

**VANDERBILT UNIVERSITY MEDICAL CENTER
DIVISION OF TRAUMA AND SURGICAL CRITICAL CARE**

Anemia Practice Management Guidelines

Anemia is a common clinical problem seen in critically ill trauma patients for a variety of reasons including bleeding, phlebotomy, decreased red blood cell production, premature destruction, and sequestration. As many as 85% of patients in the United States who have an ICU length of stay greater than one week receive at least one blood transfusion during their stay and 14% of ICU patients are transfused daily. Of patients receiving blood transfusions, only one third of the transfusions were associated with acute blood loss. Blood transfusions are associated with increased infection rates, increased risk of organ failure, increased length of stay in the ICU, and increased mortality. Finally, with the exception of patients with acute myocardial infarction, the literature has not identified a population of patients (including traumatic brain injury) that benefit from transfusion thresholds higher than that of the general ICU population.

1. Purpose

- a. Blood transfusions in and of themselves are not benign interventions and have the potential to cause serious morbid, and potentially fatal events. With this in mind, the anemia practice management guideline for the division of trauma has been established to provide target hemoglobin levels based on best available evidence in the trauma and critical care literature, designated appropriate transfusion triggers, and ensure that transfusion practices for the trauma population are conducted in a consistent manner.

2. Interventions

- a. Ensure normovolemia
- b. identify reasons for anemia
 - i. bleeding
 - ii. phlebotomy
 - iii. chronic disease
 - iv. inflammatory response
 - v. impaired erythropoietin response
 - vi. nutritional deficiency
 - vii. hemodilution
- c. assess hemodynamic stability and signs of adequate organ perfusion
 - i. normal vital signs
 - ii. adequate urine output
 - iii. normal mental status/level of consciousness
 - iv. adequate skin perfusion
 - v. normalized invasive hemodynamic parameters
- d. verify normal coagulation profile
- e. transfusion thresholds for trauma patients with active ischemic heart disease or acute ischemic syndromes he is hemoglobin <10 g/dL, hematocrit <30
 - i. particularly in unstable angina and active myocardial infarction or ischemia
- f. transfusion threshold for stable critical care patients based on the above parameters is hemoglobin <7 g/dL, hematocrit <21 unless they exhibit the following
 - i. impaired oxygen delivery
 - ii. shock
 - iii. ongoing blood loss
- g. transfusion of patients with hematocrit 21-30 mandate an attending discussion
- h. wait 3 hours after transfusion before redrawing labs unless patient clinically unstable or ongoing blood loss

- i. monitored transfuse patient carefully: As many as 20% of patients receiving blood transfusion exhibit adverse reaction
- j. if patient is anemic with chronic renal failure, consider erythropoietin therapy and iron as alternatives to increase blood cell mass
- k. when patient is able, add iron supplementation in conjunction with bowel regimen
- l. minimize blood loss by decreasing phlebotomy frequency
 - i. change labs to p.r.n.
 - ii. minimize frequency of labs for subacute patients
 - iii. serial labs are unnecessary for monitoring solid organ injury
- m. optimize nutrition
- n. monitor continuously for signs of hypoperfusion with anemia
 - i. follow neurologic and mental status, vital signs, end organ perfusion
 - ii. invasive monitoring indicated by physiology and comorbidities, not by anemia
- o. consider use of iron supplementation concomitantly with bowel regimen
 - i. iron sulfate 325 mg PO TID
 - ii. colace 100 mg PO TID or other added bowel regimen agents

Revised 2011, Oliver L. Gunter, M.D., FACS