

## Sickle Cell Disease

### Measure 14: Appropriate Emergency Department Blood Testing for Children with Sickle Cell Disease

#### Description

The percentage of children identified as having Sickle Cell Disease presenting to an emergency department (ED) with fever during the measurement year, who had a pulse oximetry reading, complete blood count, reticulocyte count, and blood culture within 60 minutes following initial contact. A higher proportion indicates better performance as reflected by appropriate testing.

#### Calculation

This measure requires medical record data and is calculated as four rates as well as an overall rate that is a composite of the four individual rates. The four individual rates are:

1. The percentage of children who had a pulse oximetry within 60 minutes following initial contact (pulse oximetry numerator divided by denominator).
2. The percentage of children who had a complete blood count within 60 minutes following initial contact (blood count numerator divided by denominator).
3. The percentage of children who had a reticulocyte count within 60 minutes following initial contact (reticulocyte numerator divided by denominator).
4. The percentage of children who had a blood culture within 60 minutes following initial contact (blood culture numerator divided by denominator).

The overall rate is the percentage of children who have received each of the four tests within the same 60-minute period (overall numerator divided by denominator).

#### Definitions

Intake period:	January 1 to December 31 of the measurement year.
Pulse oximetry reading	Pulse oximetry was performed within 60 minutes following initial contact (see Table A).
Complete blood count	A complete blood count was performed within 60 minutes following initial contact (see Table A).
Reticulocyte count	A reticulocyte count was performed within 60 minutes following initial contact (see Table A).
Blood culture	A blood culture was performed within 60 minutes following initial contact (see Table A).
Fever	Body temperature $\geq 38^{\circ}\text{C}$ ( $100.4^{\circ}\text{F}$ ).
Initial contact	Child's first presentation to ED staff. Use the earliest time stamp in the medical record.

**Table A. Blood tests for the emergency department management of sickle cell disease**

Definitions	Procedure code	Short description	Long description
Pulse oximetry reading	0Y4306	Pulse oximetry	PULSE OXIMETRY
Complete blood count	85025	Complete CBC w/auto diff WBC	BLOOD COUNT; COMPLETE (CBC), AUTOMATED (HGB, HCT, RBC, WBC, AND PLATELET COUNT) AND AUTOMATED DIFFERENTIAL WBC COUNT
Complete blood count	85027	Complete CBC automated	BLOOD COUNT; COMPLETE (CBC), AUTOMATED (HGB, HCT, RBC, WBC, AND PLATELET COUNT)
Complete blood count	85014	Hematocrit	BLOOD COUNT; HEMATOCRIT (HCT)
Complete blood count	85018	Hemoglobin	BLOOD COUNT; HEMOGLOBIN (HGB)
Reticulocyte count	85044	Manual reticulocyte count	BLOOD COUNT; RETICULOCYTE, MANUAL
Reticulocyte count	85045	Automated reticulocyte count	BLOOD COUNT; RETICULOCYTE, AUTOMATED
Reticulocyte count	85046	Reticulocyte/HgB concentrate	BLOOD COUNT; RETICULOCYTES, AUTOMATED, INCLUDING ONE OR MORE CELLULAR PARAMETERS (EG, RETICULOCYTE HEMOGLOBIN CONTENT (CHR), IMMATURE RETICULOCYTE FRACTION (IRF), RETICULOCYTE VOLUME (MRV), RNA (CONTENT), DIRECT MEASUREMENT

**Eligible Population**

The determination of eligible population for this measure requires medical record data. Age: Younger than 18 years of age during the measurement year.

Event/Diagnosis: Diagnosed with sickle cell disease and presented to an ED with fever as documented in the medical record (see Table B). All ED visits for fever during the measurement year qualify.

Note: see exclusions noted below; there are several sickle cell variants that may be recorded under the 282.49 ICD-9 code that do not qualify for inclusion (see Table C). Medical records for cases with ICD-9 code 282.49 should not be reviewed unless a diagnosis of Hb beta zero-thalassemia can be confirmed.

**Table B. Codes to identify sickle cell disease**

Condition Name	Hemoglobin Screening Result	ICD-9 Code(s)
Hb beta zero-thalassemia	Hb F only	282.49
Hb S beta-thalassemia	Hb F,S,A	282.41, 282.42
Hb SC-disease	Hb F,S,C	282.63, 282.64
Hb SD-disease	Hb F,S,D	282.68, 282.69
Hb SS-disease (sickle cell anemia)	Hb F,S	282.6, 282.61, 282.62

**Specification**

**Denominator** The eligible population for the denominator is the number of children younger than 18 years of age identified as having SCD who presented to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year.

**Numerators**

**Pulse oximetry** The eligible population for the numerator is the number of children younger than 18 years of age identified as having SCD presenting to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year who had a pulse oximetry reading within 60 minutes following initial contact.

**Blood count** The eligible population for the numerator is the number of children younger than 18 years of age identified as having SCD presenting to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year who had a complete blood county within 60 minutes following initial contact.

**Reticulocyte** The eligible population for the numerator is the number of children younger than 18 years of age identified as having SCD presenting to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year who had a reticulocyte count within 60 minutes following initial contact.

**Blood culture** The eligible population for the numerator is the number of children younger than 18 years of age identified as having SCD presenting to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year who had a blood culture within 60 minutes following initial contact.

**Overall** The eligible population for the numerator is the number of children younger than 18 years of age identified as having SCD presenting to an ED with fever (defined as 38°C [100.4°F] or above) during the measurement year who had (1) a pulse oximetry reading, (2) a complete blood count, (3) a reticulocyte count, and (4) a blood culture within 60 minutes following initial contact.

Documentation in the medical record must include, at a minimum, a note containing the time at which the test was performed.

**Exclusions**

- Inpatient stays, outpatient visits, urgent care visits, acute care (evaluation and management) visits with primary care physician.
- Children with diagnosis in the sampled medical record indicate one of the sickle cell disease variants listed in Table C should not be included in the eligible population unless there is also a diagnosis for a sickle cell variant listed in Table B.

**Table C. Excluded sickle cell disease diagnosis codes**

<b>Condition Name</b>	<b>Hemoglobin Screening Result</b>	<b>ICD-9 code(s)</b>
Hb C beta-thalassemia	Hb F,C,A	282.49
Hb D beta-thalassemia	Hb F,D,A	282.49
Hb E beta-thalassemia	Hb F,E,A	282.49
Hb C-disease	Hb F,C	282.7
Hb E-disease	Hb F,E	282.7
Hb H-disease	Hb F,H	282.49
Hb SE-disease	Hb F,S,E	282.68, 282.69
Hb C-carrier	Hb F,A,C	282.7
Hb D-carrier	Hb F,A,D	282.7
Hb E-carrier	Hb F,A,E	282.7
Hb S (sickle)-carrier	Hb F,A,S	282.5