# Fetal anaemia

**You have been referred to the fetal medicine unit because your baby has developed, or is at risk of developing, a condition called fetal anaemia.**

This factsheet explains what fetal anaemia is, how it is caused, and the steps that can be taken to treat it. It aims to support the discussions you will have with the fetal medicine team and your midwife. It is important that you take time to consider your options and ask any questions you may have.

## What is fetal anaemia?

Fetal anaemia occurs during pregnancy, when the levels of red blood cells in an unborn baby's blood are lower than normal, either because not enough red blood cells are being made or because they are being destroyed faster than your baby can make them.

The level of red blood cells in your baby's blood is important because red blood cells contain haemoglobin, a substance that carries oxygen around your baby's body, enabling them to grow and develop.

If a baby is anaemic, their heart rate will increase. This is because their heart has to work harder in order to pump blood and oxygen around their body.

The effects of fetal anaemia may be mild or severe, depending upon the severity of the anaemia. In severe cases, without treatment, fetal anaemia can cause heart failure. As the heart fails, fluid gathers in the baby's body around the heart, lungs and other organs. This is known as hydrops fetalis and can put a baby's life at risk.

## What causes fetal anaemia?

There are several causes of fetal anaemia:

- **Blood group incompatibility** – this is the most common cause of fetal anaemia and may occur if you and your baby have different blood types. If your baby's blood group is different from your own, and some of their blood cells cross the placenta into your bloodstream, your immune system may produce antibodies (protective proteins produced in response to the presence of a foreign substance) to destroy them. This is rare, occurring in approximately three in 100 pregnancies (3:100, or 3%).

  In most cases the antibodies do not cause any problems, but if they cross the placenta and enter the baby's bloodstream they may destroy the baby's red blood cells, causing the baby to become anaemic.

The antibodies most like to cause fetal anaemia are rhesus antibodies, which can form if you have rhesus negative blood (RhD negative) and your baby has rhesus positive blood (RhD positive). However, other antibodies including anti-c ('little c') and anti-K (Kell) antibodies can cause similar problems.

For more information about blood groups and antibodies in pregnancy, please speak to your midwife or download the NHS Blood and transplant service leaflet 'Blood groups and red cell antibodies in pregnancy'from the link below.
https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/15184/inf166.pdf

- **An infection** – some congenital infections (infections that cross the placenta during pregnancy) can cause fetal anaemia. These include:
  - cytomegalovirus (CMV)
  - human parvovirus B19
  - herpes
  - toxoplasmosis.

  Human parvovirus B19 (which also causes 'slapped cheek syndrome') is most likely to cause fetal anaemia if it crosses the placenta. If you develop a parvovirus infection during pregnancy, the likelihood of your baby also developing an infection is about 30%. Human parvovirus B19 can affect the way a baby's red blood cells develop, however, the risk of serious complications is small.

  For more information about parvovirus please visit:
  www.uhs.nhs.uk/Media/UHS-website-2019/Patientinformation/Pregnancyandbirth/Parvovirus-B19-during-pregnancy-3648-PIL.pdf
  www.nhs.uk/conditions/slapped-cheek-syndrome or speak to your midwife.

- **Twin anaemia polycythaemia sequence (TAPS)** - a condition that may affect identical twins (twins who share a placenta). In rare cases, blood from the shared placenta becomes unevenly distributed between the twins. One twin may receive too little blood, resulting in a low level of red blood cells.

- **Certain genetic and metabolic disorders**, including Down's syndrome (Trisomy 21) and Niemann-Pick disease.

## How fetal anaemia is detected

Fetal anaemia may be detected in several ways during pregnancy. A change, especially a reduction in your baby's movements, may be a warning sign that your baby's wellbeing needs assessing.

If blood tests show you have developed antibodies to your baby's blood cells, you will be offered further regular blood tests to measure your antibody levels. If these are high enough to suggest your baby is at risk of anaemia, or blood tests suggest you have had a parvovirus infection, your baby's wellbeing will also be monitored through regular ultrasound scans.

During your scans, the speed of blood flow in a blood vessel in your baby's head called the middle cerebral artery (MCA) will be measured. If this is unusually fast, it may be because your baby is anaemic and further monitoring will be arranged.

We will use an ultrasound scan to identify the best place to give your baby the blood transfusion. If the transfusion is given early in pregnancy when the blood vessels are very small (usually when you are less than 22 weeks), giving your baby blood directly into their abdomen is more likely to be the most appropriate option.

## How fetal anaemia may be monitored

The monitoring you and your baby will receive will depend on the cause of the fetal anaemia and its severity. In mild cases, monitoring may be all you need to ensure the anaemia does not cause problems. You may hear this approach referred to as 'conservative management'.

- **If the scans suggest your baby's anaemia is mild** you may only need careful monitoring with regular scans.
- **If the scans suggest the anaemia is more severe** we may suggest taking a blood sample from your baby. Arrangements will be made to give your baby a blood transfusion immediately after the blood test if anaemia is confirmed.

### Your baby's movements

It is important that you become familiar with your baby's usual daily pattern of movements and contact your local maternity day assessment unit immediately if you feel that their movements have changed, or you have any concerns about your baby's wellbeing.

## Treatment for fetal anaemia

In cases where the fetal anaemia is more severe, your baby may need a fetal blood transfusion (when a baby is given donor blood while in the womb) to increase the number of red blood cells in their bloodstream.

This will depend on the cause and severity of the anaemia and the stage in pregnancy at which it develops. In some cases, it may be necessary to give your baby more than one transfusion.

If it is recommended that your baby has a blood transfusion, we will discuss this in detail with you and your partner, and you will have the opportunity to ask any questions you may have.

## Risks of fetal blood transfusion

It is important to understand that fetal blood transfusion carries a risk of miscarriage (losing your baby in the womb), stiilbirth and premature labour. Between one and three in every 100 women who have a fetal blood transfusion will lose their baby (1:100 to 3:100, or 1-3%).

The risks associated with a fetal blood transfusion will vary depending upon your individual circumstances (whether your baby is already unwell due to the anaemia, the cause of the anaemia, and the timing of the procedure) and we will discuss these with you in detail. Fetal blood transfusion is only considered when the risks of continuing conservative management (watching closely) are thought to be greater for the baby than the risks of transfusion.

We understand that you may need time to discuss the procedure with your partner, or a close friend or family member before making your decision. You will have the opportunity to ask any questions you may have before you make your decision.

## Before having a fetal blood transfusion

Before we can carry out a fetal blood transfusion, the laboratory needs some samples of your blood to prepare suitable blood for your baby. We will make arrangements with you to have these samples taken up to three days before the blood transfusion. A member of the fetal medicine team will take your written consent and explain the procedure to you. Our team of fetal medicine midwives will also be available to answer any further questions and offer further support and advice.

### What happens during a fetal blood transfusion?

There are two types of fetal blood transfusion:

- **Intravascular (IVT)** where donor blood is transfused into your baby's umbilical cord
- **Intraperitoneal (IPT)** where donor blood is transfused into a blood vessel in your baby's abdomen

## What to expect on the day

You may be offered a sedative to keep you relaxed during the procedure. Your obstetrician will discuss this with you.

The team performing the procedure will wear sterile gowns and gloves and you will be covered with sterile drapes to minimise the risk of infection.

We will begin the procedure by cleaning your abdomen with a cold disinfectant solution.

When your obstetrician has identified a suitable blood vessel they will inject a local anaesthetic (a type of medication used to numb an area of the body) into the skin of your abdomen and then pass a needle through your skin, into your womb, and into your baby's blood vessel.

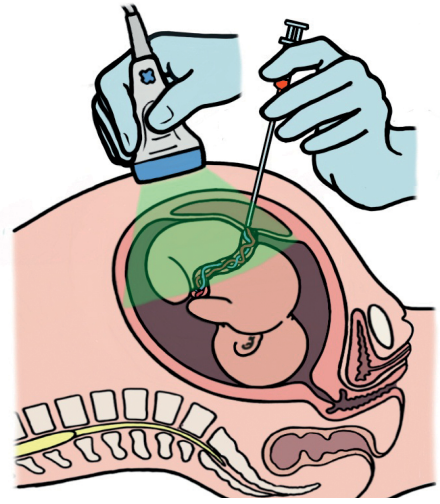

Figure 1. How a fetal blood transfusion is performed.

Depending on the position of your baby it may take more than one attempt before the needle is correctly sited. A sedative may also be given to your baby to reduce the chance of them moving during the transfusion.

As a result of this sedative, you may not feel your baby move for a few hours after the procedure. Your obstetrician will discuss this with you.

Before we begin the transfusion we will take a small sample of your baby's blood to measure their haemoglobin level so we can decide how much blood your baby will need.

The blood is given through the needle by a syringe.

Further small samples of your baby's blood will be taken as the transfusion progresses. This will allow your obstetrician to measure your baby's haemoglobin levels at regular intervals throughout the transfusion.

When a satisfactory haemoglobin level has been reached the needle will be removed. We will scan and monitor your baby throughout the procedure.

## If you are less than 26 weeks pregnant

The fetal blood transfusion will be performed in the fetal medicine unit. We will give you an appointment date and time to attend.

### Eating and drinking

You can continue to eat and drink normally before this appointment.

### Going home

You will be able to go home once you feel well enough and we will make appropriate arrangements for follow up and subsequent transfusions as needed.

## If you are more than 26 weeks pregnant

We will carry out the procedure in an operating theatre. This is because we may need to deliver your baby by emergency caesarean section if your baby becomes unwell during the transfusion.

We recommend you have two doses of steroids before your baby receives their first blood transfusion to help your baby's lungs develop in case birth by emergency caesarean section is necessary. The fetal medicine midwives will administer the first dose when they are taking your blood samples and make arrangements for you to attend our day assessment unit, or one local to where you live, for the second dose, 24 hours later.

## Your fetal transfusion appointment details:

**Please come to D Level Labour ward reception desk**

**at:……**

**on: ……..**

**Do not eat or drink after midnight on:……**

One of our fetal medicine midwives will meet you there and prepare you for theatre. We will ask you to change into a hospital gown and complete a theatre checklist with you.

You will also be seen by an anaesthetist who will place a cannula in the back of your hand, in case we should need to deliver your baby. Once the transfusion is complete, we will transfer you to a room on labour ward and begin a CTG (heart trace) to monitor your baby's well-being.

### Eating and drinking

You should not eat after midnight the night before your procedure, and only drink water after 07:30am. This is because on rare occasions your baby may become distressed during the procedure which could lead to a caesarean section. You will be able to eat and drink again after you have returned to labour ward and your baby's well-being has been assessed.

### Going home

You should be ready to go home approximately two hours after your procedure. On rare occasions we may suggest you stay overnight so we can monitor your baby's wellbeing. Please pack a small overnight bag and plan child and pet care in case this is necessary.

### Follow up

We will arrange a follow-up appointment in the fetal medicine unit where you will have an ultrasound scan. We will discuss plans for any further transfusions as needed.

### Contact us

If you have any further questions or would like to discuss having a fetal blood transfusion in more detail, please do not hesitate to contact us.

**Fetal medicine team**
Telephone: **023 8120 6025**

*Figure 1. Fetal tranfusion digram courtesy of Leeds Teaching Hospitals - reproduced with permission.*

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Version 1. Published Feb 2023. Due for review Feb 2027. 3282