American Heart Association.
Mission:Lifeline®
Stroke

EMS Best Practices for the

Rapid Arterial oCclusion Evaluation (RACE) Stroke Severity Scale

Stroke is a leading cause of serious long-term disability and the fifth leading cause of death in the United States. **Learning to recognize stroke, rate its severity, and transport a patient to the proper hospital is a fundamental contribution EMS can make in stroke management.** Several stroke severity scales have been developed to help EMS do just this.

If a prehospital stroke screen is positive, EMS providers should assess severity by using a stroke severity scale. The RACE Stroke Severity Scale[1] is one of several nationally recognized stroke severity scale options. Like all stroke severity scales, **the purpose of the RACE Scale is to help EMS identify patients whose symptoms may be due to a Large Vessel Occlusion (LVO), and may therefore benefit from mechanical thrombectomy – an endovascular therapy shown to improve outcomes for select LVO patients.**

1. Know stroke signs & symptoms

If any sign or symptom of stroke is identified during the initial patient assessment, EMS should use a standardized tool to screen for the presence of stroke (eg., BE FAST, Cincinnati Prehospital Stroke Scale (CPSS), Los Angeles Prehospital Stroke Scale (LAPSS), etc.).

Common Stroke Signs & Symptoms

- Hemiparesis (ie, weakness on one side of body)
- Hemiplegia (ie, paralysis on one side of body)
- Facial weakness or droop on one side of face
- Dysarthria (ie, slurred speech)
- Dizziness or vertigo
- Expressive aphasia (ie, loss of ability to produce written or spoken language)
- Receptive aphasia (ie, loss of ability to understand written or spoken language)
- Eye deviation (ie, fixed gaze to one side or difficulty looking to one side)
- Denial or neglect (ie, inability to respond purposefully to stimulus on one side of body)

Additional Stroke Signs & Symptoms

- Altered level of consciousness
- Sudden severe headache with no known cause
- Visual disturbances
- Generalized weakness
- Motor ataxia (ie, new onset of clumsiness or incoordination) or frequent or unexplained falls

2. Be aware of stroke mimics

It's important for EMS to not only screen for stroke when a patient presents with an acute onset neurological complaint, but also attempt to rule out stroke mimics. If EMS is unsure whether the patient's signs and symptoms are due to stroke, it's best to prenotify the receiving hospital of a suspected stroke and communicate all relevant findings, including information relating to possible stroke mimics.

Common Stroke Mimics

- Hypoglycemia
- Seizures
- Head injuries
- Migraine headaches
- Intoxication
- Cerebral Infection
- Tumors of the Central Nervous System
- Nerve damage, such as Bell's Palsy
- Psychogenic causes

3. Know the steps & scoring for the RACE Scale

If a prehospital stroke screen is positive, EMS should assess severity by using a stroke severity scale. With support from medical and EMS leadership, the state of New Jersey recommends the RACE Scale as the statewide tool for stroke

severity assessment. There is no score that indicates with certainty whether a patient has an LVO, however, a score ≥ 5 indicates a greater probability of an LVO.

Item	Instruction	Result	Score
Facial Palsy	Ask the patient to show his or her teeth, or to smile.	Absent facial palsy (Facial movement symmetrical) Mild facial palsy (Facial movement slightly asymmetrical) Moderate/severe facial palsy (Facial movement completely asymmetrical)	0 1 2
Arm Motor Function	Patient extends his or her arms, to 90 degrees if sitting or 45 degrees if lying on his or her back*.	Normal/mild arm motor dysfunction (Upholds both arms ≥10 seconds) Moderate arm motor dysfunction (Upholds either arm <10 seconds) Severe arm motor dysfunction (Unable to raise either arm against gravity)	0 1 2
Leg Motor Function	Patient separately raises his or her legs 30 degrees from the supine (lying on back) position*.	Normal/mild leg motor dysfunction (Upholds each leg ≥5 seconds) Moderate leg motor dysfunction (Upholds either leg <5 seconds) Severe leg motor dysfunction (Unable to raise either leg against gravity)	0 1 2
Head & Gaze Deviation	Ask the patient to look to the left, then to the right.	Absent: head & gaze deviation absent (Eye movement to both sides w/o head deviation) Present: head & gaze deviation present (Patient's eyes or head deviate to one side)	0 1
Aphasia (if right hemiparesis) **-OR-** Agnosia (if left hemiparesis)	If right hemiparesis or without motor impairment: First ask the patient to close his or her eyes; Second ask the patient to make a fist with his or her left hand. **-OR-** If left hemiparesis: First show the patient his or her left arm and ask, "Whose arm is this?"; Second ask the patient, "Can you move your arms and clap your hands?"	Absent aphasia (Performs both tasks correctly) Moderate aphasia (Performs one of two tasks correctly) Severe aphasia (Unable to perform either task correctly) **-OR-** Absent agnosia (Recognizes arm and attempts to move weakened arm) Moderate agnosia (Does not recognize arm or is unaware of arm weakness) Severe agnosia (Does not recognize arm and is unaware of arm weakness)	0 1 2 **-OR-** 0 1 2
Total Score			**= Sum of items**

*If the patient cannot lift his or her limbs, raise his or her limbs. Score according to the time the patient can maintain his or her limbs against gravity, without touching the bed or surface.

4. Consider the RACE Scale score when determining hospital destination

Every patient eligible for IV alteplase (a medication used to dissolve clots in ischemic stroke, but less effective at fully treating LVOs) should receive it as quickly as possible, even if a candidate for mechanical thrombectomy. For any patient with acute stroke symptoms who is otherwise stable, EMS should transport the patient to a hospital Designated as a Stroke Center by the New Jersey Department of Health. For patients suspected of having an LVO, determining which hospital they should be transported to requires balancing the benefits of rapid access to mechanical thrombectomy, with potential delay in initiation of IV alteplase in longer transport to a hospital capable of mechanical thrombectomy.

For patients suspected of having an LVO, EMS should also consider:

- The RACE Scale score
- Patient time last known well
- Distance and travel time to the closest NJ Department of Health Designated Stroke Center
- Hemodynamic stability of the patient
- Distance and travel time to a hospital capable of mechanical thrombectomy
- Additional considerations developed over time

For more information on the purpose of Stroke Severity Scales and hospital transport considerations, please visit stroke.org/stroketransportplans.

5. Prenotify the receiving hospital of suspected stroke and potential LVO

As soon as a potential stroke diagnosis is made, EMS should immediately notify its online medical control or receiving hospital. This includes notifying the receiving hospital of the RACE Scale score, and therefore the likelihood of an LVO stroke. Early notification allows the hospital to activate stroke resources prior to patient arrival, saving valuable treatment time.

6. Provide key information to receiving hospital

It's important for EMS to accurately convey key information to the receiving hospital, through the prenotification call, face-to-face transfer of the patient, and prehospital Patient Care Record (PCR). In NJ, it is required that an ePCR be completed and electronically submitted within 24 hours, however best practice is to submit the ePCR as soon as possible to maintain continuity of care.

For more information, visit www.AmericanCME.com, create a free account, and view the CE course "Identifying Large Vessel Occlusion (LVO) Strokes with Rapid Arterial oCclusion Evaluation (RACE)".*

*Providers must enter their EMS ID# in the license field when creating an account, in order to receive CE credits. This course can be found under "Free CE Courses".

[1] Pérez de la Ossa N, Carrera D, Gorchs M, et al. Design and validation of a prehospital stroke scale to predict large arterial occlusion: The Rapid Arterial Occlusion Evaluation Scale. Stroke. 2014; 45: 87-91.