National EMS Quality Alliance

Pediatrics-01 Measure Package

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Pediatrics-01: Pediatric Respiratory Assessment

This measure also does not have direct evidence to support its validity. However, it is known that providers often express discomfort with assessment of children and that respiratory distress is one of the most common serious conditions encountered by EMS providers in pediatric patients. The TEP agreed this measure is clinically important and there is value to measuring it. The medical community agrees that, if a pediatric patient is experiencing respiratory distress, a respiratory assessment should be conducted. Performing the respiratory assessment on the patient is the first step to determining if additional clinical interventions are necessary, and it is important that this process in care be measured. The intent of this measure is to determine if pediatric patients experiencing respiratory distress are receiving respiratory assessments.

The denominator, or initial population, for this measure includes EMS encounters for patients less than 18 years of age with a primary or secondary impression of respiratory distress. Those who are familiar with the original EMS Compass candidate measure may recognize the changes in the denominator for the re-specified measure. The inclusion criteria have been expanded from less than 15 years of age to less than 18 years of age and has been expanded to include a general impression of respiratory distress, which could include many different respiratory conditions. These changes mirror what is found in current published guidelines and literature for pediatric respiratory distress and assessments.

The numerator for the re-specified measure has not changed. While the TEP discussed potentially adding additional elements of a respiratory assessment, such as auscultation of the lung, it was ultimately decided to limit the numerator to SPO2 and respiratory rate measurements, due to feasibility concerns. While there are other elements to a respiratory assessment, Pediatrics-01 focuses on the completion and documentation of these two elements.

To the experienced EMS Professional, Pediatrics-01appears to state the obvious – Every patient should have an assessment of their respiratory status. However, documentation of this fundamental element of care is often not completed , This may be simply a documentation omission but may also represent an incomplete clinical assessment or perhaps because providers are less comfortable assessing children than adults An agency or system can use this measure to identify gaps in standard care or documentation of that care and target areas for improvement. This will drive recognition for the importance of this measure.

Pediatrics-01: Pediatric Respiratory Assessment

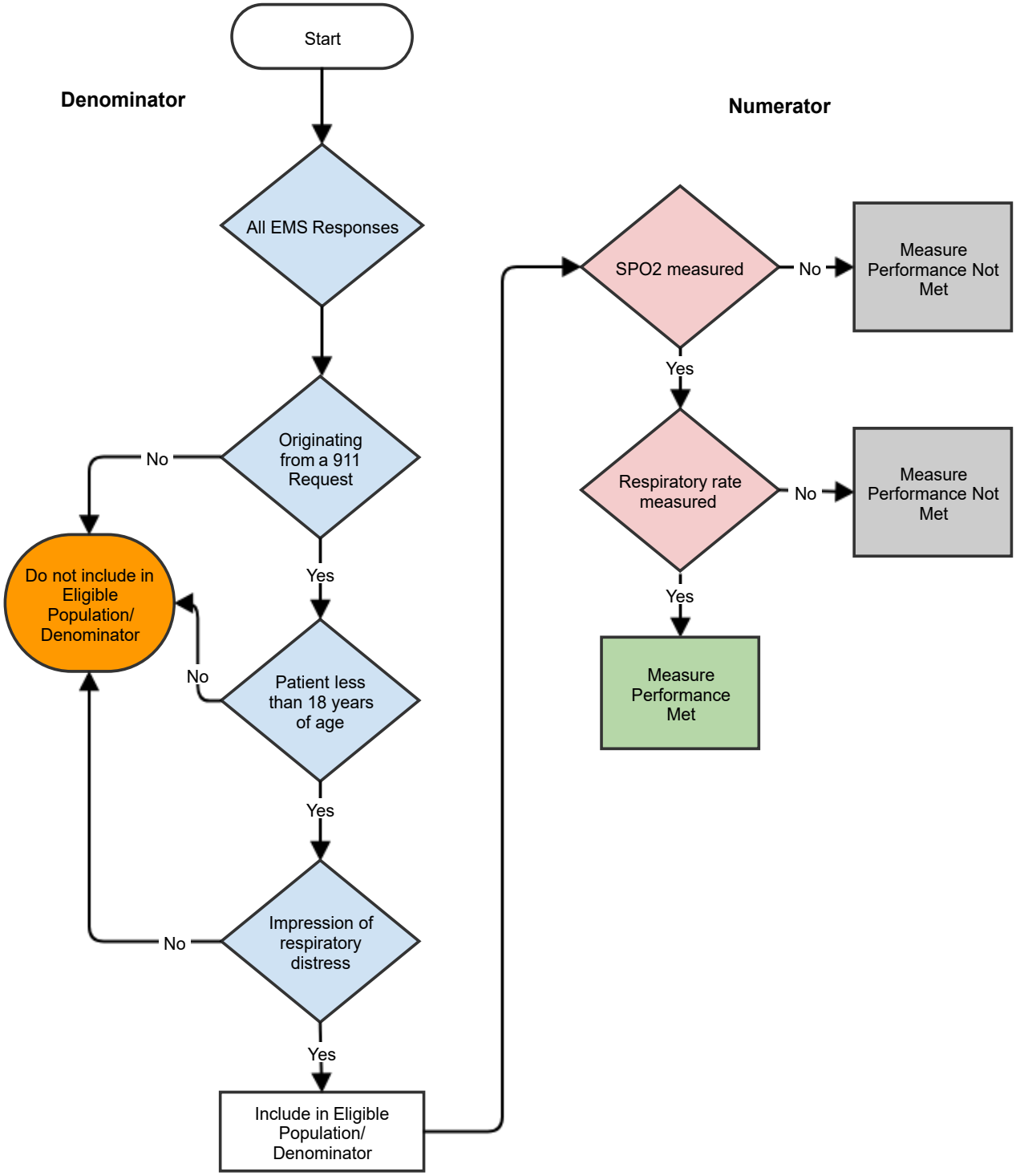
Measure Score Interpretation: For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for patients less than 18 years old with primary or secondary impression of respiratory distress who had a respiratory assessment.	
Measure Components	
Numerator Statement	EMS responses originating from a 911 request for patients who received both a SPO2 and respiratory rate measurement during the EMS response.
Denominator Statement	All EMS responses originating from a 911 request for patients <18 years of age with a primary or secondary impression of respiratory distress. Respiratory distress may include impressions of: • Asthma • Dyspnea • Unspecified Orthopnea • Shortness of breath • Diagnosis of a respiratory ailment • Complaint or condition commonly associated with dyspnea
Denominator Exclusions	None
Denominator Exceptions	None
Supporting Guidance & Other Evidence	The following flowcharts were taken verbatim from the referenced treatment protocol: National Association of State EMS Officials, National Model EMS Clinical Guidelines for Pediatric Respiratory Distress:[i] Patient Management 1. History a. Onset of symptoms (history of choking) b. Concurrent symptoms (fever, cough, rhinorrhea, tongue/lip swelling, rash, labored breathing, foreign body aspiration) c. Sick contacts d. Treatments given e. Personal history of asthma, wheezing, or croup in past 2. Exam a. Full set of vital signs (T, BP, RR, P, O2 sat) b. Presence of stridor at rest or when agitated c. Description of cough d. Other signs of distress (grunting, nasal flaring, retracting) e. Color (pallor, cyanosis, normal)

	f. Mental status (alert, tired, lethargic, unresponsive)
Measure Importance	
Rationale	Pediatric transports make up approximately 10% of all EMS requests, and respiratory distress is a common reason for these requests. A 2015 retrospective study found that 13.7% of pediatric EMS transports were due to respiratory distress.[ii]
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 Pediatrics-01
Pediatric Respiratory Assessment



NEMSIS Pseudocode: Pediatrics-01: Pediatric Respiratory Assessment

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

Measure Components	
Numerator Pseudocode	eVitals.12 Pulse Oximetry is not null and eVitals.14 Respiratory Rate is not null
Denominator Pseudocode	((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”)))) and (eSituation.11 Provider's Primary Impression matches /^I50.9|J00|J05|J18.9|J20.9|J44.1|J45.901|J80|J81|J93.9|J96|J98.01|R05R06|R09.2| T17.9/ (“Heart failure, unspecified," “Acute nasopharyngitis….,” “Acute obstructive laryngitis and epiglottitis…,” “Pneumonia, unspecified organism,” “Acute bronchitis, unspecified,” “Chronic obstructive pulmonary disease with (acute) exacerbation,” “Unspecified asthma with (acute) exacerbation,” “Acute respiratory distress syndrome,” “Pulmonary edema…,” “Pneumothorax, unspecified,” “Respiratory failure, unspecified,” “Acute bronchospasm,” “Respiratory disorder, unspecified,” “Cough,” “Abnormalities of breathing,” “Respiratory arrest,” or “Foreign body in respiratory tract, part unspecified”)

	or eSituation.12 Provider's Secondary Impressions matches /^I50.9|J00|J05|J18.9|J20.9|J44.1|J45.901|J80|J81|J93.9|J96|J98.01|R05 R06|R09.2| T17.9/ (“Heart failure, unspecified," “Acute nasopharyngitis….,” “Acute obstructive laryngitis and epiglottitis…,” “Pneumonia, unspecified organism,” “Acute bronchitis, unspecified,” “Chronic obstructive pulmonary disease with (acute) exacerbation,” “Unspecified asthma with (acute) exacerbation,” “Acute respiratory distress syndrome,” “Pulmonary edema…,” “Pneumothorax, unspecified,” “Respiratory failure, unspecified,” “Acute bronchospasm,” “Respiratory disorder, unspecified,” “Cough,” “Abnormalities of breathing,” “Respiratory arrest,” or “Foreign body in respiratory tract, part unspecified”)) and eResponse.05 Type of Service Requested is 2205001 ("911 Response (Scene)")

[i] NASEMSO Medical Directors Council. (2017) National Model EMS Clinical Guidelines. *National Association of State EMS Officials*, 138-141.

[ii] Drayna, P.C., Browne, L.R., Guse, C.E. Brousseau, D.C., & Lerner, E.B. (2015) Prehospital Pediatric Care: Opportunities for Training, Treatment, and Research, *Prehospital Emergency Care*, 19:3, 441-447.

National EMS Quality Alliance

Pediatrics-02 Measure Package

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Pediatrics-02: Administration of Beta Agonist for Pediatric Asthma

Asthma is a common disease among both children and adults, and a common reason for EMS calls. With EMS being utilized so often for pediatric asthma exacerbation, the TEP felt strongly about continuing to include this measure in the measure set. There is strong evidence demonstrating the benefits of albuterol administration to patients with an acute asthma exacerbation in the Emergency Department setting based on patient centered outcomes. There is also evidence to support that it can be administered safely and effectively by EMS. There are also national guidelines that support this measure. The intent of this measure is to determine if pediatric patients experiencing asthma exacerbation are receiving a beta agonist.

The denominator for Pediatrics-02 includes EMS responses for patients 2-18 years of age with a primary or secondary impression of asthma. The reason why patients less than 2 years of age are not part of the inclusion criteria The rationale for this exclusion is to exclude patients with wheezing form other etiologies such as bronchiolitis in which the evidence dose not support routine use of beta- agonists . The inclusion criteria for age has also been changed to include patients up to 18 years of age, as the evidence continues to support administering beta agonist medications to this age group. The TEP felt it important to include the entire pediatric population in the measure, rather than creating an upper-limit of 15 years of age in the inclusion criteria.

Two substantive changes were made to the numerator of Pediatrics-02 during the measure re-specification process. In order to meet quality standards for the measure, not only does a beta agonist have to be administered, but it must be an aerosolized beta agonist; and the beta agonist must be administered by an EMS professional. There was meaningful discussion among the members of the TEP in order to get to these changes. TEP members felt requiring that beta agonist medication be administered by an EMS professional makes Pediatrics-02 a true quality measure, as improvement can be driven by the EMS providers themselves.]

Every State and Region will have variation with regard to availability of Advanced Life Support, Basic Life Support and First Responders as well as protocols for care of pediatric patients with asthma. In considering this measure, the TEP envisioned a patient-centric stance – in other words – it doesn't matter who is responding, or, if BLS can not administer albuterol in a particular state or region, if the patient is not receiving this important, possibly life-saving medication in the course of their EMS care, there might be an opportunity to make system changes to address this lack of care.

Pediatrics-02: Administration of Beta Agonist for Pediatric Asthma

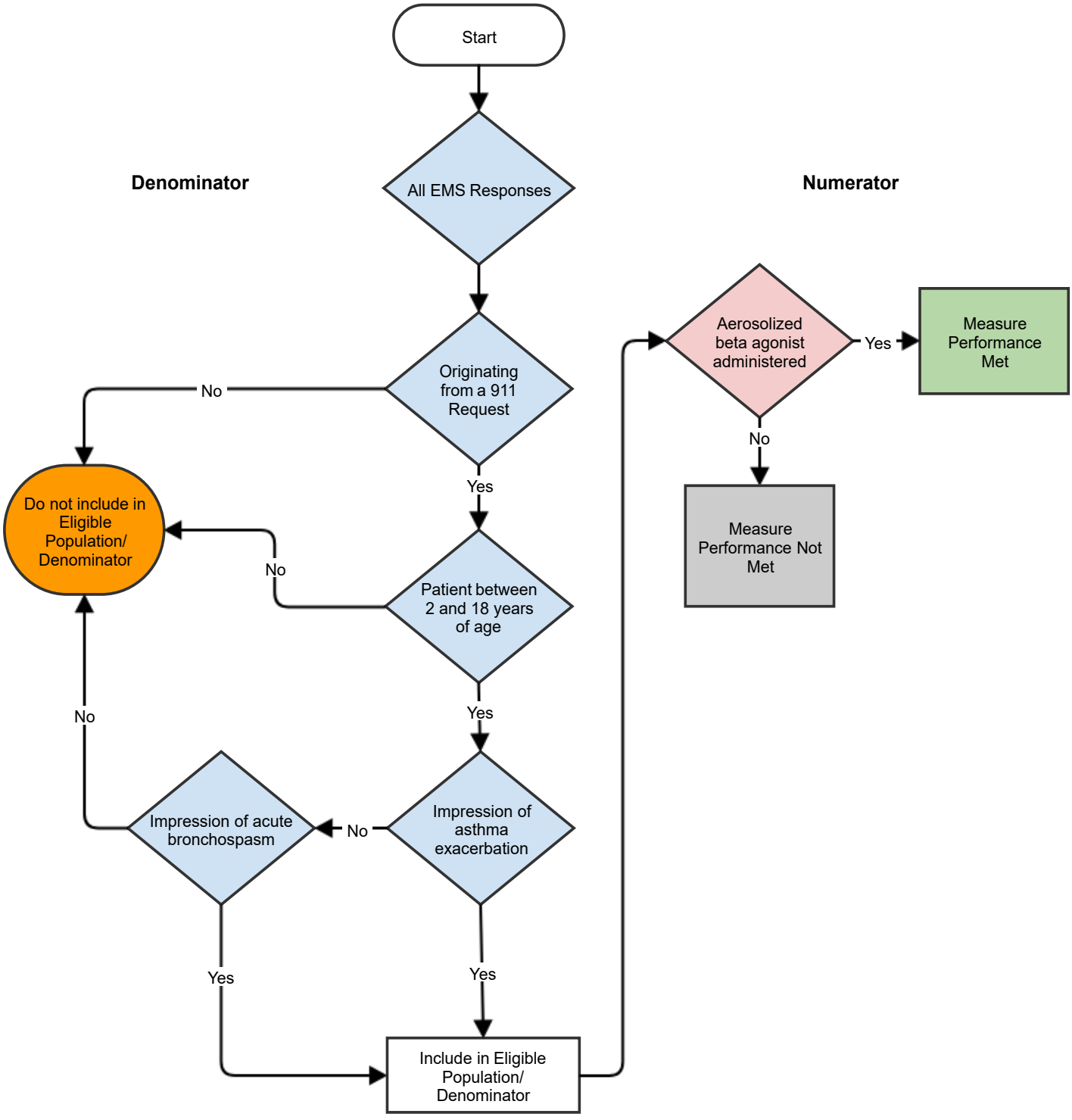
Measure Score Interpretation: For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for patients 2-18 years of age with a diagnosis of asthma who had an aerosolized beta agonist administered.	
Measure Components	
Numerator Statement	EMS responses originating from a 911 request for patients who had an aerosolized beta agonist administered by an EMS professional during the EMS response. Beta agonist medications may include: • Albuterol • Levalbuterol • Metaproterenol
Denominator Statement	All EMS responses originating from a 911 request for patients 2-18 years of age with a primary or secondary impression of asthma exacerbation or acute bronchospasm.
Denominator Exclusions	None
Denominator Exceptions	None
Supporting Guidance & Other Evidence	The following evidence statements are quoted verbatim from the referenced clinical guidelines and other statements: A Model Protocol for Emergency Medical Services Management of Asthma Exacerbations:[i] For patients with prior diagnosis of asthma or prior use of an inhaled asthma medication and who are experiencing an acute exacerbation, the workgroup recommends that EMS personnel, consistent with their scope of practice, should: • Transport all patients to the appropriate medical facility (e.g., hospital emergency department). • Provide oxygen • Provide inhaled bronchodilators, such as albuterol and ipratropium • Consider systemic corticosteroids in more severe exacerbations and when transport times are prolonged.
Measure Importance	
Rationale	Asthma is a very common disease among both children and adults. In fact, according to the Centers for Disease Control and Prevention, 1 in 13 individuals have asthma[ii], and asthma is the leading chronic disease in children.[iii]

	Of all the EMS calls that occur on an annual basis, approximately 10% are pediatric transports, and 14% of these pediatric transports are attributed to patients in respiratory distress. Because asthma is a common cause for respiratory distress in children, guidelines have been established in most states to administer beta-agonists and other medications to prehospital patients having an asthma exacerbation.[iv]
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 • ☐ Hospital/ED
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 Pediatrics-02
Administration of Beta Agonist for Pediatric Asthma



NEMSIS Pseudocode: Pediatrics-02: Administration of Beta Agonist for Pediatric Asthma

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

Measure Components	
Numerator Pseudocode	eMedication.03 Medication Given is in (435 (“Albuterol”), 7688 (“metaproterenol”), 214199 (“Albuterol/Ipratropium”), 237159 (“Levalbuterol”), 487066 (“levalbuterol tartrate”), 1154062 (“Albuterol Inhalant Product”), 1163444 (“Levalbuterol Inhalant Product”), 1649559 (“Albuterol Dry Powder Inhaler”), 1165719 (“metaproterenol Inhalant Product”), 2108209 (“Levalbuterol Inhalation Solution”), 2108252 (“metaproterenol Inhalation Solution”))
Denominator Pseudocode	((ePatient.15 Age is greater than or equal to 2 and ePatient.15 Age is less than or equal to 18 and ePatient.16 Age Units is 2516009 ("Years")) or (ePatient.15 Age is greater than or equal to 24 and ePatient.16 Age Units is 2516007 ("Months"))) and (eSituation.11 Provider's Primary Impression matches /^(J45)|(J98.01$)/ ("Asthma…" or "Acute Bronchospasm") or eSituation.12 Provider's Secondary Impressions matches /^(J45)\|(J98.01$)/ ("Asthma…" or "Acute Bronchospasm")) and eResponse.05 Type of Service Requested is 2205001 ("911 Response (Scene)")

[i]Camargo, C.A. (2006) A Model Protocol for Emergency Medical Services Management of Asthma Exacerbations, *Prehospital Emergency Care*, 10:4, 418-429.

[ii] CDC.gov. (2019). CDC – Asthma. Accessed May 8, 2019 at: http: http://www.cdc.gov/asthma/default.htm.

[iii] CDC.gov (2018). Asthma | Healthy Schools | CDC. Accessed May 8, 2019 at: http://www.cdc.gov/healthyschools/asthma

[iv] Nassif, A., Ostermayer, K., Hoang, K.B., Claiborne, M.K., Camp, E.A., Shah, M.I., (2018) Implementation of a Prehospital Protocol for Change For Asthmatic Children. *Prehospital Emergency Care*, 22:4, 457-465.

National EMS Quality Alliance

Pediatrics-03 Measure Package

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Pediatrics-03: Documentation of Estimated Weight in Kilograms

Pediatrics-03 is classified as a pediatrics measure in the EMS Compass 2.0 Measure Set, but its intent is deeply rooted in safety. There is significant published literature that attributes pediatric medication errors to errors in converting pounds to kilograms while dosing a medication. With pounds and kilograms commonly being confused, leading to pediatric medication errors, Pediatrics-03 is important for measuring a clinical documentation process that can lead to better patient outcomes. The intent of Pediatrics-03 is to determine if the weight of EMS pediatric patients is being documented in kilograms.

The denominator for Pediatrics-03 includes EMS responses for patients less than 18 years of age who receive a weight-based medication during the EMS response. The TEP discussed this inclusion criteria at great length, even considering developing a measure that would assess documentation of weight in kilograms for all pediatric patients, regardless if a weight-based medication was administered. However, after much discussion, it was determined to leave weight-based medication in the inclusion criteria so the true intent of the measure, which is to reduce medication errors, will not get lost. During the re-specification project, the inclusion criteria was also expanded so EMS responses for patients up to 18 years of age are measured, rather than limiting it to patients less than 15 years of age. The decision to expand the age range of the inclusion criteria was made to ensure the process of documenting weight in kilograms is encouraged for all pediatric patients.

The numerator for Pediatrics-03 was not changed during the measure re-specification project. EMS professionals can meet the performance for Pediatrics-03 in one of two ways – documenting the patient weight in kilograms or documenting a length-based weight.

Pediatric patients make up approximately 5-10% of patients taken care of by EMS. Critical pediatric patients make up < 1 percent of these patients. The accurate dosing of many medications to pediatric patients requires calculation based on the patient's weight in kilograms. In these rare high stress situations, he likelihood of making a medication error on a pediatric patient is high even when the weight is measured and documented appropriately. Measuring this specific population will drive regions/systems to consider how they are performing this critical task and how they can improve. This will, in turn, lead to an EMS system that will have higher likelihood of providing the correct dose to a patient thereby improving the safety of medication administration.

Pediatrics-03: Documentation of Estimated Weight in Kilograms

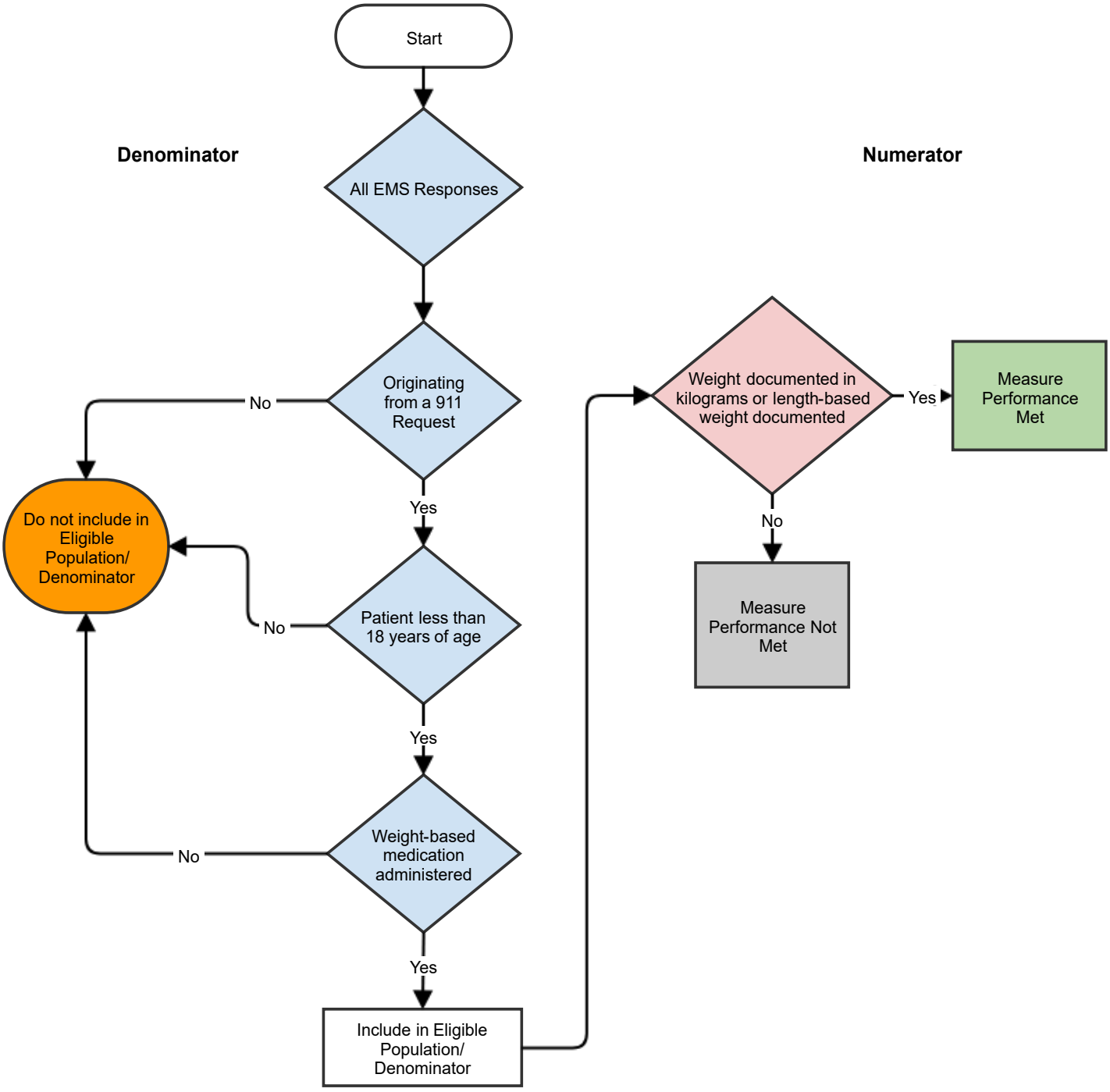
Measure Score Interpretation: For this measure, a higher score indicates better quality.

Measure Description	
Percentage of EMS responses originating from a 911 request for patients less than 18 years of age who received a weight-based medication and had a documented weight in kilograms or length-based weight estimate documented during the EMS response.	
Measure Components	
Numerator Statement	EMS responses originating from a 911 request for patients in which a weight value was documented in kilograms or a length-based weight was documented during the EMS response.
Denominator Statement	All EMS responses originating from a 911 request for patients less than 18 years of age who received a weight-based medication during the EMS response.
Denominator Exclusions	None
Denominator Exceptions	None
Supporting Guidance & Other Evidence	The following evidence statements are quoted verbatim from the referenced clinical guidelines and other references that also apply to pre-hospital care: Joint policy statement- guidelines for care of children in the emergency department, 2008:[i] 4. GUIDELINES TO IMPROVE PEDIATRIC PATIENT SAFETY IN THE ED The delivery of pediatric care should reflect an awareness of unique pediatric patient safety concerns and should include the following policies or practices: a. Children should be weighed in kg, with the exception of children requiring emergent stabilization, and the weight should be recorded in a prominent place on the medical record, such as with the vital signs. i. For children requiring resuscitation or emergency stabilization, a standard method for estimating weight in kg should be used (eg, length-based system)." The Joint Commission offers the following suggested actions to prevent pediatric medication errors and their related adverse events in pediatric care settings:

	Since patient weight is used to calculate most dosing (either as weight-based dosing, body surface area calculation, or other age-appropriate dose determination), all pediatric patients should be weighed in kilograms at the time of admission (including outpatient and ambulatory clinics) or within four hours of admission in an emergency situation. Kilograms should be the standard nomenclature for weight on prescriptions, medical records and staff communications.
Measure Importance	
Rationale	Pediatric medications require weight based on dosing and several calculations are often required to ensure that the correct dose is administered. It is common pharmaceutical practice to list medication doses in mg/kg, thus weighing pediatric patients in pounds may lead to two errors; 1. Other clinicians may see the patient's weight in pounds and assume that the weight is documented in kilograms, leading to a potential overdose of medication. 2. Errors in conversion from pounds to kilograms may lead to under dosing or overdosing. Making it common practice to weigh pediatric patients in kilograms will eliminate the need for assumptions on how weight is documented and eliminate the need for converting weight in order to calculate medication doses. The elimination of the conversion calculation will remove a potential source for potential medication error.[ii]
Opportunity for Improvement	A 2009 analysis of 479 medication errors involving wrong weights discovered that over 25% were due to "confusion between pounds and kilograms."[ii]
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 Agencies
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 Pediatrics-03 Documentation of Estimated Weight in Kilograms



[i] Commission, TJ (2008) Preventing pediatric medication errors: Sentinel Event Alert. Accessed March 12, 2019: http://www.jointcommission.org/assets/1/18/sea_39.pdf.

[ii] Authority PPS, (2009) Medication errors, significance of accurate patient weights.