Peripheral blood stem cell mobilisation and harvesting

Gloucestershire Haematopoietic Stem Cell Transplant Service

Introduction
This leaflet explains the process of stem cell mobilisation and harvesting. The leaflet is also to remind you of what has been discussed with your haematology consultant and nurse specialist. It may also be useful to share this information with your family, friends and carer (if appropriate).

What are stem cells?
Stem cells are special cells that are found in the bone marrow. Bone marrow is found in the core of each bone in our bodies and is the ‘factory’ where new blood cells are made. Stem cells grow and divide into 3 different kinds of cell: red blood cells needed to carry oxygen, white blood cells needed to fight infection and platelets which help your blood to clot. The type of blood cell that a stem cell develops into is determined by the needs of your body and through the action of substances called growth factors. Due to advances in medicine it impossible, through a process called mobilisation, to move the stem cells from the bone marrow into the blood stream.

What does the stem cell collection involve?
Before stem cells can be collected, the marrow needs to be ‘primed’ or stimulated to produce more stem cells than normal and allow them to spill into the blood stream.

This is done using growth factor (sometimes after chemotherapy) and the process is called stem cell mobilisation.

1. Growth factor:
   The transplant team will tell you about your regime for receiving growth factor and give you a written copy of your regime, including the appropriate dates. Growth factor is given as daily injections under the skin. We can teach you or your partner to inject or, if you prefer, we can arrange for a community nurse or practice
nurse to do it for you. The exact number of days you need will depend on your regime, but will be at least 4 days.

2. **Chemotherapy:**
   Some patients will have a priming regime that involves chemotherapy and growth factor. You will be given a written copy of your regime with dates for chemotherapy and growth factor injections. The chemotherapy will be administered either in the Edward Jenner Day Unit, Gloucestershire Royal Hospital or as an in-patient in the Oncology Centre at Cheltenham General Hospital.

3. **Collection of stem cells at Bristol Haematology and Oncology Centre, Bristol**
   The collection is usually made on 2 or 3 consecutive days at the Blood Transfusion Centre. The collection is a straightforward procedure which takes place while you are lying on a bed. The staff aim to start early in the morning as the collection takes about 3 to 4 hours.

   You will be given precise instructions from the blood service about your collection but below is a summary of what to expect. On the first day of collection, a blood sample will be taken to check that your white cell count is adequate to attempt stem cell collection. On the second day the collection may be started straight away. Allowing for delays you will probably be at the hospital for about 5 to 6 hours each day.

   In order to carry out the collection 2 veins (1 in each arm) are needed – one to take blood from you and one to return the blood to you. One of the transplant team will have looked at your veins before your procedure to make sure they are suitable for this. If your veins are not suitable, you will need to have a central line inserted prior to the collection and this will be used instead.

   A blood separator machine collects the peripheral blood stem cells. This machine has a centrifuge which, as it spins, separates the blood into layers: red cells, white cells, platelets and plasma. The white cell layer contains the stem cells which are collected by the machine into a special bag, while the rest of your cells and plasma are returned to
you. The total amount of stem cells collected is about 150mls.

At the end of the procedure this bag goes to the lab for processing and freezing. The amount of stem cells will be counted and the transplant team will be informed. At the same time a similar amount of plasma is collected into another bag. This plasma is used in the laboratory for freezing your stem cells. A specially trained nurse will operate the machine and remain with you throughout the whole procedure.

**Side effects**

There are very few side effects from this procedure. You may feel cold, light headed or dizzy due to small changes in your blood volume. You may have some tingling around your lips and face or pins and needles in your fingers and toes. This is because the anti-coagulant, which stops your blood clotting in the machine, temporarily, lowers your body’s calcium level. This can easily be put right by having a drink of milk or the nurse can give you a soluble calcium tablet to take.

It is important to report any of these symptoms to the nurse so that they can be treated. You may feel tired afterwards as some of your red blood cells are removed with the stem cells causing your blood count to drop slightly. If so, you may need to rest. Your blood count will usually recover as you begin to make new red cells. Most people suffer little or no side effects at all.

It is a good idea to have a light breakfast on the morning of the collection. Try not to drink too much beforehand and empty your bladder just before being connected to the machine. If you do need the toilet let the nurse know and she will be able to help you. You may eat and drink during the procedure.

**Contact information**

**Transplant Co-ordinator**

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