

Patient Blood Management

How Can I Increase Iron In My Child's Diet?

Iron Deficient Anaemia in Children

Anaemia is a medical term for low red blood cell count.

Anaemia can be caused by a variety of medical conditions or simply a poor diet. Red blood cells contain a protein called haemoglobin. Haemoglobin has the important function of delivering oxygen from the lungs to the rest of the body. Iron is the component in haemoglobin that allows the red blood cells to carry oxygen.

All tissues require oxygen to survive so iron is vital for brain development. To produce new effective red blood cells the body needs the key ingredient iron. Iron is not naturally produced by the body and must be taken in through our diet. Red blood cells are produced by the bone marrow and have a normal life span of 120 days. New red blood cells are constantly required to replace old red blood cells with millions of red blood cells being released into the blood stream each day in healthy children.

The level at which your child's haemoglobin will be considered normal is more than 110 g/L in children aged 6 months - 4 years, more than 115 g/L in children aged 5-11 years and more than 120 g/L in older children (aged 12-14). Babies, toddlers, preschoolers and teenagers are at higher risk of iron deficiency, mainly due to increased iron needs during rapid growth spurts.

Without intervention, a child whose diet does not provide them with enough iron will eventually develop iron deficiency anaemia. Please see your GP if you suspect your child may be iron deficient.



Patient Information

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/tiredness
- Breathlessness
- Increased sweating
- Strange food cravings (known as 'pica') like eating dirt or other non food matter
- 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)
- High intake of cow's milk in young children less than two years of age
- Low intake of iron rich foods such as meat, tofu and green vegetables
- Poorly balanced vegetarian and vegan eating
- Poor diet in the second year of life
- Possible bowel diseases
- Lead poisoning

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.

Patient Information

- **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 breast milk or infant formula can start to be given. Plain pureed meats can soon be offered with other solids, once your baby is used to the cereal. 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** – breast milk contains a small amount of iron, but prolonged breastfeeding can lead to iron deficiency, especially if breast milk 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 (if you are vegan or vegetarian and are not breast feeding soy based formula milk is appropriate as it is fortified with vitamins and iron). Children who drink milk in preference to eating solid foods are in danger of iron deficiency.
- **Teenagers** – adolescents are at risk because of a number of factors, including growth spurts at puberty, iron loss through periods and risk of under-nutrition due to fad dieting that restricts eating.
- **In general** – bowel disorders, such as coeliac disease, are rare but a possible cause of anaemia in children.

What is the best food for iron?

A lack of iron in your child's diet can contribute to their iron deficiency anaemia. Increasing iron rich foods in your diet can be a simple measure to combating anaemia. Iron-rich foods include:

- White and red meat
- Liver, kidney or products made from these (please note if you are pregnant do not have liver or liver products)
- Fish (sardines and pilchards are especially good)
- Iron-fortified cereals or bread
- Tofu
- Pulses and beans
- Dark-green leafy vegetables, such as watercress and curly kale
- Brown rice
- Nuts and seeds
- Eggs
- Dried fruit, such as dried apricots, prunes and raisins

Patient Information

Including foods from all these major food groups in your family's meals will ensure it is healthy and well-balanced.

For more information please visit:

<http://www.healthystart.nhs.uk/all-recipes/>

<http://www.bbcgoodfood.com/recipes/collection/iron-rich-vegetarian>

<http://www.themainmeal.com.au/index.htm>

Haem and non- haem iron

There are two forms of iron you get from food, haem and non- haem iron. Haem iron is mainly found in meat protein and non-haem iron is found mainly in enriched cereals and pasta, beans, and dark green leafy vegetables.

Suggestions for parents – babies

Some suggestions to prevent iron deficiency in babies less than 12 months of age include:

- Have an iron-rich diet during pregnancy
- 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 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 breast milk is generally the first food to offer. This has good iron content and its texture is an easy change for baby. Introduce soft lumpy foods or mashed foods at around seven months
- Under 12 months of age don't give your baby cow's milk or other fluids that may fill them up before meal times. This is so they don't miss other meals with a variety of nutrients

Suggestions for parents – toddlers and pre-schoolers

- To prevent iron deficiency in toddlers and preschoolers:
- Include lean 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 of 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, peppers and broccoli.
- Encourage solid foods at mealtimes and take care that toddlers are not 'filling up' on drinks especially milk between meals. Fizzy drinks such as cola drinks can stop your child absorbing iron from their food so should be avoided at mealtimes.
- Remember that chronic diarrhoea can deplete your child's iron stores and 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 practice nurse, health visitor or GP on how to manage a fussy eater.

You could also visit: <http://www.healthystart.nhs.uk> for further information.

Suggestions for parents – younger people

To prevent iron deficiency in younger people:

- 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, fish or tofu with the evening meal.

Patient Information

- Offer good sources of non-haem iron such as dried or tinned beans, lentils, peas, broccoli, spinach, beans, fortified cereals, breads and whole grains if your child wants to avoid red meat or become vegetarian. Foods rich in vitamin C such as fruits or vegetables should be encouraged with meals
- Encourage only moderate amounts of tea, coffee and fizzy drinks such as cola as these can stop your child absorbing iron from their food. They should also be avoided at mealtimes

How can I help my child make the most of the iron they eat?

Vitamin C helps iron absorption. To increase the amount of iron that your toddler's body gets from plant sources pair iron-rich foods with foods enriched with vitamin C. Good combinations include:

- Iron-fortified cereal and orange juice
- Iron-fortified oatmeal with fresh fruit
- Hummus with vegetable sticks
- Iron-enriched pasta with fresh steamed vegetables

What will reduce iron absorption?

Some foods, drinks and medications can inhibit iron absorption. These include:

- Antacids and calcium supplements
- Tea
- Coffee
- Fizzy drinks containing caffeine
- Chocolate
- Unprocessed bran

Your child can still eat these foods but it is best to avoid them when eating a meal and have them as occasional snacks in between meals. It is worth noting that calcium prevents your body absorbing iron effectively, if your child takes calcium supplements or antacids, avoid taking them at the same time as their iron tablets.

Patient Information

What other treatments might be used to increase my child's iron stores?

The treatment of anaemia is determined by the identification of the cause. In many cases treatment prescribed by a doctor may be as simple as iron tablets. In other situations it may be a course of specific vitamins or more complex treatment such as a red blood cell transfusion, IV iron or EPO (erythropoietin). Any underlying cause may also need to be treated. If your child has been diagnosed with anaemia or iron deficient anaemia it is important that they are monitored by your GP. This can be done by having regular blood tests.

Are there any risks?

Doses of iron are associated with constipation, nausea, vomiting and diarrhoea, especially if supplements are taken on an empty stomach. If iron tablets are irritating your child's stomach your doctor might advise taking them with food, or you might try a different type of iron tablet or a liquid supplement. If you have any concerns contact your GP.

Keep out of reach of children

Iron overdose occurs when you take an excessive amount of supplements that contain iron. Iron is toxic in large amounts and can be fatal at high doses. Children are especially at risk as they can mistake the red tablets for sweets. **Iron supplements must be stored away from children's reach** and your child must be observed whilst they are taking the tablets. If you have any concerns or you think you or your child have taken too much iron contact your GP or dial 111 for advice. In case of emergency attend your local Emergency Department.

Useful Links

www.start4life.co.uk

www.nhschoices.co.uk

<http://www.rightstartmagazine.co.uk>

www.bda.uk.com

Please keep this sheet for your own records:

Date: _____

Patient Information

If you require any further information about anaemia and diet please contact the Patient Blood Management Practitioner on 024 7696 6911 or the Hospital Transfusion Team by ringing 024 7696 4000 extension 25469 or 25470. You can also ask your GP or specialist nurse for further advice or for referral to a dietician.

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