Transfusion Medicine Bootcamp for Nurses

Pre/Post Transfusion Knowledge Questions and Answer with Rationale

Plenary Session 1. Transfusion Guidelines/Blood Administration
Intravenous albumin: giving it for the right reason and the right way.

1. *Which of the following is an evidence-based indication for albumin?*

A. Patient with presumed sepsis just admitted to the Emergency Department.
B. Patient intraoperative undergoing a hip replacement surgery.
C. Patient post cardiac surgery with active bleeding from chest tubes.
D. Patient with cirrhosis admitted with spontaneous bacterial peritonitis.
E. Patient undergoing large volume paracentesis for ovarian cancer.

Answer: D

Rationale: As discussed in the presentation, per recommendation statements from International Collaborative for Transfusion Medicine Guidelines Intravenous Albumin Guideline Group.

2. *Jackie is a 65- year- old female undergoing large volume paracentesis today, due to ascites 7 liters of fluid to be removed. Her physician has also ordered Albumin 5% 200ml IV, infuse over 2.5 hours (80/ml/hour).*
   Jackie's nurse should (select all that apply):

A. Review the albumin monograph for guidance.
B. Call the physician to confirm the product (5% vs 25% albumin).
C. Send blood work for group and screen.
D. Start IV of Ringers lactate TKVO.

Answer: A and B

Rationale: As discussed in the presentation.

Plenary Session 2. Transfusion Reactions
Anaphylactic Transfusion Reactions

1. *What kind of blood products can cause an anaphylactic transfusion reaction?*

A. Plasma and Platelets only.
B. Blood components (RBC, Plasma or Platelets) only.
C. Fractionated plasma products (IVIG or Fibrinogen) only.
D. Any blood products.

Answer: D

Rationale: As demonstrated in the presentation, any blood products can induce an anaphylactic transfusion reaction. However, generally the incidence is higher in blood components containing a high volume of plasma.

2. *What is the mechanism of anaphylactic transfusion reaction?*

A. Anti-IgA in an IgA deficient recipient.
B. IgE mediated/allergen dependent.
C. Antibodies to polymorphic forms of serum proteins (i.e., haptoglobin).
D. All of the above.

Answer: D

Rationale: The mechanism of anaphylactic transfusion reactions is incompletely understood, however, the following mechanisms have been implicated in anaphylactic reactions:

- IgA-deficient patients who have anti-IgA antibodies.
- Patient antibodies to plasma proteins (such as IgG, albumin, haptoglobin, transferrin, C3, C4 or cytokines).
- Transfusing an allergen to a sensitized patient (for example, penicillin or nuts consumed by a donor).
- Transfusion of IgE antibodies from a donor to an allergen present in the recipient.

3. *26-year-old woman with severe aplastic anemia awaiting for SCT, had experienced anaphylactic transfusion reaction to platelets while receiving the transfusion in an outpatient clinic. She reported feeling drowsy with blurred vision and developed hives >2/3 BSA towards the end of the transfusion. Her BP went down to 89/55 from baseline 103/70 and the patient had a syncopal episode. She was given hydrocortisone 100 mg IV and an NS bolus with pressure bag. A code blue was called, and the team administered a second dose of hydrocortisone 100 mg IV, Benadryl 50 mg IV and 0.5 mg of epinephrine IM.*
   What precaution should be taken/recommended for next transfusion?

A. Pre-medication with antihistamine.
B. Blood Product modification- plasma volume reduced/ washed blood products.
C. Send samples for anti-IgA testing.
D. A and B only.
E. All of the above.

Answer: E

Rationale: As discussed in the presentation, Patient management following anaphylactic transfusion reactions are dependent on the severity of the initial reaction, the treatment response and sometimes, based on the lab testing available. These are some of the precautionary measures that are routinely recommended, if patient requires transfusion immediately post reaction while the outcome of investigation is still pending.

Concurrent Session 3A:
Epoetin Alfa The Who, What, When, and Why?

1. *What should I monitor while giving eprex?*

A. CBC, serum iron profile with ferritin.
B. Hematocrit, ferritin, TSAT.
C. CBC, C-reactive protein, ferritin.
D. Hemoglobin, ferritin, B12.

Answer: A

2. *Patients should not be prescribed eprex if:*

A. They are allergic to eprex or any of its listed ingredients.
B. They have high blood pressure not controlled with medication.
C. They have been diagnosed with Red Cell Aplasia.
D. They are undergoing chemotherapy.

Options:
A) B and D
B) A, B, C.
C) D.
D) All of the above.

Answer: B

3. *Eprex can be given:*

A. Intravenously and topically.
B. Subcutaneously or orally.
C. Intravenously or subcutaneously.
D. Topically and intramuscular.

Answer: C

Rationale: As discussed in the presentation.

Concurrent Session 3B:
To Transfuse Or Not To Transfuse For Patients Sickle Cell Disease.

1. *Select the correct response:*

A. Sickle cell patients on chronic transfusions are not at high risk for iron overload.
B. Transfusion triggers are the same for patients with or without sickle cell disease.
C. The risk of delayed hemolytic transfusion reactions is decreased if phenotypically matched blood is provided.
D. Units for transfusion should be irradiated.
E. Alloantibody development occurs rarely in the transfused sickle cell patient.

Answer: C

Rationale: Delayed hemolytic transfusion reactions occur when patients are repeatedly exposed to the same foreign RBC antigen, which is a common occurrence when transfusing patients with sickle cell disease. Providing extended matching beyond the standard ABO/RhD consideration used for most patients can help protect sickle cell patients from these reactions.

2. *In the absence of symptoms of inadequate tissue oxygen delivery, at what hemoglobin range should you first consider a red cell transfusion?*

A. Less than 50 g/L.
B. When between 50 g/L – 60 g/L.
C. Whenever it's less than 70 g/L.
D. When between 70 g/L – 80 g/L.
E. Based on patient's request for transfusion.

Answer: A

Rationale: Patients with sickle cell disease are chronically anemic, and experience a higher risk of adverse reactions to transfusions than other patients. Current guidelines state that if a sickle cell patient with a hemoglobin > 50 g/L is not experiencing significant symptoms of anemia, is not bleeding, and is not showing signs of organ dysfunction, it is probably better to observe them carefully than to transfuse.

3. *True or False:*

When a patient with sickle cell disease arrives to the emergency department with an uncomplicated vaso-occlusive pain crisis, transfusions are one of the recommended treatments to help reduce pain and improve bioavailability of oxygen.

Answer: False

Rationale: When a patient arrives at the emergency department with an uncomplicated vaso-occlusive pain crisis, a transfusion is **not** recommended and is often the cause of many inappropriate administrations of transfusions. Risk for antibody development, delayed transfusion reactions, and increasing blood viscosity are all reasons to avoid transfusions for patients presenting with an uncomplicated pain crises.

Concurrent Session 3C:
Solvent Detergent Plasma: Is this Washed Plasma or …

1. *The transition to pathogen-reduced plasma (solvent detergent [S/D] plasma, Octaplasma™) provides an additional layer of safety to Canada's blood supply system. The additional safety includes:*

A. Decreased risk of allergic transfusion reactions.
B. Inactivating all viruses.
C. Inactivating all bacteria.
D. Pooled product, patient/recipient blood group not relevant.

Answer: A

Rationale: Octapharma's S/D treatment process damages lipid membranes and provides safety against lipid enveloped bacteria, protozoa, and viruses such as HIV, HBV, HCV, West Nile virus and Zika virus. However, S/D treatment has no effect on non-enveloped viruses (such as hepatitis A and parvovirus B19; nucleic acid testing is performed for hepatitis A and parvovirus B19 for the plasma pools). The sterile filtration step depletes leukocytes and bacteria, as well as reducing prion transmission risks.
The pooling of the plasma dilutes antigens, antibodies, and cytokines present in individual plasma units and provides neutralizing antibodies. S/D plasma has decreased risks of allergic transfusion reactions and transfusion related acute lung injury (TRALI).
For further details refer to
https://professionaleducation.blood.ca/en/transfusion/publications/solvent-detergent-sd-treated-plasma-octaplasma

2. *Emma is a 23-year-old female trauma patient in your emergency department. Massive hemorrhage protocol is ordered. Blood group & screen test results are pending. Select the plasma (S/D plasma) blood group to be transfused:*

A. Group O, Rh positive.
B. Group O, Rh negative.
C. Group AB, Rh negative.
D. Group AB (Rh is not relevant for plasma transfusion).

Answer: D

Rationale: As per the presentation, plasma administration, including S/D plasma must be ABO blood group compatible. Anti-A and/or anti-B antibodies in transfused plasma can hemolyse the patient's RBCs, if the patient's RBCs have the corresponding antigen on their surface. Rh(D) blood group is not relevant for plasma transfusion (plasma is a non-cellular blood component [i.e., no antigens]). In a patient scenario where the ABO blood group is unknown, group AB plasma is compatible with all ABO blood groups.

3. *When transfusing S/D plasma:*

A. Visual inspection of the product is not necessary; some visible particulates or clumping is okay.
B. Compatible with all IV fluids (0.9% sodium chloride (NaCl), 5% dextrose in water (D5W), Ringer's Lactate).
C. Use standard blood tubing with a 170 to 260 micron filter.
D. Infuse as quickly as possible (half-life of coagulation proteins is less than 30 minutes).

Answer: C

Rationale: As per the presentation.
Visual inspection of all blood to be infused is necessary. S/D plasma that is cloudy, has visible particulates/precipitates, clumping or deposits should NOT be transfused.
S/D plasma is compatible with 0.9 % sodium chloride only and can be given concurrently

with FP or other blood products.
S/D plasma must be infused using blood tubing with 170 to 260 micron filter. The blood tubing/filter can be used to infuse a maximum of 4 units of blood or for 4 hours of time, whichever comes first (refer to the specifics of your hospital policy). Platelets should always be transfused with a new tubing/filter set.
Plasma, generally, can be transfused over 30 - 120 minutes. A maximum infusion rate of 1 mL/kg/min is noted in the S/D plasma monograph (e.g., 70 kg patient, the maximum rate would allow for an infusion of 1 unit in 3 minutes).
In bleeding patient/MHP clinical scenarios, the transfusion rate for plasma is much faster (a rapid infuser can infuse at rates up to 750-1000 mL/min).
For FP, the maximum transfusion time frame is 4 hours from the time of issue from TML. For S/D plasma, the maximum transfusion time frame is 4 hours from spiking the bag.
Patients receiving plasma are at high risk for transfusion associated circulatory overload (TACO).