



Don't transfuse patients based solely on an arbitrary hemoglobin threshold. Transfuse only the minimum number of units required instead of liberal transfusion. (*Canadian Hematology Society*)

Don't transfuse red blood cells for arbitrary hemoglobin or hematocrit thresholds in the absence of symptoms, active coronary disease, heart failure or stroke. "Suggest that a restrictive approach is associated with improved outcomes". (*Canadian Society of Internal Medicine*)

Don't transfuse more than one red blood cell unit at a time when transfusion is required in stable, non-bleeding patients. (*Canadian Society for Transfusion Medicine*)

Transfusions are associated with increased morbidity and mortality in high-risk hospitalized inpatients. Single unit transfusions should be the standard for non-bleeding, hospitalized patients. Additional units should only be prescribed after re-assessment of the patient and their hemoglobin value.

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The Ontario Transfusion Quality Improvement Plan (OTQIP) has been endorsed by the Ontario Blood Advisory Committee (OBAC), Choosing Wisely Canada (CWC) and Health Quality Ontario (HQO).

Background

What is a Quality Improvement Plan?

A Quality Improvement Plan (QIP) is a formal commitment to quality improvement, aligned with system and provincial priorities. By identifying and explaining how to achieve long-term improvement goals in their QIPs, Ontario's health organizations are able to effectively focus their quality improvement efforts on those key issues that will truly improve health care in our province.

For more information on Quality Improvement Plans, visit Health Quality Ontario:

<http://www.hqontario.ca/quality-improvement/quality-improvement-plans>

What is the Ontario Transfusion Quality Improvement Plan?

The Ontario Transfusion Quality Improvement Plan (OTQIP) is a provincial quality improvement initiative developed by the Ontario Transfusion Quality Improvement Plan Committee. The OTQIP is designed to reduce inappropriate red blood cell (RBC) transfusions in Ontario by targeting the specific reason(s) for inappropriate RBC transfusions. The OTQIP and accompanying toolkit have been developed in consultation with physicians, technologists, nurses and other stakeholders within Ontario using the Health Quality Ontario framework. There are two main components to the OTQIP. The OTQIP narrative describes the rationale, partner engagement and accountability of the plan. The OTQIP describes the specific aims, measures and change ideas of the plan.

[Ontario Transfusion Quality Improvement Plan Narrative](#)

[Ontario Transfusion Quality Improvement Plan](#)

What is the OTQIP Committee?

The Ontario Transfusion Quality Improvement Plan Committee is comprised of representatives from hospital transfusion medicine laboratories (physicians, medical laboratory technologists, managers), hospital quality and risk management, hospital senior administration, the Ontario Blood Advisory Committee, the Ministry of Health and Long-Term Care (MOHLTC), the Ontario Regional Blood Coordinating Network (ORBCoN) and Ontario Transfusion Coordinators (ONTraC).

[Ontario Transfusion Quality Improvement Plan Membership](#)

Purpose of this Guidance document

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. To achieve the desired results, the appropriate intervention should be selected to match the problem at your institution.

This guidance document explains how to use the OTQIP Toolkit to support transfusion quality improvement initiatives. The toolkit includes:

- [*Institution Quality Improvement Plan Narrative Template*](#)
- [*Institution Quality Improvement Plan Template*](#)
- [*Clinical practice recommendations for blood component use in adult inpatients*](#)
- [*Transfusion order set template*](#)
- [*Standard operating procedure template for prospective blood product order screening by the medical laboratory technologist*](#)
- Additional documents to support the implementation of these quality improvement initiatives

Institution Quality Improvement Plan Narrative Template

The Institution QIP narrative provides the overview, focus, partner engagement and accountability information for the improvement plan. This document template can be inserted into a hospital's quality improvement plan or used as its own department QIP narrative by an institution (hospital) department or the institution's transfusion committee.

[*Institution Quality Improvement Plan Narrative Template – Blood Transfusion*](#)

Institution Transfusion Quality Improvement Plan Template

The Institution Transfusion QIP template is designed to be in alignment with the Ontario Transfusion Quality Improvement Plan, and provides institutions or hospitals with a template of a RBC utilization quality improvement plan to reduce inappropriate RBC transfusions, reduce adverse transfusion events associated with inappropriate transfusions, and improve patient outcomes. Both the OTQIP and the institution transfusion QIP template were designed to resemble your organizational QIP and Health Quality Ontario QIP templates. Moving forward with an institution transfusion QIP, your organization is welcome and encouraged to share the Ontario Transfusion QIP with your institution's CEO/senior administration to support and reflect any broader organizational plans.

[*Ontario Transfusion Quality Improvement Plan*](#)

[*Institution Transfusion Quality Improvement Plan template*](#)

In order to understand how to create your institution’s QIP, understanding the Ontario Transfusion QIP may be helpful. The OTQIP provides a framework for determining your organization’s improvement targets and initiatives and consists of three sections:

- AIM: What are we trying to accomplish?
- MEASURE: How do we know that a change is an improvement?
- CHANGE: What changes can we make that will result in the improvements we seek?

Aim of the Ontario Transfusion Quality Improvement Plan (OTQIP)

The aim of the OTQIP and the institution transfusion QIP is to: **Reduce unnecessary harm by improving appropriate RBC transfusions.** The goal is for patients to receive evidence-based high-quality care that is safe, patient centred, effective, efficient, equitable and timely.

Measures

This section seeks to answer the question: “How do we know that change is an improvement?” Measurement is an essential part of implementing and testing ideas for improvement. Measures tell your team whether the changes that you have implemented are actually leading to quality improvement.

The specific elements of the “Measure” section in the OTQIP and Institution QIP template are addressed below:

	OTQIP	Institution QIP Template
Measure/Indicator	<ul style="list-style-type: none"> • Percent of RBC transfusions occurring when pre-transfusion Hb less than 80g/L. • Percent of single unit (at a time) transfusions 	Each institution should establish its own measures or indicators. The OTQIP recommends collecting the two measures described as these are more feasible to collect over time. The other advantage of reporting similar measures is to allow comparison with peers in the future.
Current Performance (Baseline)	Based upon the 2013 RBC utilization audit of 5 community hospitals, the percent of RBC transfusions with pre-transfusion Hb less than 80 g/L in adult inpatients was between 50-84% and the percentage of single unit RBC transfusions ranged from 25-78%.	Each hospital should establish its own baseline/current performance data to determine if there is a high percentage of inappropriate RBC transfusions based upon the measures/indicators above.
Target (over 4 years)	For each measure (percent of transfusions with pre-transfusion Hb less than 80 g/L and percent single unit transfusions), the targets are similar. 2016/17: Establish Baseline 2017/18: Baseline + 10% improvement (towards a target of 80%)	The Measure/Indicator column should indicate the targeted outcome the organization expects to achieve by the end of the target year. Some key considerations when setting targets are: <ul style="list-style-type: none"> • Teams should consider a target that represents what they hope to achieve

	<p>2018/19: Baseline + 20% improvement (towards a target of 80%)</p> <p>2019/20: Sustained improvement</p> <p>2020/2021: Sustained improvement</p>	<p>within six and 12 months</p> <ul style="list-style-type: none"> Teams should set stretch targets in high priority areas <p>Teams should not set targets below baseline. If an organization cannot meet the baseline, information should be included in the 'comment' section to elaborate on why they cannot.</p>
Target Justification	<p>The proposed targets were chosen for the following reasons:</p> <ul style="list-style-type: none"> Hospitals will be at varying baseline levels depending on what RBC transfusion initiatives are in place Matching best hospital performance suggests that targets should be at about 80% 100% target is unrealistic/unattainable as appropriate transfusions cannot be judged by hemoglobin alone and bleeding patients may need multi-unit transfusions 	<p>Organizations should justify their performance improvement targets. Organizations may wish to consider the following common justifications for more aggressive or stretch targets:</p> <ul style="list-style-type: none"> Provincial benchmark (where this exists) Matching best performance in other jurisdictions 90th percentile among peers Match the rate of improvement attained by other leading organizations Match provincial average (appropriate only for organizations whose performance is far below average)

Change

This section seeks to answer the question: “What changes can we make that will result in the improvements we seek?” In this section you will outline what your QI team plans to do that will contribute to you reaching your objective and your outlined measures. The OTQIP offers some change ideas or quality improvement initiatives that can be incorporated into the hospital QIP but organizations may also choose other change ideas that may work specifically for their hospital.

Heading	Institution QIP template
Planned improvement initiatives (Change Ideas)	<p>This column allows teams to detail the quality improvement initiatives being put in place that will lead to the desired improvement. Change ideas should be identified for all objectives.</p> <p>Change Idea Examples</p> <ul style="list-style-type: none"> Adopt/Implement RBC transfusion guidelines and/or RBC transfusion order sets Implement a prospective screening process for RBC transfusion orders
Methods	<p>The “Methods” column allows teams to explain the process the organization will follow in order to achieve its quality improvement goals. Include details on how change ideas will be selected, assessed, and analyzed.</p>
Process Measures	<p>Process measures help teams determine whether or not their change ideas</p>

	<p>are leading to improvement. Processes must be measurable as rates, percentages, and/or numbers over specific timeframes.</p> <p>Examples of Process Measures for the OTQIP</p> <ul style="list-style-type: none"> • Adoption of guidelines by hospital Transfusion Committee (TC) and Medical Advisory Committee (MAC) • Percentage of clinicians and nurses who are able to access the hospital guidelines • Percentage of RBC transfusion orders submitting using the order set • Percentage of RBC orders prospectively screened by MLTs • Implementation of ORBCoN's policy for transfusion medical director follow up of apparently inappropriate orders
<p>Goal for change ideas</p>	<p>This is the organization's numeric goal, specifically related to the process measures, and is used to track progress on change ideas within specific timeframes. Setting aggressive or stretch targets for these process measures and implementing the change ideas to achieve them will help accelerate improvement on priority indicators.</p> <p>Examples</p> <ul style="list-style-type: none"> • Guidelines passed by MAC/TC • 80% of physicians and nurses can locate guidelines • 80% of RBC transfusion orders use the order set • 80% of RBC transfusion orders are screened by MLTs

Comment Section of QIP

This is a section for any additional comments about change ideas or quality improvement initiatives. Comments may provide context or cite organizational factors for success.

Problem Identified/Getting Started

Gathering the team: Who should be involved in institution transfusion QIP development and implementation?

The development and implementation of quality improvement initiatives outlined within depend on the involvement and engagement of a site's senior leaders, ordering providers, nurses, transfusion medicine laboratory staff, and patients.

Below are the potential roles of the individuals and groups involved in QIP development/implementation.

Chief Executive Officer or Executive Director

- The Chief Executive Officer (CEO) or Executive Director (ED) is accountable for the hospital's Quality Improvement Plan. The CEO oversees and supports the Quality Improvement initiatives as the hospital develops/implements the Institution Transfusion Quality Improvement Plan. At some institutions, the Quality Committee of the Board may provide oversight.

Medical Advisory Committee (MAC)

- Approving the adoption and implementation of clinical practice recommendations/order sets for the utilization of blood products.

Quality/Risk Department

- Communicating the strategy for the Institution Transfusion Quality Improvement Plan to all ordering physicians and other staff involved in the transfusion process.
- Providing education about the Institution Transfusion QIP
- Supporting programs, departments, and staff in the QIP objectives
- Monitoring the QIP in conjunction with Transfusion Medicine department and other quality committees

Clinical Leadership

- The clinical leadership of an organization is critical to quality improvement initiatives. Senior leaders, including a Transfusion Medicine Champion, should spearhead the development of the institution transfusion QIP and should aim to involve all ordering physicians and healthcare professionals involved in any transfusion activities in the OTQIP development and implementation.

Ordering Physicians and Healthcare Professionals

- Ordering physicians and other healthcare professionals who order blood and blood products have an important role to play in hospital transfusion QIP development and implementation. Quality improvement best practice demonstrates the importance of engaging various staff in quality improvement efforts. This group of individuals has a crucial role in discussing and educating their patients and families about transfusion options.

Transfusion Medicine Department/Transfusion Medicine Committee

- The institution transfusion QIP team should include a Transfusion Medicine Champion, the Transfusion Medicine Department Medical Director and Manager and Charge Technologist/Quality Technologists. The team should update the Hospital Quality Committee on the transfusion QIP development and its progress throughout the year.

Patients, Family Members and Caregivers

- Patients, family members, and caregivers can offer valuable insight into processes by sharing their experiences of care. QIP Teams should look for opportunities to include the patient's voice through patient engagement and co-design.

Quality Improvement Plan Toolkit

Introduction

This toolkit was created to support the implementation of interventions designed to reduce unnecessary RBC transfusions in your institution or hospital. It can be used by Transfusion Medicine departments, physician groups, clinical services or organizations to help achieve significant reductions in inappropriate RBC transfusions. Different institutions will be at different stages of transfusion quality improvement. To achieve the desired results, it is important to understand the current transfusion practice and the existing processes in place at your institution to support appropriate RBC transfusion.

To ensure that you select a module that is best suited to meet your needs, which statement best reflects the current state at your institution:

- A. We suspect but do not know whether we have a problem related to inappropriate RBC transfusions. Select Module #1 on how to measure inappropriate RBC transfusions; OR
- B. We have confirmed that inappropriate RBC transfusions occur but these practices vary based on the individual provider. Select Module #2 on how to implement transfusion guidelines; OR
- C. We already have transfusion guidelines but these are inconsistently followed leading to some inappropriate transfusions. Select Module #3 on how to implement prospective transfusion order screening.

Module #1: Confirming unnecessary red blood cell transfusions

You have selected the module to confirm **unnecessary** RBC transfusions at your institution.

Make sure this toolkit is right for you

This toolkit is well suited for your institution, if you suspect, but have not yet confirmed, that unnecessary RBC transfusions are occurring at your hospital. Sometimes problems are reported anecdotally and, without a quick audit, it is not possible to confirm whether a systemic problem truly exists. This module will assist you in quickly determining whether you have excessive RBC transfusion ordering practices that are worth addressing to improve the value of care provided.

Key ingredients of this intervention

- At this point, it is too early to implement an intervention but this module will help you confirm whether a problem exists before proceeding to other modules.

How to perform a quick audit at your institution

Determining whether you have unnecessary RBC transfusions at your institution does not require a large investment in effort. A quick audit can be undertaken by contacting your transfusion medicine laboratory or blood bank to get a list of the last 75-100 RBC transfusions issued. Even though the measures described below will be based on 50 transfusions, repeat patients will be excluded requiring a larger list of transfusions. Then use the lab system at the hospital to look up the pre-transfusion hemoglobin for each RBC transfusion. Collecting these simple data will allow you to get a rough idea of the transfusion practice at your hospital. If you have the time and resources, a chart audit can also be

done retrospectively to determine the patient’s comorbidities (e.g. cardiac disease) and whether the patient had symptoms related to anemia or active bleeding at the time of transfusion.

Choose measures

The following are the most common measures used to evaluate appropriate RBC transfusions:

- **Percent of transfusions with a pre-transfusion hemoglobin less than 80 g/L.** This measurement looks at the most recent hemoglobin level within 48 hours prior to the start of the transfusion. It can be collected for all transfusions (including inpatients and outpatients) over a certain time period. Typically we recommend collecting data for 50 RBC transfusions at baseline, selecting only the first RBC transfusion for each patient during the audit period. For example, the best performing site in the 2013 Ontario RBC transfusion audit for adult inpatients was 84% of transfusions with a pre-transfusion hemoglobin less than 80 g/L. Another parameter that could be measured with these data would be the average pre-transfusion hemoglobin.
- **Percent single unit red blood cell transfusions.** A single unit RBC transfusion is the practice of prescribing only one unit at a time, with clinical reassessment of the patient prior to prescribing a subsequent unit. Clinical reassessment should include a post-transfusion hemoglobin. This can be collected for all transfusion orders (including inpatients and outpatients) over a certain time period. Typically we recommend collecting data for 50 transfusion orders at baseline, selecting only the first transfusion order for each patient during the audit period. A transfusion order is defined as transfusions occurring within the same 24 hour period prior to a hemoglobin reassessment. The best performing site in the 2013 Ontario RBC audit for adult inpatients was 78% single unit transfusions.
- **Manual chart audit.** Manual chart audits for RBC transfusion appropriateness can be done and are more accurate in determining appropriateness. However, these require interpretation of information in the chart, consideration of the patient’s comorbidities and whether the patient was symptomatic or bleeding at the time of the transfusion. In addition once you have gathered all this information, you have to adjudicate the appropriateness of the transfusion based on criteria. An example of an electronic RBC audit tool can be found on the ORBCoN e-Tools website <http://etools.transfusionontario.org>. Please contact your Regional ORBCoN office to acquire access to the e-Tools application (if required).

The advantages and disadvantages of each measure are compared in the following table:

Measures	Advantages	Disadvantages
Percent of RBC transfusions with a pre-transfusion hemoglobin less than 80 g/L	<ul style="list-style-type: none"> • Easy to obtain on a regular basis • May identify a specific message for quality improvement • Recommended by OTQIP • Allows comparison with peers 	<ul style="list-style-type: none"> • May not always identify inappropriate transfusion

Percent single unit RBC transfusions	<ul style="list-style-type: none"> • Easy to obtain on a regular basis • May identify a specific message for quality improvement • Recommended by OTQIP • Allows comparison with peers 	<ul style="list-style-type: none"> • May not always identify inappropriate transfusion
Manual Chart Audit	<ul style="list-style-type: none"> • Gold Standard • Takes into consideration comorbidities, symptoms, and bleeding at time of transfusion 	<ul style="list-style-type: none"> • Requires adjudication for appropriateness • Labour and time intensive • Difficult to do on a regular basis

The OTQIP recommends using percent of transfusions with a pre-transfusion hemoglobin less than 80 g/L and percent single unit RBC transfusions as these two measures are more feasible to collect over time. An electronic tool will be available to facilitate data collection for both baseline and ongoing data collection. A simple method to capture the data is displayed below.

[OTQIP Quality Improvement Tracker Tool](#)

One additional measure to consider is the **monthly number of RBC transfusions per 100 acute inpatient bed days (RBC/100 AIPD)**. This is an easy metric to track one’s progress over time and adjusts for hospital inpatient activity. This value cannot be as easily compared between hospitals as hospitals may have very different patient populations with different transfusion requirements. The monthly number of RBCs can be obtained from your local transfusion service as it is reported monthly to Canadian Blood Services. The number of acute inpatient bed days per month can be obtained from your hospital’s decision support department. The following link shows how you can enter your own data and chart out your monthly RBC per 100 acute inpatient days over time.

[RBC/100 AIPD excel graph example](#)

Selecting an intervention

If an issue with inappropriate RBC transfusions has been determined at your facility, then the next question is why do these occur? Although there are many reasons for inappropriate RBC transfusions, important considerations are whether there are any institutional transfusion guidelines in place to set the transfusion expectations for the hospital and if there are guidelines, whether providers follow those guidelines.

Based on the experience in your hospital, the problem is:

- A. We have confirmed that inappropriate RBC transfusions occur but these practices vary based on the individual provider. Select Module #2 on how to implement transfusion guidelines; OR

- B. We already have transfusion guidelines but these are inconsistently followed leading to some inappropriate transfusions. Select Module #3 on how to implement prospective blood bank order screening.

Module #2: Implementing transfusion guidelines

You have selected the module to implement transfusion guidelines at your institution.

Make sure this toolkit is right for you

This toolkit is well suited for your institutions if, during your audit, you noted that practices vary among ordering providers and no transfusion guidelines are in place. This module may also be helpful to update institution transfusion guidelines as the evidence base for transfusion is always changing.

Key ingredients of this intervention

If this description accurately reflects the current state at your institution, this module may help establish your institution's expectations for transfusion practice with the following changes:

- Introduction or update of transfusion guidelines
- Introduction of preprinted transfusion order sets

Achieving physician consensus regarding appropriate indications for transfusion

Achieving consensus among physicians regarding the appropriate indications for transfusion is a crucial step in development of all interventions to reduce inappropriate transfusion. This process starts from initial discussions at the Transfusion Committee, then to stakeholder consultation, and finally to approval at the Medical or Interprofessional Advisory Committee (MAC).

As a starting point, the Ontario Transfusion Quality Improvement Committee has compiled examples of transfusion guidelines from various institutions along with evidence based guidelines to create a document entitled: [Clinical practice recommendations for blood component use in adult inpatients](#). This document can be used as an initial template for setting your hospital's transfusion guidelines or updating your current transfusion guidelines.

Since transfusion affects almost every department in the hospital, it is crucial to ensure that the rationale for implementing hospital transfusion guidelines is clear and involves potential key stakeholders. Here are some steps to consider in the implementation process.

- Prepare a brief statement with the baseline audit results showing the need for improvement, the lack of transfusion guidelines and the [Clinical practice recommendations for blood component use in adult inpatients](#)
- Present the recommendations at the hospital's Transfusion Committee to determine if any modifications are required
- Disseminate the brief statement to Medical Departments, Nursing Professional Practice Committee (or equivalent), Transfusion Medicine Laboratory staff. This step is key to ensuring that clinicians and nurses know about the guidelines, are invited to provide feedback and receive education on the guidelines at the same time. This may also provide an opportunity to discover if department-specific guidelines already exist in the hospital, of which the Transfusion Committee was unaware.
- Incorporate any feedback received and then present the revised guidelines to the hospital's Transfusion Committee for approval.
- A member of the Transfusion Committee should then present the audit results and guidelines to the MAC for approval.

Once MAC approval has been obtained regarding the criteria for appropriate transfusion, you are now ready to communicate the information. Here are some suggestions that may be helpful.

- [Screensavers](#) using the Choosing Wisely Canada slogan “Why give two when one will do?”
- [Transfusion order set template](#)
- Building guidelines into computerized provider order entry

The Transfusion Order Set

The purpose of the transfusion order set is to help guide clinicians to order blood appropriately at the time of the transfusion order. The transfusion order set typically includes the quantity, the infusion rate and the indication for a blood component. Other additional features that might be helpful include having the guidelines on the back of the form.

It is very important to determine the appetite for transfusion order sets in your institution for this intervention to be successful. Things to consider when implementing transfusion order sets include:

- Ensuring that transfusion order sets are used most of the time. Some acceptable exceptions include orders for transfusion in emergency situations and from the operating room where often these orders are verbal.
- Ensuring that the information on the transfusion order sets is delivered to the Transfusion Medicine Laboratory (Blood Bank) whether in paper form or electronically. This will help set up a process for implementing transfusion order screening (see next Module #3 for details).

The following is an example of a transfusion order set developed by the Ontario Transfusion QIP, which can be adapted for your institution:

[Transfusion order set template](#)

Measuring your performance

After implementation of guidelines and/or transfusion order sets, it is important to measure the impact of the change. Ideally, the outcome measures should be the same as the baseline measures described in Module #1. We recommend collecting data once every 6 months. The following are examples of common measures to be collected when evaluating your intervention:

Outcome measures

- Percent of transfusions with a pre-transfusion hemoglobin less than 80 g/L.
- Percent of single unit RBC transfusions
- Monthly number of RBC transfusions per 100 acute inpatient bed days (RBC/100 AIPD).

Process measures

Process measures may be collected to detail the uptake of the intervention. Examples include:

- Percentage of physicians who know how to find the transfusion guidelines
- Percentage of nurses who know how to find the transfusion guidelines
- Number or percentage of transfusion orders for which the transfusion order set is used

Balancing measures

Balancing measures should be collected to ensure that no harm occurs as a result of introducing the quality improvement intervention. Examples include:

- Under-transfusion is defined as patients with a hemoglobin less than 60 g/L who are not transfused. This can be determined by contacting the Laboratory Information System team and asking for hemoglobin values less than 60 g/L in a period of time in a particular area. Patients with hemoglobin less than 60 g/L who were not transfused can be reviewed to determine the reason for not transfusing to ensure that these patients were not under transfused. Remember that there may be reasons for not transfusing, including patients who decline transfusion (including for religious reasons) or patients who can be safely treated with alternatives to transfusion such as iron supplementation.

Sustaining early successes

Once the transfusion guidelines and/or a transfusion order set has been implemented to reduce inappropriate RBC transfusion, there are several important ways to help sustain this performance:

1. Transfusion guidelines should be provided to all new nurses and physicians joining the institution. Guidelines should be widely available on the institution's intranet or in poster format on wards where transfusion occurs frequently.
2. Periodic audit and feedback to nurses and physicians is important in confirming sustainability. The results should be presented at the institution's Transfusion Committee which plays an important role in ensuring ongoing education and training, as well as ensuring the transfusion guidelines are updated as new evidence emerges.

Module #3: Implementing prospective transfusion order screening by the Transfusion Medicine Laboratory (Blood Bank)

You have selected the module to implement prospective transfusion order screening by the Transfusion Medicine Laboratory (Blood Bank).

Make sure this toolkit is right for you

This toolkit is well suited for your institution, if during your audit, you noted that transfusion guidelines are in place at your institution but that these are inconsistently followed, leading to some inappropriate transfusions. Your transfusion medicine laboratory or blood bank is interested in playing an important role in ensuring that patients at your institution receive appropriate transfusion care.

Key ingredients of this intervention

If this description accurately reflects your current situation, this module may help establish a forcing function to check the transfusion order prior to blood transfusion release. For the intervention to be successful, it is key that transfusion guidelines have been accepted and approved by the Medical Advisory Committee or Professional Advisory Committee (MAC/PAC) to establish the hospital's expectation of transfusion practice. An audit of transfusion practice after transfusion guideline implementation should be conducted to determine whether there is still need for improvement. If there is, then ensuring that the majority of transfusions are ordered according to the guidelines can be beneficial in reducing inappropriate RBC transfusions. The second key ingredient is the engagement of the Transfusion Medicine Laboratory leadership and staff.

This module on transfusion order screening includes

- A standard operating procedure template for prospective transfusion order screening by the Transfusion Medicine Laboratory / Blood Bank Medical Laboratory Technologists (MLT)
- A technologist education module on how to screen orders
- A communication plan to increase awareness among the clinical staff

What is Prospective transfusion order screening?

Prospective transfusion order screening is the act of screening transfusion orders as they arrive in the Transfusion Medicine Laboratory or Blood Bank. It should be noted that transfusion order screening should be performed only in non-urgent situations. Typically, transfusion orders that are EXEMPT from screening are transfusion orders from the operating room, and for bleeding patients where the clinical situation is dynamic and the need for blood is urgent. Some institutions may also consider outpatient transfusions to be EXEMPT from screening. These situations have not been well studied in clinical studies, and so specific guidelines for outpatients, patients in the operating room or who are actively bleeding have not been established. Most clinical trials and guidelines refer to hemodynamically stable inpatients and this is the group of patients that is the focus of this intervention.

Engaging the Transfusion Medicine Laboratory / Blood Bank Medical Laboratory Technologist (MLT)

MLT input is extremely valuable to ensure that transfusion guidelines are followed. To engage the transfusion medicine laboratory, this intervention (prospective transfusion order screening) should be promoted as empowering MLTs to play a more active role in appropriate RBC transfusion, rather than creating additional work. In fact, the transfusion laboratory can be viewed as having not only a testing role but also a therapeutic role. Not only is it important to ensure that testing is accurate, but it is crucial to ensure that the right product, goes to the right patient for the right reason. It will be important to highlight the extra time that the MLT spends checking with nurses and physicians to ensure that transfusions are ordered according to the hospital transfusion guidelines, in the effort to improve outcomes for patients in terms of decreased transfusion reactions and appropriate transfusion care. Over time, reports have shown that these interventions can lead to fewer transfusions and subsequent reductions to inventory which lead to improved efficiency and time-savings for MLTs.

Engaging the Nurses

Nursing input is also extremely valuable to ensure that transfusion guidelines are followed. To engage the nurses, this intervention should be promoted as empowering the transfusion team (MLT, nurse, and ordering clinician) to play a more active role in ensuring appropriate RBC transfusion for patients. Often, the nurse may be the individual who follows up on abnormal hemoglobin results and is also aware of whether the patient is symptomatic or bleeding. The nurse will also be the first point of contact for the MLT calling the floor to inquire about the patient's status, and the first to notice most of the acute adverse events related to transfusion.

How to get started with Prospective Transfusion Order Screening

The next step is to contact the Transfusion Medicine Laboratory / Blood Bank Manager or Senior Technologist and Transfusion Medicine Medical Director to introduce the concept of prospective transfusion order screening. For some labs, this may be a new skill and does require training. It should be noted that this action is supported by the College of Medical Laboratory Technologists of Ontario.

Practice Guidelines for MLTs Practising in Transfusion Science

http://www.cmlto.com/images/stories/Members/practice_guidelines_for_medical_laboratory_technologists_practising_in_transfusion_science.pdf

To help establish prospective transfusion order screening, the following templates and tools have been developed:

- [*Prospective transfusion orders screening standard operating procedure \(SOP\)*](#)
- [*Technologist education module on how to screen transfusion orders*](#)

It is essential to ensure that prior to implementation, the standard operating procedure (SOP) is consistent with the hospital transfusion guidelines, has been reviewed by the technologists, and that proper training of the technologists has been conducted. Ideally, the medical laboratory technologists should be able to direct any questions to the Transfusion Medicine Medical Director who should follow-up with any unresolved inappropriate orders identified in the screening process.

One options to consider in this intervention, is to start with small, incremental changes. For example, the Transfusion Medicine Laboratory may consider starting with reducing 2 unit transfusion orders to 1 unit at a time for non-bleeding, hemodynamically stable inpatients as a first initial measure. This may help reduce the number of calls to the clinicians and help initiate the change at a more acceptable pace. The change can then be re-evaluated and the next step of introducing hemoglobin thresholds for prospective transfusion order screening can be started. Or, the intervention may be in effect during the day shift only at the start.

Inventory Management Considerations during the Implementation of a Prospective Screening Process

- Evaluate your RBC inventory numbers prior to the implementation of a prospective screening process. [Link to Inventory Management Toolkit](#)
- Monitor your RBC inventory levels during the implementation of the prospective screening process for any increase in outdated units. Adjust RBC inventory levels to account for reductions in transfusion demand where appropriate. This is extremely important if you are an institution that receives short-dated RBC units from other sites.
- Ensure there is a plan in place to redistribute RBC units should you experience increased amounts of short-dating units.

Communication of Prospective Transfusion Order Screening

It is essential that there has been clinical stakeholder awareness that prospective transfusion order screening will occur. Similar to Module #2, here are some steps to consider in the implementation process.

- Prepare a brief statement with the baseline audit results showing the need for improvement.
- Present the proposal to proceed with prospective transfusion order screening at the hospital's Transfusion Committee.
- Disseminate a brief statement to Medical Departments, Nursing Professional Practice Committee (or equivalent), Transfusion Medicine Laboratory staff. This step is key to ensuring that clinicians and nurses know about prospective transfusion order screening according to the accepted hospital transfusion guidelines.
- Conduct an initial 2-3 week pilot of screening during day time hours 9am-5pm and Monday to Friday.
- Present the results of the pilot to the Transfusion Committee for review and approval to proceed with prospective transfusion order screening 24/7.
- A member of the Transfusion Committee then presents the results of the pilot and the concept of prospective transfusion order screening to the Medical or Interprofessional Advisory Committee for approval.

Measuring your performance

After implementation of prospective transfusion order screening, it is important to measure the impact of the change. Ideally, the outcome measures should be the same as the baseline measures described in Module #1. We recommend collecting data once every 6 months. The following are examples of common measures to be collected when evaluating your intervention.

Outcomes measures

- Percent of transfusions with a pre-transfusion hemoglobin less than 80 g/L.
- Percent single unit RBC transfusions
- Monthly number of RBC transfusions per 100 acute inpatient bed days (RBC/100 AIPD).

Process measures

Process measures may be collected to detail the uptake of the intervention. Examples include:

- Percentage of transfusion orders in non-OR, non-bleeding patients that are screened
- Percentage of inappropriate orders detected by MLT screening that have been followed up by medical director
- Percentage of transfusion orders that are changed

Balancing measures

Balancing measures should be collected to ensure that no harm occurs as a result of introducing the quality improvement intervention. Examples include:

- Delays in transfusion as reported by clinical wards
- Under-transfusion is defined as patients with a hemoglobin less than 60 g/L who are not transfused. This can be determined by contacting the Laboratory Information System team and asking for hemoglobin values less than 60 g/L in a period of time in a particular area. Patients with hemoglobin less than 60 g/L who were not transfused can be reviewed to determine the reason for not transfusing to ensure that these patients were not under transfused. Remember that there may be reasons for not transfusing, including patients who decline transfusion (including for religious reasons) or patients who can be safely treated with alternatives to transfusion such as iron supplementation.
- Misapplication of screening criteria. Determining if screening criteria were inadvertently applied to patients EXEMPT from screening process: operating room and bleeding patients.

Sustaining early successes

Once prospective transfusion order screening has been implemented to reduce inappropriate RBC transfusion, there are several important ways to help sustain this performance:

1. Transfusion guidelines should be provided to all new nurses and physicians joining the institution. Guidelines should be widely available on the institution's intranet or in poster format on wards where transfusion occurs frequently. New nurses and physicians should also be made aware of prospective transfusion order screening.
2. Prospective transfusion order screening training should be provided to all new medical laboratory technologists joining the transfusion medicine laboratory.

3. Periodic audit and feedback to nurses, physicians and transfusion medicine laboratory staff is important in confirming sustainability. The results should be presented at the institution's Transfusion Committee which plays an important role in ensuring ongoing education and training, as well as ensuring the transfusion guidelines are updated as new evidence emerges.

Reporting on OTQIP Progress

Ultimately, the goal of the OTQIP is to reduce unnecessary RBC transfusion in Ontario. The OTQIP encourages institutions to report on their progress using the online electronic tool starting with their baseline measurements and their periodic audits (once every 6 months) as they implement different interventions at their institutions. The online tool will capture what changes institutions have implemented and where they are on their quality improvement path. The online electronic tool will be housed centrally by the Ontario Regional Blood Coordinating Network (ORBCoN). Data will be shared anonymously with the consent of each participating institution.

Glossary of Terms

Blood Programs Coordinating Office (BPCO) – The BPCO was established in fall 2005 by the Ontario Ministry of Health and Long-Term Care (MOHLTC). The BPCO is mandated to manage Ontario’s relationship with the Canadian Blood Services (CBS). The BPCO supports the Minister of Health, who is a corporate member of CBS, by providing advice and guidance regarding funding, strategic direction, Board of Director appointment and issues management.

Ontario Regional Blood Coordinating Network (ORBCoN) - The BPCO launched the ORBCoN initiative to provide an organized and integrated approach to blood management in Ontario. ORBCoN has also been created as the mechanism to engage hospitals and CBS; coordinate educational initiatives to facilitate the adoption of best practices and improve patient safety; and to assist with implementing aspects of the Blood Utilization Strategy and carrying out provincial projects.

Ontario Transfusion Coordinators (ONTraC)-The Ontario Transfusion Coordinators (ONTraC) Program is a provincial blood conservation program that attempts to enhance transfusion practice by promoting alternatives to allogeneic transfusion in surgical patients, improving patient care and well-being in a cost-effective manner.

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