Integrating Evidence Based Telemedicine into Stroke Systems of Care
Disclosures

- Adrian Jarquin-Valdivia, MD - no financial disclosures

- Debra Philpot, RN - no financial disclosures
Objectives

• Discuss the national and regional gaps in quality stroke care.

• Describe the TriStar Tele-neurology Network.

• Explore the capabilities and limitations of a tele-neurology consult through a real-time demonstration.

• Explain the role of telemedicine for ASRH, PSC, & CSC within the stroke system of care.

• Explore process improvement opportunities in the integration of telemedicine into existing stroke centers.
Treatment Access Gap Impacts Overall Quality of Stroke Care

US Geographic Distribution of rt-PA Utilization for Acute Ischemic Stroke, by Hospital

- Only 22% of Americans live within a 30-minute drive of a stroke center; only 55% live within a 60-minute drive.
- 64% of hospitals have yet to implement basic stroke care and have not yet delivered thrombolytic therapy to stroke patients.

rt-PA = recombinant tissue plasminogen activator.
TENNESSEE STROKE REGISTRY REPORT, 2014.
A partnership between East Tennessee State University College of Public Health, the Tennessee Department of Health and the American Heart/American Stroke Association
Locations of all 26 certified stroke centers in Tennessee, and 9 centers in surrounding states
45.1% live within 30 minutes ground travel time from a certified stroke center
69.8% within 60 minutes
89.1% within 90 minutes

10.9% of Tennesseans, an estimated 691,725 people, live more than 90 minutes ground travel time from a certified stroke center.
Policy Recommendation

1. Because of the limited distribution and availability of neurological, neurosurgical, and radiological expertise, the use of telemedicine/telestroke resources and systems should be supported by healthcare institutions, governments, payers, and vendors as one method to ensure adequate 24/7 coverage and care of stroke patients in a variety of settings.
Nashville Market
Telemedicine Vision

Initial
• Increase the TriStar Stroke Network’s capacity to triage, assess, diagnosis, and treat critically ill neurological patients by leveraging the technology of telemedicine

Expanded
• Provide TriStar and affiliate partners 24/7 access to needed sub-specialty experts across the continuum of care.
• Improve timeliness and quality of care
• Right care, right place, right time
TriStar Telemedicine Snapshot

5,152
Total telemedicine encounters in 2014

5
Service lines

23
TriStar Hospitals & Free-Standing EDs

19
Non-TriStar Hospitals

1 A Facility of Parkridge Medical Center
2 A Behavioral Health Facility of Parkridge Medical Center
3 A Facility of Skyline Medical Center
2015 TriStar Tele-Neurology Providers

- 24/7 coverage for stroke and neurologic emergencies
- One call access, TriStar Transfer Center
- 10 minute response time for emergent Code Stroke consults
- Routine neurology consults
- Hand-off process to neurology/hospitalist team
- InTouch Health technology
- Services provided by board-certified neurologist
6.7 min.
Average Response Time

**EMERGENT - 75%**
- Acute stroke <6hrs
- Status epilepticus
- Unexplained coma
- Mass effect
- Spinal cord Injury

**URGENT**
- Acute stroke >6hrs
- Seizures
- Suspect GBS
- MG crisis
- Migraine
- Brain death
- Movement disorders

**ROUTINE - 25%**
- Stroke >24hrs
- AMS

“STAT CODE STROKE/NEURO”

“CODE STROKE/NEURO”

“ROUTINE CONSULT”
Clinical Results – Disposition

- Transfer to Higher Level of Care: 11%
- Remained at Originating Facility: 89%

203 Consults resulting in a Transfer in 2015
Technical | Clinical

Identify patterns, characteristics, opportunities

Intelligence

Decisions
Challenge / Opportunity: PSC DTN Times

- Detailed review of each consult
  - Delay in notification of telemedicine
  - Delay at the Transfer Center
  - Delay in response
  - Delay in tPA admin

- Re-design code stroke protocol
  - Implemented dedicated “stroke line”
  - Developed physician score cards
  - Physician driven tPA audits
  - Increase frequency of reviews
  - Refresh tele-neurology technology

Call Transfer Center
Dial 511
Prompt 1

Call Transfer Center
Dial 511
Prompt 2
## Physician Score Cards

<table>
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<tr>
<th>Response Time</th>
<th>Emergent 10 Mins</th>
<th>Urgent 15 Mins</th>
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<tbody>
<tr>
<td>Goals</td>
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<tr>
<td>Physician Average</td>
<td>4.5 Mins</td>
<td>6.5 Mins</td>
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</tbody>
</table>

**Physician Response Time**

![Meter Graph with indicators for response time]

*Image and data courtesy of TriStar Health.*
## Stroke Timeline Report

**Patient Name:** Timeline, Stroke  
**MRN:** report  
**Date of Birth:** 08/08/1966  
**Hospital:** CLIC Hospital of Santa Barbara  
**Onset Time:** Aug 17 2015 16:57 PDT  
**Age:** 49

<table>
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<th>Goal Time</th>
<th>Actual Time</th>
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<td>Aug 17 2015 18:10 PDT</td>
<td>22 min</td>
<td>22 min</td>
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</table>

**Arrival to Consult Request Time**

- **0 min**: Suspected stroke patient arrives at ED
- **≤10 min**: Initiate ED Rapid Medical Assessment (RMA) including patient history, last known well/time of symptom onset, NIHSS and order CT and lab work
- **≤15 min**: Notify Stroke Team (including neurologic expertise)
- **≤25 min**: Initiate CT scan
- **≤45 min**: Interpret CT scan and lab; review patient eligibility for Activase
- **≤45 min**: Activase (IAP) recommended
- **60 min**: Review patient eligibility for Endovascular Reperfusion Therapy (Intraarterial Thrombolysis)
- **≤60 min**: Give Activase bolus and initiate infusion in eligible patients
Previous State

- Suspected stroke patient arrives at the ED
  - Perform the initial patient evaluation within 10 minutes of arrival in the ED
- Notify the stroke team within 15 minutes of arrival
- Initiate a CT or MR scan within 25 minutes of arrival
- Interpret the CT or MR scan within 45 minutes of arrival
- Start IV rt-PA for eligible patients immediately after scan interpretation

Request consult after CT / labs resulted

Perform the initial patient evaluation within 10 minutes of arrival in the ED.

Notify the stroke team within 15 minutes of arrival.

Initiate a CT or MR scan within 25 minutes of arrival.

Interpret the CT or MR scan within 45 minutes of arrival.

Start IV rt-PA for eligible patients immediately after scan interpretation.

Request EMERGENT consult if LSN >6 hours & normal glucose.

Suspected stroke patient arrives at the ED.

0 min

≤10 min

≤15 min

≤25 min

≤45 min

≤60 min

Current State

Integration

• Guidance & Support
  – protocols, order sets
  – JC certification
  – stroke team member - case review & process improvement

• Education
  – basic ➔ advanced
  – initial & on-going
  – EMS ground & air
  – community events

• Focus on Outcomes
  – response times
  – tPA rates & times
Stroke System of Care Summary

EMS goes to the nearest Acute Stroke Ready Hospital or PSC if more than 20 minutes from CSC

Early activation of highly skilled, committed tele-neurologist

Timely treatment (DTN) and rapid disposition to CSC

Tele-neurology facilitates Rapid, Accurate Treatment & Rapid, Appropriate Transfers
References


Need Telemedicine?

TriStar Transfer Center
1-855-372-3648