

Blood transfusions

A guide to red blood cell, platelet, fresh frozen plasma (FFP) and cryoprecipitate transfusions

A blood transfusion is a treatment where you receive blood that has been donated from someone else. The blood is usually given to you through a plastic tube into a vein in your arm.

This fact sheet explains the different types of blood transfusion used to treat people with blood cancer or a related condition, describes what happens when you have a transfusion and outlines the possible risks.

Why do I need a blood transfusion?

Most blood cancers and their treatments affect the cells in your bone marrow that produce blood. This can lead to you not having enough healthy cells in your blood. This is what causes many of the symptoms of blood cancer and makes you feel unwell. A blood transfusion can provide you with healthy blood cells until your body can produce its own. This may help to relieve your symptoms.

The treatment you have for blood cancer can also lower the number of cells in your blood – for example, if you're having chemotherapy, radiotherapy or a stem cell transplant. You may need to have blood transfusions to replace these cells.

Blood transfusions are known as 'supportive care' treatments, because they do not treat the blood cancer itself but can reduce your symptoms and the side effects of treatment.

If you have blood cancer or a related condition, you may need to have one or more blood transfusions as part of the care you receive. You can receive these with or without other treatments.

You can find out more about your blood and bone marrow in our free printed information booklets, which cover many types of blood cancer.

You can also find this information on our website: [bloodwise.org.uk/info-support/blood-cancer](https://www.bloodwise.org.uk/info-support/blood-cancer)

Types of blood transfusions

You're most likely to have red blood cell transfusions and platelet transfusions.

Red cell transfusions

Your red blood cells contain a protein called haemoglobin that carries oxygen around your body. Some blood conditions and treatments stop your body producing enough healthy red blood cells – a condition known as anaemia.

Anaemia can cause symptoms such as breathlessness, feeling cold, headaches, chest pain, dizziness and extreme tiredness (fatigue). It can be caused by the cancer or it can be a side effect of your treatment. You're most likely to have these symptoms several days after having treatment, when your blood counts are at their lowest. If you have symptoms of anaemia, your doctors might recommend that you have a red blood cell transfusion.

Platelet transfusions

Platelets are a type of blood cell that help to form blood clots, to stop you bleeding. When the level of platelets in your blood is low, this can cause you to bruise more easily or lead to nose bleeds or bleeding gums.

Your healthcare team will monitor your platelet levels closely while you're having treatment, and they'll recommend you have a platelet transfusion if you need one.

Fresh frozen plasma (FFP) transfusions

Plasma is a fluid that transports your blood cells, nutrients, and proteins – some of which naturally help your blood to clot. A low level of clotting proteins can lead to bleeding. FFP transfusions are quite rare, but you might need one if you've had a large bleed (after an operation for example), where your body's own clotting proteins have been used up.

You might also need FFP if you have problems with your liver, which may be caused by your treatment or your condition. FFP is frozen soon after it's been donated, and it can be safely thawed and given to you when it's needed.

Cryoprecipitate transfusions

Cryoprecipitate is made by thawing FFP, collecting certain proteins and then freezing it again. It can then be thawed for when you need it.

Cryoprecipitate contains a high amount of a protein called fibrinogen, which is needed to help your blood clot. You may have a cryoprecipitate transfusion if you don't have enough fibrinogen in your body – for example, if you've had a large bleed or if you've been born with fibrinogen that doesn't work properly.

White blood cell transfusions

White blood cells are also affected by blood cancer and its treatment. However, white blood cell transfusions are very rarely done as these cells only live for a few days.

How safe are blood transfusions?

There are many ways in which blood transfusions are made as safe as possible for you.

Testing

All donated blood in the UK is tested (screened) carefully for infections that might be spread

by transfusion, such as HIV, hepatitis B, C and E, and syphilis. This means the risk of getting an infection from a blood transfusion is very low.

If you're pregnant and receiving treatment, your healthcare team will make sure you receive blood and platelets that are CMV-negative, which means they do not contain the cytomegalovirus (CMV).

CMV is a common virus that causes no or mild symptoms for most people, but it can be dangerous in pregnancy because it can affect your unborn baby, which can lead to problems in the baby's development. For this reason, all pregnant women receive specially selected CMV-negative blood.

White blood cell removal

As well as this, all donated blood in the UK is filtered to remove white blood cells – except in the very rare case of white blood cell transfusions. This lowers the risk of infection from diseases such as variant Creutzfeldt-Jakob disease (vCJD), which is linked to 'mad cow disease' (medically known as 'BSE').

To reduce this risk even further, in the UK, anyone born after 1996 who needs a FFP transfusion will receive FFP that has been donated from outside of the UK. To-date, no-one in the UK has developed vCJD from blood that's been given while both of these measures have been in place, so the risk to you is very small.

Other checks

Your healthcare team will carry out many checks to make sure you receive the right transfusion for you. They'll check the blood you're going to receive in front of you. They'll ask for your name, date of birth and hospital number or address, and check this against your identification (ID) band. An ID band is a name band with all your details on it. It's very important that this is checked, so the nursing staff can be sure you receive a safe transfusion of the right type of blood.

For more information about the safety of blood transfusions, go to [nhs.uk/conditions/blood-transfusion](https://www.nhs.uk/conditions/blood-transfusion)

Irradiated blood

In some situations – for example, before and after a stem cell transplant or if you've had certain chemotherapy drugs – the donated blood you receive will need to be treated with radiation (irradiated) first. Your doctor will tell you if this applies to you.

This is done to prevent a condition called transfusion-associated graft-versus-host disease (TA-GvHD), and won't cause any harm to you. TA-GvHD is a rare but serious complication, where your immune system reacts against the donor cells. The radiation removes the risk of this happening.

Irradiated blood will be given to anyone who has had:

- › a stem cell transplant (using your own or a donor's stem cells)
- › treatment with a group of chemotherapy drugs known as purine analogues – for example bendamustine or fludarabine
- › treatment with a biological therapy drug called alemtuzumab
- › treatment with antithymocyte globulin or antilymphocyte globulin (these are medicines used to stop the immune system attacking healthy cells, and are given with a transplant or for conditions such as aplastic anaemia), or
- › Hodgkin lymphoma.

Can I refuse a transfusion?

Everyone has the right to refuse treatment. If you decide you don't want a blood transfusion, it's important to discuss this with your doctor and / or nurse. They'll be able to tell you about possible alternatives to a transfusion that might help to manage your symptoms, although there aren't always other options available.

Having a blood transfusion

Before the transfusion

Before a transfusion, you'll usually have a blood sample taken to check your blood counts, and you may have to wait for the results before you have a transfusion.

Your healthcare team will also check your vital signs (temperature, blood pressure, pulse, how much oxygen your blood is carrying and how many breaths you take per minute) and assess anything that could put you at risk. If necessary, they may advise delaying the transfusion, but will discuss the reasons for this with you.

If you're taking any medication at the time of your transfusion you can take this on the day as normal, unless your healthcare team tell you not to.

However, it's important to let your team know before the transfusion if you're taking any water tablets (diuretic medications).

How much blood is transfused?

The amount of blood you need depends on your condition and the results of your blood tests. Your doctor will take all these things into account when making a decision about your transfusion.

An average-sized adult will normally receive:

- › one unit of red blood cells (one unit contains around 220–340mls)
- › one unit of platelets (one unit contains around 150–400mls)
- › two to four units of FFP (one unit contains between 200–340mls), or
- › two five-unit pools of cryoprecipitate (one five-unit pool contains between 100–300mls).

How long does a transfusion take?

This will depend on how urgently you need to replace your body's blood cells, but as a general rule:

- › transfusing one unit of red blood cells usually takes 1.5–2 hours, and should take no longer than 4 hours
- › platelet transfusions usually take 30–60 minutes
- › FFP transfusions usually take 30 minutes per unit, and
- › cryoprecipitate transfusions usually take 30–60 minutes per five-unit pool.

What happens during the transfusion?

Blood transfusions are given to you using a cannula or a central line. A cannula is a small plastic tube that is inserted into a vein in your arm.

If you've already had a central line fitted, this might be used instead. A central line is another type of tube used to give medicine and blood – it's inserted in your arm or chest through your skin, into a large blood vessel. The nurse will attach the bag of red blood cells, platelets, FFP or cryoprecipitate, which will go through the cannula or line into your vein.

You won't be able to move around much during the infusion, as you'll be attached to an infusion pump and the drip. The nurse will monitor you closely before, during and after your transfusion, checking your temperature, pulse and blood pressure regularly.

After the transfusion

If you received your transfusion in the outpatient department or day unit, then you'll be allowed to go home afterwards if you feel well and the doctors and nurses think you're fit to leave (be discharged). You'll be given a contact number you can ring if there's anything you're worried about afterwards.

What are the risks?

There are some risks associated with blood transfusions, although the risk of severe side effects is very small. Of the 2.6 million units of blood products given each year in the UK, fewer than 300 people will experience one of the following side effects.

It's important to let your healthcare team know straight away if you feel unwell at any point during or after the transfusion – particularly during the following 24 hours.

Developing antibodies

A risk associated with red blood cell and platelet transfusions

Antibodies fight substances in your body seen as foreign, such as bacteria and viruses. After a large number of transfusions, around one in 15 people will start to develop antibodies that are programmed to fight proteins in the donor blood.

These could be activated the next time you have a transfusion, so if you develop them, you'll need to have specially matched red blood cells (which don't contain the protein for which you have the antibody) in future transfusions. This is to make sure your body doesn't react to the donor blood.

If this affects you, these details will be added to your health record and your healthcare team will give you a card explaining this, which you can keep in your purse or wallet.

Allergic, anaphylactic and haemolytic reactions

A risk associated with any type of transfusion

Very occasionally, some people develop symptoms of a reaction to a transfusion. Signs and symptoms of a reaction can include: a rise in temperature, a rash, flushing of the skin, swelling, itching, shortness of breath, back pain and blood in your urine, among other things.

These symptoms may be caused by a type of allergic reaction, anaphylaxis or a haemolytic transfusion reaction. Each year, fewer than 190 people develop these transfusion reactions in the UK, so they're very rare.

They can happen at any time during or after your transfusion but are most likely within the first 15 minutes after a transfusion starts. The nursing staff will monitor you very closely during this time and will act on any signs of a reaction immediately.

- › An allergic reaction happens when your immune system reacts to proteins or other substances in the donated blood.
- › Anaphylaxis is a more serious, and sometimes life-threatening, allergic reaction that happens when your immune system reacts to antibodies or other substances in the blood.
- › A haemolytic transfusion reaction is where your immune system reacts to the donated blood and begins attacking the blood cells.

You may need to have specially prepared (washed) transfusions in future, if you experience an anaphylactic reaction, to remove any unwanted proteins that your immune system might react to. Your healthcare team will let you know if this is the case.

Sometimes, your healthcare team may decide it's better for you not to have a red blood cell transfusion, or to delay having one, even if you're anaemic. This is because of the risks associated with having too many transfusions. Platelets, FFP, and cryoprecipitate transfusions are always given to you if you need them, as you'll usually need these transfusions to stop any bleeding.

Transfusion Associated Circulatory Overload (TACO)

A risk associated with any type of transfusion

TACO is a very rare but serious reaction that can happen when fluid is given too quickly or too much fluid is given, making it difficult for your body to get rid of the extra fluid. Fewer than 100 people develop TACO each year in the UK.

Your doctors can give you a medication known as a diuretic before your transfusion to help prevent this, if they feel it's necessary.

It is very important that you let the doctor know if you're already receiving any water tablets, (diuretic medication, like furosemide, for example), before your transfusion.

Transfusion-related acute lung injury (TRALI)

A risk associate with FFP, cryoprecipitate, platelet and red blood cell transfusions

TRALI is a serious but extremely rare reaction that can happen during, or shortly after, a plasma transfusion (FFP and cryoprecipitate) or a red blood cell or platelet transfusion containing residual plasma. It results in breathing difficulties and is thought to happen when your donor's plasma contains antibodies that react with your immune system.

In the UK, certain procedures and tests have now been introduced for donors, to minimise the risk of these antibodies being given. Fewer than five people develop TRALI each year in the UK.

Iron overload

A risk associated with red blood cell transfusions

If you have a large number of transfusions (more than 10–100 units altogether), the iron contained in the transfused red blood cells can build up in your body: this is known as iron overload.

If iron overload does happen, your doctors can give you medication to help the body get rid of the extra iron – or, less commonly, you might be treated with a venesection, which is the removal of blood (a bit like a blood donation).

Finding out more

We offer patient information on many blood cancer types and topics, online and in free printed booklets. They cover everything from symptoms and diagnosis through to treatment and living with your condition.



For our patient information, go to **bloodwise.org.uk/info-support**



We also have an online community you may like to join **bloodwise.org.uk/bloodwise-community**



Or you can call our support line on **0808 2080 888** (Mon–Fri 10am–4pm). This is a freephone number.



See our website for more details of cancer information specialists and support groups: **bloodwise.org.uk/info-support/living-with**

About Bloodwise

We're the UK's specialist blood cancer charity. We've been working to beat blood cancer since 1960.

We fund world-class research; provide practical and emotional support to patients and their loved ones; and raise awareness of blood cancer.

We'd like to thank Clinical Nurse Specialist Sasha Wilson, Professor Mhairi Copland, Doctor Marie Scully and Doctor Christopher McDermott for their help and support in developing the content and checking for clinical accuracy.

A list of references used in this fact sheet is available on request. Please email information@bloodwise.org.uk

Our fact sheets contain general information. Always listen to the advice of your specialist about your individual condition – because every person is different.

Disclaimer

We make every effort to make sure that the information in this fact sheet is accurate, but you shouldn't rely on it instead of a fully trained clinician. It's important to always listen to your specialist and seek advice if you have any concerns or questions about your health. Bloodwise can't accept any loss or damage resulting from any inaccuracy in this information, or from external information that we link to.

The information in this fact sheet is correct at the time it was printed (February 2018).

Date of next review: February 2020. Bloodwise, 39–40 Eagle Street, London WC1R 4TH

020 7504 2200 | info@bloodwise.org.uk | bloodwise.org.uk ©

All rights reserved. No part of this publication can be reproduced or transmitted without permission in writing from Bloodwise. Registered charity 216032 (England & Wales) SC037529 (Scotland).