Using Blood Wisely

Nursing 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
  - Outline the nurse’s role in promoting Using Blood Wisely
  - Highlight successful transfusion quality improvement projects
  - Share interventions and resources to help use blood wisely

Why is this Important?

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

- Oxygen supply is dependent on:
  - Cardiac output; and
  - $O_2$ content of arterial blood

- Lungs provide $O_2$
- Heart pumps $O_2$ saturated blood to all tissues
- Hb carries $O_2$
Adapting to Anemia

- Asymptomatic patients with anemia can compensate by ↑ cardiac output and/or ↓ physical activity and will not require transfusion.

- However, patients with cardiac insufficiency cannot ↑ cardiac output and may be symptomatic and require transfusion at the same Hb.

- Using the Hb level alone is NOT adequate in making a decision about transfusion: the patient’s clinical condition and symptoms must also be assessed.
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.
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) [No significant difference]

Carson et al. Am Heart Journal 2018;200:96-101
Restrictive was as Good as Liberal 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))
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**
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 patient (clinical status, Hb) before transfusing another unit
- Each unit increases Hb ~ 10 g/L in non-bleeding patient
What is the Role of Nursing?

- Nurses are patient advocates for obtaining the best possible outcome, with no unnecessary exposure to risk of harm (College of Nurses of Ontario. Standards & guidelines professional standards; revised 2019.)

- Assess your patient's clinical status and lab results

- Ensure the prescriber’s order is appropriate based on clinical status and lab results; question orders outside of guidelines

- Restrictive transfusions are best practice for safety and outcomes
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
MAC Approval of Guidelines & 24/7 Screen

↓ 31% RBC use

START Study – Key Ingredients

- Education
- Guidelines
- Prospective screening

13 Hospitals in ON, AB, SK
START Study – Results

- 2,877 RBC transfusions 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
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?

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Choosing Wisely Canada:
www.ChoosingWiselyCanada.org