Moving Stroke Care Forward in Indiana

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American Heart Association & American Stroke Association
Indiana’s Stroke Snapshot

• Approximately 120 emergency-admitting hospitals (non VA or pediatric) in the state

• 1 Comprehensive Stroke Center; 34 Primary Stroke Centers; 1 Acute Stroke Ready Hospital

• Indiana’s stroke mortality rate in 2014 was 41.7%, versus the national rate of 36.5%

• Stroke remains the 4th leading cause of death in Indiana, while it is the 5th leading cause of death nationally

• Stroke remains the leading cause of severe adult disability nationally
The Problem

• Under current law, Hoosiers who suffer a stroke are too often taken via EMS to hospitals unable to offer sufficient acute stroke care

• These patients are then processed and sent right back out the door to a second hospital with the necessary capabilities

• Minutes count during a stroke, and this type of delay can mean the difference between returning to work or permanent disability; between life and death
How big a problem is this in Indiana?


- Specifically, Indiana hit the target of door-to-needle within 60 minutes just 43.7% of the time, outpacing Arkansas and New Hampshire, but falling behind everyone else.

- This is not exhaustive data and Indiana’s numbers have likely improved somewhat, but it is a telling example of just how serious a challenge we face.
Performance Improvement & Target Stroke

Target: Stroke Phase II aims to achieve Door-to-Needle Times within 60 minutes in 75% or more of acute ischemic stroke patients treated with IV tPA.*


### GOAL
75%

### PERCENTAGE OF HOSPITALS PER STATE

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Number of States</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-74%</td>
<td>11</td>
</tr>
<tr>
<td>75-100%</td>
<td>3</td>
</tr>
<tr>
<td>25-49%</td>
<td>11</td>
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</table>

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Source: Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team. 2017
*The emergency department visits do not represent the number of people who had a stroke within that year. Hospital discharge data are de-identified, which hinders the unduplication of patient visits.
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Source: Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team. 2017

5 Year Trend for Stroke-Related, Emergency Department Visits All Cerebrovascular Diseases, Primary Diagnosis

- 2011: 6,238
- 2012: 6,135
- 2013: 6,572
- 2014: 7,070
- 2015: 6,609

The line graph shows the trend over the five years from 2011 to 2015.
The Solution – Stroke Legislation

Looking at national science and the experiences of other states that have successfully addressed similar issues, we worked with Rep. Denny Zent (R-Angola) to introduce HB 1145 this past January, a bill designed to:

• Ensure that Indiana’s EMS regions develop and adopt stroke-focused EMS protocols based on national standards and written with a focus on local needs and resources

• Ensure that the Dept. of Health maintains a list of designated stroke centers based on national stroke certification at CSC, PSC, and ASRH levels, as well as a list of non-certified hospitals with written transfer agreements to higher levels of care
Stroke Legislation Process

• The AHA/ASA then worked with stakeholders including the IN Hospital Assoc., the Stroke Consortium of IN, the IN EMS Assoc., and the IN Depts. of Health and Homeland Security to fine-tune the bill via amendment language

• Once all parties were on board, HB 1145 moved quickly through the House and Senate, receiving unanimous committee and floor votes, and currently awaits Gov. Holcomb’s signature

• HB 1145 will go into full effect on July 1, 2018, allowing time for the IN Dept. of Homeland Security and the IN EMS Commission to lead the protocol development and training process, and for the IN Dept. of Health to create the list of certified stroke centers and network hospitals
Why Legislation?

• As crafted, Indiana’s stroke legislation will help increase EMS efficiency in handling stroke patients and incentivize hospital adherence to national evidence-based guidelines without over-burdening providers with costly mandates

• Similar laws are now on the books in 14 states, including Illinois and Kentucky on our western and southern borders

• A poster presented at the International Stroke Conference in February examining the impact of similar legislation in Illinois found “a clear and significant improvement in several care metrics for patients with acute ischemic stroke”
Case Study: Illinois

• Since passage of the 2009 and 2014 IL stroke laws, 73 smaller Illinois-based hospitals have worked with their parent health systems and/or the Illinois Critical Access Hospital Network to become Acute Stroke Ready certified.

• To give you a sense of what these laws have meant for patients, consider this:

  o in 2009, roughly 18% of stroke patients received life-saving tPA medication within the nationally-recommended 60-minute door-to-needle window.

  o in 2015, 62.4% of stroke patients received tPA within that same 60-minute window, which we know correlates with lives saved and reduced disability.
Impact of Stroke Legislation on Developing Stroke Systems of Care and Improving Acute Therapy: The Illinois Experience

Elizabeth Kim, Christopher T. Richards, Shyam Prabhakaran, Tracy Love, Lesley Cranick, Kathleen O'Neill, Mark Pyesakhovich, Alex Meixner, Julie Mirostaw, Renee Sodenew, Kathie Thomas, Peggy Jones, Mark J. Alberts

1 Stanford University Medical Center, 2 Northwestern University Feinberg School of Medicine, 3 Freeport Hospital, 4 Southern IL Healthcare, 5 American Heart Association American Stroke Association, 6 Critical Access Hospital Network, 7 Hartford Hospital and Hartford Healthcare

Background

Stroke is a leading cause of death and disability. In 2008, Illinois passed stroke legislation that established a Stroke Advisory Subcommittee to advise the State EMS Advisory Council. The legislation also created 11 EMS Regional Stroke Advisory Subcommittees. Primary Stroke Centers and Emergency Ready Hospitals were formally recognized, and EMS routing protocols were updated. Comprehensive Stroke Centers were recognized in 2014, and EMS routing protocols were further updated.

Hypothesis

Implementation of the Illinois stroke legislation by EMS regions enhances stroke systems of care, improves collaboration between hospitals and EMS, and improves intervention times and outcomes.

Methods

• Data were ascertained from the Illinois Get With The Guidelines (GWTG) stroke registry from 2009-2015.
• Ninety two unique hospitals entered data from 2009-2015.
• Data points included number of patients, arrival mode, those treated or eligible for IV Alteplase, median door to needle (DTN) times, DTN times of 60 minutes or less, and discharge to home.
• Statistical analyses were performed using chi-square testing.

Table 1. Hospitals and Patients Enrolled in GWTG-Stroke in Illinois 2009-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Total IL Hospitals Participating in GWTG</th>
<th>Total GWTG stroke patient records</th>
<th>Acute Ischemic Stroke (AIS) Patients Entered into GWTG</th>
<th>AIS patients eligible for IV Alteplase</th>
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<tbody>
<tr>
<td>2009</td>
<td>27</td>
<td>10938</td>
<td>5193</td>
<td>289</td>
</tr>
<tr>
<td>2010</td>
<td>38</td>
<td>13077</td>
<td>8084</td>
<td>411</td>
</tr>
<tr>
<td>2011</td>
<td>52</td>
<td>14201</td>
<td>9109</td>
<td>628</td>
</tr>
<tr>
<td>2012</td>
<td>60</td>
<td>15383</td>
<td>9964</td>
<td>598</td>
</tr>
<tr>
<td>2013</td>
<td>73</td>
<td>29288</td>
<td>9977</td>
<td>570</td>
</tr>
<tr>
<td>2014</td>
<td>76</td>
<td>19633</td>
<td>10719</td>
<td>650</td>
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<tr>
<td>2015</td>
<td>82</td>
<td>21776</td>
<td>12081</td>
<td>864</td>
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</table>

Table 2. Types of Hospitals Participating in GWTG-Stroke in Illinois

<table>
<thead>
<tr>
<th>Year</th>
<th>Total IL Hospitals Participating in GWTG</th>
<th>ASRHs</th>
<th>PSCs</th>
<th>CSCs</th>
<th>Not Certified as Stroke Center</th>
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<tbody>
<tr>
<td>2009</td>
<td>27</td>
<td>0</td>
<td>14</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>2010</td>
<td>36</td>
<td>0</td>
<td>27</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>2011</td>
<td>52</td>
<td>0</td>
<td>35</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>2012</td>
<td>60</td>
<td>0</td>
<td>36</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>2013</td>
<td>73</td>
<td>0</td>
<td>44</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>2014</td>
<td>76</td>
<td>1</td>
<td>45</td>
<td>4</td>
<td>26</td>
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<tr>
<td>2015</td>
<td>82</td>
<td>19</td>
<td>46</td>
<td>5</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 3. Performance Metrics for Hospitals Participating in GWTG-Stroke in Illinois

<table>
<thead>
<tr>
<th>Year</th>
<th>Median Door-to-Needle Times (minutes)</th>
<th>% DTN times ≤ 60 min</th>
<th>Discharge to Home</th>
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<tbody>
<tr>
<td>2009</td>
<td>85</td>
<td>18%</td>
<td>38.0%</td>
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<tr>
<td>2010</td>
<td>84</td>
<td>18.5%</td>
<td>36.8%</td>
</tr>
<tr>
<td>2011</td>
<td>81</td>
<td>26.1%</td>
<td>32.9%</td>
</tr>
<tr>
<td>2012</td>
<td>73</td>
<td>33.5%</td>
<td>43.8%</td>
</tr>
<tr>
<td>2013</td>
<td>63</td>
<td>47.4%</td>
<td>45.4%</td>
</tr>
<tr>
<td>2014</td>
<td>56</td>
<td>60.9%</td>
<td>45.3%</td>
</tr>
<tr>
<td>2015</td>
<td>56</td>
<td>62.4%</td>
<td>44.1%</td>
</tr>
</tbody>
</table>

36.41% of patients arrived by EMS from home/scene
31.36% of patients arrived by private transportation

34% relative decrease in DTN times for IV Alteplase over 2009-2015

Conclusions

• Illinois observed a clear and significant improvement in several care metrics for patients with acute ischemic stroke
• These changes occurred after the passage of state legislation related to the identification of stroke centers and routing of stroke cases
• This experience is a good example of stakeholders working in a cooperative manner to improve stroke care on a state level

For more information, contact Kathleen O'Neill at Kathleen.O'Neill@heart.org

Quillity is the data collection coordination center for the AHA/ASA Get With The Guidelines programs.
Dr. Alberts is a speaker for Genentech, which markets Alteplase.
How Will it Work? EMS Protocols

• The IN Dept. of Homeland Security and the IN EMS Commission will lead the process to draft stroke protocols based on national guidelines, as well as efforts to educate and train EMS MDs and EMS agencies between now and July 1, 2018

• The American Heart Association & American Stroke Association will provide information and assistance, including the Severity-Based Stroke Triage Algorithm for EMS which was released at the International Stroke Conference earlier this year
SEVERITY-BASED STROKE TRIAGE ALGORITHM FOR EMS

ON SCENE
- Interview patient, family members, and other witnesses to determine last known well (LKW) time and time of symptoms discovery.
- Perform rapid stroke score at initial (e.g., history, examination, documentation) and reassess if patient has pre-existing cerebrovascular disease or is unlikely to seek medical help from others.
- Encourage family to go directly to Emergency Department if not transporting with patient and travel mobile unit at onset of illness and witnessed.
- If Mobile Stroke Unit available— follow Mobile Stroke Unit Protocol.

- Each EMS agency should assess a potential stroke patient at the scene and assess using a validated stroke scale to assess patients with non-traumatic onset to rule out stroke.
- Patients who are transferred for evaluation if transported to non-certified hospitals should be transported to a certified or designated hospital.
- Collect a list of current medications (especially anticoagulants) and obtain patient history including co-morbid conditions (e.g., history of diabetes, recent surgery, previous stroke) that may impact treatment decisions.
How Will it Work? Hosp. Designation

• The Indiana Dept. of Health will create and maintain a regularly updated list of Comprehensive Stroke Centers, Primary Stroke Centers, and Acute Stroke Ready Hospitals, and will update the IN Dept. of Homeland Security promptly of any change in hospital certification status.

• Hospitals wishing to be included on the certified stroke center list would send the Dept. of Health proof of their current certification as a CSC, PSC, or ASRH from a national certifying body (such as the Joint Commission, HFAP, DNV, etc.) on a rolling basis.

• Hospitals wishing to be included on the network hospital list would send the Dept. of Health a copy of their transfer agreement/s with certified stroke centers.
How Will it Impact Hospitals?

• Hospitals certified at the CSC, PSC, or ASRH level would largely continue business as usual, with possibly increased EMS-transported patient flow

• While the decision to become certified as a CSC, PSC, or ASRH may impact EMS patient flow, there would be no statutory requirement for hospitals to become certified

• If an area had no certified stroke centers, transport may be unaffected

• The IN State Office of Rural Health and the IN Rural Health Association may be able to provide federal flex funds to help would-be ASRH centers achieve that level of care
Questions?

Thanks for your time!

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