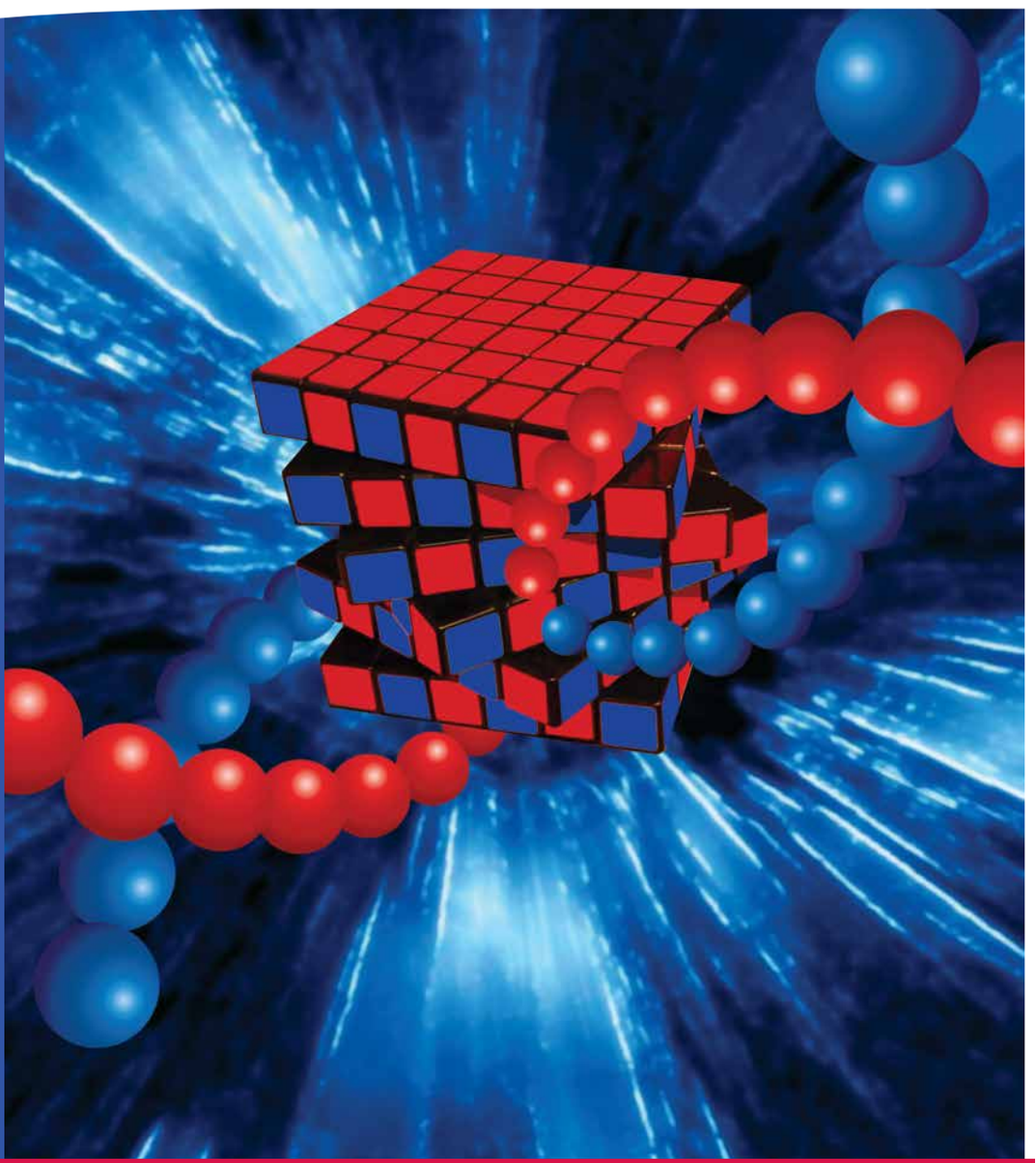
MIOT International

MARUTHUVA VIVEKAM



PLUS

Am I Anaemic?
Are you Anaemic?

Apharesis -
The washing of blood
Science fiction?

The Wait for the 'Perfect Match' comes to an End

Discover the Elixir of life

MIOT Announces First ever Haplo-identical Bone Marrow Transplant in India

May 2013 Vol:16

From the Chairman's Desk

Dear Friends,

Greetings! Your blood and all its mysteries take centre stage in this edition of Maruthuva Vivekam.

Blood studies are among our most important laboratory undertakings today - vital to the correct diagnosis and treatment of a vast number of diseases and conditions. With integrated, multispeciality care being the focus at MIOT, a centre that is dedicated to this super speciality has never been more important for us. We are very proud to introduce you to our latest addition - the ***MIOT Institute of Haematology, Haemato-oncology and Bone Marrow Transplant****. Our expert specialists at the Institute are finding newer ways of dealing with blood disorders, performing path breaking bone marrow transplants and giving more people a chance to lead a normal life.*

I hope you find this issue interesting and useful.
As always, I look forward to your feedback.

Stay healthy,

Mrs. Mallika Mohandas
Chairman, MIOT Hospitals

Laughter is the Best Medicine

"You have a rare condition called 'good health'. Frankly, I'm not sure how to treat it."

"More and more patients are going to the Internet for medical advice. To keep my practice going, I changed my name to Dr. Google."

Haematology, Haemato Oncology and Bone Marrow Transplant

Prof. Dr. P.V.A. Mohandas on the need for a world class dedicated Center

As an orthopaedic surgeon, about 40% of the patients that I see come in with complaints of neck pain and back pain. In atleast 2% of these cases, I make a diagnosis of myeloma, a bone marrow malignancy. Usually, these patients belong to middle and older age groups. With the right treatment under the care of a haematologist, they may be cured permanently.

For a very long time, even when I was Professor of Orthopaedic surgery at the Medical College, I had envisioned starting a Bone Marrow Transplant unit, specifically, a department of Haematology, Haemato-oncology and Bone Marrow Transplant.

Today, we see many patients with haematological problems, who require specialised consultation and treatment. Unless the hospital has a separate department for this speciality, it is difficult to get somebody to look after the patients, especially important in an emergency. We are also getting patients from the Middle East and Africa, where the incidence of sickle cell anaemia and thalassemia is very high. Operating on them can lead to disaster. We need a haematologist to assess the patients before surgery, get them ready for surgery and oversee their recovery, post-surgery.

Luckily for us, we have two haematologists onboard. Dedicated, focussed, enthusiastic doctors- who have trained in the UK and USA. They have formed a well knit team with haematopathologists, haemato-oncologists, infection specialists, laboratory specialists, nutritionists, dedicated nurses and counsellors to establish this new department - the ***MIOT Institute of Haematology, Haemato-oncology and Bone Marrow Transplant****. The Institute is supported by our state-of-the-art laboratory and has all the facilities to treat the gamut of blood disorders and diseases. I am happy to announce that this department has already performed a number of bone marrow transplants. Some of the indications are for the first time in India. In fact, the Institute is already a referral centre!*

"I wish these two young experts all the success."

MIOT INSTITUTE OF HAEMATOLOGY HAEMATO-ONCOLOGY & BONE MARROW TRANSPLANT

Unravelling the mysteries of the blood

Pushing the boundaries of medicine to offer fresh hope where there is little to none.

Lead Article

Constant exhaustion, weight loss, headaches, pale skin, repeated infections, night sweats, unexplained fever, unusual enlargement of lymph glands, bleeding, pain in your head and neck. The symptoms could be innocuous and unremarkable. But the possibility that something could be very wrong is considerable. Far fetched though it may seem, they could all relate to disorders of the blood, which require specialized diagnosis and treatment.

A significant gap in the system

Haematology is the science of the blood. Given that blood studies are crucial to the diagnosis of a large number of diseases and disorders - from anaemias to blood cancers and much more - it is surprising that very few healthcare institutions offer all the services of a fully functional Haematology unit. More often than not, you would have to get your tests and blood studies done in a lab that is independent from the hospital where you are seeking treatment. The onus - and the stress - of running about to get the tests done and take the reports back to your consulting specialists rests entirely on you. What's more, your specialist does not have the luxury of consulting, discussing your results or picking the brains of the Haematologist, who, if you are lucky, may have done your blood studies.

The latest feather in the MIOT cap!

Having recognized this crucial gap, MIOT International today caters to the specialized haematology needs of all its specialties under one roof through the latest entrant to the MIOT repertoire - the MIOT Institute of Haematology, Haemato-oncology and Bone Marrow Transplant.

The centre's comprehensive, world class facility is easily the most advanced in the country today. This facility is headed by an expert team of highly qualified specialists, who have had considerable exposure in some of the best medical centres across the world. They are ably supported by a dedicated and motivated team comprising specially trained nurses, technicians, nutritionists and paramedics.

We don't just diagnose, we have the latest treatments

Besides offering diagnosis and treatment of general Haematology disorders (such as anaemia, low blood count, clotting disorders etc.), the centre also offers highly specialized services for Haemato-oncology, right from diagnosis to the management of blood related malignancies like leukemias, lymphomas, myeloma etc.

This specialist centre has successfully performed all types of Bone Marrow Transplants across age groups.
It is focussed on providing transplant services that meet international standards.

State-of-the-art infrastructure

Infrastructure is critical in this specialty and can make all the difference to a patient's treatment and outcomes. Our specialist team is supported by cutting-edge diagnostic and treatment equipment.

- Sophisticated laboratory facilities, ranked 8th internationally, manned by expert specialists and technicians, including internationally trained haematopathologists.
- State-of-the-art apheresis machines, crucial for the collection of stem cells, platelets and other components, and also for certain therapeutic procedures.
- Cryopreservation Unit (processing and freezing unit) for stem cells, to ensure long term storage in a completely aseptic environment.
- 5 HEPA filtered, pressure controlled, individual rooms with en-suite facilities, to minimize airborne infections, vital to the patient's well-being after a bone marrow transplant.

Highly specialized services

The MIOT Institute of Haematology, Haemato-oncology & Bone Marrow Transplant offers a holistic approach in managing all blood disorders, across all age groups. Its services include:

- Treating and managing all blood disorders and diseases, such as anaemia, thalassemia, neutropenia (low white cell count), thrombocytopenia (low platelet count), bleeding and clotting disorders, blood cancers like leukemia, lymphoma, myeloma etc.
- Performing all types of Bone Marrow Transplants: Autologous, Allogenic, Haplo-identical and Umblical cord blood transplants.
- Providing blood and blood product support, including single donor apheresed platelets, leuco-depleted and irradiated blood products.
- Performing bone marrow biopsy, bone marrow harvest, intrathecal chemotherapy etc.
- Diagnosing haematological problems, i.e. reporting on bone marrow samples, blood films, flow cytometry etc.
- Providing in-patient, out-patient and daycare chemotherapy for complex haematological cancers like leukemia, myeloma, lymphoma etc.

HEPA filtered ward

For more information about the MIOT Institute of Haematology, Haemato-oncology and Bone Marrow Transplant, please email us at **haem.bmt@miothospitals.com** or call us at **+91 44 2249 2288, +91 44 4200 2288**, Extn: No: 61220

Apheresis underway

Spectra Optia

Article

The Elixir Of Life?

Delving into the mystery that is blood

Platelet with Red Blood cells

There are many legends about the elixir of life, a liquid that will keep one young forever. Perhaps they are mistaken. It's your blood that keeps you alive. Its functions are manifold and without it, you cease to be.

A flashback to your biology class

The average adult body has about 5 litres of blood. This living tissue performs a number of roles in your body. But first, what is your blood made of?

A few blood facts

Human blood comprises of four components. Red blood cells or **erythrocytes** are the most abundant cells in your blood. These transport haemoglobin, a protein that carries oxygen to every cell in your body. The white blood cells, **leukocytes**, are part of the immune system and work to destroy infection. There are five different types of leukocytes, including **lymphocytes**. Plasma is the yellowish liquid portion of your blood. It contains electrolytes, nutrients and vitamins, hormones, clotting factors (platelets) and antibodies that fight infection. The platelets or **thrombocytes** are responsible for clotting. When you have a wound, they join together to form a seal, thus preventing lood loss.

Blood In Artery, Vein And Capillary

For every 600 RBCs, there are about 40 platelets and 1 WBC.

An intricate transportation system

Your blood circulates through your blood vessels, namely the arteries, the veins and the capillaries. The arteries carry oxygen-rich blood to the body's tissues; the capillaries enable the exchange of water and chemicals and the veins transport blood with carbon dioxide to the lungs.

Your blood also carries heat through the body, nutrients from the digestive system to your cells and removes the waste products from your body. It transports your hormones, regulates acidity levels, protects you against infection and is responsible for the clotting of wounds. In short, it keeps a clean house.

Blood types, antigens and more

We're often asked for our blood type, mainly while filling out forms! You could have **A, B, AB** or **O** type blood. Blood types differ according to the antigens carried by your RBCs. **Antigens** are substances that induce the production of one or more antibodies.

There are two antigens, A and B. If you have the A antigen on your RBCs, then your blood is type A; your blood type is B when the B antigen is present. If your RBCs have both A and B antigens, you have type AB blood. It is type O blood when neither antigen is present.

Type O blood is the 'universal donor' and type AB blood is known as the 'universal recipient'.

When disorder reigns

When the cells that make up your blood behave abnormally, it affects your entire system. Blood disorders can be acute or chronic; many are inherited. They are also caused by other diseases, side effects of medications and the lack of certain nutrients in your diet.

Common blood disorders include anaemia, bleeding disorders, blood clots and blood cancers.

When your 'Clotters' Fail

One of the most important functions of blood is to prevent bleeding. If your blood has insufficient platelets, you could bleed uncontrollably.

In India, the most common cause for bleeding is immune thrombocytopenia (ITP), a disorder where the patient has insufficient platelets and tends to bleed internally or underneath the skin. Infections such as dengue can also cause bleeding from the nose, gums and under the skin.

Platelet dysfunction, where the number of platelets in the blood is normal but the cells do not function normally, also cause bleeding disorders.

Platelet count also drops significantly in patients who are in liver failure or have certain types of cancer, liver disease, massive tissue injury and certain viral, bacterial and fungal infections.

Haemophilia A & B are the most common inherited bleeding disorders.

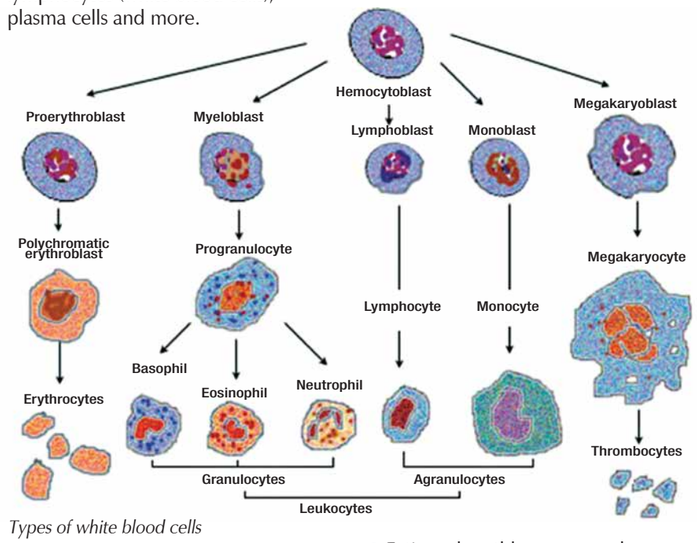
Article

When Your Army Turns Enemy

Blood cancers can attack anyone at any age. To be aware of the symptoms is to be two steps ahead of the game.

Of bone marrow and blood cancers

Your bone marrow is the production house for your stem cells. They produce several kinds of cells, which are broadly classified as erythrocytes (red blood cells), leukocytes, lymphocytes (white blood cells), plasma cells and more.



Types of white blood cells

Blood cancers are abnormalities that affect the way in which your blood cells are produced and function. Many of these cancers start in your bone marrow. In most blood cancers, normal blood cell development process is interrupted by **uncontrolled growth** of abnormal blood cells, which prevent your blood from performing many of its functions, like fighting off infections or preventing serious bleeding.

There are three major types of blood cancer: **leukaemias, lymphomas** and **myelomas**.

When white blood cells go haywire

Cancers that start in the bone marrow and cause the production of large numbers of white blood cells, which then accumulate in the bloodstream, are called leukaemias. They disrupt the function of your tissues and organs. Leukaemias can be **acute** (they progress rapidly) or **chronic** (they progress slowly). Both types can be fatal if they are not managed properly.

Patients with acute leukaemias often experience the following symptoms:

- Fatigue, breathlessness, weakness
- Recurrent and refractory infections such as chest infections, urinary infections and so on
- Bleeding and bruising
- Enlargement of lymph glands
- Abdominal pain because of liver and splenetic enlargement
- Giddiness, visual problems, cognition problems, fits etc.

Patients with chronic leukaemias could experience the same symptoms but because the disease develops slowly, they are able to tolerate them better. Therefore they often seek medical attention quite late.

When your lymph system is under attack

Lymphomas are blood cancers which involve the abnormal growth and behaviour of B or T lymphocytes, the white blood cells that form a part of your immune system. There are two major types of lymphomas: **Hodgkin's** and **non-Hodgkin's lymphoma**.

Lumps or swollen lymph nodes, weight loss, night sweats and fevers are some of the symptoms that patients experience.

Poisoning by M-protein

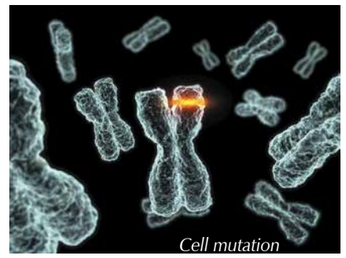
Myeloma is a complicated form of cancer. It caused by the overgrowth in the bone marrow of an immune cell called a plasma cell, which secretes what is called the 'M-protein' into the bloodstream.

Patients could experience pain in their bones, particulary those of the back, fatigue, infections, bleeding and bruising, problems with the kidneys etc. People under age 45 rarely develop the disease.

Goal: Remission

The goal in treating blood cancer is to achieve remission, a situation characterized by the absence of symptoms. Treatments include watchful waiting, chemotherapy, radiotherapy, immunotherapy, targetted therapy, biological therapy and stem cell transplants.

Patients diagnosed with blood cancer are treated by a specialist team of haematologists and oncologists. The good news is that survivorship for blood cancers have increased significantly due to advances in modern medicine. And of course, the earlier treatment starts, the more effective it is.



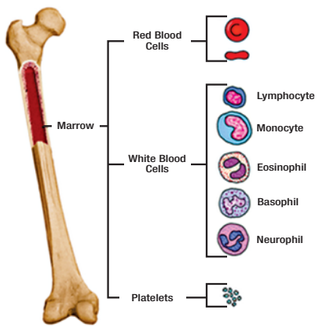
Cell mutation

Bone Marrow Transplants
Pushing the Frontiers of Modern Medicine

*Feb 4, 2013 saw a new milestone: **one million Bone Marrow Transplants worldwide.** In India though, it is still in its infancy due to problems that are unique to our country. Our specialists at MIOT International unravel the mystery and potential of Bone Marrow Transplants in India, including the relatively new **Haplo-identical transplants**, which could prove to be the **game changer** in this specialty.*

Q Basics first: what is a Bone Marrow Transplant?

A As you know, bone marrow is the tissue found in the centre of certain bones. It is the womb for 'stem cells', which produce different kinds of blood cells, specifically the oxygen-carrying red blood cells, infection-fighting white blood cells and clot-forming platelets.



Anatomy of Bone Marrow

When some of the stem cells turn abnormal or go missing, the whole system starts malfunctioning - the blood cells are no longer made in the way that your body needs. The only permanent solution is a Bone Marrow Transplant, which is a procedure where we destroy the 'unhealthy' stem cells, replacing them with 'healthy' stem cells called 'donor' cells. The donor cells then integrate with existing stem cells in the body, before producing new blood cells.

Q Where do the donor cells come from?

A Donor cells are collected from matching donors. Transplants are classified based on who these donors are.

Q How is a bone marrow match determined?

A We look for a donor who matches the patient's tissue type, specifically their human leukocyte antigen (HLA) type. HLAs are proteins (or markers) that are found on most cells in your body. The closer the match between the donor's HLA markers and yours, the better.

Even a 'perfect' match will vary slightly from your own cells, so the risk of rejection does exist.

Q When do you opt for a Bone Marrow Transplant?

A They are done for malignant conditions like acute & chronic leukemias, lymphomas, myelomas and certain solid tumours, and non-malignant conditions like aplastic anaemia, thalassemia, sickle cell disorders, auto-immune disorders and some immunodeficiencies.

Q Is Bone Marrow Transplant a last stand treatment as is commonly believed?

A Definitely not. In fact, in some cases, it is the only permanent solution. Once Bone Marrow Transplant has been identified as a treatment option, the sooner you start, the better your chances are. Excessive chemotherapy and radiotherapy prior to a transplant can actually kill the good cells to the extent that the transplant is futile or is not possible. To avoid this, patients should seek out centres that specialise in Haemato-oncology and have treatments planned with the concerned specialists right from the beginning.

Q What happens during the transplant?

A This is not an easy procedure to undergo. We ensure that we explain the process to the patient and caregiver completely, so that they are prepared.

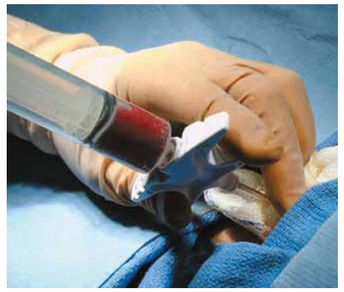
First, we prepare you for the transplant - chemotherapy or radiation is given to destroy all the bone marrow in your body to make way for the new cells. We then harvest or collect donor stem cells from the donor's bone marrow, condition or strengthen these cells if required, and cryopreserve them before radiation or chemotherapy. During the actual transplant, we put these millions of cells, which have now been treated, back into your body through a central line or vein. This takes about 30 mins.

Q What happens after the procedure?

A You will remain in the hospital for a few weeks while we monitor you closely. Until the donated cells engraft and start making blood cells and platelets, you will be completely dependent on transfusions of donor platelets and blood. Your immunity will be low and you will be susceptible to infections. To prevent this, we keep you quarantined in a HEPA ward that is 100% sterile. You will be given intravenous fluids, anti-viral, anti-bacterial and anti-fungal medications. We will also work to prevent a 'graft versus host' reaction - i.e. a rejection of the transplant. Finally, frequent blood checks are done to check that the grafted cells are taking hold.

Q What facilities are crucial for a successful transplant?

A The essential facilities are: a fully functional Haematology lab with



experienced haematologists, the 100% sterile HEPA filtered ward and the Cryopreservation unit where cells are stored at -170°C.

At MIOT, we also use two highly efficient and state-of-the-art aphaeresis machines, Spectra Optia and Cobe Spectra, to collect, process and store the peripheral stem cells. Most importantly, you need experienced specialists to plan and monitor every step of the process.

Q What are the different methods of transplants?

A We have Autologous transplants where you can donate your own cells, provided you have enough good cells. The match is naturally 100%.

Then we have Allogeneic transplants, where relatives (siblings, parents or new born babies) or people who are not related to you, but whose blood almost matches yours (90%-100%), can donate their cells.

When patients do not find a donor among relatives, they are forced to search international registries because we do not have a an organized registry in India. Infact, we are heavily dependant on stem cell donations from Europe, which are prohibitively expensive. Precious lives are lost in this endless wait for a match. Today, we are also able to perform Haplo-identical transplants, where the donor cells are not a perfect match. This makes them very exciting!

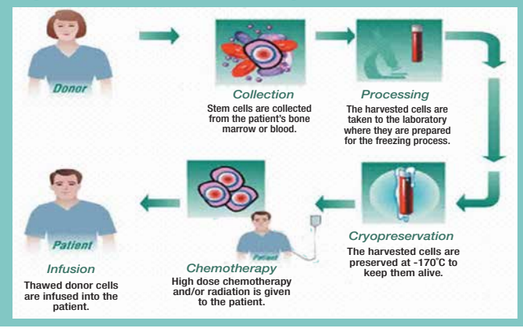
Q What is a Haplo-identical transplant?

A Haplo-identical transplant is a relatively new procedure. The donor is usually your parent or child. The match is not 100%, but it is not less than 50%. The focus is on modulating the patient's immune system to avoid rejection of the donor cells. This transplant requires more expertise and care and so there are very few centres in the world which can do it. But the good news is that the results of a successful haplo-identical transplant are as good as a completely matched transplant.

Q What should donors know about bone marrow donation?

A It is not the painful surgical procedure that most people think it is. In 3 out of 4 donations, we extract stem cells from the donor's blood via a needle in the arm. If it is a marrow donation, the liquid marrow is harvested from the donor's pelvic bone.

Haplo-identical Transplant- The Process



Q What does this mean for patients and especially for us in India?

A It can be a game changer! It opens up a whole new option for patients who desperately need a transplant but can't find a complete match. Doctors estimate that nearly all patients with blood cancers or auto-immune disorders and over 50% of sickle cell patients will find potential matches in their immediate family. It is also less expensive.

Of course, the type of transplant recommended will finally depend on the patient's disease, age, health condition and possible donors.

Q Can one store stem cells and umbilical cord blood for future use?

A Yes you can. However, in India, very few institutions have the cryopreservation facilities necessary to store stem cells. Also, unless the donated cells match the intended recipient's, there's no guarantee that these cells can be used by the intended recipient in the future.

Also donating stem cells does not harm the donor's health. Not more than 5% of the marrow is harvested and the cells replace themselves in 4 - 6 weeks.

Q Why are so few bone marrow transplants performed in India?

A Firstly, few healthcare providers have made the investments necessary to offer this specialty, in both infrastructure and expertise. Secondly, poor public awareness means that by the time patients come to us, it is already too late. And as discussed earlier, we don't have an organized Registry, which makes it very difficult to find matches within India.

Article

Doctor's Diary

A Definite Lifeline

With 70% patients not finding matching donors today, Haplo-identical transplants, as in little Somu's case, could open new gateways for those waiting...

Little Somu sat watching the other boys play football. He longed to join them, but knew he couldn't. He looked up as his father came out, his eyes sparkling with unshed tears. Mani knew exactly why his 10-year old was upset, but he was helpless. It angered him that there seemed to be no solution inspite of all his efforts over the last 2 years.

Closed doors

*His only son, Somu, had been diagnosed with **leukemia** and rejected by two of the leading bone marrow transplant centres in the country. The reason? Somu did not have a matching sibling donor. Now the family waited at home for the phone call the hospital had promised to make - one that would tell them they had found a matching donor, a promise Mani knew had been made to many. Surely they couldn't just wait while a precious life drifted away?*

Renewed hope

When Mani's brother called from Chennai that same evening with news of the MIOT Bone Marrow Transplant Centre, it revived the family's hopes. They wasted no time; they were at MIOT International the very next day.

*The Haemato-oncologist at MIOT later recalled, "When I saw the four of them together, what struck me most was the fierce determination on their faces to find a way out, at any cost. They motivated me! It was true that his sister Soumya was not a match but luckily for Somu, his mother was a **50% match**.*

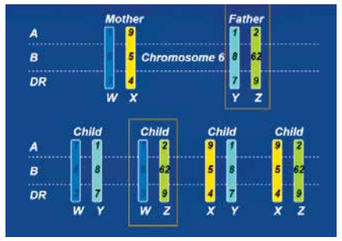
The most viable option

*After several tests, we decided to do a **Haplo-identical Transplant,** which is a more complex procedure but when successful, has the same results as a transplant with a 100% match. The procedure, side effects, risks, post transplant care - it was all explained to his parents over several sittings. They hardly had any queries - it was as though they'd placed themselves in our care completely. They were holding on tight to the chance they had as though it was a surprise gift from the Gods.*

Anxious days

The transplant started with harvesting stem cells from his mother Gomati, which were cryopreserved at -170°C. Meanwhile Somu underwent chemotherapy to destroy his faulty bone marrow. The transplant itself went smoothly. Then the waiting started for all of us.

Somu, who was on intravenous fluids and medication for nutrition and infection control, had hardly any complications. He was in complete isolation in the 100% sterile HEPA ward, but soon found a new family in our team of doctors, nurses and



paramedics, who attended to his every need and kept him cheerful. It was 17 long days before we had clear signs of his graft working. His tests results were excellent. In 2 weeks he was ready to go home with his parents and little Soumya, armed with strict instructions on his infection control regime.

Life beckons again

Somu visits us for regular reviews and insists on meeting the entire team each time. He should be ready to go back to school in 4 months, once his immunity returns to normal levels, but he's already kicking the ball around at home under his mother's watchful eye. As for us, it gives us immense satisfaction to have been able to give Somu a second chance. If it had not been for his Haplo-identical transplant, he would have joined the queue of those who wait endlessly for a 100% match, for no fault of theirs."

Article

Haematopathology - Both Art and Science?

The super speciality that gets to the root of all disorders

Marina, 45 yrs had ignored her constant exhaustion. Until she started having severe pain in her abdomen and passing discoloured urine. When her scans returned clear and doctors couldn't explain her symptoms, they referred her to MIOT International. A detailed blood workup revealed that she had Paroxysmal Nocturnal Haemoglobinuria (PNH), a rare blood disease.

During a Master Health Check-up, blood tests showed that Manoj, 32 yrs had an unusually high platelet count. Further blood studies revealed that he was suffering from Coeliac disease, an auto-immune disorder of the small intestine.

Except for constant tiredness, Smeetha, 47 yrs was in relatively good health. However, blood studies from her Master Health Check-up, showed otherwise. She had Pernicious Anaemia, a blood disorder where the body doesn't absorb Vitamin B12 and Iron.

Three unrelated people. Three different diagnoses. Three rare conditions. What did they have in common? If they had not been diagnosed in time, their diseases were potentially fatal. Also, the chances that they would be diagnosed through other indicators were negligible. It was their detailed blood workup and the correct interpretation of the results by a specialist hematopathologist that made accurate diagnoses and timely treatment possible.

A complex science & a triple specialisation

Haematopathology is a science that studies the clinical and diagnostic aspects of all diseases of stem cells. It covers bone marrow, lymphoma pathology, molecular diagnostics, clinical flow cytometry and cytogenetics.

A qualified haematopathologist is trained in medicine, pathology and haematology. Few hospitals offer this speciality; most of them bundle basic blood investigations as 'Blood Studies'.

The art of prognostication

Today, the role of the laboratory does not stop with a diagnosis. A haematopathologist also assists the treating specialists in determining a treatment course and monitors the patient's response to it. Prognosticating a disease (predicting its outcome) allows doctors to anticipate a patient's reaction to medications and therapies and customise treatment for the best possible outcomes. For patients and their families, this clinical skill allows them to prepare for challenges and effects that could be a part of the treatment.

Nipping rejection in the bud

What you should know about blood transfusions

Blood and its components are the most common 'biologic' drugs used. Blood transfusions replace a component of blood that the patient lacks - due to disease, injury or surgery. Plasma, platelets, white blood cells and red blood cells are often transfused; whole blood is rarely used.

In India, the use of blood and blood products is regulated by the Central Drug Standard Control Organisation (CDSCO).

Potential risks

Blood transfusions are not without risks, the more serious of which are: infection transmission, mismatched transfusion, transfusion associated graft versus host disease (where the donor cells attack the host cells), febrile non-haemolytic transfusion reaction (characterized by fever, chills, rigors) and post transfusion drop in platelet count.

Screening for your safety

To prevent infection transmission, donors are thoroughly screened. Voluntary donors are preferred over those who are directed to donate their blood or those who do so in exchange for compensation. The blood is screened for HIV, Hepatitis A & B, and malaria. This is done twice, ideally six weeks apart.

Leucodepletion - giving you an edge

Many blood transfusion complications are prevented by reducing the number of infection-fighting leukocytes in the blood product, through a process called leucodepletion. Apart from preventing reactions such as fever, chills, rigors etc., it also averts 'allergic' effects associated with future transfusions, solid organ and bone marrow transplants. Today, **universal leucodepletion** of all blood and blood products is carried out by very few hospitals.

Article

The Washing of Blood - Science Fiction?

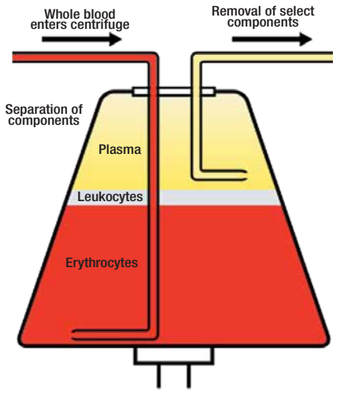
The process of Apheresis has opened new avenues in the treatment of a wide range of conditions.

Apheresis is a medical process in which a person's blood is passed through an apparatus that separates and withdraws one constituent (such as plasma, leukocytes, or platelets) and returns the remainder to circulation in the person's body. Blood is literally washed!

How is blood 'washed'?

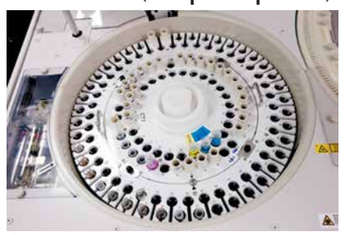
Different processes are used depending on the component needed. However, **Centrifugation** is the most common method adopted.

Here, the components of whole blood are separated within an instrument that is essentially designed as a centrifuge. The required component(s) is withdrawn and the remaining components re-transfused.



Why is Apheresis done?

Apheresis may be done to collect a specific blood component from a donor **(donor apheresis)** or as therapy for certain diseases **(therapeutic apheresis)**.



Centrifuge

Donor Apheresis and its significance

A couple of hours of your life and mild discomfort. That is all it could take to save a life.

Donors are required for different types of apheresis: plasma exchange, removal of white blood cells, removal of platelets and removal of red blood cells.

Donor apheresis is done to collect platelet units from single donors. These benefit people with blood disorders, certain types of cancer and patients who have had liver transplants.

Patients with low white cell counts, benefit from infusions of granulocytes (white cells).

Another significant role of apheresis is in the collection of stem cells and related cells for bone marrow transplants.

Therapeutic Apheresis - when conventional therapies fail

This is an option when conventional therapies become ineffective in treating chronic diseases, where the blood's plasma constituents interfere with the functioning of the immune system. In this process, whole blood is separated into its major components, the abnormalities are removed, and the 'treated blood' is re-transfused into the patient. The blood is 'treated' to modify how the cells work so that other treatments are more effective.

Therapeutic Apheresis may be used in the treatment of rheumatoid arthritis, systemic lupus, blood dyscrasias, sickle cell anemia and other malignancies.

The types of Therapeutic Apheresis

There are two major therapeutic apheresis procedures, namely:

- Plasma exchange, which could be life saving in certain neurological, rheumatological, dermatological, renal and haematological conditions.
- Red cell exchange, which is generally used in conditions like sickle cell anaemia and related conditions, poisoning etc.

65-year old Ananth was a man old before his time. He had rheumatoid arthritis and the disease had slowly taken over his life. Constant pain confined him to his house; his medication was no longer working. Then his doctors decided to try something radical. ***Therapeutic Apheresis.***

Ananth received a plasma exchange, which significantly reduced the swelling in his joints.

Sophisticated infrastructure for an efficient experience

Apheresis can be done using a dialysis machine, but this is an inefficient collection operation. Sometimes even as many as five transfusion cycles do not result in any improvement in the patient. On the other hand, using specialized and more sophisticated equipment such as the Cobe Spectra or the Spectra Optia, like MIOT International, yields as much as three times the amount of plasma. Equally crucial is the training, hands on experience and expertise of the doctors, nurses and technicians.
It is they who ensure that the process is a pleasant one with excellent results.

Article

Am I Anaemic? Are You Anaemic?

The burden of Anaemia in India & why we need to break the cycle!

A nearly fatal bout of the cold!

42-year old Ramya, a working mother of two, was constantly tired. She attributed it to her long working hours, looking after her family and excelling at work. Finally, when she seemed on the verge of collapse due to a chest infection, her husband insisted on taking her to the hospital. The doctors, finding her seriously ill, immediately took her into intensive care, where she spent the next 3 weeks.

What had brought this on? Tests revealed that Ramya's haemoglobin was just 1.5 gms per deciliter of blood, a tenth of the normal levels. Her medical records showed that a previous blood test had already indicated a low count of 8.0 gms per deciliter. Despite access to a healthy diet, she had been neglecting herself, and had weakened her system to an almost fatal degree.

Anaemia stats in India: a bleak picture

Studies reveal that 75-90% of children, 50-60% of pregnant women and 60-70% of non-pregnant women in India are anaemic. This malady affects the health of the nation as a whole. What's more, it is equally common among the upwardly mobile and economically backward in our society.

Basics first - what is Anaemia?

Anaemia is a condition in which you don't have enough healthy red blood cells to carry adequate oxygen to your tissues. This could be because your body does not make enough RBCs, it destroys RBCs or you are losing RBCs faster than your body is able to replace them.

There are many forms of anaemia, namely iron deficiency anaemia, vitamin deficiency anaemia, anaemia of chronic disease, aplastic anaemia, anaemia associated with bone marrow disease, haemolytic anaemia, sickle cell anaemia, thalassemia and anaemia caused by defective haemoglobin

Do I have Anaemia?

Anaemia can be temporary or long term, and can range from mild to severe. The symptoms that you could experience are:

- Constant exhaustion
- Pale skin
- A fast or irregular heartbeat
- Shortness of breath
- Chest pain
- Dizziness
- Cognitive problems
- Cold hands and feet
- Hair loss
- Headaches

Some of these symptoms can also indicate serious underlying problems.

You are at increased risk for the condition if your diet lacks iron, Vitamin B12 and folate. Women who are not yet menopausal are at a greater risk than men. Pregnancy is another factor.

The size '0' trend

The desire to fit into the size '0' attire (or atleast in the near vicinity!) is also contributing to the rising incidence of anaemia among young women across economic classes. In their quest to reach and maintain 'perfect' proportions, women are depriving their bodies of much needed nutrition, regardless of the consequences. And it is taking a toll on their health.

A pin prick is all it takes

A physical examination and a blood test will reveal if you are anaemic. The normal haemoglobin range in an adult's blood is generally 13.5 - 17.5 grams/deciliter for men and 12 - 15.5 grams/deciliter for women. If your numbers are lower, you are anaemic. In this case, your doctor will also perform tests to determine the shape and size of your red blood cells, and investigate further to see if there are any underlying causes for your anaemia.

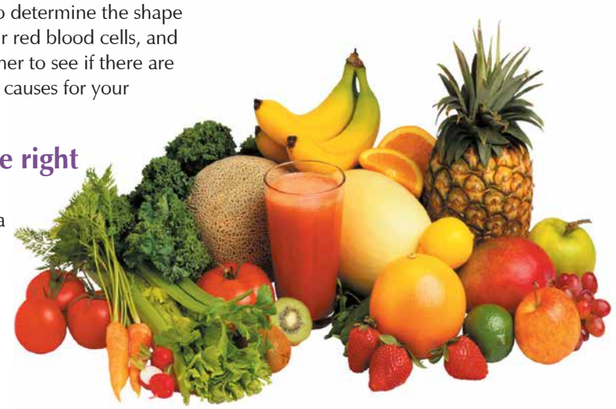
Finding the right balance

In most cases, a balanced diet and vitamin supplements take care of the problem. For vegetarians, this means eating more spinach, beans, chick peas and pumpkin.
Non-vegetarians are asked to increase their intake of fish, liver, lamb and egg.

Infections and the underlying problems, if there are any, are treated.

In severe cases, the patient is given a transfusion of blood. A hormone that controls RBC production may also be prescribed. In select cases, a bone marrow transplant may become necessary.

Finally, if you are experiencing symptoms that indicate that you could be anaemic, talk to your doctor. Treatment is simpler when you catch it early!



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Case Study

In Our Own Words

Veteran of 2 wars, Retd Colonel of the Indian Army, Mr. Mohan Krishnan, 70 yrs, thought he had a bad back; instead, he discovered that it was Multiple Myeloma, a rare cancer of the plasma cells. Mrs. Lalitha Krishnan recounts the experience of her husband's Bone Marrow Transplant at MIOT International.

My husband is an ex-army man and an extremely active one at that. He has a set routine that he follows rigorously from the time he wakes up at 6 AM until he goes to bed at 10 PM. He eats healthy and is particular about keeping fit.

Early days

Last year, when he started slowing down and complaining of aches and pains, it didn't occur to me that he could be seriously ill - we thought it was old age catching up. He was tiring quickly, complaining of persistent pain in his back and losing weight. When we finally went to our family doctor seeking treatment for his back pain, he gave Mohan some pain killers but these didn't help. We went back and he suggested a consultation with an orthopaedic surgeon. This time we were asked to do an MRI. It showed protrusions in his vertebra. The consultant asked us to get an **isotope scan** and directed us to MIOT International.

A shocking diagnosis

We were nervous at our first appointment at MIOT. Clearly there was something serious going on but we couldn't imagine what!

My husband underwent a battery of tests and scans and then the verdict was in: he had **Multiple Myeloma,** which is a cancer of the plasma cells. When we understood how serious the situation was, we were devastated.

Nuclear scan at MIOT

"Nothing in my army experience had prepared me for this. I knew my options; I didn't want to just give up, but I wanted to be sure."

The determination to fight ...

We decided to do whatever it took to beat the disease. The first step in my husband's treatment plan was **radiotherapy**. Under the capable care of doctors from the Oncology department, he underwent five weeks of radiotherapy on the world's most advanced radiotherapy machine - **TrueBeam STx**. The results were promising. There was a dramatic reduction in his pain. The radiotherapy itself was painless and comfortable and not at all what we had imagined.

Once the course of radiotherapy was done, the Haemeto-oncologists and the Bone Marrow specialists took over my husband's care. They would plan his **chemotherapy**. They sat with us and explained in great detail what chemotherapy was, how it worked, what side effects we could expect and how they could be managed.

With their guidance and the warmth and care of nursing staff, we got through the 4 weeks of chemotherapy without too much trouble.

The actual battle begins

The next phase of the treatment plan was an **Autologous bone marrow transplant**. The doctors explained that they would harvest some of Mohan's stem cells and then re-infuse them into his body. They detailed the procedure and recovery. It sounded difficult and while I did wonder if my husband would be able to manage it, I trusted our doctors' judgement completely. More importantly, he trusted their confidence and wanted to do the procedure.

The treatment was not easy but thanks to our doctors, we were mentally prepared for the challenges that we were going to face. My husband's stem cells were harvested and cryopreserved over the course of a day and a half. He was then given more chemotherapy to destroy the cancerous cells and prepare his body for the transplant. After that, the millions of harvested cells were put back into his body through a central line - a process that took less than half an hour!

The most difficult part of the experience followed. Total isolation. Because his immune system was down, he remained quarantined for almost a month. We saw no one but our care team. My husband received blood transfusions, medication to prevent infection and rejection of the graft, and intravenous nourishment. He lost weight and hair. The isolation also took its toll on his spirit.

A team effort

Through the whole experience, our care team was our rock. The doctors were very thorough and conscientious in their care. Regardless of how busy they were, they were always available when we wanted to voice our concerns or seek an explanation of what would happen next in my husband's treatment.

There was one occasion after the transplant when my husband was in pain and we needed to see the doctor. We were surprised to find that the doctors were still at the hospital even though it was well after 8 PM; we were touched but not so surprised when one of them remained all night just to check on Mohan in the morning!

The cheerful nurses were very kind and caring as well, going beyond the call of duty to reassure us and make sure we were comfortable. We could not have been better supported or cared for.

What particularly impressed my husband was the patience, confidence and transparency with which the team of doctors handled his case. He calls them his own personal 'army'. In fact, although we had the option of going to a leading hospital in Delhi, we chose to stay at MIOT International and we are glad we made that decision.

Returning to normal life!

Today, we are back at home and Mohan is recovering slowly but surely. Our doctors are pleased with his progress and his medications have decreased.

The simple things in life mean so much more today - the time we share with our children, the drive around our colony, the morning walks with the dogs .They make our decision to go ahead with the transplant all the more worthwhile. Thanks to MIOT, we've had a new lease of life."

"I realized there that it was not just the doctors' qualifications but their confidence that was important. It made me believe that fighting this disease was possible."

BREAST CANCER AWARENESS

For enquiries on Oncology: Tel: 98412 97972, 77080 97977, 2249 0707
Email: onco@miothospitals.com, radiation.onco@miothospitals.com

MIOT International

MIOT HOSPITALS 4/112, Mount Poonamallee Road, Manapakkam, Chennai - 600 089
Tel: 2249 2288, Fax: 2249 1188 Email: enq@miothospitals.com www.miothospitals.com