Improving Communication In Stroke Care
And Subsequent Benefits For Patients

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Disclosure Statement of Financial Interest

I, Brandon Means, have a financial affiliation with an organization that could be perceived as a conflict of interest in the context of the subject of this presentation.

Affiliation: Employee (Clinical Specialist)  Organization: Pulsara

I do not have a financial affiliation with Peace Health
WELCOME

......to 1962!
Root Cause Information for Delay in Treatment Events Reviewed by The Joint Commission

(Resulting in Death or Loss of Permanent Function) (3)

<table>
<thead>
<tr>
<th>Event Category</th>
<th>Count</th>
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<tbody>
<tr>
<td>Communication</td>
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<tr>
<td>Assessment</td>
<td>753</td>
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<tr>
<td>Human Factors</td>
<td>701</td>
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<tr>
<td>Leadership</td>
<td>662</td>
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<tr>
<td>Information Management</td>
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<tr>
<td>Continuum of Care</td>
<td>253</td>
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<tr>
<td>Care Planning</td>
<td>170</td>
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<tr>
<td>Physical Environment</td>
<td>147</td>
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<tr>
<td>Medication Use</td>
<td>74</td>
</tr>
<tr>
<td>Patient Rights</td>
<td>27</td>
</tr>
</tbody>
</table>

2004 through 2014 (N=971)
The Majority of Events have Multiple Root Causes
How do we improve communication in a time-sensitive emergency?

Hard-wire communication by creating one process, and consistently following it every time.
Hard-wiring Communication:
A patient’s location should not dictate the level of care they receive!
How do we improve communication in a time-sensitive emergency?

Maintain **transparency** among the entire care team.
How do we improve communication in a time-sensitive emergency?

Use current technology instead of outdated devices
Ways that data has already proven to improve outcomes in stroke...

Houston Paramedic and Emergency Stroke Treatment and Outcome Study (HoPSTO)

Annet W. Wojten-Alexandrov, PhD, Andrea V. Alex, MD, Diana Rodriguez, David Portes, MD, James C. Greer, MD

Background and Purpose—Elevation of stroke centers, combined with accurate paramedic diagnosis and rapid transport, is essential to achieve the best possible outcomes and improve patient satisfaction. The HoPSTO study compared the peri-ischemic protocol and the stroke team against the standard of care protocol delivered in Houston, Texas. Paramedic and patient data were collected prospectively pre-intervention and during the active-intervention phase of all eligible acute-stroke patients admitted to Houston System Stroke-Dependent Emergency Medical Services. A multifaceted educational intervention included paramedics, hospital, and community education. Paramedic diagnostic accuracy, hospital performance variability, and thrombolytic treat times were the main outcome indicators of the study.

Results—First-located forty stroke patients (74 patients treated pre-intervention phase vs 100 patients treated in the active-intervention phase) were compared. Both education and hospital care were improved, with a significant increase in the number of patients presenting for evaluation within 3 hours from last known to be well. Stroke center development supported patient thrombolytic therapy in community settings (Stroke 2009; 44(15):1379-1386).

Key Words: community health services • education • paramedics • stroke • stroke care • thrombolytic therapy

S troke represents a significant medical problem in the United States, with almost 100,000 new cases annually, 700,000 of which 109,000 ends in death. As the leading cause of adult disability, stroke produces significant burden for individuals and communities, costing the United States over $50 billion annually (2005). The economic burden of stroke for the United States is expected to increase by 2025 to $90 billion (2005). The leading causes of death for adults are stroke, heart disease, and cancer (National Institutes of Health, 2003). In 1997, a national consensus statement identified the need for designated stroke centers where patients with suspected acute stroke could receive appropriate, comprehensive care. 1 The Brain Attack Coalition (BAC) endorsed this recommendation for a stroke center, defined as an American Stroke Association (ASA) center with published published performance indicators for stroke care to ensure program development and ongoing performance improvement. 2 The set of ASA guidelines for the stroke center was recently developed to promote stroke center development, and most recently, the Joint Commission on Accreditation of Healthcare Organizations launched an accreditation program for Primary Stroke Centers supported by the BAC and ASA guidelines. 3 It is expected that formal stroke core center recognition will entitle hospitals to resources such as diagnostic capabilities and personnel trained to assist and implement expanded hospital-based programs as well as to educate the public about the location of centers able to support the needs of stroke victims.

Developing cooperation among competing hospitals to fund stroke center development is complex, and enforcing appropriate public recognition of stroke center designation has been difficult in the United States. 4,5 Many hospitals have devoted resources to stroke care programs, but few have been able to achieve the formal recognition necessary to adequately fund stroke center development and ongoing performance improvement. 6 Development of an adequate network of stroke care centers is critical to further improve care in this setting.

Ischemic stroke patients have better outcomes with early thrombolysis (Marler et al, 2000).

Increasing EMS stroke education improves accuracy of stroke diagnosis from EMS, and increases rate of thrombolysis in acute strokes (Wojner- Alexandrov et al, 2005).

Early stroke treatment associated with better outcome

The NINDS rt-PA Stroke Study

J S Marler, MD, D F Tipton, J L Ma, T G Smith, M T Bracht, C L Neff, J C Ficaro, S M Light, D C Marler, S B Klee, M. A. Lorand, and T P. Drotning, for the NINDS for the NINDS rt-PA Stroke Study Group

Article abstract—Background: The National Institute of Neurological Disorders and Stroke (NINDS) rt-PA Stroke Study showed a statistically significant improvement in functional and time outcome in patients who received 0.9 mg/kg of intravenous recombinant tissue plasminogen activator within 3 hours of stroke onset. Methods: Unselected patients received intravenously administered recombinant tissue plasminogen activator (0.9 mg/kg) or placebo within 3 hours of stroke onset. Significant effects were noted in the functional outcome (modified Rankin scale) score, the time to achieve a modified Rankin scale (mRS) score of 0–2, the mRS score at 90 days, the overall stroke mortality rate, and the rate of symptomatic intracranial hemorrhage. Results: Overall, 137 patients were randomly assigned to receive placebo and 138 patients received recombinant tissue plasminogen activator. Successful treatment of acute ischemic stroke was achieved in 78% of patients (63% in the placebo group and 82% in the recombinant tissue plasminogen activator group). Conclusions: Treatment of ischemic stroke within 3 hours of symptom onset with recombinant tissue plasminogen activator provides benefit to patients at about 95% stroke centers. No effect of rt-PA in intracranial hemorrhage was detected within the group treated with rt-PA, when compared to the group treated with placebo (p > 0.1). Significant improvement was noted at 90 days. 1

Ischemic stroke patients have better outcomes with early thrombolysis (Marler et al, 2000).


Aims: To highlight the National Institute of Neurological Disorders and Stroke (NINDS) rt-PA Stroke Study, the most significant trial in the treatment of acute ischemic stroke when started within 3 hours of onset. Because data from stroke used to treatment was considered an important possible differences on subsequent measures, random assignment of patients in three time windows (A, B, and C) was conducted. Patients were classified as having arterial occlusion (A), or occlusion of the vein (B). A, or occlusion of the vein (C) (p = 0.19). In the initial analysis of the results, there was 0.101% apparent observed differences.
Goal: Earlier Activation and Intervention

Question: How do we get there?

a. Try Harder?

b. CT in every unit?

c. Increase Staff?

d. None of the above!

Recent data demonstrates how hospitals are achieving drastic improvements in stroke care by simply streamlining communication!
pulsara
Acute care coordination, simplified.
St. Dominic’s Hospital is an interventional stroke facility. Prior to implementing Pulsara, stroke teams were not activated until EMS arrival.

### Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-Application</th>
<th>Post-Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean DTN (min)</td>
<td>54</td>
<td>44</td>
</tr>
<tr>
<td>Mean DTP (min)</td>
<td>107</td>
<td>98</td>
</tr>
<tr>
<td>DTP &lt;120 min</td>
<td>67.5%</td>
<td>86.6%</td>
</tr>
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January 2015-September 2015
Good Shepherd Medical Center
Longview, Texas – 425 Bed Regional Hospital

Stroke Activations (533)

02/2012-02/2014

200

333

Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-Application</th>
<th>Post-Application</th>
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</thead>
<tbody>
<tr>
<td>tPA (# cases)</td>
<td>41</td>
<td>44</td>
</tr>
<tr>
<td>Mean DTN (min)</td>
<td>77</td>
<td>56</td>
</tr>
<tr>
<td>DTN &lt;60 min</td>
<td>32%</td>
<td>82%</td>
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28% improvement

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Good Shepherd Medical Center
Longview, Texas – 425 Bed Regional Hospital

Stroke Activations with TPA

Results

<table>
<thead>
<tr>
<th></th>
<th>Without Application</th>
<th>With Application</th>
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<tbody>
<tr>
<td>Mean DTN (min)</td>
<td>87</td>
<td>47</td>
</tr>
<tr>
<td>DTN &lt;60 min</td>
<td>18%</td>
<td>85%</td>
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</tbody>
</table>

46% improvement
### Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-Application</th>
<th>Post-Application</th>
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</thead>
<tbody>
<tr>
<td>*PCI (# cases)</td>
<td>36</td>
<td>69</td>
</tr>
<tr>
<td>Mean DTB (min)</td>
<td>91</td>
<td>71</td>
</tr>
<tr>
<td>DTB &lt;60 min</td>
<td>56%</td>
<td>80%</td>
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</tbody>
</table>

**STEMI Activations (155)**

- 11/2012-09/2013
- 105 PCI
- 50 No PCI
Currently, groups at multiple comprehensive stroke centers are performing ongoing retrospective studies. These studies are evaluating blinded Pulsara data across all facilities. This data has been submitted, but not yet published.
References:


