

Final DRAFT

STROKE and LVO Stroke EMS Triage and Destination Plan

Final DRAFT

Stroke Patient

- Signs and symptoms of an acute Stroke identified on EMS Stroke Screen Assessment.
- Last Known Well (LKW)**
- Refer to UP 14 Suspected Stroke Protocol

The Purpose of this plan:

- Use plan in conjunction with UP 14 Suspected Stroke Protocol
- Rapidly identify acute Stroke patients presenting to EMS system and minimize the time from Stroke onset to definitive care
- Rapidly identify most appropriate facility destination in region
- Provide quality EMS service and patient care to the EMS system's citizens
- Maintain performance improvement of the EMS system based on NC Stroke Performance measures

Stroke Screening Tool
Insert:
Stroke Screen Tool here

LVO Suspected Score:
Insert:
Severity Score here

Stroke Screen/Severity Tool
Insert:
Severity Tool here

Positive Stroke Screen Tool
and/or
Positive Stroke Screen/
Stroke Severity Tool

Last Known Well
> 24 Hours

YES

Transport to Destination A or B:
Nearest facility or certified stroke center
honoring patient/family preference

NO

LVO Suspected
Stroke Severity Score
≥

YES

Contraindications
to fibrinolysis?
Reperfusion Checklist
Or
See box →

YES

Last Known Well
> 4.5 hours

YES

Transport to Destination B
May transport to Destination A
If transport time to Destination B is > minutes

NO

NO

Transport to Destination A

May transport to Destination B
If transport time to Destination A is < minutes
And
If total time from LKW and transport time will not
exceed 4 hours by facility arrival

Regional Stroke Centers Criteria
Absolute Contraindications to fibrinolysis
Insert:

DESTINATION A
Rapid / Early Notification of receiving facility
Activation of Stroke Team
Nearest Certified Stroke Center and/or
patient/family preference

Insert:

Acute Stroke Ready Center
Primary Stroke Center Facility(s) Here
Or
Thrombectomy Capable Stroke Center
Comprehensive Stroke Center Facility(s) Here

DESTINATION B
Rapid / Early Notification of receiving facility
Activation of Stroke Team
Thrombectomy Capable Stroke Center (TSC)
Comprehensive Stroke Center (CSC)

Insert:

Thrombectomy Capable Stroke Center
Comprehensive Stroke Center Facility(s) Here

Stroke EMS Triage and Destination Plan

Revised
09/15/2021

(Insert Name of Agency) EMS System
This protocol has been developed by the North Carolina Office of EMS

Stroke Clinical Tools for EMS

Stroke Scales

Cincinnati Prehospital Stroke Scale (CPSS / FAST)

Los Angeles Prehospital Stroke Screen (LAPSS)

Melbourne Ambulance Stroke Screen (MASS)

Miami Emergency Neurologic Deficit Score (MENDS)

Recognition of Stroke in the Emergency Room Score (ROSIER)

Stroke Scores

National Institute of Health Stroke Scale (NIHSS)

sNIHSS –5 / 8

Cincinnati Prehospital Stroke Severity Screen (CPSSS)

Field Assessment Stroke Triage for Emergency Destination (FAST-ED)

Los Angeles Motor Scale (LAMS)

Rapid Arterial Occlusion Evaluation Score (RACE)

Three Item Stroke Scale (3ISS)

For LVO: AUC 0.803-0.821 (CI 0.767-0.857)

Identification of patients with LVO

LVO scales

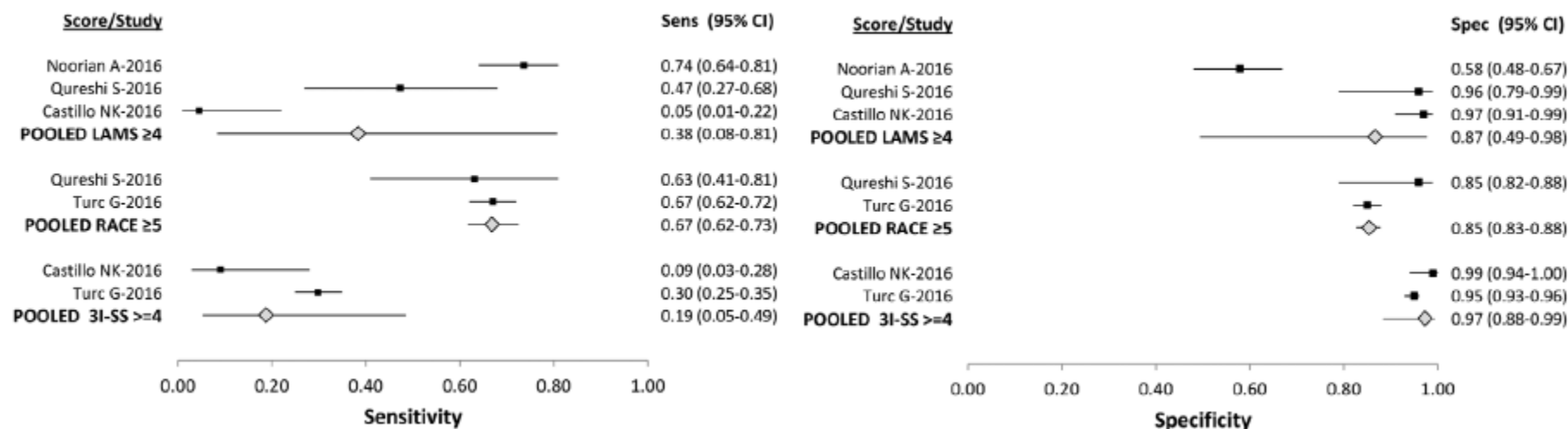
	LAMS	CPSSS	FAST-ED	PASS	RACE
	<i>Nazliel, Stroke 2005 (USA)</i>	<i>Katz, Stroke 2015 (USA)</i>	<i>Lima, Stroke 2016 (USA)</i>	<i>Hastrup, Stroke 2016 (Denmark)</i>	<i>Pérez de la Ossa Stroke 2014 (Catalonia, Spain)</i>
Items					
Level of consciousness		X		X	
Facial drop	X		X		X
Arm motor	X	X	X	X	X
Grip	X				
Leg motor					X
Gaze/Eye deviation		X	X	X	X
Speech / aphasia			X		X
Neglect / agnosia			X		X
Score (cut-off for LVO)	0-5 (≥ 4)	0-4 (≥ 2)	0-9 (≥ 4)	0-3 (≥ 2)	0-9 (≥ 5)
Sensitivity/Specificity	81% / 89%	83% / 40%	61% / 89%	66% / 83%	85% / 68%
Prospective validation	YES (AUC 0.70)	NO	NO	NO	YES (AUC 0.79)

Accuracy of Prediction Instruments for Diagnosing Large Vessel Occlusion in Individuals With Suspected Stroke

A Systematic Review for the 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

Conclusions—No scale predicted LVO with both high sensitivity and high specificity. Systems that use LVO prediction instruments for triage will miss some patients with LVO and milder stroke. More prospective studies are needed to assess the accuracy of LVO prediction instruments in the prehospital setting in all patients with suspected stroke, including patients with hemorrhagic stroke and stroke mimics. (*Stroke*. 2018;49:e111-e122. DOI: 10.1161/STR.000000000000160.)

B Ischemic Stroke



(Smith E. *Stroke*. 2018;49:e111-e122)

CDC

- A policy evidence assessment report of state policy interventions based typically on SAC addressed in at least one state law.
- Case studies underway

Centers for Disease Control and Prevention. Division for Heart Disease and Stroke Prevention. What is the Evidence for Existing State Laws to Enhance Pre-hospital Stroke Care? Atlanta, GA: Centers for Disease Control and Prevention; 2017.

Stroke Systems of Care: State Policy Interventions

A summary of policy interventions in stroke systems of care by evidence level, based on findings of the Centers for Disease Control and Prevention (CDC) Division for Heart Disease and Stroke Prevention (DHDSP) pre-hospital and in-hospital/post-hospital Policy Evidence Assessment Reports.

Pre-hospital

In-hospital/Post-hospital

Evidence Level: Best



Stroke Pre-notification



EMS Triage/Transport



Air Medical Transport



Inter-Facility Transfer



Telestroke to Initiate Treatment



State-level CQI Registry



Nationally Certified PSCs



State Standards for PSCs

Evidence Level: Promising



Pre-hospital Screening Tool Use



Nationally Certified CSCs



State Standards for CSCs



Nationally Certified ASRHs

Evidence Level: Emerging



Continuing Education for EMS Providers



CQI of EMSS for Stroke



Nationally Recognized Stroke Rehabilitation Facilities



State Standards for ASRHs

Definitions

Pre-hospital: All emergency medical care provided to the stroke patient prior to the handoff of the patient from EMS providers to staff at the acute care facility.

In-hospital: All care provided to the stroke patient at an acute care facility by hospital staff and their consulting specialists before a patient is discharged.

Post-hospital: All long-term, rehabilitative care received by the stroke patient after they have been discharged from the acute care facility.

Best Evidence: Expected to have the greatest potential for a positive health impact and an associated economic impact.

Promising or Emerging Evidence: Could also have positive impacts, but the quantity and quality of the evidence for them is limited at this time.

Acronyms

ASRH: Acute Stroke Ready Hospital

CQI: Continuous Quality Improvement

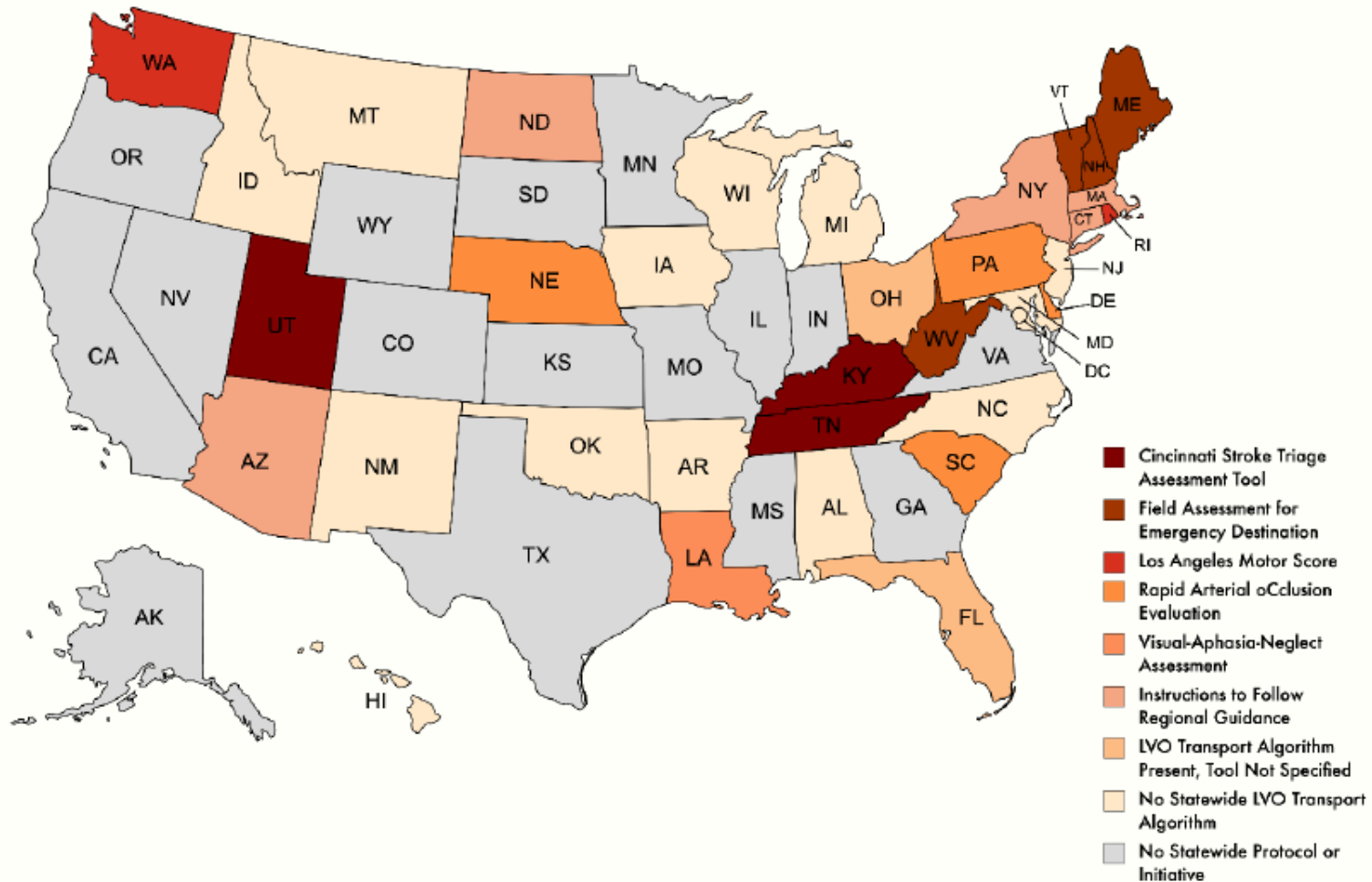
CSC: Comprehensive Stroke Center

EMS: Emergency Medical Services

EMSS: Emergency Medical Service Systems

PSC: Primary Stroke Center

State-Based LVO Assessments



Should We Standardize?

- Rational
 - Simplify training material development
 - Simplify use across neighboring regions
 - Better measure impact of tool use through larger datasets