

Therapeutic Apheresis Services

Donor Information Leaflet – Peripheral Blood Stem Cell Collection (PBSC)

Introduction

This leaflet has been prepared to give you some information about peripheral blood stem cell collection.

If you would like more information or if you have any questions, please ask the doctors and nurses in the NHS Blood and Transplant (NHSBT) Therapeutic Apheresis Services Unit. When you have considered the information given in this leaflet, and after we have discussed the procedure and its possible risks with you, we will ask you to sign a consent form to indicate that you are happy for the collection to go ahead. Before any further collections we will again check that you are happy to proceed.

What are peripheral blood stem cells?

Blood is made up of various different kinds of cells: red cells, white cells and platelets. These cells are all carried round your body in fluid called plasma. All the different kinds of blood cell start out as a cell called a "stem cell". Stem cells are formed in the bone marrow and then receive chemical signals that tell them which kind of blood cell to become before entering the blood stream.

Why do we use (need) peripheral blood stem cells?

When a person is healthy their body is constantly making new cells to replace old ones. This process may sometimes become out of control and the bone marrow can either produce too

many of some cells e.g. white cells (leukaemia) or produce virtually no cells at all.

In order to treat these conditions which affect the bone marrow it may be necessary to use very intensive treatments such as chemotherapy to destroy the unhealthy bone marrow. In these circumstances the patient can be given stem cells from a donor to kick start the production of new healthy bone marrow. Giving someone stem cells in this way is called a "stem cell transplant".

How do we get stem cells into the blood stream?

In order to collect stem cells from the blood we need to get them to move out of the bone marrow. We call this process 'mobilising' the stem cells, and we do this by means of a process called 'priming'. This process involves giving the donor a course of blood growth factors called Granulocyte Colony Stimulating Factor (G-CSF).



What is G-CSF?

G-CSF is a hormone produced naturally by the body which helps produce stem cells in the bone marrow.

When it is given artificially it encourages stem cells to move from the bone marrow into the blood stream, where they can be collected.

G-CSF is given by injection every day for four days. On the fifth day we start collecting the stem cells. G-CSF will continue to be given each day until the number of stem cells required has been collected. Arrangements will be made for you to receive these injections either by the hospital treating your relative or by the Bone Marrow Registry, if you are donating for someone who is not related to you.

When do we collect the stem cells?

We start collecting stem cells on day five after four days of G-CSF when the level of stem cells in the blood will start to peak. On day five the blood count should be high enough to start the collection. The number of cells required depends on the weight of the patient. The number of collections depends on the number of stem cells present in your blood on the day of collection.

How do we perform stem cell collections?

Stem cells are collected using a machine called a 'Blood Cell Separator' which takes the stem cells out and returns the rest of your blood back to you.

Before the collection the nurses at the Therapeutic Apheresis Services Unit will check your blood pressure, pulse and temperature and make sure you are fit to have the procedure. You will have had a number of blood tests, including to check if you have been exposed to HIV, Hepatitis B, Hepatitis C, HTLV (human T-Lymphotropic virus) or syphilis.

These tests are routine and essential for everyone donating blood. We will take more Blood samples along with your stem cells on the day/s of collection to further check your exposure to these viruses. You and your doctor will be informed if there are any abnormal results.

In order for us to collect the stem cells, a needle will be put into a large vein in each arm. If you wish you may have a small injection of local anaesthetic to numb the skin before we insert the needles.

The machine will then draw blood in from the needle in one arm and return it through the



needle in your other arm. The stem cells are collected from the blood as it passes through the machine. Only a small amount of your blood passes through the machine at one time (about the same amount as is in a mug of coffee) and the stem cells are collected very slowly.

How long will it take?

Collecting stem cells usually takes three to five hours depending on how much blood we need to process through the machine and on the dose of stem cells requested by the patient's doctor.

What happens during the collection procedure?

Your safety and comfort are of the utmost importance to us and a trained nurse will look after you throughout the procedure.

The stem cells will be collected while you rest on a reclining chair or bed. We will try to make you as comfortable as possible and you should not hesitate to ask for anything you need during the procedure. For your comfort it is best to wear loose-fitting clothing.

A stem cell collection is an outpatient procedure and arrangements will be made for you to attend the Therapeutic Apheresis Services clinic where the procedure will take place.

As your blood enters the cell separator an anticoagulant (blood thinner) solution is added to it to stop it clotting in the machine. This can cause any of the following symptoms:

- tingling in your lips, nose or fingers
- a metallic taste in your mouth
- nausea and/or a 'shaky' vibrating sensation that may or may not be unpleasant.

Such side-effects are caused by the solution temporarily lowering the body's calcium levels.

Some people experience a 'heavy' feeling in the arm as their blood is removed. You may also feel some vibration around the site of the needle. These symptoms will stop once the procedure is finished. If you experience any symptoms that cause you concern or distress let the nurse know as soon as they occur so that we can deal with them at once.

Some red cells and platelets will be removed from your blood along with the stem cells. This is an unavoidable part of the procedure. Occasionally we cannot return the blood that is in the machine back to you which means you will lose some red cells as a result. The machine only holds a relatively small amount of blood at any one time, and this loss should not cause any problems. We will however routinely check your blood count before and after the procedure to ensure that the levels remain safe.

How should I prepare for the procedure?

It is important to have something to eat and drink before the procedure and you can eat and drink normally during and after a stem cell collection. Please bring some food with you as the day can be very long. Food such as sandwiches and rolls are easiest to eat when attached to the machine.

We can offer a limited range of hot and cold drinks and savoury and sweet snacks such as crisps or biscuits. We have no facilities for preparing hot food, however there are catering outlets in the hospitals near most of our units which you may like to visit before or after the procedure.

Once you are connected to the machine you will be unable to visit the toilet so please go immediately before your treatment starts. Assistance will be provided if you do need to use the toilet once you are attached to the machine. Commodes, urinals and bed pans are available for use.

You are welcome to bring a friend or relative to sit with you during the stem cell collection. Try to avoid bringing children as you will be attached to a machine and therefore will be unable to attend fully to their needs. If you do have to bring children with you it is preferable that another adult accompanies you to take care of them.

How many stem cell collections are required?

The number of procedures will depend on the number of cells which have been requested and on how well the stem cells mobilise into the bloodstream. This may mean that one single procedure is enough, or that you may need to have two or three. We will know within a few hours how many cells have been collected and this result will determine whether you need to attend the following day. If you need to attend again you will need a dose of G-CSF before each additional procedure and arrangements will be made for you to receive this if required.

How will I feel after the procedure?

Some people feel tired after the procedure, so it is advisable that a friend or relative takes you home afterwards. If this is a problem it may be possible for transport to be arranged. You should not drive yourself home. You should not do any hard physical exercise for the rest of the day.



What happens next?

Your cells will be given to the patient you are donating for very soon after the amount required has been collected. If you have any further questions please do not hesitate to contact the Therapeutic Apheresis Services team or your hospital team.

Please Note: It is important to arrive on time for your appointment as another patient or donor may be booked for a procedure after you.

Please do not hesitate to phone us if you have any questions or concerns. We are here to help you.

NHS Blood and Transplant

NHS Blood and Transplant (NHSBT) saves and improves lives by providing a safe, reliable and efficient supply of blood and associated services to the NHS in England and North Wales. We are the organ donor organisation for the UK and are responsible for matching and allocating donated organs. We rely on thousands of members of the public who voluntarily donate their blood, organs, tissues and stem cells.

For more information

Visit nhsbt.nhs.uk

Email enquiries@nhsbt.nhs.uk

Call **0300 123 23 23**