

PathMD™: Board Review Letter

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Blood Bank - Part 4

Volume 1, Number 47

1. Which of the following is the maximum amount of whole blood that can be collected from a donor:
 - A. 9.5 mL/kg
 - B. 10.5 mL/kg
 - C. 11.5 mL/kg
 - D. 12.5 mL/kg
 - E. None of the above

Answer: B. According to the 2004 AABB Transfusion standards, the maximum amount of whole blood you can collect from a donor is 10.5 mL/kg. *Test taking strategy.* 12.5 g/dL is the minimum hemoglobin concentration for donation (38% Hct.).

2. In which of the following situations can the transfusion be continued?
 - A. A patient develops hives while receiving FFP
 - B. A patient temperature increases from 98.5 to 100.5 F
 - C. A patient becomes acutely short of breath while receiving FFP
 - D. A patient has chills and develops back pain while receiving pRBCs
 - E. None of the above

Answer: A. Urticarial reactions is the only situation where the transfusion can be continued if the hives clear (type I hypersensitivity reaction to donor plasma).

3. Which of the following tests is the most sensitive to identify an acute hemolytic transfusion reaction?
 - A. Hematuria
 - B. Hemoglobinuria
 - C. Serum free hemoglobin
 - D. Post transfusion DAT
 - E. Haptoglobin level

Answer: C. Identification of serum free hemoglobin by spinning down the blood and looking for a change in color (pink to red) of the serum is the most sensitive test (2.5 – 5 mL of lysed blood can be identified) for an acute hemolytic reaction. (*The Osler Institute: Blood Bank.* Chaffin, DJ) Hematuria (blood in the urine) is not related to a hemolytic reaction, but probably a traumatized Foley catheter insertion. A positive DAT indicates that there is *in vivo* coating of red cells with antibody, but does not indicated if they are lysed.

4. All of the following are associated with contamination of RBC units EXCEPT:
 - A. *Yersinia enterocolitica*
 - B. *E. coli*
 - C. *Citrobacter freundii*
 - D. *Pseudomonas* species
 - E. Gram positive cocci

Answer: E. Gram positive cocci are associated with platelet transfusion. *Yersinia enterocolitica* is always a popular question, and is important because it likes to grow at low temperatures (which is how blood is stored).

5. In which of the following reactions, is the pathology mediated by donor anti-HLA anti-neutrophil antibodies attacking the recipient WBCs?
- A. Transfusion associated graft versus host disease
 - B. Anaphylactoid reaction
 - C. Transfusion related acute lung injury
 - D. Febrile nonhemolytic transfusion reaction
 - E. None of the above

Answer: C. Transfusion associated acute lung injury (TRALI) is due to the donor anti-HLA antibodies attacking the recipient WBCs. This is different from transfusion associated GVH, which results from donor lymphocytes attacking and taking over the recipients body. It is important to identify TRALI so the donor can be identified and deferred from donation in the future. Febrile non-hemolytic transfusion reactions result from release of cytokines from the donor's WBCs.

6. IgA deficient patients are at risk for which of the following type transfusion reactions?
- A. Febrile non-hemolytic transfusion reaction
 - B. Anaphylactic reaction
 - C. Anaphylactoid reaction
 - D. Febrile hemolytic transfusion reaction
 - E. Urticarial hypersensitivity reaction

Answer: B. Anaphylactic reactions are classically described in IgA deficient patients. Anaphylactoid reactions are usually described in the context of someone on an ACE inhibitor (bradykinin effect).

7. A woman (O +) with sickle cell disease (h/o multiple antibodies) has a newborn baby girl (A =) with an elevated indirect bilirubin and a positive DAT. An antibody screen was performed, which was negative. Which of the following is the most likely etiology?
- A. Rh hemolytic disease of the newborn (HDN)
 - B. ABO hemolytic disease of the newborn
 - C. HDN from Duffy antibody
 - D. HDN from Kidd antibody
 - E. Baby does not have HDN

Answer: B. ABO HDN is the most common form of hemolytic disease of the newborn. HDN is diagnosed in this case by evidence of hemolysis (increased indirect bilirubin) and a positive DAT. Rh HDN is eliminated because the antibody screen would be positive, as would be the case for Duffy or Kidd antibodies. Remember, Kell and Duffy can cause severe HDN, but Kidd doesn't usually because of the dosage effect.

8. A 32 y/o female (A positive) has an abruption during delivery of a healthy baby girl (O positive). Kleihauer-Betke test shows 3.2% fetal cells. What dose of RhIG (300 µg), = one vial of RhoGam, should the mother receive?
- A. 4 vials
 - B. 5 vials

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- C. 6 vials
- D. 7 vials
- E. None of the above

Answer: E. The mother is blood group A positive, and will not form Rh antibodies in subsequent pregnancies. If the mother were A negative and the baby O positive, then 6 vials of RhoGam should be given. Number of vials of RhoGam = $5/3 \times \text{K.B.}\%$ = round up or down, and add one vial (safety factor) $\rightarrow 1.666 \times 3.2 = 5.333 \rightarrow 5 + 1 \text{ vial} = 6 \text{ vials}$.

9. Platelet transfusion in the following circumstances is contraindicated EXCEPT:
- A. Thrombotic Thrombocytopenia Purpura
 - B. Renal Failure Thrombocytopenia
 - C. Heparin Induced Thrombocytopenia
 - D. Immune Thrombocytopenia Purpura
 - E. Hemolytic-Uremic Syndrome

Answer: B. Renal failure thrombocytopenia may be helped by platelet transfusion. TTP, HUS, and HIT are absolute contraindications, but ITP is a relative contraindication because it just won't help.

10. For neurosurgery the minimum platelet count should be:
- A. 10K
 - B. 50K
 - C. 100K
 - D. 250K
 - E. None of the above

Answer: C. Neurosurgical procedures will typically require at least a 100K patient platelet count. (*The Osler Institute: Blood Bank*. Chaffin, DJ.)

Notes for question set:¹

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