

Transfusion Medicine Boot Camp for Non-Physician Prescribers
Materials based on Transfusion Camp 2018-2019 with permission from Dr. Yulia Lin and TM Boot Camp Medical Staff
Morning Seminar on Day 1

Triggers for RBC and platelet transfusions

Case 1

27 yo male with acute myeloid leukemia is admitted for induction chemotherapy. He is afebrile. He denies bleeding but examination reveals numerous petechiae on his lower extremities and a few large ecchymoses on his extremities and trunk. Morning CBC revealed Hb 73g/L and platelets 5×10^9 /L. His coagulation studies are normal. Review of his recent CBC results indicates that his platelet count has not been above 10 for at least a week, despite daily or sometimes twice daily platelet transfusions.

- 1) Which one of the following is the most appropriate transfusion strategy for this patient?
 - A) No point in transfusing him as platelet count doesn't go up
 - B) Transfuse 1 adult dose of platelets today
 - C) Transfuse 2 adult doses of platelets today
 - D) Order a slow drip of platelets to continue throughout the day

- 2) You suspect that he has developed platelet refractoriness. Which one of the following investigations is least likely to help you determine the cause of the refractoriness?
 - A) Platelet count one hour post platelet transfusion
 - B) Bone marrow aspirate and biopsy
 - C) HLA antibody screen
 - D) Panculture to look for occult infection

- 3) His investigations are consistent with alloimmune refractoriness. Which one of the following is the least appropriate management strategy while awaiting HLA-matched platelets?
 - A) Give IVIg 1g/kg daily
 - B) Transfuse ABO compatible and freshest available platelets
 - C) Transfuse platelets only if there is significant bleeding
 - D) Give oral tranexamic acid to treat minor bleeding

Case 2a

69 year old male is admitted via ER with acute subdural hematoma following a fall. He is known to have liver cirrhosis due to alcohol. His CBC revealed Hgb 125g/L and platelets 75×10^9 /L. His INR was 1.3. He is scheduled for a burr hole surgery later this evening.

- 4) Which one of the following represents the most appropriate transfusion strategy?
 - A) No need for platelet transfusion
 - B) Transfuse 1 adult dose of platelets and repeat CBC
 - C) Transfuse 1 adult dose of platelets only if significant intra-operative bleeding
 - D) Transfuse 2 adult doses of platelets

Case 2b

80 year old male on aspirin and clopidogrel presents with spontaneous ICH. His GCS is 15 and no surgical intervention is planned.

- 5) Which one of the following is the most appropriate therapy?
- A. 1 adult dose of platelets
 - B. 2 adult doses of platelets
 - C. PCC at a dose of 50IU/kg IV and Vitamin K 10 mg IV
 - D. None of the above

Case 3

70 year old male is admitted to the ICU with respiratory failure due to pneumococcal pneumonia. His past medical history is significant for DM Type 2, HTN, and coronary artery disease. He has been angina free since CABG 5 years ago. He is on antibiotics and hemodynamically stable. He is intubated and ventilated (PS10, PEEP 8, FiO2 0.5, oxygen saturation 94%). There is no evidence of bleeding or hemolysis, however, over the last few days his hemoglobin concentration has drifted down to 70 g/L.

- 6) Which of the following represents the most appropriate RBC transfusion strategy for this patient?
- A) Transfuse RBCs if Hgb <100 g/L
 - B) Transfuse RBCs if Hgb <90 g/L
 - C) Transfuse RBCs if Hgb <80 g/L
 - D) Transfuse RBCs if Hgb <70 g/L

What is the likely cause of his anemia?

Does this patient require RBC transfusion? Justify your answer.

Would your answer change if he had evidence of septic shock?

- 7) Which of the following strategies may minimize the patient's need for future RBC transfusion?
- A) Minimize unnecessary diagnostic phlebotomy
 - B) Start an erythropoiesis stimulating agent
 - C) Start B12 supplementation
 - D) Start iron supplementation

Case 4

25 year old female with no significant past medical history, is seen in the emergency room with "a critically abnormal laboratory result", a hemoglobin of 60g/L. She has a long-standing history of menorrhagia and was sent to the ER by her family MD. On questioning, she endorses fatigue and reduced stamina but continues to run for 30-45 minutes three times per week before work. Her CBC reveals Hgb 60 g/L, MCV 65fL, platelets 487 x 10⁹/L; coagulation studies are normal.

- 8) Which of the following represents the least appropriate intervention?

- A) Intravenous iron
- B) Oral iron
- C) Referral to gynecology
- D) Transfusion of RBC

Case 4a.*

You are seeing a 50 year old female who is in the thoracics unit post-operatively for a lung transplantation. Her Post-operative bloodwork shows a Hb of 94 g/L, platelet count of $195 \times 10^9/L$, and a WBC count of $6.2 \times 10^9/L$. Her post-operative INR and PTT is normal. The procedure was complicated and the patient had significant thoracic bleeding intra-operatively. On the ward, the patient suddenly becomes unresponsive and hypotensive.

9) You suspect the patient may be bleeding heavily from a post-operative complication. You suggest initially:

- A) Getting a group and screen if possible, then getting 4 units of group-specific RBCs
- B) Getting a group and screen if possible, then getting 4 units of uncrossmatched RBCs
- C) Avoiding a group and screen and having 4 units of group-specific RBCs sent
- D) Avoiding a group and screen and having 4 units of uncrossmatched RBCs sent

Case 5.

You are on medical consults and are called to the orthopedics ward to assess an 82 year old female with Hb of 75g/L. The patient had ORIF of Right hip fracture 3 days ago and is convalescing. She has a history of coronary artery disease. The patient is apparently asymptomatic and her vital signs are BP 145/90 mmHg, HR 88, and oxygen saturation 96% on room air.

10) Which one of the following represents an evidence-based transfusion strategy for this patient?

- A) No transfusion is needed
- B) Order oral iron supplementation
- C) Transfuse 1 unit RBC now
- D) Transfuse 2 units RBC now

What if she is asymptomatic?

When you go to assess the patient pre-transfusion, she looks unwell. She is complaining of chest pressure that ensued following a shower. EKG is showing ST depressions in anterior leads. You page Cardiology on call.

11) Which one of the following represents an evidence-based transfusion strategy for this patient?

- A) No transfusion is needed at this time
- B) Transfuse 1 unit RBC rapidly
- C) Transfuse 1 unit RBC over 3 hours
- D) Transfuse 2 units RBC rapidly

What if she is symptomatic and has evidence of ischemia?