Red Blood Cell Transfusion Audit Tool

Using Blood Wisely.

An initiative of:
Choosing Wisely Canada
Canadian Blood Services
Héma-Québec

This tool will provide guidance on how to undertake a simple audit that will determine if your hospital can improve its red blood cell (RBC) transfusion practices. There are multiple ways to evaluate the appropriateness of RBC transfusions at your organization.

The Using Blood Wisely audit tool will allow you to measure two indicators:

1. Percentage of single unit transfusions
2. Percentage of inpatient RBC transfusions with a restrictive transfusion threshold

1. Percentage of Single Unit Transfusions

Definition:

- A single unit transfusion measure reflects the practice of prescribing one RBC unit at a time with clinical reassessment prior to prescribing a subsequent unit.
- For this audit, a single unit transfusion is defined when a patient is transfused only one RBC unit on a given calendar day.
- Organizations can pull this data fairly efficiently from their laboratory information systems (LIS).
- The target for this metric is 65% for inpatient RBC transfusions. This target is based on the 75th percentile from audits entered into a provincial quality improvement database in Ontario.

Instructions	Example
Pull a transfusion report from your LIS for at least 50 consecutive inpatients. If you don't have 50 inpatient transfusions in a month, pull for a report for all of the transfusions you did that month.	Pull a transfusion report for one week. This may be more than 50 consecutive inpatients. This report can be exported to Excel.
This excludes transfusions in outpatient clinics, dialysis, the emergency department and the operating room.	Sort the report by location and exclude locations that are outpatient clinics, dialysis, the emergency department, or the operating room. Exclude neonates as they often have different transfusion thresholds. Then sort by patient unique identifier and date and time of issue.
Count the number of transfusion days where one patient receives 1 RBC unit in one day = A	A = 81
Count the number of transfusion days where one patient receives 2 RBC units in one day = B	B = 9
Count the total number of patients transfused each day for the LIS pull	C = 96 In this example: there were 81 instances where a patient received 1 unit on 1 calendar day, 9 instances where a patient received 2 units on 1 calendar day and 6 instances when a patient received more than 2 units on 1 calendar day.

How do I calculate Percentage of Single Unit Transfusions?

- Percentage of single unit transfusions = A/C = 81/96 = 84%
- Percentage of double unit transfusions = B/C = 9/96 = 9%

2. Percent of Inpatient RBC Transfusions with a Restrictive Transfusion Threshold

Definition:

- An RBC transfusion with a restrictive transfusion threshold reflects the practice of prescribing an RBC unit when the hemoglobin (Hb) level drops below a certain level.
- Prior studies use two different thresholds to describe restrictive transfusion practices: RBC transfusion with a) Hb ≤ 80 g/L; and b) Hb ≤ 70 g/L.
- This measure may be more difficult to collect since at some hospitals, the pre-transfusion may need to be looked up manually for each transfusion.
- The target for this metric is 80% of transfusions with a pre-transfusion Hb less than 80 g/L.

Instructions	Example
Pull a transfusion report from your LIS for for at least 50 consecutive inpatients.	Pull a transfusion report for one week. This may be more than 50 consecutive patients. This report can be exported to Excel. The same list of transfusions that was used for the single unit transfusion audit can be used here.
This excludes transfusions in outpatient clinics, dialysis, the emergency department and the operating room.	Same as above, then sort transfusions by unique patient identifier and date and time of issue.
Record the latest Hb within 24 hours prior to each transfusion.	Look up the latest Hb within 24 hours prior to each transfusion.
Count the total number of transfusions with a pre-transfusion Hb = A	A = 126 Two transfusions did not have a pre-transfusion Hb within 24 hours prior to the transfusion
Count the number of transfusions where preceding Hb ≤ 80 g/L = B	B = 109
Count the number of transfusions where preceding Hb ≤ 70 g/L = C	C = 70
Count the total number of transfusions during the audit period = D (Although this number is not used in the calculations, this will allow us to calculate the total number of transfusions included in the audits).	D = 128

How do I calculate Percent of Inpatient RBC Transfusions with a Restrictive Transfusion Threshold?

- Percentage of transfusions with pre-Hb ≤ 80 g/L = B/A = 109/126 = 87%
- Percentage of transfusions with pre-Hb ≤ 70 g/L =C/A = 56%

Results

The benchmark targets for these indicators are:

- At least 65% of red blood cell transfusion episodes are single unit
- At least 80% of inpatient red blood cell transfusions have a pre-transfusion Hb 80 g/L or less

If your hospital does not meet these benchmark targets, then there is room to improve and you are ready to move on to the next step in the Get Started section.

The Spot Audit: Alternative Method

Single Unit Transfusion

The above simplified method counts a single unit transfusion as one RBC unit given on a calendar day. With this alternative method, if 2 units are given on a single day and there is a hemoglobin check in between the units, these could be counted as 2 single unit transfusions. The denominator is the number of transfusion episodes as defined by having a Hb prior and after the transfusion before the next transfusion(s).

Pre-Transfusion Hb 80 g/L or Less

The above simplified method counts the most recent Hb prior to the transfusion and does not take into account any intervening RBC units. With this alternative method, a pre-transfusion Hb is included as long as it occurs immediately before a RBC unit transfusion without any intervening transfusion. The denominator would be the number of pre-transfusion hemoglobin levels recorded. For example, say in one calendar day a pre-transfusion Hb is 83 g/L and then 3 units are transfused before another Hb is done. The simplified Using Blood Wisely method counts a pre-transfusion Hb of 83 g/L for each of these transfusion units (3 entries). Using the alternative method a pre-transfusion Hb of 83 g/L would only be counted for the first unit (1 entry).

A validation was performed using both the simplified Using Blood Wisely method with the alternative method and the results were similar. Please ensure that you choose one method throughout your intervention. You will be asked to report which method you used on your designation form.

Frequently Asked Questions

1. **If the hemoglobin is checked in between two units, do you count as one or two?**
   Using the simplified audit process, if both units occur on the same calendar day, this would be counted as a double unit transfusion. If the two units spanned midnight with one transfusion occurring before midnight and one after midnight (and no other transfusions were administered on either day), this would count as two single unit transfusions. Using the alternative method, these would be counted as two single unit transfusions.

2. **Are multiple transfusions on a single patient included or excluded?**
   We are not excluding events based on patients that have had multiple transfusions. If all of the transfusions happened on a single calendar day, this counts as one transfusion episode in the denominator for single unit transfusions.

3. **If a patient does not have an updated hemoglobin within the last 24 hours before the transfusion, are these counted as > 80 g/L?**
   No, these are not counted. The denominator for this metric is the number of transfusions with a pre-transfusion hemoglobin done.

4. **For the data point of Hg 80 g/L or less, do we collect ALL Hgs 80 g/L or less, or just those between 70 and 80 g/L?**
   Please count all transfusions with Hg 80 g/L or less.

5. **If a patient comes into the hospital via the Emergency department, and then ends up admitted and I cannot tell where they received their blood transfusion, do I include this patient in the spot audit?**
   Yes, you can include this patient in your audit.

6. **Can we include paediatrics/NICU?**
   Paediatrics can be included. We recommend the following:
   - Include children one year of age or older
   - Any doses less than a single unit are counted as a single unit.

7. **I have 3 different labs in the region I am in charge of, in my hospital corporation – Do I include all 3 sites into the audit?**
   We would like you to audit individual sites separately (similarly to how they would submit their monthly data to Canadian Blood Services). If this causes an issue, let us know (blood@choosingwiselycanada.org) and we will work with you to figure out a solution.

8. **How do you manage MTPs that get captured in your spot audit? If we follow the protocol these should be left in.**
   Correct, we are including these transfusions if they do not occur in the emergency department or operating room. Most MTPs happen in a single day so given our definition, they should not skew the single-unit data. It may skew the hemoglobin data; however, our validation showed that there was not a significant change when considering that these data are for quality improvement purposes.

9. **Can hospitals submit more than the equivalent of a 50 chart for the audit if we have the power to automatically pull data?**
   Yes, more than 50 charts can be included in the audit.

10. **If our hospital already meets benchmarks, can we still apply for Using Blood Wisely designation?**
    Yes, your hospital can still be designated a Using Blood Wisely Hospital if you meet and have sustained the benchmarks. Please note that as part of the designation process, you will need to sign up on the Using Blood Wisely website to tell us about your hospital and enter your audit data on the Using Blood Wisely website using the form under Measurement.

11. **If our hospital is already meeting benchmarks, can we pull data retrospectively to demonstrate that benchmarks have been maintained for 4 months?**
    Yes, you can pull retrospective data from within the past calendar year to show that you have maintained benchmarks for at least 4 months.