

Iron Deficiency Anemia

What is anemia?

Anemia is a medical term that describes low amount of healthy red blood cells or hemoglobin in the body.

What is a red blood cell?

Red blood cells are the most common type of blood cell, and are responsible for delivering oxygen to all parts of the body.

What is hemoglobin?

The majority of the red blood cell is made up of hemoglobin. Hemoglobin carries 4 iron molecules. In the lungs, oxygen binds to the hemoglobin in the red blood cell. The red blood cell then travels through the bloodstream delivers oxygen to the rest of the body.

What causes iron deficiency anemia?

The cause of iron deficiency anemia is due to low amount of iron in the diet. In children, this is the most common form of anemia.

What are the signs and symptoms of iron deficiency anemia?

Symptoms usually develop slowly over months to years. This can make symptoms hard to recognize, but may include:

- Looking pale
- Fatigue or weakness
- Keeping up with peers while playing or exercising
- Poor concentration
- Headaches
- Behavioral changes or school difficulties

How is iron deficiency anemia diagnosed?

Anemia is diagnosed on a blood test called *complete blood count* (CBC). The CBC will report low hemoglobin and low red cell count. Under the microscope, the red cells look small and pale.

Low iron is diagnosed by checking ferritin level in the blood. The amount of ferritin in the blood shows how much iron is stored in the body.

What is the outlook for children with iron deficiency anemia?

Most of the symptoms improve quickly once iron is replaced. Therapy is usually given until the anemia is corrected, and then continues for another 3 months to ensure the body's iron store is replenished.

How much iron does my child need?

The recommended daily allowance (RDA) for iron varies by age and gender:

Infants aged 0-6 months	0.27 mg
Infants aged 7-12 months	11 mg
Children aged 1-3 years	7 mg
Children aged 4-8 years	10 mg
Boys aged 9-18 years	8-11 mg
Girls aged 9-18 years	8-15 mg

How is iron deficiency anemia treated?

Iron is provided through the diet and with oral supplements. In special cases children are given iron intravenously.

There are 2 forms of food iron – *heme* iron and *non-heme* iron.

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Heme iron is:

- Present in beef, pork, seafood
- Absorbed very well in the body – about 15-35% absorbed

Amount of iron (mg) in 2½ ounces of:

Clams	21	Beef	2.4
Pork liver	13.4	Shrimp	2.3
Chicken liver	8.7	Sardines	2
Oysters	6.4	Turkey, Lamb	1.5
Mussels	5	Chicken	0.7
Beef liver	4.9	Fish	0.24

Non-heme iron is:

- Present in non-meat products like fruit, vegetables, grains
- Poorly absorbed – only 2-5% absorbed
- Better absorbed if consumed with meat, citrus juice, vitamin C

Amount of iron (mg) in:

Infant cereal, 1 cup	5-10	Spinach, ½ cup	3.4
Tofu, ¾ cup	2.5-8	Soy beans, ½ cup	2.4
Oatmeal, 1pkg	2.5-5.5	Quinoa, ½ cup	1.7
Lentils, ¾ cup	4.9	Brown bread, 1 slice	1.2
Hummus, ¾ cup	3-4.5	Eggs, 2	1.2

Iron supplements come in liquid and pill forms. All the supplements work equally well, but some may taste better or be gentler on the stomach. Iron supplements are usually tolerated well, but some side effects may occur, such as stomach upset, constipation or diarrhea.

For more information you may contact the Hematology Department at BC Children's Hospital:

Hematology Clinic: (604) 875-2116

Hematology Nurse Clinician
Susan Lee, RN
(604) 875-2345 ext 7060
Email: slee@cw.bc.ca

After hours/weekend/emergency
Hematologist on-call: (604) 875-2161

Please see next page for iron preparations

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Iron Preparations

Oral formulations

For best absorption, give on an empty stomach. If stomach upset occurs, may give with food or snack

Product	Brand Name	Supplied	Notes
Ferrous fumarate	Palafer	Capsule 300 mg (100 mg Iron)	
		Liquid 60 mg/ml (20 mg Iron/ml)	Cherry flavor May stain teeth – give with dropper or drink through straw
Ferrous gluconate	Fergon	Tablet 300 mg (35 mg Iron)	
Ferrous sulphate	Fer-in-Sol	Tablet 300 mg (60 mg Iron)	
		Syrup 30 mg/ml (6 mg Iron/ml)	Lime flavor May stain teeth – give with dropper or drink through straw
		Drops 75 mg/ml (15 mg Iron/ml)	
Polysaccharide-Iron complex	Feramax	Capsules 150 mg (150 mg Iron)	

Intravenous formulations

An IV is placed in the child's vein and the iron is given directly to the bloodstream.

Product	Brand Name	Supplied	Notes
Iron sucrose	Venofer	Suspension (20 mg Iron/ml)	Must be given in health care facility No test dose required Generally well-tolerated with few side effects May be used in patients sensitive to iron dextran
Iron dextran complex	Infed	Suspension (50 mg Iron/ml)	Must be given in health care facility Test dose of 0.5 ml must be given. If no reaction after 1 hour, the remainder of the dose may be given