Choosing Wisely with the Ontario Transfusion Quality Improvement Plan

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CSTM Annual Meeting, May 13, 2016 at 11:15-11:45am
Disclosures

• Grants/Research Support
  – Glaxo-Smith Kline, Novartis

• Consulting
  – Genzyme, Boehringer-Ingelheim

• Education Support
  – CSL Behring, Grifols

• No disclosures specific to this presentation
Objectives

• List the components of the Ontario Transfusion Quality Improvement Plan Toolkit

• Identify 1 or 2 components of the toolkit that you could help implement at your institution
Why was the Ontario Transfusion Quality Improvement Plan developed?
Rationale

• For Patients

- Effective
- Safe
- Equitable

• For the Health Care System

- Efficient
Why focus on RBCs?
AABB RBC Guideline 2012

- Hospitalized, hemodynamically stable patients?
  - In adult and pediatric ICU patients, transfusion should be considered at hemoglobin of 70 g/L or less.

- Hospitalized, hemodynamically stable patients with preexisting cardiovascular disease?
  - Transfusion should be considered at a hemoglobin of 80 g/L or less or for symptoms (chest pain, hypotension or tachycardia, or CHF).

Critical Care Societies

• Don’t transfuse red blood cells in hemodynamically stable, non-bleeding ICU patients with a hemoglobin concentration greater than 70 g/L.

American Society of Hematology

• Don’t transfuse more than the minimum number of red blood cell (RBC) units necessary to relieve symptoms of anemia or to return a patient to a safe hemoglobin range (70 to 80 g/L in stable, non-cardiac in-patients).

American Society of Anesthesiologists

• Don’t administer packed red blood cells (PRBCs) in a young healthy patient without ongoing blood loss and hemoglobin of ≥ 60 g/L unless symptomatic or hemodynamically unstable.

http://www.choosingwisely.org/
Canadian Society for Transfusion Medicine

• Don’t transfuse more than one red cell unit at a time when transfusion is required in stable, non-bleeding patients.
• Don’t transfuse blood if other non-transfusion therapies or observation would be just as effective.

American Association of Blood Banks

• Don’t transfuse more units of blood than absolutely necessary.
• Don’t transfuse red blood cells for iron deficiency without hemodynamic instability.

There is room for improvement!
Current Performance:
Ontario Pilot RBC Audit 2013

www.transfusionontario.org
Red Blood Cell Audit

Add Order

**Hospital name:** Sunnybrook Health Sciences Centre

1. **Patient audit code:**

2. **Patient sex:**
   - Male
   - Female

3. **Patient birth month and year:**
   - Select a Month
   - Select a Year

4. **Transfusion order number:** 2013-790

5. **Transfusion order date and time:**

6. **Number of RBC units ordered:**

7. **Number of RBC units transfused for the order:**

8. **To what location was the RBC issued?**
   - Select a Location

9. **Specialty of the Most Responsible Physician:**
   - Select a Specialty

10. **Position of the ordering practitioner:**
    - Select a Position

11. **Specialty of the ordering practitioner:**
    - Same as Most Responsible Physician
    - Select a Specialty

12. **Was a pre-transfusion hemoglobin done?**
    - Yes
    - No

13. **Was a post-transfusion hemoglobin done?**
    - Yes
    - No

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**Pilot Audit**
- 5 Ontario hospitals
- 2 weeks
- Summer 2013
Pre-transfusion Hb < 80 g/L
(excluding outpatients 20-25%)

Percentage of Transfusions

A: 50  B: 61  C: 79  D: 75  E: 77  F: 84

ORBCON, unpublished data
Percent Single Unit Transfusions
(excluding outpatients 20-25%)

Percentage of Transfusions

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>25</td>
<td>37</td>
<td>35</td>
<td>33</td>
<td>32</td>
<td>78</td>
</tr>
</tbody>
</table>

ORBCON, unpublished data
### Pilot RBC Audit 2015: 10 hospitals
### Adjudication Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Hb pre</th>
<th>Hb post</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>&lt;50</td>
<td>-</td>
<td>Iron deficient, age &lt; 50</td>
</tr>
<tr>
<td>A2</td>
<td>&lt;70</td>
<td>-</td>
<td>No cardiac disease</td>
</tr>
<tr>
<td>A3</td>
<td>&lt;80</td>
<td>-</td>
<td>Known cardiac disease</td>
</tr>
<tr>
<td>A4</td>
<td>&lt;70</td>
<td>-</td>
<td>Iron deficient, age &lt; 50</td>
</tr>
<tr>
<td>A5</td>
<td>&lt;90</td>
<td>-</td>
<td>All other patients</td>
</tr>
<tr>
<td>A6</td>
<td>&lt;70</td>
<td>≤90</td>
<td>No cardiac disease</td>
</tr>
<tr>
<td>A7</td>
<td>&lt;80</td>
<td>≤100</td>
<td>Known cardiac disease</td>
</tr>
<tr>
<td>A8</td>
<td>&lt;100</td>
<td>≤100</td>
<td>Marked ongoing bleeding (≥4 U/24 hours)</td>
</tr>
</tbody>
</table>

Spradbrow J. et al, CSTM Abstract #22
Inappropriate RBC Transfusion

Spradbrook J. et al, 2016 CSTM abstract #22
Better performing sites

• Transfusion Guidelines in place, adopted by the Medical Advisory Committee
  — Recommend 1 unit at a time and restrictive hemoglobin triggers
• +/- Pre-printed transfusion orders
• Prospective transfusion order screening by Medical Laboratory Technologist (MLT)
• Transfusion Medicine MD back-up and education
How can we improve the Quality of RBC Transfusion Practice?

*Introducing the...*

*Ontario Transfusion Quality Improvement Plan*
What is a QIP?

- Formal blueprint on how a health care organization will address quality issues and meet its quality improvement plan
- Public commitment to improving quality

http://www.hqontario.ca/Quality-Improvement/Quality-Improvement-Plans
Ontario Transfusion QIP – Aim

• Reduce unnecessary harm by improving appropriate RBC transfusions

• Provide high quality transfusion care: safe, patient-centred, effective, efficient, equitable and timely

http://transfusionontario.org
Measures

• How do we know change is improvement?
  – Manual Chart Audit
  – Percent of RBC transfusions occurring when pre-transfusion hemoglobin less than 80 g/L
  – Percent single unit transfusions (1 unit at a time)
  – RBCs per 100 acute inpatient days

http://transfusionontario.org
Measures

• OTQIP recommends
  – Percent of RBC transfusions occurring when pre-transfusion hemoglobin less than 80 g/L
  – Percent single unit transfusions (1 unit at a time)
• Target
  – 2016/17: Establish baseline
  – 2017/18: Baseline + 10% (towards target 80%)
  – 2018/19: Baseline + 20% (towards target 80%)
  – 2019/20: Sustained improvement
  – 2020/21: Sustained improvement

http://transfusionontario.org
Change

- QIP Toolkit = Planned improvement initiatives
## Template to create your own Quality Improvement Plan

### Quality Improvement Plan

<table>
<thead>
<tr>
<th>Title &amp; Information</th>
<th>Download</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">Ontario Transfusion Quality Improvement Plan Guidance Document for Institutional Implementation</a></td>
<td><img src="download.png" alt="Download" /></td>
</tr>
</tbody>
</table>

This document was created to provide guidance on how to implement quality improvement activities to reduce unnecessary RBC transfusion at your institution or hospital. It can be used as a template by transfusion medicine committees or institutional (hospital) departments or incorporated in the institution's corporate quality improvement plan.

### Quality Improvement Plan Tools

[![Download](download.png)](download.png)
Institution QIP Narrative

Institution Transfusion Quality Improvement Plan Narrative Template (Red Blood Cells)

Overview

Blood transfusion can save lives, but every transfusion carries risks. Some complications of transfusion are not very serious, such as mild fever and mild allergic reactions (hives). Others may be life-threatening, such as lung damage or heart failure.

The Quality Improvement Plan for blood transfusion will help us to measure how well we are using blood for our patients, and show us where we can improve. It requires a team approach, including the doctors and nurse practitioners who order the blood, the laboratory staff who prepare it for transfusion, the nurses who transfuse it, and the patients who receive it.

• Public Commitment and Explanation of the QIP to patients and families

http://transfusionontario.org
### Effectiveness
- **Reduce unnecessary harm by improving appropriate RBC transfusions**
  - 1. Patient receives evidence-based care
  - 2. Applicable to all hospitals
  - 3. There is evidence (practice guidelines)
  - 4. There is a performance gap
  - 5. Aligned with HQO and CWC
  - 6. Effective transfusion care will support all dimensions of quality

#### Measure/Indicator
- Percent of all patient RBC transfusions occurring when Hb less than 80g/L

#### Current Performance
- 2016/17: establish baseline (BL)

#### Target (state if multi-year)
- 2016/17: 80% over 4-5 years
- 2017/18: BL + 10%
- 2018/19: BL + 20%
- 2019/20: Continued/sustained improvement
- 2020/21: Continued improvement

#### Methods and Process Measures
- Implement ORBCoN’s Clinical Practice Recommendations that are consistent with Ministry endorsed, evidenced based RBC transfusion guidelines 2016
- Recommendations passed by MAC/TC and available to clinicians 2016/17

#### Goal for Change Ideas
- Recommendations available to clinicians 2016/17
- 80% of physicians and nurses can locate guidelines YRS: 2016/17

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### Measures

<table>
<thead>
<tr>
<th>Aim</th>
<th>Change</th>
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</thead>
</table>

**Aim**: Improve RBC transfusion practices to reduce unnecessary harm.

**Change**:
- **Implement ORBCoN’s Clinical Practice Recommendations**
- **Utilize ORBCoN’s toolkit including prospective screening of RBC transfusion orders**

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**Your baseline data here**

- **Percent of all patient single unit (at a time) transfusions**
  - 80% over 4-5 years
  - 2016/17: establish baseline (BL)
  - 2017/18: BL + 10%
  - 2018/19: BL + 20%
  - 2019/20: Continued/sustained improvement
  - 2020/21: Continued improvement

**Rationale**:
1. Matching best performance
2. 100% target unrealistic due to critical patients

**Initiative #**: 1

**Planned Improvement Initiative**: Implement ORBCoN’s standard RBC transfusion order sets 2016/17

**Recommended Change**:
- Implement ORBCoN’s standard RBC transfusion order sets 2016/17
- RBC transfusion orders use the order set YRS: 2016/17

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**http://transfusionontario.org**
Gathering the Team

- CEO
- Medical Advisory Committee
- Quality/Risk Department
- Clinical Leadership
- Ordering Physicians and Health Care Professionals
- TM Department and TM Committee
- Patients, Family Members

http://transfusionontario.org
Where to start?

[Ontario Transfusion Quality Improvement Plan Guidance Document for Institutional Implementation]

This document was created to provide guidance on how to implement quality improvement activities to reduce unnecessary RBC transfusion at your institution or hospital. It can be used as a template by transfusion medicine committees or institutional (hospital) departments or incorporated in the institution’s corporate quality improvement plan.

[Quality Improvement Plan Tools]
Toolkits from Choosing Wisely Canada

April 5, 2016

At the Choosing Wisely national meeting March 30th, Choosing Wisely Canada (CWC) announced a new direction.

In lieu of the 10 million challenge, they are instead putting significant effort into empowering CWC enthusiasts by way of facilitating "DIY Toolkits."

Click on the image below to check out the first 5 or go to the page to learn how to submit your own:

http://www.lessismoremedicine.com/blog/toolkits-from-choosing-wisely-canada
Guidance Document / Toolkit

Suspect inappropriate RBC transfusion

- *How to do a simplified RBC transfusion audit*
How to establish your baseline?

OTQIP Tracker Tool

- Audit of 50 transfusions (1st transfusion per patient during audit period)

Total number of RBC units transfused during audit period:  

To determine percentage of RBC transfusions with a pre-transfusion hemoglobin less than 80 g/L:

A. Number of consecutive transfusions audited:  
   (Select only the first transfusion for each consecutive patient)

B. Number of transfusions with a pre-transfusion Hb:

C. Number of transfusions with pre-transfusion Hb <80:

D. Percentage of transfusions with pre-transfusion Hb < 80 g/L:  
   (= C / A * 100)
Guidance Document

Suspect inappropriate RBC transfusion
  – How to do a simplified RBC transfusion audit

Inappropriate RBC transfusion and practitioner variability
  – How to implement local transfusion guidelines
# Clinical Practice Recommendations (Adult Inpatient)

<table>
<thead>
<tr>
<th>Clinical Setting</th>
<th>Recommendation and dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb less than 60 g/L</td>
<td>Transfusion likely appropriate*. Transfuse 1 unit and re-check patient symptoms and Hb before giving second unit.</td>
</tr>
<tr>
<td>Hb less than 70 g/L</td>
<td>Consider transfusion. Transfuse 1 unit and recheck patient symptoms and Hb before giving second unit.</td>
</tr>
<tr>
<td>Hb less than 80 g/L</td>
<td>Consider transfusion in patients with pre-existing cardiovascular disease or evidence of impaired tissue oxygenation. Transfuse 1 unit and recheck patient symptoms and Hb before giving second unit.</td>
</tr>
<tr>
<td>Hb 80 to 90 g/L</td>
<td>Likely inappropriate unless evidence of impaired tissue oxygenation.</td>
</tr>
<tr>
<td>Hb greater than 90 g/L</td>
<td>Likely inappropriate. If transfusion is ordered clearly document indication in patient’s chart and discuss reason with patient.</td>
</tr>
</tbody>
</table>
| Bleeding patient | • Maintain Hb greater than 70 g/L  
• If pre-existing cardiovascular disease – maintain Hb greater than 80 g/L |

*Note: Hb stands for Hemoglobin.
# How to implement local guidelines

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
</table>
| **Prepare** | Baseline audit results showing need for improvement  
Clinical practice recommendations for blood component use |
| **Engage Transfusion Committee** | Committee reviews and modify recommendations, if needed |
| **Disseminate** | Disseminate widely to medical and surgical departments, professional practice committees, transfusion medicine laboratory staff, etc.  
Educate staff |
| **Incorporate Feedback** | Transfusion committee reviews and approves final recommendations |
| **Final Approval** | Present to MAC for final approval |

### Transfusion Order Set - Adult

<table>
<thead>
<tr>
<th>Admitting Diagnosis:</th>
</tr>
</thead>
</table>

- **□** informed consent completed as per institutional guidelines

| Date of transfusion: | **□** today  **□ other (DD/MM/YYYY) __________________ | **□** STAT (call blood bank at XXXXX) |

<table>
<thead>
<tr>
<th>Pre-transfusion laboratory tests</th>
<th><strong>□</strong> group and screen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>□</strong> if no existing IV initiate IV 0.9% NaCl to keep vein open</td>
<td></td>
</tr>
<tr>
<td><strong>□</strong> discontinue peripheral IV after transfusion complete</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre-transfusion medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>□</strong> furosemide _____ mg po prior to transfusion or _____ mg IV prior to transfusion</td>
<td></td>
</tr>
<tr>
<td><strong>□</strong> irradiated product required as per hospital guidelines, specify reason:</td>
<td></td>
</tr>
<tr>
<td><strong>□</strong> specially matched product required as per hospital guidelines, specify reason:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Red Blood Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-transfusion Hb: _____ g/L</td>
</tr>
<tr>
<td><strong>□</strong> low Hb  <strong>□</strong> significant bleeding  <strong>□</strong> symptomatic  <strong>□</strong> other</td>
</tr>
<tr>
<td><strong>□</strong> Transfuse 1 unit, over _____ hours (e.g. 1 unit over 2-3 hours, maximum 4 hrs)</td>
</tr>
<tr>
<td><strong>□</strong> Transfuse _____ units, each over _____ hours</td>
</tr>
<tr>
<td><strong>Note:</strong> consider IV iron instead of red blood cells for patients with stable iron deficiency anemia</td>
</tr>
</tbody>
</table>
Guidance Document

Suspect inappropriate RBC transfusion
  – How to do a simplified RBC transfusion audit

Inappropriate RBC transfusion and practitioner variability
  – How to implement local transfusion guidelines

Guidelines but not followed
  – How to implement MLT prospective transfusion order screening
Technologist Prospective Screening

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<table>
<thead>
<tr>
<th>Manual</th>
<th>Transfusion Medicine</th>
<th>PROCEDURE TEMPLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td>Inventory Management</td>
<td></td>
</tr>
</tbody>
</table>

**Title: Prospective Screening Blood Product Orders**

<table>
<thead>
<tr>
<th>Issued by</th>
<th>ID:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved by</td>
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</table>

**Effective Date**

**Revised Date**

Version: 1

*Draft*

Controlled document. Any documents appearing in paper form must be used for reference purposes only. The on-line copy on the file server above must be considered the current documentation.

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<table>
<thead>
<tr>
<th>Manual</th>
<th>JOB AID TEMPLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td></td>
</tr>
</tbody>
</table>

**Title: Screening Blood Product Orders for Technologists**

<table>
<thead>
<tr>
<th>Issued by</th>
<th>ID:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved by</td>
<td></td>
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</table>

**Effective Date**

YYMMDD

**Revised Date**

YYMMDD

Version: 1.0

File Name:

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http://transfusionontario.org
**Order Received: RBC**

**SCREEN ORDER IF:**
- Non-Bleeding Adult Inpatient
- Non-Bleeding Adult ER patient

**DO NOT SCREEN ORDER IF:**
- Trauma Room (Massive Transfusion Protocol)
- Operating Room
- Recovery Room or Post Anesthetic Care Unit (PACU)
- Outpatient including Cancer Care and Medical Day unit

- **Hb less than 60 g/L**
  - Transfusion likely appropriate
  - Transfuse 1 unit and re-check patient symptoms and Hb before giving second unit

- **Hb less than 70 g/L**
  - Consider Transfusion.
  - Transfuse 1 unit and re-check patient symptoms and Hb before giving second unit

- **Hb less than 80 g/L**
  - Consider transfusion in patients with pre-existing cardiovascular disease
  - Transfuse 1 unit to patient if experiencing elevated heart rate, dizziness or fainting, or cardiac symptoms like chest pain
  - Re-check patient symptoms and Hb before giving second unit

- **Hb 80 g/L to 90 g/L**
  - Likely inappropriate unless evidence of impaired tissue oxygenation
  - Transfuse 1 unit to patient if experiencing elevated heart rate, dizziness or fainting, or cardiac symptoms like chest pain
  - For all other patients, or if more than 1 unit ordered, inform the patient care area that the request is outside the hospital guidelines and refer the request to the Transfusion Medicine Physician

- **Hb greater than 90 g/L**
  - Likely inappropriate
  - Request is outside of hospital guidelines.
  - Refer the request to the Transfusion Medicine Physician
Did your Change Idea work?

• Process measures
  – % of MDs who know where to find the guidelines
  – % of orders where the transfusion order set is used
  – % of orders in non-OR, non-bleeding pts that are screened

• Outcome measures
  – Re-do the baseline audit → OTQIP Tracker Tool
  – Manual chart audit → ORBCoN RBC audit tool

• Balancing measures
  – Undertransfusion

http://transfusionontario.org
How do we know this will work?

WHY GIVE TWO WHEN ONE WILL DO?

Help reduce unnecessary red blood cell transfusions in our hospital
Best Practice Alerts at time of RBC order (computerised order entry, Stanford)

% RBC units transfused At Hb ≥80

baseline

best practice alerts at time of order

Goodnough et al. Transfusion 2014;54:2753
Pre-transfusion Hb of 60-69 g/L increased from 12% to 44% over the 12 years.
Interventions and Inpatient RBC Use (Providence, Rhode Island)

Intervention (inpatients only):
- Orders screened by BB technologists
- Questioned if Hb > 90 and not bleeding
- If Hb 80-90 asked for 2 unit order to be changed to 1 unit order
Take Home “Homework”

• Please check out the OTQIP Toolkit at www.transfusionontario.org

• Identify 1 or 2 components of the toolkit that you could help implement at your institution
  – Baseline Audit
  – Guidelines
  – Transfusion order sets, Screensavers
  – MLT Prospective Transfusion Order Screening
Acknowledgements

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Health Quality Ontario  Choosing Wisely Canada