

Antibodies Against Red Blood Cells in Pregnancy:

Information for Alloimmunized Pregnant Women¹ version July 2022

What is an antibody and why does it matter in pregnancy?

- An antibody is a protein that is produced by the body's immune system when it 'sees' foreign substances, called antigens¹.
- Antibodies against red blood cell proteins can form if your immune system 'sees' red cells from another person after a blood transfusion or during pregnancy². This is called alloimmunization
- In pregnancy, there can be mixing of the unborn baby's blood with the mother's blood. Sometimes, the baby carries antigens on their red blood cells that the mother's immune system has not seen before (inherited from the father).
- There are many different types of red blood cell antibodies that can form. Some are harmless, but others can be dangerous to an unborn baby during pregnancy. Examples of antibodies that may harm a baby are Anti-D, Anti-C, Anti-c, Anti-E, Anti-e, Anti-M and Anti-Kell.
- If the mother has an antibody against antigens on the baby's red blood cells, these can cross through the placenta into the baby and break down the baby's red blood cells. This is called hemolysis and can lead to hemolytic disease of the newborn (HDN).
- Babies that develop HDN can have health problems such as low hemoglobin (anemia) or jaundice, which require treatment.

HDN can cause heart problems and brain changes due to low oxygen with anemia or high levels of bilirubin (which causes jaundice). Bilirubin is poisonous to brain. Babies can become very sick, suffer from long-term health problems, or die if the anemia and jaundice are not treated.

How do I find out if I have an antibody?

- A blood test early in pregnancy will signal if you have any antibodies that could possibly harm your baby. Your doctor will provide you with the requisition to have this blood work done.

How can I protect my baby from Hemolytic Disease of the Newborn (HDN) due to antibodies?

- Follow the instructions from your doctor about when to get your blood work done. The lab is able to test the titer level (strength) of your antibody throughout your pregnancy. If the levels stay below a certain level, your baby will not be at risk for hemolytic disease.

¹ Inclusivity

This information was written using language supporting women at the center of care. PRAMS is committed to respecting the rights of all people. This includes transgender, gender non-binary, and intersex people that may find this information helpful. Healthcare providers should have respectful conversation with patients about their gender identity and be sure that preferred gender pronouns are used to provide safe and appropriate care.



Have your partner tested, if possible, to check his red blood cell proteins. This will help doctors understand the risk of HDN in your baby.

- **Your baby will inherit half of his/her antigens from the mother and half from the father.** If your partner tests positive for the antigen that binds with mom's antibody, then there is a chance the baby will have the antigen and be at risk of HDN.
- If your partner does not carry the red blood cell antigen that binds with mom's antibody and you are sure he is the father, your baby will not be at risk for HDN. Your doctor can provide your partner with the proper requisition for this test.

What happens if there is a risk that my baby will have HDN?

- If there is a chance your baby is at risk of HDN, your doctor may refer you to a specialist.
- If your antibody levels become too high (or the antibody you have is Anti-Kell at *any* level), a Maternal Fetal Medicine (MFM) specialist can do special ultrasounds to make sure your baby is healthy and to provide appropriate management if baby is found to have anemia (low hemoglobin).
- In **rare cases**, severe anemia because of HDN may happen. If this is the case, your doctor will discuss options for your unborn baby to receive a blood transfusion while still in your womb.
- Depending on when you are due and the strength of your antibody, your doctor may recommend that you be induced a bit earlier than your planned delivery date.
- It is really important that you follow your doctor's recommendations to keep your baby safe.

Can I find out if my baby has the antigen on their red blood cells putting them at risk for HDN?

- If your antibody titer reaches a critical level, or the antibody you have is Anti-Kell, a Maternal Fetal Medicine (MFM) specialist may be able to test your blood to determine if your baby has the antigen. This test is called cell free fetal DNA for red blood cell antigens. It is sent out of country, so there are very specific guidelines for who should have this testing. You can find out more information on this from your doctor.
- After delivery, your baby's cord blood will be tested for the antigen and determine if your baby is at risk of HDN. Taking this sample from the cord does not hurt the baby.

What will happen to my baby if he/she is found to have the antigen on cord blood testing?

- Once delivered, your baby may be at risk for jaundice and anemia. Your baby's doctor will monitor them carefully. Monitoring bilirubin (which causes jaundice) can be done with a special light through the skin. But, if this monitoring shows the bilirubin levels are high, your baby will need a blood test to get a more accurate result.

- To prevent complications from jaundice, your baby may have to be admitted to hospital for treatment with a special light. If the anemia is severe, your baby may need a special type of blood transfusion.

Will this antibody be a problem in my next pregnancy?

- It may be. In each pregnancy, the risk of HDN will depend on whether the baby has a chance of inheriting the antibody from the father.
- Sometimes the antibody can weaken or go away in your next pregnancy. Other times it can get stronger and be more dangerous to your unborn baby.
- If your baby was affected by Hemolytic Disease in this pregnancy, there is a higher chance that your next pregnancy will be affected too. Your doctor will monitor your antibody levels throughout your next pregnancy as well.

**Tell your doctor when you are pregnant again so they can do your
Prenatal Screen!**

Your healthcare provider will talk to you about alloimmunization in pregnancy and discuss the risks involved. This is a good time to ask any other questions you may have. You can write down your questions here to be ready to talk to your provider.

PRAMS is a provincial program of the Saskatchewan Health Authority. PRAMS focuses on the *Prevention of Alloimmunization in Mothers of Saskatchewan* by supporting healthcare providers in their care of pregnant patients who are at risk of forming antibodies. PRAMS Registered Nurse Specialists can assist healthcare providers and their patients in understanding how to manage antibody risks during pregnancy. For questions or further learning, a PRAMS Nurse Coordinator can be contacted at prams@saskhealthauthority.ca Permission to photocopy.

1-Medlineplus.gov

2- https://www.chesterfieldroyal.nhs.uk/Blood_groups_red_cell_antibodies_in_pregnancy.pdf