National EMS Quality Alliance

EMS Compass 2.0

Stroke-01 Measure Package

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Stroke-01: Suspected Stroke Receiving Prehospital Stroke Assessment

Because stroke is such a significant public health problem, and timing of treatment is so important to achieve better patient outcomes, the TEP felt strongly that Stroke-01 has value to the EMS Community. While the direction of published evidence can vary for prehospital stroke scales, it is widely understood that stroke assessments are helpful tools in helping identify patients with stroke and determining which facilities are most appropriate for their transport. The intent of this measure is to determine how many suspected stroke patients are receiving prehospital stroke assessments (and having the assessment documented), on scene during the EMS encounter.

No changes were made to the denominator of Stroke-01 during the re-specification project. The TEP determined that the denominator used in the original candidate measure is appropriate. However, a denominator exclusion was added to the measure – patients who are unresponsive and unable to participate in the assessment. For the purposes of this measure, patients who are unresponsive will be excluded and not be counted in the measure calculation, since they are not able to participate in the stroke assessment.

The numerator for this measure includes EMS responses for patients who had a stroke assessment performed on scene during the EMS response. The addition of on scene to the numerator ensures that the stroke assessment was conducted during the EMS response and by the EMS professional, which protects the intent of the measure. During the project, the TEP discussed limiting the stroke assessments to certain types, such as CPSS or LAMS; however, the experts decided against limiting to specific assessment types, as the intent of the measure is to determine if any stroke assessment was performed.

As Stroke Systems of Care become more robust across the country and EMS becomes an increasingly important partner in identifying stroke, this measure will support a key task of prehospital providers in the care of stroke patients – making the diagnosis and key transport decisions.

Stroke-01: Suspected Stroke Receiving Prehospital Stroke Assessment

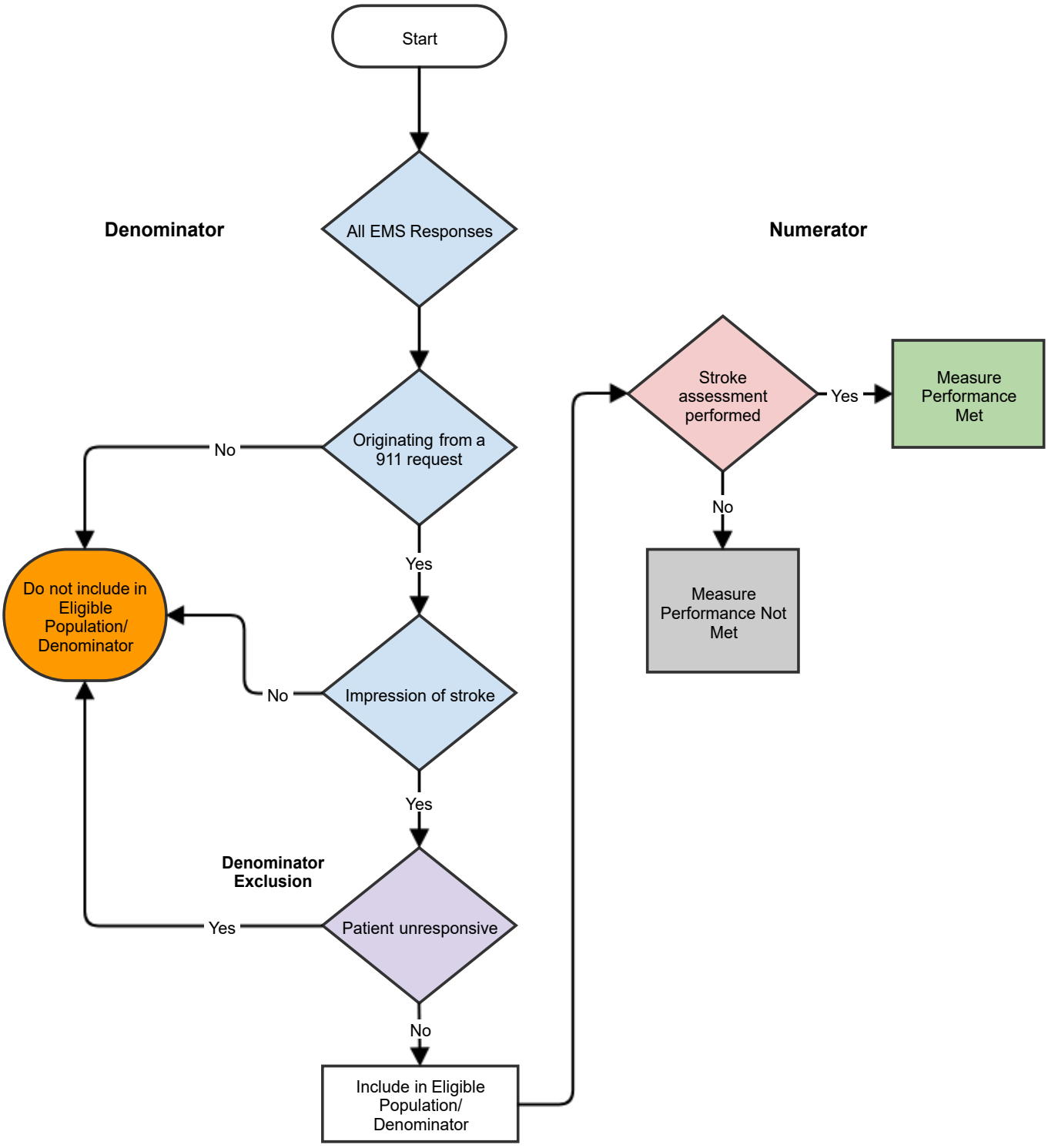
Measure Score Interpretation: For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for patients suffering from a suspected stroke who had a stroke assessment performed during the EMS response.	
Measure Components	
Numerator Statement	EMS responses originating from a 911 request for patients who had a stroke assessment performed on scene during the EMS Response.
Denominator Statement	All EMS responses originating from a 911 request for patients with a primary or secondary impression of stroke.
Denominator Exclusions	Patients who are unresponsive.
Denominator Exceptions	None
Supporting Guidance & Other Evidence	The following evidence statements are quoted verbatim from the referenced treatment protocol: American Heart Association | American Stroke Association: EMS Stroke Assessment Guide:[i] EMS management of suspected stroke: • Support ABCs: airway, breathing, circulation – give oxygen if needed • Perform prehospital stroke assessment • Establish time when patient last known normal • Rapid transport (consider triage to a center with a stroke unit if appropriate; consider bringing a witness, family member, or caregiver) • Alert receiving hospital stroke center "STROKE CODE" • Check glucose level, if possible
Measure Importance	
Rationale	Stroke is a significant public health problem. More than 795,000 strokes occur in the United States each year, resulting in 889,000 hospitalizations.[ii] The timing of treatment for patients with stroke is an important factor in determining their outcomes for morbidity and mortality.[iii] Stroke assessments are helpful tools in identifying patients with stroke in the prehospital setting, who will require therapies to treat stroke upon hospital arrival.[iv] In addition, stroke assessments can help prehospital professionals determine the type of facility in which to transport a patient. For example, interventions to treat a large vessel occlusion (LVO), a type of ischemic stroke that results from a blockage of the major artery in the brain, are often only available at hospitals in heavily populated, urban areas. Treatments for LVOs are often not

	available at rural or tertiary facilities, thus, prehospital screening and identification of LVOs is important to determine the most appropriate patient destination.[v]
Opportunity for Improvement	Although rates have significantly improved in the past decades, stroke remained the fifth leading cause of death in the United States in 2013. Despite improvements, almost 800,000 individuals in the US each year have a new or recurrent stroke, and of these people, 140,000 of them die. Stroke continues to account for one in every 20 deaths. With better recognition of stroke and stroke symptoms by emergency medical service professionals, patient outcomes can be improved.[vi]
Measure Designation	
Measure purpose	• ☒ Quality Improvement • ☒ Accountability • ☐ MOC
Type of measure	• ☒ Process • ☐ Outcome • ☐ Structure • ☐ Efficiency
National Quality Strategy/Priority/CMS Measure Domain	• ☒ Clinical Process-Effectiveness • ☐ Patient Safety • ☐ Patient Experience • ☐ Care Coordination • ☐ Efficiency: Overuse • ☐ Efficiency: Cost • ☐ Population & Community Health
CMS Meaningful Measure Domain	• ☐ Medication Management • ☐ Admissions and Readmissions to Hospitals • ☐ Transfer of Health Information and Interoperability • ☐ Preventative Care • ☐ Management of Chronic Conditions • ☐ Prevention, Treatment, and Management of Mental Health • ☐ Prevention and Treatment of Opioid and Substance • ☐ Risk Adjusted Mortality • ☐ Equity of Care • ☐ Community Engagement • ☐ Appropriate Use of Healthcare • ☐ Patient-focused Episode of Care • ☐ Risk-Adjusted Total Cost of Care • ☐ Healthcare-associated infections • ☐ Preventable Healthcare Harm • ☐ Care is Personalized and Aligned with Patient's Goals

	• ☐ End of Life Care according to Preferences • ☐ Patient's Experience of Care • ☐ Patient Reported Functional Outcomes
Level of measurement	• ☒ Individual EMS Professional • ☒ EMS Agency
Care setting	• ☒Pre-Hospital Care
Data source	• ☒Electronic Patient Care Record (eCPR) data • ☐ Administrative Data/Claims (inpatient, outpatient or multiple-source claims) • ☒ Paper medical record/Chart abstracted • ☒ Registry

Clinical Quality Measure Flow for Stroke-01
Suspected Stroke Receiving Prehospital Stroke Assessment



NEMSIS Pseudocode: Stroke-01: Suspected Stroke Patient Receiving Prehospital Stroke Assessment

Measure Score Interpretation: For this measure, a higher score indicates better quality

Measure Components	
Numerator Pseudocode	eVitals.29 Stroke Scale Score is not null or eVitals.30 Stroke Scale Type is not null
Denominator Pseudocode	(eSituation.11 Provider's Primary Impression matches /^(I60)|(I61)|(I63)|(G45)|(G46)/ ("Nontraumatic subarachnoid hemorrhage…," "Nontraumatic intracerebral hemorrhage…," "Cerebral infarction…" "Transient cerebral ischemic attacks…," or "Vascular syndromes of brain in cerebrovascular diseases…") or eSituation.12 Provider's Secondary Impressions matches /^(I60)|(I61)|(I63)|(G45)|(G46)/ ("Nontraumatic subarachnoid hemorrhage…," "Nontraumatic intracerebral hemorrhage…," "Cerebral infarction…" "Transient cerebral ischemic attacks…," or "Vascular syndromes of brain in cerebrovascular diseases…")) and eResponse.05 Type of Service Requested is 2205001 ("911 Response (Scene)")
Denominator Exclusion Pseudocode	eVitals.23 Total Glasgow Coma Score is less than or equal to 9 or eVitals.26 Level of responsiveness (AVPU) is 3326007 ("Unresponsive")

[i] American Heart Association (2011) *Target Stroke*.

[ii] American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee (2019) Heart Disease and Stroke Statistics – 2019 Update. A Report From The American Heart Association, *Circulation*, 139:e56-e528.

[iii] Musuka, TD, Wilton, SB, Traboulsi, M, Hill, M (2015) Diagnosis and management of acute ischemic stroke: speed is critical, *Canadian Medical Association Journal*, 187(12): 887-893.

[iv] Kothari, R.U., Pancioli, A., Liu, T., Brott, T., Broderick, J. (1999) Cincinnati Prehospital Stroke Scale: reproducibility and validity, *Annals of Emergency Medicine*, Apr;33(4):373-8.

[v] Krebs, W., Sharkey-Toppen, T.P., Cheek, F., Cortez, E., Larrimore, A., Keseg, D., & Panchal, A.R. (2018) Prehospital Stroke Assessment for Large Vessel Occlusions: A Systematic Review, *Prehospital Emergency Care*, 22:2, 180-188.

[vi] Yang, Q, Tong X, Schieb L, (2017) et al. Vital Signs: Recent Trends in Stroke Death Rates — United States, 2000–2015. *MMWR Morb Mortal Wkly Rep*, ;66:933–939.