SINGLE UNIT TRANSFUSION GUIDELINE

Why have a single unit transfusion guideline?

- This Guideline aims to improve clinical practice to align with the evidenced-based Patient Blood Management Guidelines.\(^1\)\(^-\)\(^3\) It is intended for use by all clinicians responsible for prescribing blood transfusion to stable, normovolaemic patients who are:
  - NOT actively bleeding, and
  - NOT in an operating theatre.


Which health care professionals should use this guideline?

- Clinicians responsible for the clinical assessment, care planning and management of patients potentially requiring red cell transfusion therapy.
- Nurses carrying out transfusion related patient care including administration and monitoring of blood transfusions.
- Laboratory staff monitoring transfusion policies.

Key Principles:

- Transfuse one unit at a time and only when clinically indicated, to alleviate patient symptoms:
  - Symptoms may include dyspnoea, tachycardia, chest pain, hypotension, increased heart rate and decreased oxygen saturation.\(^5\)\(^-\)\(^7\)
  - It may take more than 24 hours for patients to report an improvement in symptoms after a transfusion.\(^1\)
- Informed consent must be obtained with the patient or responsible person/guardian.
- Transfusion is a live tissue transplant.
- **Risks associated with transfusion are dose dependent\(^8\)\(^,\)\(^9\):**
  - A two unit transfusion increases the risk of nosocomial infection and other long term morbidities.\(^8\)\(^,\)\(^9\)
  - Transfusion Associated Circulatory Overload (TACO) is among the high risks, up to 1 in 100 per unit transfused.\(^2\)\(^,\)\(^10\)\(^,\)\(^11\)
  - If one unit has achieved the stated outcome for the transfusion, for example improvement in haemoglobin level or symptoms, further units will only increase the risks without adding benefit.
- Transfusion should not be based on haemoglobin level alone.
- Consider early haematological advice about management and alternates to blood products.
- **Reminder: This guideline only applies to the NON-bleeding patient**
What are the indications for transfusion in patients who are not actively bleeding?

In accordance with the National Patient Blood Management Guidelines:1–3

| PP1 | RBC transfusion should not be dictated by a Hb concentration alone, but should also be based on assessment of the patient's clinical status. |
| PP2 | Where indicated, transfusion of a single unit of RBC, followed by clinical reassessment to determine the need for further transfusion, is appropriate. This reassessment will also guide the decision on whether to retest the Hb level. |
| PP3 | Direct evidence is not available in general medical patients. However, evidence from other patient groups and CRG consensus suggests that, with a:

- Hb concentration < 70 g/L, RBC transfusion may be associated with reduced mortality and is likely to be appropriate. However, transfusion may not be required in well-compensated patients or where other specific therapy is available.

- Hb concentration of 70 – 100 g/L, RBC transfusion is not associated with reduced mortality. The decision to transfuse patients (with a single unit followed by reassessment) should be based on the need to relieve clinical signs and symptoms of anaemia, and the patient's response to previous transfusions. No evidence was found to warrant a different approach for patients who are elderly or who have respiratory or cerebrovascular disease.

- Hb concentration > 100 g/L, RBC transfusion is likely to be unnecessary and is usually inappropriate. Transfusion has been associated with increased mortality in patients with ACS. |

Recommendations and practice points for medical patients in a critical care setting will be found in the Patient Blood Management Guidelines: Module 4 – Critical Care. Recommendations and practice points for specific medical subgroups (ACS, CHF, cancer, acute upper gastrointestinal bleeding and chronically transfused) appear elsewhere in this module.

- For patients with acute coronary syndrome (ACS), the Patient Blood Management Guidelines state transfusion haemoglobin thresholds as:

| R1 | In ACS patients with a Hb concentration > 100 g/L, RBC transfusion is not advisable because of an association with increased mortality. |

GRADE C

Patient Blood Management Guidelines: Module 3 - Medical1
For patients who are chronically transfused please refer to the relevant practice points in the Patient Blood Management Guidelines: Module 3 – Medical.

Red cell transfusion is inappropriate therapy for Iron Deficiency anaemia unless an immediate increase in oxygen delivery is required, such as when the patient is experiencing end-organ compromise (e.g., angina pectoris or cardiac failure), or IDA is complicated by serious, acute ongoing bleeding. Oral iron therapy, in appropriate doses and for a sufficient duration, is an effective first-line strategy for most patients. In selected patients for whom intravenous (IV) iron therapy is indicated, current formulations can be safely administered in outpatient treatment centres and are relatively inexpensive.

The Patient Blood Management Guidelines: Module 3 – Medical state

All patients who receive one unit of red cells should be reassessed to determine their need for further transfusion therapy with red blood cell units. The decision to prescribe subsequent units should be based on the same parameters and clinical indications as those considered for the initial order.
The expected rise in Hb is dependent on patient’s body mass, refer to Australian Red Cross Blood Service Blood Component Information 2012.  

Why does transfusion practice need to change?

- Current practice does not always align with the current evidenced-based recommendation.
- The Patient Blood Management Guidelines (Module 2 – Perioperative, Module 3 - Medical and Module 4 - Critical Care) support restrictive transfusion and a single unit transfusion guideline.

  Patients should not receive a transfusion when the haemoglobin level is ≥100 g/L. In postoperative patients with acute myocardial or cerebrovascular ischaemia and a haemoglobin level of 70–100 g/L, transfusion of a single unit of RBC, followed by reassessment of clinical efficacy, is appropriate.

- Single unit transfusions are safe in stable, normovolaemic patients who are not actively bleeding and not in an operating theatre. They reduce transfusion associated morbidity and mortality.14–16
- If one unit has achieved the stated outcome for the transfusion, for example improvement in haemoglobin level or symptoms, then further units will only increase the risks without adding benefit.
- Transfusion is a live tissue transplant. Risks associated with transfusion are dose dependent.8,9
- A two unit transfusion increases the risk of nosocomial infection and other long term morbidities.8,9
- Transfusion Associated Circulatory Overload (TACO) is among the high risks, estimated at 1 in 100 per unit transfused.9–11
- Historically, two unit red blood cell transfusions were normal practice. Single unit transfusions remain only a small proportion of all transfusion.
- In addition to exposing patients to increased risk without commensurate benefit to patient outcome, red blood cell transfusion also poses on-going challenges in balancing supply and demand due to the increasing age of the population: demand for blood will increase but the available donor pool will decrease. Although blood is extremely safe from the currently known infectious agents, the potential threat from as yet unknown, or re-emerging pathogens deserves cautious consideration.17

Resources to support the Single Unit Transfusion Guideline

The following resources could assist with the implementation of the Single Unit Transfusion Guideline:

Single Unit Transfusion Guideline
- Appendix 1: Single Unit Transfusion Guideline – Clinical Guideline Format

Supporting Material
- Appendix 2: Implementation Guide
  - To present to the hospital Transfusion Governance Committee seeking agreement to the guideline and details of how it would be implemented
• Appendix 3: Handout
  - Handout for staff requesting written information

• Appendix 4: ISBAR Summary
  - Single Unit Transfusion Guideline in an ISBAR format – Introduction, Situation, Background, Assessment and Recommendation

• Appendix 5: Process for Data Collection

Educational Material
• Appendix 6: PowerPoint Presentation 1
  - General staff
• Appendix 7: PowerPoint Presentation 2
  - Medical, transfusion nurses
• Appendix 8: PowerPoint Presentation 3
  - Laboratory staff
• Appendix 9: Sample Newsletter
• Appendix 10: Poster options


