

Side effects of transplantation

As the brochure has outlined stem cell transplantation involves high-dose therapy. This often leads to side effects. Many of these are expected effects due to the nature of the treatment. Some of these cannot be avoided, but the symptoms they produce can be prevented or treated.

During stem cell mobilisation the doses of G-CSF used often cause some bone pains. These can be treated by paracetamol if needed.

The high-dose therapy employed will vary from disease to disease. However in general the effects are due to destruction of the normal marrow cells. This leads to:

- anaemia (tiredness, palor);
- low platelets (bleeding or bruising);
- low white cell count (infection or sepsis).

Also the lining of the mouth, gullet, stomach and bowel are affected (mucositis). Often a sore mouth and throat occurs. Sometimes eating is difficult and painful. Abdominal pain, cramps and diarrhoea can occur too, but can be treated.

Like other forms of chemotherapy, side effects include hair loss and nausea (prevented by good anti-nausea drugs).

The low period after a transplant doesn't last long. The stem cells infused are free of chemotherapy effects and can regenerate the marrow in 12-15 days. At this time the effects of the high-dose therapy start to disappear.

The immune system is not fully functional again for up to 1-2 years after transplant.

Fertility is affected and sterility often occurs.

Produced to assist patients who may require transplantation to understand the process and explain the potential benefits and side-effects

An introductory information booklet

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Bone Marrow Transplant Stem Cell Transplant

An introductory
information booklet



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BMT & PBSCT

BMT = Bone Marrow Transplant

PBSCT = Peripheral Blood Stem Cell Transplant

Stem Cell = the cell in the bone marrow which is capable of regenerating all marrow and blood cells. It is a “self-renewing” cell. Without these cells the marrow would eventually “die-out” as the cells grew old and were removed.

In this brochure all information relates to **autologous** transplantation. This is transplantation from ones self, rather than from someone else (allogeneic transplantation).

Peripheral blood stem cells are used rather than bone marrow these days. It has been discovered that we can induce the marrow stem cells into the blood stream, and then collect these from a vein. This is easier than having to collect marrow. Marrow collection requires a general anaesthetic.

Stem cell collection is performed by an apheresis machine. This takes blood from a vein, processes it to remove the stem cells, then returns the other blood components (red blood cells, plasma and platelets) back to the patient by another vein. Either the veins in the arm are used (one on each side) or a special central line is used to allow adequate blood flow in and out. This is inserted under local anaesthetic in the upper chest, neck, or thigh.

Stem cell harvesting takes 6-8 hours and may need to be performed on 1-3 days to harvest enough cells. It is usually performed as a day-case.

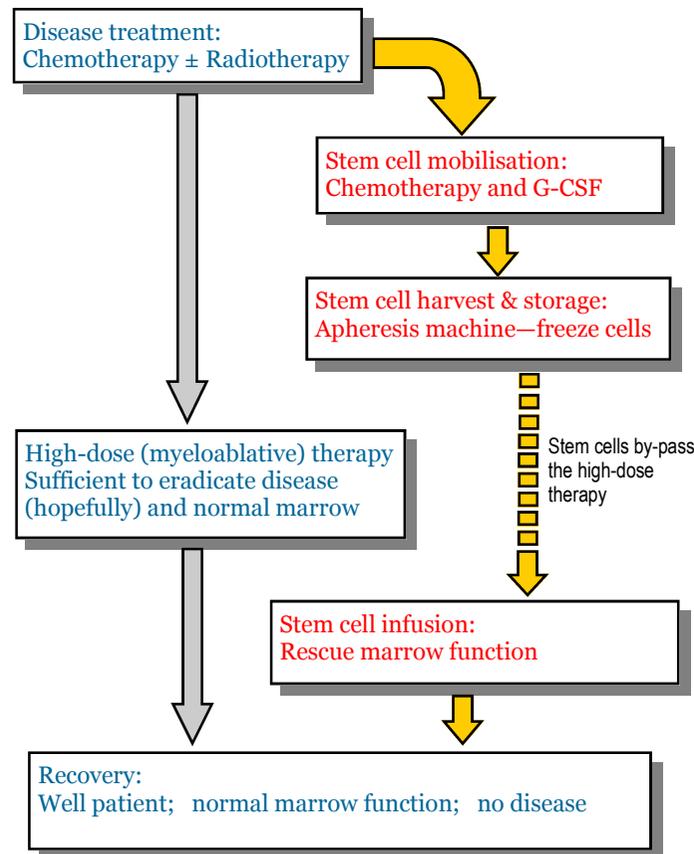
Why transplantation?

Transplantation is offered to try to eradicate the blood disease, or lead to minimal disease burden.

This is done when other, lower-dose treatments are insufficient or have failed.

How is transplantation performed?

The following flow-chart outlines the treatment:



The chart shows that stem cells must be collected in advance of the transplant. Usually stem cells are collected after initial chemotherapy to ensure the disease is responsive to the treatment and to start treating the disease.

At the appropriate time the stem cells are mobilised from the marrow where they usually reside into the blood stream. This is achieved by using chemotherapy plus G-CSF (a natural hormone that stimulates the marrow to produce stem cells). It take around 10 days for the marrow to produce sufficient stem cells in the blood to be able to collect enough for a transplant. The stem cell numbers are measured by a “CD34 count” blood test before collection begins. The CD34 counts are taken from around 9 days after starting therapy and are required each morning until the correct number is achieved. When the CD34 count is right apheresis (stem cell collection) starts.

Once the stem cells are collected they are carefully frozen and stored at -183°C until needed. Further testing on the stem cell bag is done to count the number of stem cells in total. After enough stem cells are safely frozen, the transplant can begin (or further chemotherapy/radiotherapy given first). The frozen stem cells can be stored indefinitely.

The real treatment part of transplant is the high-dose therapy immediately prior to the stem cell infusion. The high-dose therapy does the job of killing as many tumour cells as possible. It is the higher dose than is usually tolerated that achieves this. One side effect is destruction of the normal marrow stem cells. Hence to survive after a transplant you have to have a stock of marrow stem cells—that’s when the frozen collected stem cells are used. These have not been exposed to high-dose therapy. The stem cells are given just like a blood transfusion. They make their way to the marrow and after about 12-15 days they’ve filled up the marrow and regenerated normal blood cells. At this time the patient starts to feel much better.