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## Iron deficiency

Iron deficiency is the most common cause of anaemia worldwide. Anaemia is a deficiency of red blood cells and can occur either through the reduced production or an increased loss of red blood cells. To produce red blood cells, three essential elements must be present, iron, vitamin B12 and folic acid. Hence, iron deficiency anaemia is anaemia caused by the lack of iron to create red blood cells. Iron deficiency may also result in skin problems.

### What are the clinical features of iron deficiency?

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The signs and symptoms of iron deficiency depend on whether the patient is anaemic and if so, how fast the anaemia develops. In cases where anaemia develops over a period of time the patient can often tolerate extremely low concentrations of red blood cells (<100g/L) for some time before developing any symptoms. The first symptoms to appear are usually increased lethargy, shortness of breath and palpitations (awareness of the heartbeat).

On physical examination, hair, skin, nail and mucous membrane changes are often visible. This can occur before the patient is clinically anaemic.

- In some patients [pruritus](#) (itching) may be present.
- Nails become brittle and fragile and develop vertical stripes. Nail plate changes result in koilonychia (spoon shaped nails).
- Patients develop angular stomatitis, a condition in which painful cracks appear at the corners of the mouth.
- The tongue may become swollen and smooth and develop a burning sensation.
- Dryness of the mouth and throat making it difficult to swallow.
- Hair becomes dry, brittle and dull. Increased hair shedding may be noticed.
- Skin is abnormally pale if the patient is anaemic.

Iron deficiency may also predispose to bacterial and fungal infections such as [impetigo](#), [boils](#) and [candidiasis](#).

#### Iron deficiency

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Koilonychia



Angular cheilitis

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### What causes iron deficiency?

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There are several causes of iron deficiency.

- Deficiency in children is usually caused by the inadequate of intake of iron through their diet. Young children in particular are often fussy and picky eaters.
- Iron deficiency in women can be due to a number of factors
  - During pregnancy the increased need for iron often exceeds a woman's dietary intake.
  - Heavy menstrual periods cause the body to lose blood faster than the body can make it.
  - Smoking and a diet low in iron.
- Lack of iron in the diet is common in vegetarians because the main dietary source of iron in red meat.
- Gastrointestinal diseases that reduce iron absorption from the intestine, e.g. [Crohn disease](#), coeliac disease.
- Use of drugs that may cause gastrointestinal bleeding, e.g. aspirin and NSAIDS.

## What is the treatment for iron deficiency?

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Once iron deficiency has been established, the underlying cause should be investigated and managed (e.g. correct/manage GI bleeding or menstrual blood loss). In addition, most people will need iron replacement therapy to correct the anaemia and replenish iron stores. Iron preparations come in the form of tablets, oral liquids and injection. Oral preparations are most commonly used. Intravenous or intramuscular injections are only used in patients who cannot tolerate oral supplementation or where iron losses exceed the daily amount that can be absorbed orally.

In anaemic patients, once haemoglobin levels are corrected to within the normal range, iron replacement should be continued for a further 3 months to replenish iron stores. Aim for serum ferritin levels over 50 µg/ml.

Compliance with iron replacement therapy may be low with some patients as iron preparations are associated with a high incidence of side effects. These include nausea, constipation, diarrhoea and black stools. Taking the iron preparation after meals may reduce these effects.

Taking iron with vitamin C (ascorbic acid) may increase its absorption and help replenish iron stores more quickly.

Excessive levels of iron can be toxic, so it is best to take iron supplements under medical supervision.

### Related information

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#### References:

- Book: Textbook of Dermatology. Ed Rook A, Wilkinson DS, Ebling FJB, Champion RH, Burton JL. Fourth edition. Blackwell Scientific Publications.

#### On DermNet NZ:

#### Other websites:

- [Dermatologic Manifestations of Hematologic Disease](#) - emedicine dermatology, the online textbook

#### Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.

If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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