

Iron deficiency - children

Iron is an important dietary mineral that is involved in various bodily functions, including the transport of oxygen in the blood. This is essential in providing energy for daily life. Iron is also vital for brain development.

Babies, toddlers, preschoolers and teenagers are at higher risk of iron deficiency, mainly because their increased needs for iron may not be met by their diets. Without intervention, a child whose diet does not provide them with enough iron will eventually develop iron deficiency anaemia. See your doctor if you suspect your child may be iron deficient.

Iron can be toxic

Iron is toxic in large doses. Avoid the temptation to self-diagnose and give your child over-the-counter iron supplements, because an overdose of iron can cause death. In infants and young children, 20 mg per day is the safe upper limit – most iron supplements contain around 100 mg per tablet. It is important to keep iron supplements tightly capped and away from children's reach, as iron tablets are often mistaken as lollies by children.

If you suspect an iron overdose, call your doctor or the Victorian Poisons Information Centre on 13 11 26 immediately or visit your local hospital emergency department.

Symptoms of iron deficiency anaemia

The signs and symptoms of iron deficiency anaemia in children may include:

- Behavioural problems
- Repeat infections
- Loss of appetite
- Lethargy
- Breathlessness
- Increased sweating
- Strange 'food' cravings (pica) like eating dirt
- Failure to grow at the expected rate.

Causes of iron deficiency in children

Major risk factors for the development of iron deficiency in children include:

- Prematurity and low birth weight
- Exclusive breastfeeding beyond six months (not introducing solids)
- Introduction of cow's milk as the main drink before 12 months of age
- High intake of cow's milk
- Low or no meat intake
- Vegetarian eating
- Poor diet in the second year of life
- Possible gastrointestinal diseases
- Lead poisoning.

Babies, children and teenagers undergo rapid growth spurts, which increase their need for iron. The main causes of iron deficiency in children by age group include:

- **Babies less than six months old** – newborns receive their iron stores in the uterus (womb), which means the mother’s diet during pregnancy is very important. Low birth weight or premature babies are at increased risk of iron deficiency and will need iron supplements (under medical supervision only). See your doctor for further advice.
- **Babies aged six months to one year** – a baby’s iron stores run low in the second half of their first year. Iron deficiency can result if their diet doesn’t include enough iron-rich solid food. At around six months, two servings a day of plain, iron-fortified infant cereal mixed with breastmilk or infant formula can start to be given. At around seven months of age, plain pureed meats can be offered. Late introduction of solids into the baby’s diet is a common cause of iron deficiency in this age group.
- **Children aged one to five years** – breastmilk contains iron, but prolonged breastfeeding can lead to iron deficiency if breastmilk replaces solid foods in the diet. Low-iron milks such as cow’s milk, goat’s milk and soymilk should not be given until 12 months of age. Children who drink milk in preference to eating solid foods are in danger of iron deficiency.
- **Teenagers** – adolescent girls are at risk because of a number of factors including growth spurts at puberty, iron loss through periods (menstruation) and risk of under-nutrition due to fad dieting that restricts the eating of a healthy range of foods.
- **In general** – gastrointestinal disorders, such as coeliac disease, are a rare but possible cause of anaemia in children.

Suggestions for parents – babies

To prevent iron deficiency in babies less than 12 months of age:

- Include an iron-rich diet during pregnancy. Red meat is the best source of iron.
- Tests to check for anaemia should be conducted during pregnancy. If your doctor prescribes iron supplements, take them only according to instructions.
- Breastfeed your baby or choose iron-fortified infant formulas.
- Don’t give your baby cow’s milk or other fluids that may displace iron-rich solid foods before 12 months of age.
- Don’t delay the introduction of solid foods. Start giving your baby pureed foods when they are around six months of age. Fortified baby cereal made with iron-fortified infant formula or breastmilk is generally the first food to offer. This is because of its iron content, but also because its texture is easy to change. Introduce soft lumpy foods or mashed foods at around seven months and minced meat at around eight months.

Suggestions for parents – young children

To prevent iron deficiency in toddlers and preschoolers:

- Include red meat three to four times a week. Offer meat alternatives such as dried beans, lentils, chickpeas, canned beans, poultry, fish, eggs and small amounts of nuts and nut pastes. These are important sources of iron in your child’s daily diet. If your family follows a vegan or vegetarian diet, you may need to seek advice from a dietitian to ensure you are meeting all your child’s dietary needs.
- Include vitamin C as this helps the body to absorb more iron. Make sure your child has plenty of foods rich in vitamin C like oranges, lemons, mandarins, berries, kiwifruit, tomatoes, cabbage, capsicum, spinach and broccoli.
- Encourage solid foods at mealtimes and take care that toddlers are not ‘filling up’ on drinks between meals.
- Chronic diarrhoea can deplete your child’s iron stores, while intestinal parasites such as worms can cause iron deficiency. See your doctor for prompt diagnosis and treatment.
- Fussy eaters may be at risk due to poor intake or lack of variety in the foods they eat. Seek advice from your dietitian, local doctor or child health nurse on how to manage a fussy eater, or browse the Better Health Channel site for more information.

Suggestions for parents – teenagers

To prevent iron deficiency in teenagers:

- Talk to your child about the importance of iron. Help them become informed enough to make their own responsible food choices.
- Encourage iron-rich foods and meals, such as iron-fortified breakfast cereals and breads, and serve meat, poultry or fish with the evening meal.

- Offer good sources of non-haem iron such as dried beans, lentils, peas, broccoli, spinach, beans, fortified cereals, breads and whole grains if your child wants to avoid red meat or become vegetarian. Vitamin C-rich foods should also be encouraged, such as fruits or vegetables with meals.
- Encourage only moderate amounts of tea and coffee, as these can interfere with iron absorption.

Diagnosis of iron deficiency

It is important that you see your doctor if you suspect your child may be iron deficient. Diagnosis aims to exclude other illnesses that can have similar symptoms, such as coeliac disease. Diagnosis methods include:

- Physical examination
- Medical history
- Blood tests.

Treatment for iron deficiency

Treatment may include:

- Dietary changes, such as increasing the amount of iron-rich foods
- Iron supplements (tablets or liquid for infants and young children) – under medical supervision only
- Treatment for infection, as infection is sometimes the cause of mild anaemia in children.

Where to get help

- Your doctor
- An Accredited Practising Dietitian, contact the Dietitians Association of Australia.
- Maternal and Child Health Line, Victoria (24 hours) Tel. 13 22 29
- Royal Children's Hospital Tel. (03) 9345 5522
- Victorian Poisons Information Centre Tel. 13 11 26 – seven days a week, 24 hours a day – for advice about poisonings, suspected poisonings, bites and stings, mistakes with medicines and poisoning prevention advice.

Things to remember

- Babies, toddlers, preschoolers and teenagers are at risk of developing iron deficiency, mainly because their increased needs for iron may not be met if their diets are inadequate.
- If you are following a vegetarian or vegan diet, extra care needs to be taken to ensure you are getting enough iron in your diet.
- Keep iron supplements away from children – overdoses can be fatal in young children and infants.

This page has been produced in consultation with, and approved by:

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