THE WARREN ALPERT
Medical School
BROWN UNIVERSITY

Rhode Island STROKE SYMPOSIUM

Field Diagnosis, Treatment, and Triage for Suspected Acute Stroke

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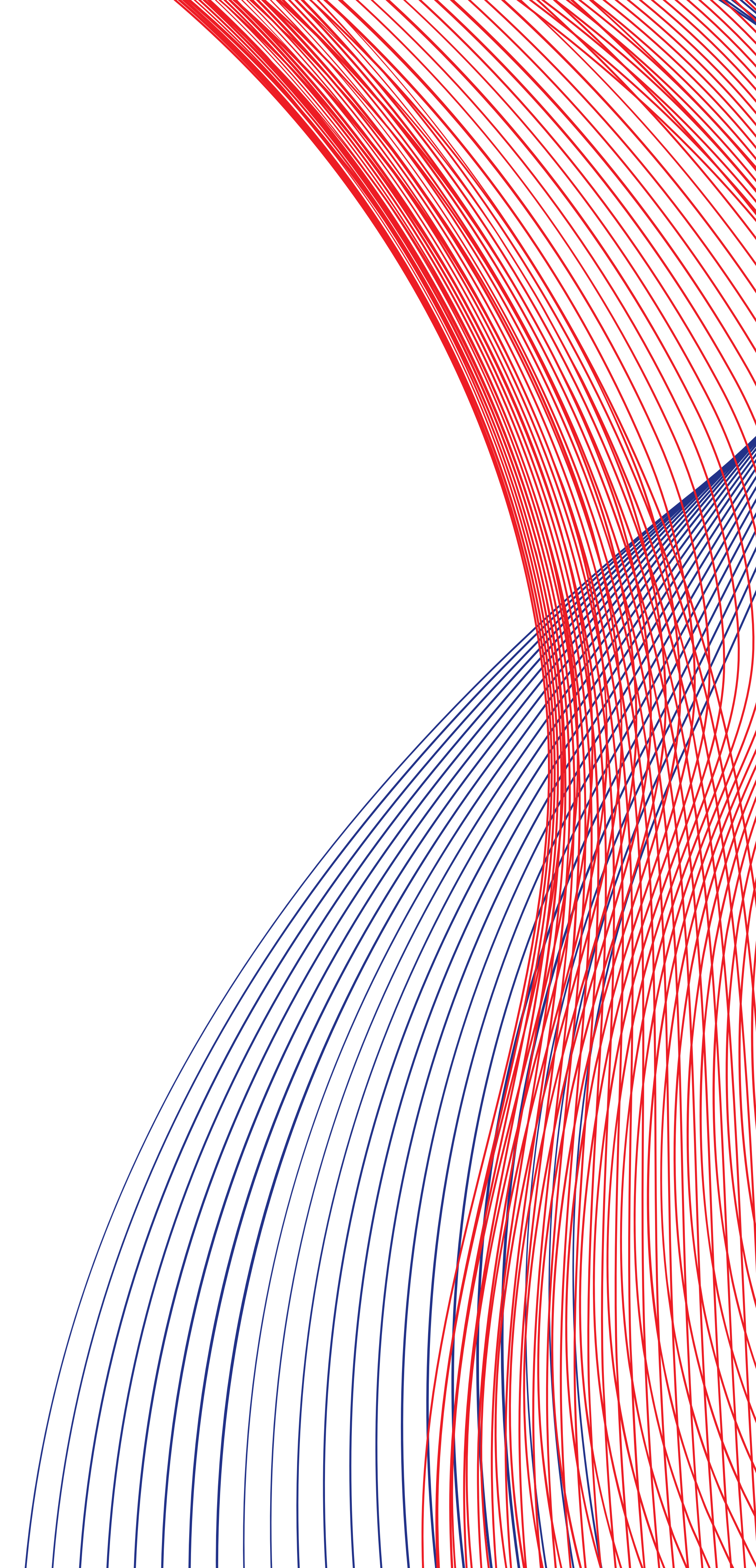
East Providence Fire Department

DISCLOSURE

- No relevant financial relationships exist
- There will be no off-label discussion

The Critical Role of EMS in Stroke Care

- Despite new and changing treatment and prevention options, stroke is not going away
- EMS personnel play a critical role in helping ensure stroke patients have timely access to the appropriate in-hospital stroke therapies
- EMS agencies are well poised to provide stroke education within the community
- EMS agencies have an emerging role in post stroke care



EMS Stroke Care Goals

The most important goals for prehospital care for stroke patients include:

- Identification of the stroke patient in the field
- Provision of appropriate prehospital care to the patient
- Transport of the patient to the most appropriate hospital

<u>These goals should be achieved in the shortest amount of time possible</u>

Acker JE, III, Pancioli AM, Crocco TJ, et al. Implementation strategies for emergency medical services within stroke systems of care: a policy statement from the American Heart Association/American Stroke Association Expert Panel on Emergency Medical Services Systems and the Stroke Council. Stroke. 2007

EMS Assessment & Management

- Support ABCs: airway, breathing, circulation. Give oxygen if needed
- Perform prehospital stroke assessment using a prehospital stroke screening tool
- If positive, perform stroke severity assessment
- Rule out stroke mimics
- Establish time when patient was last normal
- Identify current medications, especially anticoagulants, and obtain patient history including co-morbid conditions (e.g. recent surgery, procedures or stroke)
- Check blood glucose level
- Obtain IV access
- Acquire 12-lead EKG
- Provide pre-notification to receiving hospital as soon as possible of potential stroke patient “CODE STROKE”
- Obtain family contact name and phone number

1. Powers WJ, et al. 2019 Update to 2018 Guidelines for Early Management of Acute Ischemic Stroke. (2019) *Stroke.*
2. ASA Mission:Lifeline Stroke Committee. Emergency Medical Services Acute Stroke Triage and Routing. (2020)

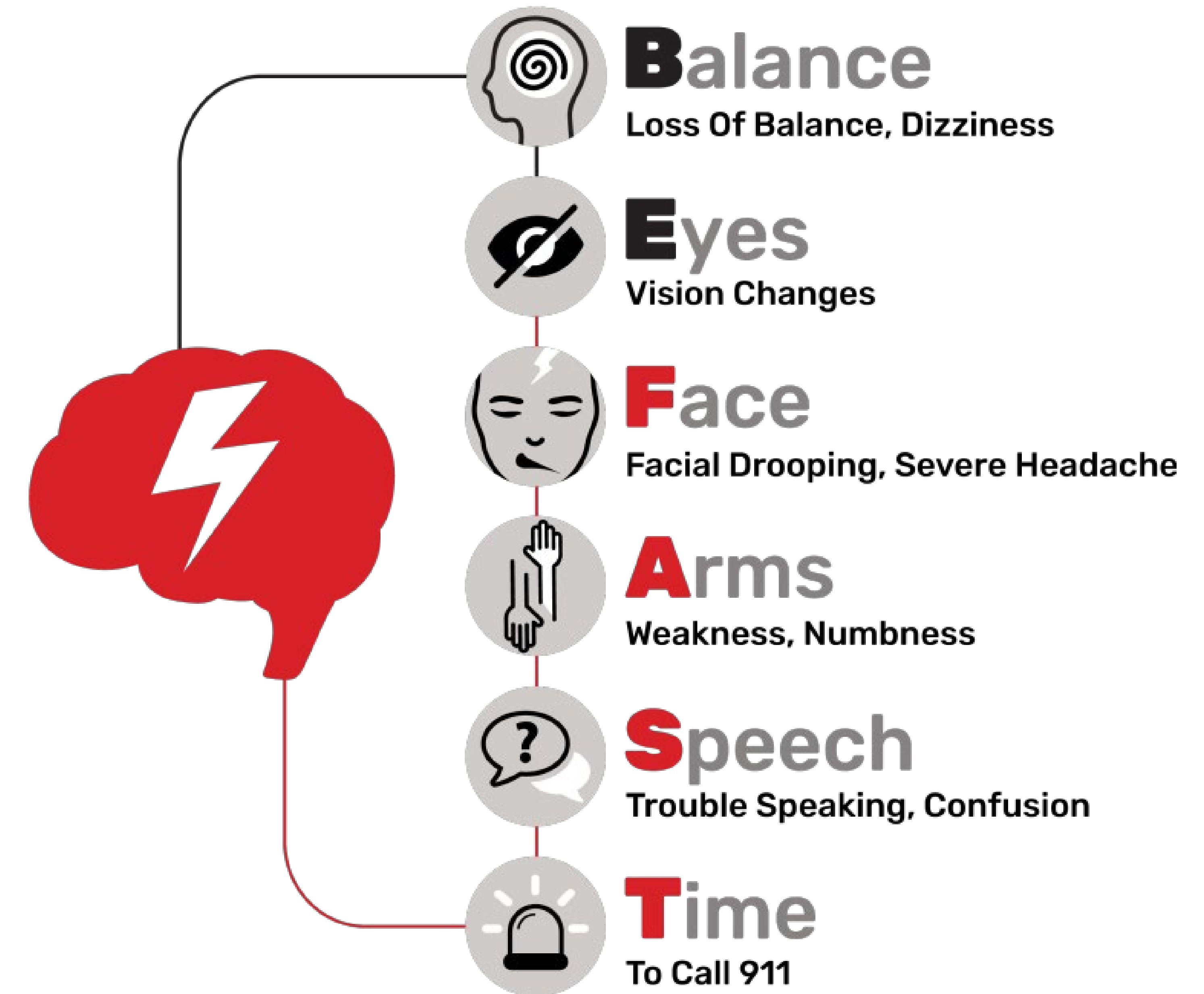
Common Stroke Mimics

STROKE MIMICS
Alcohol Intoxication
Cerebral Infections
Drug Overdose/Toxicity
Epidural Hematoma
Hypoglycemia
Metabolic Disorders
Migraines
Neuropathies (Bell’s Palsy)
Seizure and Post Seizure (Todd’s Paralysis)
Brain Tumors
Hypertensive Encephalopathy

Field Assessment of Stroke

Cincinnati Prehospital Stroke Scale	
Have patient look up at you, smile and show their teeth.	**Facial Droop** **Normal:** Left and right side of face move equally **Abnormal:** One side of face does not move at all
Have patient lift arms up and hold them out with eyes closed for 10 seconds.	**Arm Drift** **Normal:** Both left and right arm move together or not at all **Abnormal:** One arm does not move equally with the other
Have patient say a simple sentence, i.e. “You can’t teach an old dog new tricks.”	**Speech** **Normal:** Patient uses correct words with no slurring **Abnormal:** Patient has slurred speech, uses inappropriate words or cannot speak

If any 1 of these 3 signs is abnormal, probability of stroke is 72%.
If all 3 findings are present, probability of acute stroke is >85%.



Adapted from: Kothari RU, Pancioli A, Liu T., Brott T., Broderick J. “Cincinnati Prehospital Stroke Scale: reproducibility and validity.” *Ann Emerg Med.* 1999 Apr;33(4):373-8, permission for use.

Stroke Severtiy Scale

- A scale to quantify neurologic deficits to identify patients with severe symptoms likely due to LVO or hemorrhagic stroke
- At least 6 different scales have been published
- Each EMS region should choose a single severity scale and monitor adherence to usage as well as accuracy
- Examples include:
    - Cincinnati Stroke Triage Assessment Tool (C-STAT)
    - Facial palsy, Arm weakness, Speech changes, Time, Eye deviation, Denial / neglect (FAST-ED)
    - Rapid Arterial Occlusion Evaluation Scale (RACE)
    - Los Angeles Motor Scale (LAMS)
    - Vision, Aphasia, Neglect (VAN)

Los Angeles Motor Scale (LAMS)[22]		
Face	0	Both sides move normally
	1	One side is weak or flaccid
Arm	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Grip	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Total	0–5	

Adeoye O, et al. Recommendations for the Establishment of Stroke Systems of Care. (2019) *Stroke*.

<u>Facial Droop</u>: *Ask the patient to smile or show their teeth*

- Absent / Normal: 0
- Present: 1

<u>Arm Drift</u>: *Have the patient hold their arms extended for 10 seconds. Test each arm separately*

- Absent / Normal: 0
- Drifts down (does not touch stretcher): 1
- Falls rapidly: 2

Grip Strength: *Have the patient grasp both hands*

- Normal: 0
- Weak: 1
- None (no movement): 2

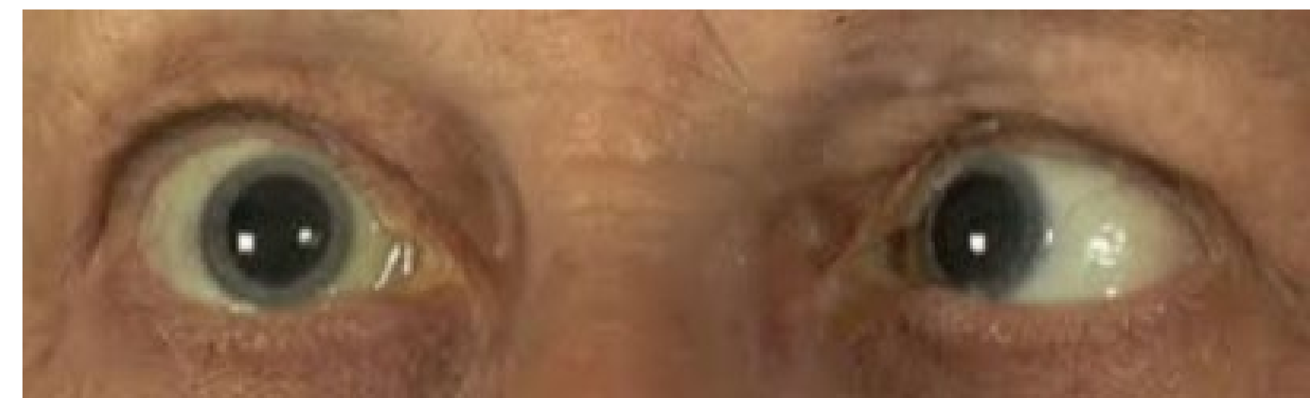
- Total score: 0-5
- Weakness of face, arm and hand should be on the SAME side
- LAMS 0-3 → Any Stroke Center
- LAMS 4-5 → Comprehensive Stroke Center

Beyond the LAMS:
Strokes Without Scores

- Speech
  - Is speech slurred or does the patient use inappropriate words or unable to speak?
- Dizziness
  - Sudden onset, constant
- Imbalance / clumsiness
- Vision Loss
  - One eye or both eyes
  - Diplopia – double vision
- Gaze preference

NORMAL VISION

HEMIANOPIA



Best-Practices

- Review your stroke protocols
- Be willing to emergently transfer patients from a PSC to the CSC
- Seek out and attend stroke educational opportunities
- Use a tool or aid

<u>Stroke Note</u>

- Symptom onset < 24 hrs.
- Last known well time
- Anticoagulant use
- Family contact (name and phone number)
- LAMS score
- Blood glucose
- Blood pressure
- 12-lead
- IV access
- Hospital pre-notification

<u>Stroke Demographics Pad</u>

Name: ______________________

DOB: ______________________

SSN: ______________________

Address: ______________________

____

Family Contact #: ______________________

Please *ALWAYS* pre-notify so we can prepare for your arrival

STROKE REPORT

- ♦Age
- ♦Gender
- ♦LAMS
- ♦Last known normal
- ♦Blood pressure
- ♦Glucose
- ♦Anticoagulants
- ♦Contact number
- ♦E.T.A.

ANTICOAGULANTS

- ♦Heparin
- ♦Lovenox (Enoxaparin)
- ♦Coumadin (Warfarin)
- ♦Pradaxa (Dabigatran)
- ♦Xarelto (Rivaroxiban)
- ♦Eliquis (Apixaban)
- ♦Savaysa (Edoxaban)

Rhode Island Hospital Medcomm: 401-444-7600

F.A.S.T

(To recognize a stroke)

FACE

-Is the face weak or drooping on one side?
-Ask the person to smile.

ARMS

-Is one arm weak or numb?
-Ask them to lift their arms;
Does one arm drift downwards?

SPEECH

-Are they slurring their speech?
Ask the person to repeat a simple sentence.
Do they repeat it correctly?

TIME

-Time is important! When did the symptoms start?
-Call 9-1-1 IMMEDIATELY!

The Los Angeles Motor Scale
LAMS (stroke severity)

Facial Droop	
Absent	0
Present	1

Arm Drift	
Absent	0
Drifts down	1
Falls rapidly	2

Grip Strength	
Normal	0
Weak grip	1
No grip	2

Total score: (0-5)
Score of 4-5 is possible ELVO

EMS Stroke Feedback and Follow-up

Demographics			
Incident ID:	2024006466	EMS Agency:	East Providence
Date of Service:	6/24/2024	Age: 46	Gender: Female

Assessments & Documentation	100%
☑	Recognizes new onset (<24 hours) of unilateral motor weakness or paralysis, facial droop, speech or language disturbance, visual disturbance, gait disturbance. Stroke Screen Performed
☑	Document Date and Time patient was Last Known Well
☑	Document anticoagulants: Heparin, Lovenox (Enoxaprin), Coumadin (Warfarin), Pradaxa (Dibigatran), Xarelto (Rivaroxiban), Eliquis (Apixaban), Savaysa (Edoxaban)
☑	Document family contact information, including name and telephone number

Key Interventions	100%
☑	Stroke Severity Score (LAMS/FAST-ED) Performed
☑	Stroke Severity (LAMS/FAST-ED) Documented as discrete field
☑	Blood Glucose Obtained
☑	Systolic Blood Pressure Documented
☑	IV Access Obtained
☑	Hospital Prenotified

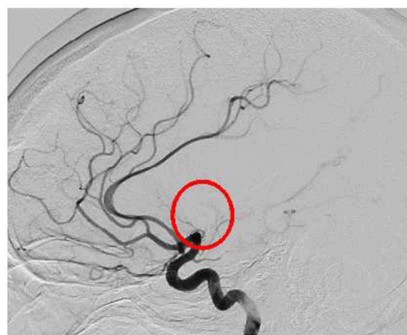
Clinical Information

Diagnosis: ELVO

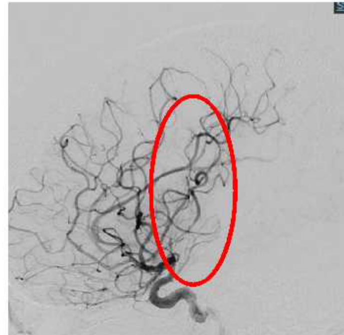
☑	IV TNK	Time of Bolus: 8:12	Door to Needle:	30	Goal: < 30 minutes
☑	Mechanical Thrombectomy		Door to Recanalization:	59	Goal: < 90 minutes
☐	Reversal for ICH				

Imaging - Time of CT: 7:51 CTA: 7:53 Discharge Disposition: Home

Notes: Patient was found to have afib, an AV block, and Lyme on admission. At discharge the patient was alert and oriented x4, had fluent language, no facial droop and equal and full strength in all extremities. Excellent job as always, we appreciate what you do for our stroke patients!



Pre-thrombectomy angiogram-Right M1 Occlusion



Post-thrombectomy angiogram-TICI 2c (near complete reperfusion) achieved

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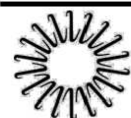
Total	0-5	

A LAMS Score of 4 or 5 is highly suspicious for ELVO or ICH

We thank you for trusting your patients with us. For more information on this patient or other patients whom you transport, contact: Melissa Harmon, RN, MSN @ 401-444-9865 or mharmon@lifespan.org.



Rhode Island Hospital
A Lifespan Partner

F
E
E
D
B
A
C
K

Stroke Follow-up

Incident #: xxxx
Age/Gender: 42/M
Agency: East Providence
Service Level: EMS
Date of Service: 3/18/24

Your results at a glance

- **4/4** • Key questions asked/documented
- **6/6** • Key interventions performed

Questions?

If you would like more information on patients that you transported contact:
Karen Schaefer MSN, APRN, AGCNS-BC, ASC-BC
Karen.Schaefer@Lifespan.org

yes	• Recognizes new onset (<24 hours) of unilateral motor weakness or paralysis, facial droop, speech or language disturbance, visual disturbance, gait disturbance.
yes	• Document Date and Time patient was Last Known Well
yes	• Document anticoagulants: Heparin, Lovenox (Enoxaprin), Coumadin (Warfarin), Pradaxa (Dibigatran), Xarelto (Rivaroxiban), Eliquis (Apixaban), Savaysa (Edoxaban)
yes	• Document family contact information, including name and telephone number

Key interventions performed AND documented:

yes	• Patient placed on monitored
yes	• Stroke severity score
yes	• Blood glucose obtained
yes	• Systolic blood pressure
yes	• IV Access Attempted
yes	• Hosptial Pre-notified

Patient Hospital Course

LAMS in Field: 2
Code Stroke: Yes
NIH Stroke Scale: 2
IV Tenecteplase: Yes
Door to Needle Time: 29 min
Notes: Left sided weakness, N/V, dizziness, and near syncope. Admitted for CVA work up, post TNK administration.
Discharge Dx: CVA

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Community Stroke Education

Addresses one of the largest gaps

Recognizing the signs and symptoms of stroke and calling 911

- Distribution of printed stroke materials
- Host stroke events for stroke month (May)
- Hold town hall meetings
- Deliver presentations to schools and other organizations
- Deliver stroke messages via website and social media
- Vehicle wraps, signage
- Host blood pressure screenings

Emerging Role of EMS in Post – Stroke Care

Partnering with stroke centers to provide post-stroke education:

- Smoking cessation programs
- Prescription compliance
  - A-fib
  - Diabetes
  - Cholesterol
- Risk screenings
  - Dysphagia

On going reassessments are the key to long-term health

Johns Hopkins Medicine, “3 ways to avoid a second stroke,” 2022. [Online]. Available: https://www.hopkinsmedicine.org/health/conditions-and-diseases/stroke/3-ways-to-avoid-a-second-stroke.

Take Home Points

- During an acute stroke, every minute is critical
- Prehospital providers play a crucial role in the care of the stroke patient
- Collaborative efforts such as EMS-feedback and Direct-to-CT improves the quality of care
- EMS agencies have an important role to provide stroke related outreach to the communities they serve

Questions?

Jpotvin@eastprovidenceri.gov