Lights and Sirens

Who should be transported emergently?

Time is brain!
After an acute arterial occlusion, the neuronal cells die rapidly. Every minute without the reperfusion, 2million neurons die. The earlier the blood flow can be reestablished by Acute Stroke Treatments, the better are the odds of someone surviving and avoiding disability.
If someone has abrupt onset of neurological symptoms and have a positive F.A.S.T or Erlanger Prehospital Stroke Screen (EPSS), they need to be rushed to the nearest Stroke Ready Hospital capable of treating the Stroke Emergently. This might require using the Air ambulance in certain cases.
As you are working with stroke patients in the field, remember these guidelines and transport these stroke patients emergently.

Basic Principles of Pre-Hospital Care

What to remember when treating a stroke alert patient…

Goal is to load and go:

< 9 minutes to the scene and <15 minutes at the scene

On Scene

1. Manage CABs: chest compression , airway ,breathing- give oxygen if needed (rare in Stroke)

2. Perform Prehospital Stroke Assessment (FAST/ LAMS/EPSS)

3. Establish the exact time of onset/ time last seen normal
4. If possible bring the witness (family/caregiver) with the patient; or record name/cell phone no.(especially when patient is impaired)
5. Establish if the patient is on any Anticoagulants/ blood thinners and record.

In Transit:

1. Rapid transport to the closest hospital capable of treating Acute Strokes Emergently
2. Alert the receiving ED 'stroke alert'
3. Check and record BP and Blood Glucose
4. Establish cardiac monitoring
5. Establish two 18gauge IV lines (time permitting)
6. Complete and fill out Erlanger Prehospital Stroke Screen

Other Things To Remember :

1. Avoid giving glucose.

Reason: Hyperglycemia causes lactic acidosis and damages the penumbra.

Exception: If hypoglycemic by finger stick <50 consult, medical direction.

2. Avoid treating hypertension.

Reason: It is commonly caused by strokes; it is required for keeping the penumbra perfused; it often subsides without treatment.

3. Avoid causing aspiration pneumonia by keeping 100% NPO and elevating head 30º.

Reason: Most stroke patients have trouble swallowing and aspiration is a major cause of morbidity and mortality.

4. Provide O2 2-4L by nasal cannula & monitor O2 saturation. (Especially if O2% is <92%)

FOCUSED NEUROLOGIC ASSESSMENT

Medic's and first responders are an integral part of stroke-chain-of survival. Pre-hospital assessment is crucial. On one hand, urgent transport is the goal. **Time is Brain**. On the other hand, the treating Physicians rely on the information the medic collects. Therefore we encourage using the **Erlanger Prehospital Stroke Screen** which takes less time and has all the pertinent elements of patients history for the physician to make treatment decisions quickly.

The **stroke history** may be difficult to obtain from a neurologically impaired patient. That is why it is important to seek information from witness/caregivers, especially regarding the last time the patient was without symptoms.

If time is available en route, we encourage performance of the expanded ASLS Exam which is a more detailed neurological assessment; however it is not mandatory at all. **Remember that the goal of EMS is to rapidly identify the problem and transport patients to Erlanger Emergency Room.** As part of this goal, the ASLS exams will:

(1) Ensure that an accurate and easy-to-learn basic screening is carried out immediately; if a stroke is suspected, the medic team should "load and go."

(2) Allow additional observations that permit the medics to expand the examination in order to assess stroke severity and identify the stroke syndrome.

The ASLS examination checklist is shown below. The following is an outline of the exact procedure to follow, step by step. This will guide you as you examine your patient.

ASLS EXAMINATION – "HEAD TO TOE"

MENTAL STATUS	Check if abnormal

Level of Consciousness (AVPU)	☐	
Speech "You can't teach an old dog new tricks." (repeat) Abnormal = wrong words, slurred speech, no speech	☐	
Questions (age, month)	☐	
Commands (close, open eyes)	☐	
CRANIAL NERVES		
Facial Droop (show teeth or smile) Abnormal = one side does not move as well as other	**RT** ☐	**LT** ☐
Visual Fields (four quadrants)	☐	☐
Horizontal Gaze (side to side)	☐	☐
LIMBS		
Motor–Arm Drift (close eyes and hold out both arms) Abnormal = arm can't move or drifts down	**RT** ☐	**LT** ☐
Leg Drift (open eyes and lift each leg separately)	☐	☐
Sensory–Arm and Leg (close eyes and touch, pinch)	☐	☐
Coordination---Arm and Leg (finger to nose, heel to shin)	☐	☐

What this means, in greater detail.

THE ASLS EXAM---An Expanded Pre-hospital Stroke Exam

Exact Procedure to Follow ("Head to Toe") with Normal Findings

MENTAL STATUS	
AVPU:	***You*** communicate with the patient using questions and Commands and, if necessary, painful stimulation with a pinch. ***The Patient*** is categorized as **A**lert, responsive to **V**erbal Stimuli, responsive to **P**ainful stimuli, or **U**nresponsive.
SPEECH:	***You*** ask the patient to say: "You can't teach an old dog new tricks." ***The Patient*** responds with no aphasic, i.e., no wrong words Or "mixing up" of words and no dysarthria, i.e., no slurring (the letter is a cranial nerve abnormality).
QUESTIONS:	***You*** ask "How old are you?" and then "What month is this?" ***The Patient*** responds correctly.
COMMANDS:	***You*** say "Close your eyes tight" and then "Open your eyes wide." ***The Patient*** responds appropriately.
CRANIAL NERVES	
FACIAL DROOP:	***You*** say: "Show me your teeth" and/or "Smile for me." ***The Patient*** responds appropriately with both sides of the face moving up equally.

VISUAL FIELDS:	***You*** say: "Look at my nose." You hold your hands out on the right and left and wiggle your fingers in one quadrant (left upper or lower, right upper or lower). You say "Point to where my fingers are moving." You repeat this for the other 3 quadrants. ***The Patient*** recognizes finger movement in all four areas.
HORIZONTAL GAZE:	***You*** say: "Follow my finger movement with your eyes." and you move your finger fully to the left and right. ***The Patient*** follows completely to both sides.
LIMBS	
MOTOR – ARM DRIFT:	***You*** say: "Hold out both arms in front of you with your palms down and close your eyes." ***The Patient*** responds appropriately. Both arms move the same and do not drift down.
LEG DRIFT:	***You*** say: "Lift this leg up in the air." (for each side) ***The Patient*** can lift each leg, with no drift or weakness.
SENSORY-ARM:	***You*** say "Close your eyes. Can you feel me touching you ARM: anywhere" Is it the same on both sides?" as you touch or lightly pinch each arm. ***The Patient*** can feel the touch, tells you where, and says that both sides feel the same.
SENSORY-LEG:	***You*** say "Close your eyes. Can you feel me touching you anywhere" Is it the same on both sides?" as you touch or lightly pinch each leg. ***The Patient*** can feel the touch, tells you where, and says that both sides feel the same.
COORDINATION	***You say*** "Touch my finger with your finger, and then touch

-ARM	your nose, back and forth," as you hold your finger in front of the patient. ***The Patient*** does this rapidly with no clumsiness.
COORDINATION -LEG	***You*** **say** "I want you to take this heel and touch it to your knee on the other leg and then run it down your shin bone." (indicate heel and do for each side) ***The Patient*** does this with no clumsiness.

THE TEN PRINCIPLES OF PRE-HOSPITAL STROKE MANAGEMENT

1) EMS personnel should start 2-4 liters of oxygen via nasal cannula and monitor oxygen saturation.

2) Place an IV of normal saline. (Two 18g IV lines preferred if time permits)

3) Avoid treatment of hypertension.

4) Position patient to avoid aspiration and leave NPO.

5) Hyperglycemia and hypotension may cause the reversibly ischemic penumbra to become irreversibly infarcted tissue. Correct these rapidly.

6) Give glucose only if the patient's finger stick value is <50 after consulting medical direction.

7) Obtain a history from any witness (including the name and telephone number of the witness).

8) Perform a brief neurological examination in the field, **BUT** do not permit the performance of the exam to delay patient transport to the hospital

9. Alert the ED if a patient meets EPSS criteria 'Stroke Alert' .Transport the patient with urgency to Erlanger Emergency Room.

10) Once in route, complete the ASLS Exam or EPSS and give to Erlanger Emergency Room RN.

MAJOR STROKE SYNDROMES AND STROKE MIMICS

The three main divisions of the brain:
-the cerebrum (including the left and right cerebral hemispheres)
-the brainstem
-the cerebellum

The signs of a patient with brain injury depend on where in the brain the lesion occurs.
Differentiating a stroke from a stroke mimic is based on
(1) history of symptom onset (e.g., stroke presents suddenly and with no associated trauma, brain tumors present over weeks to months, seizures present with shaking of a limb or a staring episode, hypoglycemia, often presents after excessive insulin use, subdural hematomas present after head trauma)
(2) past medical history (e.g., stroke patients often have vascular risk factors such as hypertension or diabetes, brain tumor patients may have a history of systemic cancer, seizure and migraine patients usually have a history of similar episodes in the past)
(3) laboratory data (e.g., hypoglycemic patients have low blood glucose and computed tomography [CT] scan differentiates stroke from tumor, abscess, and intracranial hemorrhage).

Thus, one cannot determine by neurological examination alone whether an acute stroke is ischemic or hemorrhagic. Based on brain localization, the major stroke syndromes are:

1. Left Hemisphere
2. Right Hemisphere
3. Brainstem
4. Cerebellum
5. Possible Hemorrhage

5 Major Syndromes: Typical Signs

FOCAL DEFICITS	LEFT HEMISPHERE	RIGHT HEMISPHERE	BRAINSTEM	CEREBELLUM *	HEMORRAHGIC +
SPEECH	Aphasia—Wrong or Inappropriate words	Says correctly	Dysarthria—slurring	Says correctly	Says correctly but slowly (often sleepy)
FOCAL DROOP	Right facial droop	Left facial droop	May have bilateral droop	No droop	No droop
ARM DRIFT	Right arm drift (weakness)	Left arm drift (weakness)	May have Bilateral drift (weakness)	No drift	No drift

* Finger-to-nose and/or heel-to-shin testing typically abnormal
+ Decreased level of consciousness with headache and stiff neck are typical; this syndrome without associated focal neurological deficits is most consistent with subarachnoid hemorrhage. With intracerebral hemorrhage, focal deficits may occur.

Erlanger's Stroke Center is eager to provide onsite training for your EMS or First Responder unit. Please contact, Jennifer Butler, Data Registrar at 423.778.6450 - Or email at Jennifer.butler@erlanger.org.

South East Regional Stroke Center

Any questions about treatment protocols or training contact Traci Jennings, RN, at 423-778-3437

Prehospital Stroke Score Sheet

Patient Name

Information /History From ☐ Patient ☐ Family ☐ Witness

Name _____ Phone_____

Last Known Time Patient was at Baseline or Deficit free and Awake

Time _____ Date_____

SCREENING CRITERIA

		Yes	Unknown	No
1	Age >45			
2	History of Seizure or Epilepsy Absent			
3	Symptom Duration less than 6hours			
4	At Baseline not wheelchair bound/bedridden			
5	Blood glucose between 60 and 400			

6 Exam **Look for Obvious Asymmetry:**

	Normal	Right	Left
Facial Smile/Grimace			
Hand Grip		☐ Weak	☐ Weak
		☐ No Grip	☐ No Grip
Arm Strength		☐ Drift down	☐ Drift Down
		☐ Fall Fast	☐ Fall Fast

Based on the Exam the patient has only Unilateral not Bilateral Weakness ☐ Y ☐ N

10. Items 1,2,3,4,5,6 all Yes or UNKNOWN ---Screening Criteria Met
11. If Screening Criteria Met Alert the Receiving Hospital of STROKE CODE
12. Is Patient on any Anticoagulation? ☐ No ☐ Unknown ☐ YES
    If yes specify.....
13. NOTE: Patient May be Experiencing a Stroke Even if the CRITERIA NOT MET
14. TIME Screen COMPLETED Date_____ Time_____
15. Form completed by Name_____ Contact_____