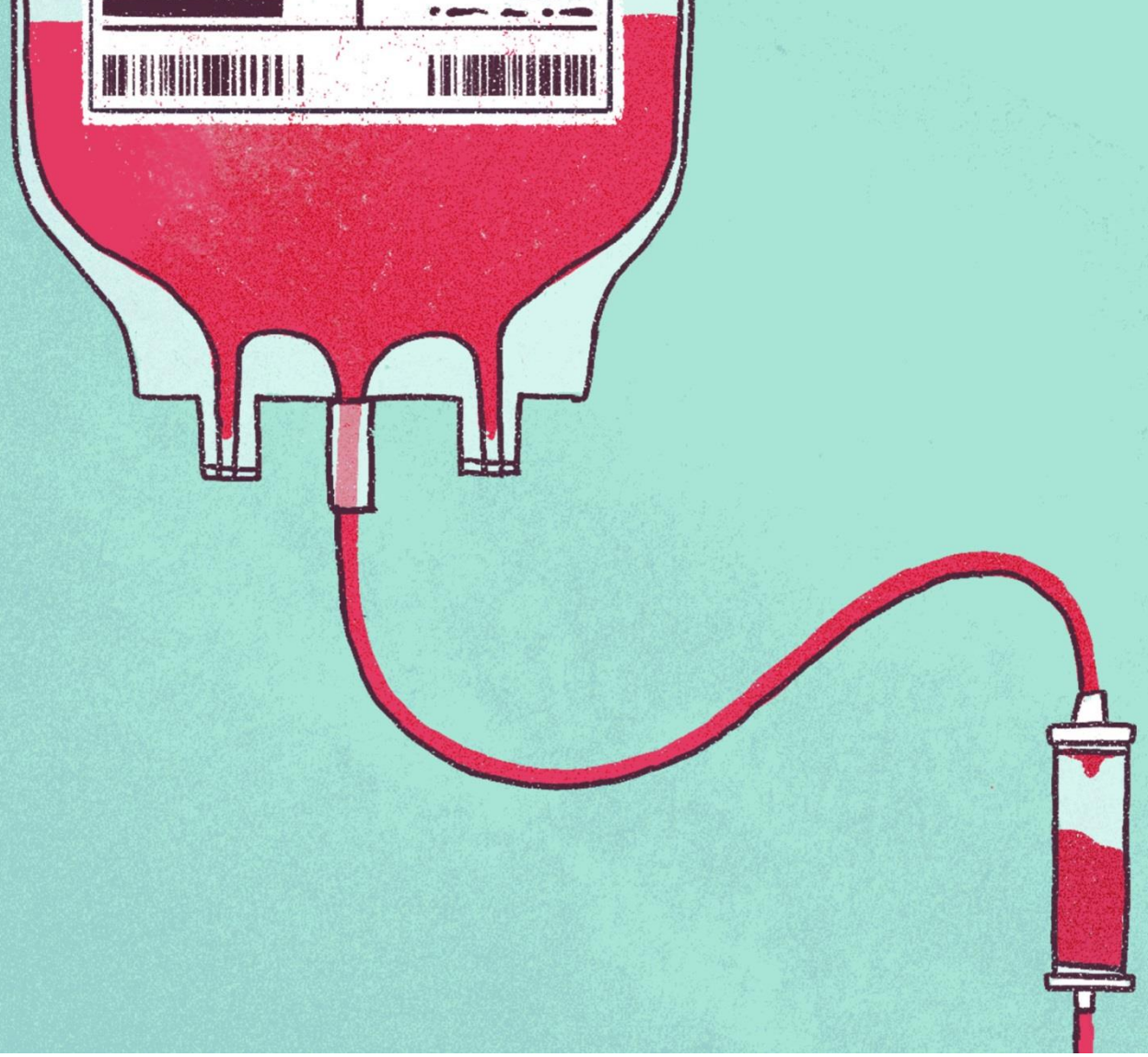

Using Blood Wisely

Medical Laboratory Technologist Education Module v1.0

Choosing Wisely Canada™

In partnership with:

Canadian Blood Services

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 given to adult inpatients in hospitals using evidence-based guidelines

- Recognize successful hospitals through Choosing Wisely Canada and Accreditation Canada

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Why Did My Hospital Get Involved?

- Transfusion audits key in ensuring appropriate transfusion
- Eligible for **Using Blood Wisely Hospital Designation**
- Implementation of resources can be used towards the **Accreditation Canada Qmentum program**

ACCREDITATION CANADA

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A Module for Screening and Auditing RBC Transfusions by Medical Laboratory Technologists

- This module will:
  - Review rationale for reducing RBC transfusions
  - Review current RBC transfusion guidelines and evidence
  - Share successful audit tools
  - Share processes for implementing technologist screening of RBC orders

- Resources and tools: www.UsingBloodWisely.ca

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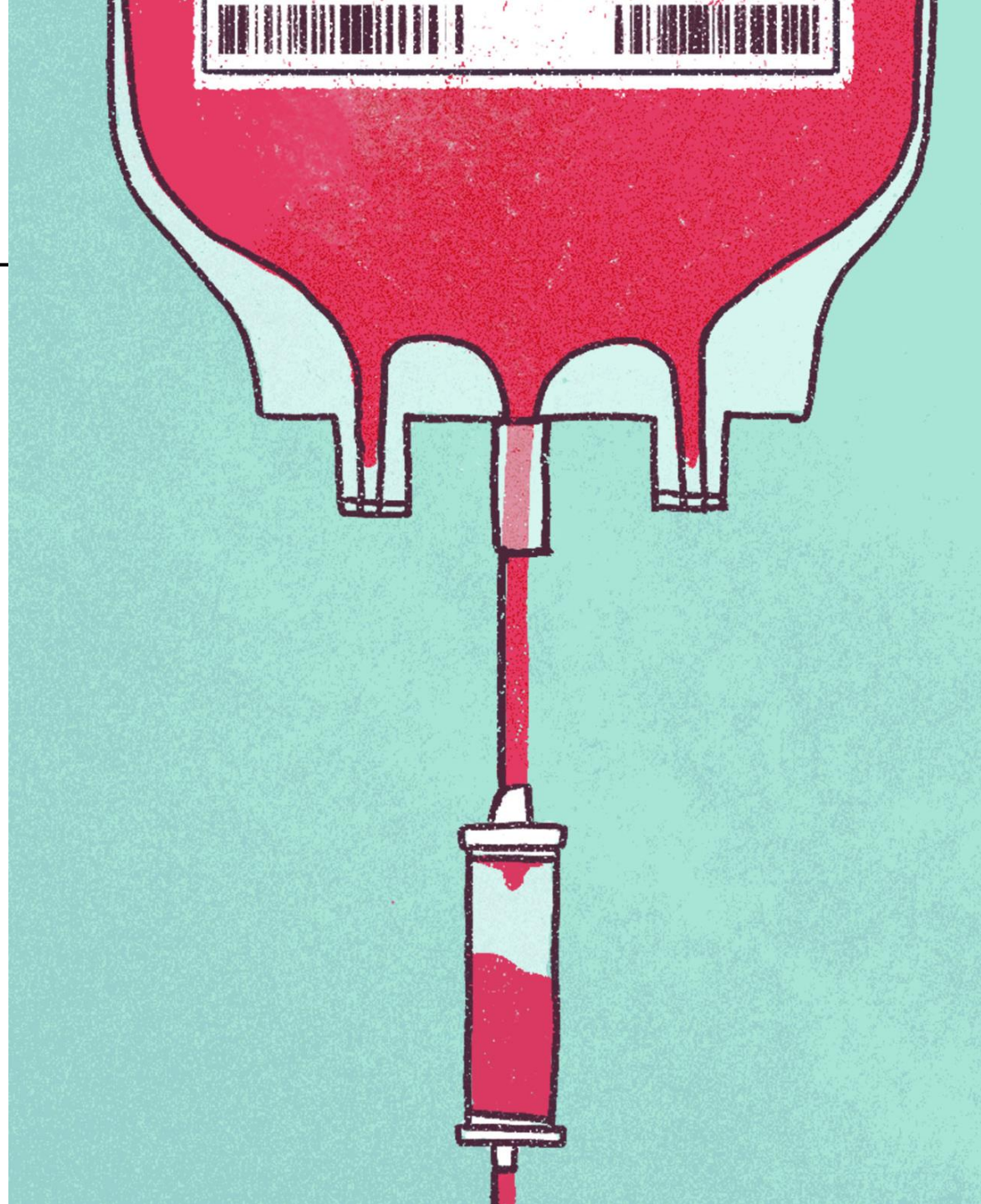
Why is this Important?

- Minimize adverse reactions in patients
  - eg. TACO occurs in up to 1% of transfusions.
- Blood is a precious resource
- Costly to collect & administer
  - Transfusions cost $522 -$1183 per RBC Unit![1]

[1]Shander et al. Transfusion 2010 Apr;50(4):753-65.



Transfusion Risks

Transfusion associated circulatory overload (TACO)	• 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 for girls and young women
Delayed hemolytic transfusion reactions	• 1 in 7000
Anaphylaxis	• 1 in 40,000

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Appropriate RBC Transfusion Practices

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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.**

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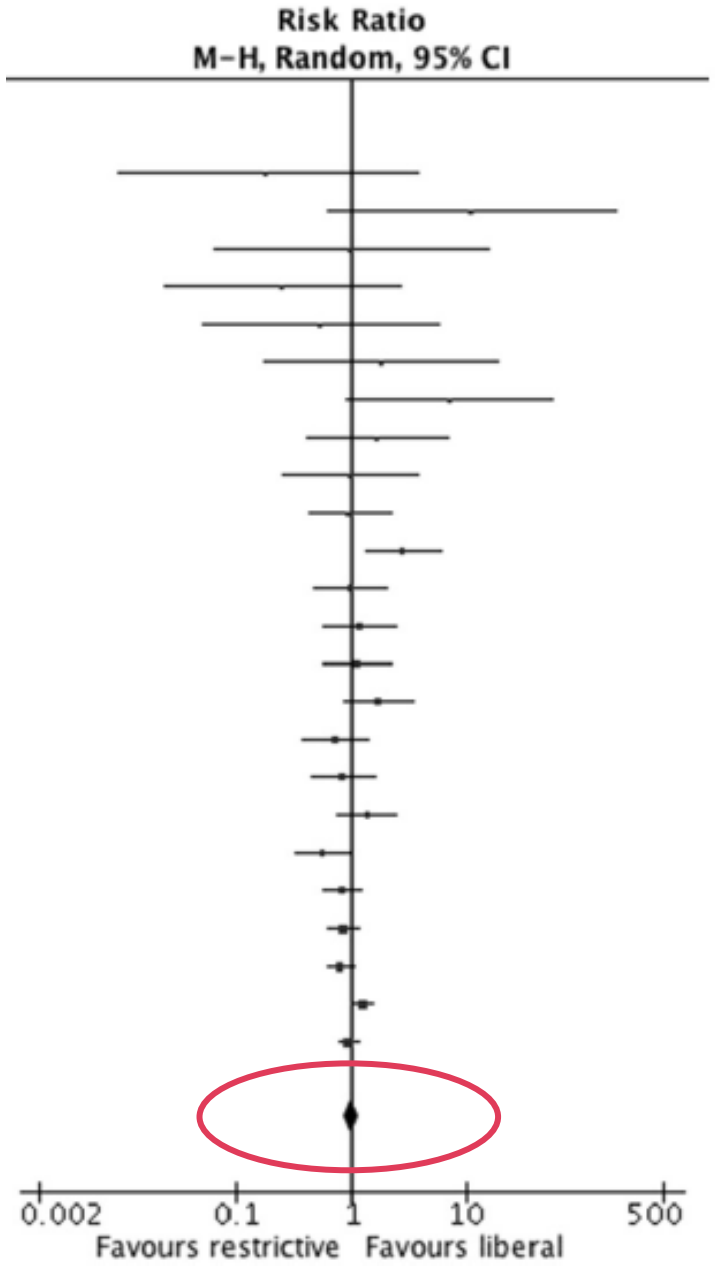

Mortality Restrictive vs. Liberal Transfusion Trials

- **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

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**
- **Hb < 60 g/L**

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

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Is Canada Using Blood Wisely?

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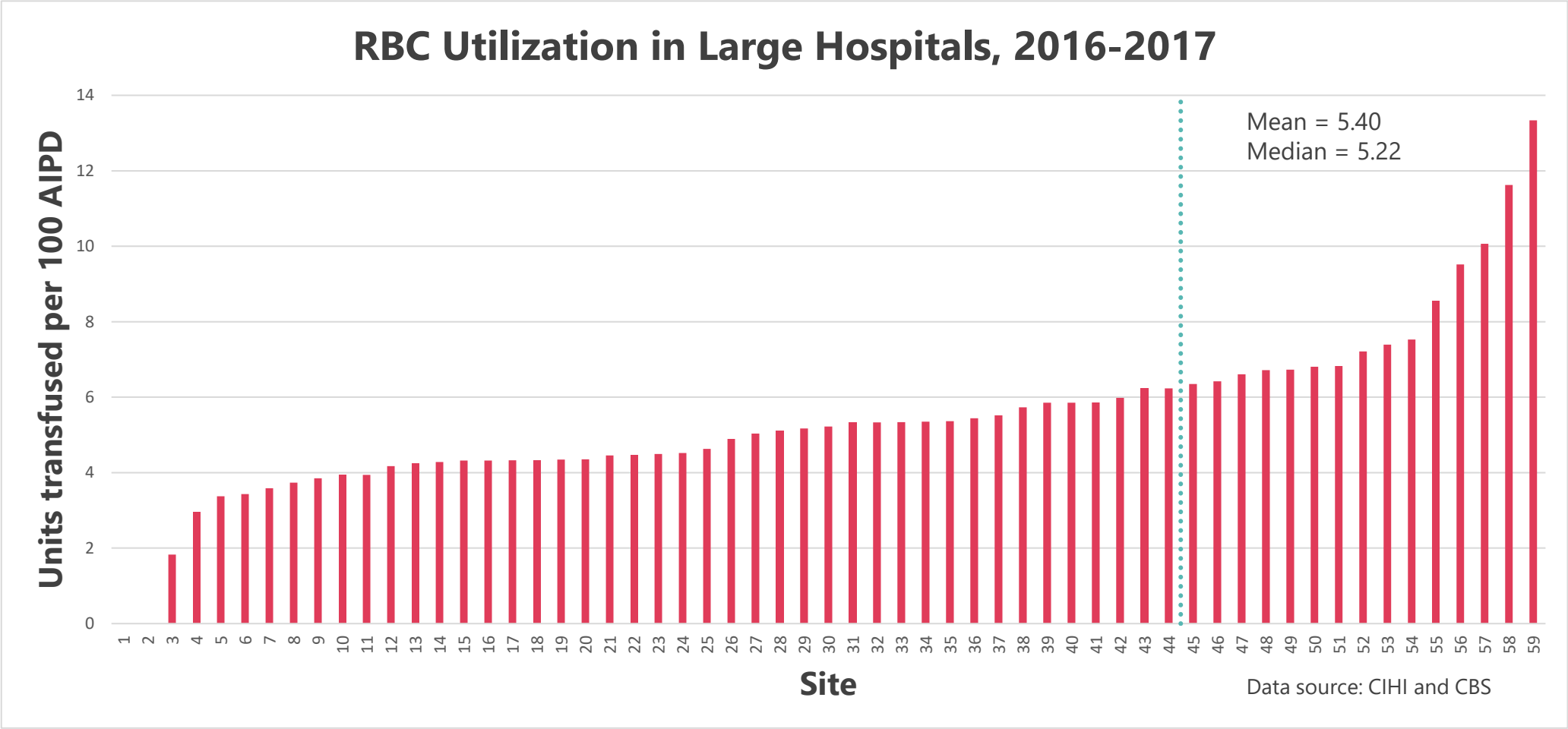
Variation Between Hospitals



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Gap Between Evidence and Practice

- 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)

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WHY GIVE TWO WHEN 1 WILL DO?

Evidence from Successful interventions

Ontario Transfusion Quality Improvement Plan – Key Ingredients

Education

Change in guidelines and transfusion order sets

Prospective Screening

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START Study – Key Ingredients

13 Hospitals in ON, AB, SK

Education

Guidelines

Prospective screening

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Results

- Implementation of Guidelines accompanied by prospective screening by MLTs:
- ↑ Appropriateness (75% to 85%)
- ↑ Single-unit orders (46% to 68%)
- ↓ Total # RBC transfused

Kron A., et al. START Study, QUEST Research Program

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Role of the Medical Laboratory Technologist

- Participate in pre-intervention spot audit
- Perform prospective screening on orders for RBCs
- Provide education in daily interactions with health care professionals
- Share the success of enhancing patient care and safety

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Pre-intervention Spot Audit

- Using Blood Wisely has developed an audit tool

- Indicators measured are:
  1. Percentage single unit transfusions
  2. Percentage of inpatient transfusions with a pre-transfusion Hemoglobin 80 g/L or less

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Prospective Transfusion Order Screening by MLTs

- Effective intervention to improve appropriate transfusion
- Evaluating the appropriateness of the blood transfusion is within the scope of MLT practice (Canadian Society for Medical Laboratory Science)
- Implementation includes
  - Establishment of institution endorsed transfusion guidelines
  - Education of clinicians, nurses and MLTs on guidelines and screening
- Your medical director will have participated in the implementation and will support you

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Prospective Screening Process

- Review RBC transfusion requests on **adult inpatients to** determine compliance with transfusion guidelines
- Notify clinical team when orders do not meet guidelines
- If order not withdrawn, escalate to Transfusion Medicine medical director or other designated physician champion

Note: MLTs are not expected to block orders or argue with nurses or prescribers.

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Prospective Screening Algorithm

- For stable adult inpatients
  - Exclude: actively bleeding patients, operating room

- Gather clinical information.
  1. Review electronic record for most recent Hgb and MCV
  2. Is the patient bleeding or symptomatic (e.g., chest pain, heart rate>100bpm, dizziness)?
  3. Does the patient have a history of cardiac disease, or show signs of it (e.g., positive troponin levels)?

- If order meets guidelines, issue product.
- If order are outside of guidelines, further action is required.

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Prospective Screening Algorithm

INAPPROPRIATE ORDER	ACTION
Order for 2 units in a non-bleeding patient with a Hgb over 60 g/L	Inform bedside nurse that 2nd unit outside of hospital guidelines and will require a repeat Hgb before the second unit can be released
Order for non-bleeding patient without cardiac history or symptomatic anemia (eg., elevated heart rate, dizziness, fainting) and Hgb > 70 g/L Order for non-bleeding patient with cardiac history but without symptomatic anemia and Hgb > 90 g/L	Inform bedside nurse that order is outside of hospital guidelines and cannot be released without escalation to transfusion MD on call
Order for non-bleeding patient with clear iron deficiency anemia (MCV < 80 fL, ferritin ≤ 30 µg/mL) and Hgb > 60 g/L	Contact transfusion MD on call immediately to determine if patient is a candidate for IV iron

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Contacting the Medical Director of TM

If it is necessary to escalate an order for further review:

- Contact the Medical Director of TM on call
- Provide:
  - Patient name, hospital number, patient location
  - Reason order needs review
  - Phone or pager number of the ordering clinician
- Medical Director of TM will review and notify technologist as to how to proceed

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Example 1

- Blood bank receives an order to issue 2 units of red blood cells for an 81 year-old female inpatient. Her most recent recent hemoglobin is 68 g/L and her MCV is normal.

- The next best course of action is:
  1. Issue product as ordered
  2. Call care area and request more information
  3. Inform care area that request is outside of guidelines.

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Example 1

- Blood bank receives an order to issue two units of red blood cells for an 81 year-old female inpatient. Her most recent recent hemoglobin is 68 g/L and her MCV is normal.

- The next best course of action is:
  1. Issue product as ordered
  2. **Call care area and request more information**
  3. Inform floor that request is outside of guidelines.

Although the hemoglobin threshold meets guidelines, the first step is to determine whether there is an indication to order more than 1 unit at time. For example, is the patient actively bleeding? If the patient is not bleeding, then proceed with informing the patient's nurse that the blood bank is authorized to release 1 unit only, after which the patient's clinical status and hemoglobin should be reassessed before transfusing more.

Example 2

- Blood bank receives an order to issue one unit of red blood cells for a 60 year-old male inpatient. His most recent recent hemoglobin is 95 g/L and the RN requesting the product indicates that while patient is not bleeding, he is feeling fatigued.

- The next best course of action is:
  1. Issue product as ordered
  2. Call care area and request more information
  3. Inform care area that request is outside of guidelines.

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Example 2

- Blood bank receives an order to issue one unit of red blood cells for a 60 year-old male inpatient. His most recent recent hemoglobin is 95 g/L and the RN requesting the product indicates that while patient is not bleeding, he is feeling fatigued.

- The next best course of action is:
  1. Issue product as ordered
  2. Call care area and request more information
  3. **Inform care area that request is outside of guidelines.**

Above a Hgb level of 90 g/L there are probably other causes for the patient's fatigue, and therefore a transfusion is more likely to cause harm than benefit.
A useful response to this order would be to state "I am not authorized to release blood in this situation, as the order is outside hospital guidelines. " Follow established process for consultation with TM Medical Director.

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Example 3

- Transfusion Medicine Lab receives an order to issue 1 unit of RBCs for an 66 year-old female inpatient. Her hemoglobin is 59 g/L post-surgery 24 hours ago and she is experiencing some bleeding.

- The next best course of action is:
  1. Issue product as ordered
  2. Call care area and request more information
  3. Inform care area that request is outside of guidelines.

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Example 3

- Transfusion Medicine Lab receives an order to issue 1 unit of RBCs for an 66 year-old female inpatient. Her hemoglobin is 59 g/L post-surgery 24 hours ago and she is experiencing some bleeding.

- The next best course of action is:
  1. **Issue product as ordered**
  2. Call care area and request more information
  3. Inform care area that request is outside of guidelines.

This patient's order is within guidelines and can be completed without delay.

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Conclusion

- Reducing unnecessary transfusions improves patient outcomes and helps alleviate blood shortages
- Prospective screening of transfusion orders by MLTs is a key intervention of Using Blood Wisely
- Thank You

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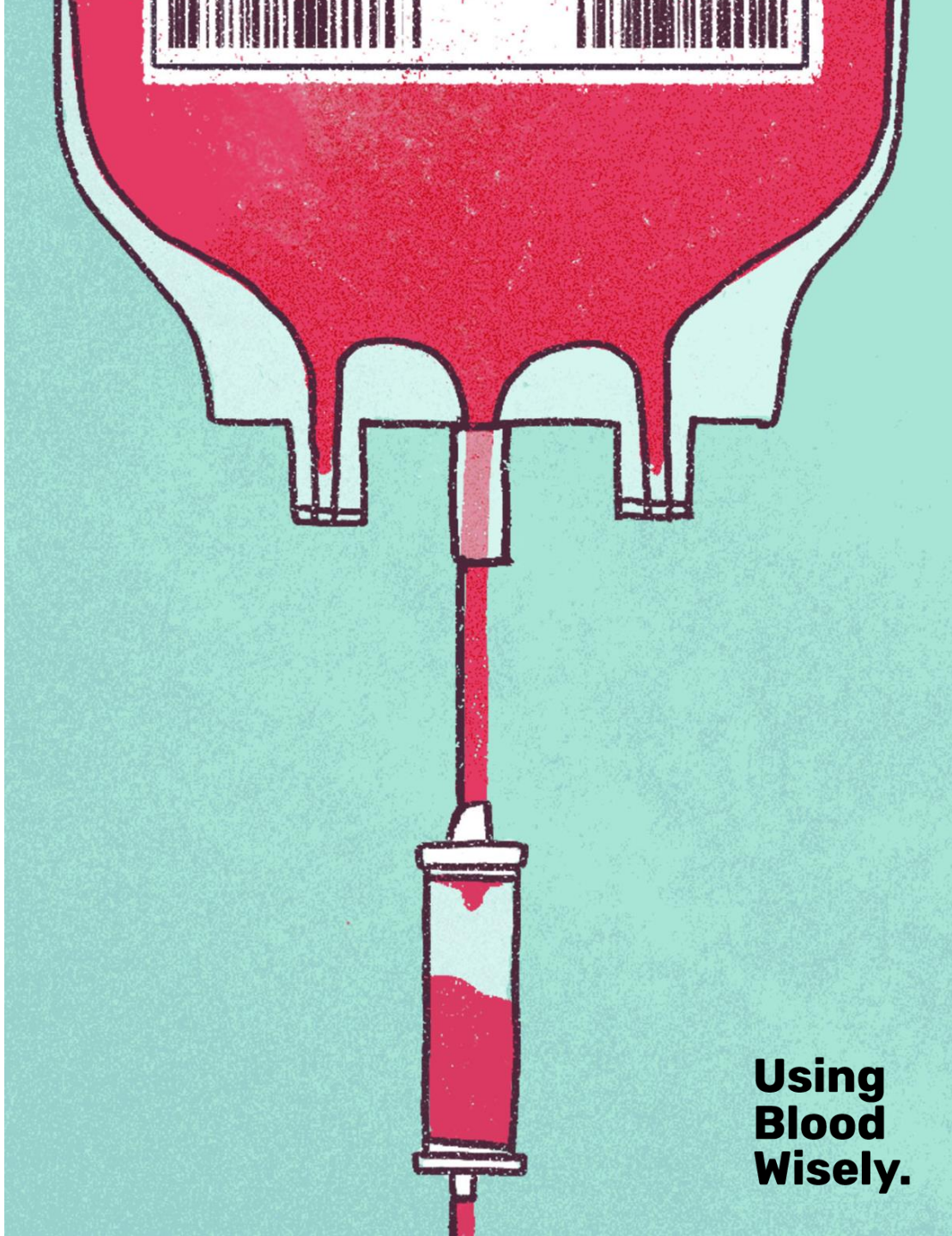
More Questions?

Website:
www.UsingBloodWisely.ca

Email:
blood@ChoosingWiselyCanada.org

Choosing Wisely Canada:
www.ChoosingWiselyCanada.org



Acknowledgments

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