

Donating stem cells

This fact sheet is for people who may be chosen to donate stem cells to someone else. It explains how stem cell transplants can help people with blood cancer, and what happens when you donate stem cells.



**Blood
cancer
UK**

How we can help

We're a community dedicated to beating blood cancer by funding research and supporting those affected. We offer free and confidential support by phone or email, free information about blood cancer, and an online forum where you can talk to others affected by blood cancer.



bloodcancer.org.uk
forum.bloodcancer.org.uk



0808 2080 888
(Mon, Tue, Thu, Fri: 10am–4pm, Wed: 10am–1pm)



support@bloodcancer.org.uk

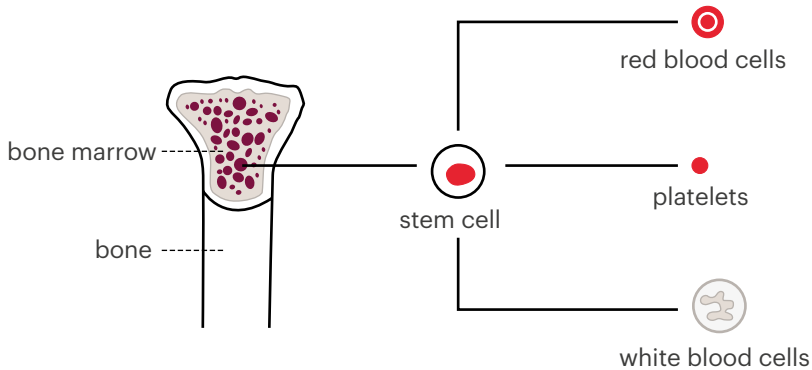
What are stem cells?

All the cells in your body come from 'parent' cells called stem cells. Some of these stem cells are blood stem cells, which develop into the different types of cells found in your bloodstream (blood cells). The main types of blood cell are red blood cells, white blood cells and platelets.

Red blood cells carry oxygen from your lungs to the rest of your body. Your body needs oxygen to turn food into energy.

White blood cells fight germs that cause infection, such as bacteria and viruses. They are an important part of your body's defence system (the immune system). There are different types of white blood cells, including lymphocytes, monocytes and granulocytes.

How blood cells develop



Platelets stick together to make your blood clot and stop you bleeding.

Blood stem cells are found in your bone marrow. That's the spongy material inside some of the bones in your body, including the long bones in your legs, your ribs, your breastbone and your pelvis (the ring of bones that forms part of your hip joints).

What is a stem cell transplant and how does it help?

Normally, we have a healthy balance of red blood cells, white blood cells and platelets in our blood. This is because chemical instructions tell blood stem cells what type of blood cell to become before they move into the bloodstream.

Sometimes the process can go wrong, and we end up with too many cells that don't develop properly. This can lead to blood cancer.

For some people with blood cancer, the best chance of recovery is to have very strong anti-cancer drugs (high-dose chemotherapy) which kills these abnormal cells. After high doses of treatment, new stem cells are needed to help build new, healthy bone marrow. Sometimes, these new stem cells need to come from another person – a donor. This is called a donor stem cell transplant, or you might hear it called an allogeneic or allograft stem cell transplant.

For people with some types of blood cancer, a stem cell transplant can lead to a cure. For others, it offers a longer period of remission – a period where there is no sign of cancer in the blood.

How are donors chosen?

Stem cell donors need to be a good match to the person who gets the stem cells. This helps lower the risk of complications. To find out if a donor is a good match, blood samples from both people are tested at a tissue-typing laboratory. The test looks at proteins called human leukocyte antigens (HLAs) and checks how similar the HLA types are. It usually takes around two weeks to get the results of a tissue-typing test.

Brothers and sisters are often tested first to see if they're suitable donors. The chance of a brother or sister being a good match is one in four, or 25%. If this isn't an option, doctors will search the UK's stem cell registries for someone else whose tissue type is a good match.



Clare (left) donated stem cells by apheresis when her sister Jane (right) needed a transplant for leukaemia. “I had some blood tests, a few injections and I was told I might feel a bit fluey on the day. Compared to what Jane was dealing with, a bit fluey was a walk in the park.” Everyone is different, and the experience of donating stem cells will vary from person to person.

Sometimes, family members who are half-matched may be asked to donate stem cells. Biological parents and children are always half-matched, and brothers and sisters have a one in two (or 50%) chance of being half-matched. A transplant using stem cells from a half-matched donor is called a haploidentical transplant. The success of haploidentical transplants has improved significantly in recent years, and for some people with blood cancer they can be a good option.

It's your decision whether you want to be a donor. If you do want to donate, you will be asked to give your consent (permission) in writing before the procedure is done.

If there's anything you don't understand or are worried about, just ask – a nurse or doctor will be able to speak to you.

What tests will I need?

If you're chosen as a potential donor, you'll be asked about your medical history to make sure that it's safe for you to donate stem cells. Your weight and height will also be checked to confirm that your body mass index (BMI) is within safe limits. If it's high, it may not be possible to donate by bone marrow harvest because of the risks of having a general anaesthetic (see page 9).

You'll also have blood tests to check for certain viruses:

- hepatitis B, C and E
- cytomegalovirus (CMV)
- human immunodeficiency virus (HIV)
- human T-cell lymphotropic virus (HTLV)
- syphilis.

This is to check for any viruses you may have been exposed to in the past that could be passed on to the person receiving your stem cells. The doctor or nurse will explain what these tests are for and ask for your consent before you have them done.

If the results show something that affects your own health, this will be discussed with you. If a test result is positive, it will be shared with your GP but will be kept confidential.

How are the stem cells collected?

There are two ways to collect stem cells from a donor, depending on what's best for the person who needs the donation.

Peripheral blood stem cell collection (apheresis)

This is the usual way to collect blood stem cells. You'll need to have injections of a chemical called G-CSF (granulocyte colony stimulating factor, also known as growth factor), which is a type of hormone that's naturally produced in the body. Having extra G-CSF helps your bone marrow produce more stem cells and moves them from your bone marrow into your blood. This is called mobilisation.

You'll need injections of G-CSF once or twice a day for four days. These can be given at your home or at work by a nurse from the hospital or the stem cell registry. If you prefer, you may be able to do the injections yourself.

On day five, your stem cells will be collected at a hospital or clinic. You'll have a needle attached to a tube put into a vein in your arm. Your blood will be drawn out through the tube into a machine called a blood cell separator, which removes the stem cells. Your blood will then pass through another tube into a vein in your hand, and back into your bloodstream. You'll be connected to the machine for about four hours.

Usually, the procedure only needs to be done once. But if it doesn't provide enough stem cells, you'll be given more G-CSF, and have the procedure again the next day.

You can eat and drink normally throughout the procedure. It's best to arrange someone to take you home as you may feel tired and shaky afterwards and shouldn't drive. You should be able to go back to your normal routine the day after the collection has finished.

Side effects of peripheral blood stem cell collection

You may experience these common side effects, which are temporary:

- **A nasty taste in your mouth or tingling in your lips, cheeks or fingertips.** This is caused by a substance in the blood cell separator machine which stops your blood clotting as it passes through. Your nurse will ask you about this. Having a calcium tablet such as Calcichew® or a glass of milk will help.
- **Feeling dizzy or light-headed.** This is because of the small change in the volume of your blood while it passes through the machine and shouldn't last long.
- **Bruising.** After donating blood stem cells, you will have a lower level of platelets. This may mean you bruise more easily, but your platelet level will soon go back to normal.
- **Flu-like symptoms.** G-CSF injections might make you feel achy and feverish. It's OK to take paracetamol or ibuprofen, but not aspirin because it stops your blood clotting properly.

- **Feeling tired.** Make sure you have a quiet couple of days afterwards and get some rest.

If you experience any side effects, tell the nurse or doctor because they will be able to help.

Bone marrow harvest

This is much less common than peripheral blood stem cell collection. One in ten people (10%) will donate blood stem cells this way. If you're asked to donate by bone marrow harvest, it's because there's a medical reason why it's better for the person receiving the stem cells. Doctors will discuss it with you.

You'll be admitted to hospital the day before the procedure. The next day, you'll be given a general anaesthetic, so you'll be asleep throughout and won't feel anything. The anaesthetic will be given through a drip into a needle in the back of your hand (a cannula). You won't be able to eat or drink anything from midnight the night before. You may need to stay in hospital for a night or two.

There's always a small risk involved in having a general anaesthetic, but for healthy donors, the risk is very low. You'll already have had a full medical assessment to check the procedure is safe for you.

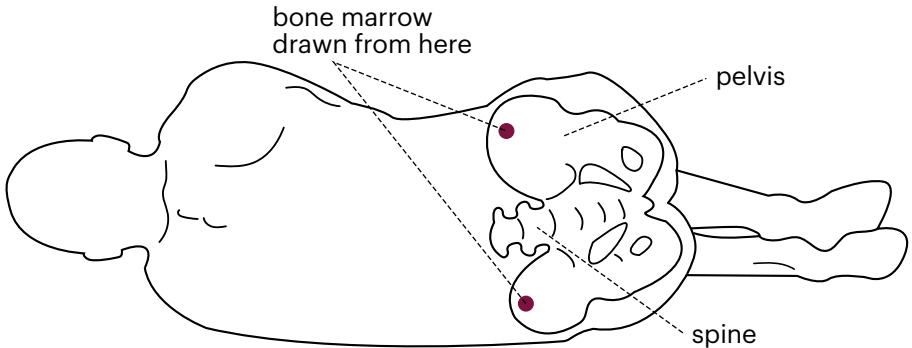
For more information on having a general anaesthetic, go to the NHS website:

[nhs.uk/conditions/general-anaesthesia/](https://www.nhs.uk/conditions/general-anaesthesia/)

The liquid bone marrow is taken from the flat area at the back of your pelvis (hip bone), on both sides, using a syringe. It takes about an hour, and one to one-and-a-half litres of marrow is drawn out. This may sound like a lot, but your body replaces it in less than three weeks.

You'll be taken to the recovery room to wake up. You may be given fluids through the cannula to replace the fluid you've lost during the procedure. Your blood pressure, temperature, pulse and oxygen levels will be checked regularly while you're in hospital. If all goes well, you'll be discharged the next day with some painkillers and iron tablets, if you need them. You'll be advised to rest for a few days and if you work, you can go back the following week. The doctor can write you a fit note (sick note) if you need one.

Bone marrow harvest



Side effects of bone marrow harvest

You might have one or more of these side effects, which will go away in about a week:

- **Feeling tired.** Make sure you have plenty of rest for a few days after the harvest.
- **Feeling dizzy or light-headed.** This may happen when you first get up in the morning. Make sure you take your time to stand up.
- **Lower back pain.** Take pain relief such as paracetamol (but not aspirin) and put an ice pack on your back if it's swollen. If you have trouble bending and lifting, avoid housework for a while.
- **Slight bruising where the needle went in.** This will soon disappear.

What happens next?

The stem cells you've donated will be counted and transported to the hospital where the stem cell transplant is being done. The stem cells will be given to the person receiving the transplant on the same or the next day. They are delivered into the person's bloodstream through a tube that goes into a vein. The stem cells can then start making new healthy blood cells.

What if the transplant doesn't work?

Sometimes transplants don't work, even though they are the best option for the person with blood cancer. It's not the donor's fault if the treatment doesn't work. By being a donor, you are giving someone the best chance of a cure, or a long period of remission.

There's a small chance you might be asked to make a second stem cell donation. This is rare but could happen if your donated stem cells aren't accepted by the person having the transplant (this is called graft rejection), or if their blood cancer comes back (relapses).

By donating your stem cells, you give someone the chance to carry on living.

Donor lymphocyte infusion (DLI)

Sometimes, having a donation of white blood cells called lymphocytes can help if someone has a relapse after their transplant. This is called a donor lymphocyte infusion or DLI.

Lymphocytes fight disease, and this includes fighting cancer cells. So stem cell donors may be asked to make a donation of lymphocytes around the time of the stem cell collection or at some stage later on. The lymphocytes are then given to the person with relapsed blood cancer through a drip into a vein.

The process of collecting the lymphocytes is very similar to peripheral blood stem cell collection (see pages 7–8). The difference is, you won't need G-CSF injections because the lymphocytes are already available in your bloodstream.

The lymphocytes are usually collected over one or two sessions of about three hours each. They are then frozen and stored in varying amounts for use if needed.

Speak to the medical team if you have any concerns about the transplant process. Or contact our Support Services Team on **0808 2080 888** (Mon, Tue, Thu, Fri: 10am–4pm; Wed: 10am–1pm) or **support@bloodcancer.org.uk**

About this fact sheet

We have produced this fact sheet in collaboration with expert medical professionals and people affected by blood cancer. The fact sheet was also kindly reviewed by people who have donated stem cells, or are considering donating stem cells. Thank you to Clinical Nurse Specialist Marisa Pereira and Consultant Haematologist Kavita Raj for their support checking the content of this fact sheet.

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

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

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. Blood Cancer UK 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 published (July 2019).

Date of next review: July 2022.

Blood Cancer UK, 39–40 Eagle Street, London WC1R 4TH

020 7504 2200 | hello@bloodcancer.org.uk | bloodcancer.org.uk

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

Because we face it together

We're a community dedicated to beating blood cancer by funding research and supporting those affected.

Get in touch for:

- free and confidential support by phone or email
- information about blood cancer and life after diagnosis
- an online forum for people affected by blood cancer



bloodcancer.org.uk

forum.bloodcancer.org.uk



0808 2080 888

(Mon, Tue, Thu, Fri: 10am–4pm, Wed: 10am–1pm)



support@bloodcancer.org.uk

Your feedback on this fact sheet can help us improve – please send any comments to **information@bloodcancer.org.uk**

Blood Cancer UK is a trading name of Bloodwise, 39-40 Eagle Street, London, WC1R 4TH. A company limited by guarantee 738089 (registered in England and Wales). Registered charity 216032 (England and Wales) SCO37529 (Scotland) © 2020

