

D negative mother's blood test to check her unborn baby's blood group



This leaflet explains why you are recommended to have a blood test to check your baby's D blood group, so that you only receive anti-D injections if you need them. It also explains what haemolytic disease of the fetus and newborn is.

This patient information leaflet does not replace the guidance provided by your treating clinician/midwife. Your clinician/midwife should advise you of the options that exist for your treatment, advise of any alternative treatment and associated risks. Your clinician/midwife should ensure that you are aware of the material risks of injury associated with this treatment. If you are unsure about any aspects of your treatment/care ask your clinician/midwife to explain

Please also read other leaflets from your Hospital Trust and NHS Blood and Transplant such as: **Blood Groups and Red Cell Antibodies in Pregnancy**. If you have not seen these leaflets, please ask your midwife or obstetrician.



Why is it important to know my D blood type (also known as 'Rhesus D', 'RhD' or 'Rhesus')?

Identifying your blood group and detecting red cell antibodies in pregnant women is important to prevent haemolytic disease of the fetus and newborn (HDFN).

In addition to the four main blood types / blood groups, O, A, B and AB there is another clinically significant blood group / type called D. You may be D positive or D negative. So, for example, you could be A positive, or A negative (the terms 'positive' and 'negative' relate to your D blood group status). 15% of people have a D negative blood group.

What is Haemolytic Disease of the Fetus and Newborn (HDFN)?

HDFN, previously known as rhesus disease, is a blood disorder in a fetus (an unborn baby) or a newborn baby. HDFN may develop when a mother and her unborn baby have different blood types (called 'incompatibility'). The mother produces substances called antibodies that attack the developing baby's red blood cells.

The D status only matters if a D negative mother is carrying a D positive baby. If any of the red blood cells from the D positive baby get into the blood of the D negative mother, her immune system may recognise the D protein on the surface of the baby's red cells as a 'foreign' substance and produce D antibodies. Women who are D positive do not produce D antibodies.



Anti-D antibodies can cross from the mother's blood into the unborn baby's blood and destroy the baby's red blood cells causing anaemia, jaundice and in severe cases brain damage or even death of the baby while in the womb or after delivery.

The antibodies remain in the mother's blood and they may also damage the red cells of a subsequent baby, if he or she has the same blood group as the first.

How can haemolytic disease of the fetus and newborn (HDFN) be prevented?

HDFN is prevented by giving anti-D injections to mothers who are D negative and have no D antibodies. This treatment can usually prevent HDFN and has been routine practice for many years.

What is anti-D and what are its associated risks?

Anti-D injections are made from plasma. Plasma is the fluid part of blood, which transports blood cells around the body. The plasma used in anti-D injections is collected from blood donors.



Can anti-D injection cause any adverse effects?

Common side effects: Soreness at the injection site is common. The soreness lasts for a few hours to a day or two.

Uncommon side effects: a mild fever, headache or rash. Very occasionally women can experience an allergic reaction to anti-D injections. If you have any concerns, please speak to your midwife or obstetrician.

Transmission of infection from anti-D injections has never occurred in the UK despite thousands of doses having been administered to pregnant women every year since the late 1960s. The possibility of a very small risk of infection from the plasma donors cannot however be completely ruled out. Please speak to your midwife or obstetrician, if you have any concerns.

Do all D negative mothers need anti-D?

Anti-D injections are only needed if a D negative woman is pregnant with a D positive baby. In about one in three pregnancies, the baby will be D negative and the anti-D injection would be unnecessary.

By identifying the unborn baby's blood group, we can ensure that only women who need it will receive anti-D.



Anti-D is offered if it is possible that some of the baby's blood may have passed into the pregnant woman's blood for example if there is vaginal bleeding, if there has been an injury to the pregnant woman of any kind, or if a doctor or midwife needs to undertake some form of investigation or treatment for the mother or baby during pregnancy such as amniocentesis. When the unborn baby's blood group is known to be D negative, injections will not be needed. If healthcare staff do not know the baby's D blood group, then an anti-D injection would be recommended.

Determining the unborn baby's blood group (fetal blood group)

A small amount of the unborn baby's DNA is present in the mother's blood. By detecting the baby's DNA in the mother's blood, it is possible to determine the unborn baby's D blood group. This is the fetal *RHD* screening test.

NHS Blood and Transplant is now able to offer this screening test to hospitals in England.

Can I have this test if I carry twins?

You can have the fetal *RHD* screening test if you carry more than one baby. If at least one of your babies is D positive you will need anti-D.



Where and when can I have a fetal *RHD* screening test to determine my baby's blood group?

A sample of your blood for the fetal *RHD* screening test can be taken by your community midwife from 11 weeks plus 2 day's gestation (usually 15 weeks) onwards.

How will the results affect my treatment?

Unborn baby is D positive

If your blood test report shows that your unborn baby is D positive, or the result is inconclusive, you will be offered an anti-D injection. However, 2.0% of these babies may in fact be D negative. This is of no concern as anti-D prophylaxis would have been offered in all cases if DNA testing had not taken place and the injection will not harm your baby.

Unborn baby is D negative

If the unborn baby is predicted to be D negative, we suggest you do not have anti-D injections before or after giving birth.

How accurate is the fetal *RHD* screening test?

If the unborn baby is predicted to be D negative there is a very small chance (0.1%, or 1:1000) that the baby might be found to be D positive after birth. In this case, you will be given an anti-D injection at that time



What is the risk when my baby was predicted D negative but tests D positive at birth?

Only 1% of D negative women become sensitised if they receive anti-D injections at birth only and do not receive anti-D at 28 weeks. The possibility of getting sensitised is reduced to 0.35% when you receive anti-D injections at 28 weeks and at birth.

What is the failure rate of anti-D injections?

The failure rate is 0.37% according to the NICE Health technology assessment 2003.

What if I attend a different hospital?

When you attend another hospital, they may wish to offer you anti-D even if your baby is D negative. Please show them this leaflet and your fetal *RHD* screening test results.

What options do I have?

When you have the test results, you can request to have the anti-D injection even if the result predicts that the unborn baby is D negative.

Equally you can decline to have anti-D injection(s) even if we recommend it in cases where your unborn baby is predicted to be D positive.

To understand the implications of the results from your fetal *RHD* screening test and your treatment options, we recommend discussing your wishes with your midwife, doctor or other lead clinician who is responsible for your care.

Further Information

If you have questions about the information in this leaflet, or if there are things that worry you, please ask your doctor or midwife.

You may also find these websites useful:

Antenatal screening in general:

<https://legacyscreening.phe.org.uk/alloantibody>

Routine antenatal anti-D prophylaxis:

www.nice.org.uk/nicemedia/pdf/TA156PublicInfo.pdf

Fetal *RHD* screening test or also known as high-throughput non-invasive prenatal testing (NIPT) for fetal *RHD* genotype

<https://www.nice.org.uk/guidance/dg25>

A to Z of useful terms

Amniocentesis: a test sometimes carried out in pregnancy to check on the baby's progress in the womb. A small sample of the fluid surrounding your baby is taken for laboratory tests.

Anaemia: levels of red cells in the blood which are below normal.

Antibodies: are produced by your immune system to fight against infections or anything foreign which enters your blood.

Anti-D: an antibody which attacks red blood cells that are D positive. The cause of HDFN.

Anti-D immunoglobulin: ready-made anti-D which is given to stop you making your own anti-D. The plasma used to make anti-D injections in England is imported from countries with effective infectious disease screening programmes where there have been no reported cases of variant Creutzfeldt-Jakob Disease (vCJD)

Blood group: ABO and D are blood groups, e.g. A, D positive or A, D negative. Your blood group is made up of natural substances on the surface of your red blood cells.

Haemolytic disease of the fetus and newborn (HDFN): anaemia and jaundice in newborn babies caused by antibodies in the mother affecting the baby's red cells. This can cause anaemia, jaundice and in severe cases brain damage or death, either while the baby is in the womb or after delivery.

Jaundice: raised levels of waste products from the breakdown of red blood cells. It gives a yellow colour to a baby's skin and eyes.

Plasma: the liquid part of blood. Prophylactic anti-D is made from the plasma of specially selected blood donors.

Prophylactic anti-D: ready-made anti-D given to D negative women to stop them making harmful anti-D. (See also anti-D immunoglobulin).

Prophylaxis: medicines given to prevent a harmful condition developing.

Red Cell Antibodies: antibodies are produced by your immune system to fight against infections or anything foreign which enters your blood. Red cell antibodies are your body's natural defence against red blood cells which are different from your own. Antibodies can destroy red blood cells.

Rhesus disease: is now known as Haemolytic Disease of the Fetus and Newborn (HDFN) caused by the anti-D antibody.

Rhesus positive or Rhesus negative: other names for 'D positive' or 'D negative' blood groups.

Routine antenatal prophylaxis: injections of ready-made anti-D offered to women who are D negative to stop them making anti-D. This is given during late pregnancy and after incidents which may cause your baby's red cells to leak into your blood.

Variante Creutzfeldt-Jakob Disease (vCJD): Since the emergence of vCJD in the UK the medical advice has been not to use UK blood in manufacturing for plasma products. Plasma is imported from a publically owned source to treat patients born after 1st January 1996 as a risk reduction measure against the possible transmission of vCJD because, as yet, there is no specific test available for screening blood donors. This blood has been tested negative to UK standards for HIV, Hepatitis B and C. This measure is taken in line with advice from the Government advisory committee on the Safety of Blood, Tissues and Organs (SaBTO).

Data Protection

NHS Blood and Transplant keeps a record of all the tests it performs and any advice it offers to your healthcare team, to run its service effectively and safely. Your data will be held securely and in accordance with your rights under the Data Protection Act 1998.

Because of the rarity of haemolytic disease of the newborn, we ask hospitals for a few details about any baby that is affected, soon after the baby is born.

We need this information to help us improve our knowledge, and give the best care possible to all mums and their babies.

NHS Blood and Transplant is a Specialist Health Authority within the NHS.

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

Visit nhsbt.nhs.uk

Email enquiries@nhsbt.nhs.uk

Call **0300 123 23 23**