



Stroke Systems Of Care:

Considerations for Optimizing Patient Care and Improving Patient Outcomes

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Disclosures

- Sharon Hammond-Heaton: None
- Jean Luciano: Genentech Speakers Bureau



Objective



- Recognize components of a stroke system of care and describe interactions among elements.



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Importance of Developing Stroke Systems of Care to Improve Access to Endovascular Stroke Therapies

K. Ruth Whelan, Jessica Hamilton, Lissa Peeling, Brett Graham, Gary Hunter, Michael E. Kelly

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Stroke

JOURNAL OF THE AMERICAN HEART ASSOCIATION



Interactions Within Stroke Systems of Care: A Policy Statement From the American Heart Association/American Stroke Association
Randall Higashida, Mark J. Alberts, David N. Alexander, Todd J. Crocco, Bart M. Demaerschalk, Colin P. Derdeyn, Larry B. Goldstein, Edward C. Jauch, Stephan A. Mayer, Neil M. Meltzer, Eric D. Peterson, Robert H. Rosenwasser, Jeffrey L. Saver, Lee Schwamm, Debbie Summers, Lawrence Wechsler and Joseph P. Wood
on behalf of the American Heart Association Advocacy Coordinating Committee

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Stroke

JOURNAL OF THE AMERICAN HEART ASSOCIATION



Recommendations for the Establishment of Stroke Systems of Care: Recommendations From the American Stroke Association's Task Force on the Development of Stroke Systems
Task Force Members, Lee H. Schwamm, Arthur Pancioli, Joe E. Acker III, Larry B. Goldstein, Richard D. Zorowitz, Timothy J. Shephard, Peter Moyer, Mark Gorman, S. Claiborne Johnston, Pamela W. Duncan, Phil Gorelick, Jeffery Frank, Steven K. Straine, Renee Smith, William Federspiel, Katie B. Horton, Ellen Magnus and Robert J. Adams

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Systems of Care: Recommendations



- Systems serve 3 functions
 - Effective communication and collaboration
 - Promote organized standards approach
 - Identify performance measures
- Provide patients and providers tools needed for prevention, treatment and rehab
- Decisions and protocols are patient centered and focused
- Identify and address barriers to success
- Must be customized for each area
 - State, region or local to ensure appropriate transitions of care



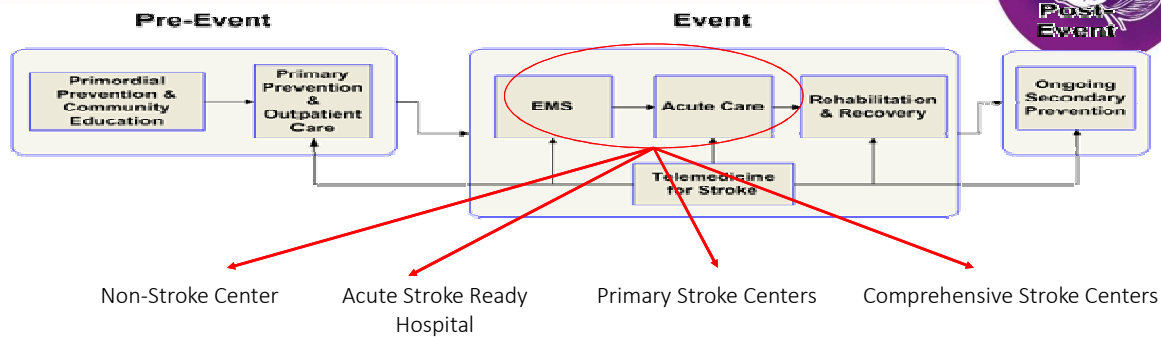
Components:



- Primordial and Primary Prevention
- Community Education
- Notification and Response of EMS
- Acute Treatment
- Subacute Stroke Care and Secondary Prevention for Stroke
- Rehabilitation for Stroke
- CQI



Stroke Systems of Care



The goal of a stroke system of care is to ensure that all stroke patients are rapidly identified, transported, or transferred in a timely fashion to a hospital that care provide the most appropriate level of care for the particular clinical situation



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Primordial and Primary Prevention

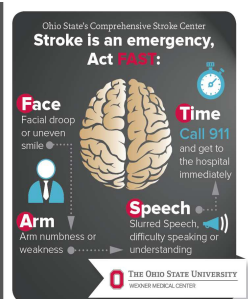
- Primordial: Focus on entire population
 - Smoking cessation, obesity increase exercise
 - Efforts have broad impact on health
- Primary Prevention: treatment of risk factors
 - Hypertension, hyperlipidemia, diabetes, atrial fib other **modifiable risk factors**
- Initiatives:
 - Community Based: Primary Prevention
 - Enhancement: post event, antithrombotic, statins, anti-hypertensives



Community Education



- Need for improved knowledge in the community for stroke signs and symptoms
- Education for all
 - Target high risk populations
 - Community based organizations, policy makers and stakeholders



Notification and Response of EMS



- Knowledgeable dispatchers
- Knowledgeable EMS Providers
- Assessment tools
 - Many
- Destination Protocols
 - Bypass?
 - Air VS Ground
- rtPA Checklists



EMS Navigating Stroke Systems of Care



1. Requires Clinical Decision Support Tools
2. Relationships within Regional Stroke Systems
3. Data to drive performance and care delivery



Systems of Care



AHA/ASA: Expanded Systems of Care

12 states and DC have enacted policies around the recognition of stroke facility designations



The Rapid Arterial Occlusion Evaluation (RACE)



1. Aim to develop and validate a simple prehospital stroke scale to predict the presence of large vessel occlusion (LVO)
2. Designed based on elements of the NIHSS
3. Simpler than a full NIHSS to assess by field providers



RACE



A RACE score ≥ 5

- Sensitivity of 0.85
- Specificity of 0.68

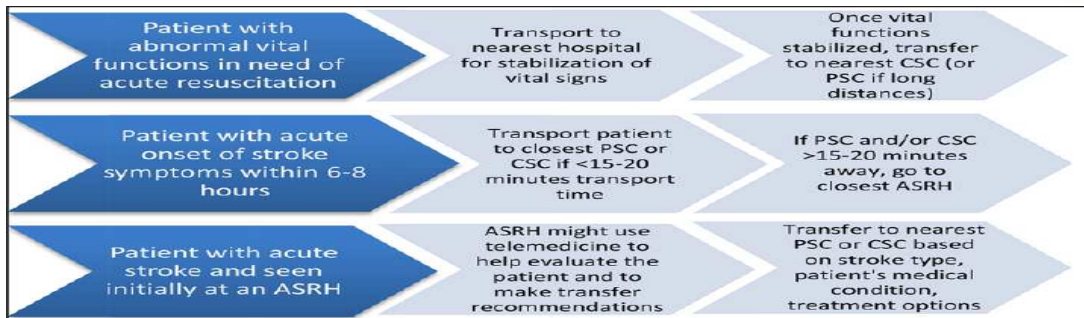
Table 1. RACE Scale

Item	RACE Score	NIHSS Score Equivalence
Facial palsy		
Absent	0	0
Mild	1	1
Moderate to severe	2	2–3
Arm motor function		
Normal to mild	0	0–1
Moderate	1	2
Severe	2	3–4
Leg motor function		
Normal to mild	0	0–1
Moderate	1	2
Severe	2	3–4
Head and gaze deviation		
Absent	0	0
Present	1	1–2
Aphasia* (if right hemiparesis)		
Performs both tasks correctly	0	0
Performs 1 task correctly	1	1
Performs neither tasks	2	2
Agnosia† (if left hemiparesis)		
Patient recognizes his/her arm and the impairment	0	0
Does not recognize his/her arm or the impairment	1	1
Does not recognize his/her arm nor the impairment	2	2
Score total	0–9	



AHA/ASA Policy Statement

Interactions Within Stroke Systems of Care A Policy Statement From the American Heart Association/American Stroke Association



Higashida, R., Alberts, M., Alexander, D., Crocco, T., Demaerschalk, B., Derdeyn, C., et al. (2013). Interactions Within Stroke Systems of Care: A Policy Statement From the American Heart Association/American Stroke Association. *Stroke*, 1-24



CQI



- % of people presenting in treatment window
- % arriving by EMS
- EMS Metrics:



EMS Target Times



- Dispatch time is <1 minute
- Turnout time (call received to in route) is <1 minute.
- **EMS response time is <8 minutes** (time elapsed from the receipt of the call by the dispatch entity to the arrival on the scene of a properly equipped and staffed ambulance).
- The **on scene time is <15 minutes** (barring extenuating circumstances such as extrication difficulties)
- **Travel time is equivalent to trauma or acute myocardial infarction calls**

Edward C. Jauch, J. L. (2013). Guidelines for the Early Management of Patients With Acute Ischemic Stroke : A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*, 1-77.

Implementation strategies for Emergency Medical Services Within Stroke Care Systems of Care





Stroke Times

	Current Period		Year-To-Date		Goals
	Avg	Median	Avg	Median	
Disp to Enroute:	1.02	0.94	1.04	1.00	1 min
Enroute to OnScene:	4.06	4.04	4.08	4.00	5 min
On Scene Time:	15.59	15.48	15.26	14.87	15 min
Transport Time:	9.89	9.59	9.73	8.97	10 min
	P25= 6.05 / P75= 13.76		P25= 6.00 / P75= 13.27		
Total Prehospital Time:	30.55	29.90	30.11	29.20	30 min
Drop Time:	27.53	25.93	28.95	26.18	20 min

On Scene Time =

Time of Arrival On Scene until Departed Scene.

Transport Time =

Time from Departed Scene until At Destination.

Prehospital Time =

Time from Dispatch to At Destination.

Drop Time =

Time of Arrival at Hospital to back InService.

Stroke LAMS Score

Inc #	Dispatched	LAMS Score
16019122	02/09/2016	1
16023743	02/18/2016	1
16024072	02/19/2016	1
16027460	02/26/2016	1
16022117	02/15/2016	2
16027044	02/25/2016	2
16018243	02/07/2016	2
16018036	02/06/2016	2
16019763	02/10/2016	2
16017760	02/06/2016	2
16021400	02/13/2016	2
16021230	02/13/2016	2
16020262	02/11/2016	2
16021665	02/14/2016	2
16015269	02/01/2016	3
16018793	02/08/2016	3
16018943	02/08/2016	3
16027504	02/26/2016	3
16028197	02/27/2016	3
16025833	02/22/2016	3
16025632	02/22/2016	4
16024023	02/19/2016	4
16023808	02/18/2016	4
16027983	02/27/2016	4
16020996	02/12/2016	4
16018706	02/08/2016	4
16015806	02/02/2016	4
16021306	02/13/2016	4
16021274	02/13/2016	4
16023063	02/17/2016	4
16023030	02/17/2016	5
16016795	02/04/2016	5
16020768	02/12/2016	5
16020768	02/12/2016	5
16020768	02/12/2016	5
16028414	02/28/2016	5
16024110	02/19/2016	5

Total # of LAMS Scores Record



Need for Direction



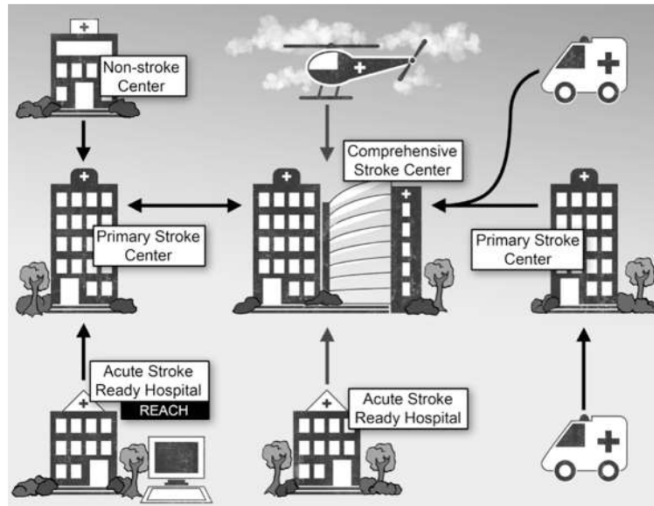
Acute Care



- A stroke system should determine the acute stroke treatment capabilities and limitations of all hospitals and make these available to primary care providers, EMS, and the public.
- A stroke system should identify the roles played by each type of hospital in the system and define the responsibilities inherent in those roles.



Treatment and Routing Options



Tiered Levels of Stroke Care



- 1. Acute Stroke Ready Hospital = ASRH
 - 2. Primary Stroke Certified = PSC
 - 3. Comprehensive Stroke Certified = CSC
-
- **ASRH**
 - •Neurologist –24/7 in person or via telemed
 - •Telemed avail w/in 20 min
 - •Transfer protocols with PSC or CSC
 - •IV tPA available –anticipate transfer if treated
 - •No stroke unit required



Tiered Levels of Stroke Care



PSC

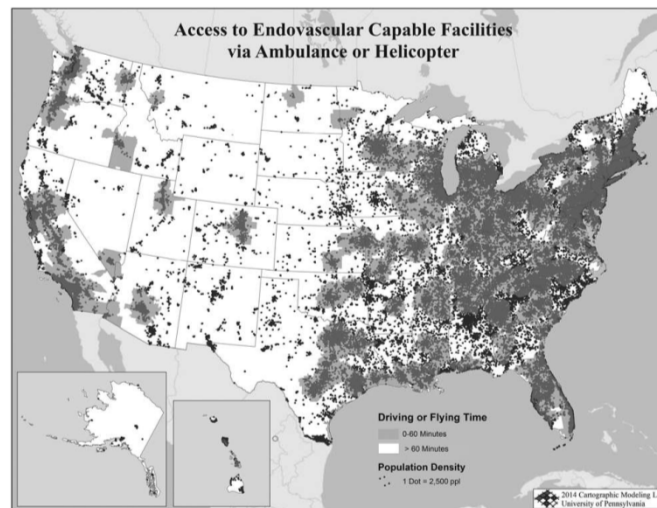
- Stroke unit or designated beds
- CTA/MRA available 24/7
- Neurologists 24/7 in person or via telemed
- IV tpa treatment
- Neurosurgeon available within 2 hrs—if onsite neurosurgeon—OR staffed 24/7

CSC

- Dedicated neuro ICU with 24/7 staffing
- Catheter angiography 24/7
- Able to meet concurrent needs of multiple complex stroke patients
- 24/7 neurointerventionalist, neurosurgeon, neurologists
- Aneurysm clipping/coiling, carotid stenting/CEA, endovascular care
- Patient centered stroke research
- Additional volume requirements for IV tPA and SAH clip/coil volume



By ground 56% of patients had access to an endovascular capable hospital within 60 minutes. By air 85% had access to an endovascular-capable hospital within 60 minutes.



Large Vessel Occlusive (LVO) Ischemic Strokes Promptly to CSC



- Longer times from stroke onset to initiation of IA therapy and revascularization are associated with lower chances of good clinical outcomes
- Achieving reperfusion at 310 minutes, compared to 280 minutes, corresponds to a 10.6% decrease in the probability of a good outcome.

Khatri et al., Neurology 2009; 73 (13): 1066-1072



Systems of Care: Subacute Care and Secondary Prevention



- The treatment of stroke patients during the subacute phase, including the early implementation of secondary prevention regimens, is critical to optimizing patient outcomes. Well established evidence-based guidelines are focused on subacute care and secondary prevention for stroke.



A stroke system should use organized approaches to optimize subacute care



- Stroke teams
- Stroke units
- Written protocols
- Order Sets
- Neuroscience nurses, educated in the optimal management of the stroke patient.
- Clinical research



Secondary Prevention



A stroke system should adopt approaches to secondary prevention that address all major modifiable risk factors and that are consistent with the national guidelines for all patients with a history or suspected history of stroke or transient ischemic events.



Secondary Prevention of Ischemic Stroke



What is the cause of the initial cerebrovascular event?

Large vessel athero

Cardioembolism

Small vessel dz

Carotid endarterectomy
Stent
Antiplatelet agent

Anticoagulation

Antiplatelet agent

Risk factor modification
Statin
ACEI / ARB



Patient Education



- All patients need to know the signs and symptoms of stroke.
- Reduction of risk factors
- Education about the hidden deficits of stroke: depression and cognitive deficits
- Lifestyle modification
- Medication compliance





Family Assessment

- Respite care
- Depression
- Stress
- Coping



Subacute and Secondary Prevention CEQI



- Length of stay
- Readmissions
- Seven day phone calls.
- Outcomes: Modified Rankin and Quality of Life scales



Systems of Stroke Care: Rehabilitation



Stroke rehabilitation should be provided by an appropriately trained and staffed multi-disciplinary team, including

- Neurorehabilitation physicians
- Rehabilitation nurses
- Physical and Occupational therapists
- Speech-language pathologists,
- Recreational therapists, social workers, neuropsychologists
- Vocational counselors
- Families and the patient should be a fully involved member of this team.



Benefits



- The intensity of rehabilitation services often is a critical determinant in the recovery of stroke patients.
- The use of coordinated, multidisciplinary stroke rehabilitation teams has been shown to diminish mortality rates for stroke patients.
- In addition, stroke patients who receive care in an inpatient rehabilitation facility are more likely to return to the community and to recover their ability to perform ADLs.



Stroke Rehabilitation CEQI



Performance measures to evaluate patient outcomes

- Mortality
- Functional status
- Community discharge
- Percentage of stroke patients who receive the appropriate level of rehabilitation services in the system



Communication



The Number one problem and the number one answer!
Communication between:

Patient – EMS

EMS- Hospitals and Hospitals back to EMS

Among the multidisciplinary teams.

Between providers and the patients and families.

To the next level of care providers.


To the primary care providers.



Multidisciplinary Care





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***Coming together is a beginning.
Keeping together is progress.
Working together is success.***


-Henry Ford



Thank you for your attention!

Sometimes the questions are complicated and the answers are simple.

~Dr. Seuss



SSQuotes.com

