

eMeasure Title	Potassium Sample Hemolysis in the Emergency Department		
eMeasure Identifier (Measure Authoring Tool)		eMeasure Version number	0.0.005
NQF Number	N/A	GUID	003d67d4-3738-4534-bddb-73c7700f4f91
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	American Medical Association-convened Physician Consortium for Performance Improvement(R) (AMA-PCPI)		
Measure Developer	American Medical Association-convened Physician Consortium for Performance Improvement(R) (AMA-PCPI)		
Endorsed By	None		
Description	Percentage of laboratory potassium samples drawn in the emergency department (ED) with hemolysis		
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Disclaimer	<p>This performance measure has not been tested for all potential applications. The measure and specifications are provided "AS IS" and without warranty of any kind.</p> <p>CPT(R) contained in the Measure specifications is copyright 2004-2014 American Medical Association. LOINC(R) copyright 2004-2014 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2014 International Health Terminology Standards Development Organisation. ICD-10 copyright 2014 World Health Organization. All Rights Reserved.</p> <p>Due to technical limitations, registered trademarks are indicated by (R) or [R].</p>		
Measure Scoring	Proportion		
Measure Type	Process		
Measure Type	Outcome		
Measure Type	Cost/Resource Use		
Measure Item Count	Laboratory Test, Performed: Potassium		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	<p>Mechanical hemolysis of blood samples can lead to inaccurate laboratory results and repeat draws on the patient, causing unnecessary pain and treatment delays. External factors such as needle size and syringe type can impact hemolysis rates.</p>		
Clinical Recommendation Statement	<p>Use of straight needles for venipuncture is effective in reducing hemolysis in the ED and is recommended by LMBP as an "evidence-based best practice." (Heyer, 2012)</p> <p>Thus, when the decision to use an IV start for collecting blood samples in the ED has been made, then the use of antecubital sites is recommended by LMBP as an evidence-based best practice to reduce the rates of hemolyzed samples. (Heyer, 2012)</p> <p>Two practices, use of <=21 gauge syringes (compared with >21 gauge syringes) and use of a syringe (rather than a vacuum tube) when collecting blood from an IV start, had "insufficient" overall strength of evidence of effectiveness for reducing hemolyzed samples in the ED. (Heyer, 2012)</p> <p>Description of Decision Options / Interventions and the Level of Recommendation: Before the Draw: Preparation & Equipment Selection</p> <ul style="list-style-type: none">-Education of the staff performing phlebotomy may decrease hemolysis [C]-The type of personnel performing phlebotomy does not influence hemolysis [C]-There is conflicting evidence regarding the influence of needle or catheter gauge on hemolysis [I/E]-There is conflicting evidence regarding hemolysis with syringes versus vacuum tubes [I/E]-Low (partial) vacuum tubes result in less hemolysis [B]-Stainless steel needles are less likely to cause hemolysis than intravenous catheters; Teflon catheters are less likely to cause hemolysis than Vialon [TM] catheters [C]-Direct venipuncture with straight needles is less likely to cause hemolysis than blood collection through intravenous catheters [B] <p>During and After the Draw</p> <ul style="list-style-type: none">-Hemolysis is less likely when blood is drawn from the antecubital fossa [B]		

	<div>-Minimize tourniquet time by removing the tourniquet after identifying the venipuncture site while preparing equipment and as soon as good blood flow is established [C] -Filling vacuum tubes to their recommended volume decreases hemolysis [C] -There is insufficient evidence regarding the impact of the rate of blood flow into the vacuum tube on hemolysis [I/E] -Drawing blood through needleless connectors does not increase hemolysis [B] -Drawing blood through an extension tubing attached to an intravenous catheter does not increase hemolysis in adults [C] -There is insufficient evidence to determine if the number of venipuncture attempts affects hemolysis [I/E] -There is insufficient evidence as to whether intravenous catheter insertion perceived to be difficult is associated with an increased risk of hemolysis [I/E] -There is insufficient evidence to determine if the volume / frequency of venipunctures performed influences hemolysis [I/E] -There is insufficient evidence to determine if monitoring hemolysis rates and providing feedback to the staff performing phlebotomy decreases the incidence of hemolysis [I/E] -Properly functioning pneumatic tube systems do not increase hemolysis [C] (Proehl, 2012)</div>
Improvement Notation	Lower score indicates better quality
Reference	Heyer NJ, Derzon JH, Wings L, et al. Effectiveness of practices to reduce blood sample hemolysis in EDs: a laboratory medicine best practices systematic review and meta-analysis. Clin Biochem. 2012; 45:1012-1032.
Reference	Proehl JA, Bradford JY, Leviner S, et al. ENA Emergency Nursing Resources Development Committee. Clinical practice guideline: prevention of blood specimen hemolysis in peripherally-collected venous specimens. Des Plaines (IL): Emergency Nurses Association; 2012 Dec. 11 p. [26 references]
Definition	None
Guidance	<div>Quantitative thresholds for hemolysis are unique to each laboratory equipment manufacturer. As such, hemolysis thresholds from facility to facility may not be comparable. To address the variation across laboratory manufacturers, this quality measure has been specified using a qualitative description of 'Hemolyzed'. The numerator provides two options to capture this qualitative result: 1) A qualitative result of 'Hemolyzed'; or 2) A resulted laboratory value accompanied by a comment indicating the sample was 'Hemolyzed'.</div> <div>This measure is an episode-of-care measure; the level of analysis for this measure is every potassium laboratory test during the measurement period. For example, for every laboratory test performed to evaluate a potassium level, the sample should be evaluated for hemolysis.</div>
Transmission Format	TBD
Initial Population	All laboratory potassium samples drawn in the emergency department (ED)
Denominator	Equals Initial Population
Denominator Exclusions	None
Numerator	Samples with Hemolysis
Numerator Exclusions	Not Applicable
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex.

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Population Criteria



- **Initial Population =**
 - AND: "Occurrence A of Encounter, Performed: Emergency Department Visit" during "Measurement Period"
 - AND: "Occurrence A of Laboratory Test, Performed: Potassium (result)" during "Occurrence A of Encounter, Performed: Emergency Department Visit"
- **Denominator =**
 - AND: Initial Population

- **Denominator Exclusions =**
 - None
- **Numerator =**
 - **AND:**
 - **OR:** "Occurrence A of Laboratory Test, Performed: Potassium (result: Hemolyzed)"
 - **OR:**
 - **AND:** "Occurrence A of Laboratory Test, Performed: Potassium (result)"
 - **AND:** "Laboratory Test, Performed: Lab Report Comment (result: Hemolyzed)" concurrent with "Occurrence A of Laboratory Test, Performed: Potassium"
- **Numerator Exclusions =**
 - None
- **Denominator Exceptions =**
 - None
- **Stratification =**
 - None

Data Criteria (QDM Variables)

- None

Data Criteria (QDM Data Elements)

- "Encounter, Performed: Emergency Department Visit" using "Emergency Department Visit Grouping Value Set (2.16.840.1.113883.3.526.3.1520)"
- "Laboratory Test, Performed: Lab Report Comment" using "Lab Report Comment Grouping Value Set (2.16.840.1.113883.3.526.3.1533)"
- "Laboratory Test, Performed: Potassium" using "Potassium Grouping Value Set (2.16.840.1.113883.3.526.3.1531)"
- Attribute: "Result: Hemolyzed" using "Hemolyzed Grouping Value Set (2.16.840.1.113883.3.526.3.1532)"

Supplemental Data Elements

- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity CDCREC Value Set (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer" using "Payer SOP Value Set (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race CDCREC Value Set (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex AdministrativeGender Value Set (2.16.840.1.113762.1.4.1)"

Risk Adjustment Variables

- None

Measure Set	Cleveland Clinic Foundation
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