Prevention of Haemolytic Disease of the Newborn (HDN) during pregnancy

During pregnancy, there are times when there is an increased risk of the baby's blood crossing the placenta into the mother's bloodstream. Some examples include when tests such as amniocentesis are performed, if a miscarriage occurs or if the mother is involved in an accident with a major blow to her abdomen. At such times it is also necessary to give all Rh (D) negative mothers an injection of Rh (D) immunoglobulin. Your doctor or midwife will know when to recommend an injection of Rh (D) immunoglobulin.

It is also known, however, that even in a normal pregnancy, blood from the baby can cross the placenta. Because of this, a small number of Rh (D) negative mothers will still develop antibodies to the baby's Rh (D) positive red blood cells even though they may receive an injection of Rh (D) immunoglobulin after delivery.

To further reduce the chance of Haemolytic Disease of the Newborn (HDN) caused by Rh (D) antibodies, it has been recommended that for all of their pregnancies, **all** Rh (D) negative women should receive Rh (D) immunoglobulin injections at 28 and 34 weeks gestation (antenatal prophylaxis) as well as at delivery. It is also recommended following sensitising events such as miscarriage, termination of pregnancy, amniocentesis or abdominal trauma considered to be sufficient to cause the crossing of fetal blood into the mother's bloodstream. Research shows that this does not harm the baby and will reduce the chance of Haemolytic Disease of the Newborn (HDN).

Where does the Rh (D) immunoglobulin come from?

Injections of Rh (D) immunoglobulin are made from the plasma of carefully selected blood donors.

In 1968, Australia became the first country in the world to make enough Rh (D) immunoglobulin to meet the country's needs. Unfortunately many of the donors from whom the plasma comes are now growing old. The Australian Red Cross Blood Service has initiated a special blood donor program to further increase the Australian supply of Rh (D) immunoglobulin.

Until the Australian supply of Rh (D) immunoglobulin increases sufficiently, an Rh (D) immunoglobulin product is also being imported from Canada.

This additional supply of Rh (D) immunoglobulin product has enabled healthcare professionals to further reduce the risk of Haemolytic Disease of the Newborn (HDN), in Rh (D) negative women by routinely giving Rh (D) immunoglobulin injections at 28 and 34 weeks gestation for all pregnancies.

Viral safety of Rh (D) immunoglobulin

In Australia to date, there has never been a confirmed case of transmission of hepatitis B or C or HIV from Rh(D) immunoglobulin products supplied in Australia. The risk of viral and other infectious agents' infectivity, however, cannot be totally eliminated.

If you have any questions about the risks and benefits of Rh(D) immunoglobulin, or your treatment generally, consult your doctor.

Giving your consent

Everyone has the right to decide whether or not to have any treatment. Before giving consent, it is important to understand why you need the treatment and also its risks and benefits for you. If you have further questions after reading this leaflet, please ask your doctor or midwife.

This booklet has been endorsed by:
RANZCOG (Royal Australian and New Zealand College of Obstetricians and Gynaecologists)
RACGP (Royal Australian College of General Practioners)
ANZSBT (Australian and New Zealand Society of Blood Transfusion)
ACMI (Australian College of Midwives Inc)
ARCBS (Australian Red Cross Blood Service)
NBA (National Blood Authority)
CSL Bioplasma

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ARCBS Transfusion Medicine Specialist
Internet: www.donateblood.com.au/clinical

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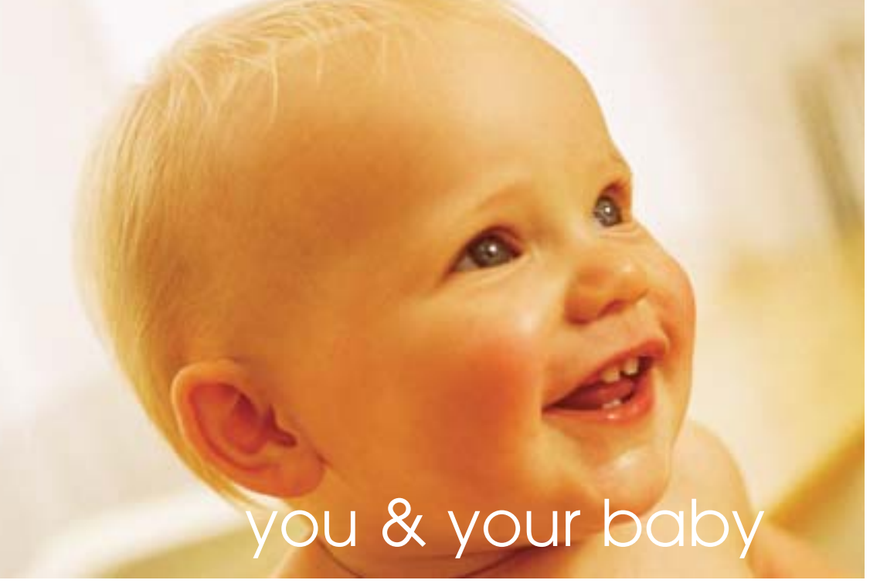
Changes in Rh (D) immunoglobulin antenatal prophylaxis in Australia for all pregnant women with Rh (D) negative blood group.
Implementation by 1 January 2005

You & Your Baby

Important Information for Rh (D) Negative Women



you & your baby

Your baby's blood type is jointly inherited from you and your baby's father. For this reason, you and your baby may have different blood types. This is normal and usually not a problem. However, in some cases, these differences can be very important.

This booklet describes one important blood type difference that may occur between a mother and baby which may cause harm to the baby. It explains how **Rh (D) immunoglobulin, a special antibody injection, can avoid this potential harm in pregnancy.**

Rh (D) immunoglobulin injection is also commonly referred to as anti-D.

What is the Rh factor?

The Rh factor is the name given to a blood group protein, Rh(D), which is attached to red blood cells. Some people have this protein on their red blood cells and others do not.

On average, of every 100 people:

- 83 will have the Rh factor; their blood type is called 'Rh(D) positive'
- 17 will not have the Rh factor; their blood type is called 'Rh(D) negative'

The percentage of Rh negative women may vary across ethnic groups.

Your baby's blood type is jointly inherited from you and your baby's father. For this reason, you and your baby may have different blood types. Usually, this is not a problem. When, however, a mother's blood type is Rh (D) negative and the baby is Rh (D) positive, serious complications can occur with current and future babies. Rh (D) immunoglobulin, a special antibody injection, can avoid this potential harm.

How can the Rh factor affect your baby?

During pregnancy and labour, a small amount of your baby's red blood cells can cross the placenta into your bloodstream. If your blood type is Rh (D) negative, and your baby's blood type is Rh (D) positive, your immune system can react by producing antibodies to your baby's red blood cells.

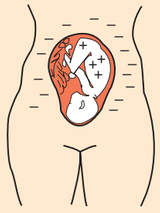
Antibodies are an important component of the body's natural defence system. In this situation, antibodies may cross the placenta to the baby and destroy the baby's red blood cells. If these antibodies develop, they will not normally affect the first Rh (D) positive baby. The immune system, however, has a good memory, and can rapidly produce high levels of these antibodies if there is contact with Rh(D) positive blood in a future pregnancy.

This may lead to serious complications such as severe anaemia, brain damage and even death of the baby in some cases. This condition is known as Haemolytic Disease of the Newborn (HDN). Due to the potential serious effects of HDN, prevention of the problem is the key.

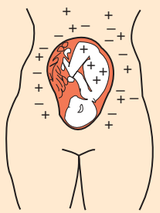
Diagram showing sequence of events which can lead to Haemolytic Disease of the Newborn (HDN).

Legend

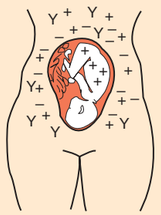
– represents the mother's Rh (D) negative red blood cells
\+ represents the baby's Rh (D) positive red blood cells
Y represents antibodies produced by the mother's immune system against Rh (D) positive red blood cells



Rh (D) negative mother with Rh (D) positive baby.

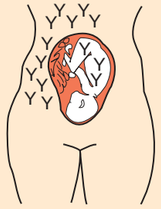


Rh (D) positive red blood cells from the baby enter the mother's blood stream either after the birth of the baby or during the pregnancy. eg. amniocentesis or major blow to the abdomen.



Antibodies (Y) are produced by the mother's immune system to destroy the Rh (D) positive red blood cells in the mother's blood. The Rh (D) antibodies remain for many years.

In the next pregnancy with an Rh (D) positive baby, the mother's antibodies may cross the placenta and destroy the baby's red blood cells.



If the baby's red blood cells are destroyed, it can lead to Haemolytic Disease of the Newborn (HDN) in the baby.

The Rh factor will not affect your pregnancy if:

- You are Rh (D) positive and your baby is Rh (D) negative
- You are Rh (D) positive and your baby is also Rh (D) positive
- You are Rh (D) negative and your baby is also Rh (D) negative

Prevention of Haemolytic Disease of the Newborn (HDN) following birth

The most likely time that the baby's blood will cross the placenta into the mother's bloodstream is during labour and delivery.

To reduce the chance of the mother forming antibodies to the baby's red blood cells, an injection of Rh (D) immunoglobulin is given to all Rh (D) negative women (who do not already have antibodies) who have given birth to an Rh (D) positive baby.

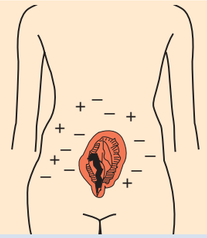
This Rh (D) immunoglobulin injection contains antibodies to destroy the red blood cells that may have passed from the baby into the mother's bloodstream during the baby's delivery.

The Rh (D) immunoglobulin injection is given before the mother's immune system has the chance to make its own antibodies against the baby's Rh (D) positive blood, which could then cause harm to a future baby.

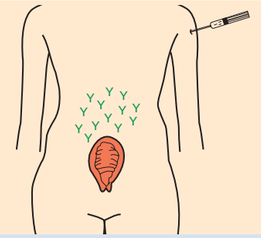
Diagrams showing the sequence of events following injection of Rh (D) immunoglobulin.

Legend

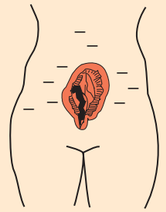
– represents the mother's Rh (D) negative red blood cells
\+ represents the baby's Rh (D) positive red blood cells
Y represents Rh (D) immunoglobulin given by injection to remove Rh (D) positive red blood cells

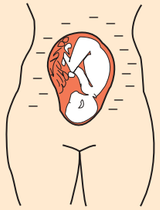


Rh (D) positive red blood cells from the baby enter the mother's blood stream (usually at birth).



Rh (D) immunoglobulin (Y) is injected within 72 hours of the baby's birth to remove Rh (D) positive red blood cells from the mother's blood stream. The mother's immune system does not produce antibodies to the Rh (D) positive red blood cells.





The Rh (D) immunoglobulin injection is given before the mother's immune system has the chance to make its own antibodies against the baby's Rh (D) positive blood. Therefore in the next pregnancy with an Rh (D) positive baby, the mother does not have pre-formed antibodies which can destroy the baby's red blood cells.