

Platelet transfusion indications

Nursing transfusion boot camp

Nov 24, 2021

Theodora (Dorien) Ruijs MD

Clinical project coordinator

ORBCoN

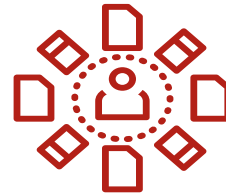


We do our work in support of our vision of appropriate and safe transfusion practices for every Ontarian, every time.

Patient Safety



Accountability




Leading Practice



Collaboration

ORBCoN Values

Strategic Goals

1. Utilization of Blood Components and Products
2. Educational Resources
3. Inventory Management
4. Communication
5. Quality and Safety



Quality

Presenter Disclosure

- Potential for conflict(s) of interest: None
- Relationships with commercial interests: None



Objectives

- Outline Ontario guidelines for Platelet transfusion indications
- Assessment and approach of platelet refractoriness in multiply transfused patients
- Considerations regarding patients on antiplatelet therapy, who are bleeding or pre-procedure



Patient scenario 1

- Patient QR, 78 F with myelodysplasia, Hgb 91 g/L
- Platelet count chronically 12 to 20x10⁹/L without transfusion. No bleeding episodes.
- Was admitted for fever. To be discharged today
- **Platelet count 12x10⁹/L.** MD orders 1 platelet dose for transfusion before discharge
- Transfusion Medicine Lab (TML) questions the order.



Indications for platelets (ORBCoN PLT toolkit)

Platelet Count x10 ⁹ /L	Clinical Indication*
< 10	Hypo-proliferative thrombocytopenia without bleeding
< 20	Minor procedure not associated with significant bleeding
< 30	Minor (Grade 2) bleeding; anticoagulation that cannot be stopped
< 50	Significant bleeding (Grade 3-4); major non-neuraxial surgery; major trauma; liver biopsy; lumbar puncture
< 80	Epidural anesthesia
< 100	Central nervous system bleeding; head trauma; neuraxial surgery; ocular surgery (excluding cataract)
Any	Platelet dysfunction with significant bleeding post cardiopulmonary bypass



Patient scenario 2

- Patient ST, 78 F with myelodysplasia, Hgb 91 g/L.
- Weekly transfusions for thrombocytopenia (2 months).
- Admitted after a fall, no fracture. To be discharged today (Wednesday). Regular transfusion day Thursday.
- **Platelet count $12 \times 10^9/L$.** Yesterday was $18 \times 10^9/L$. MD orders 1 platelet dose for transfusion before D/C
- TML questions the order.



Our patient #2

- Platelet count dropped 18 to $12 \times 10^9/L$ overnight. Scheduled for weekly transfusion tomorrow
- She has myelodysplasia (hypoproliferative); will not improve
- In order to avoid patient having to return tomorrow, transfusing today is probably reasonable, even if it is outside of guideline



Types of Platelet preparations in Canada

- Buffy coat pooled platelets: pooled from 4 donors, in group-identical plasma from 1 male donor
- Single donor (collected by apheresis)
- HLA-matched single donor apheresis, for patients with HLA-alloimmunization (require irradiation)



Platelets

- Platelet lifespan in bloodstream is about 10 days – implications for survival and function after transfusion
- Platelets express ABO antigens, not Rh. HLA antigens, and platelet specific antigens HPA
- Each Buffy coat platelet dose has up to 0.5 mL RBCs, about 300 mL plasma



Platelet refractoriness

Platelet count remains low after transfusion due to antibody.

Consider other causes eg sepsis, splenomegaly, DIC, drugs

Antibody related: In multiply transfused patients

- most often patient anti-HLA antibody
- less often due to antibody by human platelet antigen (HPA)
HPA involved in fetal/neonatal immune thrombocytopenia



Platelet refractoriness cont.

Investigate:

- Platelet count **<1 hour post transfusion**
(expected increase 15 to 25x10⁹/L)
- If increase less than 7.5x10⁹/L, then
- Give **ABO identical** platelets. If no improvement x2:
- Send blood sample for HLA antibodies. If positive:
- Patient HLA Antigen typing.
- Provide **HLA matched Platelets** (apheresis, irradiated)



Platelet refractoriness cont.

Finding HLA compatible apheresis donor may take weeks

- Bridge with ABO identical pooled platelets, not single donor.
- HLA matched platelets do not always resolve the issue

If no improvement, consider:

- Blood Sample for HPA antibodies. If positive:
- Provide HPA matched Platelets
- Re-evaluate transfusion effect

See also algorithm in ORBCoN Platelet Toolkit



Pre-procedure Platelet transfusion

< 20

Minor procedure not associated with significant bleeding

< 50

Significant bleeding (Grade 3-4); major non-neuraxial surgery; major trauma; liver biopsy; lumbar puncture

< 80

Epidural anesthesia

< 100

Central nervous system bleeding; head trauma; neuraxial surgery; ocular surgery (excluding cataract)



Anti-platelet agents

- Eg., Aspirin and clopidogrel (Plavix®), ticagrelor
- Inhibit platelet function; platelet count not affected.
- If not stopped prior to procedure/surgery, risk of bleeding is uncertain.
- For minor/low risk procedures: Platelet transfusion not indicated. Eg., endoscopy with biopsy
- Weigh risk of thrombosis vs bleeding



Intracranial Bleed on antiplatelet agents

1. Platelet transfusion in Intracranial hemorrhage (non-surgical bleed) during antiplatelet therapy was associated with worse outcome in one trial

– recommendation uncertain

2. Non-cranial significant bleed on antiplatelet agents:
Platelets generally recommended

Baharoglu. Lancet 2016;387:2605-2613

Kaufman. AABB guideline. Ann Int Med 2015;162:205



Thank you



dorien.ruijs@sunnybrook.ca



Ontario Regional Blood Coordinating Network

