Paediatric Bone Marrow Transplant (BMT) / Hematopoietic Stem Cell Transplant (HSCT)
Comprehensive Superspecialist Care
Exclusively for Children

30+ Medical Specialities

World-Class Infrastructure

30+ Superspecialist Doctors

24x7 ACLS PAEDIATRIC AMBULANCE

IN-HOUSE 2500 SQ FT CHILDREN'S PLAY AREA

BI PLANE CATH LAB - FOR ACCURATE TREATMENT

3 TESLA MRI - FOR HIGH QUALITY IMAGING

STATE OF THE ART OPERATION THEATRES

128 SLICE CT SCAN - SCANS FULL BODY IN LESS THAN A MINUTE
About Narayana Health

Narayana Health is India’s leading healthcare provider with a network of 24 hospitals, 7 heart centres and 19 primary care facilities. NH has a strong presence across 18 locations in India, and a hospital overseas at Cayman Islands, USA. Bone Marrow Transplant Services are provided in Narayana Superspeciality Hospital, Howrah, Mazumdar Shaw Medical Center, Bommasandra, Dharamshila Narayana Superspeciality Hospital and SRCC Children’s Hospital, Managed by Narayana Health.

The BMT unit at Mazumdar Shaw Cancer Centre, a unit of NH at Bengaluru, has already done over 1000 transplants and is one of the largest units in the country. It also serves as a referral center for both national and international patients.

About SRCC Children’s Hospital, Managed by Narayana Health

SRCC Children’s Hospital, Managed by Narayana Health in Haji Ali Park, Mumbai, is a state-of-the-art Multi-speciality Tertiary Care Hospital dedicated to treating infants, children and adolescents. This facility provides cutting-edge super specialist medical care in over 20 specialities. Doctors here are some of the most experienced and highly trained Paediatric Specialists in the country, capable of treating a wide range of complex medical conditions and diseases. The team also consists of experienced nurses and paramedical staff who support the specialists and ensure that the patients receive proper care and attention. The hospital is designed keeping the needs of children in mind.

The hospital has taken critical care to the next level with the concept of Level IV care where a team of qualified paediatric intensivists provides Emergency Life Support (ELS) for children with failure of vital organs including heart, lungs and kidneys.

About Bone Marrow Transplant (BMT / HSCT) Unit at SRCC Children’s Hospital, Managed by Narayana Health

BMT/ HSCT Unit at NH SRCC is a 4 bedded facility with state-of-the-art HEPA filtered rooms, isolation facilities, laminar flow and dedicated BMT trained physicians & nurses. The unit is ably supported by a child centric multidisciplinary team of transfusion medicine physician, hemato-oncologists, intensivists, nephrologists, gastroenterologists, surgeons, cardiologists, endocrinologists, hemato-pathologist, pathologist, dietician and physiotherapist. Being a dedicated paediatric hospital, the unit is geared to handle babies as well as young adolescents.

Why Choose SRCC Children’s Hospital, Managed by Narayana Health for BMT / HSCT Transplant?

Children are not miniature adults-their needs are unique and are best managed by physicians trained to handle them. NH SRCC is a dedicated children’s hospital where everyone is geared to handle the needs of small babies as well as children and adolescents. The BMT team at NH SRCC is an experienced team and has won a number of accolades. Not just the transplant team, the ancillary services are also provided by trained paediatric specialists. This ensures better management of complications which eventually leads to better outcomes. NH SRCC is a child friendly hospital and caters not only to the medical needs of patients but also prioritizes on family centric care.
About Bone Marrow

Bone marrow is the soft and spongy tissue found within bones which is rich in stem cells. The most primitive of these stem cells are the pluripotent stem cells, which are different from the other cells in the following aspects:

- They produce cells identical to themselves
- They have the capacity to produce one or more subsets of mature cells

These stem cells are of prime importance in bone marrow transplants. Other sources of stem cells have gained popularity in the last decade, because their harvesting is better tolerated by patient while delivering almost identical success rates when compared to bone marrow transplants. These include peripheral blood stem cells and cord blood stem cells.

Some conditions which require Bone Marrow Transplant (BMT)

The conditions which necessitate a BMT can be broadly classified into 2 groups:

Cancerous Conditions
- Acute Myeloid and Lymphoblastic Leukemia
- Chronic Myeloid and Lymphoblastic Leukemia
- Hodgkin’s and Non-hodgkin’s Lymphoma
- Myelodysplastic Syndrome
- Myeloproliferative Neoplasms, Primary Myelofibrosis, etc
- Solid Tumors - like Neuroblastoma, Brain Tumors etc

Non-Cancerous Conditions
- Aplastic Anaemia
- Haemoglobinopathies such as Thalassemia and Sickle Cell Anaemia
- Immunodeficiency disorders
- Congenital errors of metabolism
- Congenital storage disorders
- Bone Marrow Failure Syndromes like Fanconi Anaemia

What Are The Stages of a BMT?

Undergoing a Bone Marrow Transplant is a five-stage process.
- Physical examination – to assess recipient’s health status
- Harvesting – the process of obtaining stem cells to be used in the transplant
- Conditioning – preparing the body for transplant
- Transplanting the stem cells
- Recovery period

Physical Examination

Routine diagnostic tests such as complete haemogram, kidney function test, liver function test, X-ray, and urinalysis etc. are performed. Also Human Leukocyte Antigen (HLA) typing and blood grouping are done to assess recipient/donor compatibility. This assessment of compatibility is essential to reduce risk of rejection of transplant.

Types of Transplant

Autologous Bone Marrow Transplant: The donor is the patient himself. Stem cells are taken from the patient either by bone marrow harvest or apheresis (a process of collecting peripheral blood stem cells), frozen, and then given back to the patient after intensive treatment.
Allogeneic Bone Marrow Transplant: The cells are taken from a healthy donor. Stem cells are taken either by bone marrow harvest or apheresis from a genetically matched donor, usually a brother or sister. Other donors for allogeneic bone marrow transplants may include the following:

- A parent/relative. A haplo-identical match is when the donor is a parent / sibling and the HLA match is at least half identical to the recipient
- Unrelated bone marrow transplants. The HLA matched marrow or stem cells are from an unrelated donor. Unrelated donors are found through national bone marrow registries.

Cord Blood Transplant: Where cord blood unit is used for transplant purpose

Sources of Stem Cells

Bone Marrow Harvest: This is the traditional source of stem cells for BMT. Marrow harvest is done in operation theatre under general anaesthesia. It takes 1-1.5 hours to do the procedure.

Peripheral Blood Stem Cell Transplant: The process of peripheral blood stem cell transplant is routinely performed, when compared to the bone marrow harvest method has this procedure is less invasive and easy to perform. Some studies even suggest that the stem cell yield by this method is higher when compared to bone marrow harvest. The process takes 4-6 hours after administering necessary medication for 4 days. Donors are injected with Granulocyte Colony Stimulating Factor (GCSF) for a duration of 4 days to stimulate stem cell proliferation. The donor stem cells are collected by a process of apheresis and administered intravenously to the patient. The donor stem cells have the property of stem cell homing whereby they migrate to the patient’s bone marrow and override his defective stem cells. This restores the ability of the patient’s bone marrow to produce blood elements.

Umbilical Cord Blood Transplant: Umbilical cord blood is a rich source of stem cells. After delivery or birth of the infant, cord blood can be collected from the umbilical cord (which is a waste, by-product of child birth) and preserved for later use. Cord blood possesses a higher concentration of stem cells than the adult blood. Around 80-100 ml of cord blood is collected and these stem cells are ideally suited for transplants in children. Before storage and preservation, the cord blood stem cells are typed, counted and tested. Cord blood cells are frozen until necessary for transplant.

Conditioning of the Patient

The conditioning process involves high doses of chemotherapy and sometimes radiation. It is carried out for three reasons:

- Destruction of the existing bone marrow cells to make room for the transplanted stem cells
- Destroy any existing cancer cells
- Suppression of activity of the immune system to decrease chances of rejection of donor stem cells

Transplanting the Stem Cells

The process of Bone Marrow Transplant does not involve the physical insertion of the marrow stem cells into the marrow of the recipient, but is more of an intricate and delicate blood transfusion method. The harvested stem cells are administered via a central venous catheter into the bloodstream from where they find their way to the marrow by a property of stem cells known as stem cell homing.

Recovery: The patient is constantly monitored to assess the success of the transplant. However, the procedure does involve a few risks, which include:

1. Graft versus host disease (GvHD)
   In this disease, the transplanted stem cells (“graft”) attack the recipients cells (“host”) as they are considered alien to the body.
There are two types of GvHD:
Acute GvHD – Occurs during the first three months following the transplant.
Chronic GvHD – Develops from acute GvHD and can cause symptoms for many years.

2. Infections
As a consequence of chemotherapy and bone marrow suppression, the body is transiently unable to produce cells to combat infections.

3. Graft rejection
The donor cells are unable to grow in the patient’s body leading to the failure of the transplant.

4. Relapse of the disease
Malignancies like ALL and AML may still come back even after a transplant

5. Appearance of a new disease or reactivation of an old illness
As the patient’s immunity is low or as a result of the chemotherapy, the patient may develop a new illness like renal failure or seizures etc which may need lifelong therapy.

Dr. Purna Kurkure is Chairman - Clinical Collegium for Oncology Services, Narayana Health Group & Head, Department of Paediatric Hemato-Oncology & BMT at SRCC Children’s Hospital. Dr. Purna Kurkure has carved a niche for herself in the field of oncology after 33yrs of services at Tata Memorial Hospital & superannuating as Head, Department of Paediatric Oncology. She has contributed a great deal towards the development of paediatric oncology in the sphere of service, education & research in the country & in Asian subcontinent & represented our unique strength & weaknesses at National & International forums. She has been the Secretary & President of various national and international societies, wining many accolades. She has extensively published articles in peer reviewed national & international journals & contributed chapters to many textbooks & guidelines. Childhood cancer survivorship is well researched & new entity in paediatric oncology as a result of high curability of childhood cancers. She has pioneered an organized survivorship care by starting late effect clinic (ACT clinic) & Childhood cancer survivors support group-Ugam. Her area of interests are paediatric cancers with special reference to solid tumors & late effects of therapy in childhood cancer survivors & cancer survivorship.

Areas of expertise
Paediatric Solid Tumors
Late Effects of Therapy in Childhood
Cancer Survivors and Cancer Survivorship
**Dr. Sunil Bhat** MD, FPHO, FRAH

Dr. Sunil Bhat is Director & Group Clinical Lead - Paediatric Bone Marrow Services across NH Group hospitals-Mazumdar Shaw Medical Centre of Narayana Health City, Bangalore and SRCC Children’s Hospital, Managed by Narayana Health. He will be providing his clinical services and be a mentor for BMT programme at SRCC Children’s Hospital. Following his post graduation in Paediatric Medicine from Jammu University, he has undergone training in Paediatric Haematology, Oncology and BMT from Sir Ganga Ram Hospital at Delhi. He was further trained at the Children’s Hospital at Westmead, Sydney Australia, in Paediatric Oncology and earned a specialization in Bone Marrow Transplantation. He has published more than 60 papers and numerous book chapters. He is active member of many committees and has delivered lectures / presented papers in national & international conferences. He has been a gold medalist at the medical college, university and in the fellowship exit exams. He is recipient of Dr. Nanak Chand Gold Medal from his Excellency, The President of India. He is the Ex Chair of the Stem Cell Transplant Committee of InPOG. Currently he is the Secretary of the Karnataka Hematology and Oncology Society. He is also Medical Advisor to Thalassemia Societies: Orrisa, Raipur and Dhaka (Bangladesh) and Editor International Journal of Medical Pediatrics and Oncology. He holds an experience of more than 1000 BMTs in Children including complex transplants, one of the largest Indian experience for a Paediatric BMT specialist.

**Areas of expertise**
- Paediatric Bone Marrow & Cord Blood Transplant
- Haploidentical Bone Marrow Transplant
- Paediatric Leukemia and Lymphoma
- Thalassemia Major
- Sickle Cell Disease

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**Dr. Ruchira Misra** DCH, DNB (Paediatrics), FRAH

Dr. Ruchira Misra is a Consultant in the Department of Paediatric Hematology – Oncology and BMT at SRCC Children’s Hospital. She finished her MBBS from Kanpur University with a distinction in Biochemistry. She did DCH from LLRM Medical College, Meerut followed by a DNB (Pediatrics) from Bombay Hospital Institute of Medical Sciences. She then pursued Paediatric Hematology–Oncology and BMT training in Australia and worked at Brisbane, Melbourne and Sydney. She was further trained at the Children’s Hospital at Westmead, Sydney Australia, in Paediatric Oncology and earned a specialization in BMT. On her return to India in 2011, she was involved in setting up the paediatric transplant programme at Medanta, The Medicity hospital, Gurgaon and Rainbow Children’s Hospital, New Delhi. She has authored a number of articles in peer reviewed journals and textbooks and has been a faculty at numerous conferences.

**Areas of expertise**
- BMT for Relapsed Malignancies
- BMT for Thalassemia
- BMT for Inborn Errors of Metabolism
Dr. Rashmi Dalvi MD (Paediatrics), DCH

Dr. Rashmi Dalvi is a Senior Consultant in Department of Hematology-Oncology at SRCC Children’s Hospital. An alumnus of Seth GS Medical College / KEM & BJ Wadia Hospital for Children, she has trained in Paediatric Hematology Oncology (PHO) in India & in USA at the Children’s Hospital of Michigan & Children’s Hospital of Philadelphia. An awardee of the Hargobind foundation & the UICC-ICRETT fellowships, she was among the earliest to develop and promote PHO subspecialty in India. She has been involved in academics, clinical practice & research in Paediatric Hematology, Oncology & Immunology for over 30 years. She has been office bearer in various societies including, Chair of PHO Chapter of IAP, Chair of SIOP- PODC Committee on Education & Training, Lead in NTP-PPO, Chair & member ICON Ethics Committee. Presently she is Continental President for SIOP-Asia (2018-2021). She is Professor & Head of Pediatrics, Bombay Hospital & Medical Research center and is honorary Consultant for paediatric BMT & Hematology-Oncology at Lokmanya Tilak Municipal General Hospital and Medical College.

Areas of expertise
- Anemias, Bleeding Disorders, Bone Marrow Diseases
- Immunodeficiency, Autoimmune Disorders
- Paediatric Cancers, Histiocytic Disorders
- Supportive Care in PHO

Dr. Swati Kanakia MD (Paediatrics), DCH, PhD

Dr. Swati Kanakia is a Senior Consultant in the Department of Hematology-Oncology at SRCC Children’s Hospital. She completed graduation & postgraduation in Paediatrics from the Grant Medical College Mumbai, with multiple distinctions in various subjects and a gold medal in the DCH examination. She completed her PhD in Applied Biology with dissertation topic, “Plasma Borne Infections in Thalassemia” during her tenure at the Division of Paediatric Hematology Oncology, Department of Paediatrics at the Lokmanya Tilak Municipal General Hospital (LTMGH) and Medical College. She received travelling scholarship from the International Outreach Programme from the St. Jude Children’s Research Hospital, Memphis, USA to enhance her training in paediatric Oncology. On her return from USA, she worked as a Research Associate in the Division of Paediatric Hematology Oncology, Department of Paediatrics at the LTMGH & Medical college on a fellowship awarded by the CSIR (Council for Industrial and Scientific Research). Dr. Swati Kanakia is a recognized teacher and examiner for DNB Pediatrics. She is actively involved in academics and is currently the secretary of the prestigious Mumbai Hematology Group.

Areas of expertise
- Paediatric leukaemia
- Paediatric Solid Tumours
- Paediatric Blood Diseases
- Thalassemia
- Primary Immune Deficiency Diseases
Dr. Kalpana Velaskar MD (Pathology)

Dr. Kalpana Velaskar is Consultant & Head Transfusion Medicine at SRCC Children’s Hospital. She completed MBBS from Seth G.S. Medical College and KEM hospital, Mumbai. She then completed her MD in Pathology from Seth G.S. Medical College and KEM hospital Mumbai. She further pursued her training in Transfusion Medicine and Blood Banking at Scottish National Blood Transfusion Services, Dundee and at Academic Hospital Uppsala in Sweden. She has held various positions at different institutions in the last 33 years; prominent amongst others are:

Lecturer Seth G.S. Medical College and KEM hospital, Mumbai
Associate Professor K.J. Somaiya Medical College, Mumbai
Associate Professor Transfusion Medicine SVIMS
Consultant Transfusion Medicine PD.Hinduja Hospital, Mumbai
Consultant Plasmapheresis Programme Dhirubhai Ambani Life Sciences, Mumbai

Areas of expertise
Component Therapy
Apheresis
Platelet Functions
Immunohaematology

Dr. Sujata Mushrif MD (Paediatrics), Fellowship in Paediatric Hematology and Oncology

Dr. Sujata Mushrif is a Consultant in Department of Paediatric Hematology-Oncology. She completed MBBS from Dr. D.Y. Patil Medical College, Pune. She then pursued post-graduate residency training in Internal Medicine and Paediatrics at the Wayne State University / Detroit Medical Center in USA. She is a Diplomate of the American Board of Internal Medicine and the American Board of Paediatrics. She further pursued a Fellowship in Paediatric Hematology and Oncology from the Children's Hospital Los Angeles, USA and is also board certified in the specialty by the American Board of Paediatrics. She developed special interest in treating children with brain tumors and in line with this interest she pursued additional fellowship training in Paediatric Neuro-Oncology at Cincinnati Children's Hospital Medical Center, USA. She has presented at various oncology conferences and is a member of many professional societies. Her areas of interest include paediatric cancers with particular reference to brain tumors & paediatric cancers.

Areas of expertise
Paediatric Brain Tumors
Paediatric Cancers
Paediatric Blood Disorders
Paediatric Superspecialities

- Critical Care & Emergency Services
- Cardiology & Cardiac Surgery
- Orthopaedics & Spine Surgery
- Neurology & Neurosurgery
- General & Laparoscopic Surgery
- Cancer Surgery
- Gastroenterology & Hepatology
- Clinical Hematology and Oncology
- Clinical Genetics
- Cranio Maxillo Facial Surgery
- Paediatric Medicine
- Plastic Surgery
- Nephrology
- Urology
- Endocrinology
- Rheumatology
- Respiratory Medicine
- Ophthalmology
- ENT
- Dental Sciences
- Immunization Clinic
- Bone Marrow Transplant (BMT) / Hematopoietic Stem Cell Transplant (HSCT)
• Anesthesiology
• Biochemistry
• Histopathology
• Hematopathology
• Transfusion Medicine
• Microbiology
• Radiology
• Clinical Nutrition & Dietetics
• Rehabilitation & Developmental Paediatrics
OPD Timings: 9 am to 5 pm (Monday to Saturday)