



## **LERN Level 1 Stroke Hospital Requirement**

**Must obtain Comprehensive Stroke Center Certification by the Joint Commission.**

The following is a description of a Comprehensive Stroke Center:

1. Facilities in this category will provide acute access to stroke care for their geographic area. EMS should not bypass a LERN Level 2 or LERN Level 3 facility where care can be delivered faster to reach such a LERN Level 1 Hospital. This facility will provide support for LERN Level 2 and Level 3 facilities. The comprehensive center will provide a referral source for high level neurological critical care, medical, interventional, and surgical capabilities to support stroke care at other hospitals. The comprehensive centers will provide a resource for medical professional education, research, and stroke program development to other centers and serve as a resource providing clinical and procedural advice to other centers.
2. Emergency department staffed 24/7
  - a. Perform initial ER physician patient evaluation within 10 minutes of patient arrival
  - b. Develop and maintain an organized Stroke Team with expertise in emergency evaluation and management of stroke.
  - c. Notify Stroke team within 15 minutes of arrival.
3. Ability to perform CT of head on site within 25 minutes of arrival and interpret within 45 minutes of patient arrival.
4. Ability to draw and report results of appropriate lab work within 45 minutes of patient arrival. (CBC, platelet count, PT, PTT, INR, chemistry panel)
5. Access to vascular neurological expertise on site within 15 minutes of patient arrival.
6. Proficiency in delivery of tPA and ongoing training programs for care delivery of tPA.
  - a. Ensure door-to-drug (needle) times of 60 minutes from arrival.
  - b. Transfer patient to an inpatient setting within 3 hours of arrival
7. Written care protocols and order sets for stroke, including guidelines, algorithms, critical care pathways, NIH Stroke Scale training
8. Provision of other items important for quality stroke care:
  - a. Health professional training programs twice per year that include education on standards of acute stroke care.
  - b. Physicians involved in stroke care have adequate continuing medical education hours.
  - c. Mechanism in place to assess stroke patient satisfaction with their stroke care.

- d. Provide a mechanism for continuity of care post stroke including rehabilitation and ongoing risk factor management.
9. Personnel:
- a. Vascular neurology and neurosurgery; vascular surgery
  - b. Neuroradiology and Neurointerventional
  - c. Critical care specialists
  - d. Physical Medicine; Physical, Speech, and Occupational Therapy
  - e. Staff stroke nurses, APN, Respiratory Therapy
10. Diagnostic techniques:
- a. MRI with diffusion, MRA, MRV
  - b. CT, CTA, TCD, carotid duplex ultrasound, transesophageal echocardiogram
11. Surgical and interventional therapies:
- a. Carotid endarterectomy; hemicraniectomy
  - b. Surgical and interventional management of aneurysms and arteriovenous malformations
  - c. Placement of ventriculostomy and intracranial pressure transducer
  - d. Hematoma removal/drainage
  - e. Endovascular treatment of vasospasm
  - f. Intra-arterial reperfusion therapy (thrombolytics and embolectomy)
12. Infrastructure:
- a. Stroke unit, Neurological ICU
  - b. Operating room and interventional suite available 24/7
  - c. Stroke registry; state funding should be provided to develop and maintain such a state-wide registry.
13. Education and research:
- a. Community education; community prevention programs
  - b. Professional education; Patient education.
14. Neurosurgeon on site within 30 minutes/available 24/7
15. Neurological Intensive Care Unit and Stroke Unit
16. Neuro-Interventional available 24/7 (Neurology, Neuroradiology, Neurosurgical)
17. Research and educational training program
- a. Residency and fellowship training
  - b. Clinical and/or basic science research
18. Quality of stroke care demonstrated by maintenance of certification through the Joint Commission Certification Program for Comprehensive Stroke Centers.



## **LERN Level 2 Stroke Hospital Requirement**

**Must obtain Primary Stroke Center Certification by the Joint Commission or by the Healthcare Facilities Accreditation Program (HFAP)**

The following is a description of a Primary Stroke Center:

1. Facilities in this category will provide timely access to stroke care but may not be able to meet all the criteria specified for a LERN level 1 Center. These centers will provide acute stroke care in urban and rural areas where transportation and access are limited and is intended to recognize those models of care delivery that have shown utility including “drip-and-ship” and telemedicine. Because these centers can provide care faster these centers should not be bypassed to go to a more distant LERN Level 1 Hospital.
2. Emergency Department physician-staffed 24/7
  - a. Perform initial ER physician patient evaluation within 10 minutes of arrival.
  - b. Develop and maintain an organized Stroke Team with expertise in emergency evaluation and management of stroke.
  - c. Notify Stroke team within 15 minutes of arrival.
3. Ability to perform CT scan of head within 25 minutes of patient arrival and interpret within 45 minutes of arrival.
4. Ability to draw and report results of appropriate lab work within 45 minutes of patient arrival. (CBC, platelet count, PT, PTT, INR, chemistry panel)
5. Access to neurological expertise on site within 15 minutes of patient arrival.
6. Proficiency in delivery of tPA and ongoing training programs for care delivery of tPA.
  - a. Ensure door-to-drug (needle) times of 60 minutes from arrival.
  - b. Transfer patient to an inpatient setting within 3 hours of arrival.
7. Access to neurosurgical expertise within 2 hours of arrival.
8. Infrastructure: Intensive care unit and stroke unit. Stroke units can be defined an implemented in a variety of ways. The stroke unit does not have to be a specific enclosed area with beds designated only for acute stroke patients, but it will be a specified unit to which most stroke patients are admitted.
9. Written care protocols and order sets for stroke, including guidelines, algorithms, critical care pathways, NIH Stroke Scale training.

10. Provision of other items important for quality stroke care:
  - a. Health professional training programs twice per year that include standards of acute stroke care.
  - b. Physicians involved in stroke care have adequate continuing medical education hours.
  - c. Mechanism in place to assess stroke patient satisfaction with their stroke care.
  - d. Provide a mechanism for continuity of care post stroke including rehabilitation and ongoing risk factor management.
11. Written documentation of a plan for secondary transfer to a LERN Level 1 or other appropriate facility, if resources deemed necessary are not available at the primary destination site.
12. Personnel: Emergency physician; Stroke Champion (any physician specialty)
13. Diagnostic techniques: CT, 24/7 laboratory
14. Quality of care demonstrated by maintenance of certification through the Joint Commission Certification program or the HFAP for Primary Stroke Centers.



## **LERN Level 3 Stroke Hospital Requirements**

1. Facilities in this category will provide timely access to stroke care but may not be able to meet all the criteria specified in LERN Level 1 and Level 2 guidelines. These centers will provide acute stroke care in urban and rural areas where transportation and access are limited and is intended to recognize those models of care delivery that have shown utility including “drip-and-ship” and telemedicine. Because these centers can provide care faster these centers should not be bypassed to go to a more distant LERN Level 1 or Level 2 Hospital.
2. Emergency department physician-staffed 24/7
  - a. Perform initial ER physician evaluation within 10 minutes of patient arrival.
  - b. Contact with neurological expertise within 15 minutes.
3. Ability to perform CT on site within 25 minutes of patient arrival and interpret within 45 minutes.
4. Ability to draw and report results of appropriate lab work within 45 minutes of patient arrival. (CBC, platelet count, PT, PTT, INR, chemistry panel)
5. Access to neurological expertise by phone or telemedicine within 15 minutes of arrival.
6. Proficiency in delivery of tPA and ongoing training programs for care delivery of tPA.
  - a. Ensure door-to-drug (needle) times of 60 minutes from arrival.
  - b. Transfer patient to an appropriate higher level of care within 3 hours of arrival, if appropriate.
7. Personnel: Emergency physician
8. Infrastructure: Emergency Room, If the hospital does not have an ICU then patient transfer should be considered after tPA administration.
9. Diagnostic techniques: 24/7 CT, 24/7 laboratory
10. Written care protocols and order sets for stroke, including guidelines, algorithms, critical care pathways, NIH Stroke Scale training.
11. Written documentation of a plan for secondary transfer to a LERN Level 1, Level 2, or other appropriate facility, if resources deemed necessary are not available at the primary destination site.
12. Quality of stroke care demonstrated by involvement in quality control program such as American Stroke Association Get With the Guidelines or submission of data to LERN that indicates compliance with CMS Stroke Core Measures



## LERN Level 4 Stroke Hospital Requirements

1. These facilities are considered a Non-Stroke Hospital. EMS should not bring patients exhibiting signs or symptoms of stroke to a LERN Level 4 Hospital except for instances where the clinical situation requires stopping at the closest emergency department.
2. Physician staffed ER 24/7
3. CT scan available within 12 hours.
4. Transfer protocol in place for transfer to higher levels of care with a written and agreed upon relationship with a Level I, II, and III Center.

Criteria	LERN Level 4	LERN Level 3	LERN Level 2	LERN Level 1
Physician staffed ER 24/7	X	X	X	X
CT scan available <25 minutes		X	X	X
CT available within 12 hours	X			
CT scan available 24/7		X	X	X
Lab < 45 minutes		X	X	X
Proficient tPA delivery		X	X	X
Neurological expertise		X	X	X
Vascular neurology				X
Neurosurgery <2 h			X	
Neurosurgery < 30 min				X
Interventional				X
Research				X
Training programs				X
Stroke unit			X	X
ICU		If no ICU – should consider drip and ship	X	X
NICU				X
Quality control		GWTG, or submission of data to LERN that indicates compliance with CMS Stroke Core Measures	GWTG/JC	GWTG/JC
Protocols for stroke care		X	X	X

GWTG= Get with the Guidelines, American Heart and Stroke Association  
 JC= Joint Commission

References:

1. The Joint Commission Web Site
2. Alberts MJ, Latchaw RE, et al. Revised and updated recommendations for the establishment of Primary Stroke Centers. *Stroke* 2011; 42: 2651-2665.
3. Alberts MJ, Latchaw RE, et al. Recommendations for comprehensive stroke centers. *Stroke* 2005; 36:1597-1618.
4. Acker JE III, Pancioli AM, et al. Implementation strategies for emergency medical services within stroke systems of care. *Stroke* 2007; 116: 3097-3115.
5. Schwamm LH, Holloway RG, et al. A review of evidence for use of telemedicine within stroke systems of care. *Stroke* 2009; 40: 2616-2634.
6. Schwamm LH, Audebert HJ, et al. Recommendations for the implementation of telemedicine within stroke systems of care. *Stroke* 2009; 40: 2635-2660.
7. Schwamm LH, Panicioli A, et al. Recommendations for the establishment of stroke systems of care. *Stroke* 2005; 36: 690-703.
8. Alberts MJ, Latchaw RE, et al. Revised and updated recommendations for the establishment of primary stroke centers. *Stroke* 2011; 42: 2651-2665.
9. Demaerschalk BM. Seamless integrated stroke telemedicine systems of care: A potential solution for acute stroke care delivery delays and inefficiencies. *Stroke* 2011; 42: 1507-8.
10. Moskowitz A, Chan Y, et al. Emergency physician and stroke specialist beliefs and expectations regarding telemedicine. *Stroke* 2010; 41: 805-809.