

Applies to former Saskatoon Health Region area

Transfusion Best Practice Recommendations – Informational Document

Purpose

This document provides instructions for screening all red cell orders on stable, non-bleeding, hospitalized adults by the staff in the Transfusion Medicine Laboratory for alignment with the transfusion best practice recommendations¹². This document also provides transfusion best practice recommendations for plasma and platelet transfusions.

Policy

- Orders that are in alignment with the transfusion best practice recommendations will be filled without question.
- If necessary to determine alignment, Laboratory staff will contact the care unit involved to obtain missing information.
- Orders that are outside of the recommendations shall be cleared with the Transfusion Medicine Physician on call.

Definitions

For the purposes of this document, the following definitions apply:

Term, abbreviation, acronym, etc.	Definition
Hb	Hemoglobin
PCC	Prothrombin Complex Concentrate
RBC	Red Blood Cells
Shall	Indicates the action is mandatory
Should	Indicates the action is recommended
TACO	Transfusion Associated Circulatory Overload

General Information

A – Red Blood Cells³⁴⁵

- One unit usually raises the hemoglobin by approximately 10 g/L. The RBC age is irrelevant.
- Transfusion should not be administered based on a hemoglobin value alone.
- Transfusion of RBC is indicated in treatment of symptomatic anemia, which includes:
 - Presyncope (including orthostatic hypotension) or syncope, hypotension.
 - Dyspnea with or without tachycardia.
 - Chest pain with or without tachycardia.
 - Fatigue alone is not a symptom of anemia which should lead to transfusion.
- For non-bleeding patients, the usual dose is 1 unit of RBC.
 - Transfuse one unit of RBC then recheck hemoglobin and patient symptoms before transfusing the second unit.
- Pre-medications:
 - Antihistamines should be considered if there is a history of minor or moderate allergic reactions with previous transfusions.
 - Antipyretics for prevention of recurrent fever are not recommended.

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- Diuretics should be administered before transfusion to patients at risk for transfusion associated circulatory overload (TACO), if the patient is not hypovolemic and is hemodynamically stable. TACO risk factors include:
 - Acute or chronic renal insufficiency
 - Positive fluid balance
 - Age > 70
 - Congestive heart failure or left ventricular dysfunction
 - History of myocardial infarction
- Administer each unit at a rate appropriate for the patient volume status
 - Hypovolemic – over 1 to 1.5 hours
 - Normovolemic – over 2 hours
 - Hypervolemic – over 3 to 4 hours
- Whenever possible, all transfusions should be completed during the day shift for optimum patient safety.

Clinical Setting	Recommendation and dose
Hemoglobin (Hb) less than or equal to 60 g/L*	Transfusion should be considered. <u>Exceptions:</u> <ul style="list-style-type: none"> • Young patients may tolerate Hb levels under 60g/L without transfusion • Patients with chronic iron deficiency anemia without anemia symptoms; IV iron supplementation should be given instead Transfuse 1-2 units and re-check patient symptoms and Hb
Hb less than or equal to 70 g/L*	Transfusion of 1 unit RBC is likely acceptable. If RBC transfusion is given, re-check patient symptoms and Hb before giving second unit. <u>Exceptions:</u> <ul style="list-style-type: none"> • Young patients may tolerate Hb levels under 60 g/L without transfusion • Patients with chronic iron deficiency anemia without anemia symptoms; IV iron supplementation should be given instead • Patients with sickle cell disease
Hb less than or equal to 80 g/L*	Consider RBC transfusion in patients: <ul style="list-style-type: none"> • With pre-existing cardiovascular disease with or without symptoms of anemia. Consider maintaining Hb greater than 80 g/L in these patients. Transfuse 1 unit and recheck patient symptoms and Hb before giving second unit.
Hb 81-90 g/L*	RBC transfusion likely inappropriate, unless there is symptomatic anemia or clinical evidence of impaired tissue oxygenation.
Hb greater than 90 g/L*	RBC transfusion likely inappropriate. If transfusion is ordered, clearly document indication in patient's chart and discuss reason with patient. Request must be cleared by Transfusion Medicine Physician on call.
Bleeding patient	Low cardiovascular risk patient – maintain Hb greater than 70 g/L. Pre-existing uncorrected cardiovascular disease – maintain Hb greater than 80g/L

(*assumes patient is NOT bleeding)

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B – Plasma⁶⁷⁸⁹¹⁰¹¹¹²

- Allow at least 20 minutes for thawing of plasma. Pre-thawed plasma is not routinely stocked.
- The effectiveness of plasma in reversing an elevated INR is dependent upon the etiology of the coagulopathy.
- Dose is 10–15 mL/kg = 3-4 units (250 mL/unit) for an adult.
- One dose raises coagulation factor levels by approximately 20% and duration efficacy is dependent on the factor half-life being replaced.
- Pre-procedure plasma transfusion is not required for minor procedures regardless of the INR (for example, arterial line, central venous line placement, paracentesis or endoscopy without biopsy).
- Premedication:
 - Antihistamines should be considered if there is a history of minor or moderate allergic reactions with previous transfusions.
 - Antipyretics for prevention of recurrent fever are not recommended.
 - Diuretics should be administered before transfusion to patients at risk for transfusion associated circulatory overload (TACO), if the patient is not hypovolemic and is hemodynamically stable. TACO risk factors include:
 - Acute or chronic renal insufficiency
 - Positive fluid balance
 - Age > 70
 - Congestive heart failure or left ventricular dysfunction
 - History of myocardial infarction
- Administer each unit at a rate appropriate for the patient volume status:
 - Hypovolemic – over 1 to 1.5 hours
 - Normovolemic – over 2 hours
 - Hypervolemic – over 3 -4 hours
- Whenever possible, all transfusions should be completed during the day shift for optimum patient safety.

Clinical Setting		Recommendation and dose
Diagnosis/Indication	INR	
<ul style="list-style-type: none"> • Elevated INR without bleeding (regardless of cause) • Paracentesis in liver disease 	Any	No plasma transfusion
<ul style="list-style-type: none"> • Significant bleeding • Liver disease with coagulopathy and <u>invasive</u> procedure planned 	Greater than 3.0	3-4 units for adult (10-15 mL/kg)
<ul style="list-style-type: none"> • Microvascular bleeding • Massive transfusion 	Greater than 1.7 or unknown and cannot wait for result	3-4 units for adult (10-15 mL/kg)
<ul style="list-style-type: none"> • Urgent warfarin reversal and <ul style="list-style-type: none"> • Life threatening bleeding • Urgent surgical procedure required within 6 hours 	Greater than 1.5	<i>Do not use plasma</i> Administer 10 mg IV Vitamin K plus Prothrombin Complex Concentrates (PCC) <u>Exceptions:</u> <ul style="list-style-type: none"> • PCC unavailable

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		<ul style="list-style-type: none"> PCC contraindicated (e.g. history of heparin-induced thrombocytopenia).
<ul style="list-style-type: none"> Congenital coagulation factor deficiency where a factor concentrate is not available and <ul style="list-style-type: none"> Life threatening bleeding Urgent surgical procedure required 	Greater than 1.5	Consult a hematologist
<ul style="list-style-type: none"> Thrombotic thrombocytopenic purpura (TTP) 	Any	Pending plasma exchange; Consult a hematologist

C – Platelets¹³¹⁴¹⁵¹⁶¹⁷¹⁸¹⁹

- One adult dose of platelets = one buffy coat pool (comprised of a pool of 4 donor units) or one apheresis single donor unit.
- Transfusion of platelets is indicated for prophylaxis against bleeding or for management of acute bleeding in patients with thrombocytopenia or platelet dysfunction.
- One dose should raise the platelet count by at least $15 \times 10^9/L$ and often approximately $25-40 \times 10^9/L$.
- Pre-medications:
 - Antihistamines should be considered if there is a history of minor or moderate allergic reactions with previous transfusions.
 - Antipyretics for prevention of recurrent fever are not recommended.
- Administer each unit at a rate appropriate for the patient volume status:
 - Normovolemic – over 1 hour
 - Hypervolemic – over 1.5 to 2 hours
- Whenever possible, all transfusions should be completed during the day shift, for optimum patient safety.

Clinical Setting		Recommendation and adult dose
Diagnosis/Indication	Platelet Count $\times 10^9/L$	
Non-immune, therapy-induced hypoproliferative thrombocytopenia (prophylactic transfusion)	Less than 10	1 dose
Procedures not associated with significant blood loss (PICC line placement, tunneled and untunneled central venous line placement, paracentesis, thoracentesis, endoscopy without biopsy)	Less than 20	1 dose
Prophylactic anticoagulation that cannot be stopped	Less than 30	1 dose
Therapeutic anticoagulation that cannot be stopped	Less than 30-50	1 dose, and consult thrombosis specialist
<ul style="list-style-type: none"> Lumbar puncture Procedures with expected blood loss greater than 500 ml Major non-neuraxial surgery Significant bleeding risk (ex. Renal biopsy, hepatic biopsy) 	Less than 50	1 dose, immediately before procedure, and check platelet response before starting procedure
<ul style="list-style-type: none"> Epidural anesthesia placement 	Less than 80	1 dose, immediately before procedure, and

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		check platelet response before starting procedure
<ul style="list-style-type: none"> • Head trauma or CNS hemorrhage • Neuraxial surgery • Life-threatening hemorrhage 	Less than 100	1 dose, and check platelet count
Platelet dysfunction and significant bleeding <ul style="list-style-type: none"> • Includes bleeding with antiplatelet therapy (clopidogrel, ticagrelor, ASA 325 mg), post cardiopulmonary bypass; congenital platelet function defects 	any	1 dose Exception: Platelet transfusion NOT recommended for intracranial hemorrhage not requiring surgery, due to increased mortality risk
Immune thrombocytopenia (ITP)	any	1 dose, for life-threatening bleeding only and Consult a hematologist

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