



*If you had a stroke,
wouldn't you want the
best treatment?
available?*



**NATIONAL EMS ADVISORY COUNCIL
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TODAY'S PRESENTATION

- Stroke in the United States
- The Challenge: Getting More Stroke Patients the Appropriate Care at the Right Time
- The Solution: Improving Stroke Protocols in the United States
- The Campaign: Get Ahead of Stroke
- How NEMSAC Can Help



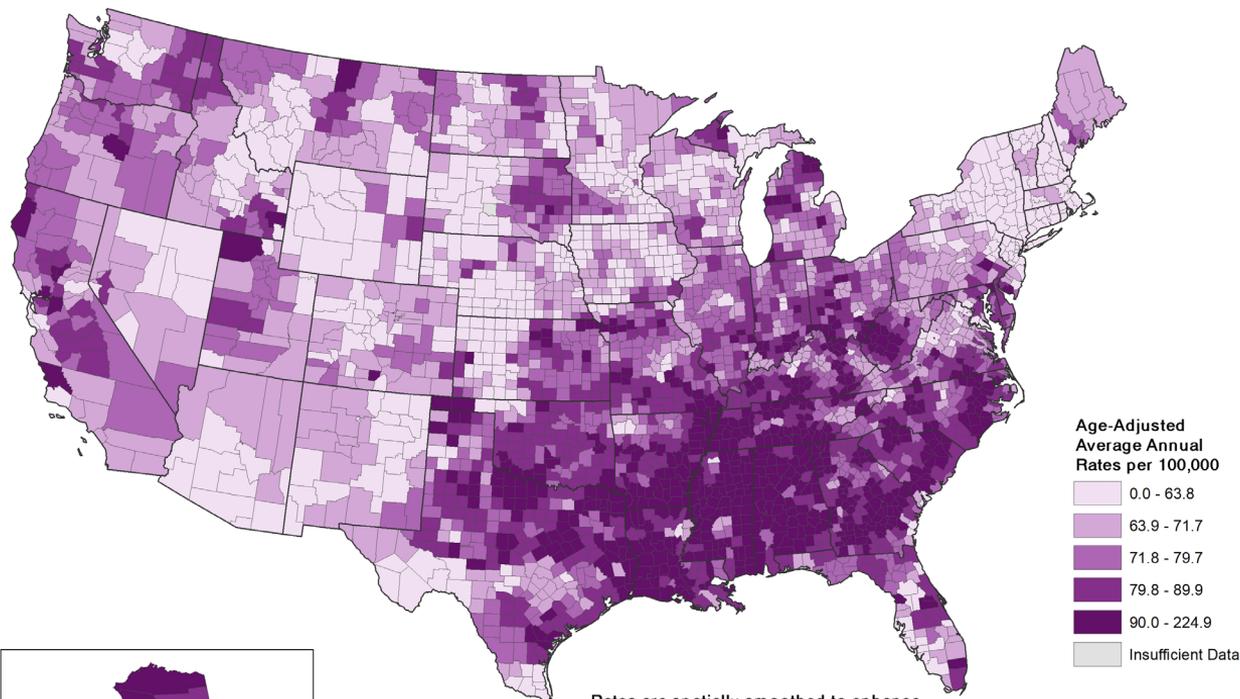
STROKE IN THE UNITED STATES

KEY STATISTICS

- Stroke is a **leading cause of death** and long-term disability in the U.S.
- More than **795,000 people** in the U.S. have a stroke every year, with one happening about **every 40 seconds**.
- Stroke kills about **140,000 people** in the U.S. each year—that's **1 out of every 20 deaths**.
- Nearly **2 million** brain cells die every minute a stroke goes untreated.



Stroke Death Rates, 2015 - 2017 Adults, Ages 35+, by County



Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

Data Source:
 National Vital Statistics System
 National Center for Health Statistics

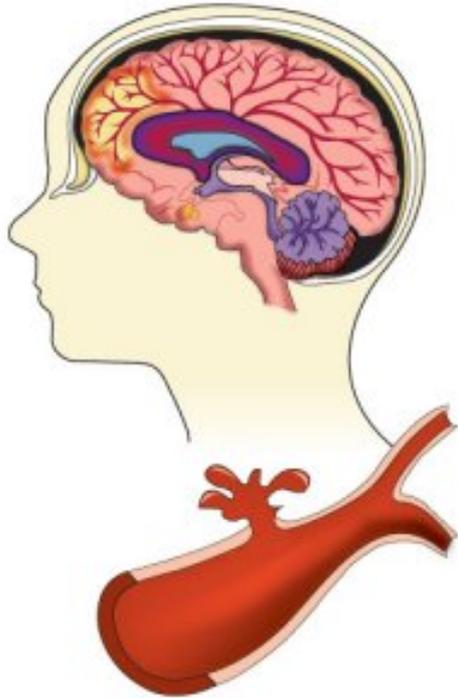


STROKE IN THE UNITED STATES

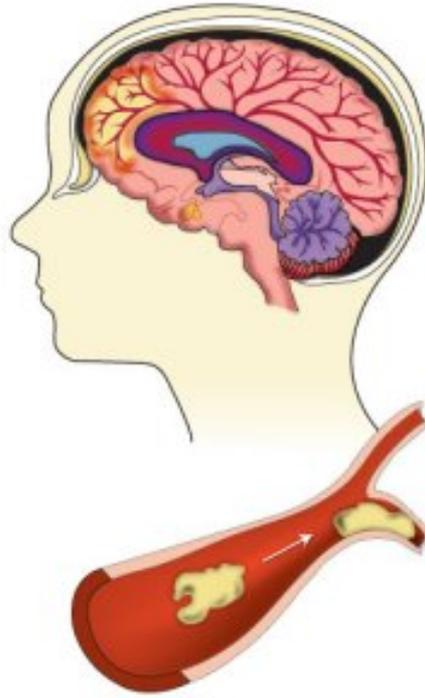
KEY STATISTICS

- Stroke costs in the U.S. are currently estimated at about **\$34 billion**.
- Stroke can inflict a chaotic toll on families when **a survivor requires long-term care**—resulting in a “butterfly effect” impacting other lives.
- For **every minute** saved in transfer to the appropriate care, there is \$1,000 in savings on medical costs.

TYPES OF STROKE



A hemorrhagic stroke occurs when a blood vessel bursts within the brain.



An ischemic stroke occurs when a blood clot blocks the blood flow in an artery within the brain.

- The vast majority of strokes (87 percent) are **ischemic strokes**, caused by a blood clot in the brain.
- The deadliest form of stroke is a **severe ischemic stroke with an emergent large vessel occlusion (ELVO)**.
- There are approximately **150,000 to 200,000** patients with ELVO each year.

COMMON STROKE MIMICS

- Hypoglycemia
- Intracranial mass lesions
- Seizures and postictal states (Todd's paralysis)
- Migraine-mimicking stroke
- Functional hemiparesis
- Encephalopathies and other toxic-metabolic conditions

EMS PREHOSPITAL MANAGEMENT OF STROKE



- Assess the airway, breathing, and circulatory status.
- Check blood glucose.
- Obtain full set of vital signs.
- Review patient's medications.
- Establish IV access.
- **Perform Neurological Exam.**
 - **CPSS (Cincinnati Prehospital Stroke Scale)**
- **Determine Stroke Severity.**
 - **Use Stroke Severity Scale**

STROKE SEVERITY SCALES

- Used by EMS personnel in the field to assess stroke severity of patients
- While there are dozens of scales in use, the most common include:
 - Cincinnati Stroke Triage Assessment Tool (C-STAT)
 - Field Assessment Stroke Triage for Emergency Destination (FAST-ED)
 - Los Angeles Motor Scale (LAMS)
 - Miami Emergency Neurologic Deficit (MEND)
 - National Institutes of Health (NIH) Stroke Scale
 - Rapid Arterial Occlusion Evaluation (RACE)
 - Vision, Aphasia, Neglect (VAN)

PATIENT REPORT TO EMERGENCY DEPARTMENT

- Patient's age, sex, and weight
- Chief complaint with brief history of present illness
- Vital signs
- Level of consciousness
- Intervention by EMS (IV, medication, administration)
- **ETA (The more critical the patient, the earlier you need to notify the receiving facility)**
 - Call the stroke alert from the field

TYPES OF LARGE VESSEL OCCLUSION (LVO)



MCA Occlusion

Recanalization rate with IV tPA:

M1: 22%, M2: 44%[‡]

Mortality: 25% vs. 42.9%^{##}



Basilar Occlusion

Recanalization rate with IV tPA: <10%

Mortality: 90% (persistent occlusion)^{**}



Internal Carotid Occlusion

Recanalization rate with IV tPA: <10%

Mortality: 73% (persistent occlusion)^{^^}

[‡] Alexandrov et al. Stroke

^{##} Proact II: Jama 1999

^{**} Meta analysis Furlan et al

^{^^} Flint et al. MERCI Registry Stroke 2008

THROMBECTOMY—A REVOLUTION IN STROKE CARE

- Neuroendovascular stroke surgery, also known as **thrombectomy**, uses catheters to reopen blocked arteries in the brain quickly.
- This procedure can be done in as **little as 10 minutes**.
- Clinical trials have proven that thrombectomy is **highly effective for treating ischemic stroke patients with ELVO**.



THROMBECTOMY—A REVOLUTION IN STROKE CARE



Patients who receive thrombectomy **increase their life expectancy by five years** compared to patients who do not receive this specialized treatment.

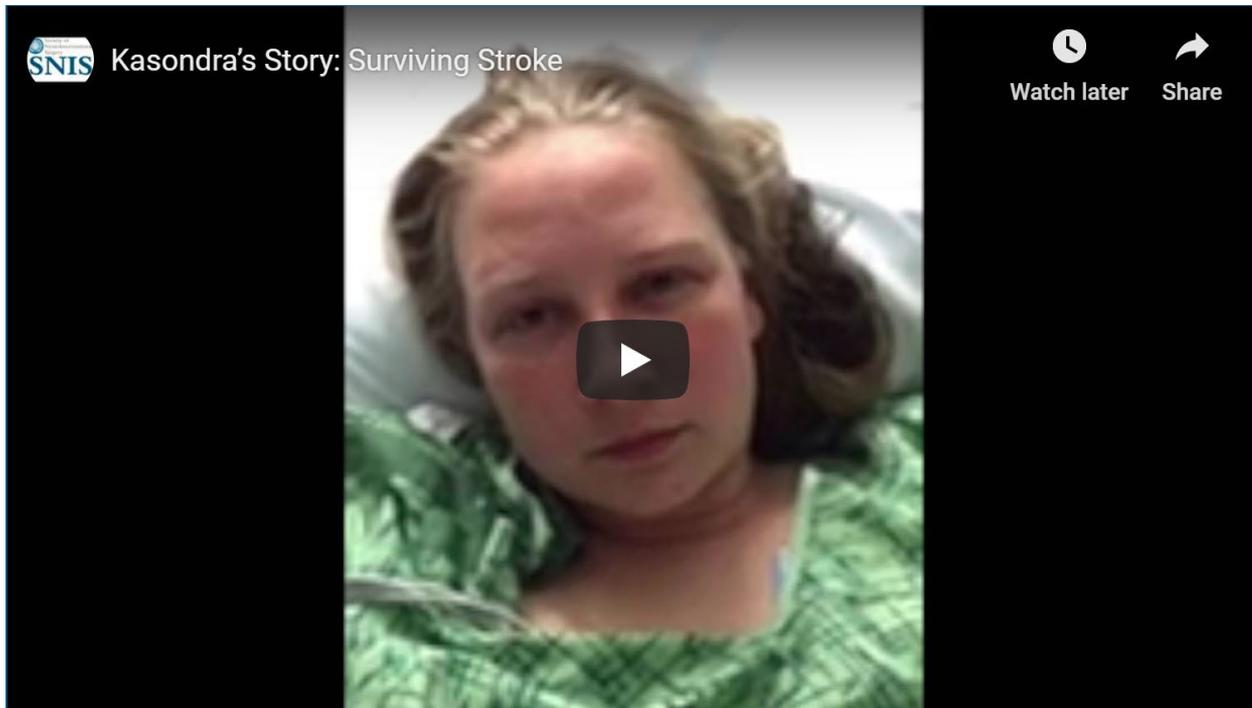


Thrombectomy **reduces mortality by half**, meaning thousands more people can walk away from stroke.



For every minute saved in transfer to appropriate care, there is **\$1,000** in savings on medical costs.

KASONDRA'S STORY: SURVIVING STROKE





THE CHALLENGE

IV-TPA usually doesn't work for ischemic stroke patients who have a severe stroke known as emergent large vessel occlusion (ELVO).

A thrombectomy does.

Out of 150,000 to 200,000 ELVO patients each year, just 15% receive a thrombectomy.

Why?

Most states do not have protocols for first responders to transport ELVO patients directly to a Level 1 (comprehensive) stroke center.

Policies and regulations that guide stroke treatment vary widely by state. Currently, no clear protocol exists to ensure a severe stroke patient is taken directly to a Level 1 stroke center.

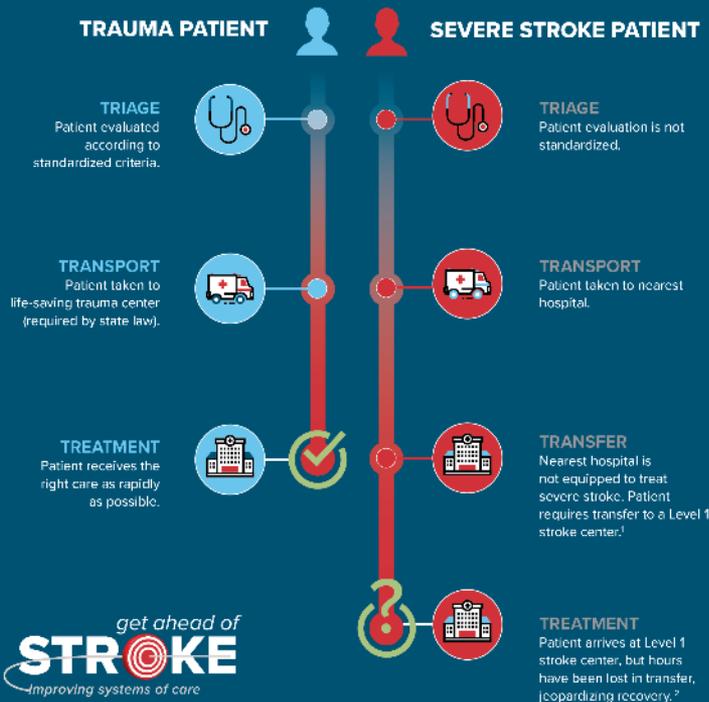


THE SOLUTION

Update EMS protocols to ensure more ELVO patients get the care they need at Level 1 stroke centers—facilities with 24/7/365 neurointerventional care.

DO STROKE PATIENTS DESERVE LESS?

Like Trauma, Stroke Patients Need a System That Helps Them Survive



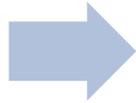
¹ Less than 10 percent of severe stroke patients get the most effective treatment.
² Due to time lost, 7 in 8 severe stroke patients who are transferred become ineligible for specialized acute therapy.

TRAUMA MODEL COMPARISON

TRAUMA PATIENT

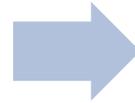
Triage

Patient is evaluated according to standardized criteria.



Transport

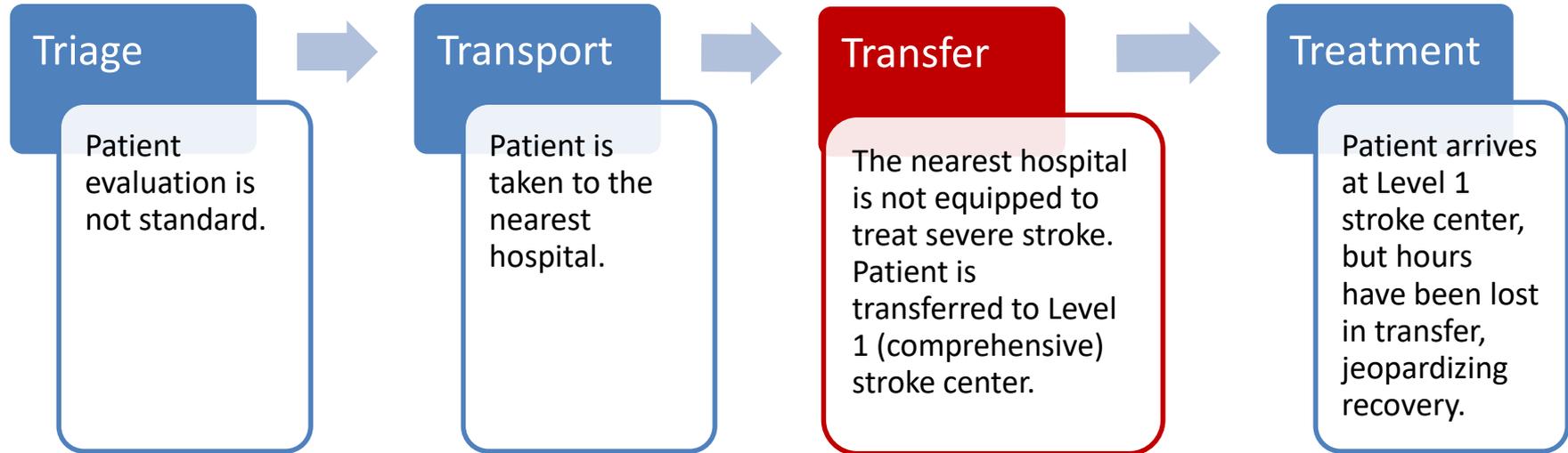
Patient is taken to lifesaving trauma center (required by state law).



Treatment

Patient receives appropriate care as quickly as possible.

STROKE PATIENT





THE CAMPAIGN

GET AHEAD OF STROKE CAMPAIGN

- An initiative of the Society of NeuroInterventional Surgery (SNIS)
- Established in 2016
- Educates EMS professionals about assessment and triage of severe stroke patients in the field
- Works to secure the best possible outcomes for severe stroke patients by driving policy change and public awareness nationwide



GET AHEAD OF STROKE OVERVIEW

The video player displays a scene of an elderly man and woman walking hand-in-hand on a sidewalk. The man is wearing a dark jacket and the woman is wearing a light-colored zip-up jacket. In the background, there is a red SUV parked on the street and some trees with autumn foliage. The video player interface includes a title bar with the SNIS logo and the video title, a 'Watch later' button with a clock icon, and a 'Share' button with a share icon. At the bottom, there is a 'MORE VIDEOS' button, a progress bar showing 0:00 / 2:25, and standard YouTube controls for play, volume, closed captions, HD quality, and full screen.

SNIS Get Ahead of Stroke Campaign Video

Watch later Share

MORE VIDEOS

0:00 / 2:25

YouTube

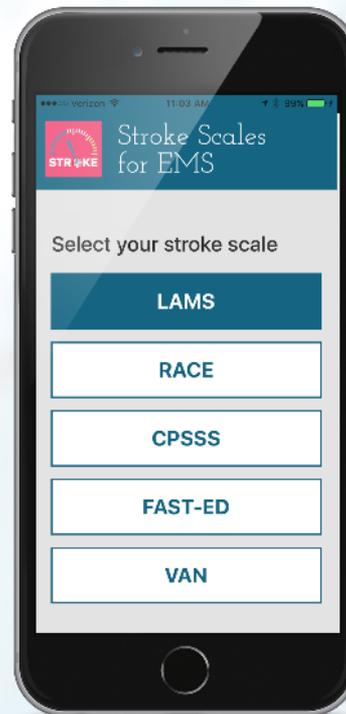
CAMPAIGN EMS ENGAGEMENT

- Have met with 2,300+ EMS personnel since 2016 at events and conferences
- Distribute educational materials about the Stroke Scales for EMS mobile app to EMS educators and providers
- Maintain an active partnership with the National Association of EMTs (NAEMT)



STROKE SCALES FOR EMS MOBILE APP

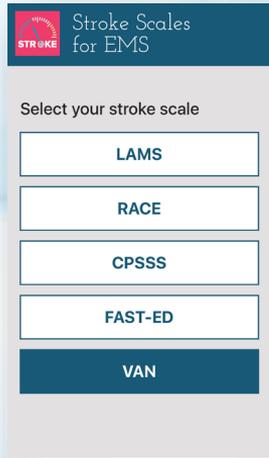
- Tool to help EMS personnel assess a patient's stroke severity in the field
- Contains LAMS, RACE, C-STAT, CPSSS, FAST-ED, and VAN scales
- Has been downloaded 12,000+ times and adopted by Northern Virginia EMS Council as part of its stroke triage plan



STROKE SCALES FOR EMS MOBILE APP

Complete the stroke scale.

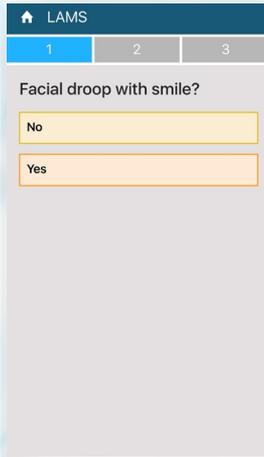
Start



Stroke Scales for EMS

Select your stroke scale

- LAMS
- RACE
- CPSSS
- FAST-ED
- VAN**



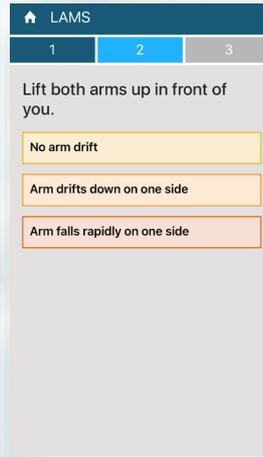
LAMS

1 2 3

Facial droop with smile?

No

Yes



LAMS

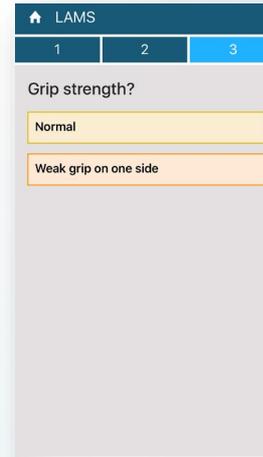
1 2 3

Lift both arms up in front of you.

No arm drift

Arm drifts down on one side

Arm falls rapidly on one side



LAMS

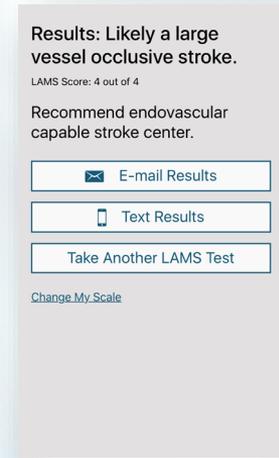
1 2 3

Grip strength?

Normal

Weak grip on one side

Finish



Results: Likely a large vessel occlusive stroke.

LAMS Score: 4 out of 4

Recommend endovascular capable stroke center.

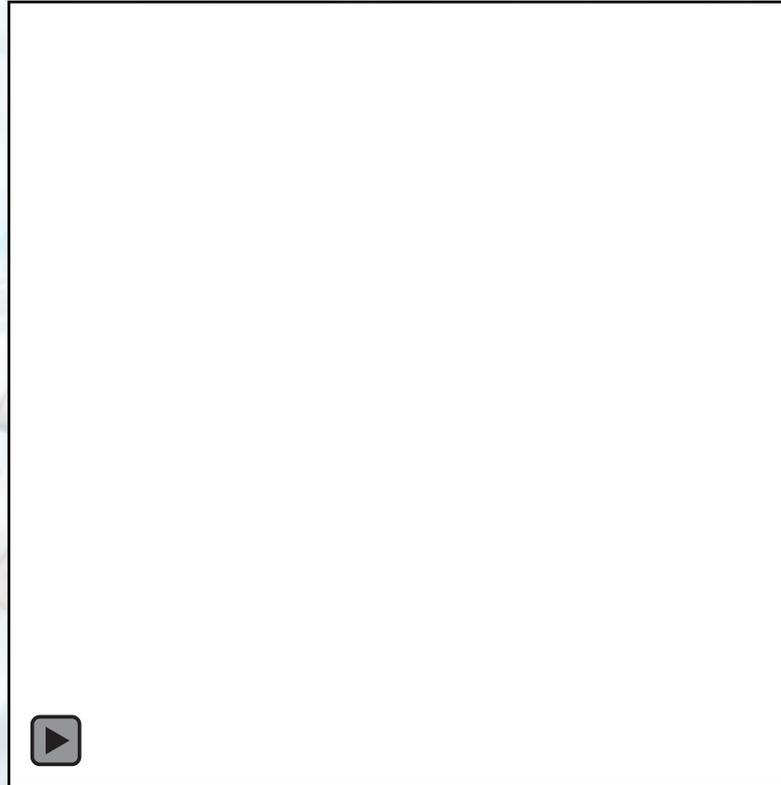
E-mail Results

Text Results

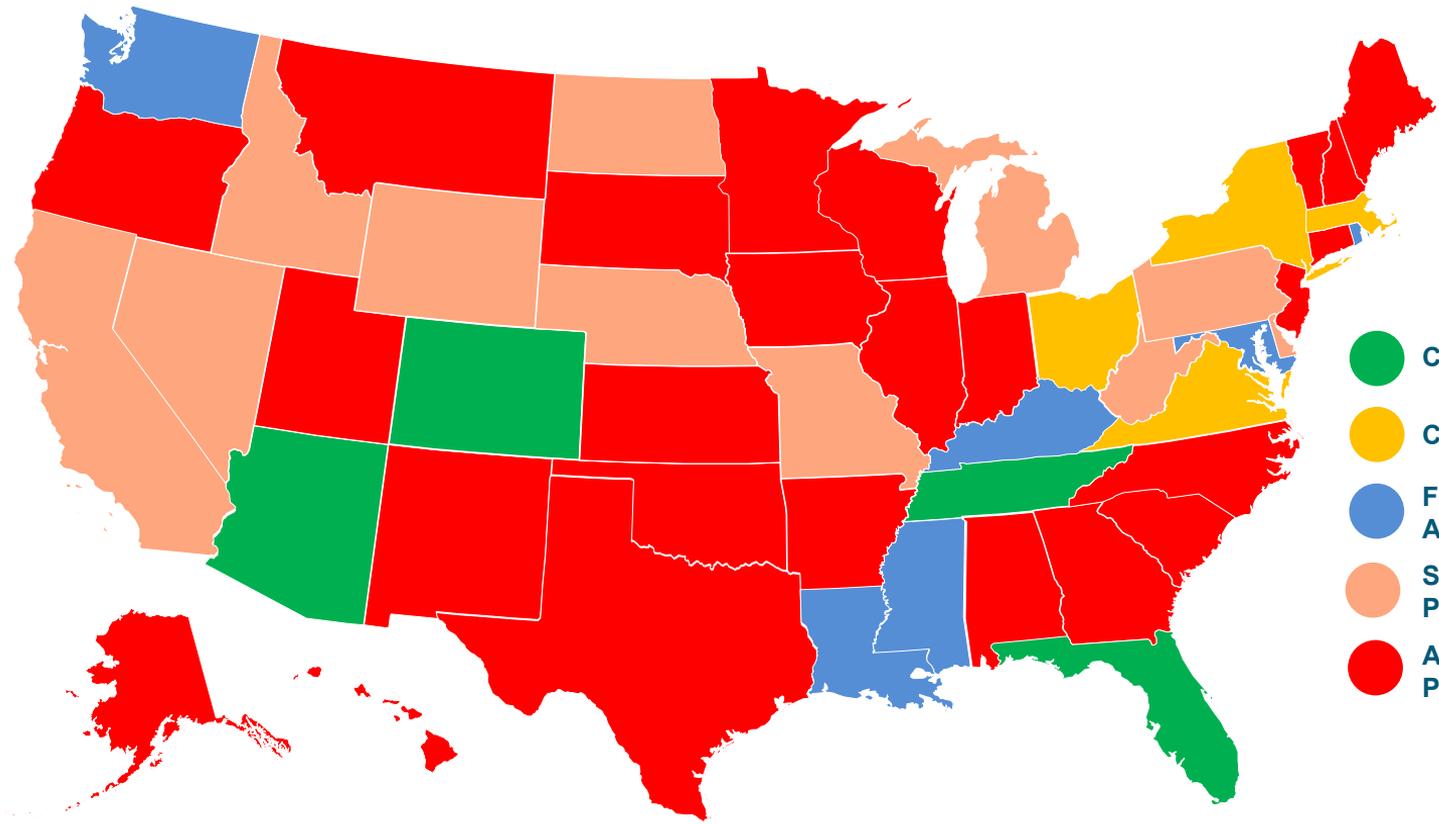
Take Another LAMS Test

[Change My Scale](#)

STROKE SCALES FOR EMS MOBILE APP



ADVOCACY: THE STATE OF PLAY



-  Campaign Success
-  Campaign Work in Progress
-  Favorable State Protocols Already in Place
-  Some Action Needed (Partial Protocols in Place)
-  Action Needed (No Protocols in Place)

MODEL LEGISLATION

Tennessee: Senate Bill 2513 was enacted into law in 2018.

- Directed the state's EMS board to establish protocols for
 - Prehospital assessment
 - Transport of stroke patients by EMS
 - EMS education

2020 AND BEYOND

- Continue pursuing legislative changes at the state level in Massachusetts, New York, and Ohio.
- Expand the campaign into additional states.
- Continue partnerships with EMS advocacy groups and create new educational materials for EMS audiences.
- Explore efficacy and viability of federal-level changes.



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HOW NEMSAC CAN HELP

- ✓ Expedite stroke system of care changes by updating protocols at the federal level—rather than a slower state-by-state process.
- ✓ Include stroke-specific protocols within the national guidelines.



THANK YOU!



QUESTIONS