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Clinical Guideline	[Insert local health network or hospital name / logo]
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Single Unit Blood Transfusion Clinical Guideline

Document Registration Number: **Insert**

Sites where Clinical Guideline applies	All hospitals within [insert local health network or hospital name] where red blood cell transfusions are administered.
This Clinical Guideline applies to:	Adults
Target audience	All medical officers, nursing / midwifery staff and transfusion laboratory staff
Description	This guideline is intended for use by all clinicians responsible for prescribing red blood cell transfusion. The single unit transfusion guideline can be applied to stable, normovolaemic adult patients, in an inpatient setting, who do not have clinically significant bleeding ^{a, 2} . The guideline is consistent with the national Patient Blood Management Guidelines. ³⁻⁵
Keywords	Single unit, blood, transfusion, non-bleeding, normovolaemic, patient, symptoms.

Related jurisdictional legislation, Australian Standards, National Safety and Quality Health Service Standard , Professional Guidelines, Codes of Practice or Ethics:

- National Blood Authority Patient Blood Management Guidelines: Modules 2-4 <http://www.blood.gov.au/pbm-guidelines>.
- National Safety and Quality Health Service Standard 7: Blood and Blood Products http://www.safetyandquality.gov.au/wp-content/uploads/2012/10/Standard7_Oct_2012_WEB.pdf.
- ANZSBT/RCNA Guidelines for the Administration of Blood Products Page 14 Section 1; Page 21 Recommendation 9
- [list as appropriate]

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^a Weibert et al *Table 2 Examples of bleeding signs or symptoms and their classification*. Grade 2: Clinically Significant Bleeding – Grade 2(a) serious bleeding, Grade 2(b) serious bleeding with significant morbidity, Grade 2(c) fatal bleeding.
Version Number Month and Year

GUIDELINE SUMMARY

This document establishes best practice for [insert local health network or hospital name]. While not requiring mandatory compliance, staff must have sound reasons for not implementing standards or practices set out within the guideline, or for measuring consistent variance in practice.

Introduction

The Single Unit Transfusion Guideline is part of Patient Blood Management (PBM); an evidence based patient centred strategy to improve patient outcomes by minimising blood transfusions.

The Single Unit Transfusion Guideline can be applied to stable, normovolaemic adult patients, in an inpatient setting, who do not have clinically significant bleeding.^{2,6,7} Transfuse one red blood cell unit at a time and only when clinically indicated, based on the need to relieve clinical signs and symptoms of anaemia.^{4,5}

Ensure clinical practice is in line with the national Patient Blood Management Guidelines:³⁻⁵ *“Where indicated, transfusion of a single unit of RBC, followed by clinical reassessment to determine the need for further transfusion, is appropriate.”*^{4,5}

GLOSSARY

Acronym or Term	Definition
NBA	National Blood Authority
ARCBS	Australian Red Cross Blood Service – “The Blood Service”.
NSQHS	National Safety and Quality Health Service
PBM	patient blood management
unit	single bag of red blood cells
TACO	transfusion associated circulatory overload
Hb	haemoglobin
g/L	grams per litre
BloodNet	National Blood Authority inventory management system
CPOE	computerised physician order entry
RBC	red blood cell

GUIDELINE

AIM:

To improve clinical practice and patient outcomes through alignment with the Patient Blood Management Guidelines.³⁻⁵

To ensure the safety and efficacy of red blood cell transfusion by confirming every unit transfused is a clinical decision where the expected benefit outweighs the risks.

WHO:

This guideline applies to stable, normovolaemic adult patients, in an inpatient setting, who do not have clinically significant bleeding.²

Health care clinicians responsible for the clinical assessment, care planning and management of patients potentially requiring red blood cell transfusion therapy, nurses carrying out transfusion related patient care including administration and monitoring of red blood cell transfusions and laboratory staff monitoring transfusion practice should follow this guideline.

WHAT:

Informed consent must be obtained from the patient or responsible person/guardian.

Each red blood cell transfusion should be an independent clinical decision based on the risk, benefits and alternatives.

Transfusion should not be based on haemoglobin level alone but should also be based on assessment of the patient's clinical status.^{4,5} For haemoglobin thresholds, refer to the national Patient Blood Management Guidelines, *Module 3 – Medical practice point 3 (PP3)* and *Module 4 – Critical Care practice point 4 (PP4)*.

Transfuse one unit at a time and only when clinically indicated, based on the need to relieve clinical signs and symptoms of anaemia.^{4,5} Symptoms may include dyspnoea, tachycardia, chest pain, hypotension, increased heart rate and decreased oxygen saturation.⁸⁻¹⁰

WHY:

Transfusing single units of red blood cells may reduce a patient's exposure to allogeneic blood.^{6,7}

Transfusion is a live tissue transplant and not without associated risks.

Optimising patient tolerance of anaemia is one of the three pillars of patient blood management.^{3-5,11}

Risks associated with transfusion are dose dependent:

- Red blood cell transfusion may be associated with a dose-dependent increased risk of nosocomial infection and other morbidities.^{12,13} For further information on transfusion risks see Appendix B of the national Patient Blood Management Guidelines.^{3-5,11}
- If one unit has achieved the stated outcome for the transfusion, for example improvement in clinical signs and symptoms of anaemia, further units will only increase the risks.

It is important to ensure that practice aligns with the national Patient Blood Management Guidelines (*Module 2 – Perioperative, Module 3 - Medical and Module 4 - Critical Care*) that support single unit transfusion.

The [National Safety and Quality Health Service Standard 7: Blood and Blood Products](#) requires blood and blood product policies and procedures to be consistent with national evidence based guidelines for pre-transfusion practices, prescribing and clinical use of blood and blood products.¹⁴

- 7.1.1 Blood & blood product policies, procedures and/or protocols are **consistent with national evidence based guidelines** for pre-transfusion practices, prescribing & clinical use of blood & blood products
- 7.1.3 Action is taken to **increase the safety & appropriateness** of prescribing & clinically using blood & blood products
- 7.2.2 Action is taken to **reduce the risks** associated with transfusion practices & the clinical use of blood and blood products
- 7.4.1 Quality improvement activities are undertaken to reduce the risks of patient harm from transfusion practices & the clinical use of blood & blood products

Single unit transfusions are appropriate in adult patients, in an inpatient setting, who do not have clinically

significant bleeding and may reduce transfusion associated morbidity and mortality.^{8,15}

Historically, two unit red blood cell transfusions were common practice as a single unit was not considered sufficient to correct anaemia.^{6,7} Single unit transfusions currently represent only a small proportion of all transfusion.

Red blood cell transfusion also poses ongoing 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.¹⁶

HOW:

These are the indications for red blood cell transfusion in stable, normovolaemic adult patients, in an inpatient setting, who do not have clinically significant bleeding:²

- Clinically assess the patient for symptoms of anaemia such as dyspnoea, tachycardia, chest pain, hypotension, increased heart rate and decreased oxygen saturation.⁸⁻¹⁰
- “Red blood cell transfusion should not be dictated by haemoglobin concentration alone, but should also be based on assessment of the patient’s clinical status.”^{4,5} For haemoglobin thresholds refer to the national Patient Blood Management Guidelines, *Module 3 – Medical* practice point 3 (PP3) and *Module 4 – Critical Care* practice point 4 (PP4).
- “Where indicated, transfusion of a single unit of RBC, followed by clinical reassessment to determine the need for further transfusion, is appropriate.”^{4,5}
- For patients who are chronically transfused please refer to the relevant practice points in the Patient Blood Management Guidelines: *Module 3 – Medical*:⁴ “In patients with myelodysplasia who are regularly and chronically transfused, there is no evidence to guide particular Hb thresholds. Decisions around appropriate triggers and frequency of transfusion need to be individualised, taking into account anaemia-related symptoms, functional or performance status, and the patient’s response to previous transfusions.”
- Red blood cell transfusion is inappropriate therapy for iron deficiency anaemia (IDA) unless an immediate increase in oxygen delivery is required, such as when the patient is experiencing end-organ compromise (for example, 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.¹⁷
- The national Patient Blood Management Guidelines: *Module 3 – Medical*⁴ state “In patients with iron deficiency anaemia, iron therapy is required to replenish iron stores regardless of whether a transfusion is indicated.”

IMPLEMENTATION PLAN

The following stepped approach may assist with the implementation of this guideline.¹⁸

1. Gain approval or endorsement of the guideline from the following:

- Transfusion Governance Committee / Patient Blood Management Committee
- Executive and Quality managers
- Relevant clinicians
- Transfusion medicine staff

2. Identify key staff / team responsible for implementing the guideline

- Identify key staff
- Document the roles and responsibilities of the staff

3. Provide education

- Individual medical specialities
- All staff, including: medical; nursing; transfusion medicine and wards areas that may or may not use blood
- Consumer education
- Education of new staff at orientation

4. Key messages

Placement of key messages in the following areas:

- Hospital Intranets, websites
- Transfusion laboratory reports
- Internal hospital newsletters, magazines
- Visible signage of key messages e.g. posters

5. Support staff to implement the guideline

- The Single Unit Transfusion Guideline should be available to all staff.
- Provide prompts for staff to determine the reason for transfusion e.g. questions to ask such as “Is the patient actively bleeding? Has the patient been reassessed since last transfusion? Is the patient still symptomatic?”
- If a patient does not fall within the criteria, staff should have access to further advice e.g. haematologist, identified medical staff or laboratory director for approval.

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

- Standard material to present to the hospital Transfusion Governance Committee / Patient Blood Management Committee seeking agreement to the guideline and details of how it would be implemented.
- Education material tailored for:
 - Consumers: For example, iTransfuse Fact Sheet, all about blood, I need to know about Patient Blood Management and Single Unit Red Blood Cell Transfusion^{19,20}
 - Staff:
 - PowerPoint presentation

- Handout of information
- Newsletter
- Visible signage

Reminder: This guideline only applies to the stable normovolaemic adult patients, in an inpatient setting, who does not have clinically significant bleeding.²

EVALUATION PLAN

Collect data and review data on a regular basis.

Some measures your hospital may be able to capture to determine the success of the guideline are:

- number units ordered per 24 hours from the Blood Service (BloodNet data)
- number of units transfused per patient (you should see more “odd” numbers)
- number of patients who received a single unit transfusion per day who are not bleeding or in an operating theatre.

Where possible, developing an “intelligent” computerised physician order entry (CPOE) system with decision support tools and guides to appropriate ordering is likely to assist.

In the absence of an electronic prescribing / ordering system, incorporation of the haemoglobin thresholds and the Single Unit Transfusion Guideline within the blood order / prescription form will provide timely point of care reminders of the guideline requirements.

Consideration should be given to introducing data collection and analysis as a standing item on the Transfusion Governance Committee / Patient Blood Management Committee agenda. This committee may nominate a person responsible for this task.

A transfusion nurse specialist or quality management staff may be involved with data collection and analysis.

Review and feedback

- Consider including audit feedback as a standing item on the Transfusion Governance Committee / Patient Blood Management Committee agenda
- Consider sharing statistics with transfusion staff to highlight the impact of the introduction of the Single Unit Transfusion Guideline
- Continue empowering transfusion staff
- Consider providing a forum to air / discuss concerns and seek resolution to problems
- Consider providing access to articles / reports about progress and new developments in Single Unit Transfusion and Patient Blood Management .

CONSULTATION WITH KEY STAKEHOLDERS

[List the key stakeholders consulted including name and title] Suggestions include:

Chair and membership of the Transfusion Governance Committee.

Directors of medicine, surgery, haematology, oncology, anaesthetics, intensive care and others.

Leading clinicians in specialties such as medicine, surgery, haematology, oncology, anaesthetics, intensive care, orthopaedics, cardiology, gastroenterology, renal medicine, surgical specialties, and others.

Visiting Medical Officers / General Practitioners, where appropriate.

Nurse Unit Managers and educators of wards and units where transfusions occur.

Senior Laboratory staff responsible for transfusion services.

Patient / community consumer representative.

Tips on the consultation process: Whilst wide consultation is preferable thought should be given to managing the process to ensure the document is finalised within a reasonable timeframe. When asking for feedback clear instructions should be given regarding what is being requested, the date by which it should be received and the contact details of the staff member who will collect the information. There are two levels of consultation:

1. **Targeted consultation** - specific staff who are experts in the field and/or whose input is important for the drafting of the document. Involve staff from whom support for the implementation of the document is vital and include representation from the applicable geographic areas and types of clinical settings.
2. **Non-targeted consultation** - you may wish to notify a wider audience that the document is in development and give them the opportunity to provide feedback by a certain date. Nursing and Midwifery staff can be consulted via the Nursing and Midwifery Clinical Guideline and Procedure Coordinator .

APPENDIXES

1. Audit Tool – An audit tool is currently under development

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