Using Blood Wisely

Physician Education Module v1.0
What is Using Blood Wisely?

A national initiative of Choosing Wisely Canada in collaboration with Canadian Blood Services.

Aim:

• Decrease inappropriate red blood cell (RBC) transfusions in hospitals using evidence-based guidelines

• Recognize successful hospitals through Choosing Wisely Canada and Accreditation Canada
A Module for Appropriate RBC Transfusions

- This module will:
  - Review risks of RBC transfusions
  - Review current RBC transfusion guidelines and evidence
  - Highlight successful transfusion quality improvement projects
  - Share interventions and resources to help use blood wisely

- Resources and tools: www.UsingBloodWisely.ca
Why is this Important?

- Minimize harm to patients
  - Adverse reactions
  - Transfusion associated circulatory overload, common (1%)

- Blood is a precious resource

- Costly to collect & administer
  - Transfusions cost $522 - $1183 per RBC Unit!¹

## Transfusion Risks

<table>
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<th>Risk Type</th>
<th>Description</th>
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| Transfusion associated circulatory overload (TACO) | - Probably really common – 1-6% of adults in ICU  
- Rarely reported to hemovigilance systems   |
| Transfusion-related acute lung injury (TRALI)   | - 1 in 10,000                                                              |
| Acute hemolytic transfusion reactions          | - Most commonly due to errors in sample or patient identification  
- 1 in 40,000                                    |
| RBC alloantibodies                             | - 1 in 13  
- Hemolytic disease of fetus/newborn risk girls and young women |
| Delayed hemolytic transfusion reactions        | - 1 in 7000                                                                 |
| Anaphylaxis                                    | - 1 in 40,000                                                               |
Appropriate RBC Transfusion Practices
Restrictive Transfusion

• Don’t transfuse more than 1 unit at a time in a non-bleeding patient.

• Don’t transfuse RBCs in asymptomatic, non-bleeding patient with Hb greater than 70 g/L.
Relationship of Hb to $DO^2$

- Transfusion Probably Beneficial
- Intravenous Iron Probably Beneficial
- Oral Iron May Work with Enough Time
- Debatable
- Probably Not

Hypoxia

$DO_{2crit}$ (Hb$_{crit}$)  Hb g/L  $DO_2$

Blood Transfus 2009; 7: 250-8
Mortality Restrictive vs. Liberal Transfusion Trials

- 26 trials restrictive vs. liberal Hb
- All trials used single unit transfusions
- 15,681 pts

30 day mortality OR 1.00 (0.86, 1.16)

Carson et al. Am Heart Journal 2018;200:96-101
Restrictive was as Good as Liberal Even in:

- Elderly patients
  - Hip Fracture Surgery patients (Carson et al. FOCUS trial. NEJM 2011)
  - Cardiac Surgery patients older than 75 (Mazer et al. Lancet Haematology 2017)
- Acute bleeding patients (Upper GI bleeding (Villanueva et al. NEJM 2013))
Give One Unit & Reassess

- Transfuse one unit at a time over 2 to 4 hours
- For patients > 65 yrs, impaired cardiac or renal function, use slower rate and furosemide iv pre-transfusion
- Assess the outcome (clinical, Hb) before transfusing further
- Each unit increases Hb ~ 10 g/L in non-bleeding patient
Restrictive Transfusion

- Don’t transfuse more than 1 unit at a time in a non-bleeding patient.

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When to Transfuse RBCs

- **Hb < 90 g/L**
  - Clear signs and symptoms of impaired tissue oxygen delivery

- **Hb < 80 g/L**
  - Cardiac disease, elderly

- **Hb < 75 g/L**
  - Cardiac surgery patients

- **Hb < 70 g/L**
  - Transfusion likely appropriate although younger patients may tolerate lower Hb (i.e. Hb < 60 g/L)

- **Hb < 60 g/L**
Is Canada Using Blood Wisely?
Variation Between Hospitals

RBC Utilization in Large Hospitals, 2016-2017

Mean = 5.40
Median = 5.22

Data source: CIHI and CBS
Gap Between Evidence and Practice

• RBC transfusion audits show inappropriate transfusion rates 3%-57%
  (Barr PJ et al. Transfusion 2011)

• Ontario study: 1 in 5 RBC transfusions inappropriate
  (Spradbrow et al, Transfusion 2016)

• Single unit transfusion decreased RBC use 10-41%
  (Shih et al Transfusion 2018)
WHY GIVE TWO WHEN 1 WILL DO?

Evidence from Successful interventions
Ontario Transfusion Quality Improvement Plan – Key Ingredients

- Education
- Prospective Screening
- Change in guidelines and transfusion order sets
↓ 31% RBC use

MAC Approval of Guidelines & 24/7 Screen

START Study – Key Ingredients

- Education
- Prospective screening
- Guidelines
- 13 Hospitals in ON, AB, SK
START Study – Results

- 2,877 RBC tx audited from 1,950 patients at 13 sites
- ↑ Appropriateness (75% to 85%)
- ↑ Single-unit orders (46% to 68%)
- ↓ Total # RBC transfused (average decrease of 458 units/month for all 13 sites combined)

Kron A., et al. START Study, QUEST Research Program
Regina: Alternatives to Blood

Education on IV iron
145 units/month reduction
19% Reduction

START Study-Screening
108 units/month reduction
18% Reduction

Courtesy of Dr. Ryan Lett
Using Blood Wisely

www.UsingBloodWisely.ca
Why Should My Hospital Get Involved?

- Eligible for Using Blood Wisely Hospital Designation

- Implementation of resources can be used towards the Accreditation Canada Qmentum program
More Questions?

Website:
www.UsingBloodWisely.ca

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Choosing Wisely Canada:
www.ChoosingWiselyCanada.org