APPROACH TO TRANSFUSION

Transfusion of blood products is frequent in the ICU. This summary will provide an approach to transfusion in critically ill patients. With COVID-19 we are anticipating a potential blood shortage. Efforts to conserve blood products are critical at this time.

OBTAINING CONSENT

Consent is the responsibility of the physician or nurse practitioner who orders the transfusion. Consent is **mandatory** except in life-threatening circumstances where consent cannot be provided.

DISCUSSION SHOULD INCLUDE:

- Description of treatment: What?
- Benefits: Why?
- Risks
- Alternatives
- Opportunity to answer patient's questions

TRANSFUSION RISKS:

- Common 1 in 100 (fever, hives, fluid overload)
- Rare < 1 in 1 million (HIV, Hepatitis B, C)
- Serious reactions < 1 in 10,000
  (lung injury, bacterial sepsis, major allergic reaction, incompatible blood)

Current evidence and risk modelling suggest that **COVID-19 is not transmissible through blood transfusion.

GENERAL CONSIDERATIONS

- Anticoagulation and thrombocytopenia:
  - Plts < 50: Hold full anticoagulation
  - Plts < 25-30: Hold VTE prophylaxis
- Most minor procedures (line placement, thoracentesis, paracentesis) can be done safely at any INR.

COVID-SPECIFIC CONSIDERATIONS

- The donor supply is at risk with COVID-19 → Conservation strategies are critical
- IVIG is not suggested
  - As of Mar 26, 2020, there is no data to support the use of IVIG. During SARS, IVIG was associated with increased thromboembolic events.
- Convalescent plasma is not suggested
  - As of Mar 26, 2020, this is not available in Canada but studies are underway.

TRANSFUSION OF SPECIFIC BLOOD PRODUCTS

The advice below does not apply to life-threatening hemorrhage which may require more rapid administration of blood products or a massive transfusion protocol.

Blood Product	When to Transfuse	How to Transfuse
RBCs	Non-bleeding, asymptomatic patient: Hgb < 70g/L Post-cardiac surgery: Hgb < 75g/L Active cardiac ischemia: Hgb < 80g/L	• 1 unit at a time over 2 hours (not more than 4 hours) • If age > 65 yrs, with CHF or renal dysfunction, use slower rate and furosemide IV pre-transfusion • Assess clinical status and Hgb before transfusing further • 1 unit = ↑ Hgb ~ 10 g/L in non-bleeding patient
Platelets	Prevent spontaneous bleeding: Plt < 10 x 10^9 Treat major bleeding or prevent bleeding with major procedure: Plt < 50 x 10^9 Treat or prevent CNS bleeding: Plt < 100 x 10^9	• Transfuse each dose over 1-2 hours (max 4 hours) • If age > 65 yrs, with CHF or renal dysfunction, use slower rate and furosemide IV pre-transfusion • Assess clinical status & plt count before transfusing further • Each platelet dose increases plt count by 15-50 x 10^9/L
FFP	Multiple clotting factor deficiencies where a more specific concentrate is not available AND Major bleeding or procedure with INR ≥ 1.8; OR Microvascular bleeding, massive transfusion and cannot wait for labs.	• The half-life of plasma is only 6-8 hrs • Dose = 15 mL/kg (3-4 units) which ↑clotting factors by 20%, giving 1-2 units is **NOT** useful • Takes 30 minutes to thaw • Consider giving vitamin K 10mg IV
PCC	Indicated for <u>urgent or emergent</u> reversal of warfarin or vitamin K deficiency (Off label for urgent or emergent reversal of oral Factor Xa inhibitors)	• Typical dose is 1000 units (40mL) but depends on INR • Reconstituted at the bedside and given over 15 minutes • Lasts only ~6 hours → Need to give IV vitamin K as well • (Typical dose for oral FXa inhibitor reversal is 2000 units)
Fibrinogen Concentrate	Life threatening hemorrhage: Fibrinogen < 1.5-2g/L Microvascular bleeding: Fibrinogen < 1g/L	• Dose = 4 g IV push (each 1 g over 5 min) or minibag over 30min • Reconstituted at the bedside • Each dose↑ fibrinogen by ~ 0.7 g/L

Adapted from *<u>Primer for Transfusion in Adult Critical Care</u>* by Dr. Yulia Lin