Measure Abbreviation: TRAN 01

Description: Percentage of cases with a blood transfusion that have a hemoglobin or hematocrit value documented prior to transfusion.

NQS Domain: Effective Clinical Care

Measure Type: Process

Measure Scope: Measured on a per transfusion basis.

Measure Summary: Blood management protocols have been implemented to prevent unnecessary blood transfusions and therefore decrease the risk to patients and decrease resource utilization. This patient blood management measure evaluates the incidence of red blood cell transfusions that have a hemoglobin or hematocrit value documented prior to transfusion.

Rationale: The American Association of Blood Banks (AABB) recommends a transfusion threshold of hemoglobin concentration less than or equal to 8 g/dL or when patient is symptomatic (chest pain, orthostatic hypotension, tachycardia unresponsive to fluid resuscitation, or congestive heart failure).[1,2] Furthermore, blood transfusions in non-cardiac surgery have been associated with increased risk of 30-day mortality and morbidity.[3]

Although the literature is not conclusive on the exact hemoglobin concentration that requires transfusion, the evidence is clear that use of fewer RBC transfusions reduces cost and risk for adverse effects of transfusion, and that transfusion for hemoglobin values greater than 10 g/dL is usually not indicated.

TRAN 01 is a process measure focused on measuring hemoglobin or hematocrit prior to transfusion. The rationale for this measure is that the decision to transfuse should include knowledge of the hemoglobin value before administration of blood. Because the literature is not absolutely conclusive on a specific hemoglobin threshold for transfusion, TRAN 01 does not include the actual hemoglobin value as part of the measure.

Inclusions: All surgical patients receiving anesthetics who receive a transfusion of red blood cells.

Exclusions:

- Massive Transfusion: Transfusion of 4 or more units of blood. Note for sites that document transfusions in ml instead of units: ASPIRE will default to 350ml/unit.
- EBL ≥ 2000 ml
- Patients < 2 years of age
- Patients <12 years old undergoing a cardiac procedure (CPT: 00560, 00561, 00562, 00563, 00567, 00580).
- Patients <12 years old where either transfused PRBC or EBL was greater than 30cc/kg.
- Burn cases (CPT Codes 01951, 01952, 01953)
- ASA 5 & 6

- Obstetric Non-Operative Procedures (CPT: 01958, 01960, 01967)
- Obstetric Non-Operative Procedure Rooms (Rooms tagged as OB-GYN- Labor and Delivery)
- Obstetric Non-Operative Procedures with procedure text: "Labor Epidural"
- Exclude patients undergoing cesarean section (CPT: 01961, 01968, 01962, 01963, 01969) with an EBL > 1500cc.
- Exclude patients undergoing cesarean section (CPT: 01961, 01968, 01962, 01963, 01969) with a HR>110, SBP<85, DBP<45, or O2Sat <95%.
- Exclude postpartum hemorrhage cases (ICD-10 code: O72.0, O72.1, O72.2, O72.3).

MPOG Concept IDs Required:

Blood Product MPOG Concept IDs		**Point of Care Testing MPOG Concept IDs**		**Formal Lab MPOG Concept IDs**		**EBL MPOG Concept ID**	
10489	Packed Red Blood Cells- Autologous	**3415**	POC-Blood gas-Hct measured	**5005**	Formal lab-Hemoglobin	**10499**	EBL
10490	Packed Red Blood Cells- Homologous	**3435**	POC-hematocrit spun	**5006**	Formal lab-Hematocrit		
10492	Whole Blood-Homologous	**3440**	POC- Coulter counter-Hemoglobin	**5038**	Formal lab-Blood gas- Hct measured		
10616	Packed Red Blood Cells- Unknown Type	**3450**	POC- Coulter counter-Hematocrit	**5080**	Formal lab-Blood gas-Hemoglobin		
10617	Whole Blood-Unknown Type	**5081**	POC- Blood gas-Hemoglobin				
10618	Categorized Note-Blood Products						

Data Diagnostics Affected:

- Percentage of Inpatient Cases with Documented Blood Loss
- Percentage of Cases with Documented Blood Transfusions
- Percentage of Fluids with a Meaningful Fluid Mapping
- Percentage of Labs Mapped to a Meaningful Lab Mapping
- Percentage of Cases with a Lab Drawn During Anesthesia
- Percentage of Cases with Point of Care Hematocrit Labs
- Percentage of Cases with Point of Care Hemoglobin Labs
- Percentage of Cases with any Staff Tracking
- Percentage of Anesthesia Provider Sign-Ins that are Timed

Success:

- Documentation of hemoglobin and/or hematocrit prior to blood transfusion
- Considerations:
    - For the first unit of transfusion, a hemoglobin or hematocrit of any value should be checked in a time period of 0 to 90 minutes before the transfusion, or the most recent documented hemoglobin or hematocrit of less than 8/24 should be within 36 hours of the transfusion.
    - If the last hemoglobin or hematocrit drawn before the first transfusion is ≤ 5/16, a second unit could be administered without rechecking hemoglobin/hematocrit.
    - If multiple units are administered, documentation of a hemoglobin or hematocrit value must be present within 90 minutes before each administration.
    - **For pediatric cases (patients < 12 years old):** Pre-transfusion hemoglobin/hematocrit required before the first unit and an additional recheck after 15cc/kg of PRBCs have been administered.
    - **For cardiopulmonary bypass cases,** all transfusions administered between cardiopulmonary bypass start and end will not be included for determining measure results for the case.
    - Cardiopulmonary bypass (CPB) start/end times defined as follows:
        - Measure will first determine CPB start and end times using the first time associated with one of the following notes and the last time associated with one of the following notes:

          50047 Perfusion – Retrograde Arterial Prime/Venous Antegrade Prime Performed (Yes/No)
          50399 Cardiopulmonary bypass -- aortic clamp on/off note
          50401 Cardiopulmonary bypass vent on - note
          50402 Cardiopulmonary bypass vent off - note
          50403 Cardiopulmonary bypass vent on detail
          50404 Cardiopulmonary bypass vent off detail
          50405 Cardiopulmonary bypass rewarm - note
          50407 Cardiopulmonary bypass systemic cooling initiated
          50409 Cardiopulmonary bypass (full/partial/left-heart) terminated
          50410 Cardiopulmonary bypass initiated (full/partial/left-heart)
          50411 Cardiopulmonary bypass -- ventilator turned off
          50412 Cardiopulmonary bypass -- perfusion start
          50413 Cardiopulmonary bypass -- perfusion end
          50415 Cardiopulmonary bypass -- aortic crossclamp off
          50416 Cardiopulmonary bypass -- crossclamp and circulatory arrest time totals
          50417 Cardiopulmonary bypass -- Access cannula removed note
          50419 Cardiopulmonary bypass -- Aortic crossclamp removal requiring therapy
          50420 Cardiopulmonary bypass -- Isoflurane vaporizer turned on
          50421 Cardiopulmonary bypass -- Arterial cannula inserted note
          50422 Cardiopulmonary bypass -- Arterial cannula insertion site detail
          50424 Cardiopulmonary bypass -- Blood pressure lowered note
          50425 Cardiopulmonary bypass -- Blood pressure lowered therapy detail
          50426 Cardiopulmonary bypass -- Ice off head
          50427 Cardiopulmonary bypass -- Ice on head
          50428 Cardiopulmonary bypass - cardioplegia start
          50429 Cardiopulmonary bypass - cardioplegia stop

50647 Cardiopulmonary bypass - Aprotinin test dose performed
50714 Cardiopulmonary bypass - Full/partial/left-heart bypass start / stop event
50766 Cardiopulmonary bypass -- Circulatory arrest start
50767 Cardiopulmonary bypass -- Circulatory arrest stop

- Finally, if there are no intraoperative notes available, the measure will review physiologic data mapped to the following variables to determine start and end times as follows:
  - At least one of these two cardiac indictors are met:
    - Systolic Blood Pressure (MPOG Concept: 3030) - Diastolic Blood Pressure (MPOG Concept: 3035) < 20
      or
    - Pulse (MPOG Concept: 3005) ≤ 5
  - At least one of these two pulmonary indicators are met:
    - Respiratory Rate (MPOG Concept: 3580) ≤ 2
      or
    - End Tidal CO2 (MPOG Concepts: 3235, 3236) ≤ 5
- Transfusion is defined as:
  - Packed Red Blood Cells-Autologous, Homologous, Unknown Type
  - Whole Blood-Homologous, Unknown Type
  - Categorized Note- Blood Products
- Hematocrit/hemoglobin are defined as**:**
  - POC - Blood gas-Hct measured, Hemoglobin
  - POC – Hematocrit spun
  - POC – Coulter counter – Hematocrit, Hemoglobin
  - Formal lab – Hematocrit, Hemoglobin
  - Formal lab - Blood gas - Hct measured, Hemoglobin

Threshold: 90%.

Responsible Provider: Provider(s) who administered blood product.

Risk Adjustment (for outcome measures):
Not applicable.

References:

1. Carson JL, Grossman BJ, Kleinman S, et al. Red blood cell transfusion: a clinical practice guideline from the AABB*. *Annals of internal medicine.* 2012;157(1):49-58.
2. Carson JL, Guyatt G, Heddle NM, et al. Clinical Practice Guidelines From the AABB: Red Blood Cell Transfusion Thresholds and Storage. *Jama.* 2016;316(19):2025-2035.
3. Glance LG, Dick AW, Mukamel DB, et al. Association between intraoperative blood transfusion and mortality and morbidity in patients undergoing noncardiac surgery. *Anesthesiology*. 2011;114(2):283-292.