



Australian Red Cross  
**Lifeblood**



2020 Edition

# Toolkit for Maternity Blood Management

A guide to improving identification and management of iron deficiency and anaemia





**2020 edition**

Toolkit for Maternity Blood Management

# Contents

Introduction	<b>2</b>
Why is this toolkit important?	<b>4</b>
A guide to using the toolkit	<b>6</b>
Step 1: Establish baseline data	<b>8</b>
Step 2: Form an improvement working group	<b>9</b>
Step 3: Seek support to proceed with a pilot	<b>10</b>
Step 4: Pre-pilot implementation	<b>12</b>
Step 5: Pilot period	<b>17</b>
Step 6: Embed changes	<b>18</b>
References	<b>19</b>



# Introduction

This toolkit provides proven strategies and tools to improve the detection and management of iron deficiency and anaemia in pregnant women, with the ultimate goal of improving maternal and infant outcomes.

These resources and strategies have been successful in improving maternity blood management when implemented using clinical practice improvement (CPI) methodology. The resources are also designed to be adaptable to other improvement frameworks.





## Partnering health services

We developed this toolkit and the accompanying resources in partnership with three health services:



CANBERRA HOSPITAL  
AND HEALTH SERVICES



Government  
of South Australia  
SA Health



Women's  
& Children's  
Hospital



Queensland  
Government

Darling Downs  
Hospital and Health Service

# Why is this toolkit important?

Iron deficiency (ID) is the most common cause of anaemia worldwide, and even in developed countries where dietary iron is readily available, it remains a significant cause of morbidity.<sup>1</sup>

## Iron deficiency in pregnancy

Increased iron demands in pregnancy often lead to iron deficiency (ferritin  $\leq 30$   $\mu\text{g/L}$ ) and iron deficiency anaemia (IDA). This can impact both the mother with increased risks, including antenatal depression and postpartum haemorrhage; and the baby, including increased risk of low birth weight and preterm birth.<sup>2,3,4,5</sup>

## Lack of routine ferritin screening in pregnancy is a missed opportunity

Routine antenatal ferritin screening is not currently recommended in clinical guidelines<sup>6,7,8</sup> and the opportunity to identify and correct ID before anaemia develops is missed. CPI projects to date have identified high rates of iron deficiency in pregnancy (60–70%)<sup>9</sup>, and that first trimester iron deficiency correlated with lower haemoglobin at delivery.<sup>10</sup> Appropriate and timely oral iron therapy reduces the likelihood of developing IDA and its subsequent impacts.

## Using this toolkit has improved outcomes for women

Published results using the resources have shown a decreased rate of anaemia at delivery from 12.2% prior to implementation to 3.6% at the end of the project.<sup>9</sup>

Ferritin screening increased five-fold and of those women screened, 60–70% were iron deficient.<sup>9</sup> There was a reduction in transfused red cell units from an average of 26 down to 17 per month in one maternity unit.<sup>9</sup>

One health service conducted a snapshot audit in the pilot phase that identified 87% of women were iron deficient but did not have anaemia. Previously, these women were likely to have gone undetected.

**“Screening with ferritin in the first trimester is especially important as low ferritins in first trimester correlate with anaemia at delivery.”**

Dr Philip Crispin, Haematologist

## The impacts of iron deficiency



Odds of developing antenatal depression were **2.5 times higher** in iron deficient women



**Low birthweight babies are less likely** when iron supplements are taken during pregnancy



Increased risk of **postpartum haemorrhage** in iron deficient women

## Improved outcomes using this toolkit



The pilot identified that **60-70% of women** screened were **iron deficient** which would previously have been missed



**Anaemia at delivery was reduced by 70%** (from 12.2% to 3.6%)



The number of units transfused was **reduced by 34%** (from 26 units to 17 units)



# A guide to using the toolkit

This process has been tried and tested in several Australian health services, resulting in improved outcomes for pregnant women. However, each health service is different, so tailor the process to your workplace.

---





1.

**Establish baseline data**  
If there is a problem worth solving, continue to *Step 2*.



2.

**Form an improvement working group**



3.

**Seek support to proceed with a pilot**



6.

**Embed changes**



5.

**Pilot period**  
Collect feedback and evaluate



4.

**Pre-pilot implementation**  
Review tools for local suitability  
Plan the pilot and communication





## Step 1

# Establish baseline data

How well does your organisation manage ID and IDA?  
Identify the presence and possible extent of the problem.

### Find and collect data

Establish your health service rates of:

- anaemia at delivery and transfusion rate compared to women without anaemia
- anaemia at delivery benchmarked against a comparable health service (e.g. 12.3% for one health service), and
- ferritin testing or screening practices.

This data may be collected by your health service via existing reports, use of snapshot audits, and data linkage between case notes and laboratory results.

**There is a temptation to invest a lot of effort into getting 'complete' data. Some data is vital, but it need not be exhaustive, so think small.**

**For example, you may ask, "How many women in the antenatal booking clinic today had ferritin available or requested?" Or, "Of the women this week with low ferritins, how many were prescribed iron and in what form?"**

Dr Philip Crispin, Haematologist

## Need help auditing?

We've got a free online maternity blood management audit, an example of a retrospective snapshot audit and an audit results template. Find them at [transfusion.com.au/maternity](https://transfusion.com.au/maternity)





## Step 2

# Form an improvement working group

Antenatal care can be complex and involve different teams and specialties. When forming an improvement working group, consider your own unique structures to ensure the team adequately represents the areas that may be affected by the change.

### Working group representation

A health service may have numerous entry points for women into their maternity units, e.g. antenatal clinic, GP shared-care clinic, specialist obstetric etc. It would be difficult to attempt to include representation from all of these streams, so ensure the working group has adequate process knowledge or contacts across the different areas.

The working group needs to have the expertise and local knowledge to review and customise the toolkit resources to meet local need.

Consider representation from:

#### Midwifery

A midwife who represents and has knowledge of the different clinics and maternity streams within your health service.

#### Obstetrics

An obstetrician who is involved in the antenatal care within your health service and an advocate for ferritin screening.

#### Haematology

A haematologist to provide expertise in diagnosis and treatment of anaemia, including ID and thalassaemia, and may also provide a useful link to the hospital pathology service to facilitate access to haemoglobin and ferritin data.

#### Safety and quality

A representative who is familiar with your health service improvement framework e.g. transfusion clinical nurse consultant, patient blood management coordinator or safety and quality officer.

If the working group does not include a quality representative, ensure they are aware of the pilot as it will contribute towards meeting National Safety and Quality Health Service (NSQHS) Blood Management Standard requirements.

Blood Management Standard, 2<sup>nd</sup> Edition, has been refined to “focus on effectively optimising and conserving a patient’s own blood, reducing risk of exposure to blood products and associated adverse events.”<sup>11</sup>

**Don't forget to include and involve your Blood Management Committee in the change process.**

Jodie Grech, BloodSafe  
Transfusion Nurse Consultant





### Step 3

## Seek support to proceed with a pilot

Endorsement from the health service executive is essential to ensure the improvement working group has the authority and resources to implement practice changes.

#### Present key data findings

Present the baseline data to health service executive and key stakeholders. Include key data findings that identify the problem such as:

- Rate of obstetric transfusion
- Rate of anaemia at delivery
- Number of women identified as iron deficient

For more impact, compare your statistics with data from other health services of similar size or state-based averages.

#### Explain the importance

Consider who you are speaking to and explain why and how you want to improve on the baseline findings.

For example, you could cover:

- What ID and IDA is
- Risk factors for ID and IDA
- Explain that ID and IDA often results in poorer outcomes for both mother and baby
- How identification and management of ID and IDA can be improved

#### Outline the aim of the pilot

Be clear about what practice change you want to pilot. Try setting a SMART aim statement i.e. Specific, Measurable, Aspirational, Realistic, Time-based.

For example, one health service's aim statement was 'To optimise antenatal haemoglobin levels and iron stores in 80% of women who have their first visit at  $\leq 20$  weeks and to increase the use of iron therapy in 80% of women diagnosed with ID booked between 1 September and 31 December 2017.'

**Comparing our baseline data to nationwide data engaged our key stakeholders in the purpose of the pilot.**

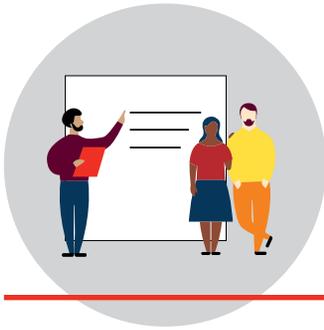
Jodie Grech, BloodSafe Transfusion Nurse Consultant

### Need help presenting?

We've provided a customisable PowerPoint presentation found at [transfusion.com.au/maternity](https://transfusion.com.au/maternity)







## Step 4

# Pre-pilot implementation

Plan how you will implement the pilot. Review and utilise the resources available, map out any new processes and communicate the upcoming changes to staff.

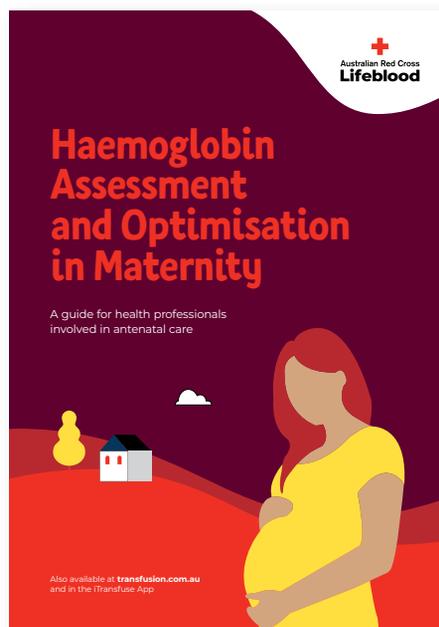
### Review the tools for suitability

Providing staff with the tools they need to implement change will ensure a more effective pilot.

As part of the toolkit, we've provided tools for this purpose, but you will need to review them with your working group to ensure they align with your local health service policy.

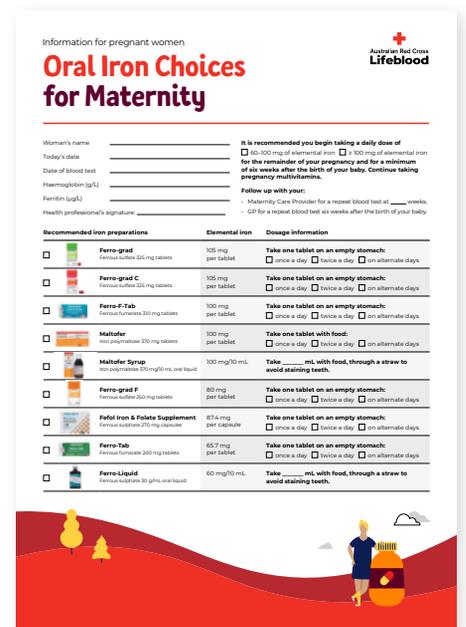
### Make the tools available

Once you've reviewed the tools, consider the various and sometimes numerous entry points a pregnant woman may have into your health service, and ensure all clinics and services are aware of new processes and have adequate copies of both the flowcharts and patient handouts, and any associated feedback forms.



### Haemoglobin Assessment and Optimisation in Maternity

These practical flowcharts can be used throughout pregnancy and postpartum to assist health professionals in identifying and managing iron deficiency and anaemia effectively.



### Oral Iron Choices for Maternity

Where oral iron is required, this resource enables health professionals to educate pregnant women on the different oral iron preparations available, so that they receive effective treatment for ID and IDA. This resource should be combined with a discussion about what ID and IDA is, and how it can affect her and her baby.



## Consider local processes

### Educate all patients

Providing women with the handout at their first presentation will ensure they have the information they need if their results indicate treatment is required.

Explaining the impact of iron deficiency and anaemia and the importance of appropriate therapy will assist with compliance.

### Test results

The working group needs to define the process of how blood results will be actioned and communicated to the women in a timely manner to allow optimal time for iron replacement.

### Intravenous iron

Check if your health service has a policy and procedure for prescription and administration of intravenous (IV) iron. If you don't have a policy or procedure available, examples can be found at [transfusion.com.au/maternity](https://transfusion.com.au/maternity)

**Some women will experience side effects from oral supplementation. What was encouraging to see however, was having the women involved in the decision-making process empowered them through the provision of information, and the vast majority persisted in taking the supplement because they understood the benefits and importance of doing so.**

Dr Farah Sethna, Obstetrics and Maternal/Fetal Medicine Specialist

## Step 4

# Pre-pilot implementation

### Raise awareness about the pilot and educate staff

When planning the pilot commencement date, allow your organisation time to ensure staff are engaged and understand their role in the processes. Consider who in your organisation needs to be included in the pre-implementation education and how this will be resourced.

Prior to the pilot, ensure all relevant staff are informed of the following:

- What the pilot is - think about your SMART aim statement
- When the pilot period is
- Who the pilot will affect, and what they need to do
- Why the pilot is happening - include details and key data findings
- Education about the diagnosis, assessment and management of ID and IDA may also be required.

**It's important to promote and provide education to all clinicians on the impact of iron deficiency on women and babies, and how to convey this to the women in a consistent manner.**

Jodie Grech, BloodSafe  
Transfusion Nurse  
Consultant

## Need help communicating to staff?

Here is what the partnering health services did to achieve successful uptake during their pilot periods.

### GP shared-care clinics

- The GP Liaison Officer was instrumental in engaging and working in partnership with the local GPs.
- GPs were individually contacted and provided with the *Haemoglobin Assessment and Optimisation in Maternity* flowcharts and a contact person for more information. "Fostering a good relationship with the GPs was key."
- The *Haemoglobin Assessment and Optimisation in Maternity* flowcharts were uploaded onto the local Primary Health Network website and hard copies provided.
- Communication flyers were provided to clinics in advance, with key information about the pilot.

### Health service clinics

- All computers in maternity contained a short 5-minute presentation outlining the whys and hows of the project to reinforce messaging and increase awareness.
- Presentations were given on the upcoming pilot at midwifery and obstetric forums.
- Hard copies of the *Haemoglobin Assessment and Optimisation in Maternity* flowcharts were printed/laminated for all clinics, as well as having electronic versions.





### **Need help auditing?**

We've got a free online maternity blood management audit, an example of a retrospective snapshot audit and an audit results template. Find them at [transfusion.com.au/maternity](https://transfusion.com.au/maternity)



## Step 5

# Pilot period

The resource *Haemoglobin Assessment and Optimisation in Maternity* gives staff a guide as to what they need to do at each stage. Ensure this resource and the patient handout *Oral Iron Choices for Maternity* are readily accessible at the point of care.

### Feedback on process and tools

Seek staff feedback during the pilot period using the Staff Feedback Survey template or similar. This will allow for further customisation of resources to meet local needs if required and further strengthen staff engagement in the change process.

Central to the project is the woman; consider conducting snapshot phone call audits to assess her access to, and usefulness of, the printed handout *Oral Iron Choices for Maternity* to identify if this resource could be altered to better meet local needs.

Allocate responsibility for collating feedback from staff and women.

The improvement team should meet regularly to monitor uptake of change, assess need for further education, check on data collection and review formal and informal feedback. Watch for planned or unplanned staff changes; respond with additional education sessions (formal or informal) for new staff.

Sharing data empowers and energises staff so ensure you inform staff of the results. Consider the best way to provide feedback e.g. presentations, newsletter.

### Evaluate changes

Ideally, similar sample sizes and data collection methods would be used to compare baseline and post-pilot findings to evaluate changes. Evaluation of antenatal interventions measured via retrospective post-delivery audit, will need to be scheduled to ensure women in the first trimester at the commencement have reached full-term.



**Midwives and doctors who used the flowcharts during clinical encounters found them a useful clinical aid that enabled them to know what to do at a glance. They also reported needing to reference the flowcharts less often with the passage of time.**

Dr Farah Sethna,  
Obstetrics and Maternal/  
Fetal Medicine Specialist



## Step 6

# Embed changes

Sustainability of practice improvements should be considered.

Determine methods to incorporate new processes into existing procedures and policies and include pathway training into new staff orientation programs.

**Midwives are passionate about improving outcomes for pregnant women - let them know the results so they know they are making a difference.**

Susan Kay, CNC Transfusion

**Start small. Trial new process in one or two settings, or one or two clinics. Seek feedback quickly and be willing to modify your plan before trying again.**

Dr Philip Crispin, Haematologist

# References

---

1. Pasricha SR, Drakesmith H. Iron Deficiency Anemia: Problems in Diagnosis and Prevention at the Population Level. *Hematology/Oncology Clinics of North America* 2016;30:309–25.
2. Dama M, Van Lieshout RJ, Mattina G, Steiner M. Iron Deficiency and Risk of Maternal Depression in Pregnancy: An Observational Study. *J Obstet Gynaecol Can.* 2018;S1701-2163(17)30570-4. doi: 10.1016/j.jogc.2017.09.027. [Epub ahead of print]
3. Kavle JA, Stoltzfus RJ, Witter F, Tielsch JM, Khalfan SS, Caulfield LE. Association between Anaemia during Pregnancy and Blood Loss at and after Delivery among Women with Vaginal Births in Pemba Island, Zanzibar, Tanzania. *Journal of Health, Population, and Nutrition.* 2008;26(2):232-240.
4. Peña-Rosas JP, De-Regil LM, Garcia-Casal MN, Dowswell T. Daily oral iron supplementation during pregnancy. *Cochrane Database of Systematic Reviews* 2015, Issue 7. Art. No: CD004736. DOI: 10.1002/14651858.CD004736.pub5.
5. Haider BA, Olofin I, Wang M, et al. Anaemia, prenatal iron use, and risk of adverse pregnancy outcomes: systematic review and meta-analysis. *BMJ (Clinical Research Ed)* 2013;346:pf3443.
6. Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Routine antenatal assessment in the absence of pregnancy complications. Sydney: RANZCOG 2016.
7. Australian Health Ministers' Advisory Council. Clinical Practice Guidelines: Antenatal Care – Module II. Canberra: Australian Government Department of Health 2014.
8. National Blood Authority. Patient Blood Management Guidelines: Module 5 - Obstetrics and Maternity. Canberra: National Blood Authority 2015.
9. Flores CJ, Sethna F, Stephens B, Saxon B, Hong F, Roberts T, Spigiel T, Burgess M, Connors B Crispin P. Improving patient blood management in obstetrics: snapshots of a practice improvement partnership. *BMJ Open Quality* 2017;6:e000009. doi: 10.1136/bmjquality-2017-000009.
10. Crispin P, Sethna F, Stephens B. Screening for iron deficiency in pregnancy with serum ferritin: A patient blood management strategy. HAA Annual Scientific Meeting 2017, 1 November 2017.
11. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards. 2nd ed. Sydney: ACSQHC; 2017.







**Published in Australia by**  
Australian Red Cross Lifeblood

The information contained in this booklet was correct at time of publishing.  
Copyright © Australian Red Cross Lifeblood 2020

Last updated: **June 2020**

Australian governments fund Australian Red Cross Lifeblood to provide  
blood, blood products and services to the Australian community.