>
</tr>
<tr>
<td>Lower administrative burden related to state licensure</td>
<td>Potential to bypass facilities that could provide services in a more timely manner</td>
</tr>
<tr>
<td>Access to hub vascular neurology expertise</td>
<td></td>
</tr>
</tbody>
</table>
TELEMEDICINE COMPANY

**Potential Advantages**
- Ability to provide telestroke services to hospitals located outside of the catchment area of the nearest hub
- Ability to draw on a large pool of providers who may be anywhere

**Potential Disadvantages**
- Possible barrier to formation of relationships due to a large number of providers
- Potential for variable vascular neurology expertise
- Lack of access to hub vascular neurology expertise
- Lack of continuity of care and delayed triage for advanced care
- Higher administrative burden related to state licensure

PRIVATE PRACTICE-BASED

**Potential Advantages**
- Ready ability to establish relationships
- Ability to provide telestroke services to hospitals located outside of the catchment area of the nearest hub

**Potential Disadvantages**
- Potential for variable vascular neurology expertise
- Lack of access to hub vascular neurology expertise
- Lack of continuity of care and delayed triage for advanced care
- Higher administrative burden related to state licensure

A PROPOSAL: THE ALABAMA TELESTROKE NETWORK

- Create a State-based network of telestroke provided by Alabama-based neurologists, the Alabama Telestroke Network (ATN)
- Link the Alabama Trauma Communication Center (ATCC) to the ATN by telemedicine to provide a novel model of medical control for stroke triage
- Goal is to provide high-quality telestroke consultation that is integrated with prehospital care and secondary triage/inter-facility transfer
A PROPOSAL: THE ALABAMA TELESTROKE NETWORK

### Potential Advantages

- **Readily able to establish relationships**
- ATCC determines destination for advanced stroke care based on real-time capacity and travel time
- Continuity of care with handoff
- Lower administrative burden related to state licensure
- Access to ATN vascular neurology expertise
- Ability to provide telestroke services to hospitals located outside of the catchment area of the nearest hub
- Ability to draw on a pool of providers across the state

### Potential Disadvantages

- Disrupts traditional referral patterns
- May require modification when state lines are crossed
- If scaled to other states, will require modification of prehospital systems

### Mobilization of Resources

1. Mobilization of resources starts from the field
2. Telestroke consult with ATCC dispatch of critical care transport team
3. Handoff to physicians at secondary triage destination