# Anaemia in Pregnancy

Disclaimer

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## Contents

## Red Flags

- Hb < 70 g/L

## Background – About Anaemia in Pregnancy

Anaemia in pregnancy is common and usually due to iron deficiency, affecting 10 to 25% of pregnant Australian women.

Iron deficiency in pregnancy is due to depleted iron stores and inadequate oral intake. Iron requirements in pregnancy are around 3 times higher than non-pregnant adult women.

Pregnant women with severe anaemia (Hb < 70 g/L) are at increased risk of cardiac failure, preterm birth, foetal growth restriction, postpartum blood transfusion, delayed recovery and wound healing.

There is a physiological haemodilution in pregnancy, resulting in different normal ranges of haemoglobin at different gestations.

## Assessment

Iron deficiency anaemia is a common complication of pregnancy.

1. Identify ***risk factors*** for iron deficiency anaemia in pregnancy.

   ***Risk factors***
   - *A history of anaemia or iron deficiency*
   - *Multiparity or recent pregnancy*
   - *Vegetarian or vegan*
   - *Adolescent, recent immigrant, low socioeconomic status, Aboriginal and Torres Strait Islander*
   - *Bariatric surgery*
   - *Inflammatory bowel disease (IBD)*

2. Consider other ***causes of anaemia*** non-related to pregnancy.

   ***Other causes of anaemia***
   - *Folate or B12 deficiency*
   - *Haemoglobinopathy*
   - *Anaemia from chronic disease*
   - *Haemolytic anaemia*
   - *Endocrine disorders*
   - *Blood loss*
   - *Bone marrow suppression*
   - *Infectious causes*
   - *Underlying malignancy*

3. Investigations:
   - ***At first antenatal visit***
     - FBE
     - Consider:
       - Ferritin if risk factors for iron deficiency anaemia or haemoglobinopathy.
       - Hb electrophoresis (if not performed previously) to ***screen for haemoglobinopathy (thalassemia).***

         ***Screen for haemoglobinopathy (thalassemia)***
         - *Haemoglobinopathies are the most common genetic defect worldwide.*
         - *Perform FBE, ferritin, haemoglobin electrophoresis – with DNA analysis to follow, if indicated.*
         - *If performed previously, testing does not need to be repeated.*
         - *Consider testing partner at the same time, particularly if they are from Southern Europe, Middle East, Africa, South-East Asia, Indian subcontinent, or Pacific Islands. Write partner details on each request slip to link at the laboratory.*

       - *active B12 (holotranscobalamin) if at risk of vitamin B12 deficiency (vegan, pernicious anaemia, gastrointestinal disease, or bariatric surgery). Note that total B12 levels fall in pregnancy, so it is important to measure active B12.*

   See also Antenatal Care - First Consult.

   - ***At 26 to 28 weeks***
     - *FBE*
     - *Ferritin, if anaemia or risk factors for iron deficiency*

   - ***At 32 to 36 weeks***

     *Note: Guidelines vary between services.*

     *Repeat Hb (or FBE) and consider ferritin if patient:*
     - *had depleted iron stores earlier in pregnancy.*
     - *had a 15 g/L fall in Hb between first antenatal result and 26 to 28 week Hb.*
     - ***risk factors for postpartum haemorrhage*** *or may refuse transfusion (e.g. Jehovah's Witness).*

       ***Risk factors for postpartum haemorrhage***
       - *Previous postpartum haemorrhage*
       - *Placenta previa or accreta*
       - *Multiple pregnancy*

   - Consider appropriate further investigations according to pathology results:
     - If possible ***haemoglobinopathy***, arrange DNA analysis, and partner screening.

       ***Screening for thalassemia***
       - *Haemoglobinopathies are the most common genetic defect worldwide.*
       - *Perform FBE, ferritin, haemoglobin electrophoresis – with DNA analysis to follow, if indicated.*
       - *If performed previously, testing does not need to be repeated.*
       - *Consider testing partner at the same time, particularly if they are from Southern Europe, Middle East, Africa, South-East Asia, Indian subcontinent, or Pacific Islands.*

*Write partner details on each request slip to link at the laboratory.*

- If increased mean corpuscular volume (MCV), check folate, and active B12.

4. Assess ***severity*** of any iron deficiency.

***Severity***
*There is some variation in local definitions of iron deficiency and iron deficiency anaemia.*

- *Ferritin:*
  - *Serum ferritin is the most useful measure of iron deficiency.*
  - *As it is an acute phase reactant, iron deficiency can be present despite an elevated ferritin in infection, inflammation, liver disease, and malignancy.*
  - *Ferritin < 15 micrograms/L indicates depleted iron stores.*
  - *In most guidelines, treatment for iron depletion is recommended when ferritin is < 30 micrograms/L.*

- *Haemoglobin concentration threshold for anaemia in pregnancy:*
  - *The WHO criteria for mean minimum normal haemoglobin concentration in healthy pregnant women is 110 mg/dL.*
  - *A threshold of Hb < 105 g/L in the second half of pregnancy is widely used throughout international guidelines and the Australian Pregnancy Guidelines. For the purposes of this guideline, these reference ranges have been used.*

# Management

## Iron deficiency anaemia

1. If Hb < 70 at any stage of pregnancy, arrange urgent obstetric or haematology review.

2. Treat according to ***severity*** and stage:

➢ **First trimester**
*First antenatal consult results:*

- ***Normal Hb with ferritin < 30 micrograms/L*** – depleted iron stores
  - *Recommend iron rich diet and commence oral iron supplementation.*
  - *Repeat Hb and ferritin at 26 to 28 weeks.*

- ***Hb 70 to 110 g/L with ferritin < 30 micrograms/L*** – iron deficiency anaemia
  - *Recommend iron rich diet and commence oral elemental iron.*
  - *Follow up FBE and ferritin at 4 weeks.*
    - *If Hb increases, continue iron supplementation through pregnancy and until at least 6 weeks postpartum.*
    - *If Hb does not increase, arrange urgent obstetric referral.*
  - *Repeat FBE and ferritin at 26 to 28 weeks, noting iron supplementation.*

- ***Hb < 70 g/L*** – severe anaemia
  *Arrange urgent obstetric or haematology review.*

- **Second trimester**

  *26 to 28 week results:*

  - ***Hb >105 g/L with ferritin > 30 micrograms/L***
    - *If iron stores depleted at first antenatal check, continue oral iron until at least 6 weeks postpartum.*
    - *Consider repeating FBE and ferritin at 36 weeks if:*
      - *≥ 15 g/L decrease in Hb from first antenatal check.*
      - ***risk factors for postpartum haemorrhage (PPH).***
      - *expected to decline a transfusion.*

  - ***Hb > 105 g/L with ferritin < 30 micrograms/L*** – depleted iron stores
    - *Commence oral iron supplementation per day.*
    - *Review adherence and side-effects at all antenatal reviews.*
    - *Repeat Hb (or FBE) and consider ferritin at 36 weeks.*

  - ***Hb 70 to 105 g/L with ferritin < 30 micrograms/L*** – iron deficiency anaemia
    - *Commence oral iron supplementation.*
    - *Review adherence and side-effects at all antenatal reviews.*
    - *Follow up Hb (or FBE) and consider ferritin at 4 weeks.*
    - *If Hb increases, continue iron supplementation through pregnancy and until at least 6 weeks postpartum.*
    - *If Hb does not increase, arrange* urgent obstetric review *to discuss intravenous iron.*

  - ***Hb < 70 g/L*** – severe anaemia

    Arrange urgent obstetric or haematology review.

- **Third trimester**

  *32 to 36 week results:*

  - ***Hb > 105 g/L***
    - Continue oral iron until at least 6 weeks postpartum.
    - Repeat FBE and iron studies prior to 6 week postpartum check.

  - ***Hb 70 to 105 g/L***
    - Recommend high dose (200 mg) oral iron daily.
    - Arrange urgent obstetric review to discuss intravenous iron or need for blood transfusion.

  - ***Hb < 70 g/L***

    Arrange urgent obstetric or haematology review.

- **Postpartum**
  - *Recheck FBE, iron studies, and if relevant, folate and B12.*
  - *Manage as per anaemia in adults.*
  - *If Hb < 110 g/L postpartum and IV iron infusion not received, recommend oral iron supplementation for at least 3 months.*

## Treatment options

- ***Dietary advice***
  - *Dietary changes alone are insufficient to manage iron deficiency in pregnancy.*
  - *Iron rich foods include meats (best is red meat), wholegrain and iron fortified breads and cereals, green leafy vegetables, legumes, nuts and dried fruit.*
  - *Vitamin C aids iron absorption.*
  - *Absorption is inhibited by calcium tablets, calcium-based antacids, unprocessed bran, milk, tea, coffee.*

- ***Oral iron preparations***
  - *Oral supplementation is first-line treatment in early pregnancy for anaemia due to iron deficiency.*
  - *The usual dose is 100 to 200 mg elemental iron per day. Recommend preparations with higher elemental iron content.*
  - *Hb level typically increases by 20 g/L every 3 to 4 weeks.*
  - *There is some evidence that iron supplements taken less frequently are effective and better tolerated, consider second daily dosing in mild deficiency.*
  - *Do not use multivitamins to treat iron deficiency.*
  - *Consider change of preparation if gastrointestinal upset.*
  - *Commonly reported side-effects of iron tablets include constipation, black stools, abdominal discomfort, nausea, and vomiting. Intermittent dosing (1 tablet every 2 to 3 days) or lower doses may reduce side-effects.*

  See National Blood Authority – Oral Iron Preparations for Treatment of Iron Deficiency Anaemiea (IDA) in Australia.

- ***Intravenous iron (IV iron infusion)***
  - *Usually not recommended in first trimester.*
  - *Is a second-line treatment reserved for patients with iron deficiency anaemia who:*
    - *are unable to tolerate oral iron.*
    - *have a poor response to oral iron.*
    - *present with iron deficiency anaemia in late gestation (> 36 weeks).*

  - *If considering intravenous iron in general practice setting, discuss with* obstetrician *prior to administration. It is generally not recommended in primary care in pregnancy due to the risk of anaphylaxis, but advice may vary with different obstetric services.*
  - *Do not use to treat iron deficiency in the absence of anaemia.*
  - *Options available include iron polymaltose, iron sucrose, and iron carboxymaltose.*
  - *Avoid intramuscular injection of iron because absorption is poor, the skin may become discoloured, and the injection is very painful.*

3. Provide appropriate information regarding oral iron supplementation.

4. Consider referral for intravenous iron after the first trimester if patient has iron deficiency anaemia and:
   - fails to respond to oral supplementation.

- oral iron is not tolerated.
- presents in late gestation (> 36 weeks).

### Anaemia due to other causes

1. If Hb < 70 at any stage of pregnancy, arrange urgent obstetric or haematology review.
2. If haemoglobinopathy, do **not** give iron supplements unless documented iron deficiency.
3. If folate deficient, replace with oral supplementation.
4. If B12 deficient, replace orally (1000 micrograms per day) or parenterally (1000 micrograms intramuscular injection 3 monthly) as appropriate.
5. If anaemia of unknown cause, arrange urgent obstetric or haematology review.

## Referral

- Arrange urgent obstetric or haematology review if:
  - severe anaemia in pregnancy (Hb < 70 g/L).
  - anaemia of unknown cause.

- Consider referral for intravenous iron after the first trimester if patient has iron deficiency anaemia and:
  - fails to respond to oral supplementation.
  - oral iron is not tolerated.
  - rapid repletion of iron stores is required, e.g. severely symptomatic.
  - presents in late gestation (> 36 weeks).

- Before administrating intravenous iron in general practice setting, discuss with treating obstetrician or obstetric registrar.

## Information

### For health professionals

- Australian Journal of General Practice – Anaemia in Pregnancy
- Australian Red Cross Blood Service – Haemoglobin Assessment and Optimisation Action Plan and Flowcharts
- Department of Health – Pregnancy Care Guidelines: Anaemia
- National Blood Authority:
  - Iron Product Choice and Dose Calculation for Adults
  - Iron Therapy Resources
  - Patient Blood Management Module 5: Obstetrics and Maternity
- The Royal Women's Hospital:
  - Folate in Pregnancy [guideline]
  - Vitamin B12 Deficiency in Pregnancy [guideline]

### For patients

- National Blood Authority – Oral Preparations for Treatment of Iron Deficiency Anaemia (IDA) in Australia
- The Royal Women's Hospital – Iron in Pregnancy

## References

**Select bibliography**

Iron Deficiency – Management in Maternity and Gynaecology Patients. Melbourne: The Royal Women's Hospital; 2018.

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