

# Why do we need patient blood management guidelines in the perioperative clinical area?

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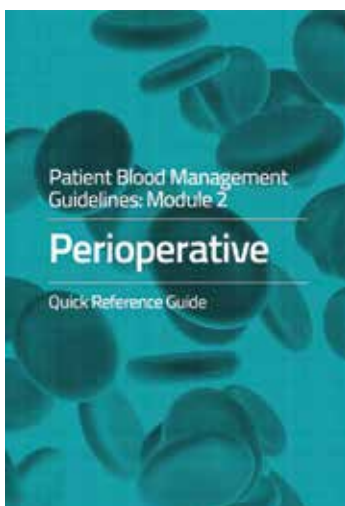
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Patient blood management (PBM) is not a new concept; it has been a process of individualised care for patients for many years. Worldwide the Jehovah Witness population has been the forefront for the 'three pillars' of PBM. It is testimony to this as a community that health care professionals can always optimise what is the most valuable blood: the patient's own. PBM should be the standard of care for all and not just care we introduce when someone refuses blood products. There is a need to avoid unnecessary exposure to blood products, rather than the default of transfusing patients; if we do this, evidence suggests we may be able to reduce length of stay, reduce risk of postoperative infection and overall improve clinical outcomes for surgical patients<sup>1,2</sup>.

The cornerstone principles of PBM or 'three pillars' that relate to the perioperative setting are:

1. Preoperative optimisation of blood volume and red cell mass.
2. Minimisation of perioperative blood loss, including meticulous attention to surgical haemostasis.
3. Tolerance of postoperative anaemia.

In 2012, the National Blood Authority (NBA) released the second module of the *Patient Blood Management Guidelines: Module 2 'Perioperative'*. The National Health and Medical Research Council reviewed and endorsed these evidence-based guidelines that underpin the principles of PBM. It is hoped this update will encourage you to reflect on the surgical area you currently work in, understand how you manage blood practices in that area and implement the guidelines for improved patient surgical care in blood management.



### What are the risks associated with transfusion?

- (a) Process risk: The very nature of providing blood for patients in a complex human and clinical process system subject to interruptions and interpretations adds real risk of administering the incorrect blood product. Local and international haemovigilance systems collating data on adverse events related to transfusion rate this risk as significant. Currently international evidence for an ABO/Rh mismatch states this occurs in 1:40,000 transfusions<sup>3</sup>.
- (b) Non-infectious risk: Transfusion reactions can cause significant poor clinical outcomes. This risk is not easy to reduce as it's difficult to determine which patient will react adversely when administered a blood product.
- (c) Infectious risk: There have been many advances in the detection and mitigation of infectious risk in blood, with current risk estimation by the Australian Red Cross Blood Service (Blood Service) calculating the human immunodeficiency virus (HIV) risk as less than 1 million<sup>3</sup> [Blood Service data 2012–13]. There, however, remains the threat of emerging infectious agents and a potential risk remains for the blood supply.

### How can the current guidelines be used in clinical practice?

There are 22 recommendations and 20 practice points in the perioperative PBM guidelines to direct you in implementing a PBM program in your surgical area. Each is grouped under four distinct blood management practices:

1. **Patient blood management program** — establishment, implementation and procedural guidelines.
2. **Anaemia and haemostasis management** — preoperative anaemia assessment, iron and erythropoiesis stimulating agent (ESA) therapy, haemostasis management.
3. **Blood conservation strategies:**
  - a. Preoperative — routine preoperative autologous donation is not recommended.

- b. Intraoperative — surgical haemostasis, prevention of hypothermia, appropriate patient positioning, deliberate induced hypotension, acute normovolaemic haemodilution, intraoperative cell salvage, haemostasis analysis, medications.
- c. Postoperative — postoperative cell salvage.

**4. Appropriate transfusion practice** — triggers for component transfusion, red blood cells, fresh frozen plasma, platelets, recombinant activated factor VII.

It is not possible to outline fully each of these strategies here; however, further information on the guidelines copies are available at <http://www.blood.gov.au/patient-blood-management>. These guidelines should be read in conjunction with other guidelines and standards that govern blood and blood product management in the operative setting.

The following will outline the recommendations for preoperative anaemia assessment, prevention of hypothermia and appropriate transfusion practice, including any resources and tools currently available to adopt and adapt for your particular perioperative area.

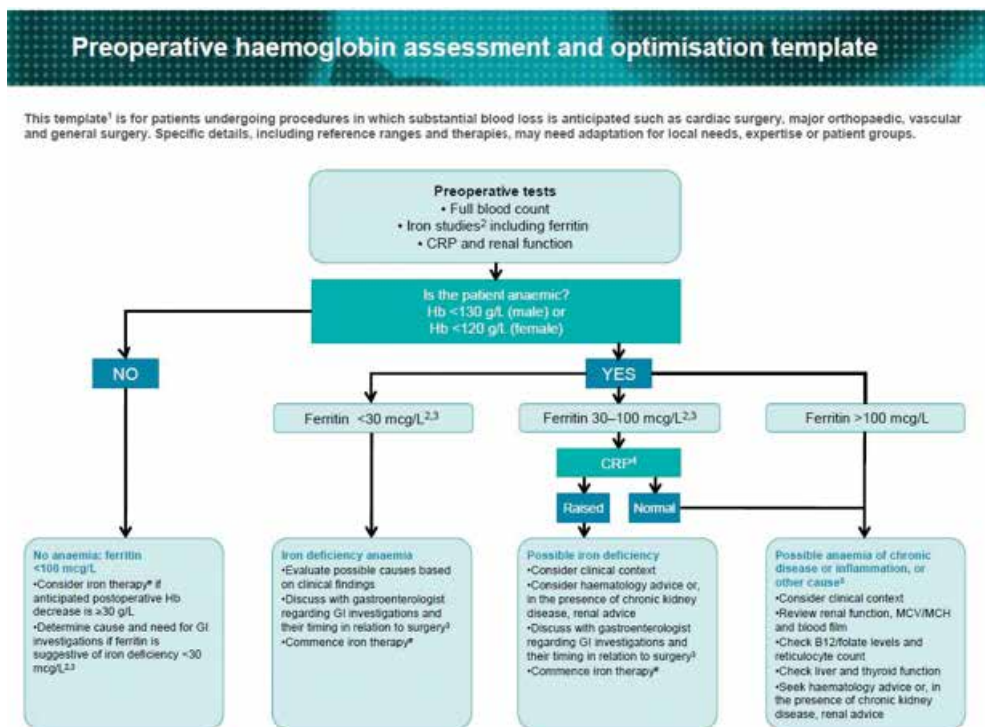
**Preoperative anaemia assessment**

Recommendation (Grade C level of evidence): *In patients undergoing cardiac or non-cardiac surgery, preoperative anaemia should be identified, evaluated and managed to minimise RBC transfusion, which may be associated with an increased risk of morbidity, mortality, ICU length of stay and hospital length of stay<sup>4</sup>.*

Preoperative anaemia is associated with an increased likelihood of red blood cell transfusion<sup>2</sup>. The aetiology of anaemia should be identified and, if necessary, referral for investigation and treatment prior to surgery. Anaemia should be viewed as a serious and treatable medical condition, rather than simply an abnormal laboratory value. Pre-optimisation of Hb in the elective surgery setting will improve outcomes.

A preoperative haemoglobin assessment and optimisation template<sup>1</sup> (Figure 1) was an included tool within the guidelines. It outlines the preoperative tests that are required to determine a patient's blood functional state prior to surgery, especially with surgery where substantial blood loss is anticipated. The tool can be adapted to apply to different surgical specialities.

**Figure 1: Preoperative haemoglobin assessment and optimisation template**



Source: National Blood Authority PBM Guidelines Module 2 — Perioperative, 2012  
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More information about implementing PBM guidelines — preoperative anaemia assessment and iron replacement can be found on the Blood Matters program website <http://www.health.vic.gov.au/bloodmatters/management/index.htm><sup>5</sup>.

### Prevention of hypothermia


Recommendation (Grade A level evidence): *In patients undergoing surgery, measures to prevent hypothermia should be used*<sup>1</sup>.

Studies demonstrate that preventing hypothermia can have a serious impact on reducing transfusion requirements and blood loss and the rate of wound infection was significantly lower in patients who are pre-warmed preoperatively<sup>6</sup>. This intervention is relatively easy to adopt, but what is missing is national standardisation as to the type of measures and interventions to guide clinical practice; it has been left to local hospitals to produce their own guidelines. Groups such as ACORN have the potential to strengthen this by developing national standards for prevention of perioperative hypothermia,

promoting standardised best practice across Australia. The United Kingdom achieved this through the National Institute for Health and Clinical Excellence (NICE)<sup>6</sup> in partnership with the National Collaborating Centre for Nursing and Supportive Care and developed clinical guidelines for 'The management of inadvertent perioperative hypothermia in adults' in 2008 and is currently under review. This guideline outlines processes and practices for active warming and thermal insulation to prevent inadvertent perioperative hypothermia to, in turn, prevent all the complications associated with it<sup>6</sup>. The NICE clinical guideline can be found at <http://guidance.nice.org.uk/CG65>.

### Appropriate transfusion practice

Appropriate transfusion practice is basing the clinical decision on the patients' clinical status in conjunction with blood test results, and then monitoring effectiveness. The decision to transfuse in a surgical situation can also be about utilising expertise as required, such as seeking specialist haematology advice for at-risk patients or complex



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References  
1. Ousey K, et al. Understanding and preventing wound blistering. Wound UK, 2011.

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procedures where bleeding is likely. It may be administering products prophylactically prior to major surgery to ensure the patient is capable of undergoing the procedure with a reduced risk of bleeding. For example, a patient who is thrombocytopenic, with a platelet count less than  $50 \times 10^9/L^1$ , may have platelets administered preoperatively which may prevent the requirement for other products during surgery.

Postoperatively where there is no evidence of cardiac or cerebrovascular ischaemia, an Hb trigger of 80g/L or less would be appropriate for management of postoperative anaemia<sup>1</sup>. The decision should also be based on the clinical status of the patient and reassessed following a single unit for clinical efficacy prior to administering any further blood. This can reduce exposure for a patient and the potential complications of transfusion. The NBA, in 2013, released a single unit guideline toolkit; this kit includes information on why a single unit guideline can be beneficial for patients and the resources for implementation. It includes a sample guideline, newsletter, handouts, posters and a guide for implementation; all can be adapted to fit local hospital requirements. Further information and the toolkit are available at <http://www.blood.gov.au/single-unit-transfusion>.

An important part of adopting new processes and guidelines is educating clinical staff; BloodSafe eLearning Australia has developed course modules to assist with hospital staff education for transfusion practice and PBM. Early in 2014 they released specific education modules for PBM based on the new guidelines, including a module for Perioperative, available through their website <https://www.bloodsafelearning.org.au/><sup>7</sup>.

### Current work and future directions in this area around Australia

PBM is occurring in Australia and each state or territory is focusing on different aspects. We have highlighted some of the current work

undertaken, though not comprehensive and future work proposed by the National Blood Authority, specifically with the Perioperative module. In the follow-up article we will outline some of these initiatives in more detail.

1. Victoria — Blood Matters program — auditing — patient blood management in major joint surgery, perioperative working group, iron infusion — tools and templates for hospitals.
2. South Australia — SA Blood Management Council, Blood Utilisation study — using data linkage for predicting the probability of red cell transfusion in surgical patients — cardiothoracic, colorectal and joint replacement surgery. BloodSafe eLearning Australia — iron deficiency anaemia course.
3. Western Australia — PBM program, Fremantle Hospital and major orthopaedic surgery.
4. National Blood Authority (NBA) — Implementing “single unit policy” guidance is available and the intraoperative cell salvage guidance will be available soon and is currently awaiting final approval.

The NBA is also developing and promoting in 2014 a preoperative anaemia case study and the PBM Guidelines companions that have been developed by the Blood Service.

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# Single Unit Blood Transfusion

Only **ONE unit of blood** should be ordered if the inpatient does not have clinically significant bleeding

**Each unit transfused is an independent clinical decision**

Second unit can be requested after patient has been assessed and remains symptomatic

Indications for a second unit:

- 🔴 Active blood loss
- 🔴 Ongoing symptoms of anaemia

For more information on patient blood management visit [www.blood.gov.au/pbm-guidelines](http://www.blood.gov.au/pbm-guidelines) to access the latest guidelines.

