

Stroke Severity Adjusted EMS Triage Has Benefits For Bypassed Primary Stroke Centers

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Background

AHA/ASA Guideline

Guidelines for the Early Management of Adults With Ischemic Stroke

A Guideline From the American Heart Association/
American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups

The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists.

(Stroke. 2007;38:1655-1711.)

complete recovery among patients with severe stroke (NIHSS score of ≥ 20) improved with treatment, but overall success in this group of critically ill patients was low.³⁰² In 2 large trials,

Special Report

Stroke Severity as Well as Time Should Determine Stroke Patient Triage

James C. Grotts, MD, Sean I. Savitz, MD, David Pense, MD

Tissue Plasminogen Activator and Time to Treatment

The National Institute of Neurological Disorders and Stroke studies,¹ published in 1995, demonstrated for the first time that in patients selected by clinical and noncontrast computed tomography criteria, intravenous tPA (IV tissue plasminogen activator) resulted in improved outcomes compared with standard treatment. Since that time, safe and quick delivery of IV tPA has become the primary focus of acute stroke management and forever changed the way that acute stroke care is delivered.

The most important variable that predicts response to treatment is time from symptom onset to treatment initiation.¹³ On the basis of European Cooperative Acute Stroke Study III (ECASS III) treatment with IV tPA in Europe is approved

in Texas where strong community and EMS education programs have existed since the development of IV tPA treatment for stroke, and where there is a citywide collaboration to report treatment rates and complications, in the last quarter of 2011, the treatment rate was 9% of all strokes directly taken to citywide stroke center EDs (81% of those patients eligible were treated).

Need for Better Treatments, Especially for Severe Strokes

As if the narrow time window were not enough of a problem, the other deficiency of IV tPA therapy is that it does not work well enough, particularly for larger cerebral territories. Only 1 in 3 of all patients treated with IV tPA within 3 hours of symptom onset will return to a modified Rankin score of 0 to 1

(Stroke. 2013;44:555-557.)



Results: Therapeutic yield

“Therapeutic Bypass Yield” Definition = *percentage of patients that got Cranial Neurosurgery or Endovascular intervention during this admission not available at Bypassed PSC’s*

Therapeutic Yield = **15%** got a CSC-specific Intervention
(77/526 CSC triaged patients)

Acute endovascular intervention

(ischemic stroke)=7.5%

Neurosurgery for Intracranial bleed = 5%

Neurosurgery for Intracranial tumor =2%

Other: Aneurysm coiling + EC/IC bypass= 0.5%

=15%



Comparison of Therapeutic Bypass yields: *Trauma vs Stroke*

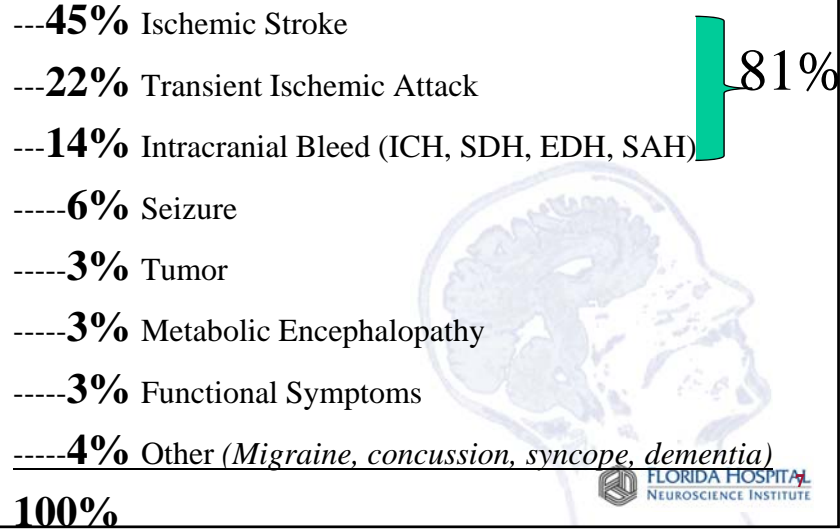
- **STROKE: 15%** got CSC-specific stroke procedure
(77 of 526)
- **TRAUMA: 18%** got taken to Operating room in 1st 48
hrs at level one trauma center (35 of 193)
- **No stat sig diff** in therapeutic bypass yields for
trauma and stroke

Odds Ratio 0.77, 95% CI = 0.5-1.2



Range of diagnoses

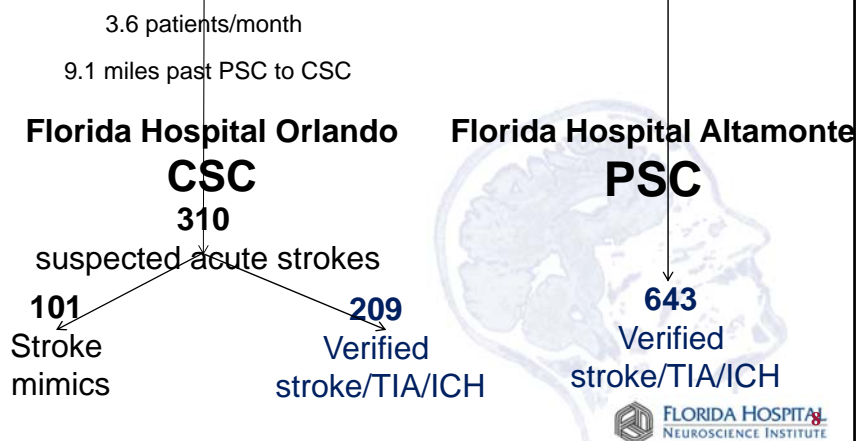
- Of 471 patients with known diagnoses



Effect on a bypassed PSC: 2006-12

**Seminole County
EMS SAST
bypass**

**EMS and Patient
operated
vehicles**



Benefits for bypassed PSC

	643 direct-to-PSC patients	209 SAST bypass CSC patients
Age (ave)	70.6 years	72.7 years
LOS (ave)	5.5 days	6.0 days
Major Complications**	13%	34%
ICH, fatal or d/c hospice*	0.6%	9.6%

1 in 8 CSC patients were transferred for a CSC-SI

Fatal/Hospice ICH: Odds ratio =15.38, 95% CI =5.2 to 45.5, P<0.0001.

Major Complications: Odds ratio =2.54, 95% CI =1.78 - 3.62), P<0.0001



*"Major Complications": respiratory failure, infection, DVT, PE, MI or recurrent stroke in house