

P. D. HINDUJA HOSPITAL  
& MEDICAL RESEARCH CENTRE

# BONE MARROW TRANSPLANT CENTER



# Bone Marrow Transplantation (BMT) or Stem Cell Transplantation (SCT)

## Bone Marrow

Bone marrow is the soft spongy tissue that lies within the hollow interior of long bones. Bone marrow in large bones produces new blood cells. The bone marrow contains stem cells. These are cells at a very early stage of development that develop into the three different types of blood cell. When the cells are fully mature, they are released into the bloodstream. Hence bone marrow works as a factory for blood.

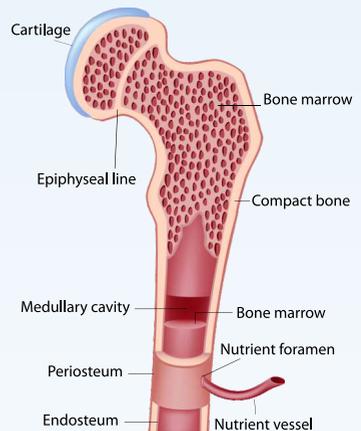
When things go wrong in the blood e.g. blood cancer (leukaemia), aplastic anaemia (empty bone marrow) its origin is in the stem cells in the bone marrow. Hence, bone marrow transplantation or stem cell transplantation can be a curative treatment for such conditions.

## Bone Marrow Transplant

Bone marrow transplant procedure is performed not only for cancerous conditions like blood cancer but also for genetic condition like Thalassemia. Here the cancerous or genetically abnormal stem cells are eradicated by chemotherapy and immuno suppressive medicines and new functionally normal stem cells are given which later populate the bone marrow and blood with normal non cancerous cells and genetically normal cells.

## Bone Marrow and Stem Cell Transplantation

The two terms “bone marrow” and “stem cell” transplants are sometimes used interchangeably. In paediatric age group and in olden days in adult age group, bone marrow acquired by aspiration served as the source of stem cells and hence the terminology of BMT was used. Now in adults we use stem cells extracted from the blood, on a machine. All bone marrow transplants are stem cell transplants but not all stem cell transplants are bone marrow transplants.



Bone Anatomy

## Conditions that can be treated with BMT / SCT

- Leukaemia (Blood cancer)
- Lymphoma (Lymph gland cancer)
- Myeloma (Bone marrow cancer)
- Germ cell cancers
- Thalassemia
- Sickle cell disease
- Gaucher's disease
- Immunodeficiency conditions
- Aplastic anaemia

## Bone Marrow Transplant Unit (BMT)

A bone marrow transplantation programme is established at Hinduja Hospital by the BMT and stem cell transplant specialist Dr Balkrishna Padate in 2012. It is a state-of-the-art transplantation unit in the country. The unit has four active transplant cubicles and four beds for transplant patients to use before and after the procedure. All cubicles have a HEPA filtration system and en-suite facilities. The transplant programme team at Hinduja Hospital provide a specialist service within Haemato-Oncology department. The team is committed to providing a quality service to all children and adults needing this procedure.

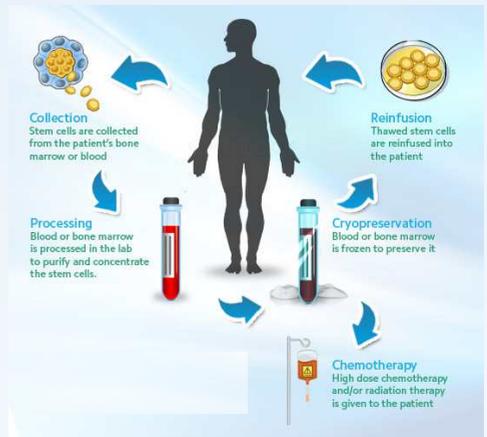
## Procedure of Stem Cell Transplant

Before stem cell transplant, stem cells are collected from either the bone marrow or the blood. Patient is given very high doses of chemotherapy, usually over a few days. Sometimes, radiotherapy is also given to the whole body, known as total body irradiation (TBI). As well as destroying any remaining cancer cells, the high doses of chemotherapy also destroy the stem cells in the bone marrow. After the chemotherapy, patient is given the stem cells that were collected before the treatment. These stem cells start producing mature blood cells again.

## Types of transplant - There are three main types of transplant

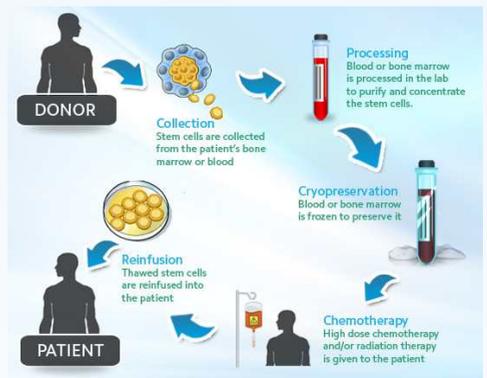
### 1. Autologous

This uses patient's own stem cells and those stem cells are used after the high-dose treatment.



### 2. Allogeneic

This uses stem cells from a donor and is also known as an allograft. An allogeneic transplant is a more complicated procedure than an autologous one and is only carried out in specialist hospitals like Hinduja Hospital. Recovery may take several months or longer. The donor is another person whose tissue has the same genetic type (HLA type) as the person needing the transplant (recipient). Because tissue types are inherited, similar to hair or eye color, it is more likely that the recipient will find a suitable donor in a brother or sister. This, however, happens only 25 to 30 percent of the time.



If a family member does not match the recipient, the request is sent to the unrelated bone marrow transplant registry database to look for a suitable unrelated individual whose tissue type is a close match. It is more likely that a donor who comes from the same racial or ethnic group as the recipient will have the same HLA type.

### 3. Umbilical cord blood stem cell transplant

Stem cells are filtered from blood in the umbilical cord after a baby is born and those cells used for transplant if they are a match. Matching is attempted as for other stem cell transplant. This is a good source of stem cells when related or unrelated matched donor is unavailable.

## Preparing yourself for Transplant

You will have a number of tests before the treatment. Your specialist nurse will explain what they are and why they are needed. Some of the tests you have may depend on the type of cancer or leukaemia you have and the stage of your disease. Once you understand what the treatment involves, you can take time to think things over and start to make practical arrangements. You will be admitted for the transplant in a room for a while, possibly several weeks. After the chemotherapy, there is a period of neutropenia during which period, patients can be very unwell requiring several medicines to prevent and treat infections and nutritional supplements etc.

## Post Transplant Care

After the transplant is completed and patient is discharged, patients need to continue some medicines to keep the transplant working.

## To know more about Bone Marrow Transplant Center (BMT):

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