

Stroke Quality Initiative

EMS Webinar I
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Excerpt From the September 2014 Letter from Lee Burns

“In 2004, the Department began building a statewide system for the effective treatment of stroke patients. Those efforts partnered the Department’s Cardiac Services and Stroke Program, the Bureau of EMS and Trauma Systems, and the State Emergency Medical Advisory Committee (SEMAC) to establish a uniform protocol so that EMS providers can make early identification of stroke patients, and to designate Stroke Center hospitals to which EMS would transport those patients. *This system has made a tremendous difference in the timely treatment and outcome for stroke patients. For continued success, however, any system must be continually evaluated through quality improvement efforts to assure the system that was built continues to work as expected.*”

“The key to successful treatment of stroke patients is always time. The earlier a stroke is identified and communicated, the earlier treatment can be initiated. To that end, the Stroke Program is again partnering with the Bureau of EMS to *evaluate* (1) is the identification of a stroke patient being effectively communicated (does the EMS provider report and does the hospital staff receive the information), and (2) does the information reported by EMS cause the hospital to activate its Stroke Team/Protocols.”

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Presentation Outline

- ▶ Stroke Facts
- ▶ Stroke Designation
- ▶ Coverdell Stroke QI and Registry Program
- ▶ Additional Quality Activities
- ▶ A Systems Approach to Stroke Care

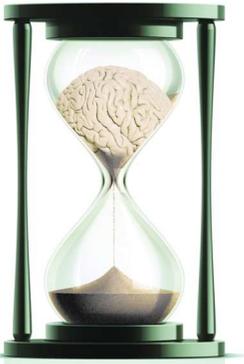
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Facts About Stroke

- ▶ The leading cause of adult disability
- ▶ Fourth leading cause of Death
- ▶ 80% of all strokes are Ischemic and can be treated with tPA
 - ▶ Ischemic: a blood vessel becomes blocked, usually by a blood clot and a portion of the brain becomes deprived of oxygen and will stop functioning
 - ▶ Hemorrhagic: when a blood vessel that carries oxygen and nutrients to the brain burst and spills blood into the brain
- ▶ Tissue Plasminogen Activator (tPA)
 - ▶ Breakdown blood clots
 - ▶ Significantly improves patient outcomes
 - ▶ *Extremely* time sensitive
 - ▶ Must be administered 3 - 4.5 hours of symptom onset

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TIME IS BRAIN

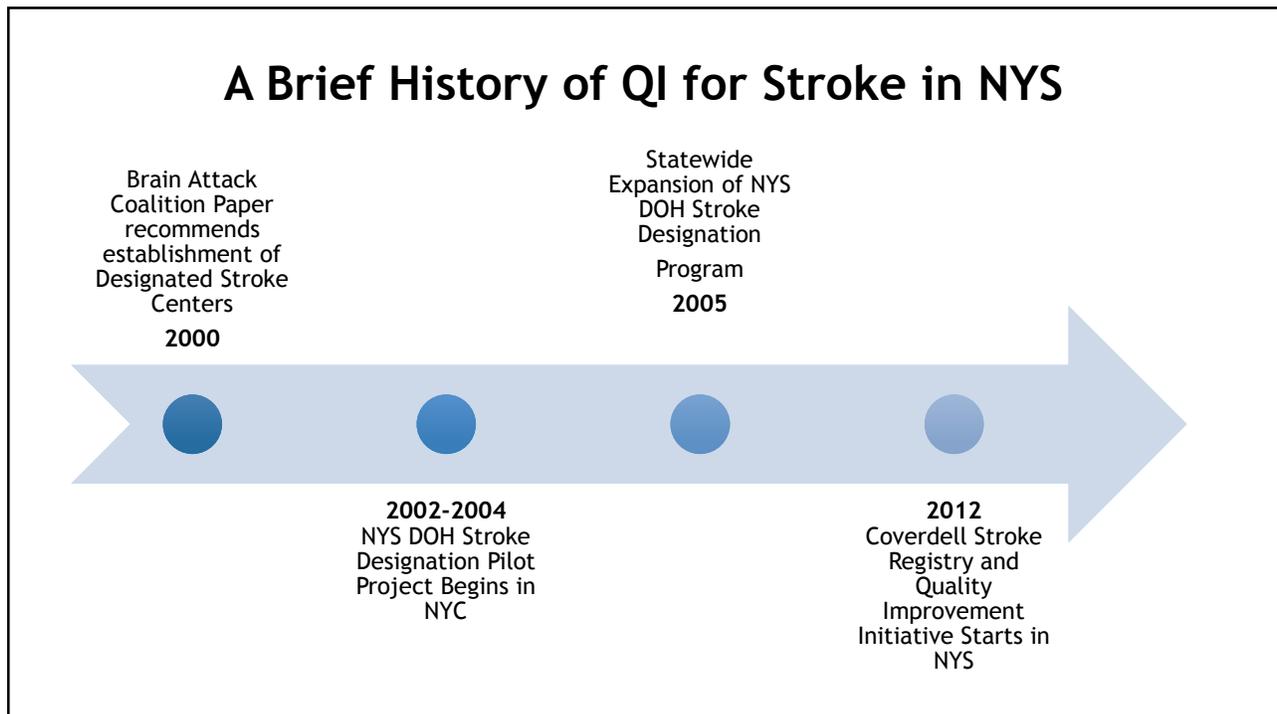


For stroke patients, every minute counts

When a stroke occurs 1.9 MILLION neurons are lost **per minute**

Stroke victims lose an average of 1.2 BILLION neurons per stroke

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BC3

Brain Attack Coalition Recommendations: Establishing a Standard of Care (2000)

Conclusions: Randomized clinical trials and observational studies suggest that several elements of a stroke center would improve patient care and outcomes. *The establishment of primary stroke centers has the potential to improve the care of patients with stroke.*

Key elements of primary stroke centers include:

1. Acute stroke teams
2. Stroke units
3. Written care protocols
4. An integrated emergency response system
5. Availability and interpretation of CT scans 24 hours every day
6. Rapid laboratory testing.
7. Administrative support
8. Strong leadership
9. Continuing education

JAMA. 2000;283(23):3102-3109. doi:10.1001/jama.283.23.3102

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NYS Stroke Designation Pilot Program (2002-2004)

- ▶ Based on the Brain Attack Coalition Recommendations
- ▶ Launched in 2002
- ▶ Participants: 19 New York City Hospitals
- ▶ Established the practice of EMS bringing patients with suspected stroke directly to the closest designated hospital
- ▶ Emphasized direct communication and strong relationship between hospitals and EMS

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Slide 7

BC(3) PSC's are part of a "system's approach" to care for patients with stroke

Bruce, Cassandra (HEALTH), 9/16/2014

Results from the Pilot Program: Working Together Improves Performance

Indicator	Baseline		Re-measurement
Door to MD Assessment	M = 25 min*	Pilot Program	M = 15 min*
Door to CT	M = 67.5 min*		M = 32 min*
Door to tPA administration	M = 108.5		M = 98 min
Eligible patients receiving tPA	21.8%*		38.7%*
Infarct patients receiving tPA	2.4%*		5.2%*

* Indicates statistically significant. From Gropen et al 2006; Neurology

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BK(2)

A Systems Approach to Improving Patient Care

- ▶ Institute of Medicine*
 - ▶ Delivery of care is fragmented
 - ▶ Stroke System should coordinate and promote patient to the full range of activities and services associated with stroke prevention, treatment, and rehabilitation
- ▶ In 2002 a Task Force from the National Institute of Neurological Disorders and Stroke was established to develop recommendations for treatment of stroke patients
 - ▶ “Recommendations for the Establishment of Stroke Systems of Care” (2005)*
 - ▶ A **systems approach** can help implement measures that decrease the time from receipt of a call for a probable stroke to the dispatch of EMS personnel
 - ▶ **Conclusion:** “Building stroke systems throughout the United States is the critical next step in improving patient outcomes in the prevention, treatment, and rehabilitation of stroke.”

*Schwamm, L., Pancioli, A., Acker, J., Goldstein, L., Zorowitz, R., Shephard, T., ... Adams, R. (2005). Recommendations for the Establishment of Stroke Systems of Care: Recommendations From the American Stroke Association's Task Force on the Development of Stroke Systems. *Stroke*, 690-703.

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Slide 10

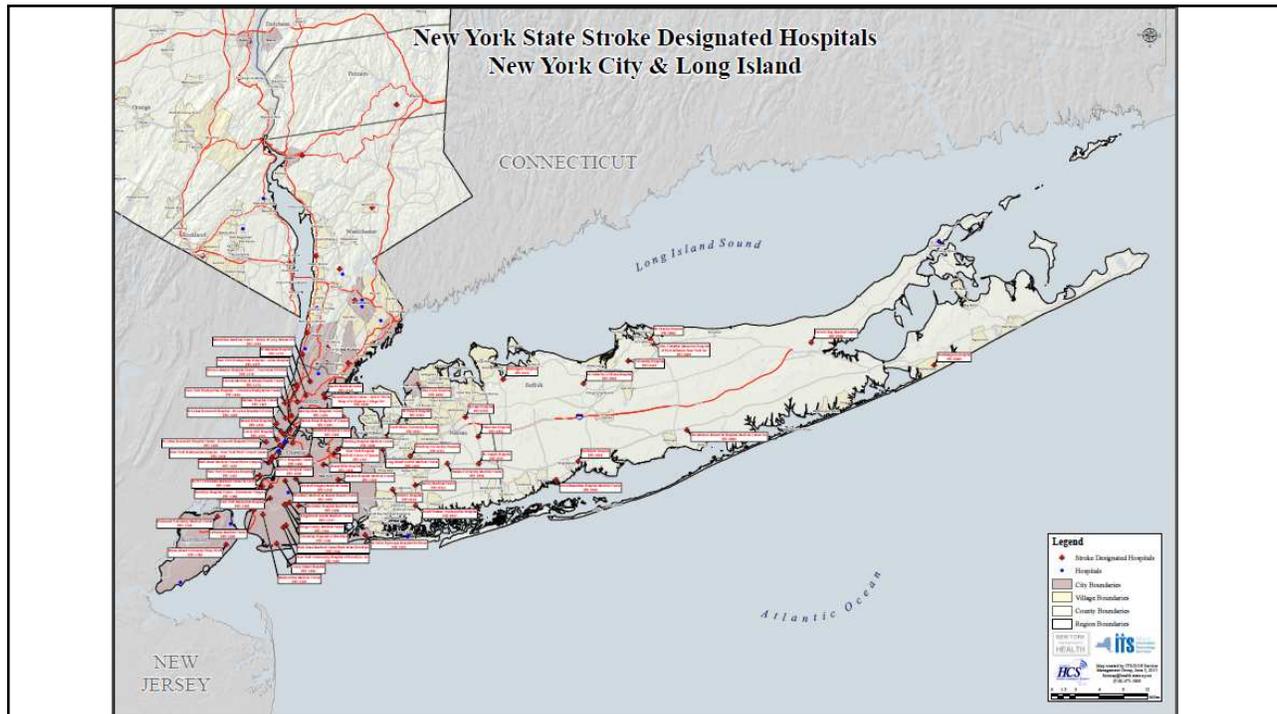
BK(2 "Further Support"

Bobseine, Katerose (HEALTH), 9/16/2014

Extension to a State-Wide Stroke Designation Program (2004)

- ▶ Recognizes hospitals that are particularly well-equipped to treat and stabilize acute stroke patients
 - ▶ Staffing
 - ▶ Infrastructure
 - ▶ Programs
- ▶ 119 of 234 Hospitals in NYS are currently designated as primary stroke centers
- ▶ Key Elements of every stroke center
 - ▶ Stroke Team
 - ▶ Education (Staff, EMS/ED, Patient, Community)
 - ▶ 24/7 Capabilities
 - ▶ Quality Assurance/Annual Data Submission

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Designated Hospitals Have Better Patient Outcomes

Table 4. Sensitivity Analysis: 30-Day Mortality at Designated Stroke Centers and Nondesignated Hospitals

	No./Total No. (%)		Adjusted Mortality Difference (95% CI) ^a	P Value
	Designated Stroke Center	Nondesignated Hospital		
Location ^b				
Metropolitan New York	1034/11 120 (9.3)	715/6881 (10.4)	-2.0 (-3.4 to -0.5)	.01
Upstate New York	509/4177 (12.2)	1236/8769 (14.1)	-2.0 (-3.8 to -0.3)	.02
Race/ethnicity ^c				
Non-Hispanic white	1091/8865 (12.3)	1635/11 649 (14.0)	-2.5 (-3.9 to -1.1)	<.001
Non-Hispanic black	204/3337 (6.1)	148/2303 (6.4)	-2.4 (-4.8 to -0.0)	.05
Hispanic	117/1507 (7.8)	73/784 (9.3)	-5.2 (-9.4 to -0.9)	.02
Other	131/1588 (8.3)	95/914 (10.4)	-3.2 (-7.3 to 0.9)	.12

Abbreviation: CI, confidence interval.

^aNegative values indicate lower mortality at designated stroke center vs nondesignated hospital.

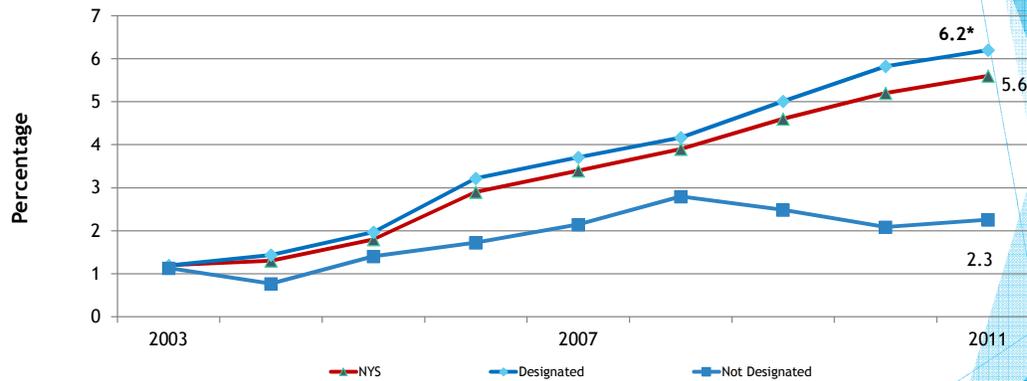
^bStratified by location.

^cStratified by race/ethnicity group.

JAMA. 2011;305(4):373-380. doi:10.1001/jama.2011.22

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Percentage of Hospital Discharges for Ischemic Stroke (ICD-9-CM 433 434) in which tPA was administered, SPARCS NY 2003-2011



Data Source: SPARCS 2003-2011

Ischemic Stroke as defined by principal diagnosis of ICD-9-CM 433-434

tPA defined as any procedure code of ICD-9-CM 99.10 or AP DRG of 880 or Federal DRG of 061 or 062 or 063 in 2008 to 2011 or Federal DRG of 559 in 2006 or 2007

Coverdell Quality Initiative (2012)

- ▶ Centers for Disease Control and Prevention (CDC) provides funding

- ▶ 5 Topics for Focus - Recommended by Stroke Physician Workgroup
 1. **Improve Time to Administration of tPA (< 60 minutes)**
 2. **Improve Number of Eligible Patients who Receive tPA**
 3. Stroke Education
 4. Dysphagia Screening
 5. Patients with LDL > 100 discharged on Statin

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Other QI Activities to improve stroke care

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Additional QI Activities (2014)

6th Annual NYS Stroke conference - May 29th, 2014

- ▶ EMS Initiatives Presented
 - ▶ The Direct to CT Protocol
 - ▶ EMS and ED: Integrated Approach to Quality Assurance

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Additional QI Activities

Annual Summit October 23rd and 24th - Newport, RI

Research Presentation: *“EMS Data Documentation Best Practices”* by Ethan Brandler, MD, MPH, FACEP

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Additional QI Activities

Community Education

- ▶ Focus on groups at higher risk for stroke and the creation of culturally appropriate educational materials
- ▶ The first link in the stroke prevention chain is community
 - ▶ Without community recognition, Stroke outcomes will not improve

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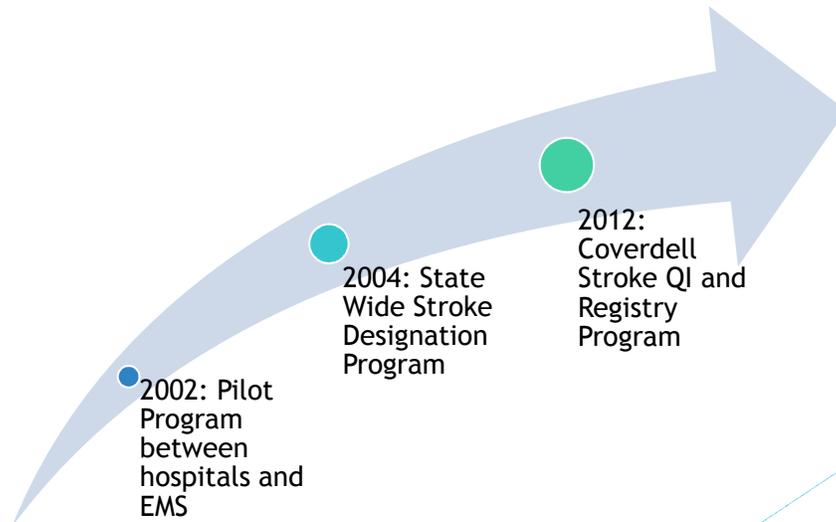
Quality Improvement

- ▶ Quality of Care is central to the mission of this initiative
- ▶ Research has found integrated systems - emergency medical services and hospitals acting together - to be crucial for quality improvement
- ▶ In 2004, the NYS DOH partnered with the Bureau of EMS to develop an integrated network for patients who experience a stroke
- ▶ Once again, the NYS DOH and the Bureau of EMS are collaborating to further improve the quality of patient care

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BK(4)

Quality Improvement and Stroke in NYS



What has been the role of EMS?

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Slide 21

BK(4 Maybe move to before EMS

Bobseine, Katerose (HEALTH), 9/16/2014

Suspected Stroke (Stroke)

Note:
This protocol is for patients who have an acute episode of neurological deficit without any evidence of trauma.

Note:
Request Advanced Life Support if available.
Do not delay transport to the nearest appropriate hospital.

- I. Perform initial assessment.
- II. Assure that the patient's airway is open and that breathing and circulation are adequate.

Caution:
Consider other causes of altered mental status, i.e. hypoxia, hypoperfusion, hypoglycemia, trauma or overdose.

- III. Administer high concentration oxygen, suction as necessary, and be prepared to assist ventilations.
- IV. Position patient with head and chest elevated or position of comfort, unless doing so compromises the airway.

1 V. Perform Cincinnati Pre-Hospital Stroke Scale:

- A. Assess for facial droop: have the patient show teeth or smile.
- B. Assess for arm drift: have the patient close eyes and hold both arms straight out for 10 seconds.
- C. Assess for abnormal speech: have the patient say, "you can't teach an old dog new tricks".

2 VI. If the findings of the Cincinnati prehospital stroke scale are positive, establish onset of signs and symptoms by asking the following:

- A. To patient – "When was the last time you remember before you became weak, paralyzed, or unable to speak clearly?"
- B. To family or bystander – "When was the last time you remember before the patient became weak, paralyzed, or unable to speak clearly?"

- VII. Transport of patient's with signs and symptoms of stroke to the appropriate hospital:
 - A. Transport the patient to the closest New York State Department of Health designated Stroke Center if the total prehospital time (time from when the patient's symptoms and/or signs first began to when the patient is expected to arrive at the Stroke Center) is less than two (2) hours.
 - B. Transport the patient to the closest appropriate hospital emergency department (ED) if:
 1. The patient is in cardiac arrest, *or*
 2. The patient has an unmanageable airway, *or*
 3. The patient has (an) other medical condition(s) that warrant(s) transport to the closest appropriate hospital emergency department (ED) as per protocol, *or*
 4. The total prehospital time (time from when the patient's symptoms and/or signs first began to when the patient is expected to arrive at the Stroke Center) is greater than two (2) hours, *or*
 5. An on-line medical control physician so directs.
- VIII. Maintain normal body temperature; do not overly warm the patient.
- IX. Protect any paralyzed or partially paralyzed extremities.
- X. Ongoing assessment. Obtain and record the patient's initial vital signs, repeat enroute as often as the situation indicates.

3 XI. Notify the receiving hospital as soon as possible of your impending arrival with an acute stroke patient, Cincinnati Stroke Scale findings, and time signs and symptoms began.

4 XII. Record all patient care information, including the patient's medical history and all treatment provided, on a Prehospital Care Report (PCR).

NYS EMT-B Basic Life Support Protocols
M-17 Page 1 & 2, Revised 2008

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NYS Stroke Protocol

- 1. Perform Cincinnati Pre-Hospital Stroke Scale**
 - A. Assess for facial droop: have the patient show teeth or smile,
 - B. Assess for arm drift: have the patient close eyes and hold both arms straight out for 10 seconds,
 - C. Assess for abnormal speech: have the patient say, "you can't teach an old dog new tricks."
- 2. If the findings of the Cincinnati prehospital stroke scale are positive, establish onset of signs and symptoms by asking:**
 - A. To patient - "When was the last time you remember before you became weak, paralyzed or unable to speak clearly?"
 - B. To family or bystander - "When was the last time you remember before the patient became weak, paralyzed or unable to speak clearly?"
- 3. Notify the receiving hospital as soon as possible of your impending arrival with an acute stroke patient, Cincinnati Stroke Scale findings, and time signs and symptoms began.**
- 4. Record all patient care information, including the patient's medical history and all treatment provided, on a Prehospital Care Report (PCR)**

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Key Quality Measures for Pre-notification

Why are the Key Quality Measures for Pre-notification Important?

- ▶ EMS pre-notification allows for the hospital stroke team to anticipate the arrival of a stroke patient:
 - ▶ Plan care based on information shared by EMS
 - ▶ Prepare for imaging
 - ▶ **Treat patient faster**

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Why focus on these Quality Measures?

Pre-notification varies nationally and in NYS

- ▶ National Study*
 - ▶ 1633 hospitals; Apr 1, 2003 - March 31, 2011; acute ischemic stroke patients
 - ▶ Of 371,988 cases with documented pre-notification
 - ▶ 67% successfully pre-notified hospitals
 - ▶ 33% did not pre-notify hospitals
- ▶ Consistent with the National Study, Among the Coverdell Cohort we found the range in documented pre-notification to be significant and requires further study for the State as a whole

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*"Patterns, Predictors, Variations, and Temporal Trends in Emergency Medical Service Hospital Prenotification for Acute Ischemic Stroke." J Am Heart Assoc. 2012;1:e002345 doi: 10.1161/JAHA.112.002345

BK3

EMS Transported Patients Experience Shorter Delay Times and More Rapid Assessment and Treatment

Stroke: Journal of the American Heart Association*

“A [primary stroke center] is one component of a large stroke system of care. Such systems include EMS, local/regional governments and agencies, PSCs, CSCs, and other healthcare facilities. **All resources should be integrated and communicate** at a citywide or regional level to ensure the most *efficient care* for patients with all types of stroke.”

Conclusion: “There is abundant evidence supporting the **key role of the emergency medical services** in providing timely identification, care, and transportation for patients with acute stroke.”

*Stroke: Journal of the American Heart Association, 42(9), 2651-2665. doi:10.1161/01.STR0000158165.42884.4F
<http://stroke.ahajournals.org/content/42/9/2651.full>

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BC1

Annual Data Submission for Stroke Designated Hospitals - 2015 Additions

Hospitals will be required to document and submit information regarding:

1. Pre-hospital stroke screen performed?
2. Advanced notification by EMS?
3. Date/Time patient last known to be well as documented by EMS
4. Did EMS pre-notification contain the following:
 - ▶ Pre-hospital stroke screen findings
 - ▶ Last Known Well (symptom onset)
5. Was the stroke team activated prior to patient arrival?

Hospitals will submit data through Get With the Guidelines, the AHA's national stroke registry

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Slide 27

BK(3) Move to before 2015 reporting additions (slide 23)

Bobseine, Katerose (HEALTH), 9/16/2014

Slide 28

BC(1) Should this be here (before the protocol) as discussed, or after the coverdell slide?

Bruce, Cassandra (HEALTH), 9/16/2014

Harmony of Elements

Stroke Protocol Elements

1. Perform the Cincinnati Stroke Scale
2. Establish the Time of Symptom Onset
3. Prenotify the Hospital of a stroke patient's impending arrival, findings of the CSS, and time of symptom onset
4. Documentation in PCR

Hospital Reporting Elements

1. Was the pre-hospital stroke screen performed?
2. Was time of patient last known well documented by EMS?
3. Did EMS Prenotification contain the following:
 - ▶ Cincinnati Stroke Scale findings
 - ▶ Time of Symptom Onset (Last known well)
4. If advanced notification by EMS, was the stroke team activated prior to patient arrival?

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A Systems Approach to Stroke Care

Prehospital Care Reports

- ▶ Transfer of patient information
- ▶ EMS Policy

Helpful practice

- ▶ Highlight on the PCR
 1. Cincinnati Stroke Scale
 2. Last Known Well (Symptom Onset)
 3. Notify of Key Findings

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Hospitals and EMS: Working Together

Do you have any “best practices” for communication?

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