



## Dr. Jeannie Callum, RBC Transfusion

# REASONABLE APPROACH FOR INPATIENTS

Patient scenario	Hemoglobin	Transfusion approach
Young patient with severe iron or B12 deficiency anemia with only fatigue and pallor	Any	Iv iron (or B12 <u>im/po</u> )
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	<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! Order <u>uncrossmatched!</u>

## Summary

- RBCs are expensive and associated with adverse events
- Adhere to a restrictive transfusion strategy – 70 g/L and 1 unit at a time = default strategy unless brisk hemorrhage
- The largest risk is TACO – be thoughtful with onboarding
- We have an extensive literature base to support a restrictive transfusion strategy
- Guidelines support a restrictive approach

## 5 things I hope you will do in 2022/2023

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. Thoughtfully onboard red cells in patients at higher risk of TACO



## Dr. Katerina Pavenski, Platelet Transfusion


PLT ( $\times 10^9/L$ )	CLINICAL SETTING	SUGGEST
<10	Non-immune thrombocytopenia	Transfuse 1 pool of platelets <sup>45</sup>
<10	Non-immune thrombocytopenia & HLA-alloimmunized	Transfuse 1 unit of HLA-matched apheresis platelets <sup>45</sup>
<20	Procedures not associated with significant blood loss (e.g., central line placement)	Transfuse 1 pool of platelets <sup>15</sup>
20-50	Procedures not associated with significant blood loss	1 pool of platelets on hold, transfuse only if significant bleeding <sup>38</sup>
<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 <sup>15,47</sup>
<50	Procedures associated with blood loss or major surgery (>500 mL expected blood loss)	Transfuse 1 pool immediately before procedure <sup>38,48</sup>
<50	Immune thrombocytopenia	Transfuse platelets only with life-threatening bleeding <sup>49</sup>
<100	Pre-neurosurgery or head trauma	Transfuse 1 pool of platelets <sup>50,51</sup>
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 <sup>38,52</sup>

### Clinical Pearls

- 1 adult dose = 1 apheresis unit = 1 buffy coat pool (derived from 4 donors in Canada)
  - Transfused over 60 minutes
  - Will raise platelet count by 30-40  $\times 10^9/L$
- 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
  - Immune platelet refractoriness may be caused by HLA (+/-HPA antibodies) and may be managed by HLA selected platelet transfusions



## Dr. Yulia Lin – Blood Bank Testing Basics

What does the group test?	ABO & <u>Rh</u>
What does the antibody screen test?	Antibodies against non-ABO antigens
How long does a fast <u>crossmatch</u> take?	2-5 minutes
When can the Blood Bank use a fast <u>crossmatch</u> ?	Antibody Screen negative
How long does a full/slow <u>crossmatch</u> 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 patients of childbearing potential
  - ▶ O negative just means O RhD negative – it is not necessarily negative for other antigens
- ▶ What's all this talk about a 2<sup>nd</sup> sample?
  - ▶ The purpose of a 2<sup>nd</sup> sample is to confirm the ABO type – this is a check using a historical group or independent 2<sup>nd</sup> 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. Aditi Khandelwal, Plasma, PCC, and Fibrinogen Replacement

### Summary – Plasma

- Different patient populations have different INR thresholds for plasma before procedures
  - 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
  - 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
  - Don't transfuse plasma if INR elevated before low-risk procedures (PLT>20)
  - limit to high-risk procedures (PLT>30, INR<2.5, FIB>1.0 only)
  - use lower risk techniques (transjugular liver biopsy)

### Summary – Prothrombin Complex Concentrate

#### Emergency reversal

- Vitamin K 10 mg IV
- PCC:
  - INR<3 – 1000IU
  - INR 3-5 – 2000IU
  - INR>5 – 3000IU
  - INR unknown – 2000IU
  - Each 1000IU (5mL) over 5 min

#### Non-emergency

- Vitamin K only!
- INR > 8 to 10: 2 mg po
- Urgent surgery: 10 mg IV
- Non-critical bleeding: 1 mg IV

### Summary – Fibrinogen Concentrate

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