



Iron & Pregnancy

The most important point to make regarding iron and pregnancy is to ensure a woman's iron stores (known as ferritin) are optimal *before* pregnancy occurs. If this hasn't been possible, then I suggest all pregnant women have their stored iron (ferritin) checked at the beginning of pregnancy. This helps to predict the woman's iron needs during pregnancy. For example if ferritin is very low (below 40), there is a greater chance of anaemia in later pregnancy. If the ferritin is 70-80, then a low dose and good quality iron supplement may help to maintain these levels throughout pregnancy and postnatally. Even if the ferritin is over 100 and a woman includes sufficient dietary iron (without taking any iron supplements) this can drop to 30-40 after the pregnancy. Being pregnant uses and requires adequate iron in the body – for both the mother and the baby's well being.

Iron can usually be obtained through a well-balanced and varied diet, and interestingly we now know that a pregnant woman's intestines adapt by being able to absorb more iron from the foods she eats, as a natural response to her increased physical needs. It is this clever natural adjustment that is probably the reason why many (**but definitely not all**) pregnant women do not end up needing iron supplements.

The aim of ensuring you have a *sufficient iron intake* during pregnancy, and *sufficient iron stores*, is to help avoid **iron deficiency** and an abnormal lowering of your red blood cell count (or haemoglobin), also known as **anaemia**. Your iron stores are called upon to make your red blood cells and haemoglobin.

An adequate haemoglobin (Hb) level helps to:

- Support the health of your pregnancy and how you cope physically and emotionally while pregnant.
- Provide the energy to gently exercise in pregnancy, and prepare for the endurance that labour and birth may require.
- Keeping up with the 50% increase in your blood volume, as well as the growth of your uterus and the placenta - your baby's lifeline.
- Supplying your baby with oxygen during the pregnancy to grow and develop.
- Providing your baby with iron to store in their liver during the last 3 months of the pregnancy (enough to last them until they are 6 months old). Women with twins, triplets (or more) often need more iron at this time to keep up with this.
- Reducing the chances of your baby becoming distressed during labour - due to reduced oxygen availability.
- Provide the energy and endurance required for labour and birth.
- Allowing you to tolerate a normal blood loss at the birth (or the blood lost with a caesarean section). The normal blood loss may range from 200 to 500 ml (if you donate blood at the blood bank you would lose about 250 ml). Most women can tolerate this readily, but if you are anaemic even this expected blood loss could make you feel weak, dizzy and have difficulty walking without fainting. If your blood loss is greater than expected (post-partum haemorrhage) you would be at an increased risk of being very unwell and/or requiring a blood transfusion.

- Assisting your recovery after the birth, especially your physical ability to keep up with the demands of caring for a newborn baby.
- Establishing and producing breastmilk for your baby.

How would I know if I am iron deficient or have anaemia?

There are three stages of iron deficiency (mild and moderate), and there are three stages of anaemia (mild, moderate, severe). You usually begin at the top with some degree of iron deficiency and if left undiagnosed and/or untreated over time often will develop into the degree of anaemia – especially if there is/has been a pregnancy involved.

During pregnancy, anaemia may be evident very early or something that does not become obvious until the last few months (after 28 weeks). This all depends on the state of a woman's iron stores before she enters pregnancy.

Blood tests for haemoglobin are routinely performed at the first pregnancy visit and perhaps once (or more if indicated) later in the pregnancy. However, it is not routine to test for iron stores (ferritin) unless perhaps there is a history of deficiency, anaemia or the woman specifically requests it. This is unfortunate because it makes far more sense to check the iron stores than the 'current' haemoglobin status. This can be compared to checking the level of petrol in the tank (haemoglobin) before heading off on a very long journey (pregnancy), instead of checking the levels in the jerry cans (iron stores/ferritin) that will eventually be called upon.

Symptoms of iron deficiency/anaemia can be found on **The Importance of Iron** information sheet.

Early pregnancy (<24weeks):

The main reason for women being iron deficient/anaemic in early pregnancy is that their daily diet did not contain enough iron-rich foods in the months (and perhaps years) before the pregnancy. Women who are vegetarian or vegan are particularly vulnerable and need to plan their diet carefully to avoid iron deficiency.

Other situations that can contribute to a woman being anaemic early in the pregnancy are:

- Experiencing heavier periods before the pregnancy.
- Being a regular blood donor (or donating 3 to 6 mths prior to the pregnancy).
- Experiencing recent miscarriage(s).
- Conceiving a subsequent pregnancy within 2 years of a previous birth.
- Women who experienced a larger than expected blood loss after their previous birth.
- Having had a recent major operation before the pregnancy.

Late pregnancy (>28wks):

Other women start off their pregnancy not being obviously iron deficient, but slowly become deficient as the pregnancy progresses. This can happen if their diet does not keep up with their increased iron needs during the pregnancy. Women carrying twins, triplets (or more) are particularly prone to becoming iron deficient as their pregnancy progresses. Another reason for iron deficiency can be heavy bleeding during the pregnancy.

Blood tests for iron

Typically blood tests are performed in the first pregnancy check-up visit around 12 weeks, or as early as 5-6 weeks pregnant.

There are a few blood tests that your doctor can use to test for iron deficiency and anaemia during pregnancy. However, only one or two tests tend to be used routinely because pregnancy changes can affect some of the results of others. As iron deficiency develops in three stages (over several weeks or months), different tests tend to be more useful than others at different times.

The body's path to iron deficiency is a slow one (usually over weeks or months) and can be broken down into 3 different stages, which are explained as follows:

Stage 1:

In the early stages of iron deficiency a person starts to lose their iron stores from their liver, spleen and bone marrow. This can be detected by a blood test that looks at your ferritin. A low serum ferritin is reflective of low iron stores and is regarded as the most valuable test in assessing a person's iron status (even before their haemoglobin level starts to fall and they are regarded as anaemic). As a guide, whether you are pregnant or not, the reference range for 'normal' serum ferritin is: 20-200ng/ml. However, I believe the target within that range is at least 70-80.

Stage 2:

If the iron deficiency continues, a protein in the blood (called transferrin) starts to rise. This protein binds with iron to transport it to the liver and bone marrow and a higher level can indicate the body trying to compensate for the lower iron stores. At the same time, the person's iron levels in the blood (serum iron) start to fall.

The problem with using transferrin and serum iron tests during pregnancy is that the physical changes of pregnancy naturally make a woman's transferrin levels higher and her serum iron levels lower (even without having an iron deficiency), therefore these tests are not as reliable. However, as a guide (if your caregiver does these tests) a serum iron of less than 60mg/dl and a transferrin saturation of less than 16% may be suggestive of iron deficiency during pregnancy.

Transferrin and serum iron are rarely tested for routinely during pregnancy, however they may be done as part of 'iron studies' if your caregiver is concerned that your low haemoglobin is a result of another illness or health disorder (not due to iron deficiency). This can include sickle cell anaemia or thalassemia, both of which affect the haemoglobin level but do not respond to iron supplements.

Stage 3.

The final stage of being iron deficient is developing low haemoglobin. This is when the lack of iron in the blood stream starts to limit the production of haemoglobin (or red blood cells) in the bone marrow. Red blood cells live for about 4 months in the body before being replaced by new red blood cells with the help of iron, folic acid and vitamin B12.

The blood test used to detect low haemoglobin is called a Full Blood Count (or FBC). A FBC tests for levels of many cells in the blood, one of them being your haemoglobin (often written as Hb). While low haemoglobin is known to **be the last sign of iron deficiency**, it is still the test most commonly used by caregivers during pregnancy because it is easy, quick and inexpensive.

During pregnancy a woman's haemoglobin (Hb) level is naturally lower than when she is not pregnant. This is because the fluid (called plasma) that the blood cells float in increases by about 50% during the pregnancy (peaking at about 32 weeks). The increased plasma dilutes

the red cells, making their level drop (which is normal and expected). When laboratories test for haemoglobin it is important that they know the test is for a pregnant woman (rather than a non-pregnant man!), otherwise they will indicate the level is abnormally low.

Pregnant haemoglobin level is: 10.5 – 15.0 gm% (105 – 150g/L)

Non-pregnant haemoglobin level is: 11.5 – 16.0 gm% (115-160g/L)

Note: Haemoglobin can also be written without the decimal point. For example, 11.2 gm% is the same as 112 g/L. It may be written on your pregnancy card in either form.

If the haemoglobin results of your first blood test(s) are low, many things are taken into consideration before iron supplements are recommended. These can include going over your diet and asking about your general health and ruling out any other health conditions or risk factors. Because a low haemoglobin level is a fairly late indicator of iron deficiency, your caregiver may also test for serum ferritin to find out about your iron stores (even if your haemoglobin level is normal). If either of these tests comes back as being low at the beginning of the pregnancy, the first step is making some adjustments to your diet and in some cases recommending iron supplements as well.

Each caregiver or hospital will have their own policies about when to advise a pregnant woman to take iron supplements. Some will recommend them at levels below 11.5 gm%, others at 11.0 gm% or less, or perhaps 10.5 gm% or less. The recommendations for iron supplements in early pregnancy are not made because the haemoglobin level is abnormally low (yet), but because the 'dilution' effect of the blood during pregnancy will usually make this level drop further, as the pregnancy progresses.

Note: Having a good diet is usually the only thing needed to prevent anaemia and iron deficiency during pregnancy. It is widely accepted that there is no need to routinely take iron supplements while pregnant, unless these tests are abnormally low and you have some risk factors associated with needing them.

The very best indicator of your iron status is a blood test of both your Hb and your iron stores (ferritin) BEFORE pregnancy and/or within the early weeks (>12wks).

Typically in Australia, the haemoglobin (and *possibly* the serum ferritin) test is routinely repeated once at about 26 to 30 weeks of the pregnancy and possibly again at 36 weeks (if the 28 week test result is low).

Note: If you make dietary changes, or start taking iron supplements to increase your haemoglobin level, be aware that it takes a good 4- 6 weeks for a blood test to show any measurable changes.

Blood test at 28wks - Your haemoglobin level around this time is generally expected to be lower than the reading at the beginning of the pregnancy (unless you have been taking supplements). This is because of the natural 'dilution' of the red blood cells caused by the normal 50% increase in the plasma fluid of your blood. This blood dilution starts to slow at around 28 to 32 weeks of the pregnancy.

From about 28 weeks of pregnancy, your baby will start to store iron in their liver (supplied from your body). This natural iron storage is designed to meet their iron requirements during the first 6 months after the birth, when they are only drinking milk. By 6 months of age your baby will be able to start eating solid foods to meet their iron needs. It is for this reason that your haemoglobin level may lower again during the last 3 months of the pregnancy.

As a general guide, the aim is to have a **minimum haemoglobin level of 10.0 -11.0 gm%** by the time you give birth. This helps your baby to receive oxygen during the labour and for you to tolerate the normal blood loss at birth (or with a caesarean). Therefore, if your test comes back as below 11.0 gm% at 28 weeks (this is the level recommended by the World Health Organisation, although some caregivers say 11.5gm%), it is generally recommended that you discuss adjusting your diet or consider iron supplements.

If your 28 wk blood test shows a haemoglobin level of at least 11.0gm% or more and/or you have an adequate serum ferritin level (stored iron), then there is no need to start supplementing with iron and generally no need to routinely repeat the haemoglobin blood test later in the pregnancy.

Blood test at 36wks - If your haemoglobin test at 28 weeks was low, your caregiver will normally repeat the test again at about 34 to 36 weeks. This is to check that you are 'on track' with your diet and/or supplements, while allowing your body 6 to 8 weeks to respond these. If the level is still low (or lower) the test at this time can allow another 4 to 6 weeks before the birth to make any further adjustments.

Ref: www.birthis.com.au

In conclusion:

Keeping an eye on your Hb throughout pregnancy will hopefully help you avoid iron deficiency anaemia, but in reality the focus should be on your stores being at an excellent level - and therefore plenty to go around - for haemoglobin production and a very healthy mother and baby before, during and after the birth.

I often hear myself saying to women "Chasing an iron deficiency during pregnancy is difficult and frustrating, and frankly can be avoided". If you are considering becoming pregnant or are newly pregnant, see your doctor and ask for your '**iron studies**' to be included in your initial routine prenatal or antenatal blood tests.

This gives you a clear picture of your individual situation before blood dilution occurs and/or you start to show signs and feel symptoms of low iron. Why wait until then?

Pregnancy should be a joyous and active time - not one of fatigue, low energy, muscle weakness and shortness of breath. Postnatally, couple this with a newborn baby and you will really have your work cut out for you! Preconception or early pregnancy preparation is important.

Kristin
