

# Using Blood Wisely

Nursing  
Education Module  
v1.0



In partnership with:

# What is Using Blood Wisely?

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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

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- 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
- Resources and tools: [www.UsingBloodWisely.ca](http://www.UsingBloodWisely.ca)

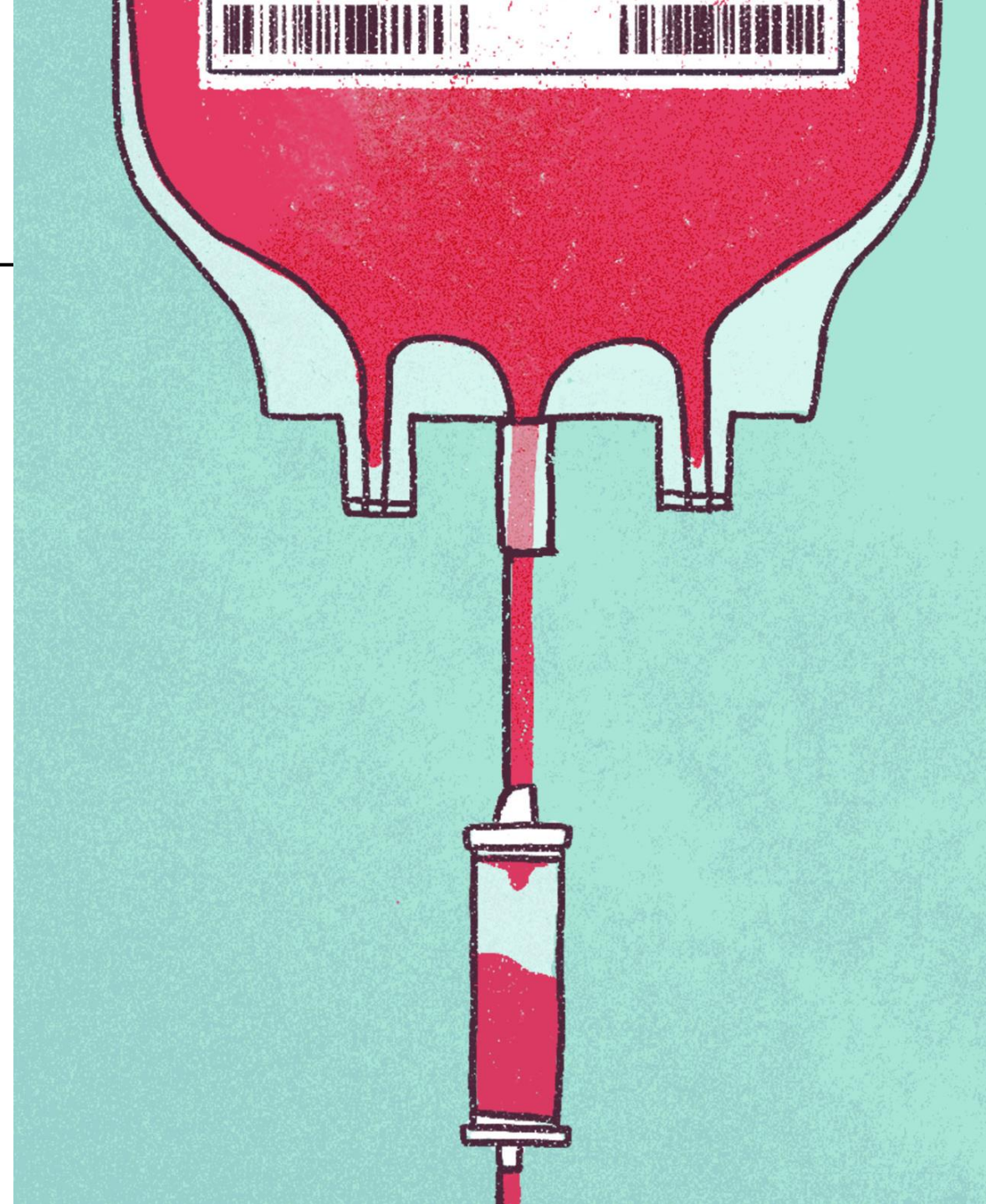


# Why is this Important?

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- 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!<sup>1</sup>

<sup>1</sup>Shander et al. Transfusion 2010 Apr;50(4):753-65.



# Transfusion Risks

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<b>Transfusion associated circulatory overload (TACO)</b>	<ul style="list-style-type: none"><li>• Probably really common – 1-6% of adults in ICU</li><li>• Rarely reported to hemovigilance systems</li></ul>
<b>Transfusion-related acute lung injury (TRALI)</b>	<ul style="list-style-type: none"><li>• 1 in 10,000</li></ul>
<b>Acute hemolytic transfusion reactions</b>	<ul style="list-style-type: none"><li>• Most commonly due to errors in sample or patient identification</li><li>• 1 in 40,000</li></ul>
<b>RBC alloantibodies</b>	<ul style="list-style-type: none"><li>• 1 in 13</li><li>• Hemolytic disease of fetus/newborn risk girls and young women</li></ul>
<b>Delayed hemolytic transfusion reactions</b>	<ul style="list-style-type: none"><li>• 1 in 7000</li></ul>
<b>Anaphylaxis</b>	<ul style="list-style-type: none"><li>• 1 in 40,000</li></ul>

# **Appropriate RBC Transfusion Practices**

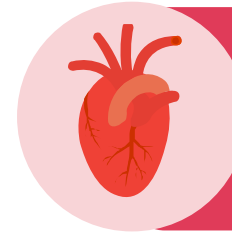
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**Using  
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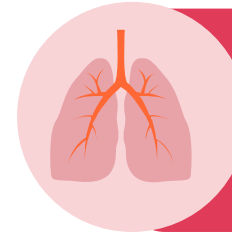
# Physiology of Oxygen Supply to Tissues

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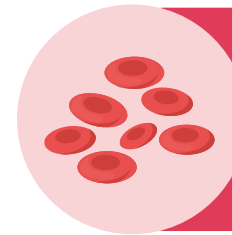
- Oxygen supply is dependent on:
  - Cardiac output; and
  - $O_2$  content of arterial blood



**Heart pumps  $O_2$  saturated blood to all tissues**



**Lungs provide  $O_2$**



**Hb carries  $O_2$**

# Adapting to Anemia

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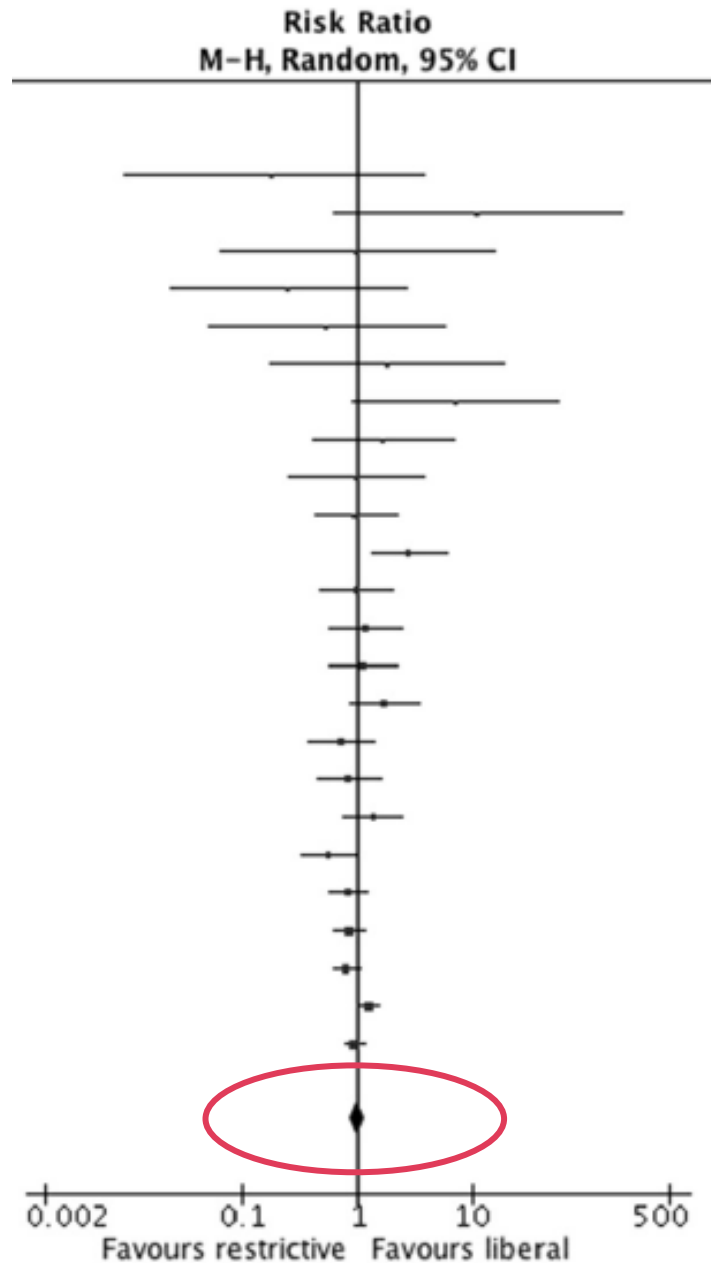
- Asymptomatic patients with anemia can compensate by ↑ cardiac output and/or ↓ physical activity and will not require transfusion
- However, patients with cardiac insufficiency cannot ↑ cardiac output and may be symptomatic and require transfusion at the same Hb
- Using the Hb level alone is NOT adequate in making a decision about transfusion: **the patient's clinical condition and symptoms must also be assessed**



# Restrictive Transfusion

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- 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]**

# **Restrictive was as Good as Liberal in...**

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- 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

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**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

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- **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?

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- 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

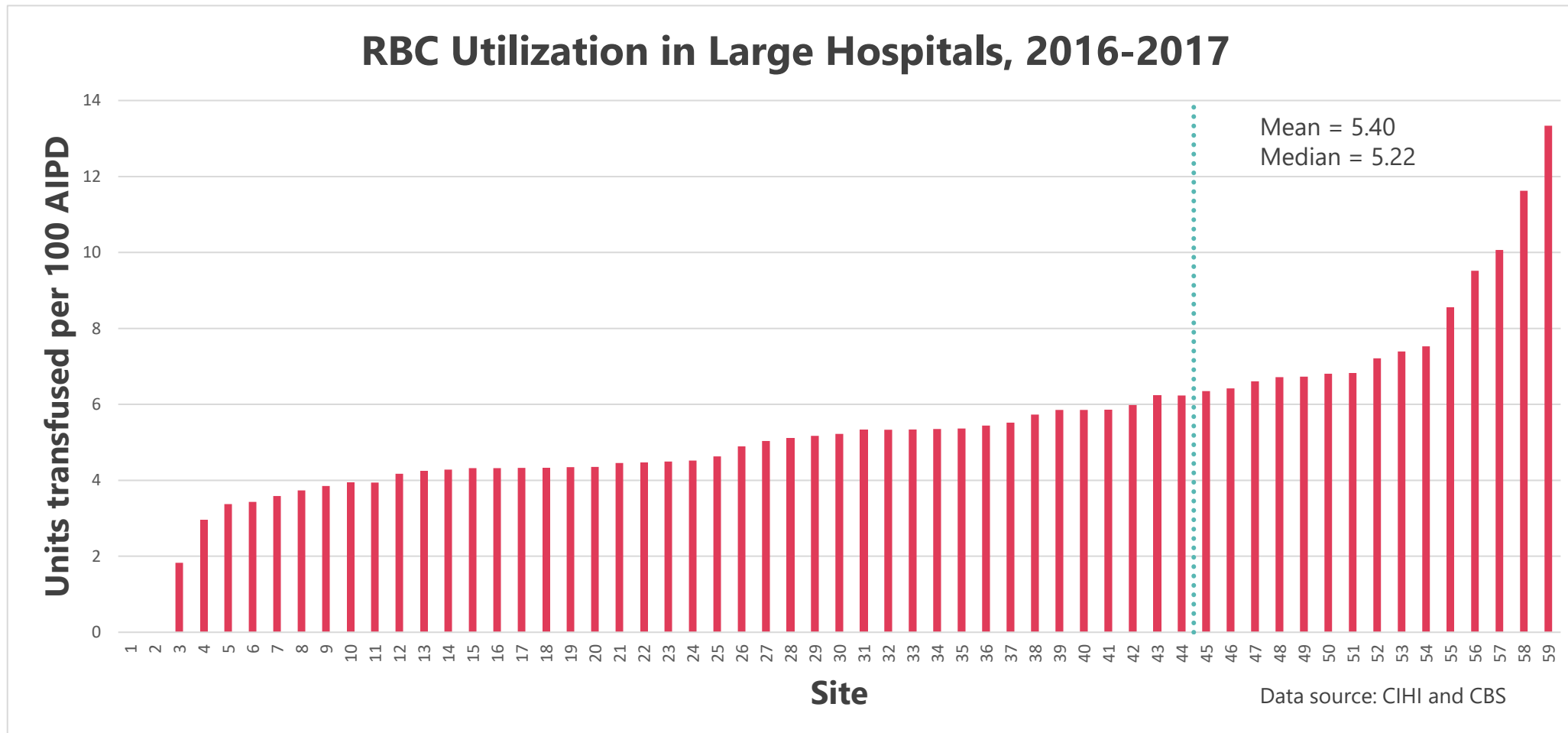


# **Is Canada Using Blood Wisely?**

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**Using  
Blood  
Wisely.**

# Variation Between Hospitals



# Gap Between Evidence and Practice

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- RBC transfusion audits show inappropriate transfusion rates 3% - 57%  
(Barr PJ et al. Transfusion 2011)  
(French CJ et al. Med J Aust 2002)  
(Joy PJ et al. Ann R Coll Surg Engl 2012)
- 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

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# Ontario Transfusion Quality Improvement Plan – Key Ingredients

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**Education**

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**Change in  
guidelines and  
transfusion  
order sets**

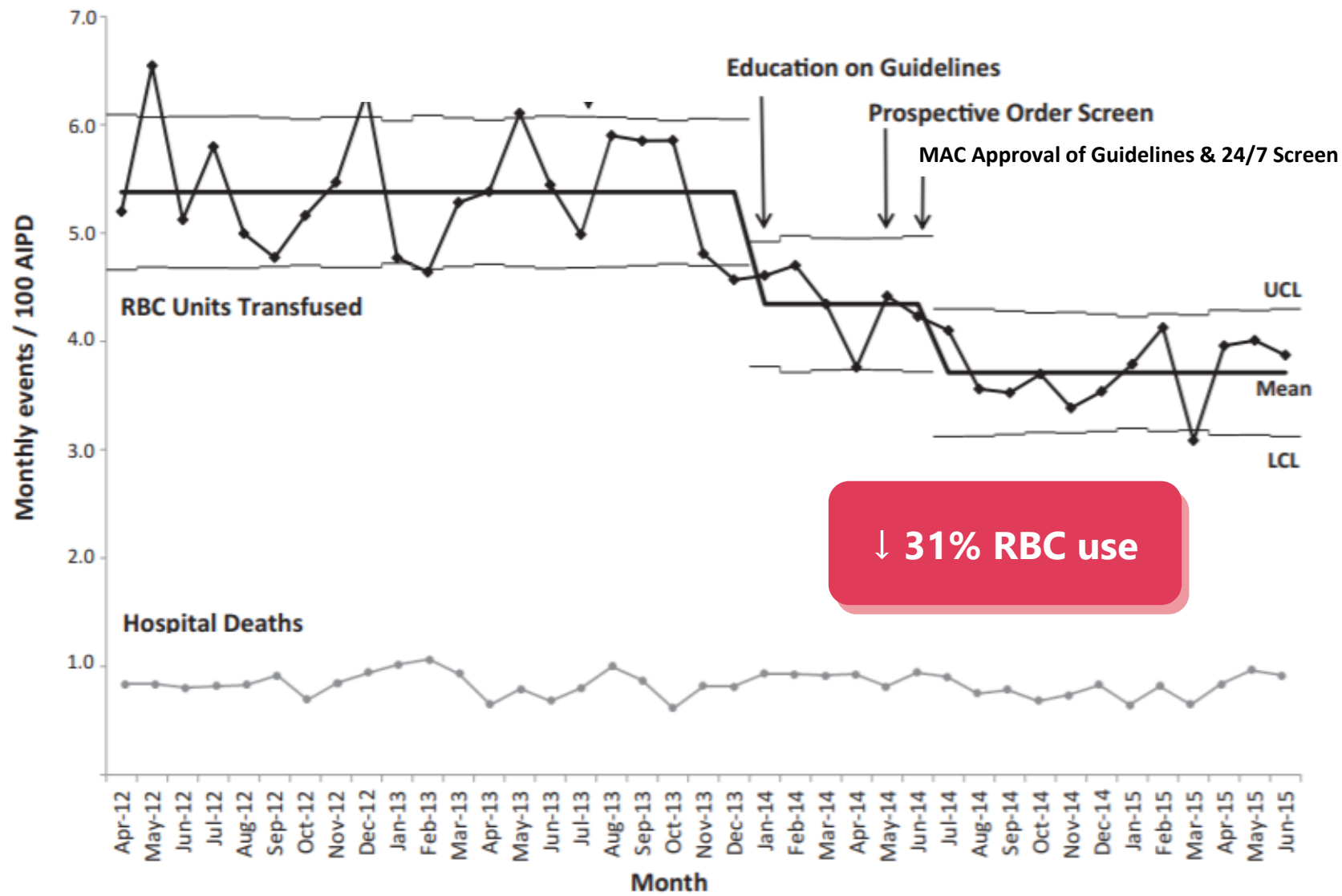
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**Prospective  
Screening**

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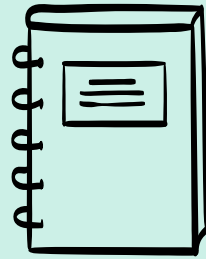


# START Study – Key Ingredients

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**Education**

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**13 Hospitals  
in ON, AB, SK**

**Guidelines**

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**Prospective  
screening**

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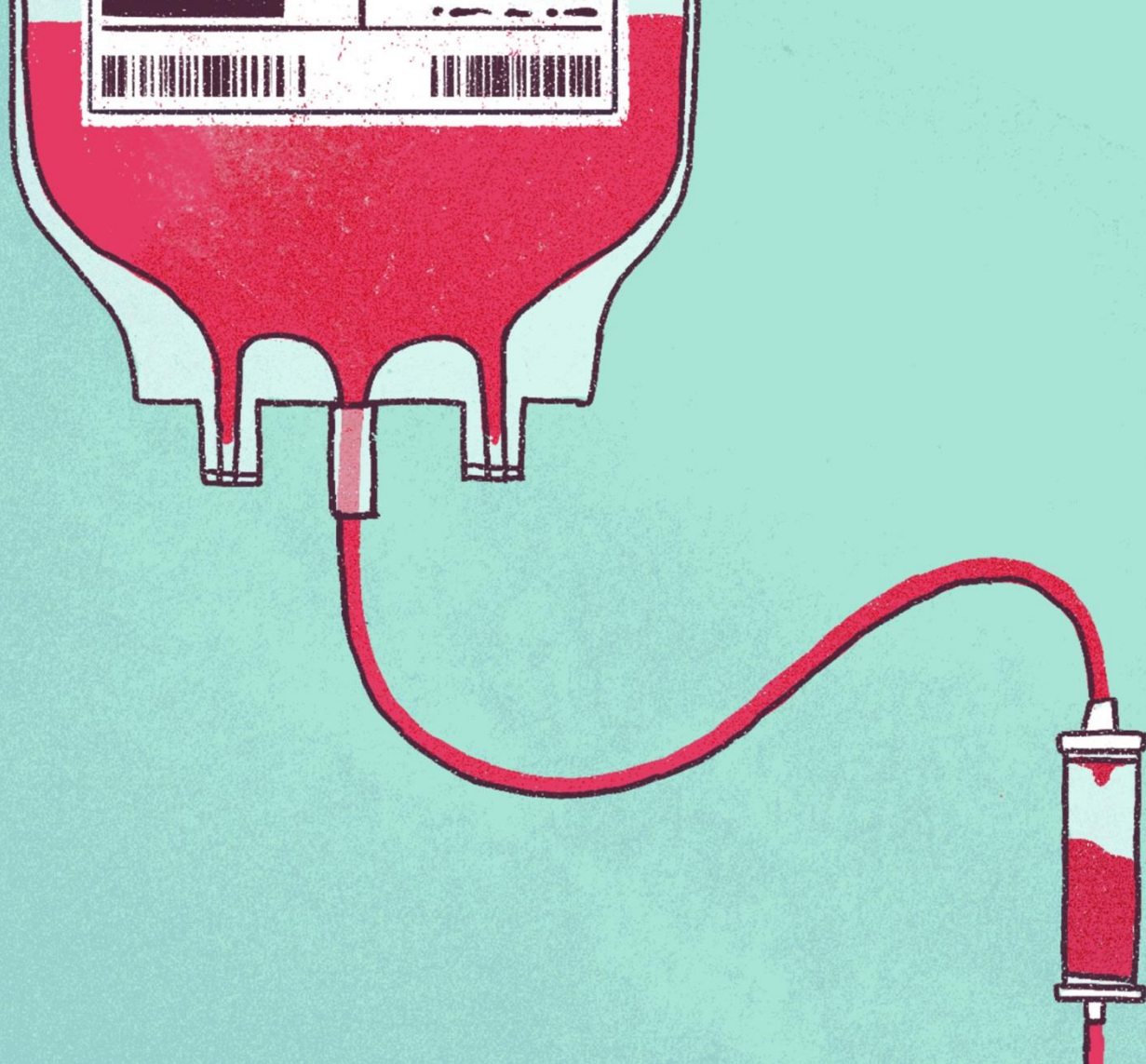


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# START Study – Results

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- 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)



# Using Blood Wisely

[www.UsingBloodWisely.ca](http://www.UsingBloodWisely.ca)



In partnership with:



# 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**

CHOOSING  
WISELY  
CANADA

CANADIAN  
BLOOD  
SERVICES

Choosing Wisely Canada and Canadian Blood Services are pleased to recognize:

**NAME**

as a designated Using Blood Wisely Hospital.

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APRIL 1 2020

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**ACCREDITATION  
CANADA**

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# More Questions?

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## **Website:**

[www.UsingBloodWisely.ca](http://www.UsingBloodWisely.ca)



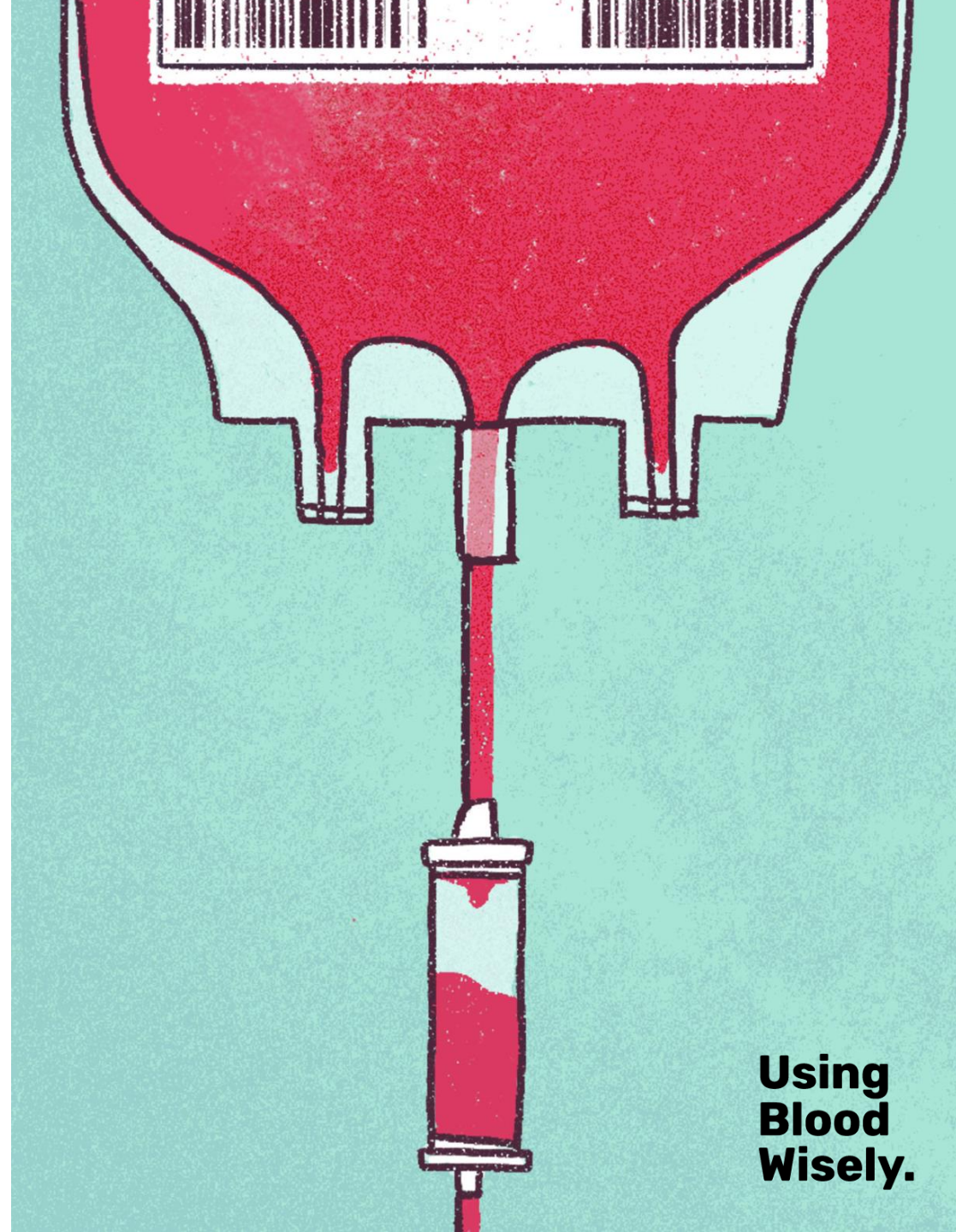
## **Email:**

[blood@ChoosingWiselyCanada.org](mailto:blood@ChoosingWiselyCanada.org)



## **Choosing Wisely Canada:**

[www.ChoosingWiselyCanada.org](http://www.ChoosingWiselyCanada.org)



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