

National EMS Quality Alliance

2021 Hypoglycemia-01 Measure Package

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Hypoglycemia-01: Treatment Administered for Hypoglycemia

Direct evidence for treating hypoglycemia/low blood sugar in the EMS environment is not available. However, it has clearly the standard of care for patients who have the condition. The medical community/literature understands that untreated hypoglycemia can cause brain injury, coma and other consequences. As noted above a randomized trial of this therapy would not be ethical. Clearly, EMS has a role in giving early treatment, be it oral, IV or IO delivery. Patients, wherever they may be, should have access to this critical, simple antidote for a life-threatening condition. The intent of this measure is to determine if treatment is being administered to EMS patients who are experiencing hypoglycemia.

The denominator, or initial population included in this measure is EMS encounters for patients who have a clinical condition associated with hypoglycemia. After much debate and discussion, it was decided that the initial population could be captured in one of two ways— encounters for patients with a documented primary or secondary impression of Altered Mental Status and a blood sugar less than 60 ug/mL (The TEP decided on this number because it is the most specific/lowest and captures the sickest patients), OR, encounters for patients with a primary impression of Hypoglycemia with a documented GCS of <15 or an AVPU score of V, P or U. The TEP believes that this denominator will offer the best opportunity to identify the patients affected by this condition.

Because the definition of and treatment for hypoglycemia in the newly born (< 24 hours old) has different parameters this population of patients has been excluded from the denominator for Hypoglycemia-01. Any EMS responses for this population of patients who meet the inclusion criteria should be removed from the denominator.

The numerator consists of EMS responses for patients who receive the care expected (and was documented!)— in this case, these are the number of patients from the denominator who receive sugar in one way or another. Many medication codes correlate to the NEMSIS capture of this treatment including IV/IO and oral formulations of dextrose and glucose; however, there is no existing treatment code for “food” We understand that some of our EMS treated patients will get this care but not be recorded for electronic specification. NEMSQA anticipates this may lower overall treatment percentages for any given EMS agency – this is likely to affect EMS agencies throughout the country. NEMSQA also hopes that NEMSIS and ePCR vendors will consider adding this code in the next round of updates so that agencies can get credit for this treatment.

Different EMS systems will allow different treatment for hypoglycemia at different levels – some BLS may be able to use a glucometer to find this condition but if the patient cannot take oral glucose, their only option is to transport without ALS backup - in this type of system, there may be a lower rate of EMS treatment of hypoglycemia compared to other similar systems. This low number might therefore incentivize the system to adapt, add resources to EMS or look for mutual aid to improve the rates of improvement for their patients suffering from hypoglycemia.

Hypoglycemia-01: Treatment Administered for Hypoglycemia

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 with symptomatic hypoglycemia who received treatment to correct their hypoglycemia.	
Measure Components	
Initial Population	All EMS responses originating from a 911 request for patients with a GCS of <15 or an AVPU of <A or patients with a primary or secondary impression of altered mental status and a blood glucose level of <60
Denominator Statement	<p>Population 1: EMS responses in the initial population</p> <p>Population 2: EMS responses in the initial population for patients greater than or equal to 18 years of age</p> <p>Population 3: EMS responses in the initial population for patients less than 18 years of age</p>
Denominator Exclusions	EMS responses for patients less than 24 hours of age
Denominator Exceptions	None
Numerator Statement	<p>Numerator for Populations 1-3 (Calculate 3 Rates):</p> <p>EMS responses for patients receiving treatment to correct their hypoglycemia during the EMS response</p> <p>Treatments to correct hypoglycemia:</p> <ul style="list-style-type: none"> • Food • Oral glucose (tablets, glucose gel, tube of cake icing, etc.) • Dextrose IV/IN • Glucagon IM/IN
Supporting Guidance & Other Evidence	<p>The following evidence statement is quoted verbatim from the referenced clinical guideline:</p> <p>National Model EMS Clinical Guidelines for Hypoglycemia Management, 2017:ⁱ</p> <p>Treatment and Interventions</p> <ol style="list-style-type: none"> 1. If altered level of consciousness or stroke, treat per Altered Mental Status or Suspected Stroke/Transient Ischemic Attack guidelines accordingly 2. If blood glucose is 60 mg/dL or less administer one of the following: <ol style="list-style-type: none"> a. Conscious patient with a patent airway:

	<ul style="list-style-type: none"> a. Glucose, oral (in form of glucose tablets, glucose gel, tube of cake icing, etc.) b. Unconscious patient, or patients who are unable to protect their own airway: <ul style="list-style-type: none"> a. Dextrose IV – administer in incremental doses until mental status improves or maximum field dosing is reached b. Glucagon IM/IN c. Remove or disable insulin pump if above treatment cannot be completed
Measure Importance	
Rationale	<p>One common diabetic emergency EMS professionals encounter is hypoglycemia, which is a condition caused by very low blood sugar levels. Signs of hypoglycemia include altered mental status, confusion, diaphoresis, shaking, tachycardia, and feeling of extreme hunger. If glucose levels are not restored, the patient’s mental status will change, and they will become confused, experience headache, and progress into semi-unconsciousness and unconsciousness, rapidly progressing to brain damage. While hypoglycemia may occur in both diabetic and non-diabetic patients, it is a medical emergency in either case that must be treated immediately.ⁱⁱ</p> <p>Because hypoglycemia does not delay gastrointestinal absorption of glucose, if an adult patient is identified as hypoglycemic and is alert and able to protect their airway, they should first receive a dose of oral glucose, which should take effect within 10-15 minutes. For patients who are unwilling or unable to safely consume oral glucose, IV dextrose is recommended.ⁱⁱⁱ</p>
Measure Designation	
Measure purpose	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Quality Improvement • <input type="checkbox"/> Accountability • <input type="checkbox"/> MOC
Type of measure	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Process • <input type="checkbox"/> Outcome • <input type="checkbox"/> Structure • <input type="checkbox"/> Efficiency
National Quality Strategy/Priority/CMS Measure Domain	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Clinical Process-Effectiveness • <input type="checkbox"/> Patient Safety • <input type="checkbox"/> Patient Experience • <input type="checkbox"/> Care Coordination • <input type="checkbox"/> Efficiency: Overuse • <input type="checkbox"/> Efficiency: Cost • <input type="checkbox"/> Population & Community Health

CMS Meaningful Measure Domain	<ul style="list-style-type: none"> • <input type="checkbox"/> Medication Management • <input type="checkbox"/> Admissions and Readmissions to Hospitals • <input type="checkbox"/> Transfer of Health Information and Interoperability • <input type="checkbox"/> Preventative Care • <input checked="" type="checkbox"/> Management of Chronic Conditions • <input type="checkbox"/> Prevention, Treatment, and Management of Mental Health • <input type="checkbox"/> Prevention and Treatment of Opioid and Substance • <input type="checkbox"/> Risk Adjusted Mortality • <input type="checkbox"/> Equity of Care • <input type="checkbox"/> Community Engagement • <input type="checkbox"/> Appropriate Use of Healthcare • <input type="checkbox"/> Patient-focused Episode of Care • <input type="checkbox"/> Risk-Adjusted Total Cost of Care • <input type="checkbox"/> Healthcare-associated infections • <input type="checkbox"/> Preventable Healthcare Harm • <input type="checkbox"/> Care is Personalized and Aligned with Patient’s Goals • <input type="checkbox"/> End of Life Care according to Preferences • <input type="checkbox"/> Patient’s Experience of Care • <input type="checkbox"/> Patient Reported Functional Outcomes
Level of measurement	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Individual EMS Professional • <input checked="" type="checkbox"/> EMS Agency
Care setting	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Pre-Hospital Care
Data source	<ul style="list-style-type: none"> • <input checked="" type="checkbox"/> Electronic Patient Care Record (eCPR) data • <input type="checkbox"/> Administrative Data/Claims (inpatient, outpatient or multiple-source claims) • <input checked="" type="checkbox"/> Paper medical record/Chart abstracted • <input checked="" type="checkbox"/> Registry

NEMESIS Pseudocode: Hypoglycemia-01: Treatment Administered for Hypoglycemia

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 with symptomatic hypoglycemia who received treatment to correct their hypoglycemia.	
Measure Components	
Initial Population	<p>((</p> <p>eSituation.11 Provider's Primary Impression matches/^(E13.64) (E16.2)/("Other specified diabetes mellitus with hypoglycemia" or "Hypoglycemia, unspecified")</p> <p>or</p> <p>eSituation.12 Provider's Secondary Impressions matches/^(E13.64) (E16.2)/("Other specified diabetes mellitus with hypoglycemia" or "Hypoglycemia, unspecified")</p> <p>)</p> <p>and (eVitals.23 Total Glasgow Coma Score is less than 15</p> <p>or eVitals.26 Level of responsiveness (AVPU) is in</p> <p>(</p> <p>3326003 ("Verbal")</p> <p>3326005 ("Painful") 3326007 ("Unresponsive"))))</p> <p>or</p> <p>((</p> <p>eSituation.11 Provider's Primary Impression matches/^R41.82/("Altered Mental Status, unspecified")</p> <p>or</p> <p>eSituation.12 Provider's Secondary Impressions matches/^R41.82/("Altered Mental Status, unspecified")</p> <p>and</p> <p>(</p> <p>eVitals.18 Blood Glucose Level is less than 60</p> <p>or</p> <p>eVitals.18 Blood Glucose Level is "low"))</p> <p>and eResponse.05 Type of Service Requested is-</p> <p>(</p> <p>2205001 ("Emergency Response (Primary Response Area)"),</p> <p>2205003 ("Emergency Response (Intercept)"),</p> <p>2205009 ("Emergency Response (Mutual Aid))))</p>
Denominator	<p>Population 1: Equals Initial Population</p> <p>Population 2:</p>

	<p>(Initial Population and (ePatient.15 Age is greater than or equal to 18 and ePatient.16 Age Units is 2516009 ("Years"))</p> <p>Population 3: (Initial Population and ((ePatient.15 Age is less than 18 and ePatient.16 Age Units is 2516009 ("Years")) or (ePatient.15 Age is not null and ePatient.16 Age Units is in (2516001 ("Days"), 2516003 ("Hours"), 2516005 ("Minutes"), 2516007 ("Months"))))</p>
<p>Denominator Exclusions</p>	<p>Apply Denominator Exclusion to Populations 1 and 3: ((ePatient.15 Age is less than 1 and ePatient.16 Age in Units is 2516001 ("Days")) or (ePatient.15 Age is less than 24 and ePatient.16 Age in Units is 2516003 ("Hours")) or (ePatient.15 Age is less than or equal to 120 and ePatient.16 Age in Units is 2516005 ("Minutes"))</p>
<p>Numerator</p>	<p>Numerator logic for Populations 1-3 (Calculate three separate rates)</p> <p>eMedications.03 Medication Administered is in (4832 ("Glucagon"), 4850 ("Glucose"), 377980 (Glucose Oral Gel), 376937 (Glucose Injectable Solution), 372326 (Glucose Chewable Tablet), 237653 ("Glucose 500 MG/ML Injectable Solution"),</p>

	<p>260258 ("Glucose 250 MG/ML Injectable Solution"), 309778 ("Glucose 50 MG/ML Injectable Solution"), 1795610 ("250 ML Glucose 50 MG/ML Injection"), 1795477 ("500 ML Glucose 100 MG ML Injection"), 1794567 ("Glucose Injection") 1165823 ("Glucose Oral Product") 1165822 ("Glucose Oral Liquid Product") 1165819 ("Glucose Injectable Product"))</p> <p>or eProcedures.03 Procedure is in (710925007 ("Provision of food"), 225285007 ("Giving oral fluid"))</p>
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ⁱ NASEMSO Medical Directors Council. (2017) National Model EMS Clinical Guidelines. National Association of State EMS Officials, 78-81.

ⁱⁱ Maggiore, W.A. (2013) Highs & Lows, Recognizing & treating hypoglycemia, hyperglycemia & other diabetes-related health problems. *Journal of Emergency Medicine Services*, 45-47.

ⁱⁱⁱ Carroll, M.F., Burge, M.R., Schade, D.S. (2003) Severe Hypoglycemia in Adults. *Reviews in Endocrine & Metabolic Disorders*. 4: 149-157.