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## Blood groups

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### Summary

- The two major classifications of blood are the ABO system and the Rh system.
  - The four blood groups are A, B, AB and O. Each of these will be either Rh-positive or Rh-negative.
  - In an emergency, a transfusion of O negative red blood cells can be given to anybody, but it is better to match the exact blood group to avoid serious reactions.
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The circulatory system consists of the heart, blood vessels and blood. The blood carries oxygen and nutrients to every cell in the body and picks up waste products (such as carbon dioxide) for removal from the body.

The bulk of your blood is made up of plasma. Floating in the plasma are the red blood cells that carry oxygen, the white cells that form part of the immune system, and clotting cells called platelets.

The two main ways to classify blood groups are the ABO system and the Rh system. Together, they make up the eight main blood groups. Other blood group systems exist – to date, researchers have identified around 300 minor blood groups.

### The ABO blood group

The four different blood groups in the ABO system are A, B, AB and O. A person's blood group is determined by a pair of genes, one gene inherited from each parent.

Each blood group is identified by its own set of molecules (called antigens), which are located on the surface of red blood cells. When a person needs a blood transfusion, the donated blood must match the recipient's blood or complications will occur.

### The Rh type blood factor

A person's blood type used to be called their 'Rhesus type' but now we say 'Rh type'. Your Rh type is determined by a different pair of genes to the ones that determine your ABO blood type (again, one inherited from each parent). Blood is either Rh-positive or Rh-negative, depending on whether certain molecules are present. A person who is Rh-negative will experience a severe immune-system reaction if Rh-positive blood gets into their bloodstream.

### Blood groups in Australia

A person's blood group is described by the appropriate letter (A, B, AB or O) and by whether their blood is Rh-positive or Rh-negative.

According to the Australian Red Cross Blood Service, the percentage of blood group frequency in Australia is:

- O positive – 40 per cent
- O negative – 9 per cent
- A positive – 31 per cent
- A negative – 7 per cent
- B positive – 8 per cent
- B negative – 2 per cent
- AB positive – 2 per cent
- AB negative – 1 per cent.

## Blood transfusion

A blood transfusion is the transfer of blood or blood components from one person to another. Transfusions are of red blood cells or other components such as plasma or platelets.

O negative red blood cells can be given to anybody if necessary, but it is always preferable to match the exact blood group. Australia has one of the safest blood supplies in the world, and donating blood here is a very safe process.

Read more about [blood transfusions](#) and [donating blood](#).

## Rh blood factor and pregnancy

Problems can occur during pregnancy if an Rh-negative woman carries an Rh-positive baby. If blood cells from the baby travel across the placenta, the woman's immune system will see the Rh-positive cells as a threat. Specialised white blood cells will make antibodies designed to kill Rh-positive blood cells.

If the woman later conceives another Rh-positive baby, her immune system will flood the fetus with antibodies. These antibodies then destroy the baby's red blood cells. If left untreated, this can result in severe anaemia or even death of the baby. This is called haemolytic disease of the newborn (HDN).

## Preventing haemolytic disease of the newborn (HDN)

HDN is now rare, since Rh-negative mothers are immunised throughout their pregnancy and within 72 hours of giving birth, using an immunoglobulin made from donated blood products. The immunoglobulin breaks down the baby's red blood cells inside the mother's bloodstream before her immune system has time to react.

## Where to get help

- Your **GP (doctor)**
- **[Australian Red Cross Blood Service](#)** Tel. **13 14 95**

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Australian Red Cross Blood Service

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