Integrated Endovascular Workflow

NATIONAL STROKE ASSOCIATION®

5 Rs of EMS Stroke Activation[1]

Dispatch
9-1-1 Call

- Pre-arrival Instructions
- Pre-packaging Instructions
- Verbalize stroke evidence/grade to EMS/FD

On Scene
<10 Minutes

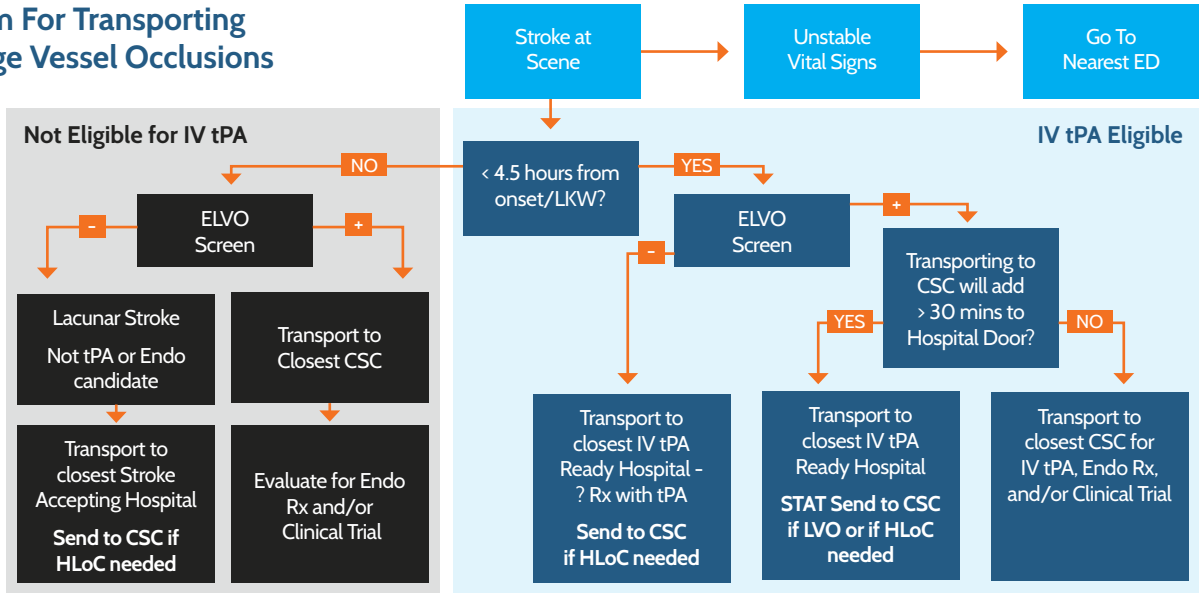
- **RECOGNIZE** Stroke Scale to Identify Stroke
- **RULE OUT** BGL, Sepsis, Seizure, Toxins
- **RANK** RACE/LAMS/C-STAT
- **REPORT** Stroke Alert to Hospital, LKW time, Previous Disabilities, Severity, ETA

Transport
CSC Vs. PSC

- **ROLLOUT** 3/12 Lead, Bilateral IV's, Pre Registration of patient, Beta Blockers if severe Hypertension (t-PA parameters of 185/110)

Pre-hospital Bundle

EMS Algorithm For Transporting Emergent Large Vessel Occlusions (ELVO)



ELVO Screen LAMS or RACE or C-STAT

Destination Determination

Example ED Stroke Protocol[2]

F	A	S	T	V	TIME LINE GOALS
Facial weakness	Arm numbness/ tingling; weakness	Slurred speech/ aphasia	Time to call	Vision changes/ loss of vision	MD in ED: 10 min • Patient Straight to CT Door To IV tPA < 30 min Door to Groin Puncture < 60 min Door to Reperfusion Goal of < 90 minutes

Primary work up for all stroke alerts - obtain non-contrast CT brain & CTA head and neck.

LEVEL 1	LEVEL 2	LEVEL 3
• Patient with stroke symptoms (FASTV (+) exam) with last known well (LKW) less than 24 hours • Patients who have received IV Alteplase from outside facilities • All Intraparenchymal hemorrhages	• Patient with neurologic deficits (FASTV (+) exam) with last known well (LKW) greater than 24 hours	• Patient with stroke symptoms that have resolved at the time of presentation
• Do CT, CTA head & neck. • If patient candidate for Endo Rx & 6 - 24 hrs do CTP *(Do CTP for stroke 0-6 hrs or CTA for ICH at neuro discretion)*	• Do CT, CTA head & neck. • Do CTP at neuro discretion.	• Do CT, CTA head & neck. • Do CTP at neuro discretion
CT Table to be Prioritized	CT Table to be Prioritized	CT < 30 minutes
Call Neurosurgery for all Hemorrhages		

ED Workflow

Top 10 Tips for Stroke Teams

1. **Time remains Brain** for all reperfusion strategies, thus minimizing delays to all forms of reperfusion maximizes patient's chances of a good recovery.

2. **Alteplase remains standard of care**, and assessment for LVO should not delay alteplase administration in eligible patients.

3. **Build a regional stroke system** of care that ensures sharing of best practice and develops a regional triage protocol which optimizes use of hospital resources. *Mission Lifeline: Stroke* is an example of such a protocol.

4. **Build an expert stroke team** rather than a team of stroke experts, and work collectively to maximize the stroke program.

5. **Preparation is key.** Implement proven *Target Stroke I and II* strategies to minimize treatment delays.

6. **Provide continuous EMS training** on stroke screens, scores, and triage protocols (EMS 5 R's of Stroke Activation).

7. **Encourage EMS triage and pre-notification** based on suspicion of stroke and stroke severity.

8. **Primary Work-up** NCCT/CTA Head and Neck **0-6 hours** LKW and Secondary Perfusion Studies 6-24 Hours or Wake if Confirmed LVO on Primary work up (within 6 hours of stroke onset for patients with a LVO perfusion imaging is not required for EVT).

9. **Decreasing Door In Door Out times** for interfaculty transfers is critical to maximizing eligibility for and outcomes of EVT.

10. **Emphasize Team Communication,** Transparency and Feedback. Share in the success of patient outcomes with the entire stroke system of care.

[1] *Montgomery County Hospital District EMS Clinical Department*
[2] *Erlanger Health System*

NATIONAL STROKE ASSOCIATION®
HOPE AFTER STROKE

The National Stroke Association's mission is to reduce the incidence and impact of stroke by delivering education and programs focused on prevention, treatment, rehabilitation and support for all impacted by stroke.

Find resources and information at stroke.org.