get ahead of STROKE

Improving systems of care

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

WELCOME

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This webinar is hosted by the National Association of Emergency Medical Technicians (NAEMT) and supported by an educational grant from Medtronic.

WELCOME

- This webinar will be recorded for future viewing on the NAEMT website.
- There will be a question-and-answer period at the end of the webinar.
  - To ask your question, please send it via the chat box in the bottom right of your screen.
- If you have questions at any point throughout the webinar, please send them via the chat box.
- If you have technical issues, please send a message to Faith James via the chat box.

PRESENTERS

Blaise W. Baxter, MD

Joseph Holley, MD

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GET AHEAD OF STROKE

GET AHEAD OF STROKE OVERVIEW

WHO?

Society of NeuroInterventional Surgery and partners

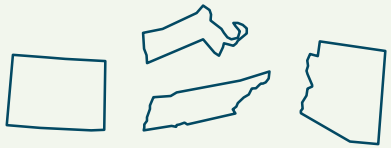
WHAT?

Improve care for stroke patients.

HOW?

Update state stroke policies.

GET AHEAD OF STROKE OVERVIEW



WHERE?

Nationwide, with recent efforts focused in AZ, CO, MA, NY, OH, TN, and VA.

WHY?

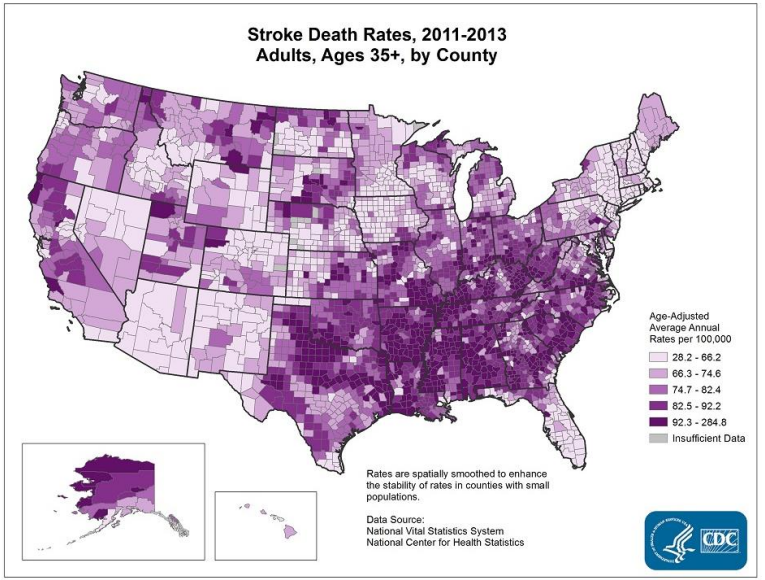
We can reduce the likelihood of disability and save lives.

WHEN?

Now, but we are committed to improving stroke systems of care over the long term.

THE REALITY

- 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.
- Stroke kills about 140,000 people in the U.S. each year.
- The vast majority of strokes (87 percent) are ischemic strokes, caused by a blood clot in the brain.



ISCHEMIC STROKE SYNDROMES

Left Hemisphere	Right Hemisphere
Left gaze preference	Right gaze preference
Right visual field deficit	Left visual field deficit
Right hemiparesis	Left hemiparesis
Right hemisensory loss	Left hemisensory loss neglect

Cerebellum	Brainstem
Truncal/gait ataxia	Nausea and/or vomiting
Limb ataxia	Diplopia, dysconjugate gaze, gaze palsy
Neck stiffness	Dysarthria, dysphagia
	Vertigo, tinnitus
	Hemiparesis or quadriplegia
	Sensory loss in hemibody or all 4 limbs
	Decreased consciousness
	Hiccups, abnormal respirations

Source: Summers et al. *American Heart Association*. 2009;2911–2944.

HEMORRHAGIC STROKE SYNDROMES

Hemorrhage
Focal neurological deficits as in AIS
Headache (especially in subarachnoid hemorrhage)
Neck pain
Light intolerance
Nausea, vomiting
Decreased level of consciousness

Source: Summers et al. *American Heart Association*. 2009;2911–2944.

RISK FACTORS FOR STROKE

Modifiable Risk Factors	Noncontrollable Risk Factors
High blood pressure	Age
Cigarette smoking	Heredity
Diabetes mellitus	Race
Carotid or other artery disease	Gender
Peripheral artery disease	Prior stroke, TIA or heart attack
Atrial fibrillation	
Other heart disease	
Sickle cell disease	
High blood cholesterol	
Poor diet	
Physical inactivity and obesity	

Source: Mozaffarian D et al. *Circulation*. 2016;133:e38-e360

COMMON STROKE MIMICS

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

Source: Huff JS. Stroke mimics and chameleons. *Emerg Med Clin North Am.* 2002 Aug. 20(3):583–95.

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THE CHALLENGE

No clear protocol exists to ensure first responders transport ELVO stroke patients directly to a Level 1 stroke center for lifesaving treatment.

THE SOLUTION

1. Educate emergency medical services (EMS) professionals about assessment and triage of severe stroke patients in the field.
2. Get more ELVO patients the treatment they need at Level 1 stroke centers – facilities with 24/7/365 neurointerventional care.
    a. A new study (Holodinsky) shows that direct transfer to a Level 1 stroke center is better than the alternative, even if the stroke center is as many as 90 minutes away.
3. Update EMS protocols in all 50 states to ensure more patients survive stroke.

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CINCINNATI PREHOSPITAL STROKE SEVERITY SCALE

FACIAL DROOP (The patient shows teeth or smiles)	ARM DRIFT (The patient closes their eyes and extends both arms straight out for 10 seconds)	SPEECH (The patient repeats "The sky is blue in Cincinnati")
NORMAL: Both sides of face move equally.	**NORMAL:** Both arms move the same, or both arms do not move at all.	**NORMAL:** The patient says correct words with no slurring of words.
ABNORMAL: One side of face does not move as well as the other.	**ABNORMAL:** One arm either does not move, or one arm drifts down compared to the other.	**ABNORMAL:** The patient slurs words, says the wrong words, or is unable to speak.

Adapted from: Kothari et al. *Ann Emerg* Med. 1999; 33(4): 373–8.

LOS ANGELES PREHOSPITAL STROKE SCREEN

SCREENING CRITERIA	YES	NO	UNKNOWN
1. Age over 45 years			
2. History of seizures or epilepsy absent			
3. Symptom duration less than 24 hours			
4. At baseline, patient is not wheelchair bound or bedridden			
5. Blood glucose between 60 and 400			N/A
6. Exam: Look for obvious asymmetry			N/A

FACIAL SMILE/ GRIMACE	GRIP	ARM STRENGTH
☐ Normal	☐ Normal	☐ Normal
☐ Droop (Right)	☐ Weak grip (Right)	☐ Drifts down (Right)
☐ Droop (Left)	☐ Weak Grip (Left)	☐ Drifts down (Left)
	☐ No grip (Right)	☐ Falls rapidly (Right)
	☐ No Grip (Left)	☐ Falls rapidly (Left)

	YES	NO
Based on exam, patient has only unilateral (and not bilateral) weakness:		
7. If Yes (or unknown) to all items above LAPSS screening criteria met:		
8. If LAPSS criteria for stroke are met, call receiving hospital with "CODE STROKE", if not then return to the appropriate treatment protocol. (Note: the patient may still be experiencing a stroke even if LAPSS criteria are not met)		

Adapted from: Kidwell CS, Starkman S, Eckstein M, Weems K, Saver JL. "Identifying stroke in the field. Prospective validation of the Los Angeles prehospital stroke screen (LAPSS)." *Stroke* 2000 Jan;31(1):71–6

RACE SCALE

RAPID ARTERIAL OCCLUSION EVALUATION STROKE

Design and Validation of a Prehospital Stroke Scale to Predict Large Arterial Occlusion

The Rapid Arterial Occlusion Evaluation Scale

Natalia Pérez de la Ossa, MD, PhD; David Carrera, MD; Montse Gorchs, BD; Marisol Querol, BD; Mònica Millán, MD, PhD; Meritxell Gomis, MD, PhD; Laura Dorado, MD, PhD; Elena López-Cancio, MD, PhD; María Hernández-Pérez, MD; Vicente Chicharro, MD; Xavier Escalada, MD; Xavier Jiménez, MD, PhD; Antoni Dávalos, MD, PhD

Background and Purpose—We aimed to develop and validate a simple prehospital stroke scale to predict the presence of large vessel occlusion (LVO) in patients with acute stroke.

Methods—The Rapid Arterial oCclusion Evaluation (RACE) scale was designed based on the National Institutes of Health Stroke Scale (NIHSS) items with a higher predictive value of LVO on a retrospective cohort of 654 patients with acute ischemic stroke: facial palsy (scored 0–2), arm motor function (0–2), leg motor function (0–2), gaze (0–1), and aphasia or agnosia (0–2). Thereafter, the RACE scale was validated prospectively in the field by trained medical emergency technicians in 357 consecutive patients transferred by Emergency Medical Services to our Comprehensive Stroke Center. Neurologists evaluated stroke severity at admission and LVO was diagnosed by transcranial duplex, computed tomography, or MR angiography. Receiver operating curve, sensitivity, specificity, and global accuracy of the RACE scale were analyzed to evaluate its predictive value for LVO.

Results—In the prospective cohort, the RACE scale showed a strong correlation with NIHSS (r=0.76; P<0.001). LVO was detected in 76 of 357 patients (21%). Receiver operating curves showed a similar capacity to predict LVO of the RACE scale compared with the NIHSS (area under the curve 0.82 and 0.85, respectively). A RACE scale ≥5 had sensitivity 0.85, specificity 0.68, positive predictive value 0.42, and negative predictive value 0.94 for detecting LVO.

Conclusions—The RACE scale is a simple tool that can accurately assess stroke severity and identify patients with acute stroke with large artery occlusion at prehospital setting by medical emergency technicians. **(*Stroke*. 2014;45:87-91.)**

Source: Perez de la Ossa et al. *Stroke*. 2014; 45: 87–91.

RACE SCALE

RAPID ARTERIAL OCCLUSION EVALUATION STROKE

ITEM	INSTRUCTION		RACE Score
FACIAL PALSY	Ask the patient to show their teeth	**ABSENT** (symmetrical movement) **MILD** (slightly asymmetrical) **MODERATE TO SEVERE** (completely asymmetrical)	0 1 2
ARM MOTOR FUNCTION	Extending the arm of the patient 90 degrees (if sitting) or 45 degrees (if supine)	**NORMAL TO MILD** (limb upheld more than 10 seconds) **MODERATE** (limb upheld less than 10 seconds) **SEVERE** (patient unable to raise arm against gravity)	0 1 2
LEG MOTOR FUNCTION	Extending the leg of the patient 30 degrees (if supine)	**NORMAL TO MILD** (limb upheld more than 5 seconds) **MODERATE** (limb upheld less than 5 seconds) **SEVERE** (patient unable to raise the leg against gravity)	0 1 2
HEAD AND GAZE DEVIATION	Observe eyes and cephalic deviation to one side	**ABSENT** (eye movements to both sides were possible and no cephalic deviation was observed) **PRESENT** (eyes and cephalic deviation to one side was observed)	0 1
APHASIA If right hemiparesis	Ask the patient two verbal orders: - *"close your eyes"* - *"make a fist"*	**NORMAL** (performs both tasks correctly) **MODERATE** (performs one task correctly) **SEVERE** (performs neither task)	0 1 2
AGNOSIA If left hemiparesis	Asking: - *"Who's arm is this?" while showing him/ her the paretic arm (asomatognosia)* - *"Can you move your arm?" (anosognosia)*	**NORMAL** (no asomatognosia nor anosognosia) **MODERATE** (asomatognosia or anosognosia) **SEVERE** (both of them)	0 1 2
		RACE SCALE TOTAL: Any score above a "0" is a "Stroke Alert"	

Adapted from: Perez de la Ossa et al. *Stroke*. 2014; 45: 87–91.

PATIENT REPORT TO EMERGENCY DEPARTMENT

- Patient's age, sex, and weight
- Mechanism of injury or medical problem
- Chief complaint with brief history of present illness
- Vital signs
- Level of consciousness
- General appearance, distress, cardiac rhythm
- Intervention by EMS (IV, medication, administration)
- ETA (The more critical the patient, the earlier you need to notify the receiving facility.)

Source: Campbell S, Robinson MR. *Paramedic Lab Manual.* Upper Saddle River, NJ: Prentice Hall; 2005.

PREHOSPITAL MANAGEMENT OF AN ACUTE STROKE

- Assess the airway, breathing, and circulatory status.
- Check blood glucose.
- Obtain full set of vital signs.
- Review patient's medications.
- Perform 12 lead ECG.
- Establish IV access.

Source: Maggiore, W. A. (2012). 'Time is Brain' in Prehopsital Stroke Treatment. *Journal of Emergency Medical Services*, 1–9.

ACUTE ISCHEMIC STROKE – IV-TPA CONTRAINDICATIONS

- Active internal bleeding
- Recent intracranial or intraspinal surgery or serious head trauma
- Intracranial conditions that may increase the risk of bleeding
- Bleeding disthesis
- Current severe uncontrolled hypertension
- Current intracranial hemorrhage
- Subarachnoid hemorrhage

Source: Genentech USA, Inc. Highlights of prescribing information. Activase (alteplase for injection, for intravenous use), http://gene.com/download/pdf/activase_prescribing.pdf. Accessed on February 15, 2016.

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NEUROENDOVASCULAR STROKE SURGERY

- Neuroendovascular stroke surgery is a type of minimally invasive procedure that removes blood clots from a blocked artery.

- Landmark trials show that this treatment is highly effective in treating ischemic strokes caused by emergent large vessel occlusions (ELVO).

THE RESULTS

- Improves life expectancy of patients who experience ischemic stroke by 5 years.
- Reduces stroke mortality by half.
- Could allow more patients to walk away from severe stroke if they get the right care.

SURVIVING STROKE: JOHN'S STORY

https://www.youtube.com/watch?v=lTqNvr2aDyg

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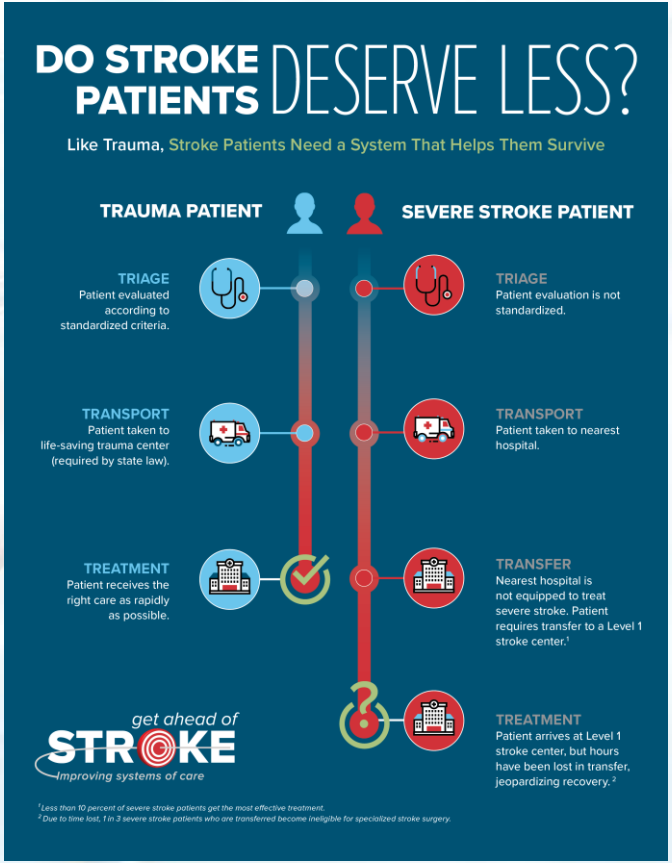
STATE ADVOCACY

- Charted a path forward via rules or legislation in priority states: Arizona, Colorado, Massachusetts, New York, Ohio, and Tennessee.
- Working on a parallel track with state and regional stroke councils.

TRAUMA MODEL COMPARISON



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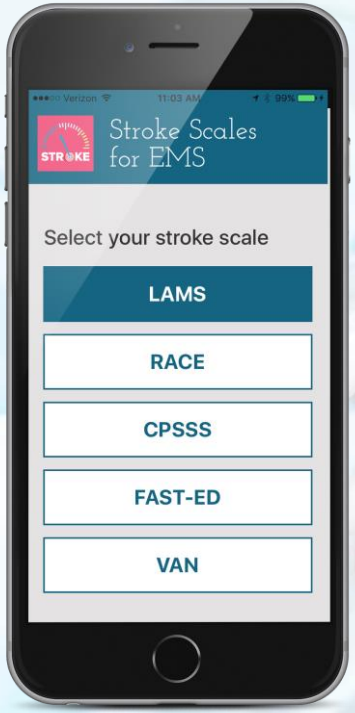
RESOURCES FOR EMS

ABOUT THE APP

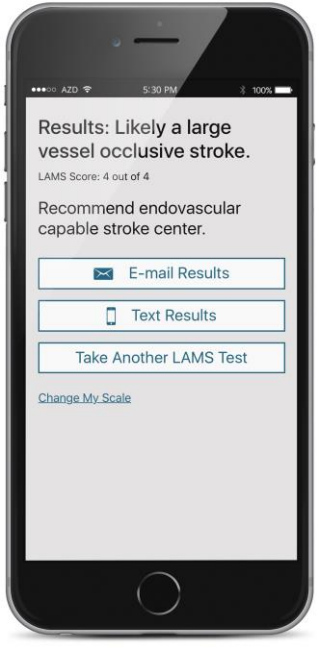


The Stroke Scales for EMS mobile application helps EMS personnel identify stroke severity and emergent large vessel occlusion (ELVO) in the field using stroke scales.

ABOUT THE APP

- Features five stroke scales
  - The Los Angeles Motor Scale (LAMS)
  - Rapid Arterial oCclusion Evaluation (RACE)
  - Cincinnati Prehospital Stroke Severity Scale (CPSSS)
  - Field Assessment Stroke Triage for Emergency Destination (FAST-ED)
  - Vision, Aphasia, Neglect (VAN)

ABOUT THE APP

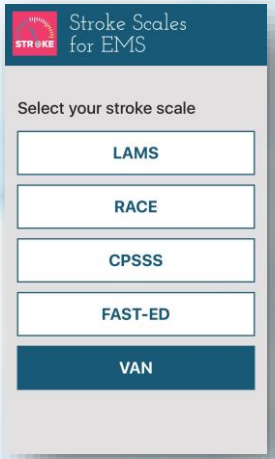


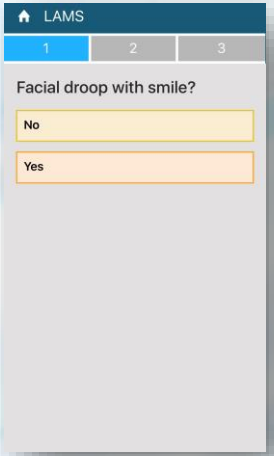
Based on results from the stroke scale you use, the app recommends the type of facility the stroke patient needs.

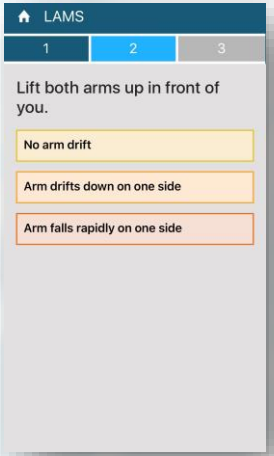
AT-A-GLANCE

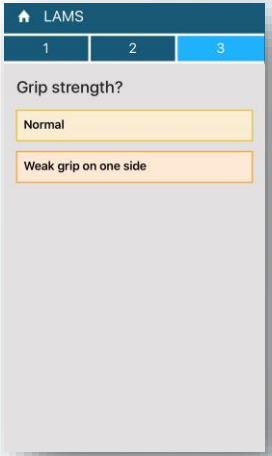
Complete the stroke scale.

Start









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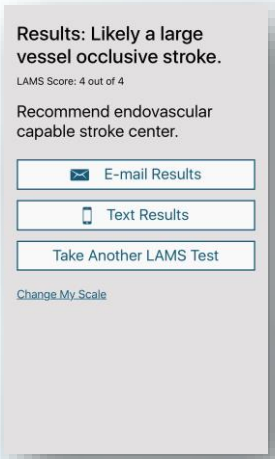

HOW TO DOWNLOAD

- The app is available for download in the iOS App Store and Google Play.
- Search for “Stroke Scales for EMS” to find and download the app.

OTHER RESOURCES

- First Responders fact sheet
- Patient stories and videos
- Infographics and social media graphics

WHAT YOU CAN DO

- ✓ Take the pledge to strengthen stroke systems of care and learn more about how you can support advocacy efforts in your state or region. Visit getaheadofstroke.org.
- ✓ Follow @SurviveStroke on Facebook, Twitter, and Instagram.
- ✓ Use #SurviveStroke to join the conversation on social media.
- ✓ Download the Stroke Scales for EMS app in the iOS App Store and Google Play.

CAPCE CREDIT

The link for completing the evaluation for your CAPCE continuing education credit is in the chat box below. We will also follow up with more information.

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QUESTIONS?

Visit www.getaheadofstroke.org for more information.

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THANK YOU