Dr. Jeannie Callum, RBC Transfusion

Reasonable approach for inpatients

Remember not to transfuse for pallor/fatigue!

Patient scenario	Hemoglobin threshold	Transfusion approach
Young patient with severe iron or B12 deficiency anemia with only fatigue and pallor	Any	Iv iron (or B12 im/po)
Young patient with reversible asymptomatic anemia (eg. Postpartum, recovering young trauma)	<50 g/L	1 unit
Average patient without symptoms or cardiac history (eg. ICU, CVICU, hem-onc)	<70 g/L	1 unit
Cardiac history without symptoms	<70-80 g/L	1 unit
Hemodynamic symptoms (tachycardia, pre-syncope, etc)	<90 g/L	1 unit
Myocardial infarction with only fatigue and pallor (or randomize to MINT)	<80 g/L	1 unit GO SLOW
Slow bleeding and asymptomatic anemia	<70 g/L	1-2 units
Rapid hemorrhage (eg. Stabbing, gunshot, varices)	Keep 60-110 g/L	As many as you need! Don't forget to use the term uncrossmatched!

Clinical Pearls

- Request K negative RBCs for females of child bearing age
- Check if your patient requires irradiated RBCs

Summary

- Use these trials to help set your 'general' transfusion trigger where you might **consider** a transfusion
- Don't be overly prescriptive – just because the hemoglobin is 69 g/L you don't have to transfuse
- Look at your patient – Are they symptomatic? Adjust the trigger to your patient's co-morbidities
- Unless rapid bleeding, transfuse 1 unit at a time (inpatients)
- Write a rate
- Anticipate and prevent TACO

5 things I hope you will do in 2020

1. Give iron deficient patients iron instead of blood unless clear hemodynamic instability
2. Make extra efforts for young women to prevent transfusion and alloimmunization risk
3. Adopt a restrictive transfusion approach for most patients
4. Transfuse one at a time (even in the operating room) unless brisk bleeding – check hemoglobin after every unit
5. Think about the other patient (the donor) when you transfuse – we have a duty of care to the other patient

Dr. Yulia Lin, Blood Bank Testing Basics

What does the group test?	ABO & Rh
What does the antibody screen test?	Antibodies against non-ABO antigens
How long does a fast crossmatch take?	2-5 minutes
When can the Blood Bank use a fast crossmatch?	Antibody Screen negative
How long does a full/slow crossmatch take?	45 minutes
If there is a positive antibody screen, what does this mean for your patient?	There may be a delay in blood 

Clinical Pearls

- Antibody screen negative
  - = FAST crossmatch = No need to crossmatch units ahead of time
- Antibody screen positive
  - = Possible DELAY in getting blood because of extra steps to find blood
  - Blood bank has to identify antibody, find antigen negative units and do a full crossmatch
- Uncrossmatched blood
  - Used in an emergency where the risk of delaying transfusion outweigh the risks of acute hemolysis
  - To get uncrossmatched blood, call Blood Bank and ask for blood NOW
- O negative uncrossmatched RBCs are reserved for females of childbearing age
  - O negative just means O RhD negative – it is not necessarily negative for other antigens
- What's all this talk about a 2nd sample?
  - The purpose of a 2nd sample is to confirm the ABO type – this is a check using a historical group or independent 2nd sample drawn at a different time
  - NEVER draw 2 tubes at the same time and hold one back to send later – this is a dangerous practice and you could be drawing the wrong blood twice!
- What to do if you don't end up needing a unit?
  - Return back to blood bank as soon as possible (60 minutes or less; otherwise blood bank may have to discard the unit)
  - If you received it within a cooler, than you may have 4 hours (check with your local blood bank)
  - Return the products as you received them
    - In a plastic bag, return as is (do not put in cooler).
    - In a cooler, keep in cooler with lid closed.

Dr. Katerina Pavenski, Platelet Transfusion

PLT (x 10^9/L)	Clinical Setting	Suggest
<10	Non-immune thrombocytopenia	Transfuse 1 pool of platelets[45]
<10	Non-immune thrombocytopenia & HLA-alloimmunized	Transfuse 1 unit of HLA-matched apheresis platelets[45]
<20	Procedures not associated with significant blood loss (e.g., central line placement)	Transfuse 1 pool of platelets[15]
20-50	Procedures not associated with significant blood loss	1 pool of platelets on hold, transfuse only if significant bleeding[38]
<30	Patient on anticoagulants that should not be stopped	Transfuse 1 pool of platelets
<50	Epidural anesthesia and lumbar puncture	Transfuse 1 pool immediately before procedure[15,47]
<50	Procedures associated with blood loss or major surgery (>500 mL expected blood loss)	Transfuse 1 pool immediately before procedure[38,48]
<50	Immune thrombocytopenia	Transfuse platelets only with life-threatening bleeding[49]
<100	Pre-neurosurgery or head trauma	Transfuse 1 pool of platelets[50,51]
Any	Platelet dysfunction and marked bleeding (e.g., post cardiopulmonary bypass). **Exception: Transfusing platelets for intracranial hemorrhage not requiring surgical management in patients on antiplatelet agents leads to increased morbidity**	Transfuse 1 pool of platelets[38,52]

Clinical Pearls

- 1 adult dose = 1 apheresis unit = 1 buffy coat pool (derived from 4 donors in Canada)
- 1 adult dose will raise the platelet count by 30-40 x 10^9/L
- Check if your patient requires irradiated platelets
- For platelet refractoriness
  - Confirm refractoriness with 2 consecutive post-transfusion count increments
  - Poor 1 hour post-transfusion count increase is consistent with immune refractoriness
  - Adequate 1 hour post-transfusion with poor 18-24 hour count increase is most often associated with non-immune refractoriness
- For immune platelet refractoriness, think about HLA antibodies (and less common anti-HPA antibodies)

Dr. Aditi Khandelwal, Plasma, PCC, and Fibrinogen Replacement

Summary – Plasma

- Different patient populations have different INR thresholds for plasma before procedures
  - MESSAGE#1: You must know why the INR is high
- In liver disease, plasma for INRs 1.3 to 1.8 is unlikely to even change the INR let alone patient outcomes
  - MESSAGE#2: Don't transfuse plasma if INR<1.8 in a patient with liver disease without hemorrhage
- In liver disease, the use of plasma does not reduce bleeding risk before procedures
  - MESSAGE#3: Don't transfuse plasma if INR elevated before low risk procedures (PLT>20) and limit to high risk procedures (PLT>30, INR<2.5, FIB>1.0 only) and use lower risk techniques (transjugular liver biopsy)

Summary - PCCs

Emergency reversal

- Vitamin K 10 mg iv
- PCC:
  - INR<3 – 1000
  - INR 3-5 – 2000
  - INR>5 – 3000
  - INR unknown – 2000
  - Each 1000 over 5 min

Non-emergency

- Vitamin K only!
- INR>8-10 – 2 mg po
- Urgent surgery – 10 mg iv
- Non-critical bleeding – 1 mg iv

Summary - Fibrinogen

- Fibrinogen replacement:
  - MESSAGE#1: Transfuse fibrinogen or cryo for bleeding patients <1.5-2.0 g/L
  - MESSAGE#2: Acute promyelocytic leukemia patients if fibrinogen<1.5 g/L in acute phase even without bleeding (no other non-bleeding patients)