Acute Mobilization/ Primary Stroke Center

Concord Hospital Health System

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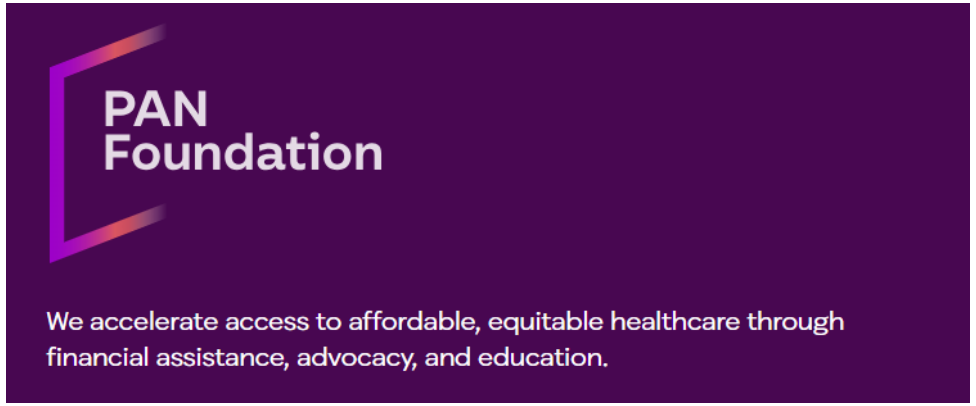
Financial Disclosures

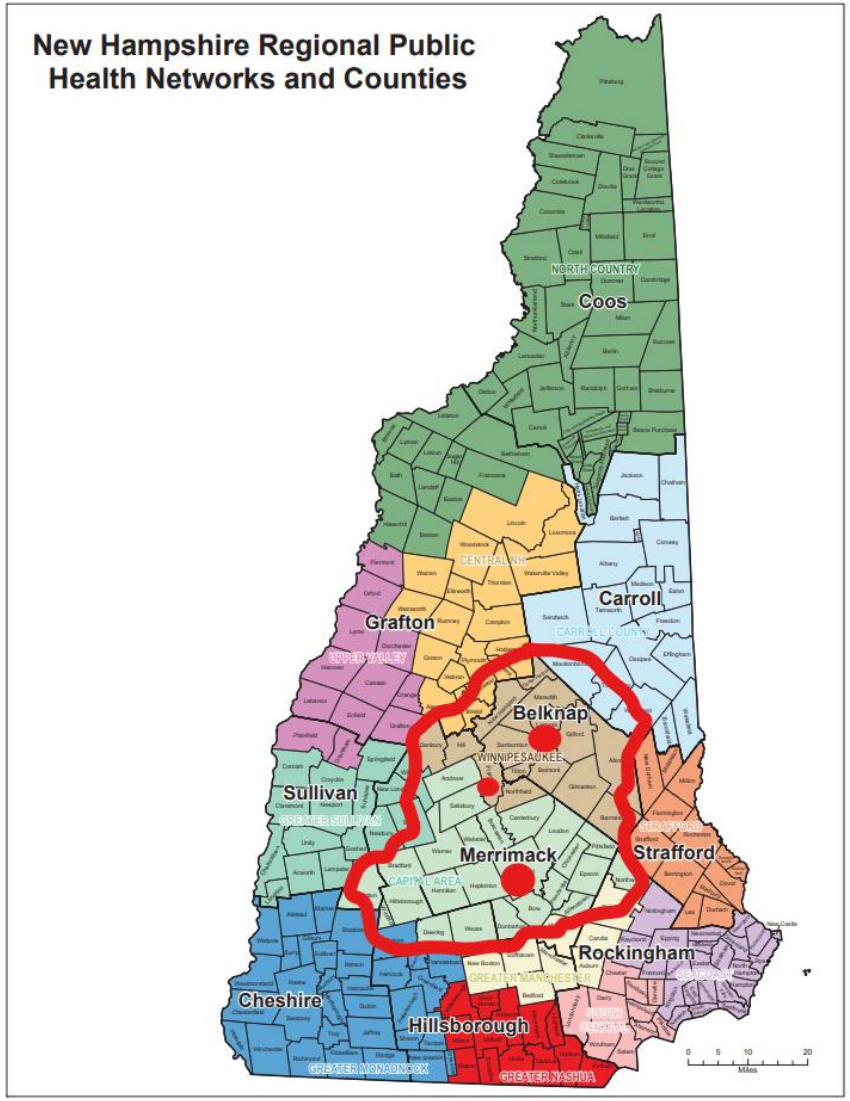
- None



CONCORD HOSPITAL

Your Regional Health System

CONCORD | FRANKLIN | LACONIA



Non-profit, independent, charitable organization

Concord Hospital Health System

Concord | Franklin | Laconia

- **CH-Concord (295 Beds)**
  - Primary Stroke Center
- **CH-Laconia (100 Beds)**
  - Acute Stroke Ready
- **CH-Franklin (25 Beds)**
  - Critical Access

CONCORD HOSPITAL
Regional Health System

PRIMARY SERVICE AREA

SECONDARY SERVICE AREA

GROWTH MARKET AREA

HOSPITAL LOCATION

SERVICE LINE IDENTIFIER AND NUMBER OF THAT SPECIFIC SERVICE LINE IN A GIVEN TOWN LOCATION

- **Primary Care** 18 Total
- **Specialty Care** 39 Total
- **Laboratory Services** 9 Total
- **Diagnostic Imaging** 5 Total
- **Ambulatory Surgery and Specialty Center** 5 Total
- **Behavioral Health Designated Receiving Facility** 1 Total

Stroke Activations 2024

690

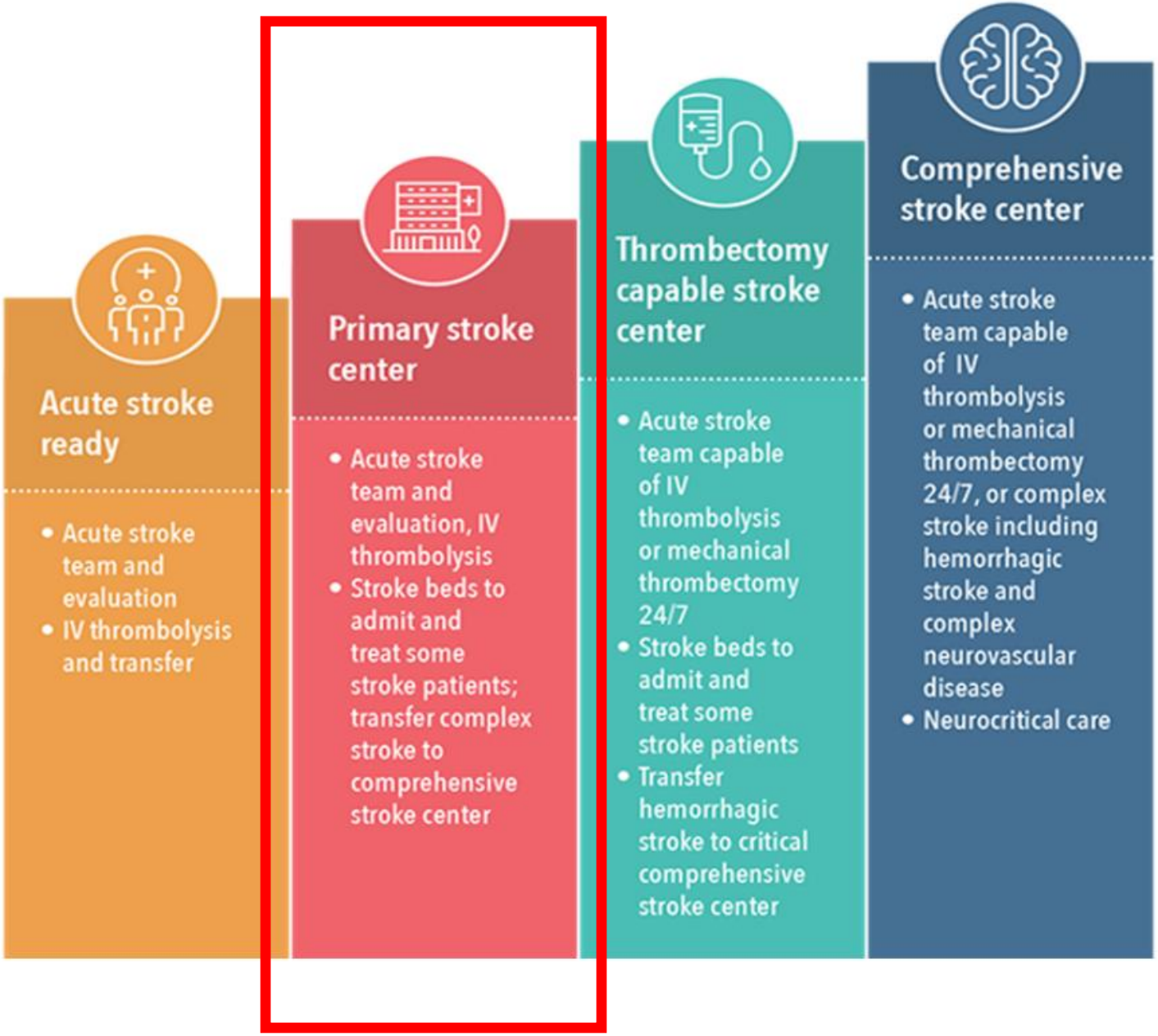
Diagnosis

Hemorrhagic	Acute Ischemic Stroke	Large Vessel Occlusion	Transient Ischemic Attack
66	335	35	173

Intervention

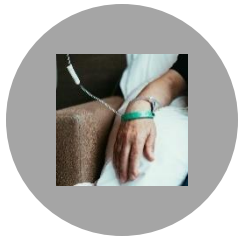
Tenecteplase (TNK) only	TNK + LVO	Large Vessel Occlusion Transfer
60	8	19

CH-Concord (Primary Stroke Center)



Comprehensive Stroke Center

24/7 ADVANCED IMAGING



THROMBECTOMY CAPABLE

MANAGEMENT OF POST-STROKE COMPLICATIONS

CLIP/ COIL RUPTURED ANEURYSM

NEUROCRITICAL CARE EXPERTISE

Barriers: Resources, Expertise, Cost, Volume

Best Practices: 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

Coordinated Stroke Systems of Care → Multiple parallel workflows

Best Practices: Rural Stroke Care

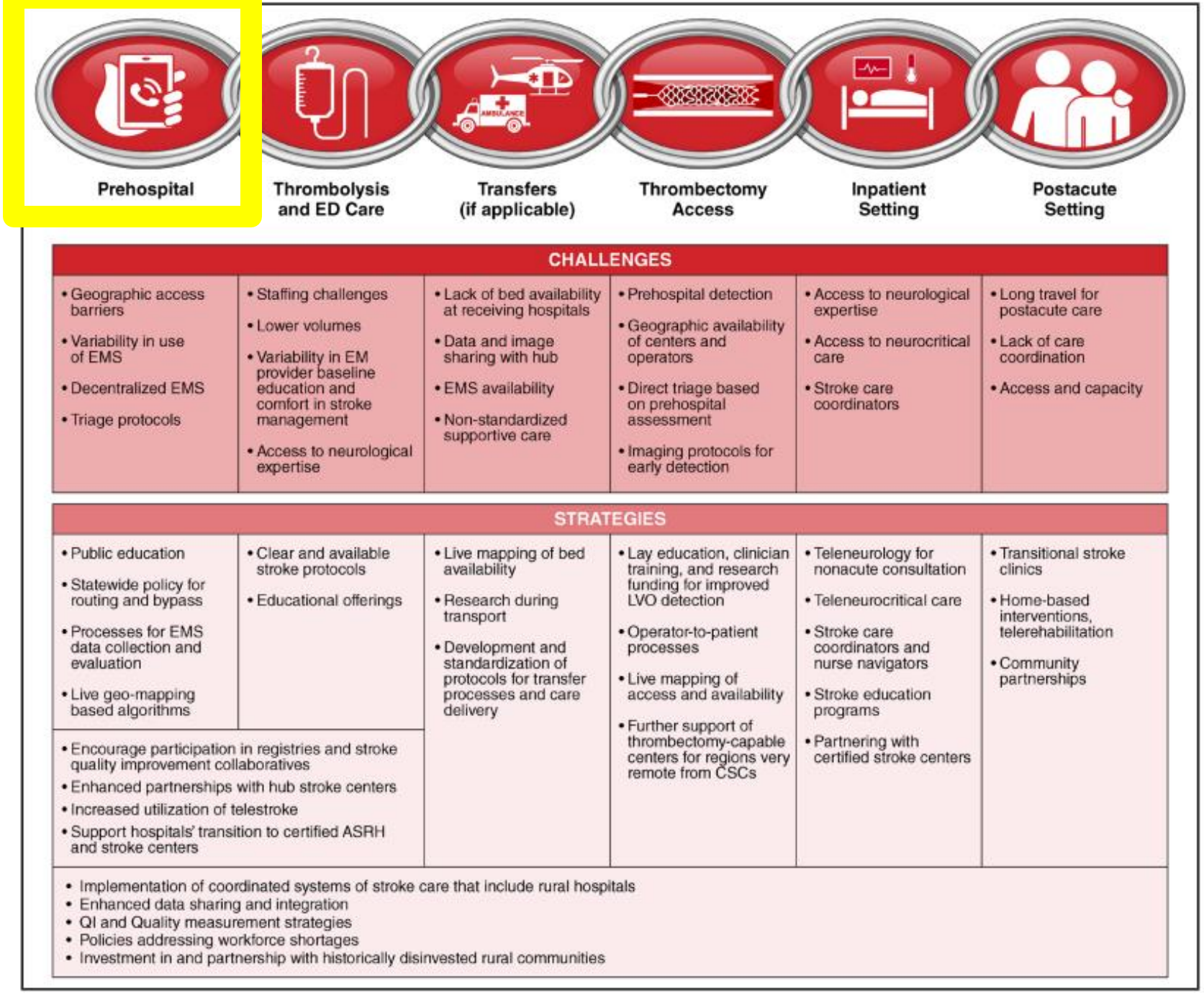


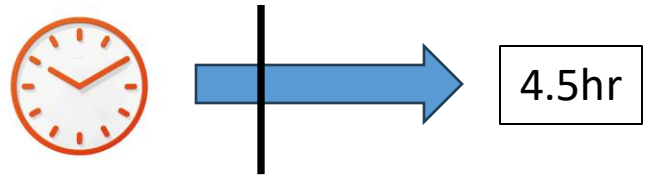
Figure 2. Potential strategies to address challenges in caring for patients with stroke in rural settings across the continuum of

Symptom recognition

EMS utilization (associated with improved outcomes)

Community Challenges

- Time to EMS activation (911)
- Scene Time
- Transport Time



Regional policy for Stroke Assessment Tool Implementation

2.24 Northern New England Unified Guideline
Stroke – Adult

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		

Medical Protocol 2.24

Establish Stroke Alert Criteria

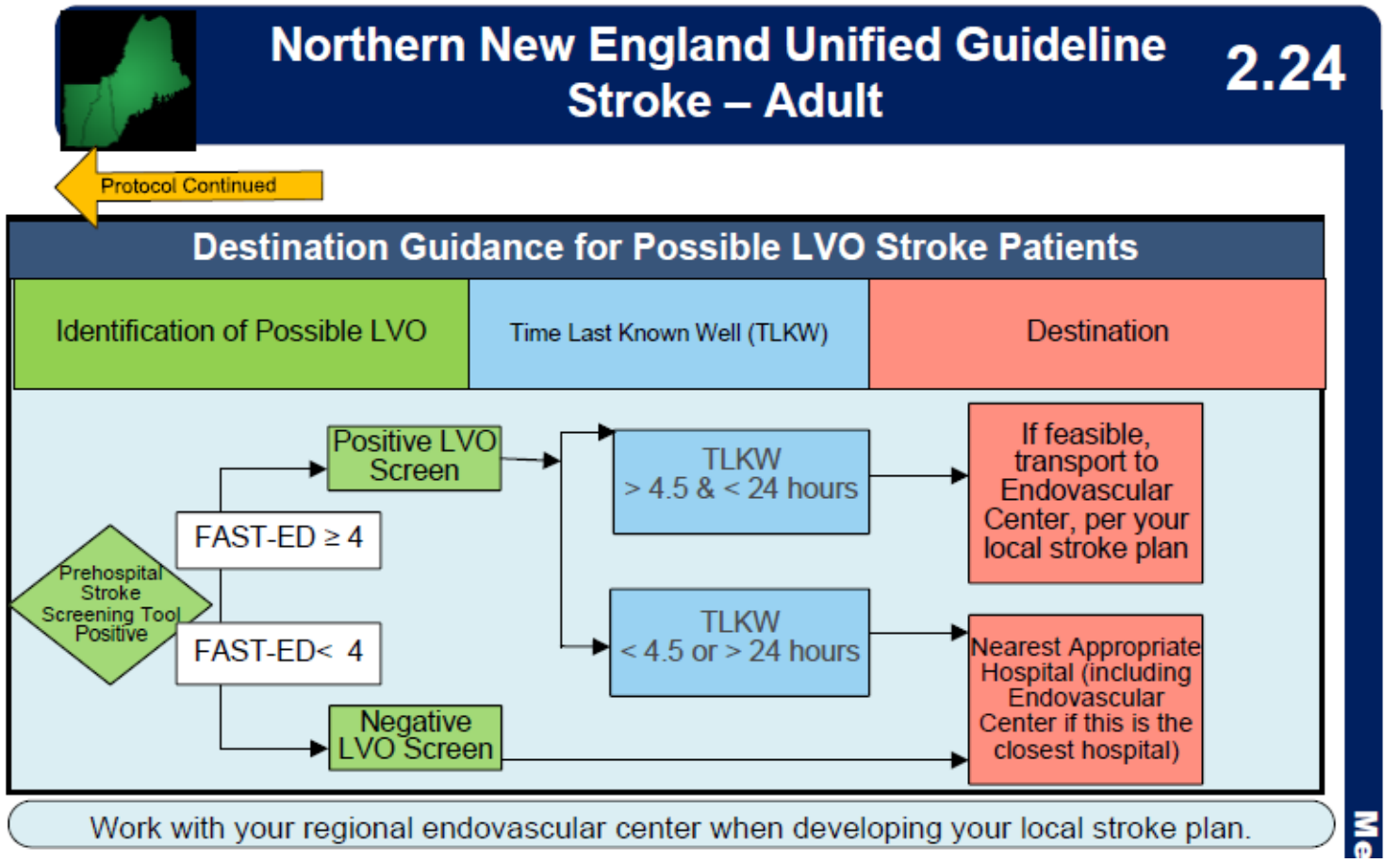
Yes	No	Stroke Alert Criteria – Please check Yes or No:
☐	☐	Blood glucose is or has been corrected to greater than 60 mg/dL?
☐	☐	Deficit unlikely due to head trauma or other identifiable causes?
☐	☐	Positive Prehospital Stroke Screen: - and time last known well is less than 4.5 hours **OR** - FAST-ED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

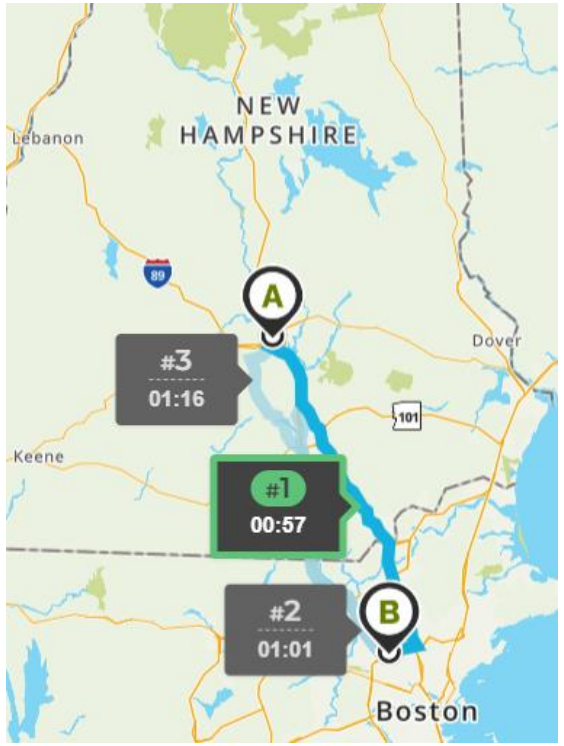
New Hampshire Department of Safety, Division of Fire Standards and Training & Emergency Medical Services 2024

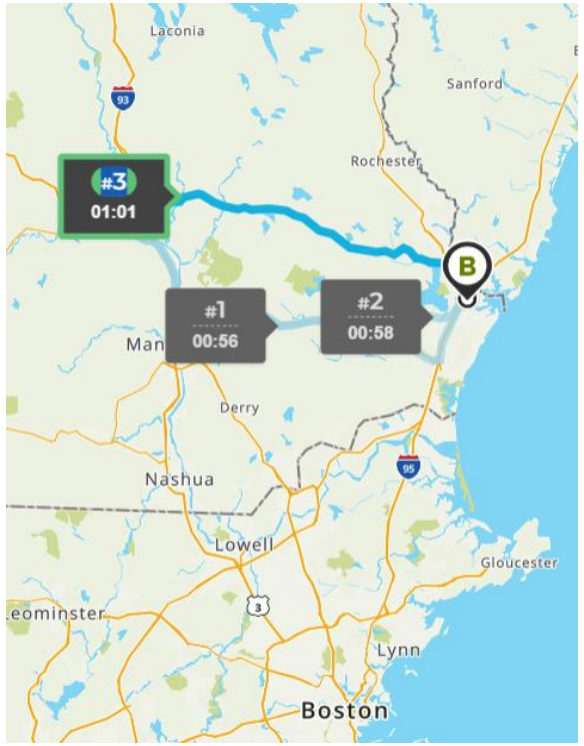
Pre-Hospital Time > 1 hour

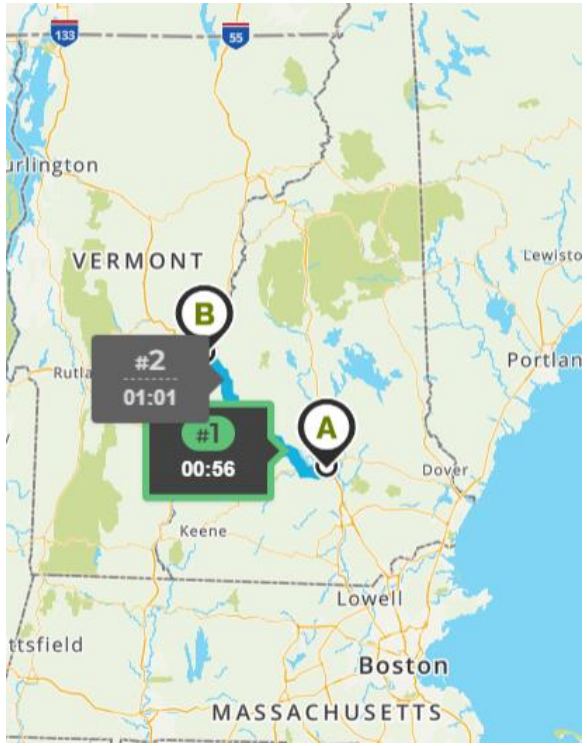
Regional Policy for Bypass Decisions



Regional Comprehensive Stroke Centers







Primary Stroke Center: Prehospital Focus

Low threshold for EMS stroke activation

Community education → EMS utilization

Pre-hospital intervention:

IV – 18G

Structured report

EMS Lab

50% Reduction in time to initial lab result

Concord Hospital Health System - Prehospital Lab Draw Process

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 extension set. Clean hub with alcohol prep, attach Blood Collection Adapter, 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.

CONCORD HOSPITAL

Laboratory Services

EMS ORDER OF DRAW

COLOR		INVERT
WHITE (no additive)		N/A
BLUE (sodium citrate)		3 - 4 times
GOLD (clot activator)		5 times
GREEN (heparin)		8 – 10 times
PURPLE (EDTA)		8- 10 times

Thrombolysis

Telehealth Decentralization

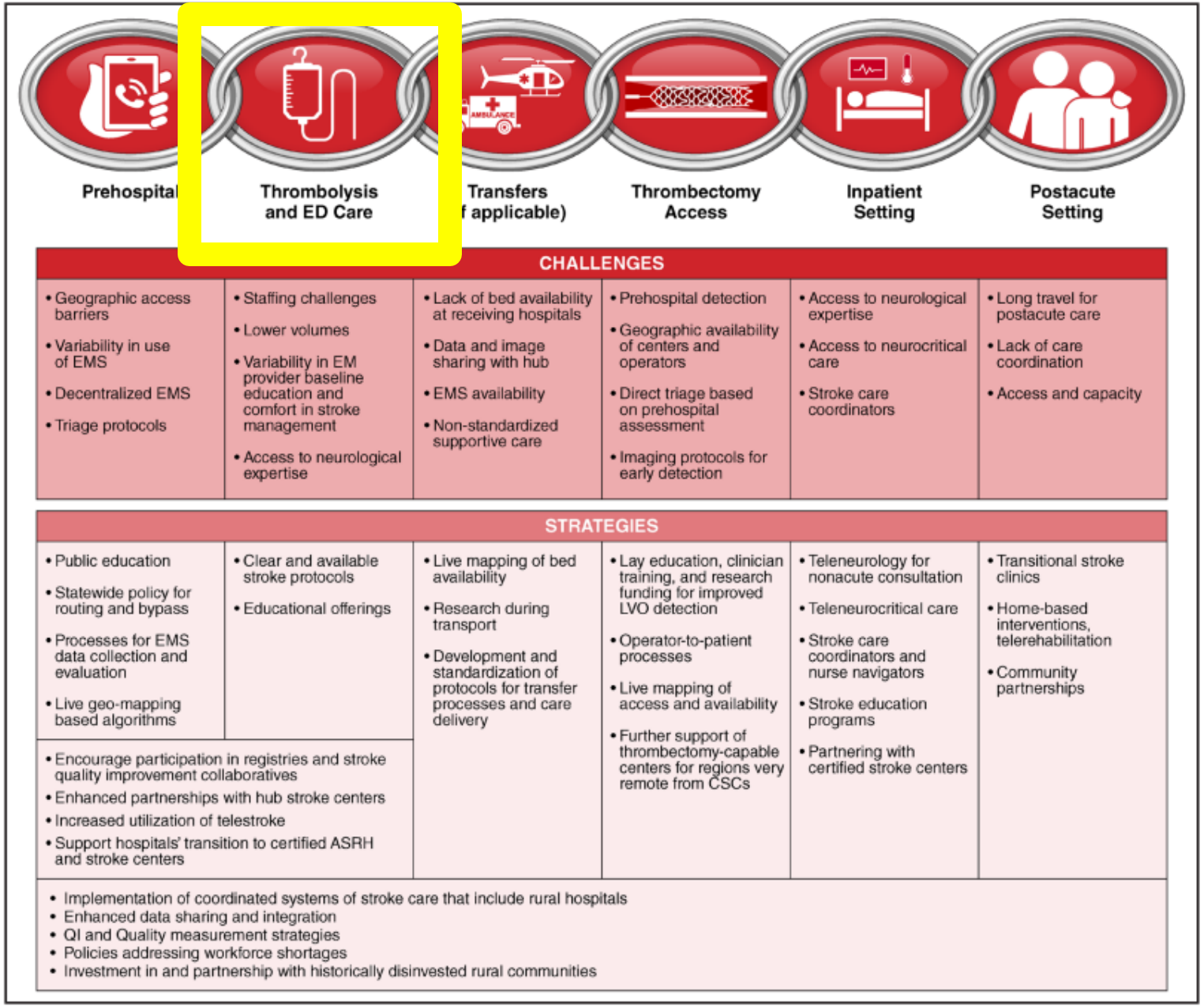


Figure 2. Potential strategies to address challenges in caring for patients with stroke in rural settings across the continuum of care.

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

“PIT” Process

STRUCTURED EMS REPORT

RAPID NEUROLOGICAL EXAMINATION WITH TELEHEALTH

LAB DRAW

CT BRAIN W/O CONTRAST

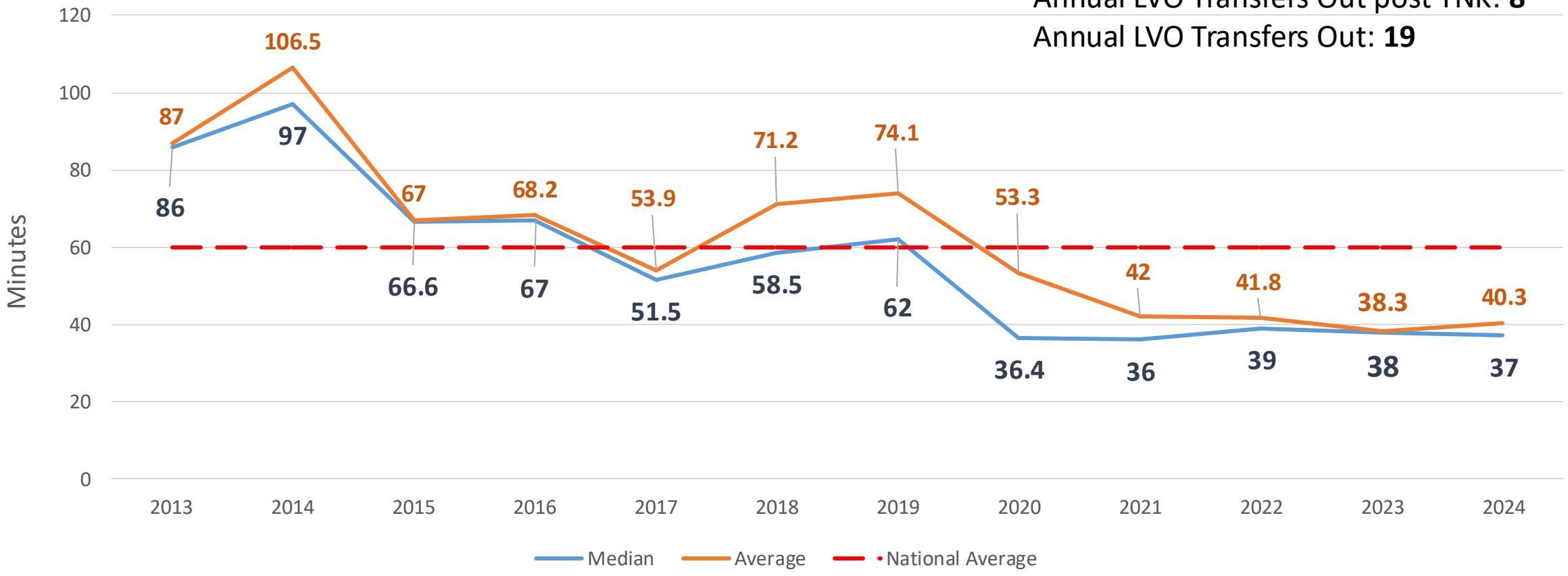
Primary Stroke Center: Thrombolysis & ED Care

Critical Time Intervals	Goals
Door to RN/NRP evaluation	< 5 min
Door to MD exam	< 10 min
Door to CT N/C first slice	< 20 min
Door to CT N/C read	< 45 min
Door to decision	< 30 min
Door to Needle	< 45 min
Door to Labs	< 45 min
Door to decision admit/transfer	< 180/120 min

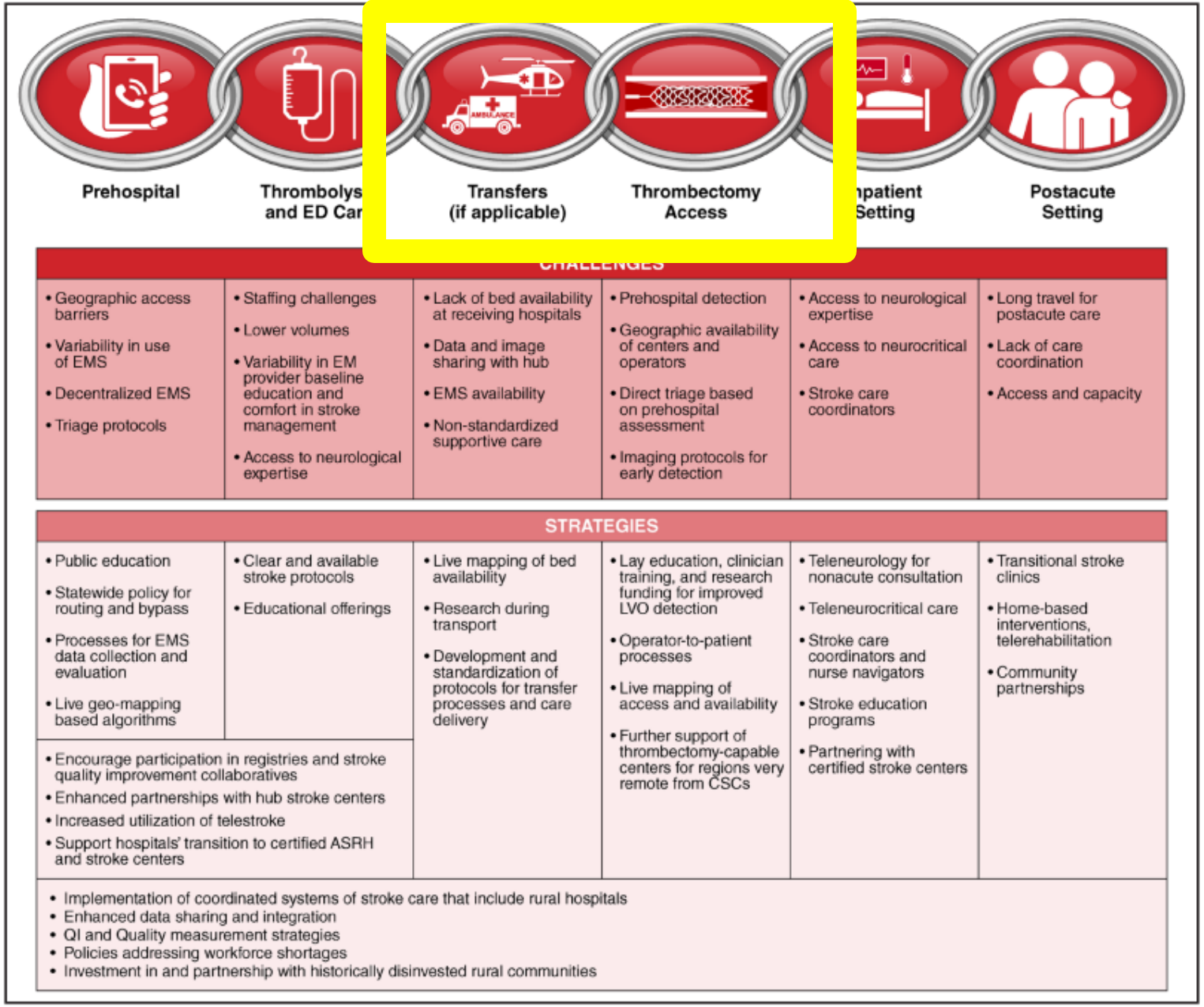
Door to Needle (CH-Concord)

Through the years…

Annual TNK Administrations: **60**
Annual LVO Transfers Out post TNK: **8**
Annual LVO Transfers Out: **19**



Best Practices: Rural Stroke Care



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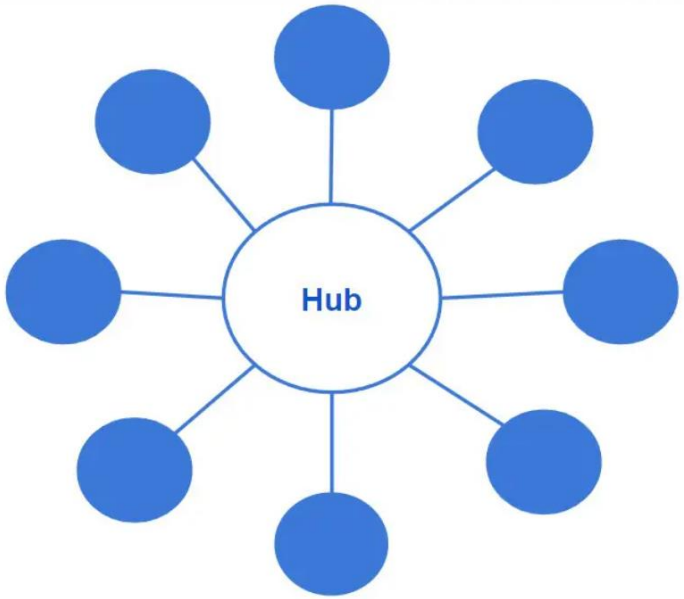
Thrombectomy Access

Geography

- 20% of the US population has access to thrombectomy-capable center within **15 minutes**
- 30% of the US population has access to thrombectomy-capable center within **30 minutes**

Primary Stroke Center:
Transfers / Thrombectomy Access



Hospital-Based Protocols PSC:
Clinical & Imaging

Bed Capacity

Data sharing:

EMR/ Image Sharing

Transfer Process:

Transfer Center/ Bed Management

EMS Transport

Feedback Loops

“Repatriation” to PSC

Should primary stroke centers perform advanced imaging?

Advanced Imaging

Acute Stroke Care

Determining thrombolytic and thrombectomy eligibility are the foundation of the acute stroke assessment

(Clinical Assessment + Imaging)

Most patients experiencing a stroke are not candidates for either intervention

Speed of reperfusion impacts treatment effect

Acute Stroke Care: Imaging

Thrombolysis

- CT w/out contrast

Thrombectomy

- *CT Angio Head/ Neck*
- *CT Perfusion*
- *MRI/MRA*

Advanced Imaging: **Vessel (CT Angio)**

LVO NIHSS ≥ 6 Cutoff & LVO Detection
- Sensitivity: 87%
- Specificity: 52%

Understanding patient eligibility for thrombectomy

High sensitivity for LVO (no patient denied therapeutic intervention)

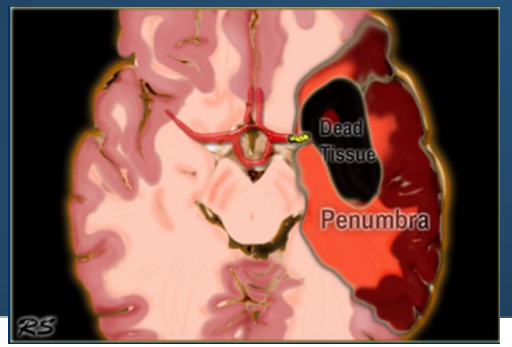
Arterial occlusion coinciding to clinical symptoms provides therapeutic direction

Image acquisition is fast

Vessel image acquisition → No change in door to needle time

Contrast administration

Advanced Imaging: **Perfusion**



Identify patients with large treatment effect from EVT (predict at-risk tissue)

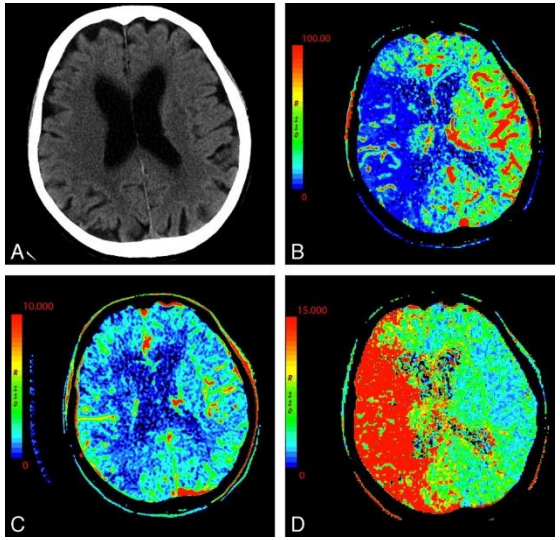
Image acquisition is fast

Improved CSC resource utilization

Late-window reperfusion therapy selection

Wake-up stroke / stroke onset uncertain

Stroke mimic detection



Delay in transfer/ treatment (morbidity/ mortality)

Expertise in interpretation (improving with AI)

Cost of image processing and interpretation

CTP is time-dependent (transfer time)

Thank you