Attachment 2.1 Chart Abstraction Form

						Age upon admission (YEARS) [e.g. for 12.5 year old, years = 12]	Age upon admission (MONTHS) [e.g. for 12.5 year old, months = 6]
				Basic Elements			
Patient ID	**Race**	**Ethnicity**	**Gender**	**Payer**	**Preferred Language**		
1	White	Non-Hispanic	Female	Medicaid	English	12	3
2	Black	Non-hispanic	Male	Medicaid	English	5	0
3	White	Hispanic	Male	Private	Spanish	8	12
4	Asian Pacific Iland	Non-Hispanic	Male	Private	Chinese	10	0
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	Denominator					Numerator		
								Appropriateness of Red Cell Transfusions
PICU Admission Date (mm/dd/yyyy)	PICU Admission Time (hh:mm, military)	PICU Discharge or Transfer Date (mm/dd/yyyy)	PICU Discharge or Transfer Time (hh:mm, military)	Evidence of blood transfusion (Yes - 1/No -2)	Date of transfusion (mm/dd/yyyy)	Time of transfusion (hh:mm, military)	Hemoglogin lab value prior to transfusion (integer in 0-15 g/dL range)	Date of hemoglobin lab value (mm/dd/yyyy)
12/12/2011	13:01	12/14/2011	12:30	2	-	-	-	
3/3/2012	0:15	3/7/2012	8:10	2	-	-	-	
1/17/2012	23:59	1/18/2012	22:10	1	1/18/2012	6:00	7.1	1/18/2012
5/6/2012	10:45	5/8/2012	23:30	1	5/8/2012	1:00	9	5/7/2012

Time of hemoglobin lab value (hh:mm, military)	Exclusions				
	Diagnosis of cyanotic heart disease? (Yes - 1/No -2)	Diagnosis of unstable shock? (Yes -1/No -2)	Evidence of active bleeding or diagnosis of acute hemolysis? (Yes - 1/No -2)	Is the patient on ECMO? (Yes -1/No -2)	Diagnosis of Sickle Cell Disease? (Yes - 1/No -2)
	-	-	-	-	-
	-	-	-	-	-
5:00	2	2	2	2	2
23:00	2	2	1	2	2

eMeasure Title	Appropriateness of Red Cell Transfusions		
eMeasure Identifier (Measure Authoring Tool)	384	eMeasure Version number	0.0.004
NQF Number	None	GUID	b4ef497a-9c6a-4abc-9391-fae3b9d2fd87
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward			
Measure Developer			
Endorsed By	None		
Description	Percentage of transfusions in PICU patients who have a hemoglobin of less than or equal to 7 (rounding down for 7.5 or less).		
Copyright	TBD		
Disclaimer	These performance Measures are not clinical guidelines and do not establish a standard of medical care, and have not been tested for all potential applications. THE MEASURES AND SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND.		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification			
Risk Adjustment	None		
Rate Aggregation	State, geographic region, health plan, practice, provider, Medicaid/CHIP		
Rationale	Relationship to Desired Outcome: The three primary outcomes of the measure would be to decrease the number of transfusions in PICUs and thereby decreasing transfusion-related event risks, to decrease utilization of donor blood, which is a limited resource, and to decrease costs associated with a PICU admission. Fifteen to 49% of PICU patients receive at least one red blood cell transfusion during their intensive care unit (ICU) admission.(3) Sixty-two percent of children who were transfused received more than one transfusion. Low hemoglobin was the most common reason provided for transfusion, with the median hemoglobin for transfusion ranging from 8.2 g/dL in adolescents to 12.5 g/dL in neonates. The overall median pre-transfusion hemoglobin was 9.2 g/dL. Opportunity for Improvement: Despite the mounting evidence that red blood cell transfusions may be associated with more harm than benefit, current transfusion practices vary within and between PICUs.(4,5) The results from a case-based survey administered by Nahum et al, showed significant variation among pediatric intensivists in the hemoglobin that would trigger an order for transfusion of red blood cells. Most transfusions occurred at hemoglobin values that were higher than recommended guidelines. (5) Another frequently stated reason for red blood cell transfusion relates to the perceived improvement in oxygen delivery. Other factors influencing decisions to transfuse include: hemoglobin < 9.5 g/dL during the ICU stay, an admission diagnosis of cardiac disease, an admission PRISM (Pediatric Risk of Mortality) of >10, the presence of multiple organ dysfunction syndrome during the ICU stay, hypoxemia, young age, active gastric bleeding, and emergency surgery(3,4) . According to a pediatric critical care study on transfusion practices (Laverdière et al., 2002), a striking variation in practice patterns among pediatric critical care practitioners was concluded. The threshold Hb concentration chosen by pediatric intensivists for typical cases ranged at least from 7 to 13 g/dL (Laverdière et al., 2002). Also, the volume of RBCs given is not related to the threshold Hb concentration, which suggests that RBC transfusions are not optimally utilized (Laverdière et al., 2002) Laverdière, C., Gauvin, F., Hébert, P.C., Infante-Rivard, C., Hume, H., Toledano, B.J., Guertin, M.C., Lacroix, J., for the Canadian Critical Care Trials Group. (2002). Survey on transfusion practices of pediatric intensivists. Pediatr Crit Care Med, 3(4): 335. IOM Domains of Health Care Quality Addressed: * Safe * Effective * Patient-centered * Efficient * Equitable Harmonization with Existing Measures:		

	This measure strives to harmonize to the extent possible with all other existing pediatric measures such that the process of care expected of health care providers does not contradict what may be expected of them across the full spectrum of patient care in a Pediatric Intensive Care Unit (PICU).
Clinical Recommendation Statement	The following evidence statement(s) are quoted verbatim from the referenced clinical guidelines and represent the evidence base for the measure: In stable, critically ill children a hemoglobin threshold of 7 g per deciliter for red-cell transfusion can decrease transfusion requirements without increasing adverse outcomes. (Controlled-trials.com number, ISRCTN37246456 [controlled-trials.com].). Lacroix, J., Herbert, P.C., Hutchinson, J.S., Hume, H.A. et al. (2007). Transfusion Strategies for Patients in Pediatric Intensive Care Units. The New England Journal of Medicine, 356(16):1609-1619.
Improvement Notation	
Reference	
Definition	1 transfusion = 1 blood bank transfusion record.
Guidance	None
Transmission Format	TBD
Initial Population	
Denominator	Number of transfusions performed in the PICU during the reporting period.
Denominator Exclusions	- All patients with cyanotic heart disease. - All patients with unstable shock.1 - All patients who are actively bleeding or have acute hemolysis. - All patients who are on ECMO. - All patients with sickle cell disease. 1: The addition of or an increase in a continuous infusion of any cardioactive drug within the last 24 hours.
Numerator	Number of transfusions in PICU patients who have a hemoglobin of less than or equal to 7 grams/deciliter (rounding down for 7.5 or less).
Numerator Exclusions	None
Denominator Exceptions	None
Measure Population	Not applicable
Measure Population Exclusions	Not applicable
Measure Observations	Not applicable
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and gender.

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Population criteria

- **Initial Population =**
  - *# Number of transfusions performed in the PICU during the reporting period.*
    - AND: Intersection of:
      - Intersection of:
        - "Occurrence A of Encounter, Performed: PICU Admission or Transfer"
        - Intersection of:
          - "Occurrence A of Encounter, Performed: PICU Admission or Transfer (admission datetime)"
      - Intersection of:
        - "Occurrence A of Procedure, Performed: Transfusion of Red Blood Cells"
        - Intersection of:
          - "Occurrence A of Procedure, Performed: Transfusion of Red Blood Cells (start

datetime)"

- **Denominator =**
  - AND: Initial Population
    # Same as initial population
  - AND: Intersection of:
    - Intersection of:
      - "Occurrence A of Encounter, Performed: PICU Admission or Transfer"
      - Intersection of:
        - "Occurrence A of Encounter, Performed: PICU Admission or Transfer (admission datetime)"
    - Intersection of:
      - "Occurrence A of Procedure, Performed: Transfusion of Red Blood Cells"
      - Intersection of:
        - "Occurrence A of Procedure, Performed: Transfusion of Red Blood Cells (start datetime)"
- **Denominator Exclusions =**
  # All patients who have cyanotic heart disease, unstable shock (the addition of or an increase in a continuous infusion of any cardioactive drug with 24 hrs), active bleeding, acute hemolysis, sickle cell disease, or are on ECMO.
  - OR: Union of:
    - Union of:
      - "Diagnosis, Active: Cyanotic Heart Disease"
    - Union of:
      - "Symptom, Active: Unstable shock due to the addition of or an increase in a continuous infusion of any cardioactive drug within the last 24 hours"
    - Union of:
      - "Symptom, Active: Active bleeding"
    - Union of:
      - "Symptom, Active: Acute hemoysis"
    - Union of:
      - "Procedure, Performed: Extracorporeal Membrane Oxygenation (ECMO) (procedure)"
    - Union of:
      - "Diagnosis, Active: Sickle Cell Disease"
- **Numerator =**
  # Number of transfusions in PICU patients who have a hemoglobin of less than or equal to 7 grams/deciliter (rounding down for 7.5 or less).
  - AND: Intersection of:
    - Intersection of:
      - "Laboratory Test, Performed: Hgb (Hemoglobin) Laboratory Test (result <= 7000 mg/dL)"
      - Intersection of:
        - "Laboratory Test, Performed: Hgb (Hemoglobin) Laboratory Test (start datetime)"
      - Intersection of:
        - "Laboratory Test, Performed: Hgb (Hemoglobin) Laboratory Test (reason)"
- **Numerator Exclusions =**
  - None
- **Denominator Exceptions =**
  - None
- **Stratification =**
  - None

Data Criteria (QDM Variables)

- None

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- "Diagnosis, Active: Cyanotic Heart Disease" using "Cyanotic Heart Disease User Defined QDM Value Set (1.1.1.1)"
- "Diagnosis, Active: Sickle Cell Disease" using "Sickle Cell Disease User Defined QDM Value Set (1.1.1.1)"
- "Encounter, Performed: Occurrence A of PICU Admission or Transfer" using "Occurrence A of PICU Admission or Transfer User Defined QDM Value Set (1.1.1.1)"
- "Laboratory Test, Performed: Hgb (Hemoglobin) Laboratory Test" using "Hgb (Hemoglobin) Laboratory Test User Defined QDM Value Set (1.1.1.1)"
- "Procedure, Performed: Extracorporeal Membrane Oxygenation (ECMO) (procedure)" using "Extracorporeal Membrane Oxygenation (ECMO) (procedure) User Defined QDM Value Set (1.1.1.1)"
- "Procedure, Performed: Occurrence A of Transfusion of Red Blood Cells" using "Occurrence A of Transfusion of Red Blood Cells User Defined QDM Value Set (1.1.1.1)"
- "Symptom, Active: Active bleeding" using "Active bleeding User Defined QDM Value Set (1.1.1.1)"
- "Symptom, Active: Acute hemoysis" using "Acute hemoysis User Defined QDM Value Set (1.1.1.1)"
- "Symptom, Active: Unstable shock due to the addition of or an increase in a continuous infusion of any cardioactive drug within the last 24 hours" using "Unstable shock due to the addition of or an increase in a continuous infusion of any cardioactive drug within the last 24 hours User Defined QDM Value Set (1.1.1.1)"

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- "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 AdministrativeSex Value Set (2.16.840.1.113762.1.4.1)"

Risk Adjustment Variables

- None

Measure Set	Not applicable