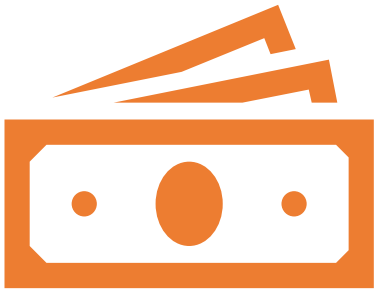
Concord Hospital as a Primary Stroke Center and NH EMS Stroke Care

Robert Rix, MD, FACEP

Medical Director, Concord Hospital and State of NH Emergency Medical Services

Associate Medical Director, Concord Hospital Emergency Department

Disclosures



No financial disclosures

Views and opinions are my own

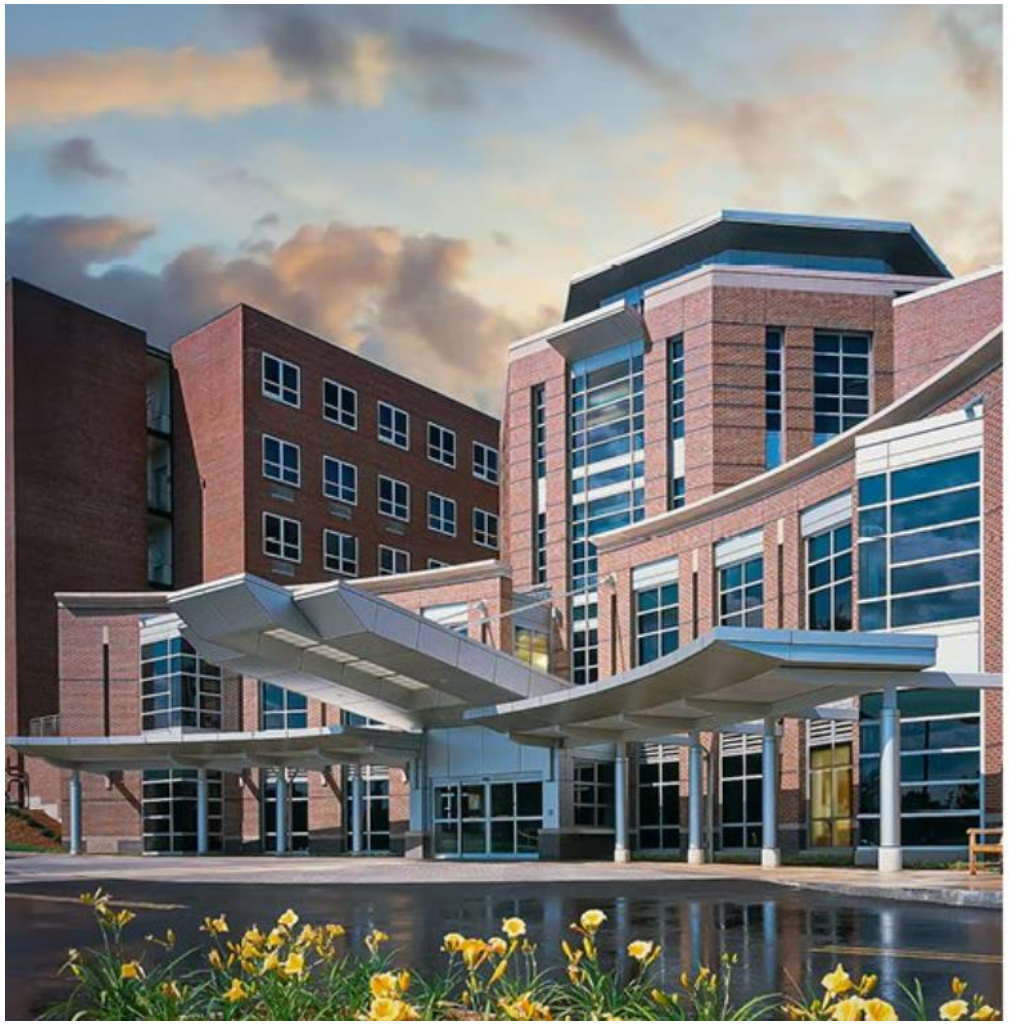
Outline

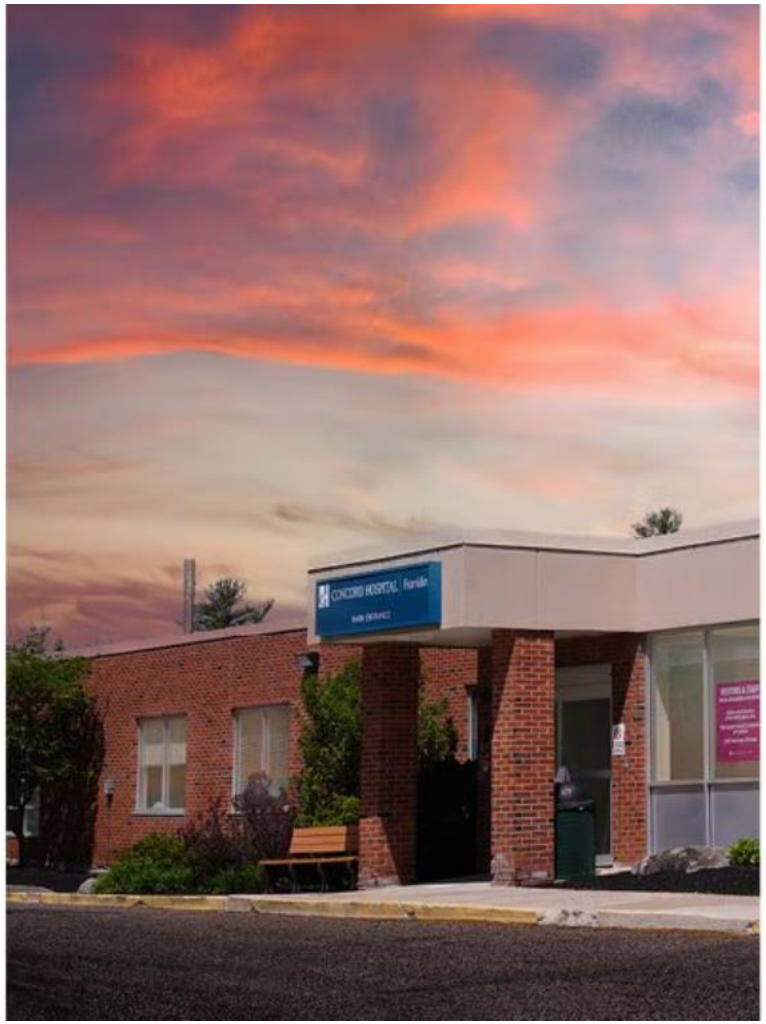
- Concord Hospital Health System
- NH EMS stroke care
- Initial ED stroke evaluation
- Challenges faced in our central NH location

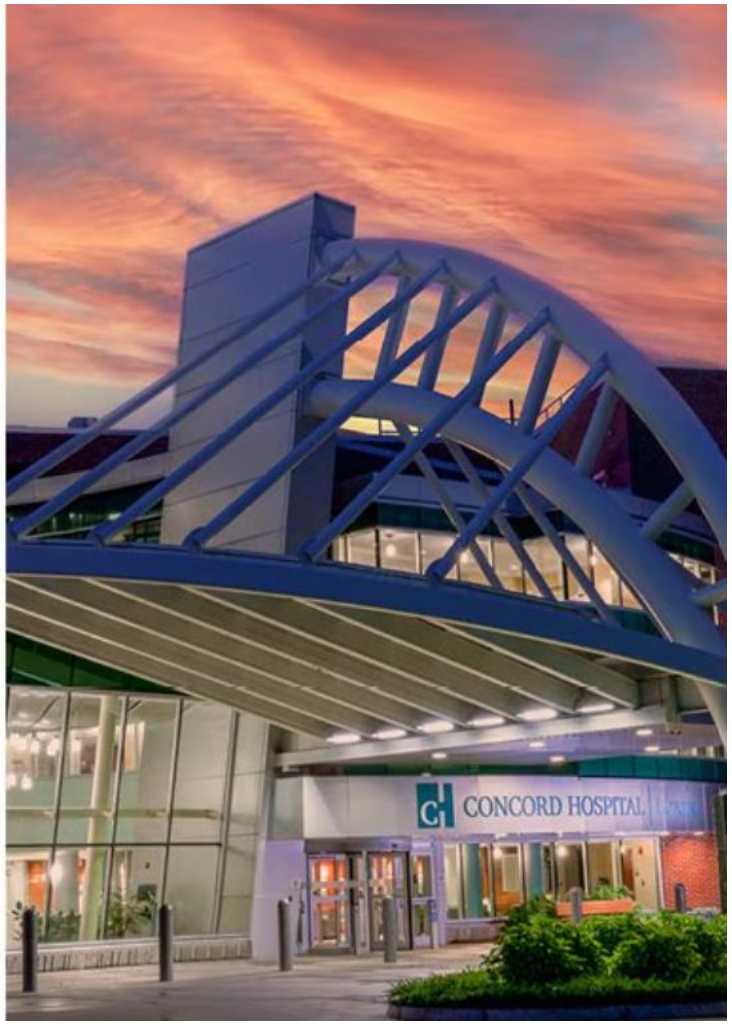
- **CH-Concord (295 Beds)**
- Primary Stroke Center

- **CH-Franklin (25 Beds)**
- Critical Access

- **CH-Laconia (100 Beds)**
- Acute Stroke Ready



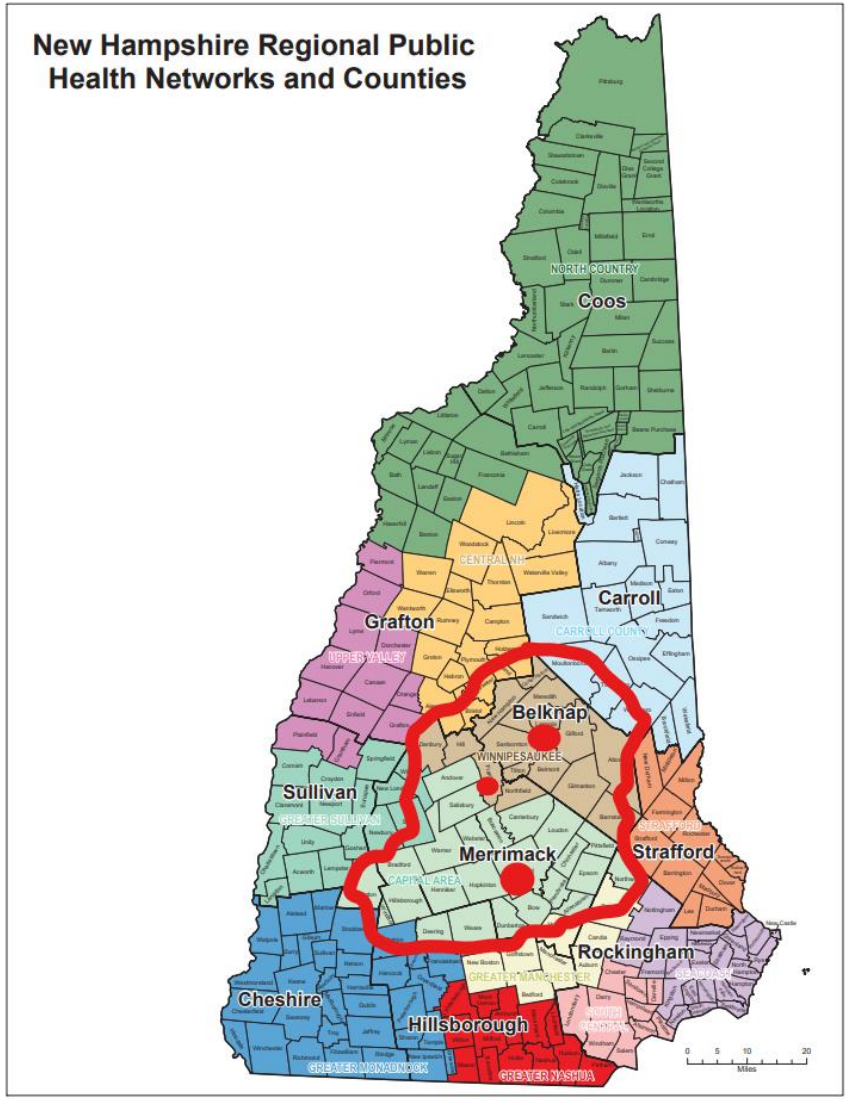




CONCORD HOSPITAL

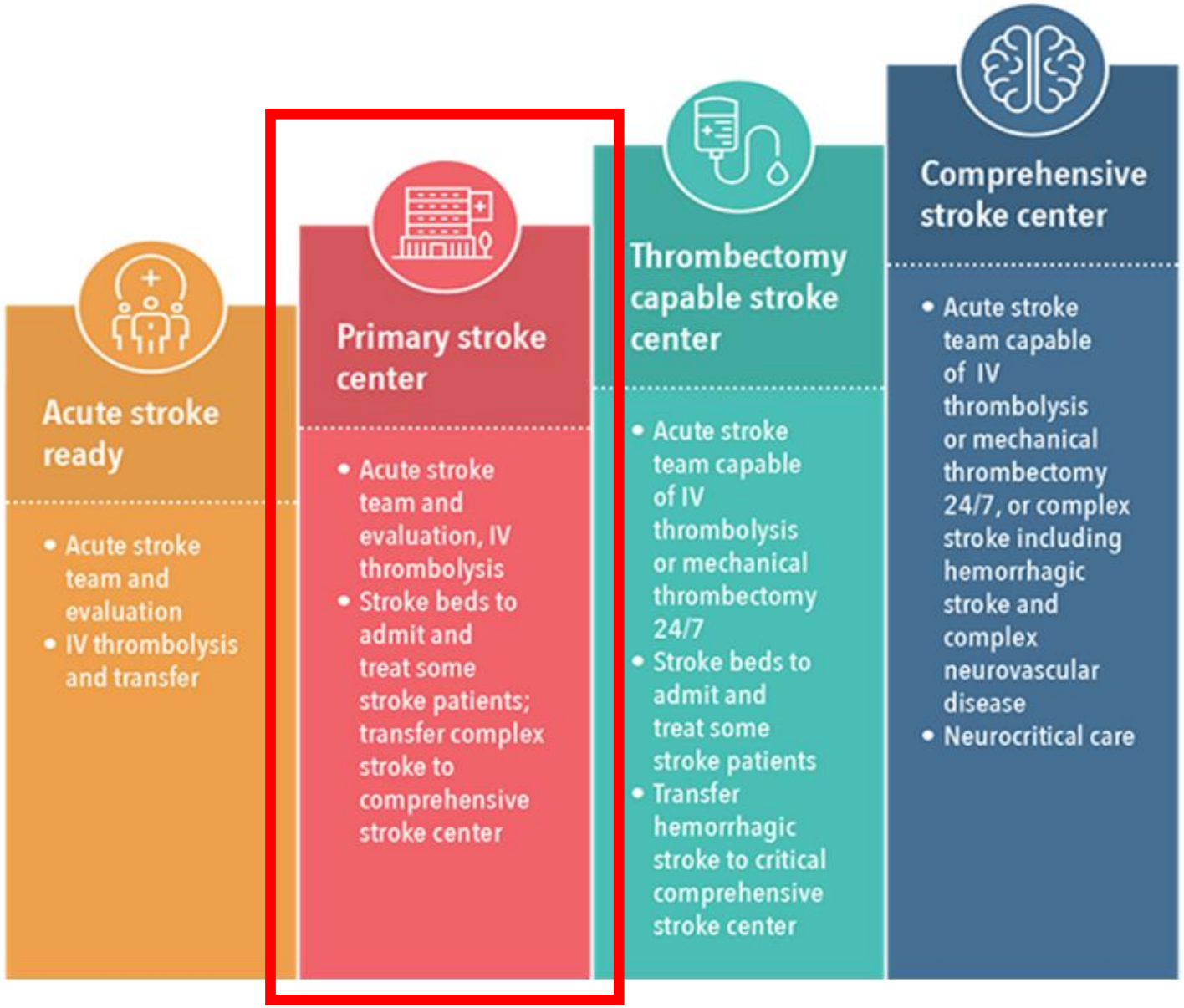
Your Regional Health System

CONCORD | FRANKLIN | LACONIA



Non-profit, independent, charitable organization

CH-Concord (Primary Stroke Center)

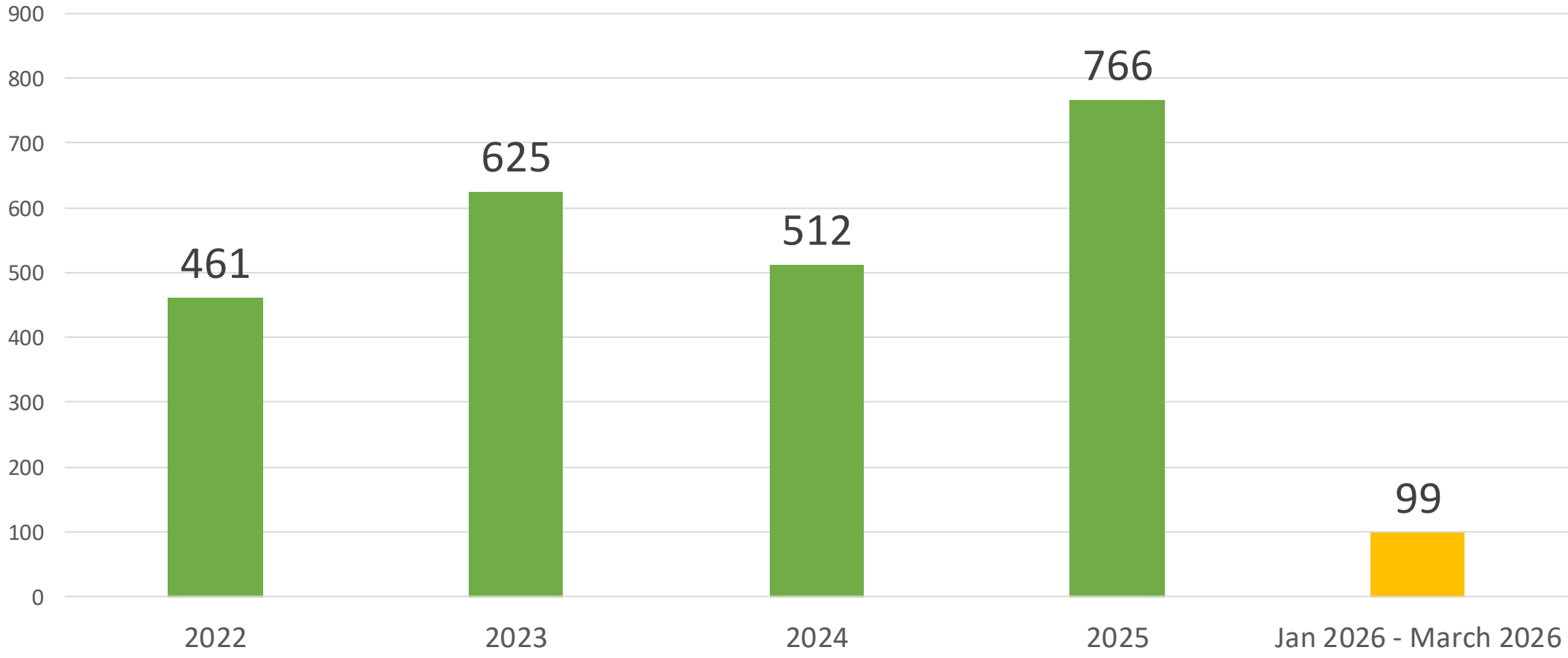


Barriers to expansion: Volume, Resources, Expertise, Cost

CH-Concord Stroke Program

CONCORD HOSPITAL
Your Regional Health System

Stroke Alerts



CH-Concord Stroke Program

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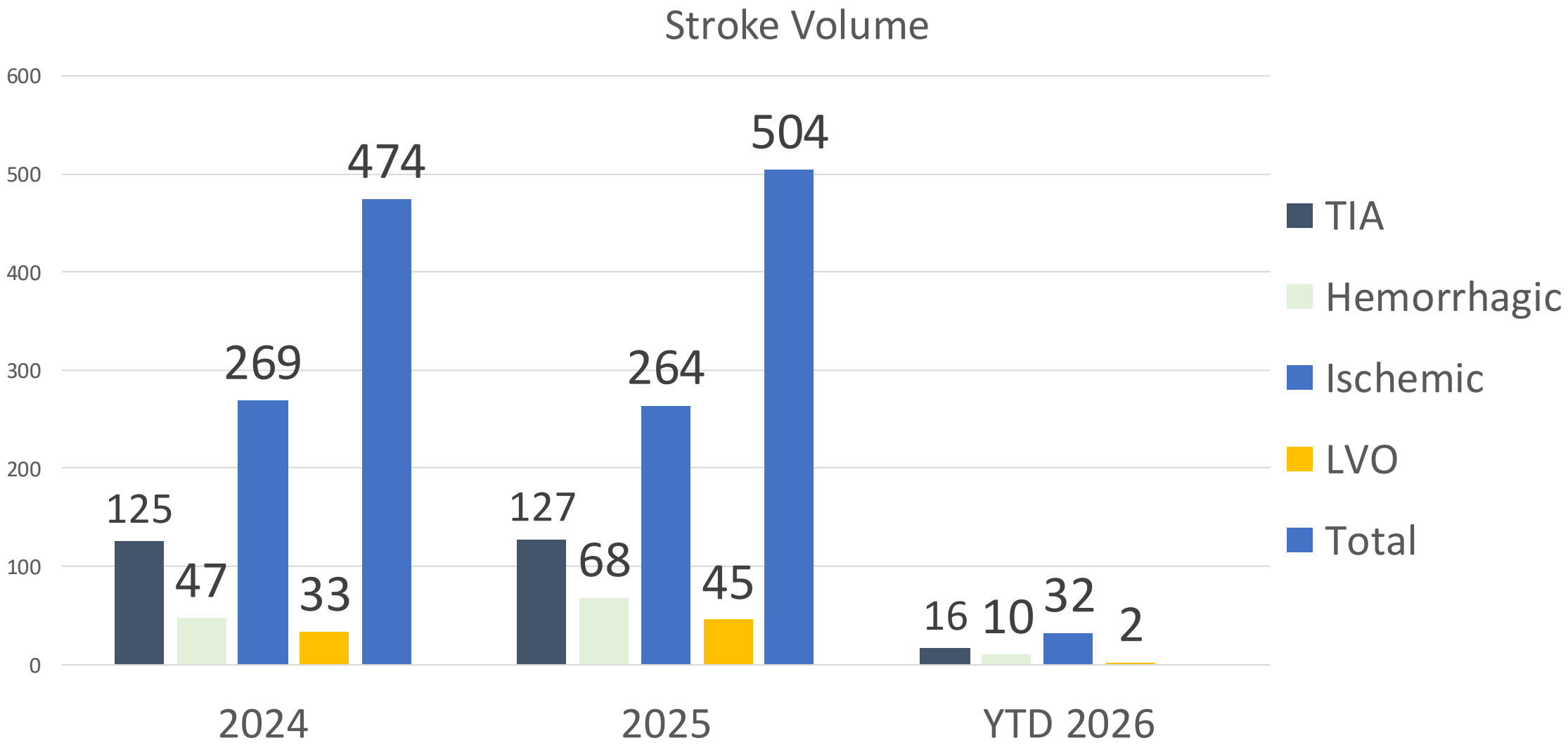

CH-Concord Stroke Program

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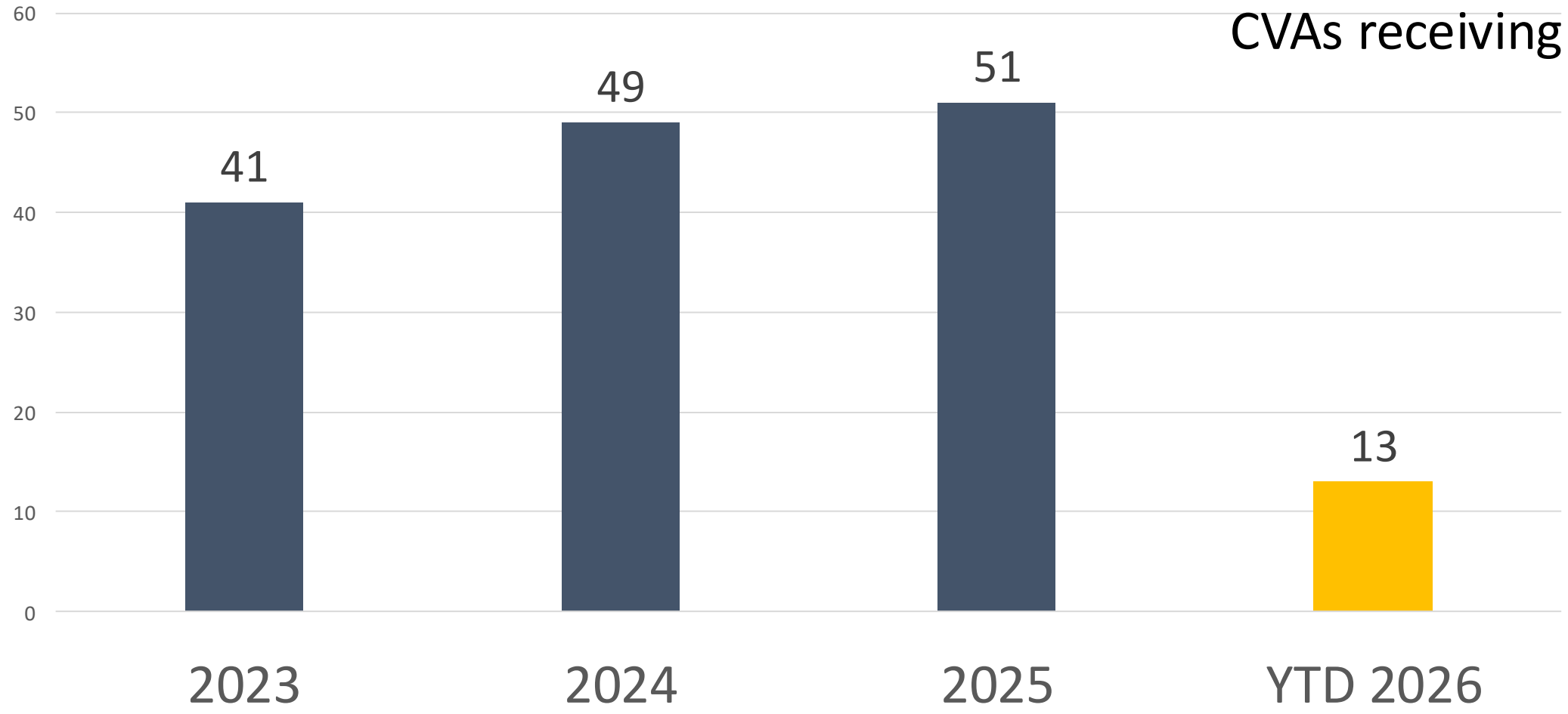
TNK Patients



CVAs receiving TNK = 20%

Considerations: Rural Stroke Care

Stroke

American Heart Association.

2024

AHA SCIENTIFIC STATEMENT

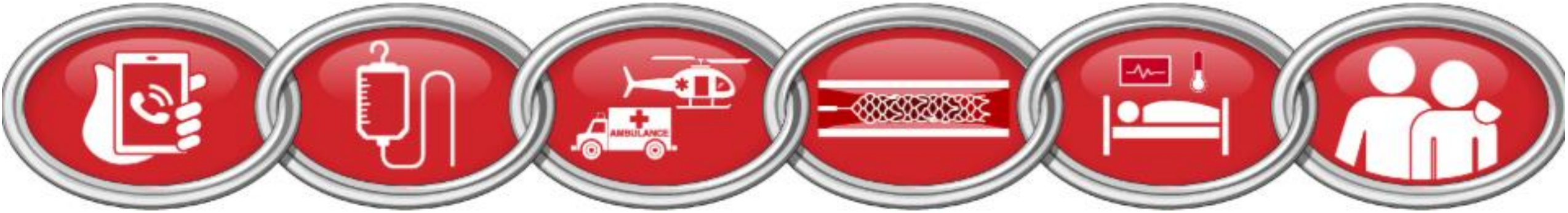
Identifying Best Practices for Improving the Evaluation and Management of Stroke in Rural Lower-Resourced Settings: A Scientific Statement From the American Heart Association

The American Academy of Neurology affirms the value of this statement as an educational tool for neurologists.

Kori S. Zachrison, MD, MSc, Chair; Kaiz S. Asif, MD, Vice Chair; Sherita Chapman, MD; Karen E. Joynt Maddox, MD, MPH; Enrique C. Leira, MD, MS; Susan Maynard, DNP, MS; Christa O'Hana S. Nobleza, MD, MSCI; Charles R. Wira, MD; on behalf of the American Heart Association Emergency Neurovascular Care and Telestroke Committee of the Stroke Council; Council on Cardiovascular and Stroke Nursing; and Council on Cardiovascular Radiology and Intervention

ABSTRACT: Considerable variation exists in the delivery of acute stroke care and stroke outcomes across settings and population groups. This is attributable in part to variation in resources among emergency departments in the United States, most notably in rural regions. Structural constraints of the US health care system, including the geographic distribution of where patients live relative to the location of hospitals and certified stroke centers, will continue to mean that many patients with stroke initially present to community emergency departments that have fewer stroke-related resources. These sites also tend to serve populations in rural areas who experience disparities in care and outcomes. Reducing health disparities related to stroke for populations in rural areas requires investment in these more remote community settings as the anchor of the stroke chain of survival for their respective communities. This scientific statement performs a critical appraisal examining challenges in rural stroke care related to access and variation in stroke-related capabilities for the acute phase of care to inform strategies and propose solutions. The scientific statement considers the value of expansion of Acute Stroke Ready Hospital and Primary Stroke Center certification in rural areas, the role of telehealth and improved transfer processes, as well as increased engagement and mentorship from larger, comprehensive centers to the rural hospitals to which they are connected. Multistakeholder collaboration and policy interventions need to be directed to enhance public awareness, impart staff training, grow infrastructure, enhance access to clinical expertise, streamline data management, and implement quality assessment and improvement programs.

Key Words: AHA Scientific Statements ■ delivery of health care ■ health resources ■ rural hospitals ■ rural population ■ stroke



Prehospital	Thrombolysis and ED Care	Transfers (if applicable)	Thrombectomy Access	Inpatient Setting	Postacute Setting
CHALLENGES					
• Geographic access barriers • Variability in use of EMS • Decentralized EMS • Triage protocols	• Staffing challenges • Lower volumes • Variability in EM provider baseline education and comfort in stroke management • Access to neurological expertise	• Lack of bed availability at receiving hospitals • Data and image sharing with hub • EMS availability • Non-standardized supportive care	• Prehospital detection • Geographic availability of centers and operators • Direct triage based on prehospital assessment • Imaging protocols for early detection	• Access to neurological expertise • Access to neurocritical care • Stroke care coordinators	• Long travel for postacute care • Lack of care coordination • Access and capacity

Best Practices: Rural Stroke Care

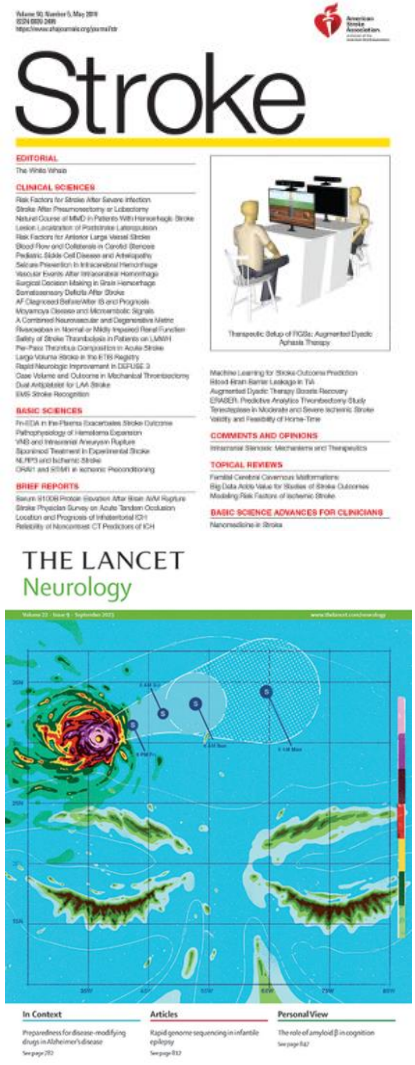
Coordinated Stroke Care → complex interplay of systems

Addressing the Challenges

EMS Education

- **“Brief Educational Intervention Improves Emergency Medical Services Stroke Recognition”; Stroke 2019**
  - EMS stroke recognition increased from 63.8% to 69.5%
  - TPA delivery within 45 minutes went from 5.7% to 8.9%, p=0.042
  - *Changes not sustained after 3 months*

- **“Prehospital screening of acute stroke with the National Institutes of Health Stroke Scale (ParaNASPP)”; Lancet 2023**
  - More complex intervention did not change recognition
  - Use of NIHSS increased scene time by 5 minutes



Protocol Continued

If stroke screening scale is positive calculate stroke severity score using FAST-ED

Stroke Severity Score (FAST-ED)

A FAST-ED greater than or equal to 4 is considered high probability for an LVO

Assessment	Points	Score
Facial Palsy (ask the patient to smile)		
No facial droop or only minor paralysis on one side of the face	0	
Partial or complete paralysis of one side of the face	1	
Arm Weakness (arms out with palms up for 10 secs)		
No drift, or both arms slowly move down equally	0	
Arm drift or some effort to lift the affected arm against gravity	1	
No effort against gravity or no movement in one or both arms	2	
Speech Change (ask the patient to name 3 common items; ask them to show you 2 fingers)		
Able to name at least 2 of 3 objects and follow command	0	
Names none, or only 1 of the 3 items correctly	1	
Unable to "show two fingers" to command	1	
Time - when was patient last known well?		
Eye Deviation		
Able to look to both sides without difficulty	0	
Able to move eyes horizontally in both directions but with clear difficulty	1	
Gaze is fixed to one side and does not move	2	
Denial/Neglect (only do if there is arm weakness AND commands followed)		
Recognizes weakness in their weak arm and recognizes their weak arm	0	
Unable to recognize weakness when asked "Are you weak anywhere"	1	
Does not recognize own arm when asked "Whose arm is this?"	1	
Total		

Establish Stroke Alert Criteria

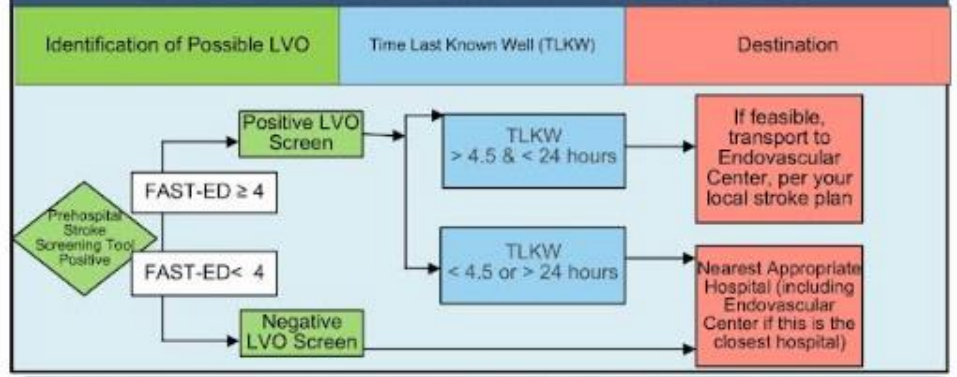
Yes	No	Stroke Alert Criteria – Please check Yes or No:
☐	☐	Blood glucose is or has been corrected to greater than 60 mg/dL?
☐	☐	Deficit unlikely due to head trauma or other identifiable causes?
☐	☐	Positive Prehospital Stroke Screen: - and time last known well is less than 4.5 hours **OR** - FAST-ED score is greater than or equal to 4 AND time last known well is less than 24 hours

Stroke Alert Criteria – If yes to all criteria determine appropriate destination, contact receiving hospital and report a STROKE ALERT with time last known well, FAST-ED score & thrombolytic checklist results

Northern New England Unified Guideline
Stroke – Adult 2.24

Protocol Continued

Destination Guidance for Possible LVO Stroke Patients



Work with your regional endovascular center when developing your local stroke plan.

Thrombolytic Checklist for patients eligible for thrombolytics (t-PA), try to complete the following:

YES	NO	Has the patient had any of the following:
☐	☐	1. Severe head trauma or intracranial or spinal surgery within the past 3 months?
☐	☐	2. Major non-cranial surgery or trauma within 14 days with uncontrolled bleeding (e.g.; internal organs)?
☐	☐	3. Spontaneous (non-traumatic) intracranial hemorrhage at any time in the past?
☐	☐	4. Is the patient taking any anticoagulants, including oral or injectable medications? If yes, clarify when last dose was taken (see PEARLS below)

PEARLS for Anticoagulants:

- Patients may recognize anticoagulants as "blood thinners". Ask about anticoagulants including warfarin (Coumadin or Jantoven), Heparin (IV/IM - including Lovenox), dabigatran (Pradaxa), rivaroxaban (Xarelto), apixaban (Eliquis), betrixaban (Bevyxxa) or edoxaban (Savaysa) and immediately communicate to hospital staff.
- **Please note**, medication manufacturers are producing new anticoagulants frequently.

PEARLS:

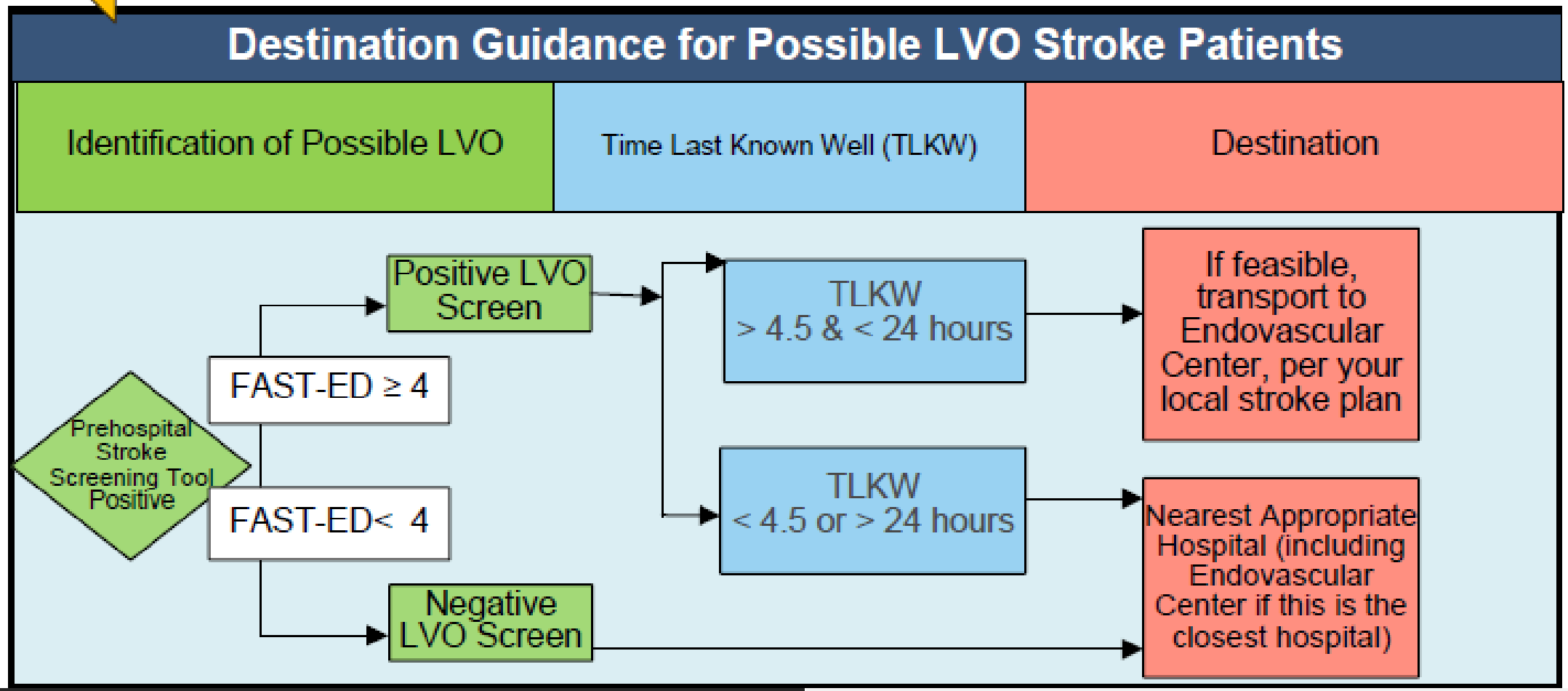
- **Stroke requires time sensitive interventions. Time = Brain**
- **Posterior Circulation Stroke (PCS):** Usually not identified with most commonly used stroke screens (e.g., CPSS, FAST-ED). Most common signs/symptoms include sudden visual deficits, sudden changes in balance and coordination, sudden dizziness or nausea and vomiting. PCS require prompt treatment and should be evaluated for a stroke alert/activation. Medical Direction should be contacted if patient presents with negative initial stroke screens, but clinical judgement of the EMS provider and presentation are still concerning for a possible stroke.
- Every minutes of acute stroke = about 2 million neurons lost.
- Transport witness, family or caregiver or obtain witness best phone number for hospital staff to verify time of symptom onset or Time Last Known Well (TLKW).
- TLKW is the last time patient known to be at their neurological baseline. If patient awakes with symptoms, TLKW is time patient was last known to be at their neurological baseline – Ask if patient got up during the night and was at baseline!
- Consider **stroke mimics** including: migraine, hypoglycemia, seizures, intoxication, sepsis cerebral infectious process, toxic ingestion, neuropathies (Bell's palsy), neoplasms, hypertensive encephalopathy.

Northern New England Unified Guideline
Stroke – Adult

2.24

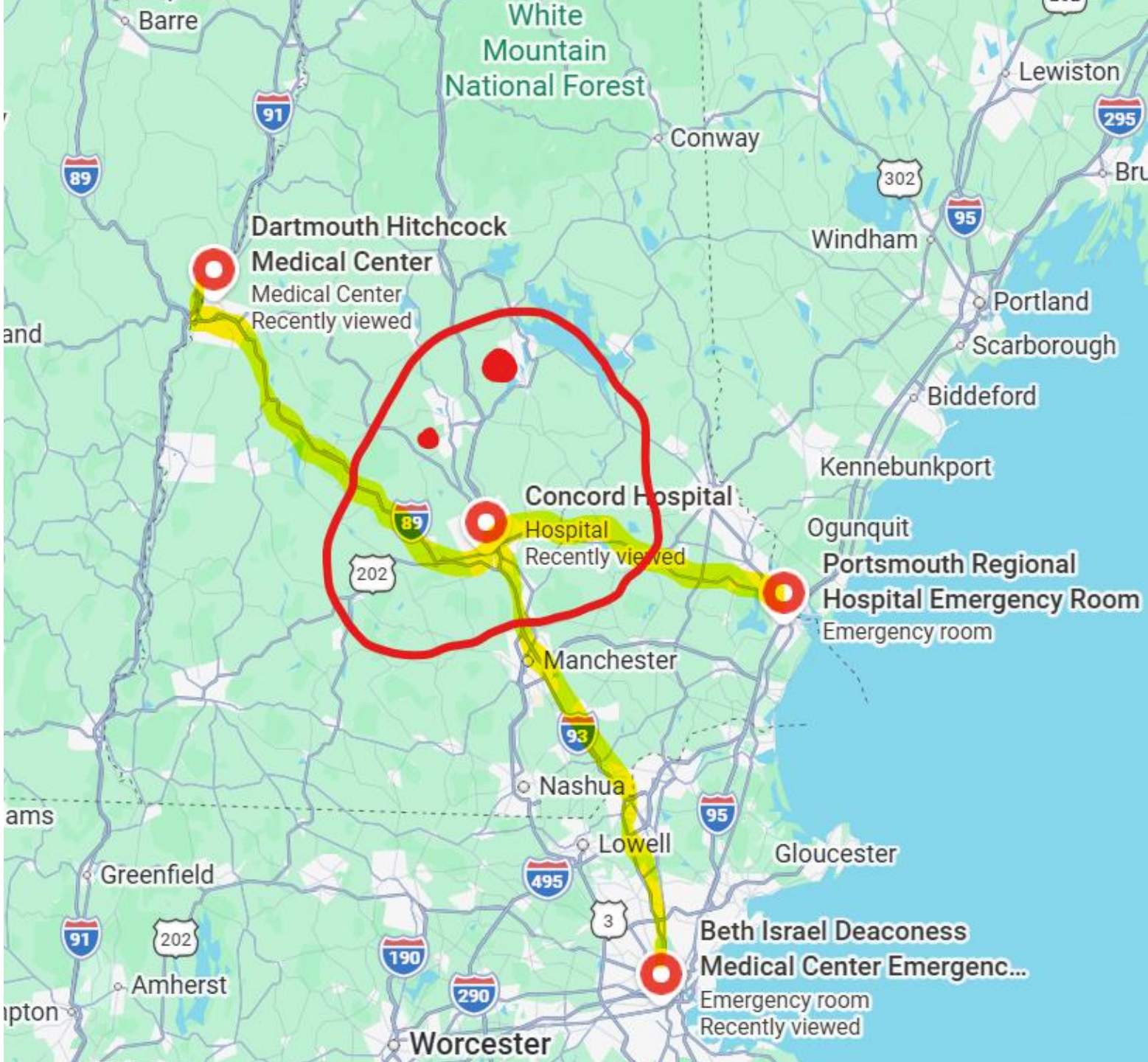
Protocol Continued

Destination Guidance for Possible LVO Stroke Patients



Challenges to the NNE Unified Protocol

Geography, distance, resources and mutual aid



Challenges to the NNE Unified Stroke Protocol

- Resource utilization
- Over-triage (stroke mimics, ICH)
- Weather
- Removing from community

Head of Bed at 0 for EMS Stroke Alerts?

- 2025 ZODIAC trial
- HOB: 0 degree vs 30 degree in LVO patients
- Primary outcome: neuro deterioration before thrombectomy
- 0 degree >>>> 30 degree
  - p<0.001
- 2026 AHA/ASA guidelines:
  - 0 degree may have clinical utility with discrete types of AIS.
- **What about EMS?**

Concord Hospital Health System - Prehospital Lab Draw Proce

1) **VERIFY** the patient's identity.

WRITE the patient's name, DOB, Date/Time of draw and initials of EMS provider using a ball point pen.

2) **WRAP** the tail of the detachable stickers around the patient's wrist and clamp.

3) **DRAW** labs off IV extensi
set. Clean hub with alcohol p
attach Blood Collection Adap
follow the order of draw:

White
Blue
Gold
Green
Purple

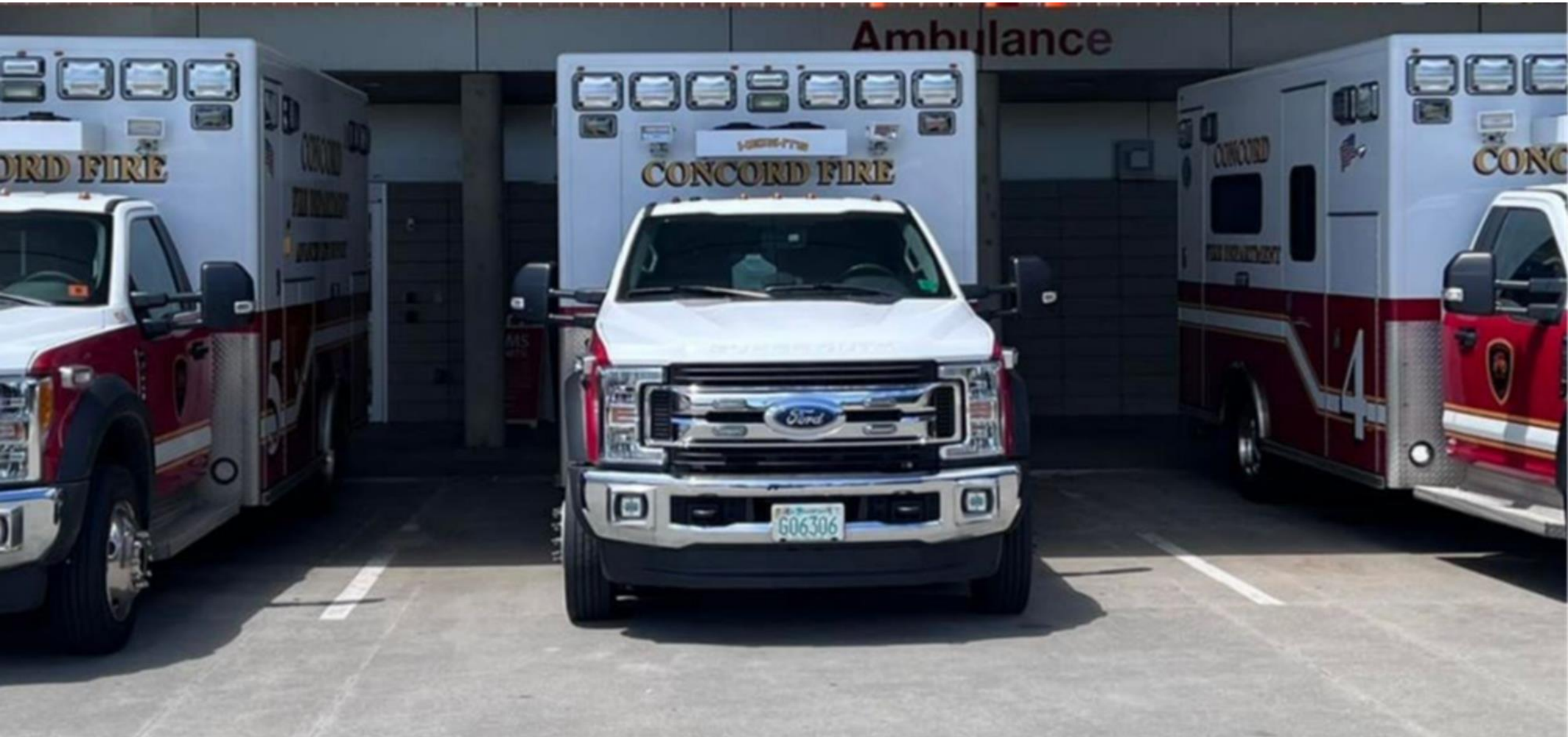
4) **LABEL** all tubes with a number decal from the patient's yellow wrist band. Place on bottom of tube.

5) **PLACE** all tubes in yellow bag and give to receiving hospital clinical staff member.

EMS Lab Draws

- **Turn-around time improvement in lab results:**
  - ✓**Concord 18 min**
  - ✓**Laconia 14.5 min**
  - ✓**Franklin 8 min**

ED Stroke Alert



Hot Cot via EMS or “PIT”

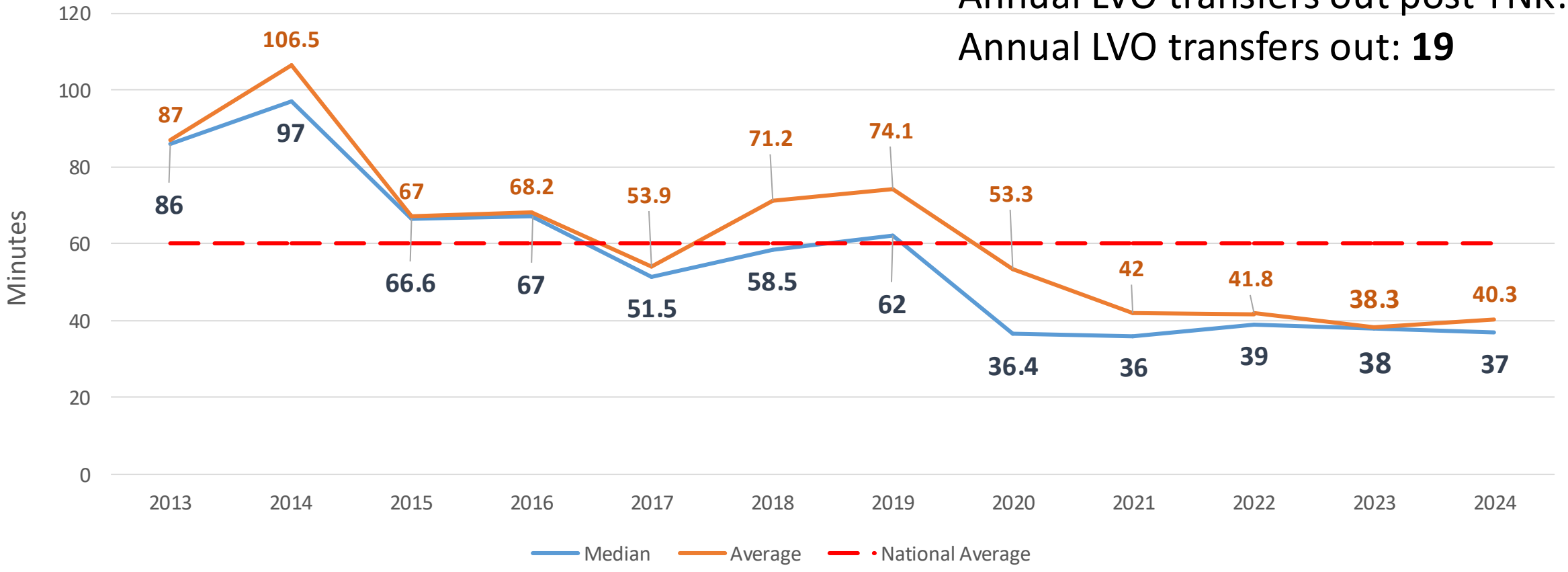
STRUCTURED EMS REPORT IN CT HALLWAY

RAPID NEURO EXAM WITH TELEHEALTH

CT BRAIN W/O CONTRAST

Door to Needle (CH-Concord)

Annual TNK administrations: **50**
Annual LVO transfers out post TNK: **8**
Annual LVO transfers out: **19**



Best Practices: Rural Stroke Care

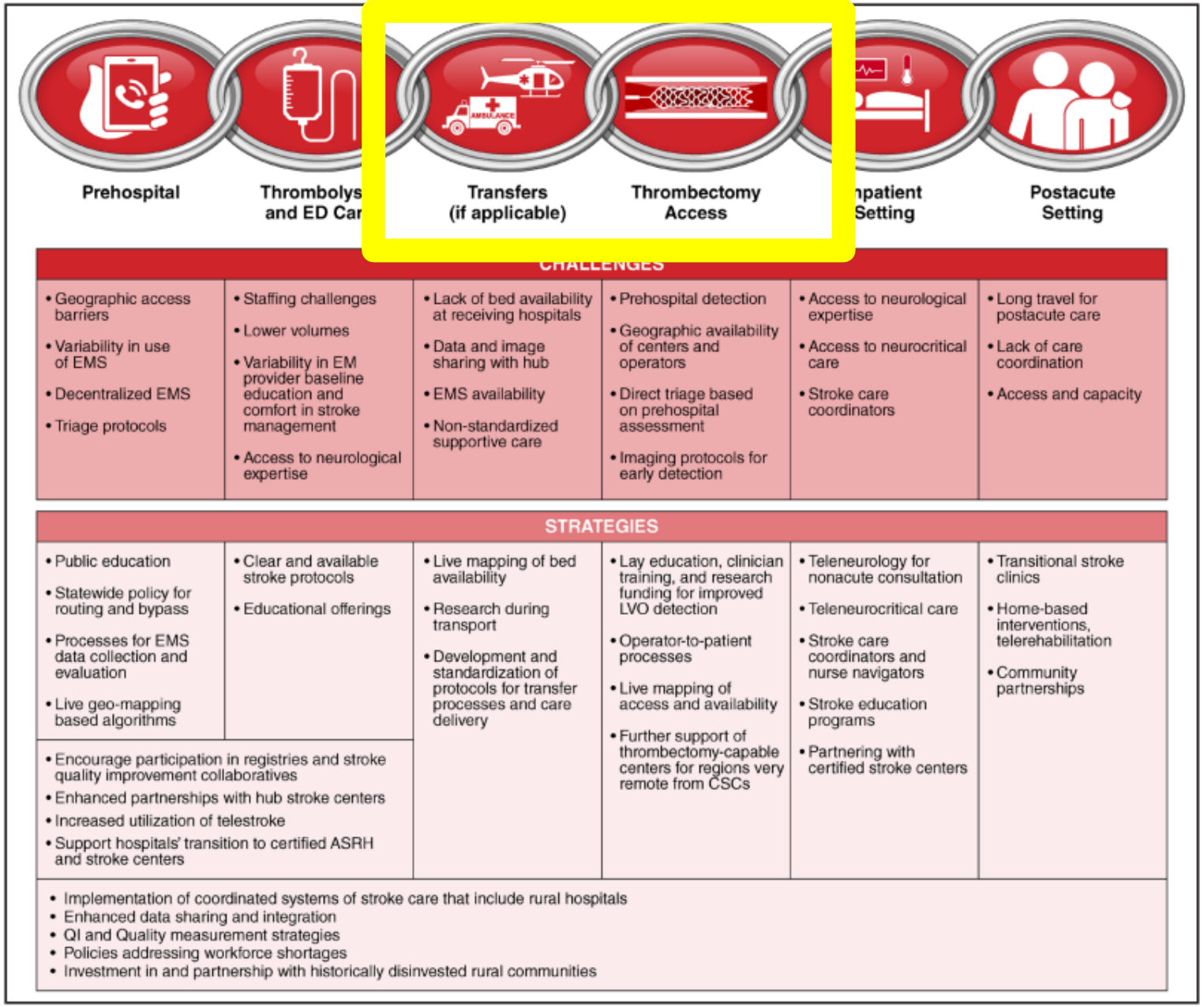


Figure 2. Potential strategies to address challenges in caring for patients with stroke in rural settings across the continuum of care.

ASRH indicates Acute Stroke Ready Hospital; CSC, Comprehensive Stroke Center; ED, emergency department; EM, emergency medicine; EMS,

Thrombectomy Access at Concord Hospital

Perfect world:

2 hours by ground

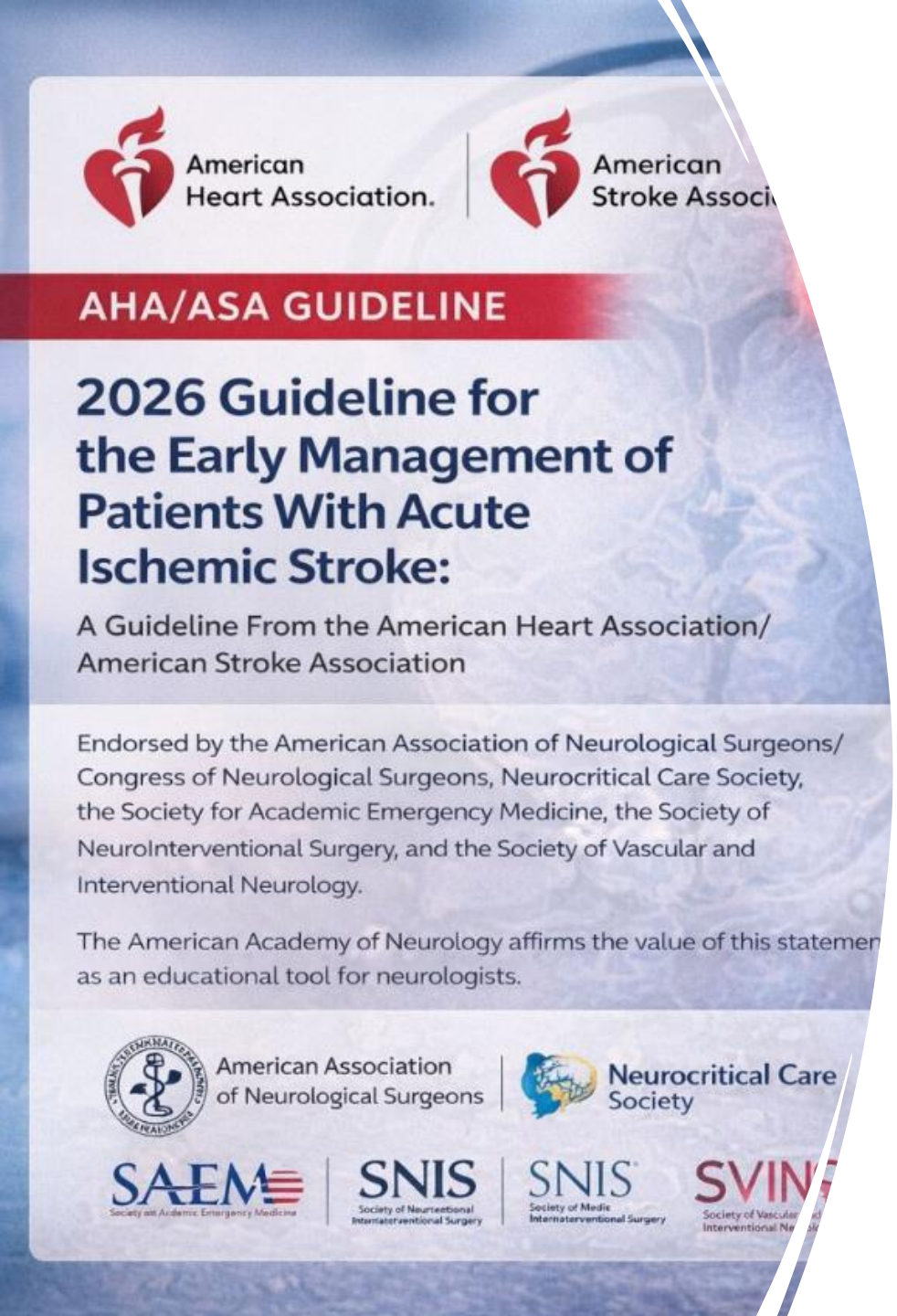
1.5 hour by air

- 30% of the US population has access to thrombectomy-capable center within **30 minutes**

Strategies to optimize transfers

- **Hospital-Based Protocols**
- EMR/Image Sharing
- “Agreements” with comprehensive stroke centers
- **EMS transport contract**
- **“Repatriation” to PSC**

Should primary stroke centers perform advanced imaging for extended window thrombolysis?



Advanced imaging

- CTA: ☑

- CT perfusion vs MRI?
  - 2026 AHA/ASA guidelines incorporating extended window (>4.5-24 hour) thrombolysis based on perfusion imaging.

Extended Window Thrombolysis at a CHHS?

- Per Teleneurology:
  - No clients using extended window.
  - Not recommending at this moment.
  - “Noone actually knows what to do with these new guidelines”.

Thank you!