

# AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE



National Patient  
Blood Management  
Collaborative

**November 2017**

## **Resources for Improved Patient Blood Management**

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# Introduction

Patient Blood Management (PBM) is the management and preservation of a patient's own blood to reduce or avoid the need for a blood transfusion. PBM was identified as an area where there continues to be opportunity to improve patient outcomes and reduce unnecessary interventions within the hospital setting.

The intention of this document is to provide a range of tools in establishing and advancing PBM programs and pre-operative anaemia and iron deficiency protocols. This document complements the other team resources available from: [www.safetyandquality.gov.au/national-priorities/pbm-collaborative](http://www.safetyandquality.gov.au/national-priorities/pbm-collaborative)

PBM can be achieved by minimisation or avoidance of unnecessary exposure to blood components; optimising a patient's own blood; minimising patient blood loss; and optimising patient tolerance to anaemia. Blood and blood products are essential to effective health care. However, there are also risks associated with their administration to patients; these include allergic and immunological complications, storage-related complications, infections, incorrect blood transfusions and other adverse outcomes.

The National Safety and Quality Health Service (NSQHS) Standards were developed by the Australian Commission on Safety and Quality in Health Care (the Commission) to improve the safety and quality of health care in Australia. NSQHS Standard 7: Blood Management aims to ensure safe and appropriate, efficient and effective use of blood and blood products. This NSQHS Standard requires policies, procedures and protocols to be consistent with national evidence-based guidelines for pre-transfusion practices, prescribing and clinical use of blood and blood products.

The National Blood Authority has developed a series of Guidelines to assist healthcare professionals in clinical decision-making relating to blood and blood products. The Guidelines are evidence-based and are supported by the Three Pillars of PBM. The states and territories have also developed and implemented local strategies to achieve an overall improvement in PBM, and a reduction in red cell use.

The Commission has successfully implemented the National Patient Blood Management Collaborative (NPBMC), funded by the Australian Government Department of Health, from April 2015 which focused on improving the management of anaemia and iron deficiency for patients having selected gastrointestinal, gynaecological and orthopaedic elective surgical procedures. Appropriate pre-surgical management of anaemia and iron deficiency play important roles in reducing the potential for blood transfusion, and the associated risks which come with the administration of blood products.

The NPBMC contributed to real improvements in the management of anaemia and iron deficiency for elective surgery patients. It encompassed the patient journey from the time that the need for surgery was identified, through inpatient care, and subsequent care back in the community.

Data was analysed by the Commission at the start of each month to provide a range of information on progress to participants. Activity reports showing trends for anaemia and iron deficiency, as well as detailed data for the three surgical streams, were forwarded to each site on a monthly basis.

Broad-based review of the data at coordinator meetings and learning workshops promoted discussion and opportunities for further quality improvement. The NPBMC health services shared valuable resources they had developed either throughout the course of the Collaborative, or prior, with the Commission and other teams. Many were used by other sites to enhance their own PBM processes and procedures.



## Collaborative Overview

- Two years of data collection
- Seven states and territories were represented
- Twelve health services participated

**12,648**  
patient episodes  
recorded

**THREE SPECIALTIES**  
**Gastrointestinal**  
**Gynaecology**  
**Orthopaedics**

The NPBMC cohort:

**67%**  
Female

**33%**  
Male

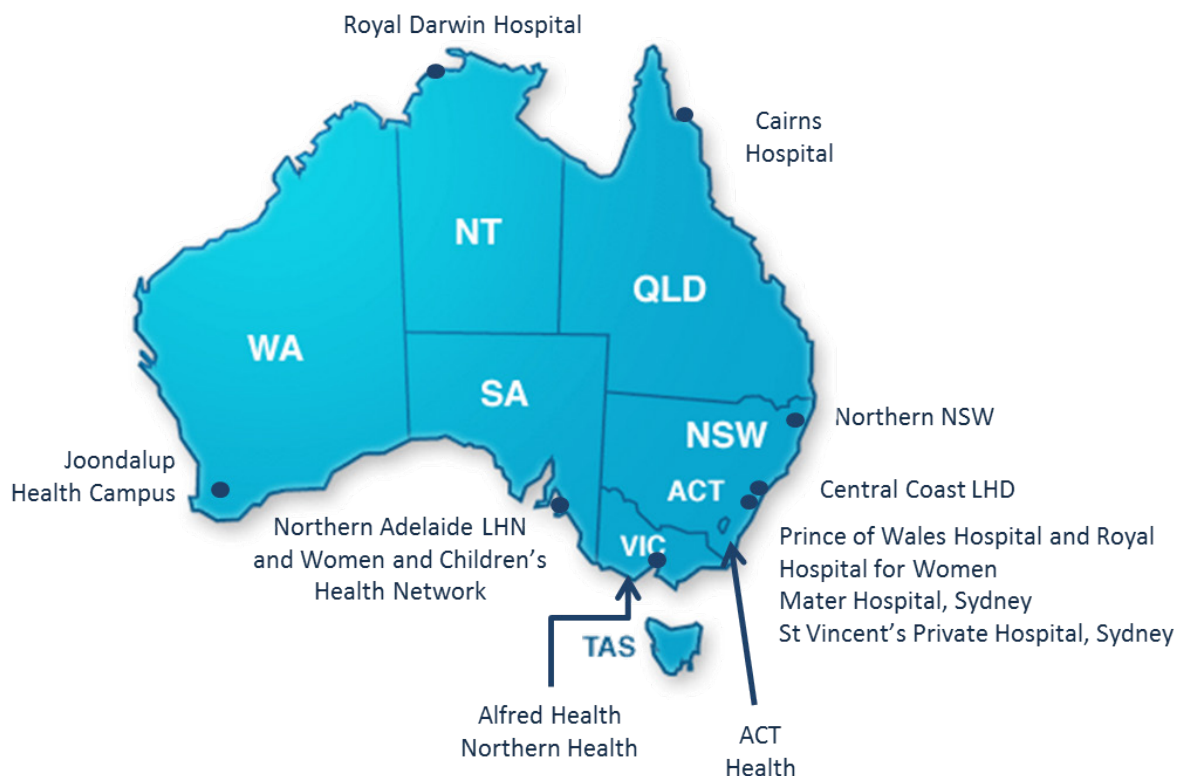
### Age

- 20% <49 years
- 44% 50-69 Years
- 36% >70 years

### Status

- 95.4% Non Indigenous
- 4.6% Aboriginal and/or Torres Strait Islander

Figure 1: NPBMC health services



## Collaborative Methodology

The Collaborative methodology is designed to implement change in small, manageable cycles, and identify where a change leads to improvement so that there can be further adoption of these changes.

The teams applied the Model for Improvement (MFI) framework as the quality improvement process for PBM. The NPBMC focussed on the entire patient journey, from the time the need for surgery was identified through to surgery being performed.

Participants were supported in their use the MFI framework to design and test local change ideas, and MFI cycles (incorporating the Plan Do Study Act (PDSA) cycle) were submitted to qiConnect, the online web portal developed by the Improvement Foundation for the Commission.

Teams implemented changes in small manageable stages, through a series of learning cycles and also:

- Consulted with experts in Collaborative methods, quality improvement and PBM
- Shared knowledge on current quality improvement processes
- Shared actions and processes used to make change
- Tested practice changes against a series of measures
- Discussed outcomes and impacts on patients to identify practice changes to further improve patient care.

A total of 384 MFI cycles were undertaken during the course of the NPBMC.

Analysis of the proportion of the cycles was undertaken by Change Principle, this indicated the following focus of change efforts:

- 42% (163) of the PDSA cycles related to Change Principle 1: Implement a systematic and proactive approach to pre-operative optimisation of haemoglobin and iron stores for patients undergoing elective surgery.
- 30% (116) of the PDSA cycles were for Change Principle 2: Ensure patients receive integrated and coordinated PBM pre-operatively.
- 17% (65) of the PDSA cycles were for Change Principle 3: Enhance knowledge of evidence based best practice in PBM.
- 10% (40) were for the Foundation Change Principle: Build and maintain the team.

## Collaborative Measures

The establishment of the NPBMC was underpinned by an extensive planning and design phase with significant consultation to inform the scope, in terms of clinical content and settings.

The decision as to which surgical procedures and surgical streams were to be included, and data to be collected, was determined through a process of consultation with experts in PBM, Collaborative methodology, primary care providers and members of the Commission's PBM Project Reference Group.

The resultant surgical streams were:

- Gastrointestinal (surgery of oesophagus, stomach, duodenum, small and large bowel, and rectum)
- Gynaecology (hysterectomy without malignancy, and uterine and adnexal malignancies)
- Orthopaedics (primary hip and knee joint replacement).

Not all measurable aspects of PBM were able to be included for measurement, as data was not readily available for some and a large number of measures would have resulted in onerous reporting for participants. The resultant measures balanced availability of the data and highlighting key elements of the patient journey.

The NPBMC health service teams provided the following data on a monthly basis via the qiConnect web portal:

- The procedure performed from an agreed range of diagnostic related groups
- Did the patient receive a pre-operative assessment for anaemia, iron deficiency, or both?
- The assessment setting, i.e. in hospital, specialist rooms, primary care
- Was anaemia or iron deficiency confirmed?
- Was it managed?
- Was there evidence of improvement?
- Units of red blood cells transfused (pre-, intra- and post- operatively).

Based on evidence from the literature, optimisation of patient haemoglobin and iron stores can lead to:

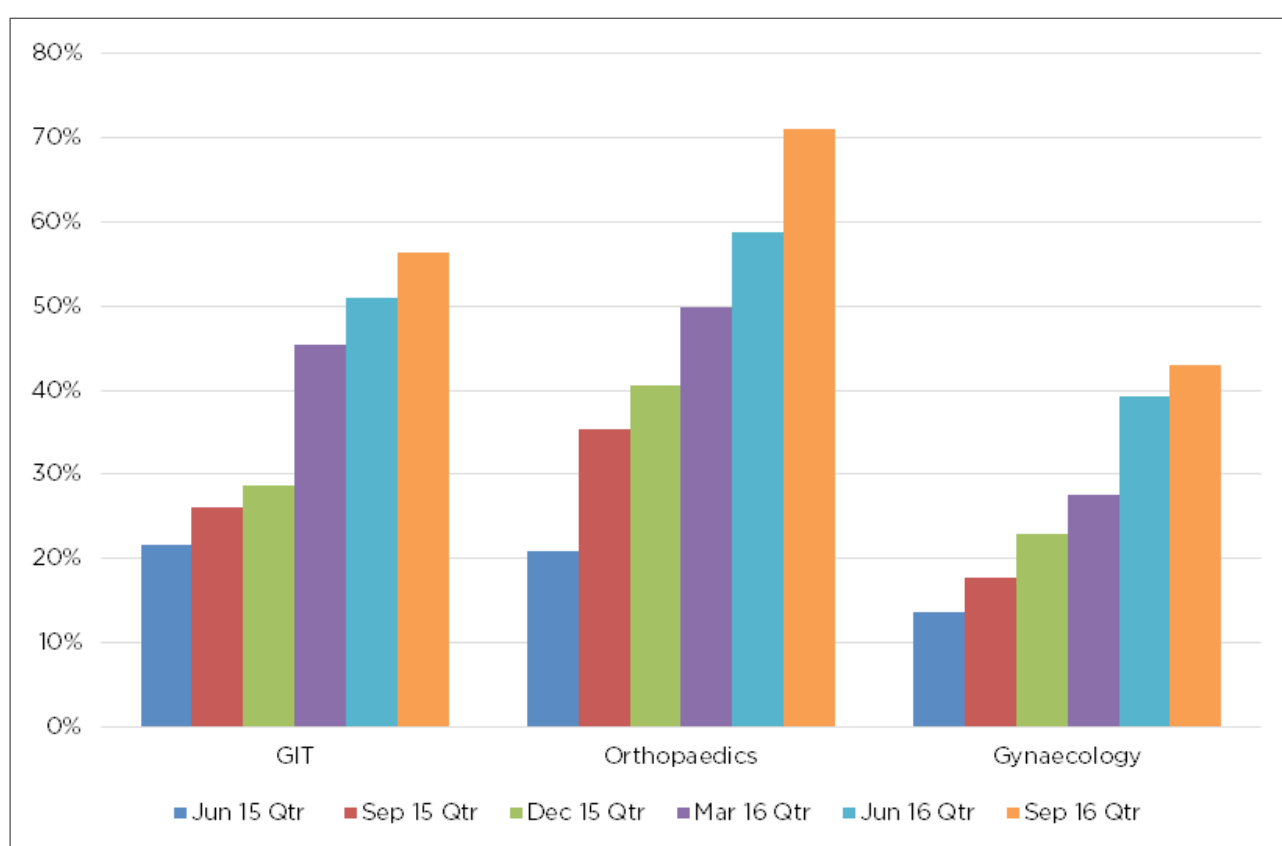
- Fewer post-operative infections and adverse reactions from blood products
- Fewer transfusion related inflammatory events
- Shorter hospital lengths-of-stay
- Fewer readmissions from infectious complications of transfusion
- Fewer elective surgery cancellations.

# Iron Deficiency Anaemia

Assessment rates for iron deficiency more than doubled for each surgical speciality between June 2015 and September 2016 quarters:

- Gastrointestinal – 22% to 56%
- Orthopaedic – 21% to 71%
- Gynaecology – 14% to 43%

**Figure 2:** Percentage of patients assessed for iron deficiency, by quarter, by surgical stream, June 2015 and September 2016

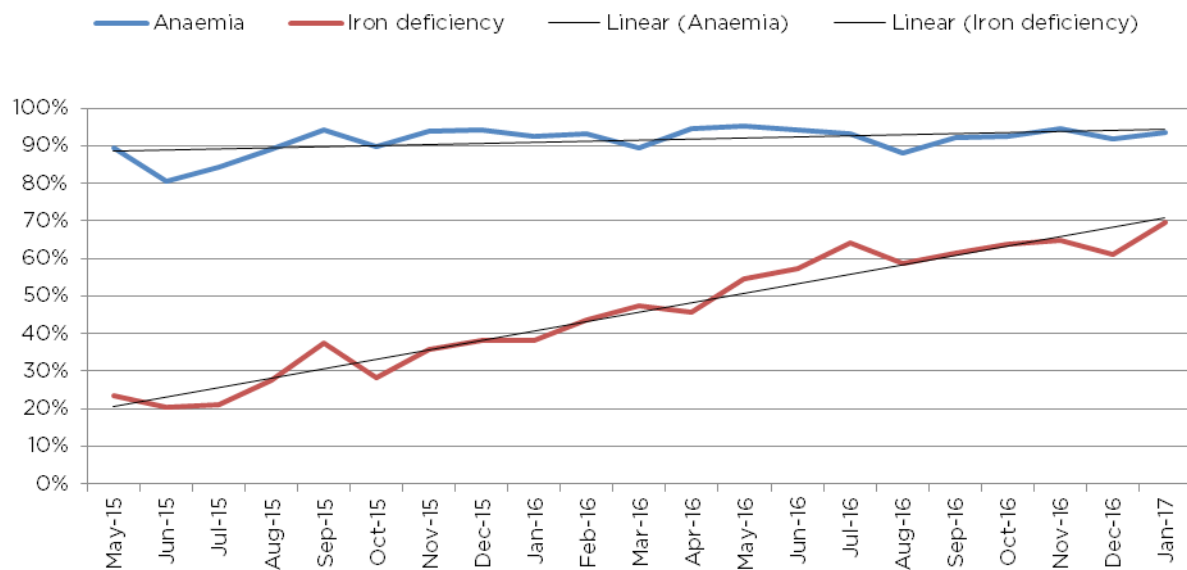


## Assessment and Management

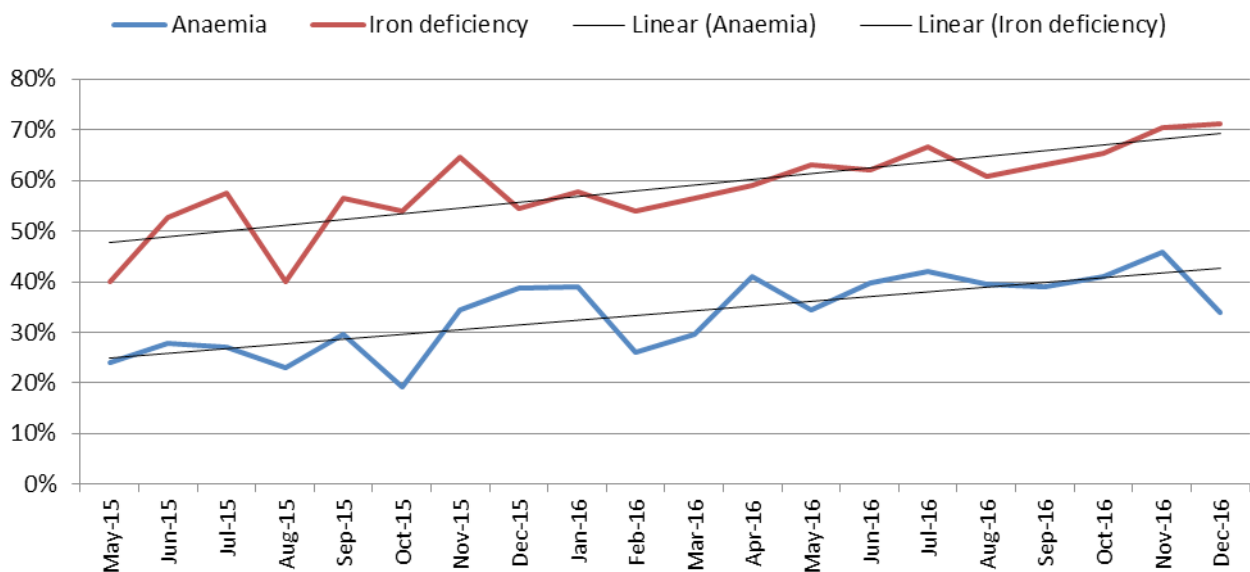
Regular review of data and monitoring progress over time is key to embedding practice and sustainability.

Improved assessment and management of anaemia and iron deficiency across participating sites was enabled through a series of targeted interventions.

**Figure 3: Percentage of patients assessed for anaemia and iron deficiency, by month, as at end of January 2017**



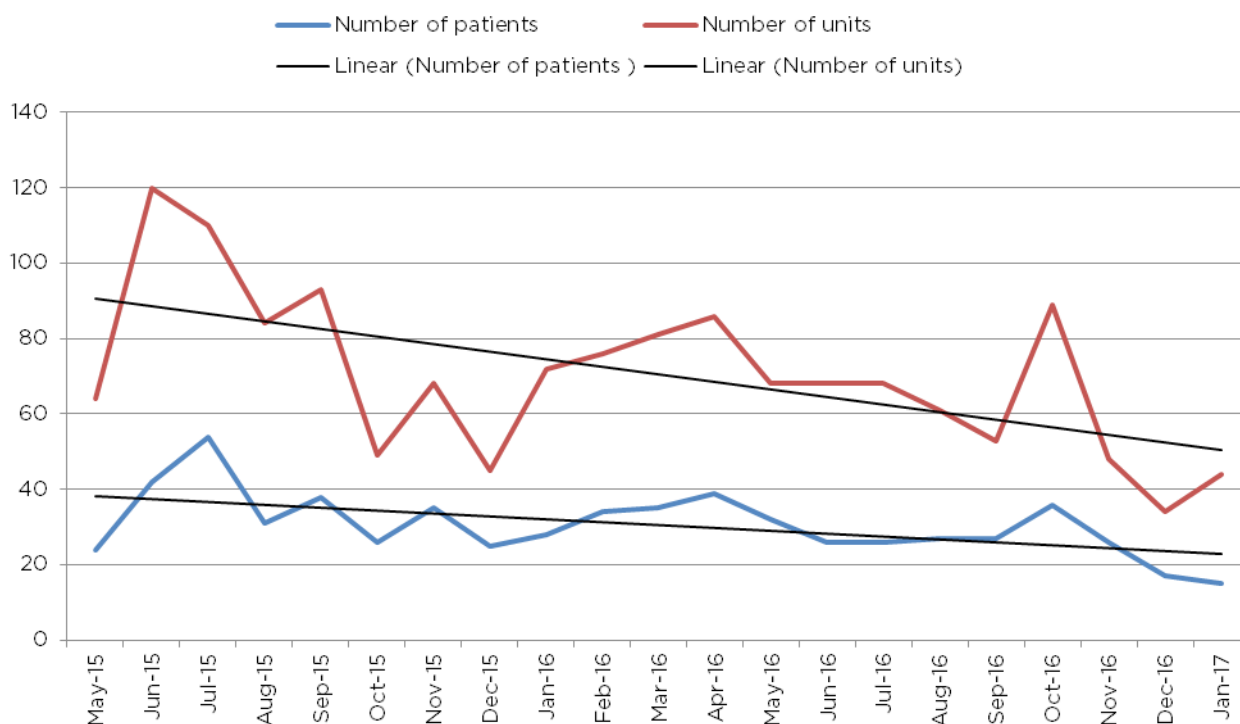
**Figure 4: Percentage of patients managed for anaemia and iron deficiency, by month, as at end of January 2017**



## Red Cells

Reduced red cell transfusions were achieved, when measured by patient numbers and in the overall number of units transferred.

**Figure 5: Number of patients and units transfused, by month, to January 2017**



## Outcomes and Lessons Learned

- Improved integration of care between primary and acute service systems is a essential for improved patient care.
- Collaborative sites worked to embed PBM strategies, within the usual work of the health services, with a view to ensuring long term sustainability
- Clinical leadership in the health services, and in general practice, was vital to progress.
- Success in changing clinical practice and workflow at participating sites resulted in improvements in the preoperative management of patients
- Improved assessment and management of anaemia and iron deficiency prior to surgery was achieved across participating sites
- Critical success factors were identified as health service executive 'buy-in' and support; strong and effective clinical leadership; and well defined project support and data support

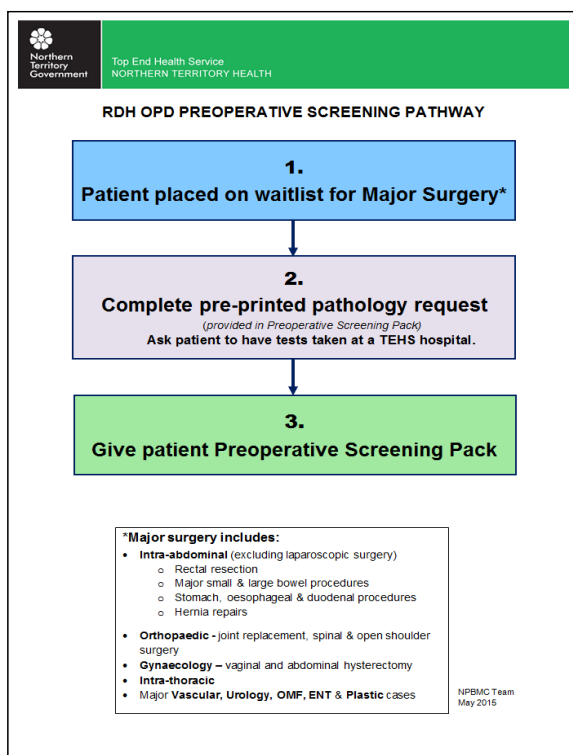


# Royal Darwin Hospital

## Achievements

- The percentage of patients assessed for iron deficiency increased from 30% in December 2015 to 58% in December 2016.
- As a result of practice change, all patients in Darwin's NPBMC surgical groups were assessed for anaemia prior to surgery since August 2016.
- Evidence of anaemia management increased from 20% in December 2015 to 41% in December 2016.
- Awareness of anaemia and iron deficiency was raised more generally and put 'on the radar' for action, across the health service.
- The Royal Darwin Hospital Preoperative Optimisation (Fit for Surgery) Program:
  - Will continue beyond the length of the NPBMC
  - Has become established practice at Royal Darwin Hospital
  - Includes all patients listed for major elective surgery:
    - \* Intra-abdominal (excluding laparoscopic surgery)
    - \* Orthopaedic
    - \* Gynaecology
    - \* Intra-thoracic
    - \* Major vascular, urology, OMF, ENT and plastic cases

**Figure 7: Royal Darwin Hospital Outpatient Department Pre-operative Screening Pathway**



**Figure 8: Julie Domanski, Royal Darwin Hospital's NPBMC Project Coordinator presenting at Grand Rounds at Royal Darwin Hospital in May 2016.**






# Royal Darwin Hospital, NT


## Shared resource

Figure 9: Letter to general practitioner and surgeon



Northern Territory Government

Top End Health Service  
NORTHERN TERRITORY HEALTH



**Royal Darwin Hospital**  
Division Surgery and Critical Care  
Rocklands Drive TIWI NT 0810  
Postal Address: PO Box 40596  
Casuarina NT 0811  
Tel: 08 8922 8713  
Fax: 08 8922 8325

To: Division Surgery and Critical Care Staff

**RDH Pre-operative Optimisation for Major Surgery**

The RDH Department of Anaesthesia, in partnership with the RDH National Patient Blood Management Collaborative (NPBMC) Team, has introduced a screening program aimed at optimising patient health in the period leading up to their elective surgery. The screening focuses on identifying anaemia; poorly controlled chronic medical conditions such as diabetes; and smoking habits. It is anticipated that optimising patient health will minimise surgery delays and cancellations and provide patients with the best outcome from their scheduled surgery.

Performing tests at the time of waitlisting rather than at pre-admission for procedure will allow time for assessment and optimisation of identified issues. In order to optimise as many patients as possible we are asking that you request the following tests at the time of *waitlisting* a patient for major surgery:

- FBC
- CRP
- Blood urea and electrolytes
- Creatinine
- Hb A1C
- Iron Studies


Preoperative screening packs are available in RDH Surgical Outpatients clinics. The packs include:

- Pathology request form with pre-printed tests
- Patient letter and questionnaire
- Pre-paid envelope

An anaesthetist or NPBMC project officer will follow up the results and take appropriate action if any issues are identified.

Dr Richard Bradbury, Dr Dan Holmes, Dr Indra Kumarasena and RN Julie Domanski (Blood Transfusion Nurse) as well as myself are part of the NPBMC team. Please feel free to contact us with any questions, queries or concerns.

Yours sincerely





Dr Brian Spain  
CoDirector Division of Surgery & Critical Care  
Director of Anaesthesia  
20<sup>th</sup> November 2015

# Royal Darwin Hospital, NT

## Shared resource

Figure 10: Poster for clinicians promoting Preoperative Screening Pack



# Royal Darwin Hospital

## Fit for Surgery

### Preoperative Optimisation for Major Surgery

Have you placed a patient on the waitlist for major surgery?  
You will need to give them a Preoperative Screening Pack.

The RDH Department of Anaesthesia, in partnership with the RDH National Patient Blood Management Collaborative (NPBMC) Team, has introduced a screening program aimed at optimising patient health in the period leading up to their elective surgery.

Performing tests at the time of waitlisting rather than at pre-admission for procedure will allow time for assessment and optimisation of identified issues.

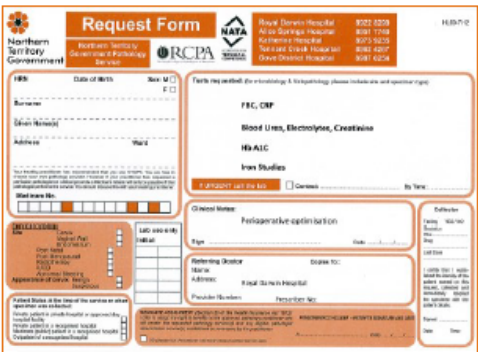
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An anaesthetist or NPBMC project officer will follow up the results and take appropriate action if any issues are identified.


Preoperative screening packs are available in RDH Surgical Outpatients clinics. The packs include:

- Pathology request form with pre-printed tests
- Patient letter



For further information on the Preoperative Screening Program please contact the NPBMC Team:

- Dr Indra Kumarasena, Consultant Anaesthetist
- Dr Richard Bradbury, Consultant Surgeon
- Dr Dan Holmes, Anaesthetics and Intensive Care Specialist



National Patient Blood Management Collaborative

# Cairns and Hinterland Hospital and Health Service, QLD

## Overview

Cairns and Hinterland Hospital and Health Service supports a population of 283,000, which is forecast to grow by 9% by 2026. It is responsible for the delivery of health services to a geographical area of 141,000 km<sup>2</sup>.

It is the major referral centre for tropical North Queensland. The Hospital is Australia's first large-scale regional Digital Hospital with a total of 531 beds.

Cairns and Hinterland Hospital and Health Service collected data for all three of the surgical specialties.

Figure 11: Cairns and Hinterland Hospital and Health Service

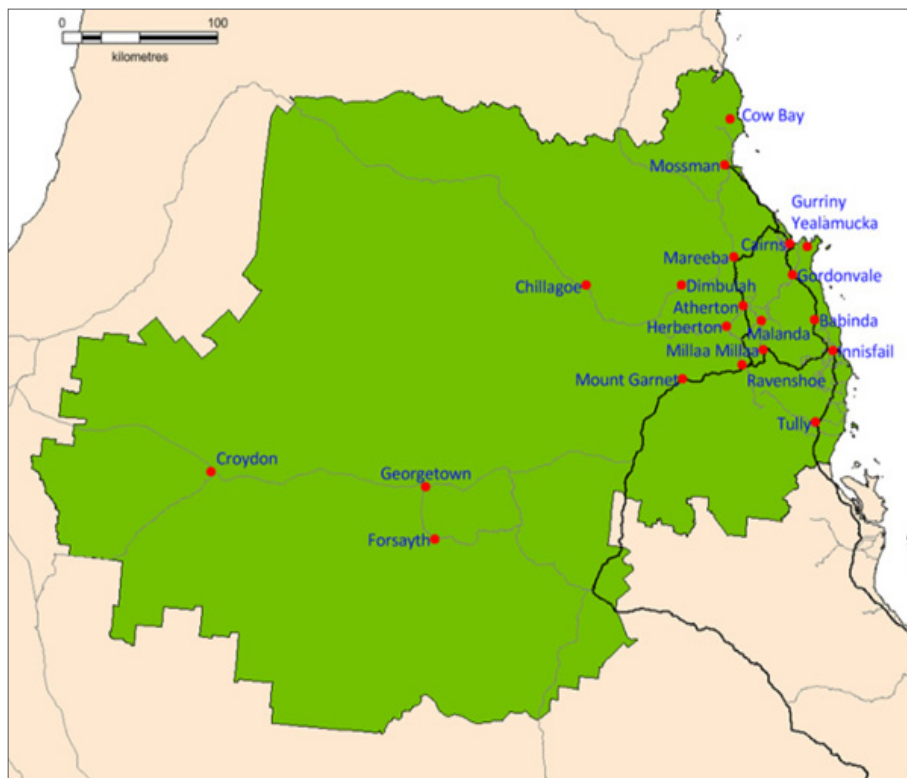


Figure 12: Keiko Bowles, Cairns and Hinterland Health Service's NPBMC Project Coordinator at the NPBMC Showcase in June 2017



# Cairns and Hinterland Hospital and Health Service, QLD

## Achievements

- An updated Pre-admission Screening Form was developed to support improved PBM
- Increased iron studies and anaemia screening and management for elective patients over the course of the NPBMC
- Iron studies were included as part of the pre-surgical assessment for patients undergoing elective surgery for gastrointestinal, orthopaedic and gynaecology procedures
- Iron deficiency assessment rates increased from 19% in December 2015 to 83% in December 2016
- Established a follow up process for elective surgical patients
- Developed a letter for anaemia patients who had received iron infusion in the hospital to inform follow-up care
- Decreased number of blood transfusions for elective surgery patients
- Decreased length of stay at Hospital

*Cairns and Hinterland Hospital has had a history of focussing on anaemia management and had established an anaemia clinic in October 2012. This service was suspended at the end of the 2013 due to increasing demands on the Transfusion Clinical Nurse Consultant (CNC).*

*The NPBMC team consisted of a Haematologist as the clinical lead, and a Transfusion CNC and a Registered Nurse (RN) as project officers. As part of the Collaborative the Commission funded part of the RN position. Increased RN hours would increase in the lead-up to establishing an anaemia clinic are being considered.*

*Support for the Collaborative was sought from three surgical stream Directors from the anaesthetic department and the pre-admission clinic. The pre-admission assessment form was modified to include iron studies for major surgery patients and the pre-admission clinic nurse conducted anaemia screenings.*

*The team faced a major challenge when the clinical lead changed during the Collaborative and RN hours were unable to be increased. However, a haematologist and anaesthetic consultant came on board and were keen to make changes to improve the service. Cairns and Hinterland Hospital and Health Service have now screened over 80% of patients for iron deficiency and decreased the number of blood transfusions.*

# Cairns and Hinterland Hospital and Health Service, QLD

## Shared resource


Figure 13: Fit for surgery patient information

Cairns and Hinterland Hospital and Health Service

# FIT FOR SURGERY


Information for Patients who have received an Iron Infusion  
Before your surgery

Your blood tests showed that you have iron deficiency. As a result you received an iron infusion to increase the iron stores in your body.




**ACTION**  
You will receive a letter for your doctor. Please alert them about this issue.

### IRON DEFICIENCY: THE FACTS




About 1 in 10 people in Australia have low iron levels also called iron deficiency




3 in 10 people having elective surgery have low iron or anaemia – this puts you at a much higher risk of blood transfusion.


### CAUSES OF ANAEMIA




Chronic disease



Blood loss




Dietary deficiency (iron, B12)




Problems with digestive system

### WHY IS IRON IMPORTANT?




You need iron to make haemoglobin. Haemoglobin carries oxygen from your lungs to your body.



If left untreated low iron levels and anaemia can:

- delay your surgery
- increase your chance of needing a blood transfusion
- increase your chance of complications
- slow down your recovery after surgery.




Having anaemia before you go in for surgery puts you at a higher risk of needing a blood transfusion.

- Blood is a precious commodity and should not be used lightly.
- A blood transfusion is an organ transplant and comes with inherent risks.

More patient information available on Australian Red Cross Blood Service <https://mytransfusion.com.au/>

Contact Details: Transfusion Nurse, Phone 42269868



14

National Patient Blood Management Collaborative Resources



# Lismore Base Hospital and St Vincent's Lismore, NSW

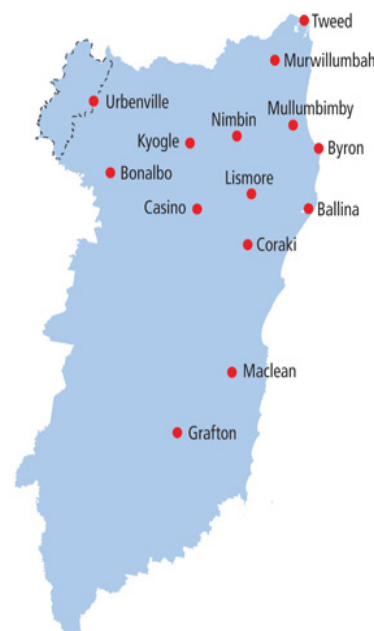
## Overview

Figure 14: Northern NSW LHD

Northern NSW Local Health District (LHD) covers an area of 20,732 square kilometres and services a population of approximately 300,000 people. The partners in this health service Collaborative were:

- Lismore Base Hospital is a major regional referral hospital within the Northern NSW LHD undertaking over 8,100 surgical procedures annually.
- St Vincent's Lismore is an acute private hospital providing a wide range of services, including surgical procedures.
- The North Coast Primary Health Network and general practitioners (GP) in Lismore.

Lismore Base and St Vincent's both collected data for all three of the surgical specialties.



**Health**  
Northern NSW  
Local Health District

**St Vincent's**  
LISMORE  
*more than just a hospital.*

*The Lismore Base Hospital, St Vincent's, Lismore and the local Primary Health Network demonstrated how a collaboration between GPs and the public and private hospitals can work effectively to achieve improved patient care.*

*Data demonstrated improvements in assessment and management of iron deficiency from 14% to 40% and 42% to 63% respectively. This was achieved by engaging with pre-operative clinic staff and establishing links to general practice. Articles in GPSpeak, a publication of the Northern Rivers GP Network, was a major influence in the increases in iron deficiency assessment and management by general practice. These articles highlighted the benefits of PBM and illustrated data to demonstrate the progress made locally.*

*The achievement of 100% iron deficiency assessment at St Vincent's, Lismore in the last year of the NPBMC can be attributed to a number of strategies:*

- Consultation with key stakeholders on processes
- Data collection requirements and benchmarking systems
- Education and support of the pre-operative clinicians.

*PBM is currently a well integrated part of the pre-admission screening process allowing consideration of further expansion of the current program into other surgical specialties such as major urology and vascular surgery.*

*Further collaboration with referring clinicians will enable the sustainability of the program over time and improve overall iron deficiency management – which was a strong focus of the project team.*

# Lismore Base Hospital and St Vincent's Lismore, NSW

## Achievements

- Developed a suite of resources in pre-operative clinic to promote patient blood management (PBM).
- “GP speak” articles were published to create broader awareness of PBM in local General Practice

*“Our focus on the North Coast was to engage GPs in optimising a patient's blood prior to surgery as we believed that GPs are best placed to manage iron deficiency and anaemia and would play an important role in the Collaborative.”*

*Update to Ironing Out Perioperative Challenges by Bev Hiles, GPSpeak, 2017*

- Interest was also shown in providing educational visits to GP practices.
- Trends showed increases in both iron assessment and iron deficiency management and there was a decrease in transfusion rates during the NPBMC.
- Developed an Iron Infusion page for HealthPathways, a web-based information portal to help primary care clinicians plan patient care through primary, community and secondary health care.
- Collaborated with the North Coast Primary Health Network for the inclusion of iron deficiency information for bowel cancer symptoms on the Mid and North Coast of NSW HealthPathways with an aim to increase iron deficiency management in the primary care setting in the gastrointestinal cohort, as time to surgery is often short post colonoscopy findings.




**Figure 15:** Beverley Hiles, Lismore Base Hospital's, NPBMC Project Co-ordinator and Garth Brown, NPBMC Project Co-ordinator, St Vincent's, Lismore at the NPBMC Showcase in June 2017.



# Lismore Base Hospital and St Vincent's Lismore, NSW

## Shared resource

Figure 16: Sample fax to GP/surgeon requesting an iron infusion

<b>Perioperative Unit</b> <b>Lismore Base Hospital</b> PO Box 419 Lismore 2480 Phone: 66202500 Fax 66202502	 <b>Health</b> Northern NSW Local Health District
<b>Facsimile</b>	
<b>TO:</b>	<b>Fax number:</b>
<b>FROM:</b>	
<b>DATE:</b>	<b>Total pages:</b>
<b>SUBJECT:</b>	

---

Dear Doctor

Your patient

was seen at the Pre-Admission Assessment Clinic in preparation for an elective surgical procedure where significant blood loss may occur.

The patient has been instructed to make an appointment with you, as routine preoperative screening indicates that your patient has iron deficiency. A copy of results is attached.

To assist with preoperative preparation, could you please organize an iron infusion for your patient for rapid replenishment of iron stores prior to surgery?

Please ring the above clinic number for any queries.

With thanks

*Dr Signature .....*  
Perioperative Unit, Lismore Base Hospital


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# Lismore Base Hospital and St Vincent's Lismore, NSW

## Shared resource

Figure 17: Fax to GP/surgeon confirming a patient's iron deficiency

<b>Perioperative Unit</b> <b>Lismore Base Hospital</b> PO Box 419 Lismore 2480 Phone: 66202500 Fax 66202502	 <b>Health</b> Northern NSW Local Health District
<b>Facsimile</b>	
<b>TO:</b>	<b>Fax number:</b>
<b>FROM:</b>	
<b>DATE:</b>	<b>Total pages:</b>
<b>SUBJECT:</b>	

---

Dear Doctor

Your patient

was seen at the Pre-Admission Assessment Clinic in preparation for an elective surgical procedure where significant blood loss may occur.

The patient has been asked to commence oral iron therapy, as routine preoperative screening indicates that your patient has iron deficiency. A copy of results is attached.

The patient has been advised to make a follow up appointment with you 2 months post-surgery to have their iron status reviewed.

Please ring the above clinic number for any queries.

With thanks

*Dr Signature .....*  
Perioperative Unit, Lismore Base Hospital

The information contained in this fax message is intended for the named addressee only. If you are not the intended recipient you must not copy, distribute, take any action reliant on, or disclose any details of the information in this fax to any other person or organisation. If you have received this fax in error please notify us immediately.

# Central Coast Local Health District, NSW

## Overview

The Central Coast Local Health District (CCLHD) consists of two local government areas (Gosford and Wyong) and has a population of 320,000 residents which is around 4.5% of the NSW population.

Located between Sydney and the Hunter Valley, the Central Coast is a popular coastal region attracting young families and retirees.

Sites participating in the NPBMC included:

- CCLHD - Gosford and Wyong Hospitals
- GP Collaboration Unit
- Hunter New England Central Coast Primary Health Network

Data was collected for all three surgical streams.



Figure 18: Central Coast Local Health District



# Central Coast Local Health District, NSW

## Achievements

- Development and implementation of robust and reliable assessment and management processes for patients presenting for surgery which ensure iron stores and haemoglobin are optimised
- Engaged clinicians to promote best clinical practice through education and regular project related feedback
- Achieved a sustained increase in the percentage of patients being assessed and managed for sub-optimal Iron and haemoglobin stores from 41% (baseline) to > 98% (current local data)
- Management of iron deficient patients increased from 66% in December 2015 to 91% in December 2016
- Developed a number of resources to ensure patients have access to information about iron and anaemia and being ready for surgery
- The initial three surgical specialties in the NPBMC have been extended to include urology and can be adapted for other procedures, e.g. vascular surgery
- A future opportunity has been identified to incorporate the model into ortho-trauma; the feasibility of transferring the model is being explored
- The Anaesthetics Department is also looking at incorporating the model into intraoperative pathway for specified cases.

**Figure 19:** Greg Thomson, NPBMC Project Coordinator, CCLHD and the Commission's Board Chair, Professor Willis Marshall, AC at the NPBMC Showcase in June 2017



# Central Coast Local Health District, NSW

## Shared Resource

Figure 20: Intravenous Iron Infusion Patient Information Brochure

### Side effects of IV iron

- Changes in what you taste (eg metal taste in your mouth)
- Headache, feeling or being sick
- Muscle and joint pain
- Feel short of breath
- Feeling itchy or a have a rash
- Change in blood pressure or pulse
- Redness, pain and swelling at injection site
- If your drip starts to hurt or if you feel any side effects, tell your nurse

Severe side effects are rare. You will be watched closely for any signs of these side effects by nursing staff.

**When you get home if you have chest pain, problems breathing, feel dizzy or have neck/mouth swelling CALL 000 for an Ambulance**

## Central Coast Local Health District

**IV Iron**  
Telephone Info line  
(02) 4320 3855

**Medical Day Unit**  
Gosford Hospital  
Ph (02) 4320 9960

**Ambulatory Care Unit**  
Wyong Hospital  
Ph (02) 4394 8111

www.cclhd.health.nsw.gov.au/  
ourservices/Pages/Ambulatory-Care-Units

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## Intravenous Iron Infusions

**Information for Patients**



This leaflet answers some questions about IV iron infusions and does not take the place of talking to your doctor about why you need IV iron.



**Health**  
Central Coast  
Local Health District

### What is an IV iron infusion?

"Intravenous" or "IV" means giving something into the blood stream through a vein. A needle is put into a vein (in the back of the hand or arm). Then a mix of iron and saline (salt water) is slowly "dripped" (infused) into the vein and mixes with the blood in your body.

### Why do we need iron?

Iron helps your body make red blood cells which carry Oxygen around your body. If you have low iron levels you may feel weak and lack energy.

### Why might I need IV iron?

The best way to treat low blood iron levels is to take iron as a tablet or liquid. This works well for most people and is usually tried first.

You may need IV iron if you:

- Cannot take iron tablets
- Are unable to absorb iron through the gut
- Are about to have major surgery and your iron levels are low
- Find the iron tablets do not work
- Have kidney or heart problems

### Before IV iron

Tell your doctor if you:

- Are having a baby or trying to get pregnant
- Have had asthma, eczema or other allergies
- Have had problems with any type of iron injection or infusion in the past
- Have ever had high iron levels
- Are on any medications (don't forget the supermarket or herbal medications)

### On the day of IV iron

- Eat your breakfast / lunch. It is OK to eat and drink before IV iron
- Take all of your normal medications
- You can drive home after IV Iron and do what you would normally do during the rest of the day (unless there is a problem)

### After IV iron

Side effects can start 1 to 2 days after IV iron such as headache, mild fever, joint and muscle aches. These will go away over the next few days. If you are worried call your doctor or the Medical Day Unit Gosford or Ambulatory Care Unit Wyong.





# Prince of Wales Hospital and The Royal Hospital for Women, NSW

## Overview

Prince of Wales Hospital (POWH) and The Royal Hospital for Women (RHW) are located on the Randwick campus of South Eastern Sydney Local Health District (SESLHD).

The GP Network involved the Central and Eastern Sydney Primary Health Network.

Due to the statewide services provided by both hospitals, a large proportion of admissions were not residents of SESLHD; this creates challenges for networking with primary care.

In 2011 the SESLHD population was 838, 415, which equated to 11.6% of the NSW population. The majority of these residents are elderly.

These hospitals worked together in the NPBMC, with POWH collecting data for gastrointestinal and orthopaedic patients and RHW collecting gynaecological patient data.

Aggregated data for both hospitals showed an increase in assessment rates for iron deficiency from 6% in December 2015 to 26% in December 2016.

Figure 21: South Eastern Sydney Local Health District Map

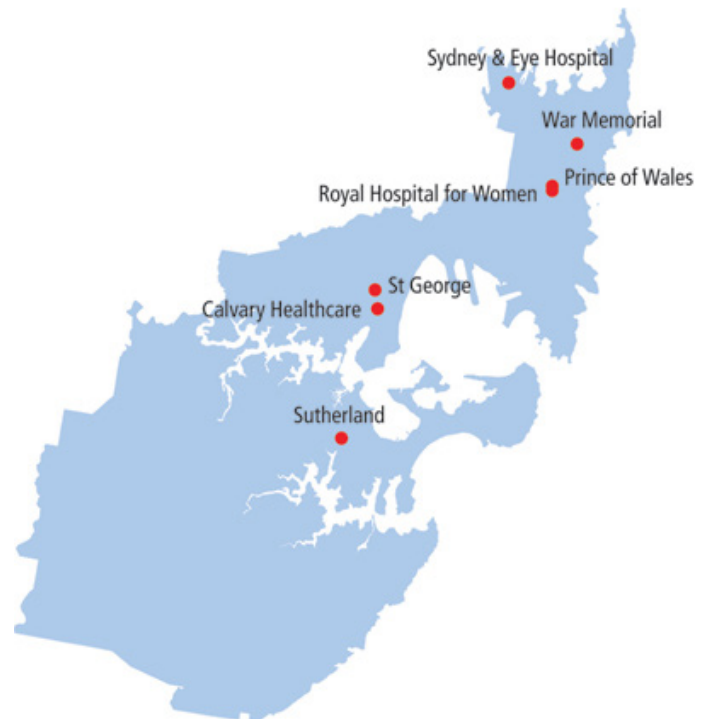


Figure 22: From left: Ellen Barlow from RHW; and Elizabeth McGill and Dr Susan MacCallum from POWH at a Collaborative Learning Workshop in 2016



# Prince of Wales Hospital and The Royal Hospital for Women, NSW

## Achievements

### Royal Hospital for Women


- Achieved buy-in from gynaecological oncology.
- Agreement of Day Surgery Unit to administer iron transfusions and the involvement of Clinical Nurse Educator to support the Day Surgery Unit staff to administer iron transfusions.
- Increased awareness of staff to assess for iron deficiency anaemia.




### Prince of Wales

- Achieved interest from the preoperative service and the involvement of an orthopaedic Clinical Nurse Consultant.
- Uptake of PBM by radiation and medical oncologists and the new Cancer Care Centre is able to provide for more iron infusions.
- Developed a 'traffic light' monitoring approach to managing perioperative anaemia.
- Patient letter registered on CHIER (Consumer Health Information and Education Resource)

Figure 23 POWH patient letter



National Patient  
Blood Management  
Collaborative



The Prince of Wales Hospital  
& Community Health Service

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Haematology Department  
Prince of Wales Hospital  
Randwick, NSW 2031  
(02) 9382 9047  
[Susan.MacCallum@health.nsw.gov.au](mailto:Susan.MacCallum@health.nsw.gov.au)

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[Gemma.Carroll@health.nsw.gov.au](mailto:Gemma.Carroll@health.nsw.gov.au)

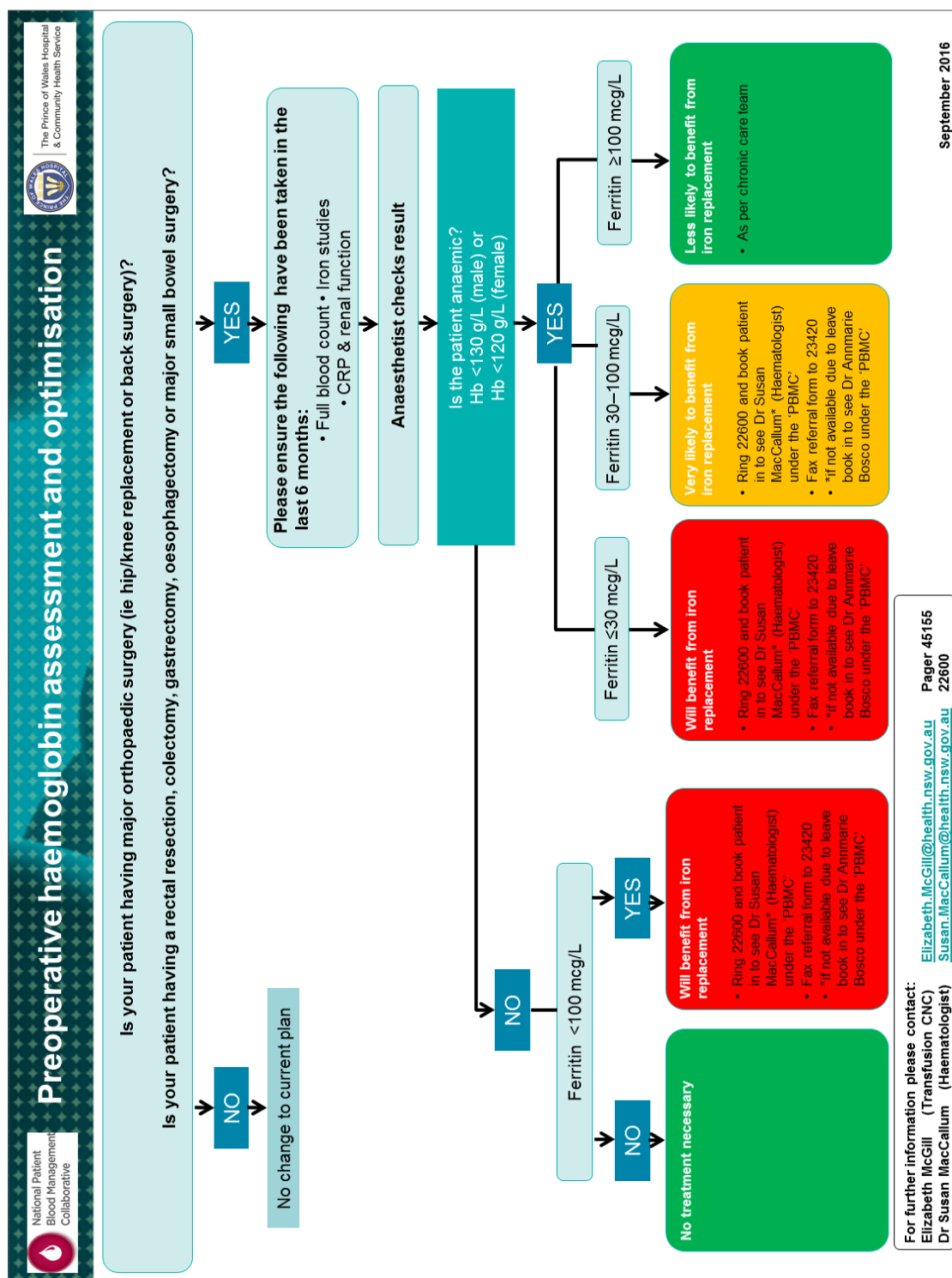


Health  
South Eastern Sydney  
Local Health District

# Prince of Wales Hospital and The Royal Hospital for Women, NSW

## Shared resource

Figure 24: Preoperative haemoglobin assessment and optimisation flow chart for clinicians



# Mater Hospital, NSW

## Overview

- The Mater Hospital, part of St Vincent's Health Australia, is located in North Sydney.
- The Mater Hospital is a 216 bed hospital with intensive care, orthopaedic and rehabilitation wards and a large maternity unit.
- By April 2016, 98% of patients had a full blood count and 65% have full iron studies. For the Orthopaedic cohort more than 90% of patients had full iron studies
- The Mater Hospital collected data for gynaecological and orthopaedics.



Figure 25: Mater Hospital, North Sydney





# Mater Hospital, NSW

## Achievements

- Developed a Six Minute Intensive Training (SMIT) module for Nurse Education providing information on:
  - What is patient blood management?
  - What is the Collaborative about?
  - Who started the National Patient Blood Management Collaborative?
  - What surgeries are being focused on with the Collaborative?
  - Who is participating in the Collaborative?
  - How will the impact and success be measured?
  - Outcomes of the Collaborative.

The SMIT was used by other health service teams under the Collaborative philosophy of 'steal shamelessly, share generously'.

- Distribution of a one page summary for orthopaedic surgeons providing information on the NPBMC with the objective of pre-operative optimisation of haemoglobin and iron stores for patients undergoing elective surgery
- Development of a flow chart to provide guidance on when to administer an iron infusion for when iron studies suggest iron deficiency.
- All orthopaedic surgeons adopted the maximum surgical blood ordering schedule recommendation for 'group and hold' rather than 'cross-match'.

**Figure 26:** Mater Hospital NPBMC Project Coordinator, Paul Morgan, presenting at the NPBMC Showcase in June 2017 (right)



Figure 27: PBM Education resource

### Six Minute Intensive Training (SMIT) – Patient Blood Management

**What is Patient Blood Management?**

Patient Blood Management (PBM) aims to optimise blood volume and red cell mass, minimise blood loss and optimise the patient's tolerance of anaemia.

PBM is not an alternative to blood transfusion but good clinical practice. A reduction in unnecessary blood transfusions minimise transfusion associated complications and supports appropriate use of blood products

PILLAR ONE	PILLAR TWO	PILLAR THREE
Pre-Op	Intra-Op	Post Op
Optimise Hb and Iron stores	Minimise Blood Loss	Manage anaemia / tolerance of anaemia

**What is the Collaborative about?**

The Collaborative embodies Pillar One: to increase the percentage of patients who have had their haemoglobin and iron stores optimised prior to elective surgery. The three pillars underpin PBM and highlight:

- Risks associated with blood transfusion – infection, length of stay
- Rising costs with provision and transfusion of blood
- Challenges of maintaining an adequate blood supply due to increased demand and ageing population
- Use of blood and blood products are not always in accordance with clinical guidelines.

Historically blood transfusion has been used indiscriminately without considering real clinical need. Blood is a vital resource that should be used when clinically indicated based on individual patient parameters.

**Who started the National Patient Blood Management Collaborative?**

The Australian Commission on Safety and Quality in Health Care established the National Patient Blood Management Collaborative to address the use of blood in elective surgery.

**What surgeries are being focused on in the Collaborative?**

- ✓ Gastrointestinal
- ✓ Gynaecological
- ✓ Orthopaedic

**Who is participating in the Collaborative?**

**WE ARE!!**

Along with 11 health services which are a mix of public, private and not-for-profit hospitals.

**Change Principles**

Between 2015 and 2017 health services will develop and trial strategies to enhance PBM and the effective use of the National Blood Authority (NBA) Guidelines. Three change principles will be used when developing strategies:

**Change Principle 1:** Implement a systematic and proactive approach to pre-operative optimisation of haemoglobin and iron stores for patients undergoing elective surgery.

**Change Principle 2:** Ensure patients receive integrated and coordinated PBM pre-operatively.

**Change Principle 3:** Enhance knowledge of evidence-based best practice in PBM.

**How will the impact and success be measured?**

By reviewing the patient's journey and looking at:

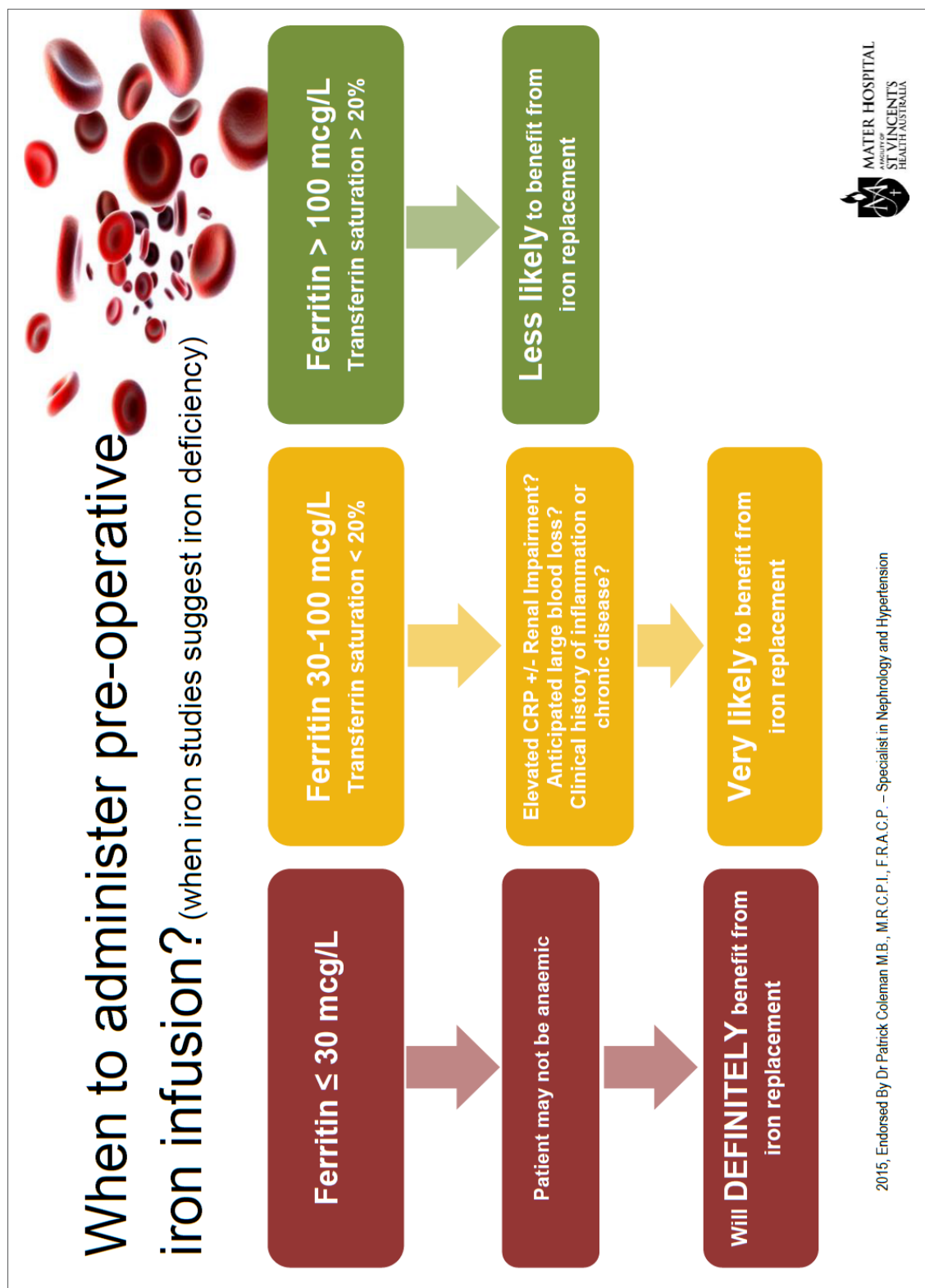
Step in clinical pathway	Indicator description
Assessment	<ul style="list-style-type: none"> <li>Assessed for anaemia</li> <li>Assessed for iron deficiency</li> </ul>
Diagnosis made	<ul style="list-style-type: none"> <li>Anaemia confirmed</li> <li>Fe deficiency confirmed</li> </ul>
Condition managed	<ul style="list-style-type: none"> <li>Anaemia managed</li> <li>Fe deficiency managed</li> </ul>
Outcome	<ul style="list-style-type: none"> <li>Anaemia improved</li> <li>Fe deficiency improved</li> </ul>
Transfusion	<ul style="list-style-type: none"> <li>Pre-operatively</li> <li>Intra-operatively</li> <li>Post-operatively</li> </ul>

**Outcomes of the Collaborative**

By addressing low Hb and Fe deficiency prior to elective surgery the Collaborative hopes to reduce:

- ✓ Avoidable blood transfusions
- ✓ Post-operative infections and adverse reactions to blood products

Figure 28: Iron Infusion Flow Chart



# St Vincent's Private Hospital, Sydney NSW

## Overview

St Vincent's Private Hospital, Sydney (SVPHS) is a 270-bed acute care facility which provides a wide range of general and specialised medical and surgical services and provides significant training and research activities.

St Vincent's Private Hospital, Sydney has 8 theatres, a 12-bed Intensive Care Unit (ICU), a Day Surgery Unit with 5 operating theatres including a lithotripsy suite, a post-anaesthetic care unit and a cardiac catheter laboratory.

St Vincent's Private Hospital commenced the NPBMC collecting data for orthopaedic patients but expanded their data collection to include gastrointestinal surgery patients in 2016.



Figure 29: St Vincent's Private Hospital, Sydney



Figure 30: SVPHS NPBMC clinician Lisa Davey at a Learning Workshop, September 2015





# St Vincent's Private Hospital, Sydney, NSW

## Achievements

- Iron studies have been embedded into elective orthopaedic surgery standing orders. The assessment and management of elective surgical orthopaedic patients for iron deficient anaemia is now embedded into the preadmission process
- The PBM processes are now being embedded into care pathways for gynaecological and gastrointestinal elective surgery patients
- A formal process has been established to investigate the cause of iron deficiency. This is being coordinated by the anaesthetic team, for each patient
- Communication is now provided to the referring patients GP with evidence-based information on assessing and treatment for iron deficiency anaemia
- Assessment rates for iron deficiency in orthopaedics increased from 44% in December 2015 to 96% in December 2016
- The Same Day Centre delivers iron infusions to patients who require it, and from January 2018, a state of the art ambulatory care service will deliver iron infusions
- The success of the NPBMC can be attributed to a dedicated Executive Sponsor and clinical lead, strong project support, and:
  - Preadmission service and Same Day Centre Nursing Team
  - Relationship between Preadmission Nursing team and anaesthetists
  - The SVPHS multidisciplinary 'Blood Squad'
  - SVPHS Operational Plan 'patient safety priority'
  - VMOs incorporating iron studies into Standing Orders, and preadmission staff following these orders (visit 2 weeks to 1 day prior to surgery)

**Figure 31:** SVPHS NPBMC Project Coordinator, Edel Murray (centre) participating in an On the Couch session at the NPBMC Showcase in June 2017 with Dr Lilon Bandler, Chair, NPBMC Project Reference Group (left) and Dr Pradeep Jayasuriya, a GP from Western Australia and member of the Project Reference Group (right).



# St Vincent's Private Hospital, Sydney, NSW

## Shared resource

Figure 32: IV iron infusion information for patients (page 1)



ST VINCENT'S  
PRIVATE HOSPITAL  
SYDNEY  
GOVERNED BY THE BOARD OF HEALTH OF AUSTRALIA

## Intravenous (IV) iron infusions

Why iron given by a drip into a vein is sometimes needed. This leaflet answers some common questions about IV iron infusions. It does not contain all available information and does not take the place of talking to your doctor about why IV iron has been recommended in your particular case.

### What is an IV iron infusion?

"Intravenous" or "IV" means giving something directly into the blood stream of the body through a vein. A needle placed into a vein (usually in the back of the hand or arm) is attached to a drip that contains iron mixed with saline (a sterile salt water solution). This fluid is slowly "dripped" (infused) into the vein and mixes with the blood in your body.

### Why is iron important?

Iron is essential for the body to make haemoglobin (Hb), a pigment that makes red blood cells red. When the amount of iron in the body gets too low, the haemoglobin level falls below normal. This is known as "iron deficiency anaemia". Haemoglobin is very important as it carries oxygen from the lungs to the rest of the body. If your haemoglobin or iron levels are low this may make you feel tired and not able to carry out your normal routine.

### Why might I need IV iron?

The most common way to treat iron deficiency anaemia is to take iron by mouth as a tablet or liquid. This works well for most people and is usually tried first.

IV iron might be needed if you are:

- Unable to tolerate iron taken by mouth
- Unable to absorb iron through the gut
- Unable to absorb enough iron due to the amount of blood the body is losing
- In need of a rapid increase in iron levels to help avoid important complications or a blood transfusion (such as, before or after major surgery, significant anaemia late in pregnancy or after delivery)
- Not responding to iron tablets (such as due to chronic health problems)
- Have chronic kidney or heart failure

### Risks & benefits of IV iron

Your doctor will explain the risks, benefits & available alternatives to IV iron in your particular case. The most significant risk of IV iron is a small chance of having an allergic reaction which can, in rare cases, be life threatening. IV iron is prescribed for iron deficiency anaemia when oral iron is not tolerated, effective or likely to work quickly enough & the benefits of IV iron outweigh the risks in your particular case. If there is a chance you could be pregnant, inform your doctor, as IV iron should be avoided in the first trimester in pregnancy.

### Alternatives to IV iron

**ORAL IRON:** If you are able to tolerate and absorb iron taken by mouth this is the first option that should be tried (unless a more rapid increase in your Hb level is needed). If you get stomach (tummy) upset with iron tablets, a lower dose of iron as syrup can be tried and increased slowly as tolerated or iron tablets can be taken 2 or 3 times a week instead of daily— discuss this with your doctor as it is important that the right amount of iron is given. Many iron tablets claim to be gentle on the stomach but don't have enough iron in them to treat anaemia.

**IM IRON:** Injection of iron into muscle (IM) is not recommended as it is painful & can cause permanent skin scarring & discolouration.

**BLOOD TRANSFUSION:** Transfusion can be life saving when severe anaemia or bleeding is present. It carries greater risks than IV iron & should be avoided unless an immediate increase in Hb level is needed (when benefits outweigh risks).

**DIET:** Once a person has already become low in iron and anaemic it is difficult to get enough iron back into the body even with a diet that is high in iron.

### Before you have IV iron


Tell your doctor if you:

- Are pregnant or trying to get pregnant
- Have a history of asthma, eczema or other allergies
- Have had a reaction to any type of iron injection or infusion in the past
- Have a history of high iron levels, haemochromatosis or liver problems

# St Vincent's Private Hospital, Sydney, NSW

## Shared resource

Figure 33: IV iron infusion information for patients (page 2)



**ST VINCENT'S  
PRIVATE HOSPITAL  
SYDNEY**  
CONSTITUTED BY THE ACTS OF PARLIAMENTS OF AUSTRALIA

- Are on any medications (including over the counter or herbal supplements)

### How much iron is needed?

Your doctor will calculate how much iron is needed to return Hb levels to normal & also to have some iron stored in reserve for the future. When all the iron needed by the body is given in a single infusion (one treatment) this is called a "total dose" infusion. Sometimes a "total dose" is needed but in other cases just giving smaller amounts of IV iron can help increase Hb levels enough to improve symptoms and help avoid a blood transfusion. The rest of the iron can then be given back to the body slowly over the coming months with iron tablets. The iron will take a few weeks to have its full effect and your doctor will check your Hb level to see how you are responding.

### Types of IV iron in Australia

Iron polymaltose (Ferrosgic or Ferrum H) can be given in a single large dose ('total dose' infusion) or less over a number of hours.

Iron sucrose (Venofer) cannot be given in a large dose but may be given as a series of small doses taking about 1/2 an hour and repeated over a period of days or weeks.

Iron carboxymaltose (Ferinject) can be given as medium dose over about 15 minutes. It may need repeating on another occasion.

### Side effects of IV iron

Patients receiving iron infusions can experience side effects including

- Temporary changes in taste (eg metallic)
- Headache, feeling sick or vomiting
- Muscle and joint pain
- Shortness of breath
- Itchiness, rash
- Changes to blood pressure or pulse
- Burning and swelling at injection site

Severe side effects are rare. You will be closely monitored for any signs of these side effects by nursing staff.

### Day of the iron infusion

- Have your breakfast/lunch. You do not need to fast for an iron infusion
- Take all of your regular medications
- You can drive home after the infusion and resume usual activities (unless there is an unexpected reaction)
- The iron will be given through a small IV drip which will be put in your arm
- If you experience any side effects, inform your nurse immediately

### After the iron infusion

Sometimes side effects can start 1 to 2 days after the infusion and include headache, mild fever, joint and muscle aches. These generally settle down by themselves over the next few days. They are more common with 'total dose' infusions of iron polymaltose. If they are worrying you or interfere with your daily activities contact your doctor or infusion centre for advice.

**If you have chest pain, difficulty breathing, dizziness or neck/mouth swelling SEEK URGENT MEDICAL ATTENTION / CALL AN AMBULANCE (000).**

Iron tablets should be stopped for a week after an iron infusion because the iron in them will not be absorbed by the body. If you are having more than one iron infusion then stop the iron tablets during the course of treatment as well. They are often not needed after IV iron infusions (especially after a 'total dose' is given): Check with your doctor if & when iron tablets are needed.

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St Vincent's Private Hospital Sydney  
406 Victoria Street Darlinghurst NSW 2010  
[www.stvincentsprivatehospital.com.au](http://www.stvincentsprivatehospital.com.au)

CONTACT: Lisa Davey 02 8382 6460

# Canberra Hospital and Health Services, ACT

## Overview

Canberra Hospital and Health Service (CHHS) is an acute care teaching hospital of approximately 600 beds, and is a tertiary referral centre that provides a broad range of specialist services to the people of the ACT and south east NSW. It is the largest public hospital in the region, supporting a population of almost 620,000 with strong links to community-based services that provide continuity of care for patients.

The CHHS has taken a territory-wide approach to participation in the NPBMC with the support of Calvary Bruce Public Hospital; Calvary John James Hospital; and, GP Liaison/ Capital Health Network.

As the first point of contact for patients requiring surgical intervention, general practice (GP) was identified as essential stakeholder for the ACT arm of PBM Collaborative project. GP Liaison from both Canberra and Calvary Hospitals were immediately included in the project teams.

The CHHS collected data for all three of the surgical specialties.



Figure 34: ACT Health





# Canberra Hospital and Health Services, ACT

## Achievements

- Establishment of a 'virtual IDA clinic' to provide IV iron at both CHHS and Calvary Hospital In the Home Clinic.
- Increased awareness of anaesthetics assessment including PBM
- ACT hosted a very successful Iron Symposium, from Primary to Tertiary Care, in April 2016, developed through a partnership between CHHS and the Australian Red Cross Blood Service, with 100 delegates who were provided with a range of tools to assist them with:
  - Identifying and screening patients at risk of iron deficiency and anaemia
  - Interpreting laboratory investigations for iron deficiency anaemia
  - Ordering investigations where appropriate to determine the underlying cause of iron deficiency
  - Incorporating the use of patient information handouts to discuss treatment of iron deficiency
  - Applying the principles of prescribing and administering iron therapy in practice with a focus on PBM
- Improving communication with GPs regarding services to support PBM was achieved via HealthPathways and GP HealthNet. GP HealthNet is designed to improve interactions between GPs and services within ACT Health. The revision of CHHS haematology clinical services page on HealthNet will streamline access to the haematology department and include referral pathways for IV iron administration.
- Worked collaboratively with Capital Health Network, HealthPathways, GP Liaison and other key stakeholders to develop and publish two new ACT and Southern NSW HealthPathways: Anaemia in pregnancy and Iron Deficiency in Pregnancy; and Pre Operative Iron Deficiency and Anaemia
- HealthPathways is an information portal supporting primary care clinicians plan patient care through primary, community and secondary health care systems.



**Figure 35:** ACT Health team: Amy Beath, RN, ACT Health; Maria Burgess, NPBMC Project Coordinator; Savi Lecamwasam, Project Officer, Calvary Bruce and Dr Philip Crispin, Clinical Haematologist and NPBMC Lead Clinician at the NPBMC Showcase in June 2017.



# Canberra Hospital and Health Services, ACT

## Shared resource

Figure 36: Letter to patient (page 1)

		
To Address   Dear		
<b>Getting as fit as possible for your surgery</b>		
Patient name Patient address DOB		
You have been placed on the elective surgery waiting list for your Hip/Knee joint replacement surgery.		
Anaemia (low red blood cells) is known to adversely affect surgical outcomes, so we would like to test your blood cells and iron levels early to allow time to correct any abnormalities. For this reason, we request that you have additional blood tests in the next 2 weeks, so that appropriate investigation and therapy can be set up if needed.		
Please find enclosed a form for blood tests to be completed. These include:		
<ul style="list-style-type: none"><li>• Full blood count-FBC</li><li>• Iron studies including ferritin levels</li><li>• Renal (kidney) function tests</li></ul>		
A copy of the results from these tests will be automatically sent to your GP; Dr -----		
We have informed your GP you are on the elective surgery waiting list for your planned surgery and to request their follow up care.		
Please call and make an appointment to see your GP after you have had your blood collected for follow up of your results.		
<b>Please ensure that you take this letter with you to your appointment with your GP.</b>		
<small>PO Box 11 Woden ACT 2606   phone: 02 6244 2222   <a href="http://www.health.act.gov.au">www.health.act.gov.au</a></small>		

# Canberra Hospital and Health Services, ACT

## Shared resource

Figure 37: Letter to patient (page 2)

If your test results are normal, there will be no need for further tests. If your results show that you are iron deficient your GP will be able to start appropriate management prior to surgery.

Your GP will communicate your results any management Canberra Hospital. This will ensure you are in the best health for your planned operation.

We welcome feedback from you and your patients about this process. To provide feedback or if you have any questions regarding this process, please contact:

**GP Liaison Admin**  
**Ph: 6244 4183**  
**Fax: 6205 2826**  
**Email: [gpliaison@act.gov.au](mailto:gpliaison@act.gov.au)**

Dr Philip Crispin  
Haematology Dept  
Canberra Hospital  
PO Box 11  
WODEN ACT 2606

Date August 2015

# Northern Health, VIC

## Overview

Northern Health is the major provider of acute, sub-acute and ambulatory specialist services in Melbourne's north; the five campuses provide a range of primary, secondary and some tertiary health care services.

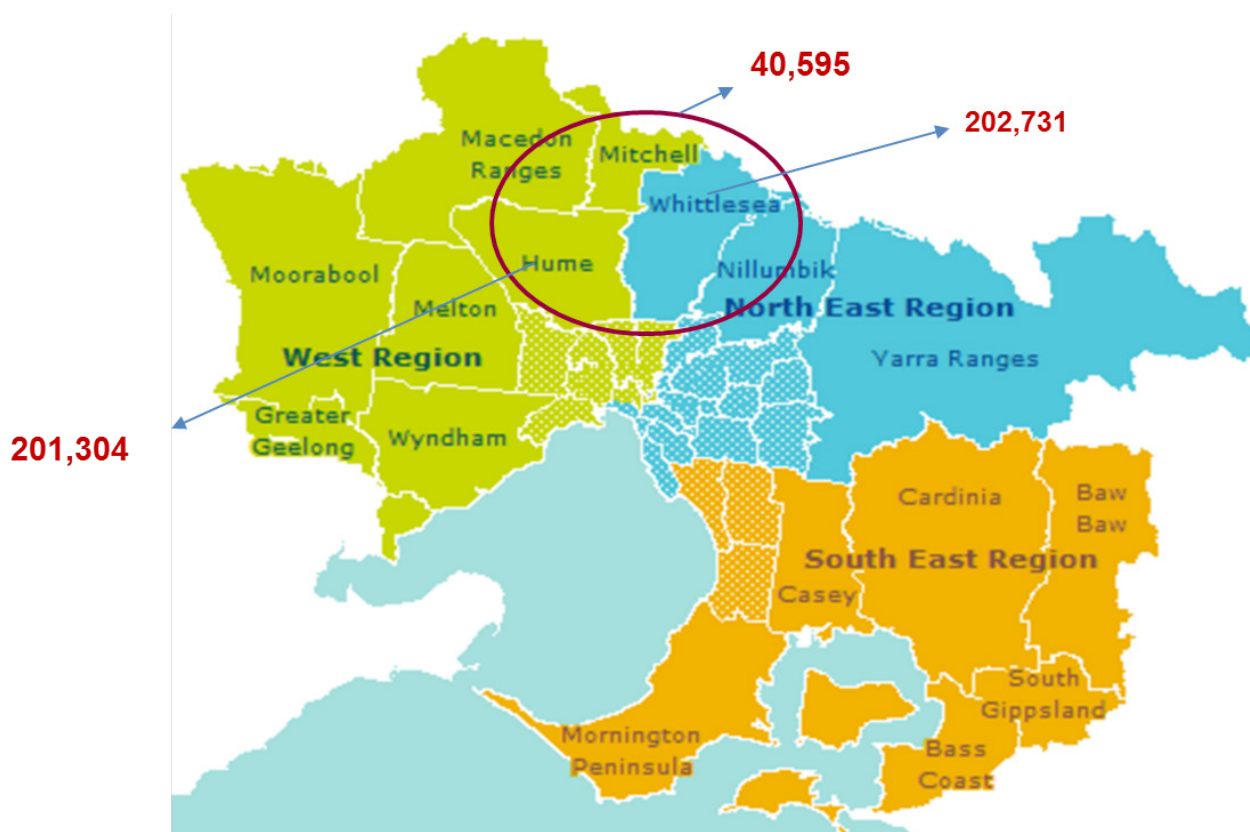
Northern Health is comprised of Broadmeadows Health Service, Bundoora Extended Care Centre, Craigieburn Health Service, Panch Health Service, and The Northern Hospital.

The population catchment is around 455,000 (2016) with a project growth of 59% between 2016-2031. The campuses work together to provide a unique mix of services including medical, surgical, emergency, intensive and coronary care, paediatrics, women's and maternal health, mental health, aged care, palliative care, and rehabilitation programs. These services are provided through inpatient, ambulatory and community-based programs.

Northern Health's programs and services are designed to assist services to be integrated across the five campuses, and ensure that patients have access to the best healthcare within the most efficient time frame.

Northern Hospital collected data for all three of the NPBMC surgical specialties.

Figure 38: Northern Health catchment area



# Northern Health, VIC

## Achievements

- Developed and formalised preoperative anaemia guidelines.
- Developed a new process for the ordering of iron infusions.
- Embedded preoperative anaemia management in Northern Health's Proactive Intervention Medical Assessment in Elderly Elective Surgical Patients (P.R.I.M.E.) Service for orthopaedic patients. Extended the implementation of the preoperative anaemia management process in other satellite campus (Broadmeadow and Craigieburn).
- Established a Surgical Liaison Coordinator to ensure the optimisation of a patient's condition pre-surgery.
- Integrated PBM program and concepts into education programs and packages for clinicians.
- Commenced engagement with the Primary health care network in north western area of Melbourne .
- Management rates for patients with anaemia increased from 32% in December 2015 to 43% in December 2016.

Figure 39: Betty Dumayas, Northern Hospital's NPBMC Project Coordinator presenting at the NPBMC Showcase in June 2017




Figure 40: Northern Hospital






## Shared resource

Figure 41: Administration of iron carboxymaltose infusion form (page 1)



FNH376605

 <b>PHARMACY IRON CARBOXYMALTOSE INFUSION (1000MG) FERINJECT®</b>	<p style="text-align: center;">AFFIX PATIENT IDENTIFICATION LABEL HERE</p> <p>U.R. NUMBER: _____</p> <p>SURNAME: _____</p> <p>GIVEN NAME: _____</p> <p>DATE OF BIRTH: ____/____/____ SEX: _____</p>
---	---

**Warning:** DO NOT use this protocol for iron Polymaltose (Ferrosig®/Ferrum H®), iron Sucrose (Venofer®) or ANY OTHER IV iron product as maximum dose per infusion, rate of infusion and dilution are NOT interchangeable. This protocol applies to Adult, second and third trimester pregnant patients. Seek expert advice for other patients.

**INSTRUCTION FOR THE ADMINISTRATION OF IRON CARBOXYMALTOSE INFUSION (Ferinject®)**

Iron Carboxymaltose should only be prescribed if the patient has had a documented reaction to other iron formulations and must be discussed with the Clinical Haematology Service.

For patients ≥ 50 kg, the recommended dose is 1000 mg of iron Carboxymaltose as a single dose. However, patients ≥ 50 kg on a fluid restriction may be prescribed TWO doses of 500mg each to be administered ONE week apart; see the 500mg iron Carboxymaltose form to prescribe this.

For patients <50 kg the recommended dose is 500mg iron Carboxymaltose as a single dose.

The infusion shall be prepared in the sterile cabinet in pharmacy and delivered to the ward. For doses of iron 1 g (20 mL of iron Carboxymaltose injection) the infusion volume will be: [iron dose] diluted in 250 mL 0.9% sodium chloride, infused over 30 minutes.

ALL patients receiving intravenous iron Carboxymaltose, the medical officer will need to prescribe the necessary emergency drugs (hydrocortisone, promethazine\* and adrenaline) in the table below. These drugs should be readily available but are not required to be drawn up. A Valid PBS prescription will be needed for patients on outpatient wards as well.

**Prescription:** DO NOT document prescribed dose on IV Infusion Chart 365900

Known allergies:..... WARD:.....(Provide a PBS script for outpatients)

Verbal Consent obtained: ☐ Yes Dr's Signature:..... Date:.....

Previous exposure to iron Carboxymaltose ? ☐ No ☐ Yes ,Date of last infusion: / /

Patient's weight:.....kg Hb levels:..... Ferritin levels:.....

Date	Iron Carboxymaltose (Ferinject®) in 250 mL of 0.9% sodium chloride over 30 minutes Maximum dose per infusion is 1000 mg if >50kg (use ideal body weight if overweight)	Start Time (or to speedy)	Medical Officer's signature	Nursing Staff signature
...../...../.....	Iron Carboxymaltose 1000mg in 250 mL 0.9% sodium chloride			
...../...../.....	Hydrocortisone 100 mg IV PRN			
...../...../.....	*Promethazine 25 mg IV PRN			
...../...../.....	Adrenaline (1:1000 ampoule) 0.5 mL IM PRN			

Medical officer name (print):..... Date / / Pager Number:.....

Ward Pharmacist (signature): ..... Sterile manufacturing Pharmacist (signature):.....  

For iron Carboxymaltose

Carboxymaltose 1000mg

HEALTH

NORTHERN

**C**

1000mg


PHARMACY IRON CARBOXYMALTOSE INFUSION (1000MG) FERINJECT


376605



## Shared resource

Figure 42: Administration of iron carboxymaltose infusion form (page 1)





**PHARMACY**  
**IRON CARBOXYMALTOSE**  
**INFUSION (1000MG)**  
**FERINJECT®**

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: \_\_\_\_\_

SURNAME: \_\_\_\_\_

GIVEN NAME: \_\_\_\_\_

DATE OF BIRTH: \_\_\_\_/\_\_\_\_/\_\_\_\_ SEX: \_\_\_\_\_

**\*For pregnant women particularly in the third trimester of pregnancy, consider oral premedication with dexchlorpheniramine (Polaramine®) 2mg (ADEC Category A).**

**Administration:**

Due to the better safety profile of iron Carboxymaltose compared to older dextran formulations, it is not necessary for the medical officer to be in attendance during the infusion.

No test dose is required for iron carboxymaltose, unlike the other iron formulations.

The infusion is to be delivered via an infusion pump over 30 minutes.

The Nurse should monitor and record the patient's vital signs (temperature, pulse, respiration and blood pressure) prior to (baseline), during (15 minutes post commencement) and post the infusion. The patient should be observed for signs of allergy during the infusion. Signs of an adverse reaction are:

Skin rash, respiratory distress, dizziness and change in conscious state.

Patients receiving their first dose of Ferinject® should remain under observation for 30 minutes after completion of the infusion (i.e. 1 hour after commencement) prior to discharge. With subsequent infusions, observe for 20 minutes after completion

If any sign of allergic reaction or intolerance is detected, the treatment for anaphylaxis should be given, urgent medical review should be sought and the iron infusion cancelled.

**If severe signs of anaphylaxis occur, refer to your site's medical emergency escalation process.**  
**In the event of a reaction, a tryptase level (serum tube) to be collected within 4 hours**

**References:**

1. Aspen. Ferinject® (iron Carboxymaltose) product information. (MIMS revision date 1 Mar 2012).
2. Steinmetz T, Tschekne B et al. Clinical experience with ferric carboxymaltose as treatment of cancer-associated anaemia. J Clin Oncol. 29: 2011 (suppl; abstr e19561)
3. Bailie G R, Mason N A, Valaoras T G. Safety and tolerability of intravenous ferric carboxymaltose in patients with iron deficiency anaemia. J International Society of Hemodialysis. 2010; 14:47-54.
4. Myers B, Myers O, Moore J. Comparative efficacy and safety of intravenous ferric carboxymaltose (Ferinject®) and iron (III) hydroxide dextran (Cosmofer®) in pregnancy. Obstet Med. 2012;5(3):105-107

Carboxymaltose 1000mg

# The Alfred Hospital, VIC

## Overview

The Alfred Hospital is a tertiary metropolitan hospital with three campuses and is approximately 5km from the Melbourne central business district

- The Alfred has one of Australia's busiest emergency and trauma centres, the state's largest Intensive Care Unit and provides a number of statewide services
- Caulfield Hospital specialises in community services, rehabilitation, aged care and aged mental health
- Sandringham Hospital provides healthcare in emergency, paediatrics, general medicine and in outpatient clinics. The hospital also delivers elective general and orthopaedic surgery.

The Alfred commenced the NPBMC collecting data for orthopaedic patients only but expanded their data collection to include gastrointestinal surgery patients in 2016.



Figure 43: The Alfred Hospital



# The Alfred Hospital, VIC

## Achievements

- The team set up a process that is sustainable in their service and moved into other surgical groups to follow a similar process
- Over the term of the NPBMC there was a reduction in transfusion rates for orthopaedic surgery
- Improvements were likely due to multiple factors such as changed practice and increased use of tranexamic acid
- Increased testing for iron deficiency and management, usually with IV infusion
- Management of program was achieved within available hospital resources
- There will be a continuation of the program post Collaborative.

**Figure 44:** The Alfred Hospital's NPBMC Project Officer, Christine Akers presenting at the NPBMC Showcase in June 2017



**Figure 45:** The Alfred Hospital's Team: Dr Amanda Davis, Haematologist and NPBMC Lead Clinician and Christine Akers at a Learning Workshop in September 2015

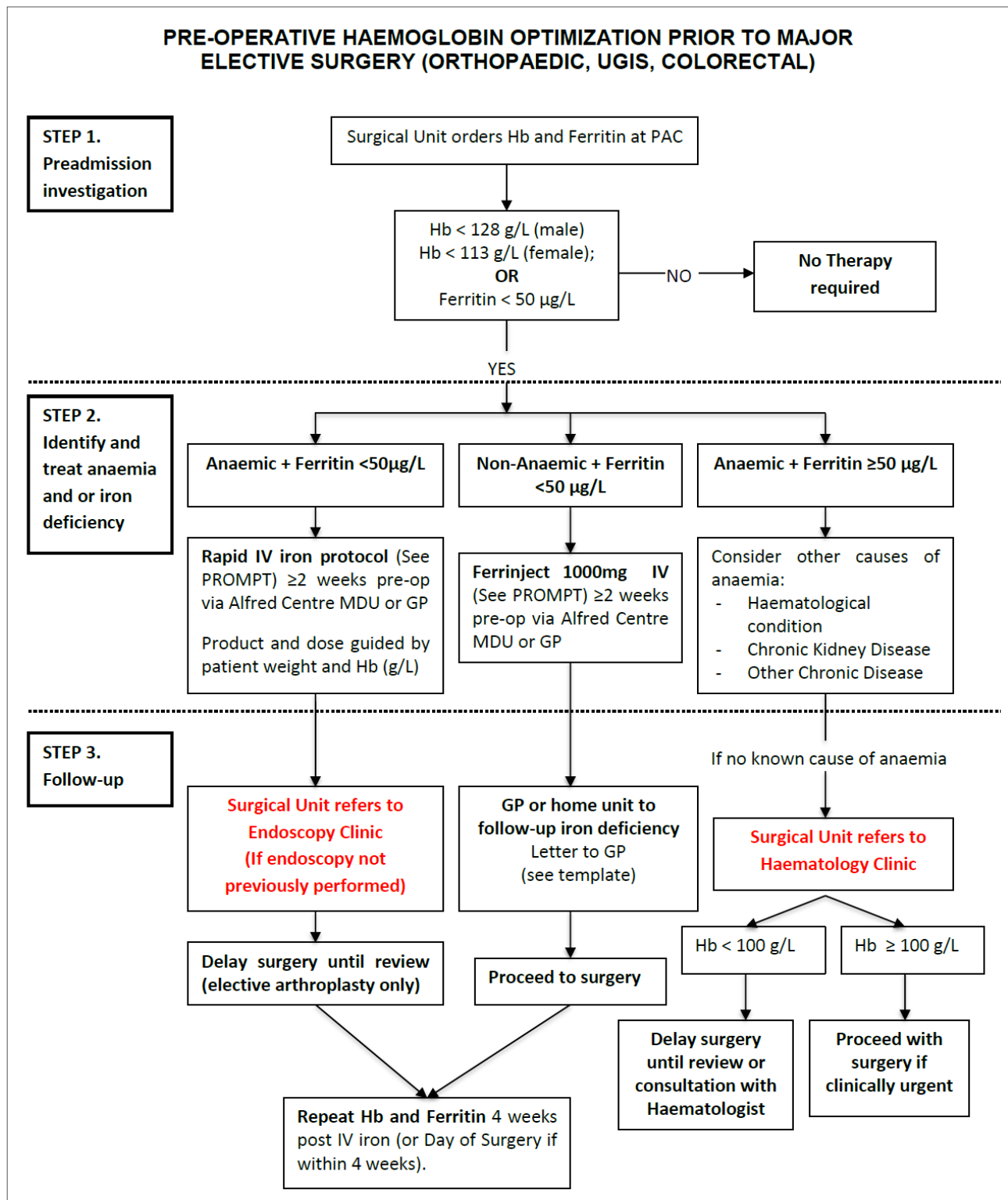




# The Alfred Hospital, VIC

## Shared resource

Figure 46: Flow chart for clinicians



# Lyell McEwin Hospital and Women's and Children's Health Network, SA

## Overview

The Northern Adelaide Local Health Network (NALHN) provide a range of specialist and outpatient Services across Lyell McEwin Hospital, Modbury Hospital and GP Plus for patients within the Northern Adelaide and greater Adelaide regions as well as country and interstate patients.

The Women's and Children's Health Network (WCHN) is South Australia's leading provider of health services for children, young people and women.

Lyell McEwin Hospital and WCHN worked together in the NPBMC. Lyell McEwin Hospital collected data for the three specialties and WCHN collected gynaecological data. The collection of data by Lyell McEwin was expanded to other sites in the NALHN in 2016.

The health service Collaborative team also partnered with GPs in the Northern Adelaide Health Network.



Figure 47: Map of the NALHN



Figure 48: Lyell McEwin Hospital



Figure 49: Women and Children's Health Network





# Lyell McEwin Hospital and Women's and Children's Health Network, SA

## Achievements

### LYELL McEWIN HOSPITAL

- Development of 'one stop' sources for PBM information and resources including a PBM Care Plan and Pre-Operative Iron Deficiency Guidelines
- Developed a patient letter with diary and consumer information
- General practice resources including a letter for GPs, a generic PBM email to assist GPs with access support and advice; a PBM page on the SA Health NALN referral site for GPs; and the introduction of IV Iron infusion service for GPs to access in the community
- IV iron infusion referrals for Lyell McEwin Hospital day surgery and Modbury GP Plus Super Clinic
- Promotion of preoperative PBM via medical, nursing and GP education sessions within the NLHN.

### WOMEN'S AND CHILDREN'S HEALTH NETWORK (WCHN)

- Early focus on referral to gynaecology service with the development of a GP letter with identification template.
- Implemented key points for testing on waitlisting for surgery and at preoperative clinic appointment.
- Improved identification and management of iron deficiency in patient population.
- Improved documentation in medical record regarding investigation and management of these women.

**Figure 50:** The South Australian NPBM team: Dr David Papendorf, Clinician and Karen Olson, Project Officer from Lyell McEwin Hospital; Jodie Grech, Project Officer WCHN; and A/Professor Bernd Froessler, Anaesthetist, and NPBM Lead Clinician from Lyell McEwin Hospital.



# Lyell McEwin Hospital and Women's and Children's Health Network, SA

## Shared resource

Figure 51: PBM Care Plan Medical Record

**NORTHERN ADELAIDE LOCAL HEALTH NETWORK**

☐ MH ☐ LMH

**PATIENT BLOOD MANAGEMENT CARE PLAN**

Government of South Australia  
SA Health

**MR830.1**

Surname: \_\_\_\_\_ U.R. No: \_\_\_\_\_

Given: \_\_\_\_\_ D.O.B.: \_\_\_\_\_

Sex: \_\_\_\_\_

DO NOT HAND WRITE THESE DETAILS EXCEPT WHEN ADHESIVE BARCODE LABELS ARE UNAVAILABLE.

<b>Surgical Team:</b> Gynaecology / Orthopaedics / Gastrointestinal / Other (circle)						
<b>Diagnosis/Planned procedure:</b>						
<b>Expected time to surgery:</b> < 1 week / < 1 month / 1-3 months / 3-6 months / 6-12 months / > 12 months (circle)						
<input type="checkbox"/> <b>Letter to GP requesting iron deficiency anaemia screen and management</b>			<input type="checkbox"/> Yes <input type="checkbox"/> No		Date: _____	
<input type="checkbox"/> <b>Hx of iron deficiency:</b>		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		<b>Date(s) of Dx:</b>		<b>Past Tx:</b> Oral iron / IM iron / IV iron (circle)
<p>➤ See preoperative Hb assessment and Optimisation template on next page for more information (NBA PBM Guidelines: Module 2)</p> <p>➤ For IV Iron Infusions, contact 2F ext. 21352 for booking.</p> <p>➤ See IV iron prescribing checklist for indications, contraindications and precautions.</p>						
<b>Iron therapy consumer information (circle preferred language)</b>						
English / Arabic / Greek / Italian / Polish / Turkish / Vietnamese / Croatian / Persian / Simplified Chinese						
FBE and Iron Studies review	Treatment Plan			Referrals		
	Iron therapy not required/	Oral Iron therapy	IV Iron therapy	GP referral to manage IDA/ID	For IV Iron Infusion	Other referrals / Investigations required
<b>No anaemia or iron deficiency (ID)</b> • Hb ≥130 g/L (male) or Hb ≥120 g/L (female) • Ferritin ≥100 mcg/L						
<input type="checkbox"/> <b>No anaemia, ferritin &lt;100mcg/L</b> • Hb ≥130 g/L (male) or Hb ≥120 g/L (female) • Ferritin <100 mcg/L						
<input type="checkbox"/> <b>Iron deficiency anaemia (IDA)</b> • Hb <130 g/L (male) or Hb <120 g/L (female) • Ferritin <30 mcg/L						
<input type="checkbox"/> <b>Possible iron deficiency anaemia (IDA)</b> • Hb <130 g/L (male) or Hb <120 g/L (female) • Ferritin 30-100 mcg/L • CRP raised • TSAT < 20%						
<input type="checkbox"/> <b>Possible anaemia of chronic disease or inflammation or other cause</b> • Hb <130 g/L (male) or Hb <120 g/L (female) • Ferritin 30-100 mcg/L or Ferritin >100 mcg/L • CRP normal • TSAT < 20%						
Comments:						
Date: _____	Name: _____		Signature _____		Pager/speed dial _____	

JULY 2016

PATIENT BLOOD MANAGEMENT CARE PLAN – MR830.1

# Lyell McEwin Hospital and Women and Children's Health Network, SA

## Shared resource

Figure 52: Preoperative PBM Care Plan

PREOPERATIVE PATIENT BLOOD MANAGEMENT CARE PLAN						
<b>Surgical Team:</b> Gynaecology / Orthopaedics / Gastrointestinal / Other (circle) <b>Diagnosis/Planned procedure:</b> <b>Expected time to surgery:</b> < 1 week / < 1 month / 1-3 months / 3-6 months / 6-12 months / > 12 months (circle) <input type="checkbox"/> <b>Letter to GP requesting iron deficiency anaemia screen and management</b> Yes / No <b>Date:</b> <input type="checkbox"/> <b>Hx of iron deficiency:</b> Yes / No / unknown (circle) <b>Date(s) of Dx:</b> <b>Past Tx:</b> Oral iron / IM iron / IV iron See preoperative Hb assessment and Optimisation template on next page for more information (NBA PBM Guidelines: Module 2) For IV Iron Infusions, contact 2F ext. 21352 for booking. See IV iron prescribing checklist for indications, contraindications and precautions. <b>Iron therapy consumer information</b> (circle preferred language) English / Arabic / Greek / Italian / Polish / Turkish / Vietnamese / Croatian / Persian / Simplified Chinese						Patient details
FBE and Iron Studies review	Treatment history and/or treatment plan			Referrals		Other referrals / Investigations required
	Iron therapy not required/recommended	Oral Iron therapy	IV Iron therapy	GP referral to manage IDA/ID	For IV Iron Infusion	
<input type="checkbox"/> <b>No anaemia or iron deficiency (ID)</b> • Hb ≥130 g/L (male) or Hb ≥120 g/L (female) • Ferritin ≥100 mcg/L						
<input type="checkbox"/> <b>No anaemia, ferritin &lt;100mcg/L</b> • Hb ≥130 g/L (male) or Hb ≥120 g/L (female) • Ferritin <100 mcg/L						
<input type="checkbox"/> <b>Iron deficiency anaemia (IDA)</b> • Hb <130 g/L (male) or Hb <120 g/L (female) • Ferritin <30 mcg/L						
<input type="checkbox"/> <b>Possible iron deficiency anaemia (IDA)</b> • Hb <130 g/L (male) or Hb <120 g/L (female) • Ferritin 30-100 mcg/L • CRP raised						
<input type="checkbox"/> <b>Possible anaemia of chronic disease or inflammation or other cause</b> • Hb <130 g/L (male) or Hb <130 g/L (female) • Ferritin 30-100 mcg/L or Ferritin >100 mcg/L • CRP normal						
<input type="checkbox"/> <b>Comments:</b>	N/A	N/A	N/A			
<b>Date:</b>				<b>Name:</b>		<b>Signature</b>
				<b>Pager/speed dial</b>		

# Joondalup Health Campus, WA

## Overview

Joondalup Health Campus, part of Ramsay Health Care provides service to both public and private patients under a long-standing public-private partnership agreement with the WA Health. The Campus provides specialist services and comprises a standalone private hospital and a co-located hospital that provides public patient services.

Joondalup health campus is the major hospital for Perth's northern corridor, one of the fastest growing regions of Australia. Joondalup is the Noongar Aboriginal word for the lake that is close to the hospital.

The main objective for the Joondalup team was to adopt an effective mechanism for elective patient referral in preoperative IDA identification and treatment to ensure patients have optimal iron stores and thus reduce the likelihood of prescribing blood transfusions. This will optimise patient care, surgical outcomes and further success of PBM initiatives within a private organisation.

Joondalup Health Campus collected data for all three of the surgical specialties.

**Figure 53: Joondalup Health Campus**



**Figure 54: Joondalup Private Hospital**



**Figure 55** Joondalup Health Campus NPBM Project Coordinator Ruth Webster (left) with Professor James Isbister who assisted the Commission with clinical advice and Angie Monk, NPBM Project Coordinator at a Learning Workshop in September 2015.



# Joondalup Health Campus, WA

## Achievements

- Development of resources for the anaemia clinic included:
  - Iron infusion prescribing chart which includes consent
  - Preoperative anaemia pathway
  - Iron infusion patient leaflet with consumer input outlining the procedure and necessary precautions.
  - Letters drafted and fact sheets designed for provision to patient and GPs outlining requirements for pre-operative anaemia assessment
- PBM will be an identified cost centre from July 2017 with ongoing funding
- A gynaecologist will be a member of the Blood Transfusion Committee going forward.
- There was an overall downward trend in length of stay across all specialties and reduced transfusions from 26 in July 2015 to 12 In July 2016
- Improved communication and awareness within the hospital, and to the wider community of iron deficiency and anaemia.

Figure 56: Improved management of iron deficient patients

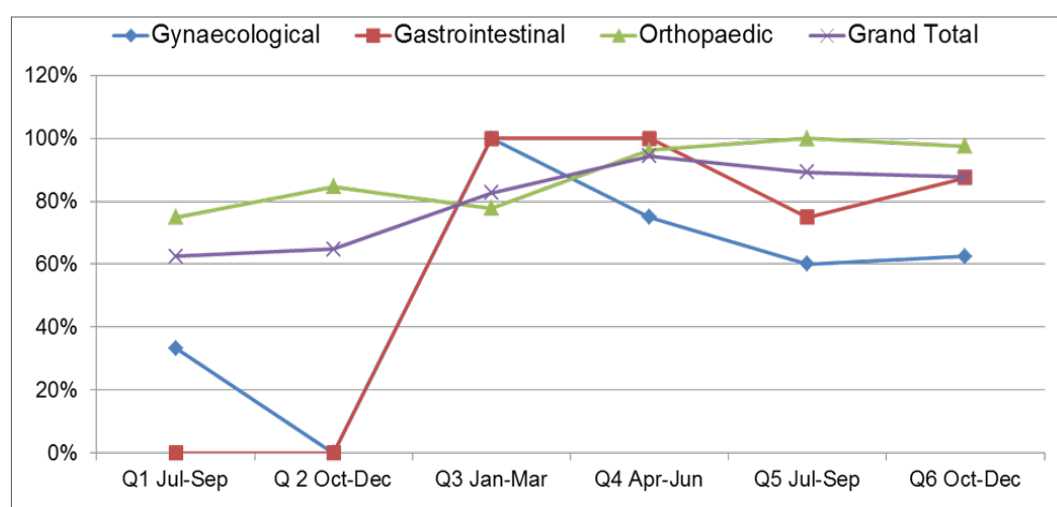


Figure 57: Joondalup Health Campus Project Coordinators, Angie Monk (left) and Ruth Webster (right) at the NPBMC Showcase in June 2017.



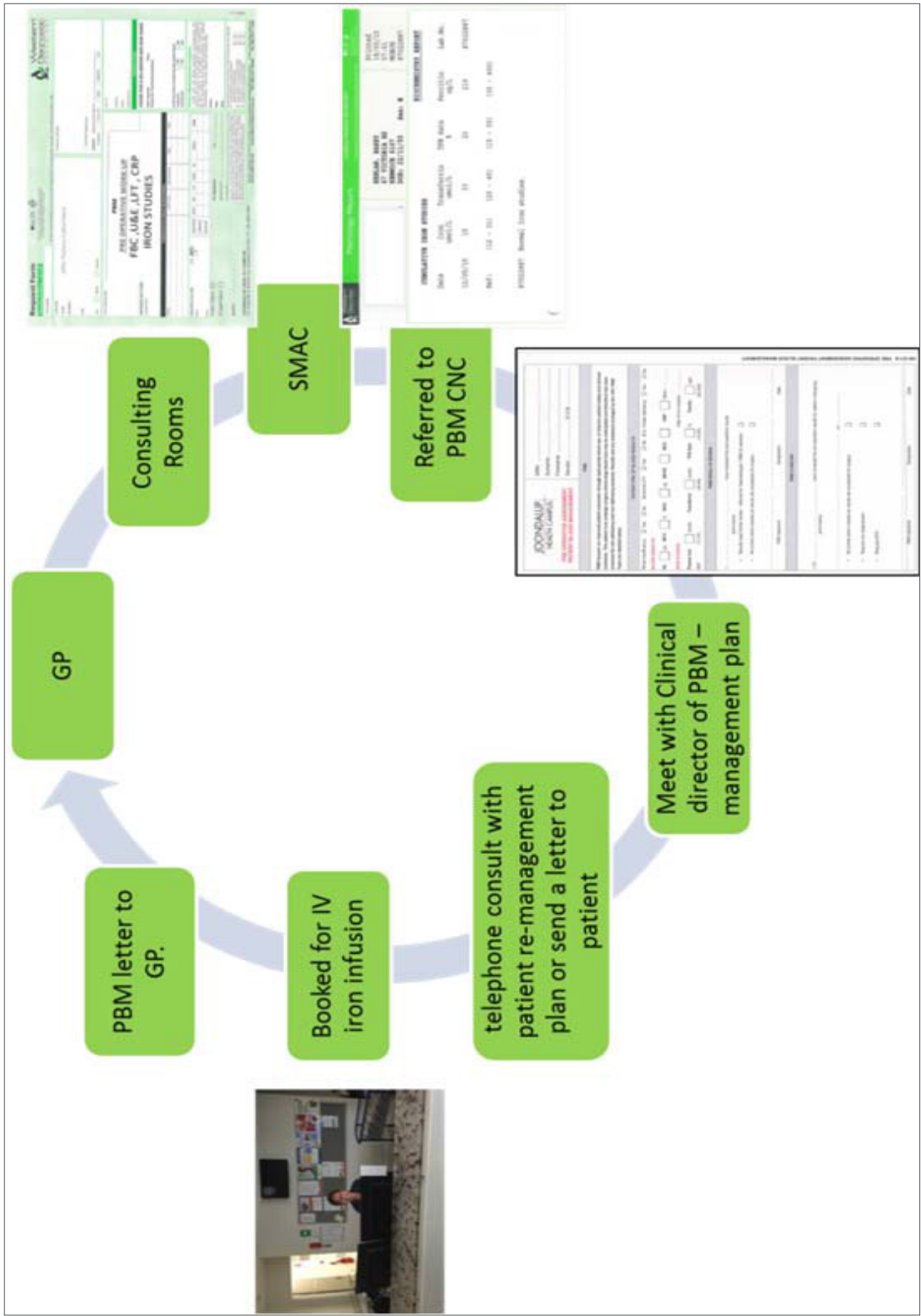
Angie Monk was awarded HESTAs Nurse of the Year in 2016 recognising the leading role she played in advocating for improved practices and her instrumental role in delivering extensive education and training to colleagues and other health professionals



# Joondalup Health Campus, WA

## Shared resource

Figure 58: PBM flow chart for clinicians



# Joondalup Health Campus, WA

## Shared resource

Figure 59: Preoperative assessment PBM form including iron studies

<b>JOONDALUP</b> <b>HEALTH CAMPUS</b> <b>PRE OPERATIVE ASSESSMENT</b> <b>PATIENT BLOOD MANAGEMENT</b>	MRN: ..... Surname: ..... Forename: ..... Gender: ..... D.O.B. ....
<b>PBM</b>	
PBM focuses on improved patient outcomes, through appropriate blood use, to improve patient safety and clinical outcomes. This patient is to undergo surgery where large blood loss may be anticipated and therefore has been screened for iron deficiency and iron deficiency anaemia. Results and any treatment arranged by the JHC PBM Team are detailed below.	
<b>PATIENT PRE OP BLOOD RESULTS</b>	
Renal Insufficiency <input type="checkbox"/> Yes <input type="checkbox"/> No    Abnormal LFT <input type="checkbox"/> Yes <input type="checkbox"/> No    B12 / Folate deficiency <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>BLOOD RESULTS:</b>	
Hb <input type="text"/> g/L    MCV <input type="text"/> fL    MCH <input type="text"/> pg    MCHC <input type="text"/> WCC <input type="text"/> CRP <input type="text"/> Other: .....	
<b>IRON STUDIES:</b>	
Plasma iron <input type="text"/> umol/L    Transferrin <input type="text"/> umol/L    TFN Satn <input type="text"/> %    Ferritin <input type="text"/> ug/L <small>REF (11-27) (20-45) (15-55) (25-300)</small>	
<b>PBM RESULTS REVIEW</b>	
I, ..... have reviewed the pre-operative results: (print name)	
<ul style="list-style-type: none"> <li>• Results need further review – referred for Haematologist / PBM Dr attention <input type="checkbox"/></li> <li>• No further action needed as results are acceptable for surgery <input type="checkbox"/></li> </ul>	
.....	.....
PBM signature	Designation      Date
<b>PBM CLINICIAN</b>	
I, Dr ..... have reviewed the pre-operative results for patient undergoing (print name)	
..... on ..... / ..... / .....	
<ul style="list-style-type: none"> <li>• No further action needed as results are acceptable for surgery <input type="checkbox"/></li> <li>• Require Iron replacement <input type="checkbox"/></li> <li>• Requires EPO <input type="checkbox"/></li> </ul>	
.....	.....
PBM signature	Designation      Date

HR 411-0 PRE OPERATIVE ASSESSMENT PATIENT BLOOD MANAGEMENT

## Shared Resources

*“Steal shamelessly and share generously”*

Collaborative philosophy

This booklet contains examples of resources developed by the 12 health service teams participating in the NPBMC. These resources provide tools for health services across Australia to assist in establishing and advancing PBM programs and pre-operative anaemia and iron deficiency protocols.

*The efforts of the teams over the last two years are to be commended and I would sincerely like to thank those health services for their commitment to, and support of, the Collaborative.*

*I would like to thank each of the Project Coordinators for their commitment and successful implementation of patient blood management at their health service. Each will now be a shining example for other health services across the country”*

*Professor Villis Marshall AC, Australian Commission on Safety and Quality in Health Care Board Chair, Collaborative Showcase, June 2017*

Figure 60: NPBMC Project Coordinators at the NPBMC Showcase, June 2017: From left: Karen Olson, Lyell McEwin Hospital; Maria Burgess, Canberra Hospital and Health Services; Ruth Webster, Joondalup Health Campus; Betty Dumayas, Northern Hospital; Keiko Bowles, Cairns and Hinterland Hospital and Health Service; Christine Akers, The Alfred Hospital; Beverly Hiles, Lismore Base Hospital; Angie Monk, Joondalup Health Campus; Gregory Thomson, Central Coast Local Health District; Garth Brown, St Vincent's Lismore; Paul Morgan, Mater Hospital; Jodie Grech, Women and Children's Health Network; Edel Murray, St Vincent's Private Hospital; and Julie Domanski, Royal Darwin Hospital.



*“The participant teams achieved something quite unique”*

*Professor James Isbister, Consultant in Haematology and Transfusion Medicine*

## Acknowledgements

The Commission would like to acknowledge:

- The Australian Government Department of Health for funding to support the NPBMC
- Improvement Foundation for their expertise in the Collaborative methodology, and for establishing the qiConnect web portal
- Dr Kelly Shaw for her clinical leadership and expertise in facilitating the learning workshops and promoting the work of the health service Collaborative teams through site visits and ongoing support
- Members of the Commission's PBM Project Reference Group for their expertise and assistance in guiding the NPBMC, and Associate Professor Lilon Bandler for her leadership as Chair of the Project Reference Group
- The commitment and dedication of the 12 health service teams whose participation resulted in the NPBMC being a great success
- The National Blood Authority and the states and territories which supported the scoping of this Collaborative from the earliest stages.

**For more information on work of the NPBMC**

**[www.safetyandquality.gov.au/national-priorities/pbm-collaborative](http://www.safetyandquality.gov.au/national-priorities/pbm-collaborative)**

**AUSTRALIAN COMMISSION**  
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