Washington State EMS
Prehospital Stroke Triage Tool
Presentation Overview

How did we get here? History & background of Washington’s Emergency Cardiac and Stroke System

CDC Paul Coverdell grant

The triage stroke tool ~ Initial, revised, and the need for change

How Flex funds support the program

Strengths and areas of opportunity
Stroke and Washington State

Washington’s Emergency Cardiac and Stroke System

- 1999 EMS trauma directed work group to assess cardiac and stroke care
- 2002 First ECS report showing variations in care; no funding
- 2005 CDC Heart Disease and Stroke Prevention grant to improve emergency response to heart attack and stroke
- 2008 Second ECS report
- 2010 ECS Legislation; no funding
- 2011-2013 system/stroke triage tool implementation
- 2015 CDC Coverdell grant received (through June 2020)
- 2016-2017 stroke triage tool revised, implementation in process
WHO Stroke Definition

• A neurological impairment or deficit of
• Sudden onset, and
• Lasting more than 24 hours (or leading to death)
• Of presumed vascular origin
• Three major types of stroke
  ➢ Ischemic Stroke
  ➢ Intracerebral Hemorrhage
  ➢ Subarachnoid Hemorrhage
3 Major Types of Stroke

- Normal
- Ischemic Stroke
- Intraparenchymal Hemorrhage
- Subarachnoid Hemorrhage
Stroke Facts

• > 795,000 people have a stroke each year in the US
• About 25% die at the time of the stroke event or soon after.
• 15%–30% remain permanently disabled.
• Total annual stroke costs to the nation are about $38.6 billion.
• Transport of stroke patients to the hospital results in faster treatment, yet > 1/3 of stroke patients do not call 9-1-1 and use EMS to get to the hospital.
• Gaps remain in the quality of care provided to acute stroke patients.

http://www.cdc.gov/dhdsp/programs/stroke_registry.htm
Acute Stroke Treatment Advances

• 1990s
  ▪ tPA shown effective for ischemic stroke
    • Narrow time window (3 hours then in 2008 4.5 hours)

• 2000s
  ▪ Stroke Units decrease mortality, improve function
  ▪ Hemicraniectomy for large strokes
  ▪ TJC begins to certify Stroke Centers

• 2015
  ▪ Endovascular therapy to remove clots
    • 6 hour time window
The Components of a Stroke System of Care

Pre-Event
- Primordial Prevention & Community Education
- Primary Prevention & Outpatient Care

Event
- EMS
- Acute Care
- Rehabilitation & Recovery
- Telemedicine for Stroke

Post-Event
- Ongoing Secondary Prevention

http://www.cdc.gov/dhdsp/programs/stroke_registry.htm
Goals

- Rapid workup
- Rapid decision making
- Rapid treatment
- Minutes matter!

Stroke: Time lost is brain lost
SSHB 2396 – Key Points

• It is the intent of the legislature to support efforts to improve emergency cardiac and stroke care in Washington through an evidence-based coordinated system of care

• By January 1, 2011, the department shall endeavor to enhance and support... through:
  – Encouraging hospitals to voluntarily self-identify cardiac and stroke capabilities/levels
  – Adopting cardiac and stroke prehospital patient care protocols, patient care procedures, and triage tools, consistent with the guiding principles and recommendations of the emergency cardiac and stroke work group report
Quick Overview of the Cooperative Agreement with the CDC

Paul Coverdell

National Acute Stroke Prevention

DP15-CDC-1514
A short history on Coverdell

- US Senator from Georgia
- Died from a cerebral hemorrhage in 2000.
- 2001: Congress directs CDC to implement state-based registries to measure and track acute stroke care to improve quality.
- Congress named the Paul Coverdell National Acute Stroke Registry (PCNASR) in memory of Senator Coverdell.
High Level Goals

GOAL: Reduce time to treatment and improve outcomes.

MAJOR STRATEGIES:

• Increase the public’s recognition of signs and symptoms
• Standard EMS stroke assessment, triage based on result, and early notification to hospital
• Rapid, evidence-based treatment at hospitals
• Improved post-acute care by increasing the use of rehab and improving transitions back to home and primary care.
• Quality improvement based on meaningful, standardized data through a registry that links EMS, hospital, and post-acute data so we can measure performance across the system and use it for process and outcome improvement.
Washington Coverdell Stroke Program 2015-2020

GOAL: Better stroke outcomes by increasing stroke awareness, improving care along the continuum, and measuring performance to continuously improve quality of care.

- Stroke
  - Call 9-1-1 right away!
  - Dispatch EMS
  - EMS on-scene
  - Door to needle <60 minutes
- Acute Stroke-Ready Hospital
  - Interhospital transfer
  - Notify hospital
- Home
- Primary/Comprehensive Stroke Center
- Inpatient Rehab
  - Notify hospital
- Acute Stroke-Ready Hospital
  - EMS on-scene
  - Dispatch EMS
  - Call 9-1-1 right away!
Our Peer States

- California
- Georgia
- Massachusetts
- Michigan
- Minnesota
- New York
- Ohio
- Washington
- Wisconsin
Community Education
Risk Factors & Warning Signs

Raising awareness about FAST, sodium, high blood pressure & AFib

SPOT A STROKE

FACE DROOPING
ARM WEAKNESS
SPEECH DIFFICULTY
TIME TO CALL 911

The AFib Five
5 Steps to Your Healthiest Life with AFib

140 = is too HIGH
heart.org/HBP
Primary & Secondary Prevention
Resources for Practitioners

<table>
<thead>
<tr>
<th>Blood Pressure Category</th>
<th>Systolic mm Hg (upper #)</th>
<th>Diastolic mm Hg (lower #)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>less than 120</td>
<td>less than 80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120 – 139</td>
<td>or 80 – 89</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 1</td>
<td>140 – 159</td>
<td>or 90 – 99</td>
</tr>
<tr>
<td>High Blood Pressure (Hypertension) Stage 2</td>
<td>160 or higher</td>
<td>or 100 or higher</td>
</tr>
<tr>
<td>Hypertensive Crisis (Emergency care needed)</td>
<td>Higher than 180</td>
<td>or Higher than 110</td>
</tr>
</tbody>
</table>

Resources Include:
- Patient Education Handouts
- Customizable Spot a Stroke F.A.S.T. Materials
- Community Slide Decks
- EMS Marketing and Training Tools
- Stroke Infographics

Check it out at StrokeAssociation.org/resources!

Even the strongest individual needs support.

Getting results with our new Blood Pressure Algorithm, the Stroke Resource Center, education on cryptogenic stroke, & an online community on the Support Network
**State of Washington**

**Prehospital Stroke Triage Destination Procedure**

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**Assess Applicability for Triage**

Report from patient or bystander of one or more sudden:
- Numbness or weakness of the face, arm or leg, especially on one side of the body
- Confusion, trouble speaking or understanding
- Trouble seeing in one or both eyes
- Trouble walking, dizziness, loss of balance or coordination
- Severe headache with no known cause

**NO**

- Transport per regional patient care procedures and county operating procedures where they exist

**YES**

**Perform F.A.S.T. Assessment**

- Face: unilateral facial droop?
- Arms: unilateral drift or weakness?
- Speech: abnormal or slurred?
- Time last normal (determine time patient last known normal)

**YES**

| Yes to any one sign (Face, Arms, Speech) = YES |
| No to all three signs = NO |

**NO**

- Transport per regional patient care procedures and county operating procedures where they exist

**Determine Destination**

- Transport the patient to the nearest Level I, II, or III Stroke Center.
- If the nearest center is a Level III, and there's a Level I or II available with no more than 15 minutes increase in transport time, go to the nearest Level I or II Stroke Center.

See side box for additional destination considerations

**Limit scene time and alert destination hospital ASAP**

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**Additional Destination Considerations:**

- Any additional transport time should not take the patient outside of the IV thrombolysis window of 3.5 hours from the time last seen normal.
- For patients last seen normal plus transport time ≥ 3.5 hours to ≤ 6 hours, consider transport to a Level I Stroke Center or a Level II Stroke Center with intra-arterial interventional capability.
- Assess availability of critical care air transport if it can help get the patient to a Stroke Center within the window of time for intervention.
- If unable to manage airway, consider rendezvous with ALS or intermediate stop at nearest facility capable of definitive airway management.
- If there are two or more Stroke Centers of the same level to choose from within the transport timeframe, patient preference, insurance, physician practice patterns, and local rotation agreements may be considered.
**STEP 1: Assess Likelihood of Stroke**
- Numbness or weakness of the face, arm, or leg, especially on one side of the body
- Confusion, trouble speaking, or understanding
- Trouble seeing in one or both eyes
- Trouble walking, dizziness, loss of balance, or coordination
- Severe headache with no known cause

*If any of above, proceed to STEP 2. If none, transport per regional PCP/county operating procedures*

**STEP 2: Perform F.A.S.T. Assessment** (positive if any of Face/Arms/Speech abnormal)
- Face: Unilateral facial droop
- Arms: Unilateral arm drift or weakness
- Speech: Abnormal or slurred
- Time: Best estimate of Time Last Known Well = ______

*If FAST negative, transport per regional/county operating procedures*

**STEP 3: If F.A.S.T. Positive - Calculate Stroke Severity Score**

<table>
<thead>
<tr>
<th>Facial Droop:</th>
<th>Present 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Drift:</td>
<td>Falls Rapidly 2</td>
</tr>
<tr>
<td>Grip Strength:</td>
<td>No Grip 2</td>
</tr>
</tbody>
</table>

Total Stroke Severity Score = _______  (max. 5 points)

**STEP 4: Determine Destination: Time Last Known Well + Stroke Severity Score**

- **Time Last Known Well ≤ 6 Hours**
  - (Provide stroke alert to destination hospital ASAP)
  - Stroke Severity Score 4 or more?
    - YES
    - **Transport to nearest Level I or II Stroke Center with endovascular capability provided transport time is no more than 15 minutes greater than to a nearer Level II or Level III Stroke Center.**
  - NO

- **Time Last Known Well > 6 Hours**
  - (regardless of Stroke Severity Score, alert destination hospital)
  - Transport to nearest Level I or any Level II Stroke Center provided transport time is no more than 15 minutes greater than to a nearer Level III Stroke Center.

**Additional Destination Considerations:**
- Any additional transport time should not take the patient outside of the IV tPA time window.
- Assess availability of critical care air transport if it can help get the patient to a Stroke Center within the window of time for intervention.
- If unable to manage airway, consider rendezvous with ALS or intermediate stop at nearest facility capable of definitive airway management.
- If there are two or more Stroke Centers of the same level to choose from within the transport timeframe, patient preference, physician practice patterns, and local rotation agreements may be considered.
Why Change the EMS Prehospital Stroke Triage tool?

• In the past primary treatment was tissue plasminogen activator, or tPA, which all facilities can provide.

• Recent research (next slide) has shown that thrombectomy (clot retrieval) is more effective at treating large vessel occlusion ischemic strokes.

• Not all Level II facilities can perform this procedure, so it was necessary to adjust the tool to account for this.

• EMS will now have the ability to transport a qualifying patient to a thrombectomy-capable even though it might not be the nearest.
# Thrombectomy Trials 2015

<table>
<thead>
<tr>
<th></th>
<th>MR CLEAN</th>
<th>EXTEND-IA</th>
<th>ESCAPE</th>
<th>SWIFT-PRIME</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total N</strong></td>
<td>500</td>
<td>70</td>
<td>316</td>
<td>196</td>
</tr>
<tr>
<td><strong>Age limit</strong></td>
<td>none</td>
<td>none</td>
<td>None</td>
<td>80</td>
</tr>
<tr>
<td><strong>Time window</strong></td>
<td>6 hrs to initiation</td>
<td>6 hrs to puncture</td>
<td>Up to 12 hours 75% w/in 6 hrs</td>
<td>6 hours to puncture</td>
</tr>
<tr>
<td><strong>Vascular Imaging</strong></td>
<td>ICA, M1,2, A1,2; neck ICA occlusion per local judgment</td>
<td>ICA or MCA occlusion</td>
<td>MCA +/- prox ICA Good collaterals</td>
<td>Distal ICA, M1</td>
</tr>
<tr>
<td><strong>Brain Imaging</strong></td>
<td>None</td>
<td>ischemic core of less than 70 ml</td>
<td>ASPECTS of 6 to 10</td>
<td>No CT &gt; 1/3 MCA APECTS &gt;= 6 Target mismatch</td>
</tr>
<tr>
<td>%tPA</td>
<td>89%</td>
<td>100%</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>% Retr. Stents</td>
<td>81.5%</td>
<td>100%</td>
<td>86%</td>
<td>100%</td>
</tr>
<tr>
<td>%GA</td>
<td>38%</td>
<td>36%</td>
<td>9%</td>
<td>?</td>
</tr>
<tr>
<td>% ↑ GO</td>
<td>13.5%</td>
<td>31%</td>
<td>24%</td>
<td>25%</td>
</tr>
<tr>
<td>NNT</td>
<td>7-8</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Key Controversies

• Concern that patients might bypass a tPA capable center in favor of an thrombectomy-capable center, leading to a delay in treatment.

• Concern that thrombectomy-capable facilities will be overwhelmed with the influx of patients that may not need the procedure.
Adoption in the Field

• EMS adoption in the field has been slow ~ but progressing.

• We are developing a tool that each county Medical Program Director can use to train their EMS personnel. Each individual MPD is responsible for training EMS personnel.

• Stroke facilities need to sign attestations indicating their current stroke capabilities and their plan to being providing thrombectomy. This is necessary for EMS triage.
Contact Information

www.doh.wa.gov/ecs

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