UNC SCHOOL OF MEDICINE

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

DEPARTMENT OF PEDIATRICS
DIVISION OF HEMATOLOGY-ONCOLOGY

CAMPUS BOX 7236
CHAPEL HILL, NC 27599-7236

T 919.966.1178
F 919.966.7629

UNC Pediatric Hematology / Oncology Clinical Guidelines

Topic: Transfusion threshold parameters for pRBCs and platelets for oncology patients

Date of Last Revision: 9th April 2018

Created by: Thomas Alexander, MD, MPH

**These guidelines have been developed to aid clinicians in making informed decisions about pediatric hematology and oncology patients. They are not intended to take the place of physician judgement. Recommendations may not be appropriate in all circumstances.

Recommendations:

1) Unless otherwise clinically indicated, pRBC should be transfused for Hgb < 7 mg/dL.[1]

2) For inpatients with hematological malignancy or non-CNS solid tumors, platelets should be transfused for platelet count < 10 x 10^9/L, unless otherwise clinically indicated*.[2,3]

3) For inpatients with CNS tumors, platelets should be transfused for platelet count < 30 x 10^9/L, unless otherwise clinically indicated*.

4) No increased transfusion threshold is needed for bone marrow biopsy or aspiration.

5) For patients undergoing lumbar puncture, platelets should be transfused for platelet count < 30 x 10^9/L. (see exception below)

6) Specific circumstance that are different from above:
   a. For diagnostic lumbar puncture for acute leukemia, platelet count should be ≥ 50 x 10^9/L.[4]
   b. For patients receiving anticoagulation, platelet should be transfused for platelet count < 50 x 10^9/L.

7) No increased transfusion threshold is needed for patients receiving radiation therapy.

8) For outpatients, transfusion thresholds are more dependent on times between visits and timing in therapy and therefore no specific threshold is recommended.

*Any circumstance for which the healthcare provider places the patient at increased risk of bleeding such as large solid tumor, recent surgery, fever, coagulopathy, invasive procedure (other than bone marrow biopsy / aspiration or lumbar puncture), bleeding, respiratory distress, cardiovascular compromise overrule the above guidelines.

Background / Data Summary:

Data from ICU settings has consistently shown no benefit, but increase transfusions when using higher prophylactic hemoglobin thresholds for pRBC transfusions.[1] Most ICU guidelines now recommend pRBC transfusion threshold of 7 mg/dL. Following this evidence base and with lack of literature or theoretical reason our patients would benefit from higher levels than critically ill patients, our common hemoglobin transfusion threshold is 7 mg/dL outside of indication for higher threshold for any reason as judged by healthcare team.

Specifically for inpatients with a hematologic malignancy, there is strong evidence in acute leukemia populations that it is safe to hold off transfusing platelet until count is below 10 x 10^^{9}/L in absence of other indications or invasive procedures.[2,3] This general threshold will also be applied to patient with solid tumors (non-CNS) except when a higher threshold is indicated, as is often the case for newly diagnosed patients with large tumor burden, or recent surgery or other clinical indications. For patient with CNS solid tumors, we have adopted a higher threshold in keeping with common practice, without a specific evidence base to determine a transfusion threshold.

Outside of diagnostic lumbar puncture, limited evidence supports the safety of lumbar puncture with intrathecal chemotherapy with platelet levels down to 10 x 10^^{9}/L.[5] However, cooperative guidelines and expert consensus panels recommend platelet thresholds from 20 to 50 x 10^^{9}/L.[6,7] Therefore, we our group supports a general recommendation of a platelet transfusion threshold of 30 x 10^^{9}/L.

References:

1 Lacroix, J. *et al.* Transfusion strategies for patients in pediatric intensive care units. *N Engl J Med* **356**, 1609-1619, doi:10.1056/NEJMoa066240 (2007).

2 Estcourt, L. J., Stanworth, S. J. & Murphy, M. F. Different Platelet Count Thresholds to Guide Use of Prophylactic Platelet Transfusions for Patients With Hematological Disorders After Myelosuppressive Chemotherapy or Stem Cell Transplantation. *JAMA Oncol* **2**, 1091-1092, doi:10.1001/jamaoncol.2016.2466 (2016).

3 Estcourt, L. J. *et al.* Guidelines for the use of platelet transfusions. *Br J Haematol* **176**, 365-394, doi:10.1111/bjh.14423 (2017).

4 Howard, S. C. *et al.* Risk factors for traumatic and bloody lumbar puncture in children with acute lymphoblastic leukemia. *JAMA* **288**, 2001-2007 (2002).

5 Howard, S. C. *et al.* Safety of lumbar puncture for children with acute lymphoblastic leukemia and thrombocytopenia. *JAMA* **284**, 2222-2224 (2000).

6 Gibson, B. E. *et al.* Transfusion guidelines for neonates and older children. *Br J Haematol* **124**, 433-453 (2004).

7 Kaufman, R. M. *et al.* Platelet transfusion: a clinical practice guideline from the AABB. *Ann Intern Med* **162**, 205-213, doi:10.7326/M14-1589 (2015).