Saskatchewan Health Authority

MEMO

DATE: 2020-Apr-02

TO: Saskatchewan Clinical Care Providers
Saskatchewan Transfusion Service/Laboratory Staff

FROM: Dr. Sheila Rutledge Harding, Provincial Clinical Lead, Transfusion Medicine
Dr. Ryan Lett, Anesthesiologist and Physician Lead for the Patient Blood Management Program

RE: **Continuation of the Green Phase Advisory Affecting Blood Inventory – Platelet Addendum**

Dear Colleagues:

Canadian Blood Services is expecting a Canada-wide blood shortage during the isolation period of the COVID-19 pandemic, due to reduced donation. The first component that will be affected is platelets because of their relatively short shelf life.

There are very few randomized controlled trials on which to base recommendations regarding precise platelet transfusion thresholds. A 2018 Cochrane review on platelet transfusion prior to surgery in the setting of thrombocytopenia found no differences between those transfused to higher versus lower platelet thresholds but there was insufficient evidence to issue a recommendation. There are, however, well-researched expert opinion guidelines that have been incorporated into Saskatchewan's *Transfusion Best Practice Recommendations in Adult Patients*. Please take the time to familiarize yourself with the platelet guidelines specifically (pages 4-5; attached), as there are several nuances to be considered depending on the patient, the procedure, and ongoing bleeding.

In summary:

- Platelets are inappropriate for
  - heparin-induced thrombocytopenia,
  - thrombotic thrombocytopenia purpura/hemolytic uremic syndrome,
  - asymptomatic patients with chronic bone marrow failure, and
  - intracranial hemorrhage not requiring surgery even if on ASA or clopidogrel due to increased mortality.
- For non-bleeding prophylaxis, platelet transfusion may be considered for platelets less than 10 x 10^9/L.

- For procedures with a low risk of bleeding, transfusion may be considered with a platelet count less than 20 x 10^9/L.
- For patients with a high risk of bleeding or severe hemorrhage, platelet counts should be kept greater than 50 x 10^9/L.
    - The exception is for patients in liver failure, for whom platelet transfusion has not been shown to improve outcomes because most platelets are sequestered.
- For neuraxial bleeding or surgery, the expert consensus remains to aim for a platelet count of 100 x 10^9/L. If you have read the guidelines and still have questions, please consult the Transfusion Medicine physician on call.

There are several therapeutic adjuncts that may **improve hemostatic function of platelets** without altering the platelet number:

1. Discontinue antiplatelet agents early in the care of patients at risk of hemorrhage. Administer activated charcoal if recent ingestion less than 4 hours in the setting of active bleeding.
2. Maintain a hematocrit greater than 30 percent (approximate = Hb 90 g/L). Ideally, this should be done using intravenous iron and erythropoietin in the non-bleeding patient but may require RBC transfusion in the setting of active hemorrhage. Iron deficiency exacerbates platelet dysfunction.
3. DDAVP 0.3 mcg/kg up to 20 mcg total dose can be considered in the setting of Von Willebrand Disease or other platelet dysfunction, including uremia and patients taking ASA.
4. The use of cryoprecipitate or fibrinogen concentrate improves the aggregation of platelets and may be considered. 4 grams of fibrinogen concentrate raises the plasma level by approximately 1 g/L in adult patients. Plasma levels should be greater than 1.5 g/L in the setting of hemorrhage.
5. Conjugated estrogens (Premarin) administered intravenously at a dose of 0.6 mg/kg/day (divided into 4 doses to improve tolerability) have been shown to reduce bleeding complications when administered for 5 days to two weeks prior to procedure. Oral estrogens are less well studied but likely effective at a dose of 50 mg/day. Prolonged exposure to exogenous estrogen beyond the peri-operative period is not recommended.
6. Dialysis may benefit patients with uremia by improving platelet aggregation and should be considered prior to procedures at risk of hemorrhage.
7. Tranexamic acid (15 mg/kg IV, up to 2 g total dose) should be considered in all cases of severe hemorrhage or patients at risk of bleeding. Administration should occur as close to onset of bleeding as possible.

Thank you for your partnership in transfusing wisely.

From Saskatchewan's *Transfusion Best Practice Recommendations in Adult Patients (page 4)*:

Platelets

General Platelet Transfusion Considerations

- Platelet transfusion is indicated for prophylaxis against bleeding or for management of acute bleeding in patients with thrombocytopenia or platelet dysfunction.
- Platelets are routinely stocked in Saskatoon and Regina only, but can be shipped to any transfusing facility from Canadian Blood Services, upon request.
    - Requests for platelet transfusion in rural facilities for indications other than prophylaxis of bleeding in patients with hypoproliferative thrombocytopenia with a count less than 10 x 10^9/L may be subject to approval by the on-call Transfusion Medicine Physician.
- Request for 1 adult dose platelets will lead to issue of 1 buffy coat pool (comprised of a pool of 4 donor units) or 1 apheresis single-donor unit.
    - Buffy coat pool and apheresis platelets are considered equivalent in terms of clinical effectiveness.
    - It is acceptable practice to transfuse ABO incompatible platelets if compatible platelets are unavailable from the transfusion medicine laboratory due to inventory restrictions. Hemolysis risk is minimal.
    - Rh negative females under 50 years old who receive a platelet transfusion from an Rh positive donor should receive a dose of 120 mcg Rh immune globulin (WinRho) to prevent against RhD alloimmunization.
        - Rh immune globulin prophylaxis is not necessary for Rh negative males or females 50 years of age and older.
- 1 dose of platelets should raise the platelet count by at least 15 x 10^9/L, and often raises the count by approximately 25-40 x 10^9/L.
    - A post-transfusion CBC should be drawn within 10-60 minutes following the completion of a platelet transfusion to evaluate for an appropriate platelet increment prior to a major procedure, or if there is a clinical concern of platelet refractoriness.
- Pre-medications:
    - Antihistamines should be considered if there is a history of recurrent or severe allergic reaction with previous transfusion;
    - Antipyretics for prevention of fever have not been found to be effective and are not recommended.
- Administer each unit (about 300 mL volume per dose) at a rate appropriate for the patient volume status.
    - Normovolemic – over 1-1.5 hours
    - Hypervolemic – over 2-3 hours
- Whenever possible, all transfusions should be completed during the day shift, for optimum patient safety.
- All transfusion adverse reactions should be reported to the Transfusion Medicine Laboratory.

From Saskatchewan's *Transfusion Best Practice Recommendations in Adult Patients (page 5)*:

PLATELET TRANSFUSION – INPATIENT OR OUTPATIENT		
Clinical Setting		Recommendation and Adult Dose
Diagnosis/Indication	Platelet Count x 10^9/L	
Asymptomatic patients with chronic bone marrow failure (including those taking low dose oral chemotherapy or azacitidine) or immune thrombocytopenia	Any	No platelet transfusion
Non-immune, hypoproliferative thrombocytopenia due to bone marrow failure on intensive treatment (prophylactic transfusion)	Less than 10	1 dose
Procedures with a low risk† of bleeding, including: • PICC line placement • Tunneled and untunneled central venous line (CVL) placement or removal • Paracentesis, thoracentesis • Endoscopy without biopsy • Bone marrow aspirate and biopsy	Less than 20 Tunneled CVL placement: Less than 20-30	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
Severe, life-threatening bleeding	Less than 50	1 dose at a time, clinical judgement and platelet count should guide repeat dosing
Major procedure with a high risk† of bleeding, including: • Lumbar puncture or spinal procedure with hematoma risk • Arterial intervention • Biliary tract intervention or TIPS procedure • Deep abscess drainage • Urinary tract intervention • Solid organ biopsy	Less than 50 Patients with chronic liver disease: Less than 30	1 dose, immediately before procedure, and check platelet response before starting procedure
Epidural anesthesia placement or removal	Less than 80	1 dose, immediately before procedure, and check platelet response before starting procedure
Neurologic bleeding or surgery: • Head trauma or CNS hemorrhage • Neuraxial surgery	Less than 100	1 dose, and check platelet count
Platelet dysfunction **and** significant bleeding • Congenital platelet function defects • Post cardiopulmonary bypass • Life-threatening bleeding with antiplatelet therapy (clopidogrel, ticagrelor, ASA 325 mg)	any	1 dose Exception: Platelet transfusion NOT recommended for intracranial hemorrhage not requiring surgery, due to increased mortality risk
Immune thrombocytopenia (ITP) or Thrombotic Thrombocytopenic Purpura (TTP) **and** life-threatening bleeding	any	1 dose, and **consult a Hematologist**

†Consult Table 3 of the Society of Interventional Radiology Consensus Guideline for details *(J Vasc Interv Radiol 2019; 30:1168-84)*