Acadian Ambulance/National EMS Academy

EMS Stroke Management

Charles Burnell MD, FACEP

Stroke Webinar Series
Session 2
Objectives

- Define the call taking and dispatch process for suspected stroke
- Understand EMS assessment process
- Describe EMS management of suspected stroke
- Identify factors in determining optimum transport methods and patient destination
Stroke Incidence

• >700,000 occur annually
• About 2% of all EMS calls nationwide
• Acadian responded to > 8000 suspected stroke calls in 2015 (Includes Interfacility and scene calls)
Detecting Stroke at Dispatch is a Challenge

- Phone Triage alone
  - U.K study showed <50% sensitivity for identifying and prioritizing stroke and need for improvement
- Pro-QA Process
  - Automated tool to guide the dispatcher with prehospital patient care instructions
  - San Diego County showed 83% sensitivity and Positive Predictive Value of only 42% for stroke at Emergency Medical Dispatch

EMS Assessment

• EMS Assessment has significant variability
  • Cincinnati Prehospital stroke scale or CPSS remains the most common EMS assessment tool with a sensitivity of 79% but poor specificity at 24% ¹
  • Takes less than 2 minutes to perform

• Miami Emergency Neurologic Deficit (MEND) and Los Angeles Prehospital Stroke Scales
  • adds components of NIH exam to increase specificity but lowers overall detection rates ²

Assessment outside the ED

F.A.S.T. / Cincinnati Prehospital Stroke Scale

F - Facial droop
A - Arm drift
S - Speech difficulty
T - Time to call 911/ EMS = Time of Onset

(Time last seen normal)

CPSS assessment identical to FAST but with scoring system

Image: AARP.com
EMS Stroke Management

- **Definitive** Diagnosis and treatment is not possible in pre-hospital setting
- **Primary Goals** are rapid recognition of possible stroke and need for immediate transport to **MOST** appropriate facility
EMS Stroke Management

- **Consists of**
  - Support for ABC’s
  - Transport decision making process
  - LERN Notification
  - Stroke Alert – Variable notification processes

- **Facilitation of inter-facility transport when indicated**
  (Drip and Ship)

- **Suspected Large Vessel Occlusion Study**

EMS Stroke Management

- Assessment and transport decision making guided by Regional protocols
- LERN can assist with identifying destination hospitals with resources for time-sensitive disease
Management

- Suction as needed
- Basic Airway adjuncts as indicated
- Supplemental oxygen titrated to $\text{SpO}_2$
- Intubation if GCS < 9 with failure to maintain airway
- Support of respiratory rate and effort if indicated using $\text{EtCO}_2$ as target
Assessment Tools and Targets

- GCS determination (< 9 Airway)
- Oxygen Saturation -> 95%
- Respiratory rate 8-12 / min
- EtCO₂ 35-45 mmHg
- B/P > 90 systolic at all times
- CBG > 50-90 mg/dl
- ECG monitoring
Stroke Alert

• Follows Regional Alert Criteria
  • Positive stroke indications from CPSS or MEND
  • Time of onset less than 8 hours
  • No history of recent head trauma or seizure
  • CBG greater than 50 mg/dl
  • Greater than 18 years of age
LERN Hospital Classification

• Four levels of classification
  • 1 – Comprehensive Stroke Center (CSC) 24/7 Neuro capable facility
  • 2 – Primary Stroke Center (PSC) with or without endovascular capability and neurosurgery within 2 hours of activation
  • 3 – Tertiary Stroke Center - 24/7 lab and CT imaging for Drip- and- ship protocol
  • 4 – No CT or Lab

• Louisiana protocol recommends closest Level 1, 2 or 3 for rapid access to thrombolytic therapy and rapid referral to Level 1 or 2 as needed
Quality Assessment Tools and Targets

- Scene Time
  - < 10 minutes
- CBG measurement
  - 100% compliance
- Future Measurements?
  - FMC to Definitive Treatment
  - Regional Protocol Compliance
Transport

- Transport Destination using regional protocol if possible
- Air versus Ground
  - Time/logistics driven
- < than 2 hrs. transport time transport directly to a primary stroke center
- > 2 hrs. transport to closest Tertiary Stroke Center
Interfacility Transport (Drip and Ship)

- Interfacility Transfer
- Documentation
- Pre-packaging patient and data is CRITICAL to shortening time at facility
- Choreography of EMS and hospital staff must be SEAMLESS
# Interfacility Transport (Drip and Ship)

- **Mini NIH Stroke Scale**

## 1a. Level of Consciousness

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Alert; keenly responsive.</td>
</tr>
<tr>
<td>1</td>
<td>Drowsy; arousable by minor stimulation</td>
</tr>
<tr>
<td>2</td>
<td>Suporously; requires <em>repeated stimulation</em> to attend, or is obtunded and requires <em>strong or painful stimulation</em> to make movements.</td>
</tr>
<tr>
<td>3</td>
<td>Coma; responds only with reflex motor or autonomic effects or totally unresponsive, flaccid, and areflexic.</td>
</tr>
</tbody>
</table>

## 1b. LOC Questions: The patient is asked the month and his/her age. The answer must be correct—there is no partial credit for being close. If intubated, arbitrarily score 1.

<table>
<thead>
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<th>Score</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Answers both questions correctly.</td>
</tr>
<tr>
<td>1</td>
<td>Answers one question correctly.</td>
</tr>
<tr>
<td>2</td>
<td>Answers neither questions correctly.</td>
</tr>
</tbody>
</table>

## 1c. LOC Commands: The patient is asked to open and close the eyes and then to grip and release the non-paretic hand. Demonstration is permitted.

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</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Performs both tasks correctly.</td>
</tr>
<tr>
<td>1</td>
<td>Performs one task correctly.</td>
</tr>
<tr>
<td>2</td>
<td>Performs neither task correctly.</td>
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## Motor Arm: The limb is placed in the appropriate position; extend the arms (palms down) 45 degrees. 10 second count for arm.

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<tbody>
<tr>
<td>0</td>
<td>No drift; limbs holds for full count.</td>
</tr>
<tr>
<td>1</td>
<td>Drift; drifts before full count; does not hit the bed or other support.</td>
</tr>
<tr>
<td>2</td>
<td>Some effort against gravity; limb cannot get to, or maintain position, drifts to bed, but has some effort against gravity.</td>
</tr>
<tr>
<td>3</td>
<td>No effort against gravity; limb falls</td>
</tr>
<tr>
<td>4</td>
<td>No movement.</td>
</tr>
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</table>

## Motor Leg: The limb is placed at 30 degrees. 5 second count for leg.

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<td>No effort against gravity; limb falls</td>
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<td>4</td>
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Questions?

Next Session:

Acute Stroke Management
Stroke Webinar Series Session 3
March 24, 2016 at 10:00 am

Presented by: Dr. Joseph Acosta