

# Protecting women and babies with anti-D Immunoglobulin



## Blood Groups

Just as every human being is unique, so are the factors in your blood. People can belong to one of four blood groups, A, B, AB and O, which are substances carried on the red blood cells.

There is another important difference in people's blood called 'rhesus factor', or D-type, which is a substance found on the red blood cells. Blood group and D-type are inherited from both parents.

People who are 'rhesus' positive have what is known as the D antigen on the surface of their red blood cells – they are said to be D-positive.

People who are 'rhesus' negative do not have the D antigen on their blood cells – they are D-negative.

In Europe around 85% of people are D-positive and 15% D-negative.

## Why is the 'Rhesus' D-type important in pregnancy?

Unborn babies inherit their blood type from BOTH parents. This is important because pregnant women with D-negative blood can carry babies who have D-positive blood, having inherited the factor from the father.

However it is important to realise that not ALL babies who have D-positive fathers will have D-positive blood.

Inside the womb, the placenta usually acts as a barrier between the red blood cells of the mother and baby.

However, even in normal pregnancies small amounts of the baby's blood may cross over into the mother's blood stream.

The most common time for a baby's blood cells to get into the mother's blood is at the time of birth.

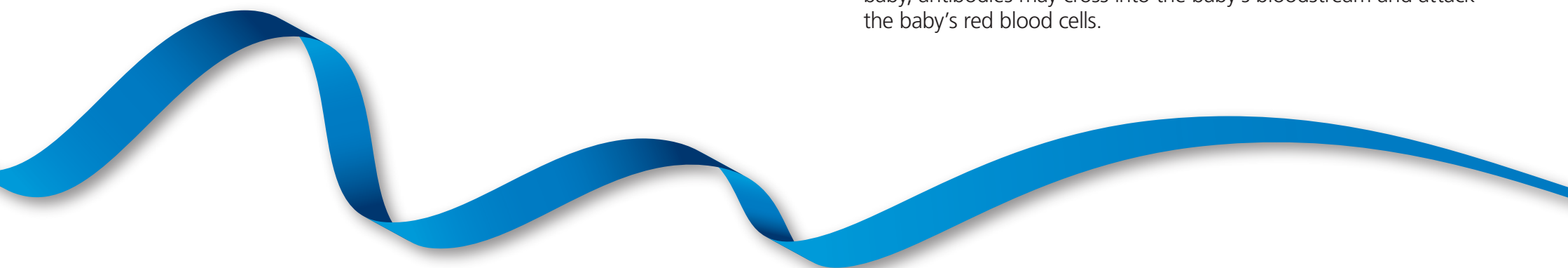
But it can happen at other times, for example during a miscarriage or termination of pregnancy, or if something happens during the pregnancy such as having an amniocentesis, chorionic villus sampling, vaginal bleeding or after abdominal injury such as following a fall, a blow to the abdomen or trauma from a seat belt.

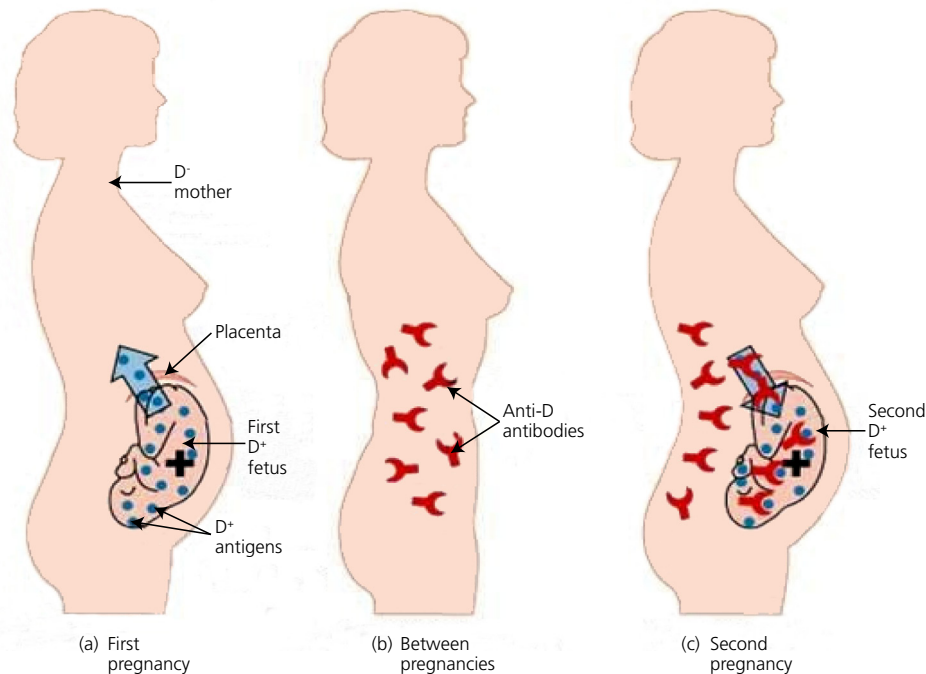
If any of the blood cells from a D-positive baby get into the blood of a D-negative woman, she recognises the D antigen in the baby's blood as a foreign substance and will produce antibodies to it.

This is called 'sensitisation', and anything that could cause the mother to produce antibodies against the D antigen is called a 'potentially sensitising event'.

As a general rule the first child that triggers this sensitisation does not suffer any adverse consequences, as it will already have been born by the time antibodies have developed.

However, if the woman becomes pregnant again with a D-positive baby, antibodies may cross into the baby's bloodstream and attack the baby's red blood cells.





This is called 'haemolytic disease of the fetus and newborn' or 'HDFN'.

HDFN can be mild, but if more severe can lead to anaemia, heart failure, jaundice, brain damage, or even to the death of the baby.

With further pregnancies and further D-positive babies the risk of earlier and more severe HDFN increases and the outcomes can be more serious. This is why a preventative measure such as the use of anti-D prophylaxis is so important.

There are about 65,000 births of D-positive babies to D-negative mothers in England and Wales each year and it is estimated that, without routine preventative treatment, there would be over 500 problem pregnancies each year, leading to the deaths of over 30 babies and more than 20 brain damaged children.

## Prophylaxis with anti-D immunoglobulin

Prophylaxis means giving a medicine to prevent something happening. Anti-D prophylaxis means giving a medicine called anti-D immunoglobulin to prevent a D-negative woman producing antibodies against D-positive blood cells and so to prevent the development of HDFN in an unborn baby.

Thanks to prophylaxis with anti-D immunoglobulin, sensitisation during pregnancy and after childbirth can now largely be prevented.

Anti-D immunoglobulin is given as an injection, usually into the muscle of the upper arm (intramuscular injection) or sometimes into a blood vein (intravenous injection).

## What exactly is anti-D immunoglobulin?

Anti-D immunoglobulin is made from the clear part of the blood, called plasma, and is sourced from countries outside of the UK. As with all blood products donors are screened very carefully and the plasma is treated during manufacture so that the chance of passing on any infection is very low.

## Anti-D prophylaxis during pregnancy

### a) Potentially Sensitising Events

In the event of potentially sensitising events such as the examples listed below, additional injections of anti-D immunoglobulin may be necessary.

- Impending or actual miscarriage.
- Ectopic pregnancy.
- Termination of pregnancy (abortion).
- Vaginal bleeding.
- Obstetric interventions such as chorionic villus sampling, amniocentesis, or external cephalic version (ECV) in a breech presentation.
- Abdominal injury e.g. after a fall, blow to the abdomen or a traffic accident.

**In order to reduce the possible effects of a sensitising event, it is crucial to report any events such as vaginal bleeding or abdominal injury to your midwife or doctor as soon as possible.**

### **b) Routine prophylaxis**

Generally, all pregnant women who are D-negative and who have not already been sensitised (those who already have antibodies to the D-antigen) are advised to have prophylaxis with an anti-D immunoglobulin, regardless of whether they have already received anti-D for a sensitising event. This is known as 'routine antenatal anti-D prophylaxis', or 'RAADP' and is achieved by either:

- a single injection of 1500IU between the 28th and 30th week of pregnancy, or
- two injections of at least 500IU, one at 28 and one at 34 weeks.

### **Anti-D prophylaxis after childbirth**

After birth, your baby's blood group will be tested. If your baby is found to be D-positive, you will receive a further injection of anti-D immunoglobulin, ideally within 3 days of delivery for it to be effective. This is known as 'postnatal prophylaxis'.

If baby's blood group has not been tested, or if there is any doubt as to the result, then you should receive anti-D.

### **Does every D-negative pregnant woman need prophylaxis?**

There are certain circumstances when this treatment may not be necessary:

- If you have opted for sterilisation after birth, though it may still be routinely offered.
- If you are certain that the father of the child is D-negative.
- If it is certain you will not have another child after the current pregnancy.
- If your antenatal clinic offers a screening test looking at baby's DNA in your blood that can show whether the baby is D-negative.

### **What should I do next?**

If you are pregnant and have been informed that you are D-negative, the person responsible for delivering your antepartum care (midwife, obstetrician or GP) should discuss anti-D prophylaxis with you and explain the options available so that you can make an informed choice about treatment.

### **Anti-D prophylaxis following miscarriage, termination of pregnancy or stillbirth**

The loss of any pregnancy, for whatever reason, is traumatic for all those involved and there are many competing concerns following such a difficult time.

However it is still important to receive anti-D immunoglobulin, to reduce the risk of sensitisation and problems in following pregnancies. This is the case even where it is not possible to determine the baby's blood group.

Your midwife, nurse or doctor should discuss anti-D prophylaxis with you so that you are able to make an informed choice as to your treatment.

Generally, anti-D prophylaxis is advised for:

- Any women undergoing expectant, surgical or medical management of miscarriage (including molar pregnancy).
- Any woman undergoing expectant, medical or surgical management of ectopic pregnancy.
- Any woman undergoing medical or surgical termination of pregnancy (abortion).
- At diagnosis of intrauterine death and again following delivery of the baby.

**Remember – If in doubt, do not be afraid to ASK!**

# Appendix – Useful addresses and telephone numbers:

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**Midwife’s name:**.....

Telephone number:.....

**Hospital doctor’s name:**.....

Telephone number:.....

**GP’s name:**.....

Telephone number:.....

**Blood Group:**..... **Antibody Screen:**.....

Date Tested:.....

**Date of LMP:**..... **Date for RAADP:**.....

Patient Information Leaflet written by NHSBT Patient Blood Management Team, with acknowledgement to CSL Behring UK Ltd for kind permission to use text from their anti-D leaflet.

Further information may be accessed at:  
[www.nhs.uk/conditions/Rhesus-disease/Pages/Introduction.aspx](http://www.nhs.uk/conditions/Rhesus-disease/Pages/Introduction.aspx)

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## NHS Blood and Transplant

NHS Blood and Transplant (NHSBT) saves and improves lives by providing a safe, reliable and efficient supply of blood and associated services to the NHS in England and North Wales. We are the organ donor organisation for the UK and are responsible for matching and allocating donated organs. We rely on thousands of members of the public who voluntarily donate their blood, organs, tissues and stem cells.

### For more information

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