



Iron Deficiency Assessment for Child Health Procedure

1. Guiding Principles

The aim of this document is to guide Population Health staff in the early detection, management and referral of children 0 – 5 years with iron deficiency anaemia (IDA). Refer to Appendix 1 for an overview (flow chart) of the procedure.

The rapid growth of the brain in the early stages of life requires adequate nutrition, including iron. Delayed identification and intervention for iron deficiency can lead to faltering growth, stunting and neurodevelopmental delay. Infants and young children with iron deficiency have been shown to have poorer cognitive, motor and social/emotional functioning than healthy infants.¹

Anaemia is the term used to describe low haemoglobin levels and impeded ability for red blood cells to transport oxygen around the body, and impairment of other bodily functions.¹ Anaemia is generally an indicator of poor nutrition and poor general health,² however, it is important to explore any underlying medical conditions that may be causing iron deficiency, for example; coeliac disease or blood loss.³ In children, undetected anaemia is associated with delay of cognitive and psychomotor functions.⁴ In addition, individuals may experience compromised immunity and increased risk of infectious diseases.⁵

It is estimated that in Australia, 8% of preschool children, 12% of pregnant women and 15% of non-pregnant women of reproductive age have anaemia, with inadequate dietary iron intake the most common cause.³ Anaemia is highly prevalent in Aboriginal communities, with one WA study finding 55% of women afflicted by the condition.³ Babies born to mothers with IDA are likely to start life with low iron stores and are at risk of iron deficiency in the first six months and beyond, if there is no intervention.⁶

Iron deficiency is largely preventable with adequate dietary iron intake.⁵ Serial growth monitoring in conjunction with developmental assessment is important to identify any deviation from normal parameters.⁷ Population Health staff, especially Child Health Nurses (nurses) are well positioned to monitor growth and development, provide practical nutrition education, observe risk factors, sign and symptoms and to facilitate early intervention for IDA.

2. Procedure

Steps	Additional information
<p>Step 1. Promotion and Prevention</p> <p>1.1 At every contact, promote key health education messages:</p> <ul style="list-style-type: none"> - Breastfeed exclusively for the first six months, and continue to 12 months. - Encourage mothers to consume a healthy diet including foods high in iron. - For infants not breastfeeding, (iron-fortified) infant formula to 12 months - Introduction of solid foods at around 6 months of age. - Introduce iron rich foods first; iron-enriched infant cereals, pureed meat, fish or chicken, pureed cooked tofu and pureed legumes. - Encourage water as the main drink. - Consume vitamin C rich foods such as citrus fruits, berries and capsicum with iron rich foods to optimise iron absorption. Pureed or whole fruit and vegetables high in vitamin C are preferred over fruit juice. - Avoid tea for infants and young children. Tea contains tannins and other compounds that inhibit iron absorption. - For children over 12 months of age, limit cow’s milk to no more than 500ml per day. High intake of cow’s milk can displace high-iron foods in the diet. - Encourage child and family consumption of iron-rich food, as Appendix 2. <p>1.2 Provide positive feedback about what is going well for the family and the health promoting activities or practices they have already adopted.</p>	
<p>Step 2. Identify child at risk of anaemia</p> <p>2.1 Consider if there are any child and maternal risk factors.</p> <p>2.2 Observe child’s appearance and discuss behaviours with parent/carer. Infants and children who are iron deficient <u>may</u> exhibit signs and symptoms:</p> <ul style="list-style-type: none"> - Listless, lethargic, irritable or tired - Behaviour problems - Recurrent infections/illness - Loss of appetite - Strange food cravings or eating behaviour (pica) - Breathless - Increased sweating 	<p>See Appendix 3 for child and maternal risk factors.</p>

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<p>2.3 Review growth and development.</p> <p>2.4 Conduct or refer for assessment if there are any risk factors, signs or symptoms evident, and/or growth is below expected norms.</p>	<p>Refer to CAHS policy documents Growth birth - 18 years and Growth faltering.</p>
<p>Step 3. Assessment</p> <p>3.1 Conduct a haemoglobin screening test.</p> <p>3.2 Refer for medical assessment, if haemoglobin is outside of normal limits.</p>	<p>Conduct assessment if within scope of practice and if timely medical assessment is not locally available.</p> <p>Refer to CAHS Community Health Blood Sampling (Heel and Finger Prick) procedure.</p> <p>Refer to Appendix 4 for haemoglobin analysis and lower limits.</p>
<p>Step 4. Management</p> <p>4.1 Plan follow-up contact (at least within 3 months) to monitor progress. Set Recalls.</p> <p>4.2 Provide nutrition education to enhance iron intake so as appropriate for parent/carer.</p> <p>4.2 Continue to monitor growth as per the Enhanced Child Health Schedule</p> <p>4.3 Refer for medical assessment and care as required.</p>	<p>Make a clinical judgement about need for support to action referrals and interventions. Some families will need early and more frequent follow-up to ensure child's needs are met.</p> <p>Refer to CAHS policy documents Growth birth - 18 years and Growth faltering.</p>

Useful resources

Australian Government Department of Health [Aboriginal and Torres Strait Islander Guide to Healthy Eating](#)

Kimberley Aboriginal Medical Service [How much sugar is in your drink?](#)

National Health & Medical Research Council, [Australian Dietary Guidelines](#)

National Health & Medical Research Council: [Infant Feeding Guidelines: Information for health workers](#)

Queensland Department of Health [Healthy Food and drinks for children aged 1 – 4 years](#)

Queensland Department of Health [Healthy food and drinks for your grandkids](#)

Queensland Department of Health [Iron rich foods for babies and growing children](#)

Queensland Department of Health [Keeping food safe](#)

Queensland Department of Health [Starting solids](#)

[Raising Children Network](#) Nutrition related information and videos

Women's Health and Family Services [High Iron Foods pamphlet \(Photographic\)](#)

3. Definitions

Iron deficiency anaemia (IDA)	A common form of anaemia caused when iron losses or requirements exceed absorption of iron.
Haemoglobin	Protein found in red blood cells which contains iron and is responsible for transporting oxygen.
Anaemia	Deficient concentration of haemoglobin in the blood. The range is specific for aged, gender and gestation.

4. Roles and Responsibilities

Population Health staff conducting health assessments for children aged 0-8 years; Enhanced Child Health Schedule (ECHS), Children in Care checks, child and school health assessments or other opportunistic health checks on children are required to;

- Identify children with iron deficiency concerns.
- Conduct or refer for haemoglobin screening assessment, promptly.
- Refer and/or manage iron deficiency as described in this document.

All Staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

5. Compliance

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the [Integrity Policy Framework](#) issued pursuant to section 26 of the [Health Services Act 2016](#) (WA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Records Management

All WACHS child and school health activity is recorded in the Community Health Information System (CHIS). Note clinical items for iron deficiency assessment.

7. Evaluation

Monitoring of compliance with this document is to be carried out in partnership by the Director Population Health and Central Office Population Health, annually using:

- CHIS reports and audits of iron deficiency assessment, referrals and outcomes.

8. Standards

[National Safety and Quality Health Service Standards](#) 2.1 & 5.3

9. Legislation

[Public Health Act 2016](#)

[Health \(Miscellaneous Provisions\) Act 1911](#) – Part XIII - Section 335

10. References

1. World Health Organization. *Nutritional Anaemia: Tools for effective prevention and control*. Geneva, WHO, 2017.
2. World Health Organization. *Joint Statement by the World Health Organization and the United Nations Children's Fund*. Geneva, WHO, 2004.
3. Pasricha SR, et.al. Diagnosis and management of iron deficiency anaemia: a clinical update. *Medical Journal of Australia*. 2010;193(9):525-32.
4. Royal Children's Hospital (RCH) *Clinical Practice Guidelines for Anaemia*. 2015
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6. Central Australian Rural Practitioners Association. *CARPA Standard Treatment Manual*. 7th Edition. Alice Springs: Centre for Remote Health; 2019.
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10. Davies J, Majumdar S, Forbes RT, Smith P, Currie BJ, Baird RW. Hookworm in the Northern Territory: Down but not out. *Medical Journal of Australia*. 2013 198(5):278-281.
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12. Pasricha S-R. Should we screen for iron deficiency anaemia? A review of the evidence and recent recommendations. *Pathology*. 2012;44(2):139-47.
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16. Royal Children's Hospital (RCH) *Clinical Practice Guidelines for Anaemia*. 2019.

11. Related Forms

WACHS Community Health Services E-Referral form (CHIS)

12. Related Policy Documents

[CAHS Blood Sampling \(Heel and Finger Prick\) procedure.](#)

[CAHS Child Health Services policy](#)

[CAHS Growth Birth - 18 Years](#)

[CAHS Growth Faltering](#)

[CAHS Nutrition for Children - 1 to 11 years](#)

[CAHS Nutrition for Children - Birth to 12 months](#)

[CHIS Data Entry Standards, Clinical Item Guides and Document Naming Conventions](#)

[Kimberley Aboriginal Health Planning Forum. Clinical Protocols and Guidelines](#)

[WACHS Enhanced Child Health Schedule Guideline](#)

[WACHS Enhanced Child Health Schedule Practice Guide](#)

[WACHS WebPAS Child at Risk Alert Procedure](#)

13. Related WA Health System Policies

OD0606/15 [Guidelines for Protecting Children 2015](#)

14. Policy Framework

[Clinical Services Planning and Programs](#)

[Public Health](#)

15. Appendices

Appendix 1: [Iron Deficiency Assessment for Children 0-5 years Care Pathway](#)

Appendix 2: [Iron Rich Foods](#)

Appendix 3: [Risk Factors](#)

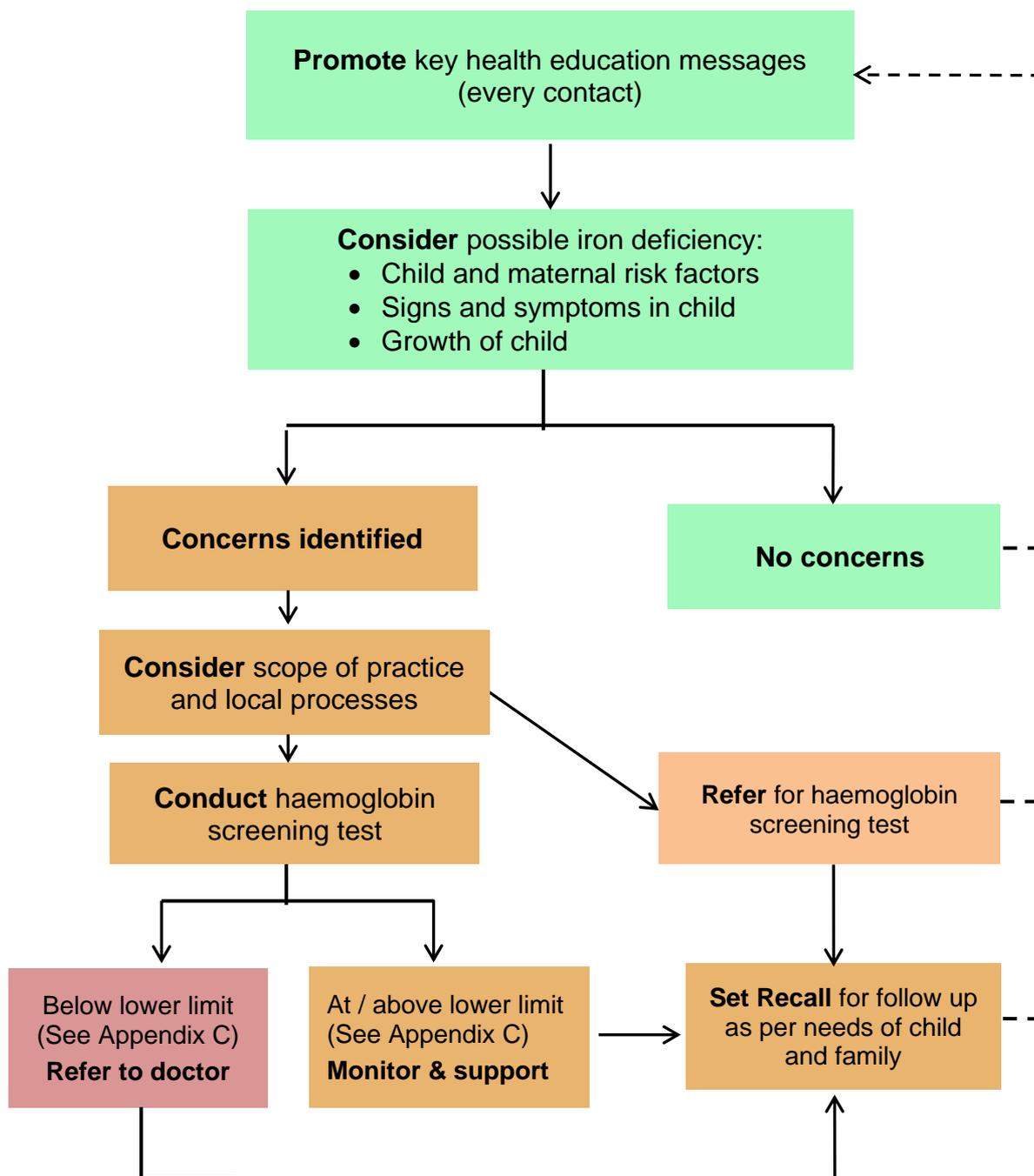
Appendix 4: [Haemoglobin Levels for Anaemia](#)

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Appendix 1: Iron Deficiency Assessment for Children 0-5 years Care Pathway



Age	Lower limit	Age	Lower limit
At birth	<130 g/L	1 - 4 years	110 g/L
<6 months*	95 g/L	5 - 7 years	115 g/L
6 - 12 months	105 g/L		

Appendix 2: Iron Rich Foods

Encourage child and family consumption of iron-rich food, as below.

Iron rich foods ¹³	
Food	Iron (mg)
Baked beans (small can 130g)	1.66
Breakfast cereal (iron fortified) 1 cup	3.0
Egg – large 65-70g	1.0
Kangaroo (grilled loin fillet) 100g	4.1
Lean beef (cooked) 100 g	2.0-3.0
Lean lamb (cooked) 100 g	2.0 - 2.5
Lean pork (cooked) 100 g	0.6 – 1.0
Legumes – cooked ½ cup	2.0 -2.5
Salmon (canned or grilled) 100 g	1.1 - 1.3
Skinless chicken breast (cooked no skin) 100g	0.4 - 0.9
Tuna (canned in water) 100 g	1.0 -1.3

Iron in food takes two forms; haem iron occurs in red meat and to a lesser extent in fish and poultry, and; non-haem iron which occurs in wholemeal breads, breakfast cereals, green leafy vegetables, legumes and eggs. Haem iron is more easily absorbed by the body than non-haem iron.¹³

Appendix 3: Risk Factors

Maternal

- Medical conditions or complications during pregnancy and/or postnatal e.g. haemorrhagic disease or infection.
- Untreated maternal anaemia during pregnancy.
- Restricted diets such as vegetarian or vegan diets, if insufficient iron-rich foods are not consumed.
- Multiple pregnancy⁵

Child

- Premature (born prior to 37 weeks gestation)
- Low birth weight⁹
- Exclusive breast feeding after 6 months⁴
- Chronic or parasitic infection^{10,11}
- Late or insufficient introduction of iron rich foods⁴
- Intake of cow's milk before 12 months of age¹²
- High intake of cow's milk in infants over 12 months of age (which can displace other iron-rich foods).
- Restricted diets such as vegetarian or vegan diets, if insufficient iron-rich foods are not consumed.
- Gastrointestinal disorders e.g. coeliac disease, inflammatory bowel disease
- Gastric or intestinal surgery
- Poor quality diet
- Lack of access to iron-rich foods

Note: Aboriginal, Culturally and Linguistically Diverse (CALD) and refugee children do not have an additional genetic risk of IDA. The prevalence of IDA in children in some of these communities can be attributed to low socio economic status (i.e. poor maternal iron stores, reduced access to iron containing foods and increased infection rates) or exposure to soil transmitted helminths.

Appendix 4: Haemoglobin Levels for Anaemia

Table 1: Haemoglobin levels for anaemia	
Age	Anaemia if haemoglobin below the lower limit of the reference range:
At birth	<130 g/L
<6 months*	95 g/L
6 – 12 months	105 g/L
1 - 4 years	110 g/L
5 – 7 years	115 g/L
8 – 11 years	115 g/L (KAMSC and CARPA + 119 g/L)

Source: PathWest QE11 Haematology Reference Data – Haematology Methods Manual 2012

* There is some variation in the values for the first five weeks.