Apollo PROTON Cancer Centres

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INDEX

THE CANCER CARE LEGACY:

BREATHING HOPE INTO LIVES FOR OVER 28 YEARS

250+ *Oncologists*

14 *Cancer Centres*

1000+ *Beds*

2 lakh *Onco Surgeries*

over **5000+** *Radio Surgeries*

600 thousand *Radiation Sessions*

2 Million *Chemos*

Over **4000** *Robotic Surgeries*

Over **2000** *BMT Procedures*

50000 *PET-CT`s*

Largest number of **Proton Therapies** *are done in south asia*

RAY OF HOPE TO 3.5 BILLION FROM OVER 147 COUNTRIES

With the increasing global burden of cancer, advanced cancer care is becoming more and more crucial. Cancer care today means 360-degree comprehensive care, which requires commitment, expertise and an indomitable spirit from the cancer specialists.

It also demands constant innovation and a fresh way of thinking.

At Apollo Proton Cancer Centres, we aim to bring together the best minds in Oncology to discuss and deliberate the emerging trends in cancer management and their impact on clinical practice. The comprehensive treatment planning system involves a Tumor Board which consists of a panel of competent medical, surgical and radiation oncologists all working together to win over cancer.

CHAIRMAN'S NOTE

39 YEARS AGO, WHEN WE STARTED APOLLO HOSPITALS, THE PURPOSE WAS TO CREATE A HEALTHCARE SYSTEM OF GLOBAL STANDARDS. THERE WAS A SENSE OF COMMITMENT IN EVERYTHING WE DID.

Way back in 1995, we performed India's first heart transplant and since then, we have treated over ten million cardiac patients. But alongside, we realized that we needed the same passion for excellence in oncology, to win the war against cancer.

Whether it's cardiology or oncology, at Apollo, the effort is to be second to none.

We are changing the way cancer is managed by focusing on early diagnosis and personalized molecular oncology for surgical, medical and high-precision radiation treatment. We are driving smarter, safer and more effective treatments by being at the forefront of technology, expertise and research globally. Outcome measures which are benchmarked with the best centers around the world, empower the teams to achieve the highest standards of success in treatment.

With the first and only Pencil Beam Proton Therapy Centre in South Asia & The Middle East, and the zealous mission of Pro Health incorporating preventive oncology, Apollo Proton Cancer Centres have all that is needed to strengthen the battle against cancer.

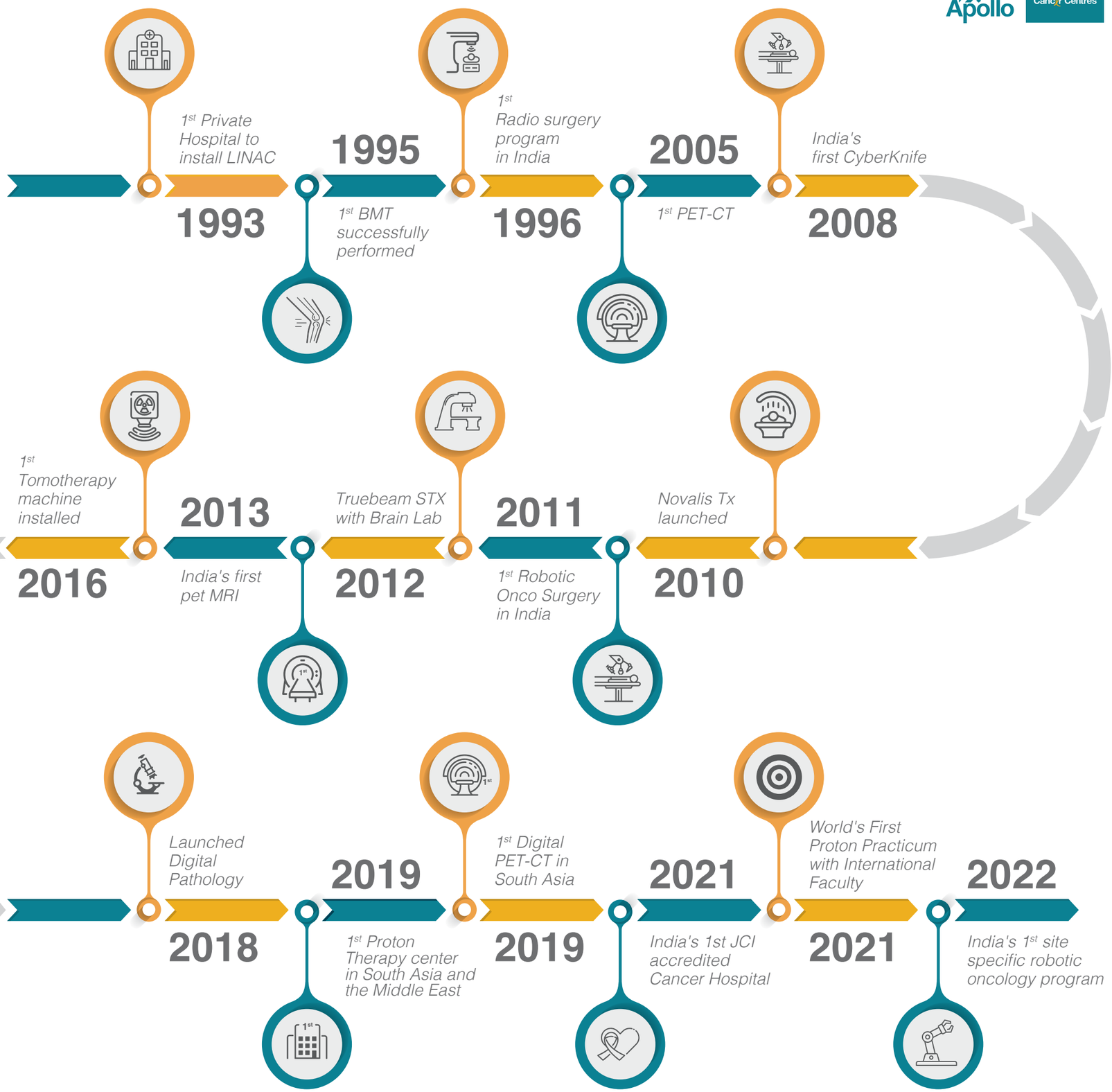
Across 14 cancer centers and 1000 dedicated beds, over 250+ Oncologists oversee delivery of high-end Precision Oncology Therapy. It warms my heart that our oncologists deliver world-class cancer care following an organ-based practice under competent Cancer Management Teams. This helps us in delivering exemplary treatment to the patient in an environment which has consistently delivered an international standard of clinical outcomes.

There was a time when people had to go abroad for advanced cancer care and cure. Today people from over 147 countries come to India for cancer treatment at Apollo Proton Cancer Centres. The fact that cases of cancer are rising dramatically, worries me. I believe that to beat the disease, we must do all in our power to prevent it and also diagnose it as early as possible.

Just as India has come together to fight the pandemic, we must step up our efforts to reduce the burden of cancer and make it curable, ideally for every patient. This is my goal and I need the support of my fellow citizens to build a healthier and happier India!

Dr. Prathap C Reddy
Chairman I Apollo Hospitals Group

OUR NETWORK & MILESTONES



DEDICATED PEDIATRIC ONCOLOGY INFRASTRUCTURE AND EXPERTISE

INDIA'S FIRST & ONLY SITE-SPECIFIC ROBOTIC ONCOLOGY PROGRAM

MULTI-DISCIPLINARY TUMOUR BOARD APPROACH

HIGH END DIAGNOSTICS IMAGING CENTER

PRECISION ONCOLOGY

ORGAN-SPECIFIC CANCER MANAGEMENT TEAM

APOLLO PROTON CANCER CENTRE (APCC) IS

THE FIRST AND ONLY PROTON THERAPY CENTER IN SOUTH ASIA AND MIDDLE EAST

AND IT IS

INDIA'S FIRST JCI ACCREDITED CANCER HOSPITAL.

A STEP AHEAD IN CANCER MANAGEMENT

MOST ADVANCED CANCER CARE

- *Personalized medicine care for cancer management*
- *Genomic Profiling for Cancers including DNA sequencing and Digital Pathology services*
- *Surgical oncology fully integral part of cancer care with 5 Modular Digital MRI integrated OT and inpatient beds*
- *State-of-the-Art Proton therapy center - 3 Gantries*
- *Advanced Radiation Oncology center*
- *Medical Oncology, Specialist pharmacy, Nursing, Molecular MDTs and Clinical trials*

COLLABORATIVE CANCER CARE
EXCELLENCE. EXPERTISE. EXPERIENCE.

Apollo Hospitals sounded the clarion call to battle cancer over two decades back, and since then has played a pivotal role in ensuring that India emerges as a global leader in the fight against cancer. This mission to conquer cancer demands the confluence of modern technology with the collaboration and commitment of the entire oncology fraternity in the nation. At APCC we will strive to create an ecosystem of excellence, where knowledge and priceless experience is shared. We seek to create a platform that touches and enriches lives with the dynamic and powerful impact of cutting-edge technology. Our mission is to give every patient the best possible chance to conquer cancer; your support is critical for the success of this mission.

Our patient referral system is guided by the unwavering values of complete transparency and regular dialogue. We understand you care for your patients; our protocols make sure that there is close communication with the primary healthcare professional and we go the extra mile to ensure that you are always a part of the treatment process.

We are looking to build a vibrant community that is united in its vision of curing cancer through innovation, commitment and empathy. Being a part of this community will give us a ringside view of exciting new developments in this field — be it in path-breaking clinical trials, incisive learning materials or the chance to follow deeply impactful conferences in proton therapy.

TECHNOLOGY DIFFERENTIATORS

COMPREHENSIVE MEDICAL CARE, BACKED BY THE LATEST TECHNOLOGICAL INNOVATIONS.

As cancer care has become one of the fastest-growing healthcare imperatives across the globe, Apollo Proton Cancer Centre (APCC) stands as a ray of hope for millions of cancer patients from 147 countries to access the most advanced cancer care, helping them with the courage to stand and stare cancer down.

APCC has a fully integrated treatment suite that offers the most advanced treatment in surgical, radiation and medical procedures. True to the Apollo Pillars of Expertise and Excellence, the Centre brings together a powerful team of clinicians renowned globally in cancer care.

1. Proton Therapy

APCC has established the first Proton Beam Therapy Centre for cancer treatment to serve over 3.5 billion people. Proton therapy is a cancer treatment that targets tumours with high accuracy, allowing for favourable outcomes with a low risk of side effects. As a result, normal, healthy tissue receives less exposure to radiation treatment, reducing the risk of complications. Fewer treatment complications may enable our physicians to deliver higher doses of radiation to the tumour. And this increased dose of proton radiation may improve a patient's chance for a successful outcome.

2. Helical TomoTherapy/IMRT/IGRT

TomoTherapy System is designed to safely and routinely deliver image-guided, intensity-modulated radiation therapy (IG-IMRT) for the treatment of cancer and other diseases. What has made the TomoTherapy System stands out when compared to conventional radiation systems in the integration of computed tomography (CT) scanner to perform daily imaging before each treatment session. APCC has the first and only helical TomoTherapy Machine in Tamil Nadu.

3. Robotic Surgery

Our state-of-the-art operating theatres are equipped with the 'Da Vinci Surgical System', the most advanced platform for minimally invasive surgery available today. The four-armed surgical robotic system is a breakthrough in surgical technology and is a crucial component of our integrated cancer care program. Robot-assisted surgery integrates advanced computer technology with the experience of skilled surgeons. This technology provides the surgeon with a 10x magnified, high definition, 3D image of the body's intricate anatomy. The robot helps replicate the surgeon's hand movements while minimizing hand tremors. The surgery is thus conducted with enhanced precision, dexterity, and control even during the most complex procedures.

4. Digital PET-CT

APCC is equipped with the most advanced state-of-the-art Digital PET-CT scanner, the first of its kind in South Asia. The fastest time of flight technology and digital detectors offer high resolution and crystal clear images with an ability to detect lesions as tiny as 1-2 mm in size at lesser imaging times and injected doses thereby imparting lesser radiation exposure to patients. The equipment also boasts of a wide-bore gantry which makes the scan seamless for a less claustrophobic experience and for large-sized patients. The newer reconstruction techniques allow scans to be completed almost twice as fast as the other conventional analogue PET-CT systems.

5. Digital Pathology

Digital pathology — also known as "whole-slide imaging" — is the process of scanning conventional glass slides and then digitally knitting consecutive images into a single, whole image that replicates the information on the glass slide. This virtual image is paired with associated clinical information to give pathologists an integrated picture of the person's unique cancer Pathologists can then perform additional diagnostics, including image analysis tests that are not possible on traditional glass slides.

6. Theranostics

The Theranostics program at APCC integrates diagnostic nuclear medicine and radionuclide therapy for various cancers throughout the body using suitable tracers and treatments that target specific biological pathways or receptors. Apart from the traditional Theranostics for thyroid cancer, neuroblastoma / pheochromocytoma with radioiodine compounds, Latest Theranostics also called 'Peptide Receptor Radionuclide / Radioligand Therapy (PRRT/ PRLT)' for advanced, metastatic, inoperable Neuroendocrine tumours and Prostatic cancer are being done here with state-of-the-art infrastructure by using Beta and Alpha emitting radio-isotopes like Lutetium 177 and Actinium 225.

7. Stereotactic Radiosurgery (SRS)

This is a procedure utilising very accurate targeted radiation in large doses to effectively kill a tumour or destroy a lesion. A non-invasive procedure that has been used as an effective alternative to surgery or conventional standard fractionated radiation therapy for treating small tumours. Stereotactic radiosurgery uses precisely focused radiation beams to treat tumours and other abnormal growths in the brain, spinal column and other body sites. Brain lab SRS system achieves submillimetric radiotherapy positioning and real-time monitoring through thermal surface tracking and real-time X-ray tracking. Highly beneficial for cranial and extracranial work.

8. 3 Tesla MRI

At APCC, we have the revolutionary 3 Tesla MRI. Operating at twice the power, it provides a greater signal-to-noise ratio, which is a major determinant in generating the highest quality image. The higher resolution images produced by the 3 Tesla MRI are beneficial when diagnosing pathological conditions involving the brain, spine, and musculoskeletal system. The resolution and clarity also allow radiologists to identify smaller lesions and anatomical structures that cannot be seen with less powerful machines.

RADIATION ONCOLOGY

PAINLESS & NON-INVASIVE TREATMENT OF CANCER

Radiation therapy *is a form of cancer treatment where cancer cells are destroyed using high-energy X-rays or particles such as protons. It is a painless and non-invasive local treatment which damages the DNA of the cancer cells and leads to the death of the cancer cells in the area irradiated. It is usually given from a machine outside the body (called external-beam radiation therapy). It is one of the pillars of cancer treatment; the others being surgery, chemotherapy, precision oncology and immunotherapy.*

Radiation therapy can destroy tumours by directly killing the cells and also by damaging the DNA of the cancer cells by the production of free radicals and/or preventing them from returning. It can be used by itself as the only treatment or in combination with surgery, systemic therapy (such as chemotherapy, targeted therapy and immunotherapy), or both. Sometimes radiation is used to shrink a tumour before surgery (neoadjuvant therapy) or given after surgery to halt the growth of remaining cancer cells (adjuvant therapy). Radiation may also be combined with chemotherapy (concurrent chemoradiation) to destroy cancer cells.

ADVANTAGES OF RADIATION THERAPY

- *Highly precise*
- *Protects the majority of other organs and tissues in the body*
- *Contributes to 50% of all cancer cures worldwide*
- *Relieves symptoms such as pain, and improves the quality of life for others involved*
- *Side effects of radiation are generally confined only to the area treated*
- *In some cases, radiation therapy may cause less damage compared to surgery, and the part of the body involved may be more likely to work the way it should after treatment*

PENCIL BEAM PROTON THERAPY

PINPOINT PRECISION FOR GREATER IMPACT AND MINIMAL DAMAGE.

Proton therapy is a cancer treatment that targets tumours with high accuracy, allowing for favourable outcomes with a low risk of side effects. Proton radiation oncology targets cancer more accurately. Unlike traditional X-rays, protons can be directed to reach only the areas of the body affected by cancer. As a result, normal, healthy tissue receives less exposure to radiation treatment, reducing the risk of complications. Fewer treatment complications may enable our physicians to deliver higher doses of radiation to the tumour. And this increased dose of proton radiation may improve a patient's chance for a successful outcome. Designed with the latest technology, the Proton Beam offers the unique possibility of configuring the most appropriate combination of features specific to each individual patient and provides the versatility to meet the clinical objectives of our physicians.

The benefits of Proton Therapy include

- *Delivering less radiation to healthy tissues and critical organs*
- *Fewer treatment-related short- and long-term side effects for some tumours*
- *Reduced incidence of secondary tumours resulting from radiation treatment in long-term survivors*
- *The treatment is applicable to over twenty different types of cancers including brain tumours, head & neck, lung, prostate, sarcoma, breast, gastrointestinal, and spinal tumours*
- *It is especially beneficial to children, who are vulnerable to negative effects of radiation including developmental and growth problems*

Apollo Proton Cancer Centres has established the first Proton Beam Therapy Centre for cancer treatment to serve over 3.5 billion people. This Proton Beam Therapy Centre is the first of its kind across South East Asia. On par with international standards, APCC is powered by **PROTEUS® PLUS** – a unique proton therapy solution designed to treat even the most complex tumours.

HERE IS WHY PROTON THERAPY AT APCC IS SAFER AND MORE EFFECTIVE

In conventional therapy, the X-ray beam delivers an 'exit dose' along the path beam, which can damage normal tissue or organs. Proton Therapy uses high-energy proton beams, instead of X-rays, to treat cancer. These high precision beams attack only the cancer cells.

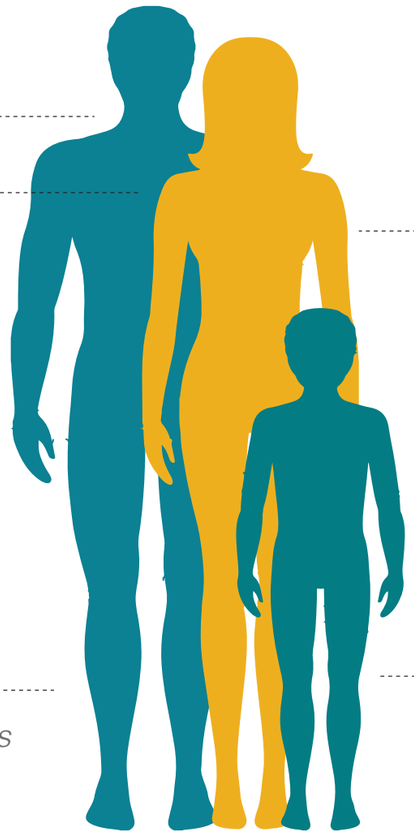
The point where most energy is released by the proton path beam can be accurately set to conform to the shape and depth of a tumour. Powerful cyclotrons, fully-revolving gantries and state-of-the-art delivery modes in the treatment process ensure unprecedented precision offered in a multi-room environment, considered the pinnacle of Radiation Oncology.

PENCIL BEAM PROTON THERAPY

APPLICATIONS OF PROTON THERAPY ACROSS VARIOUS TYPES OF CANCER

Head & Neck, Eye orbit
- *Paranasal Sinus*
- *Salivary Glands Carcinomas*
- *Nasopharynx*
- *Recurrent Chordomas*

Central Nervous System
- *Low and High Grade Gliomas*
- *Recurrent Meningiomas, Craniopharynglomas*
- *Medulloblastoma, Pituitary Adenomas*



Gastrointestinal Malignancies
- *Oesophagael Carcinomas*
- *Recurrent Rectal Cancer Pancreatic Cancer*
- *Hepatocellular Carcinomas*
- *Gynecologic Carcinomas*
- *Locally Advanced Cervix Carcinomas*

Thorax
- *Lung Carcinomas*
- *Breast Cancer*
- *Early Stage - Medically inoperable Paraspinal Tumors*

Pelvis
- *Early Stages Prostate Carcinomas*
- *Locally Advanced Prostate*
- *Pelvic Sarcomas*
- *Ewing's Sarcomas*
- *Retroperitoneal Sarcomas*
- *Emerging cases*

Pediatric
- *Pediatric Malignancies*
- *Pediatric Gliomas*

CUTTING-EDGE TOMOTHERAPY

Driven by the transformative radixact platform

Tomotherapy *is the combination of intensity-modulated radiation delivered with the precision and accuracy of Computed Tomography scanning technology. This integrated approach is a powerful weapon in the fight against cancer, especially in the case of complex and hard-to-access tumours. In Tomotherapy, radiation is delivered slice-by-slice. Extremely high-end imaging provides 4D volume images of the tumours that are moving. This allows precision targeting. A sophisticated motion monitoring technology continuously updates the affected part, which is then targeted by the radiation beams.*

The advanced multi-leaf collimator shapes the beam, allowing for microscopic precision and accuracy. At APCC, we take precision and excellence to the next level with the revolutionary Radixact system, which is the new frontier of Tomotherapy. Powered by state-of-the-art 3D CT imaging, it uses a linear accelerator to deliver high dose of radiation to the tumour with sub-millimetre precision. This ensures that only the affected cells are targeted; surrounding healthy tissue is not exposed to radiation. The Radixact Tomotherapy system at APCC is the first of its kind sophisticated treatment modality, available in Chennai.

SURGICAL ONCOLOGY FOCUS ON ROBOTIC SURGERY

THE BEST OF ROBOTICS, PIONEERED BY THE BEST IN ROBOTICS.

Our Surgical Oncology department is dedicated to offering cutting-edge, multidisciplinary treatment of primary metastatic and recurrent tumours. The team is a dedicated group of surgeons working closely to provide patients with the highest standard of clinical excellence. As per the needs of the patient, our CMTs chalk up a treatment blueprint that includes the following surgeries:

- *Diagnostic Surgery: Diagnose cancer through biopsy to determine the stage/extent of the disease.*
- *Preventive Surgery: Remove body tissue that is likely to become cancerous even though there are no signs of cancer at the time of the surgery.*
- *Debulking Surgery: Remove some, but not all, of cancer. This surgery is usually combined with radiation, chemotherapy or other treatments*
- *Oncoplastic/Reconstructive Surgery: Improve the way patients look after major cancer surgery. Also used to restore the function of an organ or body part after surgery.*
- *Palliative Surgery: Improve the quality of life by easing pain or discomfort caused by a tumour.*

Robotic Surgery

Apollo Institutes of Robotic Surgery are pioneers in this niche field and Robotic Surgery at Apollo Proton Cancer Centres is built on the same platform of excellence and expertise. We are committed to providing patients with an exceptional experience using cutting-edge treatment options. We have the largest robotic oncology program in India.

Our state-of-the-art operating theatres are equipped with the 'Da Vinci Surgical System', the most advanced platform for minimally invasive surgery available today. The four-armed surgical robotic system is a breakthrough in surgical technology, and is offered across the following specialities:

- *Urology*
- *Gynecology*
- *Cardiac*
- *Gastrointestinal*
- *Thoracic*
- *Spine*
- *Head and Neck*
- *Pediatric*

Robot-assisted surgery integrates advanced computer technology with the experience of skilled surgeons.

This technology provides the surgeon with a 10x magnified high definition, 3D-image of the body's intricate anatomy.

Advantages of Robot-Assisted Surgery

- *Micro-Precision surgery*
- *Better cancer control*
- *Less damage to healthy tissue*
- *Reduced risk of wound infection*
- *Minimal blood loss during surgery*
- *Faster return to urinary continence*
- *Faster return of sexual function*
- *Quicker return to bowel movement*
- *Reduced hospital stay*
- *Faster recovery*
- *Less pain*
- *Less visible scars*

The Apollo Institutes of Robotic Surgery are committed to providing patients with an exceptional experience using cutting-edge treatment options. Our highly trained surgeons, our tender loving approach to care and our state-of-the-art medical facilities are all geared towards providing excellent outcomes for the benefit of the patient.

Minimally Invasive Surgeries

The Apollo Hospitals Group has been a leader in the use of laparoscopic and robotic surgery for the management of thoracic, gynecologic, gastrointestinal, prostate, and other cancers. Our surgeons are actively developing new devices to make operations safer and more effective. Their work is enhanced by the latest software, imaging equipment, and high-definition monitors that our premises offer.

Hyperthermic Intraperitoneal Chemotherapy (HIPEC)

Hyperthermic Intraperitoneal Chemotherapy (HIPEC)

Cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (HIPEC) is an innovative procedure used to treat cancers that have originated in or spread to the abdominal cavity, such as appendiceal cancer, pseudomyxoma peritonei, colon cancer, gastric cancer, ovarian cancer, and peritoneal mesothelioma.

Benefits of HIPEC surgery:

- *Best survival rates of any peritoneal mesothelioma treatment*
- *Fewer side effects than traditional chemotherapy*
- *Safe delivery of higher drug doses than systemic chemotherapy*
- *Local application means more cancerous cells than normal cells are exposed to the drugs, which prevents resistance to chemotherapy*

Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC)

PIPAC is a novel therapeutic method of administering chemotherapy within the abdominal cavity. This approach allows for direct treatment of cancers within the peritoneum, an area in which systemic chemotherapy has a little effect due to a low number of blood vessels within this area to effectively transmit traditional chemotherapy.

At the time of treatment, the surgical team performs a minimally invasive laparoscopic procedure that allows for direct access to the abdominal cavity. A high-pressure micro-injection pump converts liquid chemotherapy into an aerosolized spray that can reach every corner of the abdominal cavity, even typically hard-to-reach tumour cells.

MEDICAL ONCOLOGY

A POWERFUL COMBINATION THAT STRIKES AT THE HEART OF CANCER.

Medical Oncology is the use of powerful therapeutics to launch a sustained attack on cancer cells. Tremendous strides have been made in this crucial field. Medical Oncology has moved beyond conventional chemotherapy and now straddles new and revolutionary facets like personalized systemic treatments, targeted therapy, hormonal therapy and immunotherapy. For young patients, onco-fertility, genetic counselling, is offered routinely and for older patients – the geriatric oncology program ensures safe delivery of systemic treatments. APCC's multi-disciplinary approach leverages great expertise and skill in site-specific Medical Oncology to augment our radiation and surgical treatment so as to provide patients with a comprehensive and 360 degree treatment blueprint.

At APCC, the protocols are tailor-made to the patient's specific type of cancer. If indicated, our specialists use cutting-edge next generation sequencing to identify key genetic mutations in a patient's tumour. These individual variations in genes allow doctors to administer very focused tumour categories and prescribe treatments to address the cancers' individual make-up. At APCC we will use IBM Watson – one of the world's best platforms for collating, sorting and analysing data

Personalised Therapy

At APCC we deliver cutting edge chemotherapy which is individualised to each patient's needs to maintain quality of life. Genomic tests may guide in de-escalating treatment in some patients and avoid chemotherapy. If indicated, next generation sequencing is offered and optimal drug treatment is considered for patients to personalised therapy. This is overseen by the weekly molecular MDT.

Targeted Therapy

At APCC we use the precision medicine approach to deliver personalized and targeted cancer treatment. We use therapeutics to target specific genes or proteins that make up cancer cells and launch an all-out attack on them to arrest the growth and spread of cancer cells. Our approach is to identify potential targets to compare the amounts of individual proteins in cancer cells with those in normal cells. Proteins that are present in cancer cells but not normal cells or those that are more abundant in cancer cells would be potential targets, especially if they are known to be involved in cell growth or survival.

Hormone Therapy

Hormone therapy fights cancer by changing the number of hormones in the body to treat certain forms of cancer that rely on these chemicals to grow and spread. We use drugs to prevent hormones from making cancer cells grow and divide.

Immunotherapy

Immunotherapy leverages the patient's immune system to form an effective arsenal against cancer. The immune system is our first line of defence against cancer; immune cells patrol the body vigilantly looking out for cells that are not normal, such as bacteria, viruses, cancer *cells, to destroy them.*

Molecular Profiling

Molecular profiling is a great catalyst to improve the efficacy of systemic therapies. Our expert pathologists and molecular biologists analyse the cancer tissue sample collected for biopsy or the patient's blood sample and perform rigorous molecular biology testing on them. These tests predict the patient's chance of responding to cancer drugs when administered for treatment. This forms the basis for bespoke treatment plans for individual cases of cancer.

Genetic Counselling

In Genetic Counselling, the gene mutation of the cancerous cells is checked to predict whether the patient can respond to a particular drug or not.

NUCLEAR MEDICINE - THERANOSTICS

Theranostics uses specific biological pathways in the human body, to acquire diagnostic images and also to deliver a therapeutic dose of radiation to the patient. A specific diagnostic test shows a particular molecular target on a tumour, allowing a therapeutic agent to specifically target that receptor on the tumour cells that have them. Thus the normal cells that do not have such receptor expression are spared of treatment.

1. Target expression

Identify the most useful target for each patient and cancer through diagnostic scans. Choosing the vehicle to deliver radiation: Once the target is identified, we need to choose the range of the missile that we are going to send. Long range for larger tumours- beta emitters. Short targeted bursts of energy are delivered with alpha emitters making them more potent. Sometimes even electrons with much lesser range for a single or couple of cells kill. We also choose the vehicle depending on the life that we expect for the medicine once we inject it into the body. Sometimes you need rapid deposition of energy in a shorter period or sometimes longer time with slower energy deposition.

2. Peak precision

The vehicle and ligand reach the targeted area, attach to the cell and continuously release a burst of energy that will kill the tumour cells mostly selectively. So once administered it stays on inside the body for long periods giving off treatment effect for many days and weeks.

3. Minimum side effects

In RN Therapy, the delivery of radiation is mostly only to those cells that express a particular target at the precise site of the tumour, minimizing damage to healthy tissue around it. This results in minimal side effects, faster recovery and a better quality of life.

Advantages of Theranostics

- *Targeted radiation to specific cells only*
- *Intravenous therapy mostly, so minimally invasive and not painful*
- *Much better tolerance*
- *Proven credentials in reducing the risk of side-effects*
- *Better quality of life during and after treatment*
- *A painless and non-invasive procedure*
- *Seeing what you treat and treating based only on what you see*
- *Personalizing the radiation delivered based on individual patient's tumour characteristics and expression*

Role of Theranostics in Cancer

- *Brain tumours- meningiomas and glioblastomas*
- *Pediatric cancers- neuroblastoma*
- *Bone & soft tissue cancers- pain palliation*
- *Head & neck cancers- thyroid*
- *Urology cancers- prostate*
- *GI cancers (gastrointestinal)- liver cancer*
- *Thoracic cancers- advanced lung cancer*
- *Breast cancers- advanced breast cancer*

NM Diagnostics

Nuclear Medicine Diagnostics is an established integral part of cancer management and plays a dominant role right from the staging, to treatment response assessment and follow up of patients. The accuracy and resolution help in offering personalized cancer care to each individual by analysing the behaviour of cancer in depth. The Department of Nuclear Medicine at Apollo Proton Cancer Centre is equipped with the most advanced state-of-the-art Digital PET-CT scanner, the first of its kind in South Asia. The fastest time of flight technology and digital detectors offer high resolution and crystal clear images with an ability to detect lesions as tiny as 1-2 mm in size at lesser imaging times and injected doses thereby imparting lesser radiation exposure to patients.

Exclusive Features of Digital PET-CT

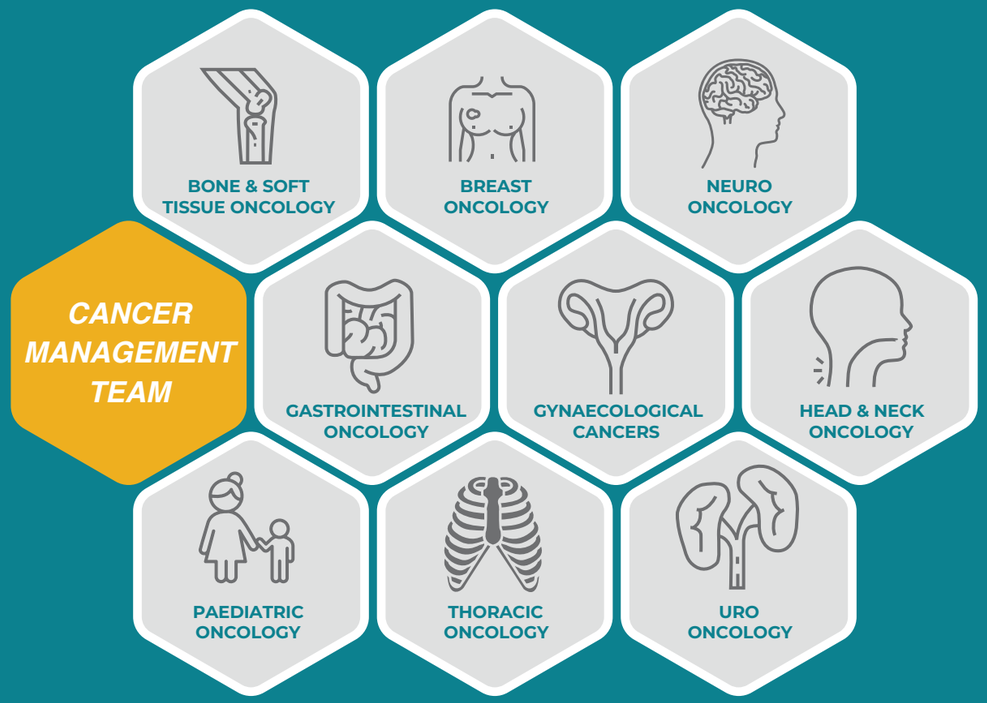
- *Fastest- less than 10 minutes for whole body scan*
- *Safest- lowest radiation exposure*
- *Smallest- can pick up even 2mm lesions compared to analog PET*
- *Highest Sensitivity- 50% to 60% more pick-up*
- *Clearest- true 3D image quality*

Advantages of Digital PET-CT

- *Wide gantry bore size (78 cm)- It provides 25% more space compared to other PET-CTs to reduce claustrophobia and improves patient experience*
- *Even large sized patients can be imaged easily*
- *Simultaneous contrast enhanced 192 slice-whole body CT for anato-metabolic information*
- *Early detection of small lesions*
- *Accurate staging and restaging of cancers*
- *Accurate quantification of tumour metabolism before and after treatment*

APCC'S UNIQUE
CANCER MANAGEMENT TEAM APPROACH
MULTI-DISCIPLINARY EXCELLENCE

Our approach to cancer care is best defined by our unique Cancer Management Teams (CMTs). We believe that cancer is a complex enemy; conquering it demands the coming together of the finest experts in specific cancer groups. Each CMT at the Apollo Proton Cancer Centre of site specific specialists who undertake diverse disciplines like Surgery, Radiation & Medical Oncology, Pathology, and Rehabilitation. A CMT is further fortified by world-class support staff like nurses, dieticians, therapists and clinical trial coordinators. These experts play a pivotal role in drawing up the treatment blueprint based on their vast experience, the unique needs of the patients and the collective expertise of the team.



BONE & SOFT TISSUE CANCER MANAGEMENT TEAM

Bone tumors are of two major types. Primary which occur de novo and secondary bone tumors in which a tumor in some other part of the body has spread. Primary bone tumors may be benign (which do not spread) or malignant (sarcomas). Sarcomas are rare tumors and are seen 1 in every 100 cancers. Sarcomas are made up of cancers that start in the extremities with examples including cancers that start in bone, cartilage, muscle, nerves, and fat. There are nearly 100 different types and subtypes of sarcoma and this is called as primary bone or soft tissue sarcomas. Our orthopedic oncology specialists are experts in the management of all types of this disease. Cancer that starts in other parts of the body (such as the breast, prostate, lung, kidney or thyroid) can often spread to bones—which can cause pain at first—but if the cancer in the bone gets large enough, it can cause the bone to break without trauma, called a pathologic fracture. This is called as secondary bone tumors. Pathologic fractures can be extremely painful and have difficulty healing without surgery and radiation therapy. In addition, they can cause significant delays in care of the overall cancer. For this reason, specialty expertise in orthopedic oncology is critical for the appropriate management of skeletal lesions from all types of cancer.

Cancers treated by Proton Therapy

- Chordoma
- Chondrosarcoma
- Sarcoma of the trunk (Chestwall, abdominal wall, pelvis, etc)
- Recurrent sarcoma
- Non-extremity osteosarcoma (Pelvis, vertebra, ribs, etc)
- Retroperitoneal sarcoma
- Rhabdomyosarcoma
- Ewing's Sarcoma
- Giant cell tumor
- Solitary fibrous tumor
- Aggressive desmoid fibromatosis
- Recurrent benign bone tumors requiring radiation

Radiation Oncology

Radiation therapy has an important role in most bone and soft-tissue tumors. For bone / soft-tissue tumors in complex location (Pelvis, vertebra, axilla, chest wall, etc) where surgery could result in significant morbidity and debilitation, definitive radiotherapy is performed with curative intent. In general, bone and soft-tissue tumors are less radio-sensitive (therefore require high dose for tumor control). Delivery of such high doses of radiotherapy with conventional techniques of radiation is challenging and hence high precision radiation therapy techniques such as intensity modulated radiation therapy (IMRT), stereotactic body radiation therapy (SBRT), helical Tomotherapy and intensity modulated proton therapy (IMPT) ensure that high dose of radiation can be precisely delivered to the tumors and with minimal doses to adjacent critical organ at risk for effective cure and long term disease control.

Surgical Oncology

For sarcomas that begin in the extremities, the treatment goal is for complete removal whenever appropriate. This often requires a multi-disciplinary approach involving specialists from orthopedic surgery, radiation oncology, medical oncology, pathology and radiology. Surgical techniques include limb salvage surgery, in which difficult tumors can be removed and the limb reconstructed using advanced techniques, such as endoprosthetic replacements. This allows both optimal resection of the tumor and maximization of limb function. In patients who have cancer that has spread to the bone, the goal is to prevent pathologic fracture and limit pain. This is accomplished by carefully studying the lesions in the bone as the treatment progresses and making sure that patients who present a risk of fracture are treated before they cause a problem. While surgery is the most common form of treatment, patients may also receive radiation therapy or chemotherapy. Treatments may be applied individually or combined as part of an overall care plan.

Medical Oncology

Site wise medical oncology practice based on multidisciplinary tumor board decisions is the unique highlight of the medical oncology unit at APCC. Bone and Soft tissue tumors often present in advanced cancers (locally advanced or metastatic) and need systemic therapy for better treatment outcomes in terms of survival and quality of life. All bone and soft tissue tumors are recommended to be treated at high volume centers like APCC with a dedicated musculoskeletal tumor board. In APCC, all cancer patients are worked up optimally and offered treatment like targeted therapy as indicated. Intensive chemotherapy regimens need excellent critical care backup which is available at APCC. In state of art Daycare, each patient is provided with the ideal systemic treatment in the most comfortable way creating a beautiful experience every time.

BREAST CANCER MANAGEMENT TEAM

The Breast CMT at APCC has been formed with the express intention of driving excellence in the space of Breast Oncology in APCC, including clinical service, academic research and education. Multi-disciplinary care remains at the core of treating Breast cancers. This relies upon an effective multidisciplinary network of surgeons, medical and radiation oncologists, Plastic surgeons, pathologists, radiologists (including interventional and nuclear medicine), nursing and palliative care physicians. Our core strengths include top-of-the-line infrastructure and internationally and nationally acclaimed faculty. The treatment strategies are evidence based and where appropriate national and international guidelines are incorporated into the care plan for each patient.

Cancers treated by Proton Therapy

- Adjuvant radiotherapy following breast conserving surgery
- Adjuvant radiotherapy following mastectomy
- Radiotherapy for bilateral breast cancer
- Reirradiation for locally recurrent breast cancer
- Stereotactic body radiotherapy (SBRT) in selected patients
- Whole brain radiotherapy with hippocampal avoidance in selected patients
- Stereotactic hypofractionated radiosurgery for brain metastases in selected patients

Radiation Oncology

Radiotherapy for head neck cancers requires exacting attention to detail and close monitoring, in addition to sophisticated equipment and treatment techniques. At APCC, we specialize in individualization of breast cancer treatment and radiation techniques to limit long term morbidity of treatment. Among the foremost is proton therapy, which results in the least dose to the normal organs, the heart, lungs and opposite breast. This is especially important in patients with a high risk of radiation induced heart disease viz., diabetes, obesity, chronic pulmonary disease and chronic NSAID use. Proton therapy reduces the risk of second cancers, especially in young women.

In addition, radiation techniques such as Helical Tomotherapy and Deep Inspiratory Breath-hold reduce the risk of heart disease being treated photon based radiation. Oligometastatic breast cancer patients i.e. those with a few metastases are treated with hypofractionated stereotactic radiation in 1-5 sessions.

Surgical Oncology

At APCC, breast cancer surgical planning is a personalized process, where treatment is tailored to the disease extent, and stage, based on international guidelines, and also to the needs and lifestyle of the patient. Patients have access to the latest technology and the best clinical practices with treatment decisions discussed in the comprehensive multidisciplinary tumour board. Our team has expertise in performing Breast Conservation Surgery, Oncoplastic Breast Surgery (wherein local plastic surgical techniques are incorporated along with oncological techniques) to restore breast cosmesis, Stereotactic Breast Procedures, Modified Radical Mastectomy, Breast Reconstruction, and surgeries related to axillary staging, such as Dual-Dye Sentinel Lymph Node Biopsy and Axillary Clearance. The surgical treatment is well coordinated between the radiology, breast surgery, and pathology departments, to ensure accurate diagnosis and surgical management.

Medical Oncology

Medical Oncology is the use of medical treatments to treat the cancer systemically. APCC's multi-disciplinary approach leverages great expertise and skill in site specific Medical Oncology. Precision oncology helps us *understand more about the biological basis of an individual patient and identifying the genomic drivers has helped us in individualising therapy and improving outcomes for patients with cancers. This has also helped in de-escalating treatment for some patients. A weekly robust molecular MDT has inputs from site-specific* oncologists -national and global, molecular oncologists, panomics specialists, biostatistician, germline *geneticists, clinician-scientists and other leading experts in the field of precision oncology.*

- *Chemotherapy*
- *Targeted therapy*
- *Hormone therapy*
- *Immunotherapy*
- *Molecular profiling*
- *Oncofertility*
- *Geriatric oncology*
- *Specialist oncology pharmacy*
- *Specialist oncology nursing*
- *Scalp cooling (to come)*
- *Art therapy*
- *Patient support group meetings*
- *Patient reported outcome and experience measures*
- *Tele –consults, Tele-genetics*

GASTROINTESTINAL CANCER MANAGEMENT TEAM

The Gastrointestinal CMT at APCC has been formed with the express intention of driving excellence in the space of Gastrointestinal Oncology in APCC, including clinical service, academic research and education. Multi-disciplinary care remains at the core of treating GI cancers. This relies upon an effective multidisciplinary network of surgeons, medical and radiation oncologists, gastroenterologists, pathologists, radiologists (including interventional and nuclear medicine), nursing and palliative care physicians. Our core strengths include top-of-the-line infrastructure and internationally and nationally acclaimed faculty. The treatment strategies are evidence based and where appropriate national and international guidelines are incorporated into the care plan for each patient.

Cancers treated by Proton Therapy

- Liver Cancer- Hepatocellular carcinoma, Cholangiocarcinoma
- Esophageal cancer
- Liver metastases-from colon cancer, breast cancer etc.
- Recurrent rectal cancer
- Locally advanced and Recurrent pancreatic cancer

Radiation Oncology

In Gastrointestinal cancers, radiation therapy is an established component of oncological treatments. Proton Therapy which is unique to APCC, uses high-energy proton beams, instead of X-rays, to treat cancer. This allows high precision treatment of tumours in the GI tract and reduces side effects to the surrounding healthy tissues and critical organs. With the help of a 4-dimensional CT scan and surface- guided radiotherapy (SGRT) with Visionrt, available only at our center (in Chennai) and high-quality cone-beam CT imaging on-board our Proteus Plus proton therapy machine, we have successfully addressed the unique challenges of treating gastrointestinal organs in the abdomen. Our TomoTherapy Radixact™ (IG-IMRT) system also delivers image-guided, helical Intensity modulated radiotherapy (IMRT), creating a new standard in Photon therapy in the state of Tamil Nadu. Along with the evidence based practice and multi-disciplinary approach which is embedded in the ethos of our institution, this provides the highest level of clinical care excellence to every patient entering our doors.

Surgical Oncology

Our gastrointestinal surgical team have decades of experience and expertise in GI surgical oncology as well as advanced minimally invasive procedures for GI, hepato-pacreato-biliary and peritoneal surface malignancies. We operate some of the most challenging and complex cases and consistently provide good outcomes. We treat hundreds of gastrointestinal patients in a year and have particular expertise in:

- Esophageal and gastric malignancy
- Hepatobiliary malignancy
- Pancreatic malignancy
- Colorectal and anal canal malignancy

Surgery forms the base around which the integrated cure of the disease rests upon!

- Robotic surgery
- Complex minimally invasive surgery
- Transanal endoscopic microsurgery (TEMS) and transanal total mesorectal excision (TATME)
- Cytoreductive surgery (CRS), Hyperthermic intraperitoneal chemotherapy (HIPEC) and pressurized intraperitoneal aerosolized chemotherapy (PIPAC) for peritoneal surface malignancies
- Complex multivisceral surgery including exenterations
- Intraoperative ablation therapy

Ours is one of the few institutions in the country where our GI surgeons involve surgeons from different specialities routinely to remove tumors from different organs in the same surgery (multivisceral resections). This strategy provides oncological benefit for patients who have advanced tumors as they start their next line of treatment earlier.

Medical Oncology

Medical Oncology is the use of medical treatments to treat cancer systemically. APCC's multi-disciplinary approach leverages great expertise and skill in site specific Medical Oncology. Precision oncology helps us understand more about the biological basis of an individual patient and identifying the genomic drivers has helped us in individualising therapy and improving outcomes for patients with cancers. This has also helped in de-escalating treatment for some patients. A weekly robust molecular MDT has inputs from site-specific oncologists -national and global, molecular oncologists, panomics specialists, biostatisticians, germline geneticists, clinician-scientists and other leading experts in the field of precision oncology.

- Chemotherapy
- Targeted therapy
- Hormone therapy
- Immunotherapy
- Molecular profiling
- Oncofertility
- Geriatric oncology
- Specialist oncology pharmacy
- Specialist oncology nursing
- Scalp cooling (to come)
- Art therapy
- Patient support group meetings
- Patient reported outcome and experience measures
- Tele –consults, Tele-genetics

GYNAEC CANCER MANAGEMENT TEAM

The Gynaecologic oncology department offers an integrated approach to the diagnosis and management of women's cancers of the reproductive system. These include cervical cancer, ovarian cancer (includes fallopian tube and peritoneal), pelvic masses, uterine cancer, vaginal cancer and vulvar cancer. We are one of the best cancer care providers in the continent and a tertiary referral center. We have nationally and internationally recognized doctors treating you, and are up to date with current evidence and research. Our team offers you comprehensive care with compassion, clinical excellence and with a multi-disciplinary team (MDT) including gynaecologic oncologists, radiation oncologists, medical oncologists, surgeons of other specialities, specialist nurses, radiologists, pathologist and other supportive services.

Cancers treated by Proton Therapy

- Primary, post op and recurrent Cancer cervix,
- Post op, primary and recurrent Cancer Endometrium,
- Post op, primary and recurrent Vulvar cancer,
- Primary, pos op and recurrent Vaginal cancer,
- Gynecological cancers with paraaortic lymph nodal disease.
- Fertility and bone marrow sparing treatments

Radiation Oncology

At APCC, patients have access to sophisticated radiation therapy treatments such as Helical Tomotherapy, a form of Image Guided Intensity Modulated Radiotherapy (IGRT, IMRT) and Intensity Modulated Proton Therapy (IMPT). These techniques are designed to deliver radiation accurately to the affected regions of the body while ensuring that normal structures near the tumour, such as the small and large bowel, urinary bladder, pelvic bone marrow, sacrum and pelvic bones receive less dose. This translates into a better chance of curing cancer with fewer short and long term side effects.

Surgical Oncology

Our team has expertise in performing open, laparoscopic and robotic gynaecological oncological procedures to the best standards. We offer minimally invasive procedures (Robotic and laparoscopic), sentinel node, fertility preserving and nerve sparing procedures for endometrial and cervical cancers. We offer fertility preserving surgery in early ovarian cancer. In advanced ovarian cancer we offer Cytoreductive surgery for removal of macroscopic abdominal and peritoneal disease, combined with Hyperthermic perioperative intra peritoneal chemotherapy (HIPEC) – Complete Cytoreduction rates around 90%, on par or better than the best centers in the world. We are a specialist center in treating advanced ovarian cancers, HIPEC, recurrent cancers and robotic surgery.

Medical Oncology

Site wise medical oncology practice based on multidisciplinary tumor board decisions is the unique highlight of medical oncology unit at APCC. Gynecological cancers often present in advanced cancers (locally advanced or metastatic) and need systemic therapy for better treatment outcomes in terms of survival and quality of life. The current line of systemic therapy includes chemotherapy, targeted therapy, immunotherapy etc. Main cancers include ovarian cancers, endometrial and cervical cancers. Most important factor that decides treatment is comprehensive multidisciplinary tumor board. Genetic factors like BRCA mutation play an important role in treatment and at APCC, we discuss and evaluate the genetic basis also followed by the management with targeted therapy. In state of art Daycare, each patient is provided the ideal systemic treatment in most comfortable way creating a beautiful experience every time.

HEAD AND NECK CANCER MANAGEMENT TEAM

An integrated team approach for assessment, treatment and rehabilitation of head neck cancer patients. The Head Neck CMT comprises experienced clinicians- Head Neck Surgical and Reconstructive oncologists, site specialized Radiation and Proton Therapy specialists and site-specific Medical Oncologists. This expert team is backed by sophisticated equipment for the treatment of difficult head neck cancers including those involving ITF, base skull, sinonasal region. The Head Neck Cancer Management Team works in conjunction with experienced oncoradiologists and oncopathologists and is assisted by a dedicated supportive care team, that pays attention to swallowing and speech therapy, physiotherapy, psychotherapy, nursing and nutrition.

Cancers treated by Proton Therapy

Skull base chordomas and chondrosarcomas – Locally advanced, inoperable, Postop, and Recurrent

- Paranasal sinus cancers
- Nasopharyngeal cancers
- Nasal cavity cancers
- Oral cavity cancers: Locally advanced, inoperable, Postop, and Recurrent Buccoalveolar cancer (cancer of the cheek) Cancer of tongue, Cancer of floor of the mouth
- Oropharyngeal cancers: Cancer tonsil, Cancer base tongue,
- Laryngo- hypopharyngeal cancers – Locally advanced, Recurren
- Salivary gland cancers Locally advanced, inoperable, Postop, and Recurrent

Radiation Oncology

Radiotherapy for head neck cancers requires exacting attention to detail and close monitoring, in addition to sophisticated equipment and treatment techniques. At APCC, we specialize in difficult head neck cancers that lie in close proximity to critical structures, such as the visual and hearing pathway and brain and brainstem. Treatment techniques such as Image Guided Intensity Modulated Proton Therapy (IMPT), Helical Tomotherapy, a form of IMRT with IGRT and SBRT are used to treat the entire spectrum of head neck cancers ranging from advanced skull base lesions to early vocal cord cancers.

Surgical Oncology

All the patients are discussed in multidisciplinary tumor board and joint clinic- for the best possible treatment plan. We have a surgical team with vast experience in treating all head and neck cancers. Surgical planning meetings help us plan the best possible approach to the tumor with best oncologic and esthetic outcome. Reconstruction is critical in functional outcome, its incorporated in the surgical planning from the first visit. Rehabilitation (SPEECH and SWALLOWING) + (DENTAL REHABILITATION) are critical part of surgical planning. Virtual surgery and 3D Printing are available in house and are considered when required. Our area of special interest includes,

A) Oral cancers-early and locally advanced oral cancers with particular interest in functional and esthetic reconstruction.

B) Recurrent head and neck cancers- post chemo/radiation / surgery

C) Primary and secondary Reconstruction of complex head and neck defects- for best functional and esthetic outcomes

D) Open and Endoscopic Skull base surgeries –for benign and malignant skull base tumors

E) Lateral skull base surgeries

F) Transoral laser microsurgery

G) Robotic Head and Neck surgeries- TORS (Lateral Oropharyngectomy/ Base tongue resection/ Supraglottic laryngectomy), Robot assisted neck dissection, Robot assisted thyroid surgery

H) Thyroid surgeries using specialized nerve monitoring technique

I) Minimally invasive thyroid and parathyroid surgeries

J) Laryngectomy and pharyngectomy +post laryngectomy voice rehabilitation

K) Tracheal resection and reconstruction

L) Salivary gland surgeries

M) Dental implants and restoration

Medical Oncology

Site wise medical oncology practice based on multidisciplinary tumor board decisions is the unique highlight of medical oncology unit at APCC. Head and neck cancers often present in advanced cancers (locally advanced or metastatic) and need systemic therapy for better treatment outcomes in terms of survival and quality of life. The current line of systemic therapy includes chemotherapy, targeted therapy, immunotherapy etc. Most important factor that decides treatment is comprehensive multidisciplinary tumor board. In APCC, both curative and palliative lines of treatment are provided along with optimum symptomatic care. In state of art Daycare, each patient is provided the ideal systemic treatment in most comfortable way creating a beautiful experience every time.

NEURO CANCER MANAGEMENT TEAM

The Central Nervous System (CNS) is made up of the brain and the spinal cord. CNS tumours comprise of the tumours in the above two locations. Tumors arise when healthy cells in the brain or spinal cord change and grow out of control, forming a mass. While brain tumours are of different types ranging in a spectrum from benign to malignant, all of them require specialized treatment. Each patient is unique and according to the nature of the lesion, we formulate a customized plan with multimodality approach consisting of surgery, radiation and chemotherapy.

Cancers treated by Proton Therapy

- *Adult low and high-grade glioma*
- *Paediatric gliomas*
- *Acoustic neuromas*
- *Atypical, recurrent or unresectable meningioma*
- *Medulloblastomas*
- *Posterior fossa tumours*
- *Chordomas and low grade Chondrosarcomas*
- *Arteriovenous malformation*
- *Recurrent or unresectable craniopharyngiomas*

Radiation Oncology

There are more than 120 different types of brain tumours, and standard of care has always been surgery followed by histopathological evaluation, molecular analysis followed by radiotherapy with or without chemotherapy. Proton Beam Therapy is a form of radiation therapy which is ideally suited to treat brain tumours and is the global benchmark of excellence in treating paediatric brain tumours. Proton beam therapy, by virtue of its unique phenomenon of "Bragg peak" results in no exit dose, thereby sparing critical structures, and resulting in improved quality of life. Proton beam therapy, especially pencil beam scanning intensity modulated proton beam therapy reduces the chances of exposure of normal tissues to low dose irradiated volumes that is common with conventional radiotherapy, thereby reducing the incidence of secondary malignant neoplasms, and resulting in preserved quality of life.

Surgical Oncology

Brain cancer unlike cancer in other parts of the body confronts us with unique challenges. Being the seat of almost all of our day today functions like vision, hearing, sensation, motor movements, memory among all others, each and every small part of our brain is concerned with special functions and warrants exceptionally fine and delicate surgical strategy which may not be the case with cancers in other areas of the body. We have state of the art operation theatres with the most advanced neurosurgical equipment consisting of Zeiss Kinevo operating microscope, StealthStation S 8 Neuronavigation system, Intraoperative Neuromonitoring, Sonopet Cavitron Ultrasonic Surgical Aspirator, among many others. The combination of our experienced team of neurosurgeons along with our advanced neurosurgical infrastructure strive to deliver the best possible surgical outcome in all of our patients.

Medical Oncology

Site wise medical oncology practice based on multidisciplinary tumor board decisions is the unique highlight of medical oncology unit at APCC. Neuro-oncology practice in adults usually include advanced gliomas and need systemic therapy like chemotherapy, targeted therapy for better treatment outcomes in terms of survival and quality of life. Most important factor that decides treatment is comprehensive multidisciplinary neuro-oncology tumor board including neuroradiologists. In APCC, the focus is to provide patient centric systemic therapy which can improve the quality of life of patients as often they have neurological symptoms which needs special attention. In state of art Daycare, each patient is provided the ideal systemic treatment in most comfortable way creating a beautiful experience every time.

PEDIATRIC CANCER MANAGEMENT TEAM

Curing cancer in children requires a multidisciplinary approach. No single specialist will be able to do it on their own. Bearing this in mind at Apollo Proton cancer center we have built up a team of doctors from various specialties with interest and expertise in treatment of childhood cancers. These doctors are available at the same time in the same place and children and their anxious families do not need to "run around" to meet these specialists. This facilitates quick and good communication between the stake holders and ensures commencement of treatment at the earliest, which is a major factor in curing cancer.

Cancers treated by Proton Therapy

Brain Tumors

- Craniopharyngioma
- Pituitary Adenoma
- Meningioma
- Pilocytic astrocytoma
- Diffuse astrocytoma
- High grade glioma
- Glioblastoma
- Germ cell tumor
- Choroid Plexus Tumor
- Ependymoma
- Medulloblastoma
- Atypical teratoid rhabdoid tumor (ATRT)
- Diffuse midline Glioma
- Pineal tumors
- Dysembryoplastic Neuroepithelial tumor
- Hemangioblastoma
- Other rare pediatric brain tumors

Extracranial Tumors

- Rhabdomyosarcoma
- Ewing's Sarcoma
- Chordoma
- Chondrosarcoma
- Unresectable and postoperative Osteosarcoma
- Nasopharyngeal carcinoma
- Soft tissue sarcoma
- Hodgkin's Lymphoma
- Non-Hodgkin's Lymphoma
- Retinoblastoma
- High risk Neuroblastoma
- Wilm's tumor
- Juvenile nasopharyngeal angiofibroma
- Olfactory neuroblastoma
- Germ Cell tumor

Radiation Oncology

Radiation therapy is extremely challenging in children, adolescents and young adults. High precision radiation therapy techniques such as intensity modulated radiation therapy, helical Tomotherapy, image guided radiation therapy and Proton therapy are preferred to mitigate the damage to normal healthy tissues and thereby avoid late effects related to the function of brain, heart, lungs, kidneys, liver, bowel, bones, endocrine organs, fertility etc. At APCC dedicated pediatric cancer centered focus including dedicated pediatric multi-disciplinary tumor boards ensure a high-quality pediatric radiation oncology service. We also have a dedicated pediatric anesthesia unit to enable safe radiation therapy delivery for very young children (younger than 4 years).

Surgical Oncology

Surgical interventions in children with cancer are performed by Pediatric surgeons with special interest in cancer surgery. We at APCC are a group of 3 surgeons with over 3 decades of experience who perform this. We bring together our training and experience from the west and India to provide the best possible surgical outcome for our patient. We have consistently provided results that are comparable with the best centers in the world. We have the expertise to perform Robotic surgery, laparoscopic and thoracoscopic surgery where indicated in addition to performing open surgical procedures. We also liaise with surgeons from other specialties when needed so as to provide the best outcome for our patients.

Medical Oncology

The pediatric oncology team at APCC includes Dr Revathi Raj, Dr Ramya Uppuluri and Dr Venkateswaran VS (HOPE Team). Every case is discussed in a multidisciplinary tumor board including pediatric oncologists, pediatric surgical oncologists, radiation oncologists, radiologists and pathologists. All diagnostic facilities including MRI, PET CT scan, histopathology, and molecular diagnostics, are available under one roof. All treatment offered is protocol and evidence based. Chemotherapy is delivered through a team of specialists including doctors, nurses, and clinical pharmacists. We have facilities for vascular and venous access such as chemo ports and PICC lines so as to make delivery of chemotherapy a pain- free process for the children. We also have adequate facilities for supportive care including 24 hours' emergency services and an in-house pediatric intensive care unit.

THORACIC CANCER MANAGEMENT TEAM

Thoracic CMT has been constituted to provide comprehensive evidence -based multimodality cancer treatment as per the highest standards. The cancers treated in Thoracic CMT include lung cancers, mediastinal tumors, esophageal cancers (surgical), thymomas, thymic carcinomas etc. The rationale of developing a dedicated thoracic CMT is to provide multidisciplinary treatment protocol based on dedicated tumor boards where surgical, radiation and medical oncologists specialized specifically in thoracic cancers. Lung cancers are the most common cancer among males all over the world and the incidence among females also is increasing. Lung cancer also is most common cause of cancer related mortality. With thoracic CMT, we aim to provide optimum treatment aimed at improving the survival and quality of life.

Cancers treated with Proton

- Early-stage Lung Cancer
- Locally advanced lung cancer
- Oligometastatic & Oligoprogressive lung cancer
- Thymoma and other thymic tumors
- Mediastinal Lymphoma (both Hodgkin's and Non-Hodgkin's lymphomas)
- Mesothelioma
- Thoracic Sarcoma
- Metastatic cancers to thoracic region
- Paraspinal (Dorsal tumors)

Radiation Oncology

Most thoracic tumors need radiation therapy for effective and long-term control. High precision radiation therapy techniques such as intensity modulated radiation therapy (IMRT), stereotactic body radiation therapy (SBRT), helical Tomotherapy and intensity modulated proton therapy (IMPT) ensure that the radiation can be safely delivered to the tumors while restricting doses to critical structures such as heart, lungs, esophagus, spinal cord, bronchovascular structures, thymus, breast, etc. The tumor motion is assessed individually with the help of 4D CT scans during the treatment planning and surface guidance is used to monitor motion during the treatment delivery. Some patients also are treated in voluntary breath hold to limit the impact of the motion.

Surgical Oncology

Surgery plays an integral part of multidisciplinary management of all thoracic cancers which includes Lung, Esophagus, Thymus, and other Mediastinal tumors, Primary and secondary pleural tumors. We at APCC routinely perform minimally invasive thoracic surgery (Robotic & Video assisted Thoracoscopic surgery for all thoracic cancers, which is lesser pain, negligible blood loss, precise and accurate, early recovery, lesser hospital stays, affordable cost, and Hyperthermic intra thoracic chemotherapy for primary and secondary pleural malignancies.

Medical Oncology

Thoracic cancers especially Lung cancer often present in advanced cancers (locally advanced or metastatic) and need systemic therapy for better treatment outcomes in terms of survival and quality of life. The current line of systemic therapy includes chemotherapy, targeted therapy, immunotherapy etc. The most important factor that decides treatment is proper workup including molecular markers and immunohistochemistry for PDL1 etc. In APCC, all lung cancer patients are worked up optimally and offered treatment like targeted therapy, immunotherapy as indicated. In state of art Daycare, each patient is provided the ideal systemic treatment in most comfortable way creating a beautiful experience every time.

UROLOGY CANCER MANAGEMENT TEAM

Genito-urinary CMT has been constituted to provide advanced, novel, evidence based multimodality cancer treatment as per international standards. The cancers treated in Genito-urinary CMT include Prostate cancers, Kidney cancers (Renal cell carcinoma), Urothelial cancers (Bladder, ureters, Renal pelvis and upper tract), Penile cancers, Testicular cancers, Sarcoma involving the genitor-urinary system, etc. The rationale of developing a dedicated genito-urinary CMT is to provide modern, sophisticated, state of the art treatment facilities in all specialties surgical, radiation and medical oncology namely robotic surgery, Image guided pencil beam scanning proton therapy, immunotherapy, targeted therapy, etc. Prostate cancer one of the most common cancer in the western world, is on an increasing trend in the Indian sub-continent considering the development, implementation of screening programs and health awareness. Genito-urinary CMT strives to provide evidence based optimal treatment and considering the elderly population of patients it is also aimed at improving the quality of life.

Cancers treated by Proton Therapy

- Early stage prostate cancer
- Locally advanced prostate cancer
- Oligometastatic & Oligoprogressive prostate cancers
- Bladder cancer
- Oligometastatic kidney cancer
- Sarcomas of the genito-urinary system (Rhabdomyosarcoma, retro-peritoneal sarcomas, etc.)
- Testicular germ cell tumours (Seminoma and non-seminomas) requiring pelvic/para-aortic nodal irradiation
- Extragonadal germ cell tumors
- Penile cancer

Radiation Oncology

Radiation therapy plays a key role in management of most genito-urinary cancers for long term cure and disease control with an emphasis on maintaining and improving quality of life. Image guidance is key as structures harbouring tumours (Bladder, prostate, etc) have relatively higher degree of motion compared to other areas in the body. Radiosensitive organs such as rectum, urinary bladder, gonads, small bowel and bone marrow are very close to the target in most scenarios making delivery of radiation therapy challenging. Therefore, high precision radiation therapy techniques such as intensity modulated radiation therapy (IMRT), stereotactic body radiation therapy (SBRT), helical Tomotherapy and intensity modulated proton therapy (IMPT) are preferred form of radiation therapy technique to ensure adequate sparing of healthy tissues and therefore excellent quality of life.

Surgical Oncology

Surgery forms the base around which the integrated cure of the disease rests upon!

Our state-of-the-art operating theatres are equipped with the 'Da Vinci Surgical System', the most advanced platform for minimally invasive surgery available today. The four-armed surgical robotic system is a breakthrough in surgical technology and is a crucial component of our integrated cancer care program. Robot-assisted surgery integrates advanced computer technology with the experience of skilled surgeons. This technology provides the surgeon with a 10x magnified, high definition, 3D-image of the body's intricate anatomy. The controls in the console allow the surgeon to manipulate special surgical instruments that are smaller, as well as more flexible and maneuverable than the human hand. The surgeon is thus in complete control of the surgical procedure. The robot helps replicate the surgeon's hand movements while minimizing hand tremors. The surgery is thus conducted with enhanced precision, dexterity, and control even during the most complex procedures.

Medical Oncology

Site wise medical oncology practice based on multidisciplinary tumor board decisions is the unique highlight of medical oncology unit at APCC. Urological cancers included Kidney cancers, bladder cancers, testicular cancers etc. They often present in advanced stages (locally advanced or metastatic) and need systemic therapy for better treatment outcomes in terms of survival and quality of life. The current line of systemic therapy includes chemotherapy, targeted therapy, immunotherapy etc. Most important factor that decides treatment is comprehensive multidisciplinary tumor board. There have been tremendous improvements in immunotherapy that has prolonged the patient survival. In APCC, we have facilities for most advanced systemic therapy options. In state of art Daycare, each patient is provided the ideal systemic treatment in most comfortable way creating a beautiful experience every time.

SURVIVORSHIP AND LIFE AFTER CANCER

WITH YOU THROUGH EVERY STAGE OF RECOVERY.

A great cancer programme rests on the foundation of excellence, expertise and experience. However it also needs a little extra - it requires the definitive edge of empowerment.

An empowered programme has the power to make a change. This strength, that often determines the efficacy of a group, comes from a strong managerial system, a forward-looking leadership and a culture where human relations always gets priority. Apollo Proton Cancer Centres invest a lot to nurture this ecosystem of empowerment, collaboration and respect. We track healthcare trends and developments the world over, and ensure that the systems within are never behind the curve. Apollo Proton Cancer Centres were one of the first to realize that healthcare - which is moving beyond silos - is becoming inclusive and collaborative. This new healthcare is completely patient-facing and takes care to make the patient experience as smooth, effective and as efficient as possible. This has tied in strongly with our core value of touching and enriching lives.

Tender Loving Care

TLC is a silent revolution that sweeps the corridors of every Apollo Proton Cancer Centre, every single day. Its objective is simple and clear - ensure the best patient experience possible. This focus transcends beyond just the soft and emotional aspects. At Apollo Proton Cancer Centres, it is practised like a science. It consists of a deck of best practices that encompass the universe of patient touch-points. A wide range of systems that have been perfected to ensure that every process at Apollo Proton Cancer Centres is patient-centric. Cancer care draws strongly on our strong credentials in TLC. This is a long and elaborate process that only begins with detection and treatment. Rehabilitation, counsel and support are vital facets of a well-rounded cancer programme. At Apollo Proton Cancer Centres, no stone is left unturned in ensuring the maximum comfort and well-being of our patients. A robust network of expert support staff and initiatives further enhance our patient-focused approach to cancer care. Some of these unique offerings are:

Physiotherapy and Rehabilitation

Physiotherapy is a therapy for the preservation, enhancement or restoration of movement and physical functions that are impaired or threatened by disability, injury or disease. It utilizes therapeutic exercises, physical modalities, assistive devices, patient education and training. At Apollo Proton Cancer Centre, patients can benefit from Exercise Therapy, Electrotherapy and Occupational Therapy.

Cancer Support Groups

Apollo Hospital Cancer Support Group was started on March 8, 2004. It was set up with the belief that cancer survivors, having experienced and combated cancer, and having come back with a renewed vigor for life could provide emotional, psychological and spiritual support to newly diagnosed patients and help them fight cancer with grit and grace.

Sunshine Stores

This is an exclusive outlet catering to the needs of cancer patients. It is a retailer solution that offers wigs, breast prosthesis, pressure garments, gowns, scarves, innerwear and CDs.

APOLLO PROTON CANCER CENTER MULTI-DISCIPLINARY TUMOR BOARD

Multidisciplinary care is the hallmark of high-quality cancer management and we at the Apollo Proton Cancer Centre believe everyone deserves the best possible cancer care. Our mission dictates that we will help people who have cancer regardless of their location. APCC Multi-Disciplinary Tumor Board are meetings where specialists from surgery, medical oncology, radiation oncology, radiology, genetics, and pathology collaboratively review a patient's condition and determine the best treatment plan. Through this multidisciplinary approach, patients have access to a diverse team of APCC cancer experts instead of relying on a single opinion.

Patients are provided with a personalised treatment approach which is evidence based and comprehensive keeping in mind the various needs of the patient. At APCC we have site specific MDT based on our individual cancer management teams (CMT). Depending on the CMT specific MDT, representation from all or a combination of the following disciplines is required along with the primary doctor/referring oncologist:

- *Surgery/surgical oncology*
- *Pathology (digital)*
- *Radiation oncology*
- *Medical oncology*
- *Diagnostic radiology*
- *Nuclear Medicine*
- *Pediatric oncology*
- *Molecular pathology*
- *Research staff*
- *Nurses*
- *Rehabilitative staff*

APOLLO PROTON ADVISORY BOARD
AN ALLIANCE OF EXCELLENCE

Proton therapy is an exciting area in Radiation Oncology. Globally, the treatment of cancers using powerful proton beams has gained great momentum. The ultra-precision and sheer superiority in terms of outcomes have enabled proton therapy to be accepted at the forefront of cancer treatment.

The Apollo Proton Cancer Centre is the nation's first foray into this revolutionary field. The onus is on the stakeholders of cancer care in India to nurture this technology and the ecosystem around it. The Apollo Proton Advisory Board is a positive step in this direction.

The Apollo Proton Advisory Board is a forum of highly skilled radiation, surgical & medical oncologists, physicists and other professionals dedicated to cancer management, with special expertise in the technical and clinical aspects of proton therapy.

The mission of the Board is to educate and empower the oncology fraternity and to work towards a reality where proton therapy is the preferred mode of treatment to treat the complex cases of cancer.

The mandate of the APAB is clear – be the conduit for seamless patient referrals and workflow, and create a community that is informed and inspired to help proton therapy break new ground.