A New Quality Horizon

The Ontario Transfusion Quality Improvement Plan
Conflicts of Interest

None
Objectives

1. Describe a provincial Quality Improvement Plan (QIP) for transfusion.
2. Explain the tools available to implement the use of transfusion quality indicators.
3. Define the role of the Transfusion Committee in the monitoring of transfusion initiatives.
Why a QIP for Transfusion?

• Patients should receive evidence-based transfusion therapy at all hospitals
• Evidence and guidelines are available
• Ontario audits have showed marked variability in transfusion practice
• Liberal transfusion practice harms patients
• Iron deficiency in blood donors: 24% repeat blood donors have ferritin less than 25 µg/L*
• Blood products are costly

*Goldman. CSTM 2015
The QIP Development Process

• Ontario Transfusion QIP Committee
• Quality Focus days Feb 2014, Nov 2014
  – external facilitator assistance from a hospital Director of Quality
• Wide consultation with stakeholders
  – ONTraC, ORBCoN, nurses, CBS, MOHLTC, TM technologists, TM physicians, administrators, patient representative
  – interest and support from HQO, MOHLTC, OHA, CWC, CSIM, CSTM, others
• Working Groups: Recommendations/Order Set, Technologist Screening Tools
  – draft recommendations reviewed by ordering clinicians from multiple specialties
OTQIP Indicators

1. Percent of all RBC transfusions with a pre-transfusion Hb of less than 80 g/L
   - eventual goal 80%
   - justification: matching best performance

2. Percent of all RBC transfusions which are single unit transfusions
   - prescribe 1 unit at a time and reassess the patient (preferably including Hb) before prescribing a second unit
   - eventual goal 80%
   - justification: matching best performance
ORBCoN RBC audit 2013

Pre-transfusion Hb < 80 g/L
(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></td>
<td>50</td>
<td>61</td>
<td>79</td>
<td>75</td>
<td>77</td>
<td>84</td>
</tr>
</tbody>
</table>

Slide credit: Yulia Lin

www.transfusionontario.org
Ontario RBC Audit 2013
Single Unit Transfusions
(excluding outpatients 20-25%)

Slide credit: Yulia Lin
Quality Improvement Interventions (the “toolkit”)

- QIP narrative and template spreadsheet for institutions (hospitals), based on the HQO model
- Clinical Practice Recommendations for Blood Component Use in Adult Inpatients
- Order Set template
- Technologist Screening Tools
  - SOP, job aid, algorithms, worksheet
- Education slides for technologists
  - including prospective screening case studies
- Tracker Tool for reporting audit results
- Guidance document (pulls it all together)
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.

Follows the Health Quality Ontario model for QIPs. A template that can be adapted for your hospital. Language is appropriate for a patient and family audience.
### Objective 2016/17

Reduce unnecessary harm by improving appropriate RBC transfusions

<table>
<thead>
<tr>
<th>Quality Dimension</th>
<th>Objective 2016/17</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness</td>
<td>Reduce unnecessary harm by improving appropriate RBC transfusions</td>
<td></td>
</tr>
</tbody>
</table>

#### Measure/Indicator

- Percent of all patient RBC transfusions occurring when Hb less than 80g/L
- Percent of all patient single unit (at a time) transfusions

<table>
<thead>
<tr>
<th>Current Performance</th>
<th>Target (state if multi-year)</th>
<th>Target Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>80% over 4-5 years</td>
<td>2016/17: establish baseline (BL) 2017/18: BL + 10% 2018/19: BL + 20% 2019/20: Continued/sustained improvement</td>
<td></td>
</tr>
<tr>
<td>80% over 4-5 years</td>
<td>2016/17: establish baseline (BL) 2017/18: BL + 10% 2018/19: BL + 20% 2019/20: Continued/sustained improvement</td>
<td></td>
</tr>
<tr>
<td>80% over 4-5 years</td>
<td>2016/17: establish baseline (BL) 2017/18: BL + 10% 2018/19: BL + 20% 2019/20: Continued/sustained improvement</td>
<td></td>
</tr>
</tbody>
</table>

#### Target Justification

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

<table>
<thead>
<tr>
<th>Initial #</th>
<th>Planned Improvement Initiative</th>
<th>Methods and Process Measures</th>
<th>Goal for Change Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Implement ORBCoN's Clinical Practice Recommendations that are consistent with Ministry endorsed, evidenced based RBC transfusion guidelines 2016/17</td>
<td>Hospital MAC/TC adoption of Recommendations available to clinicians 2016/17</td>
<td>Recommendations passed by MAC/TC. 80% of physicians and nurses can locate guidelines YRS: 2016/17</td>
</tr>
<tr>
<td>2</td>
<td>Implement ORBCoN's standard RBC transfusion order sets 2016/17</td>
<td>RBC transfusion order sets adopted by MAC/TC and implemented 2016/17</td>
<td>80% of RBC transfusion orders use the order set YRS: 2016/17</td>
</tr>
<tr>
<td>3</td>
<td>Utilize ORBCoN's toolkit including prospective screening of RBC transfusion orders by MLTs 2016/17</td>
<td>Implement prospective RBC screening by MLTs 2017/18</td>
<td>80% of RBC transfusion orders are screened by MLTs YRS: 2018/19</td>
</tr>
</tbody>
</table>

#### Effectiveness Goal for Change Ideas

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

#### Methods and Process Measures

- Implement prospective RBC screening by MLTs 2017/18
- 80% of RBC transfusion orders are screened by MLTs YRS: 2018/19

#### Goal for Change Ideas

- Recommendations passed by MAC/TC. 80% of physicians and nurses can locate guidelines YRS: 2016/17

Your baseline data here
<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                                                                             |
Blood Product Order Set Template RBC/PLT/FP - Adult

Allergies/Sensitivities
- none known
- yes (specify) ________________________________

Admitting Diagnosis: ________________________________

- informed consent completed as per institutional guidelines

Date of transfusion: 
- today
- other (DD/MM/YYYY) ________________
- STAT (call blood bank at XXXXX)

Pre-transfusion laboratory tests
- group and screen

Previous transfusion within 3 months
- yes
- no

Previous pregnancy within 3 months
- yes
- no

- if no existing IV initiate IV 0.9% NaCl to keep vein open
- discontinue peripheral IV after transfusion complete

Pre-transfusion medications
- furosemide _____ mg po prior to transfusion or _____ mg IV prior to transfusion
- ________________

- irradiated product required as per hospital guidelines, specify reason:
- ________________________________

- specially matched product required as per hospital guidelines, specify reason:
- ________________________________

Red Blood Cells
Pre-transfusion Hb: _____ g/L
Indication:
- low Hb
- significant bleeding
- symptomatic
- other
- Transfuse 1 unit, over _____ hours (e.g. 1 unit over 2-3 hours, maximum 4 hrs)
- Transfuse _____ units, each over _____ hours

Note: consider IV iron instead of red blood cells for patients with stable iron deficiency anemia and more...
# Technologist Screening Tools

<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

**Issued by**

**Approved by**

**Effective Date**

**Revised Date**

Version: 1

ID: 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.

---

<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

**Issued by**

**Approved by**

**Effective Date**

**Revised Date**

YYMMDD

Version: 1.0

ID: Project Sponsor

File Name:

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.
Technologist Screening Tools: RBC

**Order Received: RBC**

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

**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 if experiencing elevated heart rate, dizziness or fainting or is experiencing 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.
  - Issue 1 unit to patient if experiencing elevated heart rate, dizziness or fainting, or is experiencing cardiac symptoms like chest pain or shortness of breath.
  - For all other patients, or for order of more than 1 unit, inform the patient care area that the request is outside the recommendations and refer the request to the Transfusion Medicine Physician

**Hb greater than 90 g/L**
- Likely inappropriate. Request is outside of recommendations. Refer the request to the Transfusion Medicine Physician

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

Prospective Screening of Blood Product Orders Worksheet

**PATIENT INFORMATION:**

<table>
<thead>
<tr>
<th>Patient Name:</th>
<th>UPI#:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TM Order#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOB:</th>
<th>Ordering Physician:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DISCREPANCY IDENTIFIED:**

- [ ] Patient Clinical History Missing
- [ ] Order does not fall within established guidelines for:

<table>
<thead>
<tr>
<th>Identified by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Paper-based documentation of screening, can be used if documentation cannot be done by LIS
Educational Resource for Technologists

• online resource
• the physiology of tissue oxygenation including the role of red cells
• hemostasis including the role of platelets and coagulation factors (plasma)
• appropriate use of RBC, platelets and plasma
• case studies of screened orders
Tracker Tool

- Simplified audit tool to capture the required RBC transfusion information
- The ORBCoN RBC audit tool (used in 2013) was time-consuming to use
- Data entry into tracker tool will automatically generate graphs
- Paper version available now
Guidance Document

• Explains how to use the toolkit
• Two versions:
  • OTQIP is housed on the ORBCoN website
  • Shorter version on the CWC website
• Hyperlinks to the toolkit contents
• Presented in three modules
Guidance Document

1. If you suspect that there is inappropriate RBC transfusion, then choose Module 1
   – RBC transfusion audit
2. If you have confirmed inappropriate RBC transfusion but suspect that it is due to individual practitioner variability, then choose Module 2
   – implement Guidelines
3. If you have Guidelines but these are inconsistently followed, choose Module 3
   – implement prospective order screening
Where to find the Material

- Quality Improvement tab
- Toolkits tab →

www.choosingwiselycanada.org
Role of the Transfusion Committee

1. Perform an audit of RBC utilisation
2. Review RBC audit data and available Quality Improvement (QI) interventions
3. Find one or more TM ‘Champions’
4. Select a QI intervention as appropriate for hospital
Role of the Transfusion Committee

1. Perform an audit of RBC utilisation
2. Review RBC audit data and available Quality Improvement (QI) interventions
3. Find one or more TM ‘Champions’
4. Select a QI intervention appropriate for your hospital
5. Educate medical, hospital, and laboratory staff:
   - results of the audit and the rationale for the selected QI intervention(s)
6. Obtain MAC support
7. Implement the QI intervention(s)
8. Provide ongoing training and feedback
Can these interventions work?
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
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
Single Unit Transfusions

Stay Single ... prescribe single units

Prescribing a single unit of blood may reduce the risk of an adverse event.

In accordance with the NHMRC Guidelines.

Only one unit of blood can be ordered if a patient is not actively bleeding.

Only one unit will be issued at a time.

If units will be issued if clinically indicated after the patient has been reviewed.

Indications for second unit are:
- Active Blood loss
- Hypotension
- Persistent chest pain
- Less than 80% rise in Hct following first unit

If requested the Hematology Department will be happy to provide advice on the appropriate management of patients.

One Unit Policy

Freemantle, Western Australia

Leahy. Transfusion 2014;54:1133
Ratio of 1 unit to 2 unit orders with Point of Care Clinical Decision Support: US

Mean 1:2 unit ratios shown for each period of the study

Baseline 0.34
Guidelines 0.50
CPOE 1.20

McKinney. Transfusion 2015;55(9):2086
Pre-transfusion Hb of 60-69 g/L increased from 12% to 44% over the 12 years.
Ontario RBC Benchmarking Audit 2015

<table>
<thead>
<tr>
<th>Site</th>
<th>Pre-Transfusion Hb (g/L)</th>
<th>Appropriateness (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>67</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>69</td>
<td>95.0</td>
</tr>
<tr>
<td>8</td>
<td>71</td>
<td>89.6</td>
</tr>
<tr>
<td>3</td>
<td>68</td>
<td>88.0</td>
</tr>
<tr>
<td>6</td>
<td>73</td>
<td>86.0</td>
</tr>
<tr>
<td>7</td>
<td>70</td>
<td>85.0</td>
</tr>
<tr>
<td>9</td>
<td>73</td>
<td>82.5</td>
</tr>
<tr>
<td>1</td>
<td>73</td>
<td>73.3</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>68.6</td>
</tr>
<tr>
<td>10</td>
<td>78</td>
<td>31.7</td>
</tr>
</tbody>
</table>

Decreasing appropriateness correlates (somewhat) with Increasing pre-transfusion Hb

Slide credit: J. Callum
Ontario 2015

<table>
<thead>
<tr>
<th></th>
<th>Mean nadir Hb (g/L)</th>
<th>Discharge Hb If transfused</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No transfusion</td>
<td>Transfusion</td>
</tr>
<tr>
<td>All CABG</td>
<td>94</td>
<td>75</td>
</tr>
<tr>
<td>All CABG + valve</td>
<td>91</td>
<td>71</td>
</tr>
<tr>
<td>All valves</td>
<td>94</td>
<td>74</td>
</tr>
<tr>
<td>One knee</td>
<td>107</td>
<td>73</td>
</tr>
<tr>
<td>One hip</td>
<td>105</td>
<td>76</td>
</tr>
<tr>
<td>All Gyne</td>
<td>102</td>
<td>69</td>
</tr>
</tbody>
</table>

Data from Ontario Transfusion Coordinator (ONTraC) program 2015. These 25 hospitals have ONTraC nurses or MLTs reviewing preoperative patients and optimising preoperative Hb to avoid allogeneic blood transfusion.

Slide credit: J Freedman ONTraC
Acknowledgements

• Dr. Yulia Lin (QIP co-lead)
• Denise Evanovitch (QIP co-lead)
• Dr. John Freedman (ONTraC)
• Recommendations Working Group
• Technologist Screening Toolkit Working Group
• External reviewers (many!)
## OTQIP Committee (non-ORBCoN members)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Location/Representing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom Alloway</td>
<td>Patient representative</td>
<td>Patients</td>
</tr>
<tr>
<td>Jennifer Bawden</td>
<td>Technical Coordinator-Lab</td>
<td>Windsor Regional Hospital</td>
</tr>
<tr>
<td>Donna Berta</td>
<td>Blood Conservation Coordinator</td>
<td>London Health Sciences Centre</td>
</tr>
<tr>
<td>Chris Campbell</td>
<td>Medical Laboratory Technologist</td>
<td>EORLA, Renfrew Victoria Hospital</td>
</tr>
<tr>
<td>Craig Ivany</td>
<td>CEO</td>
<td>EORLA</td>
</tr>
<tr>
<td>Yulia Lin MD</td>
<td>Transfusion Medicine Specialist &amp; Hematology</td>
<td>Sunnybrook Health Sciences Centre</td>
</tr>
<tr>
<td>Lisa Ruston</td>
<td>Director, Quality, Risk &amp; Medical Affairs</td>
<td>Peterborough Regional Health Centre</td>
</tr>
<tr>
<td>Menaka Pai MD</td>
<td>Hematologist</td>
<td>HRLMP</td>
</tr>
<tr>
<td>Robert Romans</td>
<td>Associate Director, Account Management</td>
<td>Canadian Blood Services</td>
</tr>
<tr>
<td>Danielle Watson</td>
<td>Charge Technologist</td>
<td>Grey Bruce Health Services</td>
</tr>
<tr>
<td>Sophie Yang</td>
<td>Project Coordinator</td>
<td>Blood Programs Coordinating Office</td>
</tr>
<tr>
<td>Sandra Fazari</td>
<td>Manager HRLMP, TM, Stem Cell and Tissue Typing</td>
<td>HRLMP</td>
</tr>
</tbody>
</table>

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