

Transfusion Camp 2023-24

Day 1: Seminar 1A, September 22, 2023

Triggers for RBC and platelet transfusions, Dr. Sebastian Vuong & Dr. Shuoyan Ning

Please start session by asking trainees if they have any questions from the didactic sessions.

Please remind trainees that although one answer is bolded as the correct answer, there may be more than one reasonable answer to the questions. The purpose of the seminar is to promote discussion and explore why certain answers may be more appropriate in certain situations.

Case 1

70 year old male is admitted to the ICU with respiratory failure due to pneumococcal pneumonia. His past medical history is significant for coronary artery disease but he has been asymptomatic since CABG approximately 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 79 g/L.

- 1) 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

Does this patient require RBC transfusion?

- 2) 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

What is the likely cause of his anemia?

- 3) You review the patient's laboratory results and notice that his troponin is significantly elevated. Troponin was ordered to further investigate an episode of rapid atrial fibrillation and ST changes earlier in the morning. Which one of the following represents the best 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

Case 2

27 yo patient with acute myeloid leukemia is admitted for induction chemotherapy. The patient is afebrile. The patient denies bleeding but examination reveals numerous petechiae on the lower extremities and a few large ecchymoses on the extremities and trunk. Morning CBC reveals Hb 73g/L and platelets $5 \times 10^9/L$. Review of recent CBC results indicates that the platelet count has not been above 10 for at least a week, despite daily or sometimes twice daily platelet transfusions.

- 4) In addition to investigating the lack of post-transfusion platelet count increment, which one of the following is the most appropriate transfusion strategy for this patient?
 - A) No point in transfusing the patient as platelet count doesn't go up
 - B) Order a slow drip of platelets to continue throughout the day
 - C) Transfuse 1 adult dose of platelets today
 - D) Transfuse 2 adult doses of platelets today
- 5) You suspect that the patient has developed platelet transfusion refractoriness. Which of the following investigations is NOT required to help you establish the cause of the refractoriness?
 - A) Bone marrow aspirate and biopsy
 - B) HLA antibody screen
 - C) Panculture to look for occult infection
 - D) Platelet count measured within the first hour post platelet transfusion
- 6) The investigations are consistent with alloimmune refractoriness and you request HLA-selected platelets. Please select the management strategy that would be least appropriate while awaiting arrival of HLA-selected platelets?
 - A) Give IVIg 1g/kg daily
 - B) Give oral tranexamic acid to treat minor bleeding
 - C) Transfuse ABO compatible and freshest available platelets
 - D) Transfuse platelets only to treat clinically significant bleeding

Case 3a

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

- 7) 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 3b

80 year old patient on aspirin and clopidogrel presents with spontaneous ICH. The patient's GCS is 15 and no surgical intervention is planned. The platelet count is $249 \times 10^9/L$ and INR and aPTT are normal.

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

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 remains active and continues with her weekly spinning classes. Her CBC reveals Hgb 60 g/L, MCV 65fL, platelets $487 \times 10(9)/L$; coagulation studies are normal.

- 9) Which of the following is NOT an appropriate initial intervention?**
- A) Intravenous iron**
 - B) Oral iron**
 - C) Referral to gynecology**
 - D) Transfusion of RBC**

Case 5.

A 2.5 year old toddler is seen because of pallor and the child's mother feels that she is less active than the other toddlers. Nutritional history indicates that the child is a fussy eater and continues to drink as many as 6 bottles of homogenized milk per day. CBC shows hemoglobin 79 g/L, MCV 72 fL, WBC $7.9 \times 10^9/L$, platelets $475 \times 10^9/L$.

- 10) Which of the following is the most appropriate management of this child's anemia?**
- A) Administer IV iron weekly for 6 weeks**
 - B) Increase dietary iron intake**
 - C) Provide nutritional intervention and oral iron supplementation**
 - D) Transfuse a weight-based dose of RBCs**