TATA MEMORIAL CENTRE

A Grant-in-Aid Institute of the
Department of Atomic Energy, Govt.of India




Annual Report
2014-2015

Caring with Technology

हीरक जयंती वर्ष
60
गौरवशाली वर्ष
1954-2014

Celebration of **'Diamond Jubilee Year'**
Tableau of Department of Atomic Energy
on the occasion of
66th Republic Day Parade 2015 at Rajpath, New Delhi.

TATA MEMORIAL CENTRE

A Grant-in-Aid Institution of the Department of Atomic Energy, Government of India

Tata Memorial Hospital

Centre for Cancer Epidemiology

Advanced Centre for Treatment, Research and Education in Cancer

ANNUAL REPORT 2014 - 15

Mission & Vision of the Tata Memorial Centre

Mission Statement : "The Tata Memorial Centre mission is to provide comprehensive cancer care to one and all through our motto of excellence in service, education and research".

Vision of the Tata Memorial Centre

"As the premier cancer centre in the country, we will provide leadership for guiding the national policy and strategy for cancer care by:

Promoting outstanding **services** through evidence based practice of oncology.

Emphasis on **research** which is affordable, innovative and relevant to the needs of the country.

Committed to impart **education** in cancer for students, trainees, professionals, employees and the public".

CONTENTS

ACTREC

CRI - Research Support Facilities

Administrative & Core Infrastructure Groups

TMC Publications

Message From Director - TMC

The aim and focus this year like the preceding years, draws inspiration and direction from the long standing vision of efficacious cancer care and control for one and all.

This year the major thrust has been in the domains of epidemiology, public health and treatment. Epidemiological data which helps us to accurately determine the nature and extent of the problem becomes an all-important referential for strategy and planning. Data collected from various cancer registries set up by TMC across India, with adequate representation from rural urban and semi urban segment demonstrates some germane findings.

A review of trends in cancer revealed that in women of India the rise in breast and ovarian cancer was offset by a steep reduction in uterine cervical cancer. This **reduction in uterine cervical cancer bears a direct correlation to personal hygiene and sanitation** since it is more evident in areas where running water with privacy of bathroom has been provided. We also noted that in the region where cervical cancer is high, our Muslim brethren had lowest incidence of this cancer compared to that in Hindu and Christian community. This could be explained on the basis of circumcision in early years of life guaranteeing good genital hygiene and not allowing transmission of viral infection like HPV (Human Papilloma virus) which can cause cancer.

Rise in breast cancer is supplemented with findings of geographical variations to the tune of 9 per 100,000 in rural population to a demonic increase of 32 per 100,000 in urban population. The causes of these variants find reason in formative years spent in natural environs, adopting endemic lifestyles complemented with lack of obesity which seem offer an adequate protection against breast cancer. Subsequently thus, establishing the **link between breast cancer and obesity / unhealthy lifestyles (late first full term pregnancy and lack of breast feeding).**

Another perturbing thought was that of Punjab carrying the highest incidence of cancer. This was diametrically opposite to rural India statistics of low incidence as compared to urban parts. Data from Sangrur and Mansa shed light on the anomaly – Punjab could no longer be considered as “rural” it had stealthily donned modernism and crept into the “urban” zone. The statistics thus bespeak of an **incidence of cancer in Punjab that is comparable to semi urban India.**

A paradox which sought clarity was the common perception that cancer in India has been on an upswing. India over the past decades, unlike other emerging economies like China Russia and Brazil has only witnessed a relatively stable incidence of cancer which belies the existent beliefs of a rise of cancer in India. **The data from registries cleared the haze by indicating that though the total number of cancer patients in India has increased, the incidence per 100,000 populations remains stable.** The increase in the number of cases can be attributed to the rising population and increasing life expectancy. Registries have also offered some reassuring data about cancer in the vicinity of nuclear power stations in

India. The incidence of cancer in people working in or residing in the vicinity of power stations has been similar to that in semi-urban/urban Indian population.

Public Health efforts towards anti-tobacco activity over the last decade reaped benefits by way of an **encouraging dip in the incidences of oral cancer in Mumbai cancer registry.**

Cancer care primarily revolves around fulfilling the tenets of **access to care & uniform care** across India. It is envisioned that efficacy in access to healthcare could be well achieved through a hub and spoke model. TMC commissioned the first spoke in Sangrur, Punjab. Radiotherapy unit and a day care facility for administering chemotherapy are functional already. It is anticipated that by the middle of next year surgical services will be also commissioned. Hubs will be created at Chandigarh, Vishakhapatnam & Guwahati to be part of a major project of National Cancer Grid. Sixty four centres have enrolled onto this grid for uniform care in India. The grid has offered over 10 cancer journals across 64 centres for updating knowledge. To guarantee QA/QC of cancer care a peer review process has been adopted. The first peer review was conducted for Kacchar Cancer Centre in Assam. It resulted in technology transfer and training of technicians creating human resource that would offer optimum care in remote parts of India. These efforts coupled with our thoughts on cancer control for India were also implementable in other low resource settings and these resulted into 4 publications in Lancet Oncology, sharing it with the rest of world.

Testing latest and improved technology for increasing quality of care has been our forte and **this year we acquired Robotic surgery.** This technology will be tested for its suitability for Indian environment over the coming years.

Research has been the eternal bedrock of evolution and development. Two new avenues are being explored as possible significates and criterion in cancer mystique. The first is hypoxia in solid tumours and the second is micro-environment. Hypoxia is being assessed on NGS platform for mRNA and microRNA. The testing for hypoxia in breast cancer is midway through and is scheduled to commence shortly for oral squamous cell carcinoma and lung cancer whereas pancreatic cancer is being evaluated for hypoxia as well as micro-environment. Organoids have been evolved for pancreatic cancer in laboratory in collaboration with Princess Margaret Hospital in Canada.

Overall it has been a fruitful year from public health point of view with some infant steps in translation and basic research. We seek to consolidate and strengthen our mission for cancer care with every passing year in the hope and conviction that we will do and offer our best in setting world class standards of cancer care.

Dr R A Badwe

Message From Director - TMH

Mindful of the exponential increase in the number of care-seekers at the hospital year after year, we have strived to undertake pioneering initiatives that aid in ensuring faster, friendlier, cost-effective and more accurate patient care. Technology has been at the forefront of this endeavor and the year 2014 saw an extensive adoption of newer technologies in various modalities of cancer care delivery at the hospital.

The smart card based financial transactions previously introduced, have found new and varied applications during the year. Self-operated kiosks, accessed with the help of smart cards, enable the patients to view their medical records, report status and account balances, at their convenience; obviating the need to wait in long queues for such activities.

We extended further our constant efforts of going 'paperless' by adopting 'filmless' operation with stoppage of printing radiographic films, namely X-rays, CT scans and MRIs. This was possible due to the upgradation of High Definition Picture Archiving and Communication System (PACS) which helps clinicians access and view radiology images from any location within the hospital. In view of an increased dependency on diagnostic scans, addition of radiology equipment and growing number of patients, the storage capacity of PACS has been upgraded from 30TB in 2013 to 58TB in 2014.

The robotic bar coding system for labeling samples of blood collection was introduced leading to greater efficiency and more importantly accuracy. This system has helped in reducing the time taken for labeling blood samples, the requirement of manpower and occurrence of human errors; thereby improving the throughput at the blood collection area which caters close to 800-1000 patients daily.

Giving boost to the clinical capabilities of our doctors, the institute added newer state-of-the-art medical equipment. The Hybrid DSA-CT machine was a first of its kind installation in India wherein an angiography machine is coupled with a Computed Tomography (CT) scanner to allow the physicians to use the equipment independent of each other or simultaneously without the need to move the patient between rooms. The machine thus facilitates complex interventional procedures with higher degree of precision and efficiency. The hospital has always been renowned for its cutting-edge surgical expertise and towards this, we have added the Robot to our surgical armamentarium. In addition, a state-of-the-art carbon dioxide LASER has been procured through a generous philanthropic donation. We also upgraded our cardiology facilities with the addition of 3D Echocardiography.

In our quest for excellence we introduced several new diagnostic molecular assays, which aid contemporary management of pediatric and several adult tumours viz. sarcomas, brain tumours, lymphoma, cancers of colon, breast, lung, and gastrointestinal stromal tumours. Our research facilities earned the prestigious AAHRPP (Association for the Accreditation of Human Research Protection Programs) accreditation which certifies towards the highest standards of research in cancer care and patient safety measures.

Space constraints force me to restrict listing other hospital achievements in this message and I encourage you to go through individual department reports highlighting many of these. Once again I place on record the untiring efforts of each and every one of our employees in helping us keep the hospital at the pinnacle of cancer care in the country.

(Dr. A. K. D'Cruz)

Message from Director Academics, TMC

TATA MEMORIAL CENTRE, is a stand – alone post graduate and superspeciality centre as one of the constituent Institute of Homi Bhabha National Institute (Deemed to be University) under Dept. of Atomic Energy, Govt. of India. Our Institute is recognized by Medical Council of India, New Delhi for undertaking MD, DM/M.Ch programme in Oncology and other subjects, namely, Anesthesiology, Radiology, Radiotherapy, Nuclear Medicine, Microbiology, Immuno-Hematology & Blood Transfusion Medicine, Pathology and Palliative Medicine. It also conducts postgraduate and doctoral programmes and encourages research in all sub-sets of cancer biology.

During 2014 the intake capacity of post-graduate students, increased by three-fold to provide specialized and trained human resource in oncology and related subjects in the country. Under Homi Bhabha National Institute, a two years certified Fellowship programme is conducted in sub-sets of oncology and other subjects. Twenty Fellowships are offered every year.

The centre continued to conduct Six month training programs for sponsored candidates from State Government Medical colleges, Central Government Hospital, Public Sector Undertaking Hospitals and Regional Cancer Centres across the country. Specialized training programmes in the field of oncology and related subjects were conducted for doctors from South East Asia Region and South African Countries These received appreciation of its applicability from WHO and UICC. Several specialists from developing countries participated as 'Observers' for hands-on training in various aspects of cancer management.

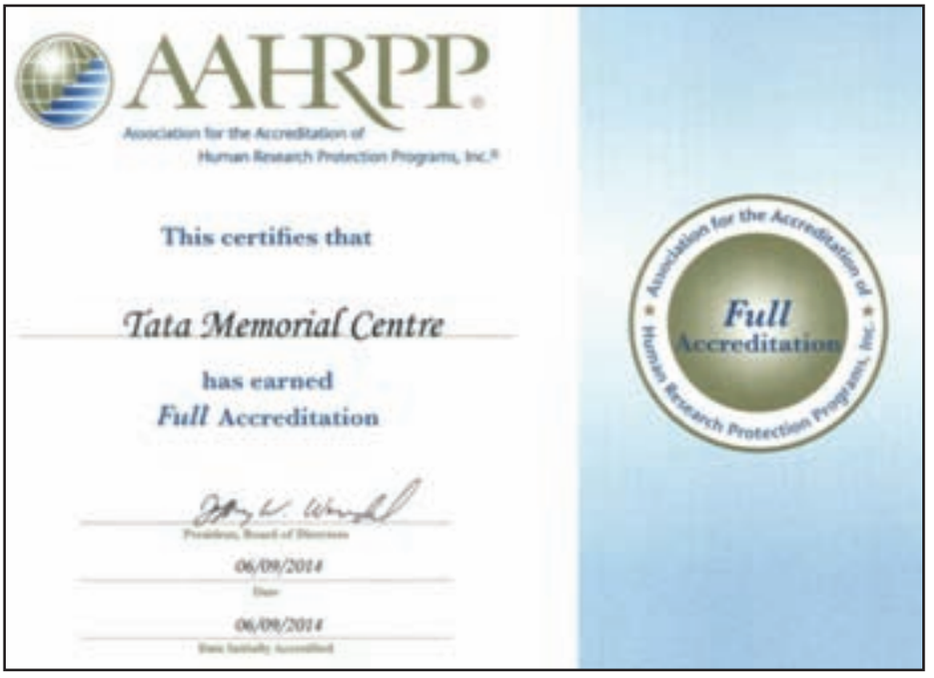
The Centre also conducts Post-Doctoral Fellowship programs and P.hD program at Advanced Centre for Training, Research and Education in Cancer at Kharghar, Navi Mumbai in Life Sciences and Health Sciences. Specialists from Punjab (Government Medical College, Amritsar and Patiala, Sangrur have been trained. DM and M.Ch. residents have been deputed at the outpatient and day care services at Sangrur, Punjab. Considering the growing needs for professionals for management of clinical trial sites, a post graduate course in Clinical Research was initiated during the year, and it received good response from science and pharma graduates. A summer school in Oncology for Under-Graduate and Post Graduate Students from Medical Colleges across the country was organized in collaboration with Kings Hospital, London.

Dr. Kailash Sharma

Governing Council
Tata Memorial Centre

Chairman	**Dr. R. K. Sinha,** Chairman, AEC & Secretary,Dept.of Atomic Energy.
Member	**Dr. N. K. Ganguly,** Distinguished Biotechnology Fellow & Advisor,Translational Health Science & Technology Institute, National Institute of Immunology,New Delhi& Former Director, ICMR.
Member	**Shri Jayant Kumar Banthia,** Ex – Chief Secretary, Govt. of Maharashtra.
Member (Ex-Officio)	**Dr. C.B.S. Venkataramana,** Additional Secretary (R & D), DAE, Mumbai.
Member	**Shri. Praveen P. Kadle,** Sir Dorabji Tata Trust, 24, Homi Bhabha Street, Bombay House, Mumbai – 400 001.
Member	**Mr. S. J. Phansalkar,** Sir Dorabji Tata Trust, 24, Homi Bhabha Street, Bombay House, Mumbai – 400 001.
Member	**Smt.R. F. Savaksha,** Sir Dorabji Tata Trust,24, Homi Bhabha Street, Bombay House, Mumbai – 400 001.
Member (Ex-Officio)	**Dr. R. A. Badwe,** Director, Tata Memorial Centre, Mumbai – 400 012.
Co-opted Member	**Shri R.A. Rajeev,** Jt. Secretary (Finance), DAE, Mumbai.
Co-opted Member	**Dr. Snehalata S. Deshmukh,** Ex- Vice Chancellor, University of Mumbai.
Permanent Invitees	**Dr. A. K. D'Cruz,** Director, Tata Memorial Hospital.
	Dr. K. S. Sharma, Director (Academics), Tata Memorial Centre.
	Dr. S. V. Chiplunkar, Director, Advanced Centre for Treatment Research and Education in Cancer,Kharghar, Navi Mumbai – 410 210
	Dr. D. Raghunadharao, Director, Homi Bhabha Cancer Hospital& Research Centre, Visakhapattnam.
Secretary	**Dr. Venkata V.P.R.P.,** CAO, TMC

Recognitions For Research



Association for the Accreditation of Human Research Protection Programs

Forum for Ethical Review Committees in Asia and the Western Pacific Region

Swachh Bharat Mission

CAMPAIGNS

Tata Memorial Centre observed 'Swachh Bharat Mission'on 2nd October 2014, the occasion of 150th Birth Anniversary of Mahatma Gandhi. The Director, TMC administered the 'Swachh Bharat Shapth to the Staff of TMC. In his address to the staff on the occasion, he said, that he perceived the Prime Minister's mission of cleanliness, as cleanliness not just from in and round us but within us as well. He urged that, every individual should not only initiate cleanliness but continue throughout the year and for rest of the life. One must contribute to cleanliness at workplace, travel/ tourist places, home and area around residence. He appealed to all, to dedicate atleast two hours every week for this cause. At the closing of this event, he urged, every individual should ensure cleanliness in the department. He also said that the cleanliness drive would be reviewed on 26th of January, 2015.

The pledge was administered in Hindi and English.

SYMPOSIUM

A symposium was organized on 3rd Jan 2015 on " Good Governance" (Su-ShasanDiwas). Speaking on the occasion, the Director, TMC said "The purpose of governance is essentially to make things smooth for our patients and make things congenial for all people working with us and our colleagues. The success of Governance lies in satisfying these two goals. Governance means functioning in harmony.He compared good governance, or governance through harmony to human body. He felt no other thing functions as harmoniously as our own body. All organs work harmoniously and help clean toxins and maintain the body. He further stated that the word corpora emanates for our body. The word "corporation" or an Institute/ company, comes from this word. The various departments of institution should function in harmony like our body organs. Our patients represent the heart. Thus our activities should be focused for the well functioning of our heart and that can happen only when we have a harmonious approach to our functions.

Executive Summary - TMC

TATA MEMORIAL CENTRE

The Tata Memorial Centre [TMC] comprising Tata Memorial Hospital [TMH], the Advanced Centre for Treatment, Research and Education in Cancer [ACTREC], and Centre for Cancer Epidemiology [CCE] is a grant-in-aid institution under the administrative control of Dept. of Atomic Energy, Govt. of India. The mandate of TMC is Service, Research and Education. The TMC continued to provide the highest standard of patient care through its services and research, and capacity building by imparting knowledge through various educational activities.

Tata Memorial Hospital

Services:

The year saw an overall increase of 7.2% in new cases registered as compared to last year. During the year, 37,731 new cases were registered in addition to the 5,441 new cases registered in Preventive Oncology. About 21,687 referral cards were issued for investigations like mammography, pathology and second opinion. Total beds increased by 8.64% in 2014 [579 in 2013 to 629 in 2014].

The Disease Management Groups [DMG] formed for each cancer site, ensured evidence based diagnosis, treatment and management of the treatment modalities for holistic patient care, viz. surgery, radiation and chemotherapy as combination or independent, for each individual patient. This also ensured better outcome and quality of life for the patient. There are 11 DMGs namely, Head and Neck, Breast, Gynaecology, Thoracic, Bone and Soft Tissue, Gastrointestinal, Uro Oncology, Neuro Oncology, Paediatric Solid Tumours, Adult Hematolymphoid and Pediatric Hematolymphoid.

The Department of Surgical Oncology has 31 surgeons on the faculty, supported by registrars, specialty fellows and research fellows.

The Surgical Oncology department has spearheaded the field of cancer surgery in the country for several decades. Surgical services are comprehensive for cancer at all sites and are offered both at TMH and ACTREC for optimum utilization of operating rooms. During the year 8,107 major surgeries and 34,405 minor surgical procedures were performed. Increasing application of minimally invasive surgery, skull base procedures, major vascular replacements, and limb salvage and micro-vascular surgery has further strengthened the department. Induction of the latest Da Vinci Xi Robotic system boosted minimal access surgery and about 49 procedures were performed. The neurosurgery service upgraded the operating microscope with facilities for providing fluorescence guided resections. Immediate postoperative outcomes are comparable with the best in the world.

The department of Anaesthesiology anaesthetized 19,841 patients. The recovery room catered to 9326 patients and a total of 2,952 patients were admitted to post-surgical and medical ICU's of which 1,152 patients were ventilated. 2,550 patients were treated for acute pain and a total of 6,920 patients were treated at the chronic pain clinics, of which 3,459 were new patients.

In the year department of Radiation Oncology offered radical or palliative radiotherapy treatment to 6,135 patients. The department is equipped with state of art equipments like - Linear Accelerators replaced by modern units such as "True beam" and "Unique" LA's, Telecobalt Units, Conventional Simulator (Imaging), a CT Simulator (Somatom-Emotion) with Virtual Simulation and a fully equipped Mould Room. The PET-CT and MRI Based Treatment Planning for newer radiation techniques are networked with Radiodiagnosis and Nuclear medicine and Molecular Imaging departments. The CT - Simulator (Light Speed) is capable of image acquisition for 4D treatment planning & Gated Radiotherapy along with advanced linear accelerators with facilities for Image Guided Radiation Therapy (IGRT). The equipment like – Tomotherapy Hi-Art IGRT Accelerator, Bhabhatron II Cobalt Unit at ACTREC are being upgraded. The Radiation Oncology Information System (ROIS) is useful in maintaining patient appointments, radiotherapy treatment records, information archival and departmental audit.

The Medical Oncology services for the planning and delivery of chemotherapy is achieved with a team of 21 specialists supported by registrars, fellows and observers. The respective disease management groups plan the treatment protocols depending on the site of the disease. They advise treatment based on chemotherapy regimen and participate in DMG based research projects. Chemotherapy is delivered through Day Care Units and In-patient services.

The Department of Nuclear Medicine and Molecular Imaging provides comprehensive nuclear oncology services. The department undertakes conducting and reporting functional hybrid imaging studies that includes PET/CT & SPECT/CT, planar and dynamic isotope studies and uptake studies with thyroid Probe. PET/CT scans are

available as service using four 18F labelled radiopharmaceuticals and two 68Ga labelled radiopharmaceuticals. Using nine technetium labelled and two iodine 131 labelled radiopharmaceuticals fifteen planar and SPECT studies are performed routinely. Low dose 131I, 153 samarium EDTMP, 177 Lutetium EDTMP are given to appropriate patients. Post therapy scan studies are performed after 131I, 153 Samarium EDTMP and 90Y microspheres therapy using SPECT/CT & PET/CT.

The equipment's in the Radiology department to advanced Digital Imaging technology, like - 1.5 T MRI, LOGIQ* E9 with XD-clear ultrasound, portable ultrasound, LuminosdRF - Fluoroscopy System with human touch technology and such others, facilitating speedy diagnosis for patients. A total of 1,40,694 radiological investigations were conducted showing huge volume rise over the previous year.

The physical and psychological support plays an important role in the total rehabilitation of patients. The Occupational therapy services are provided on OPD and IPD basis. In the year 2014, 9,101 OPD patients and 3,621 IPD patients received Occupational Therapy services and overall 187 orthoses, 39 prostheses and 37 temporary prosthesis were prepared. In all 220 Lymphedema kits and 1410 Jaw stretcher keys were prepared by Occupational Therapy Department at RRC, EBMH. The Speech Therapy Dept. rehabilitated total 3,499 patients. Physiotherapy Department is committed to restoring patients to their highest level of function and independence through individualized therapeutic exercise program and a wide range of state of the art techniques. Physiotherapy treatment is extended to patients admitted in the Private and General wards, critically ill patients in the Intensive Care Unit and the patients attending the Out Patients Department. A total of 8,438 patients were offered Physiotherapy services.

A total number of 3,403 patients were seen by the Psychiatry Service, including 1,668 new referrals and 1,735 reviews, seen as part of consultation and liaison inputs of the psycho-oncology service. Screening of patients for psychiatric disorders was undertaken in the wards and continues as part of the service. Twelve Mentoring and Capacity Building group sessions conducted for survivors of childhood cancer. Monthly support group meetings were facilitated by Psychiatric Unit for brain tumour patients. The nursing services are important for patient care. A team of about 350 specially trained nurses constantly strive to provide efficient and consistent care and quality services to patient. The department also runs specialized PG and Doctoral training programs under HBNI.

Dental a major player of Head Neck DMG support services, providing dental care and maxillofacial prosthetic rehabilitation required for cancer patients. During the year 12,776 patients were seen of which 1,247 patients were treated with prosthetic rehabilitation and several other services were offered.

The Department of Transfusion Medicine collected 22,765 units of blood through outdoor voluntary donation camps. The voluntary platelet donors registered through platelet donation awareness camps increased six fold this year.

The department of Pathology provided histopathology services for accurate diagnosis of cancers. Total 1,85,999 pathological investigations and 24,893 Cyto Pathological investigations were performed. Post operative support is complemented by other laboratory services like biochemistry, emergency laboratory. Infectious complications are assisted with an accurate diagnosis by the department of Microbiology which performed 1,90,375 microbiological tests.

The departments of general medicine and chest medicine provide the requisite support for preoperative evaluation of patients as well as other medical complications. End of life care and pain relief is achieved through the services of the department of Palliative Medicine which also offers home visits. Out patient services of the department registered 3,692 new adult patients and 256 new pediatric patients. There were 5,114 follow up visits. Home based palliative care service registered 538 new patients for palliative home care and did 2,765 home visits in 283 working days. Among the visits 938 were doctor visits, 1868 were nurse visits and 2,484 were medical social worker visit.

The department of Preventive Oncology (PO) conducts hospital and community based clinics for the prevention, screening and early detection of common cancers. 7,015 new patients were registered in the PO clinic at TMH in 2014. During the same period over 1,50,000 patients continued to be followed up in the TMC Urban Outreach Programme and 1,10,000 were registered under the TMHMOP programme which covers the project affected population near BARC. 1,703 new patients registered for quit tobacco clinic. The department is recognized as

a WHO Collaborating Centre for Cancer Prevention, Screening and Early Detection.

Academic Activities

The TMC educational activities are affiliated to Homi Bhabha National Institute (HBNI) Mumbai, a Deemed University, for Post Graduate training in oncology and other broad specialties, covering Surgical oncology, Plastic Surgery, Gynecological Oncology, Head and Neck Oncology, Pediatric Medical Oncology, Radiation oncology, Gastroenterology and Critical Care. The MD program is conducted in Anesthesiology, Radiology, Pathology, Transfusion Medicine, Microbiology, and Nuclear Medicine. Doctoral programs in basic sciences like Epidemiology and Medical Physics are also conducted. During the year it registered 109 students for postgraduate studies.

Short term courses in the areas of Radiotherapy technology, medical imaging technology, Masters in Nursing, Infection Control, Palliative care, cytotechnologist and other laboratory technologies are offered. The institute offered training to 157 trainees and 470 observers during the year 2014.

Clinical Research

During the year the DAE-CTC funded 10 clinical trials, 102 studies were provided with statistical assistance, and supported translation of informed consent documents for 49 studies. The "Clinical Research Methodology Course" and "Good Clinical Practice Workshop" were organized. The EBM conference for 2014 focused on "Perioperative Care: Improving Outcomes after Surgery" and "Oncologic Imaging: A Multidisciplinary Perspective" and was attended by 376 delegates.

The Institutional Ethics Committees were accredited by AAHRPP and FERCAP- SIDCER (A WHO / TDR initiative) in 2014.

Awards & Recognitions

Tata Memorial Centre was awarded the 'Rajbhasha Shield' for 10th consecutive years effective implementation of Official Language for the year 2014-15.

The research facilities achieved recognition of prestigious AAHRPP (Association for the Accreditation of Human Research Protection Programs) accreditation which certifies the highest standards of research in cancer care and patient safety measure.

TMC also achieved Prestigious FERCAP Award from forum for Ethical Review Committees in Asia and the Western Pacific Region, as recognition for the Strategic Initiative for Developing Capacity in Ethical Review (SIDCER).

ACTREC

The Centre's basic, applied and clinical research projects drive towards the translational platform for cancer patients. The Centre's clinicians and scientists are engaged in collaborative projects within ACTREC, with Tata Memorial Hospital and with national/ international partners from Academia and Industry. The Centre's research projects receive institutional, intramural or extramural funding.

During the year 2014, the CRI received a sum of Rs. 8.30 crore from governmental agencies (DBT, DST, ICMR, LTMT, etc) to support 43 out of 182 on-going projects. Ten new projects, to the tune of Rs. 3.18 crore, for a three year period received Rs.1.55 crore from the above government agencies.

The Cancer Research Institute is engaged in research on normal, stem cell, cancer cell & molecular biology, structural biology, cell signalling & macromolecular interactions, genetics & epigenetics, immunology & chemoprevention. The protein interaction research focused on identifying novel therapeutic strategies for cancer treatment, and their role in regulating cell cycle progression and neoplastic progression. Findings indicate a tissue specific role of K8/K18 in malignant transformation/ progression of carcinomas. Putative driver genes associated with oral carcinogenesis have been identified. The significance of epigenetics in gastric cancer and hepatocarcinoma is being investigated. Immunological studies focus on understanding the immune scenario, immune dysfunction in cancer patients, and development of cell based immunotherapy for cancer treatment. Under the Science Initiative Program in *Ayurveda*, the mode of action of *bhasmas* is being examined. The fly lab (*Drosophila melanogaster* – fruit fly*)* lab was established, to study the relationship between growth and patterning in developing tissues, and its relevance to cancer

The CRC commissioned a new 22-bed ward. Over 2100 major procedures (Jan – Nov), 70 allogeneic/ autologous/ unrelated donor bone marrow transplants and cord transplants, 11 haplo-identical transplant were conducted; and admitted about 1000 in-patients in the Leukemia/ Lymphoma Ward and around 50 outpatients/ day were seen in the adult hematolymphoid OPD.

Research findings from the Translational Research Lab clearly indicated that chromatin fragments from dead cells induce epigenetic changes, stemness and cancer in living cells.

The Academic Programs of the Centre include the Doctoral program and several training programmes. During 2014, a total of 108 graduate students were working towards the Ph.D. degree. A new batch of 13 junior research fellows, 246 trainees from colleges, universities, academic/ research institutions and hospitals from across the country were accepted in various labs in CRI and departments in CRC. Twenty one national and international conferences, workshops, symposia, etc. were organized at ACTREC. The centre also organized DBT sponsored workshop on 'Applications in Bioinformatics' in January and the 10th National Research Scholars Meet in Life Sciences in December 2014. The Centre invited national and international experts to conduct and deliver lectures at research seminars on a various topics pertaining to biology and cancer. The Centre also conducted a number of Cancer Awareness Programs for the general public as a social responsibility initiative.

TMC Annual Events

The 12th EBM 2014 conference focused on Perioperative Care: Improving Outcomes After Surgery and Oncologic Imaging: A Multidisciplinary Perspective, held during 27th February to 2nd March 2014.

The Perioperative Care: Improving Outcomes After Surgery Several international and national speakers deliberated on evidence based patient care for improved clinical outcomes during the perioperative period. The Workshops on performing and interpreting Cardiopulmonary exercise testing (CPET), first of this kind in India and Thoracic Anaesthesia - Lung isolation techniques and Paravertebral analgesia held on 28th February 2014, were the highlights of the programme.

The Oncologic Imaging: A Multidisciplinary Perspective – The meeting held during March 1-2, 2014, focused on the role of imaging in oncology. The discussions highlighted important clinical issues in different disease systems in oncology and identifying the best imaging methods based on current evidence. The limitations of imaging, controversial issues and the scope of imaging in future research areas were also discussed. This two day event was preceded by a preconference workshop on Feb 27-28, 2014. The workshop focused on state of art oncologic imaging in various disease regions. Renowned international and national faculty contributed in both events.

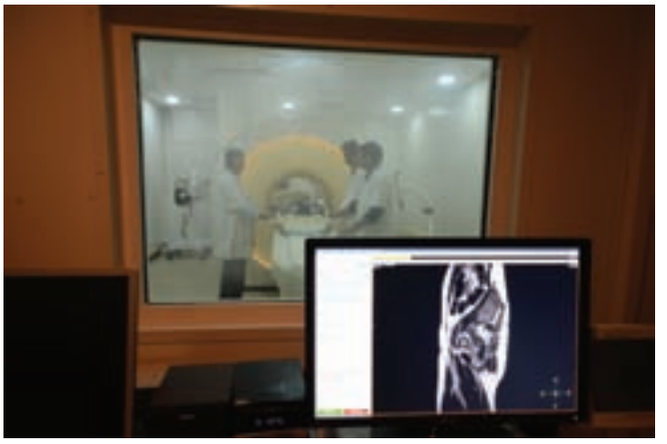
The Hospital Day Oration on 1st March 2014 was delivered by **Prof. Henrik Kehlet on "Improving Outcomes After Surgery: On The Fast Track". Professor Henrik Kehlet, gastrointestinal surgeon, and former professor of surgery, Copenhagen University, Denmark.** He is now Professor of perioperative therapy and Head of Section of Surgical Pathophysiology, Rigshospitalet, Copenhagen University. He is also an Honorary Fellow of the Royal College of Anaesthetists, UK, the American College of Surgeons, the German Surgical Society and the German Anaesthesiological Society.

His research interests focus on surgical pathophysiology, acute pain physiology and treatment, the transition from acute to chronic pain, postoperative fatigue and organ dysfunction. These efforts have condensed to form the concept of 'fast-track surgery' with the aim of achieving the 'pain and risk-free operation' He has published more than 700 articles within perioperative pathophysiology, pain relief and surgical outcome summarized into the concept of 'fast-track surgery', which also includes a focus on perioperative fluid management. He has delivered more than 200 lectures at international scientific meetings, including several honorary lectures.

Two EBM books - Guidelines for Perioperative Care: Improving Outcomes After Surgery (Part A) and Guidelines for Perioperative Care: Improving Outcomes After Surgery (Part B) were released during the event. These books were distributed to all medical college libraries of India and are also are accessible from TMC website.

Augmentation in the year 2014

Hyperion X7 digital OPG machine Department of Radiodiagnosis.



Philips Ingenia 1.5 T MRI Department of Radiodiagnosis

LOGIQ* E9 with XDclear ultrasound equipment: The LOGIQ* E9 with XDclear, Department of Radiodiagnosis

Siemens' LuminosdRF - Fluoroscopy System, Department of Radiodiagnosis

3 D Scanner RFA, Department of Medical Physics

Davinci Xi-System for Robotic Surgery

Visitors to TMC

H.E. Dr. Sai Mauk Kham, Vice President of Myanmar along with dignitaries

Honourable Chief Minister Mr. Devendra Fadanvis visited Tata Memorial Hospital on the eve of World Cancer Day.

Faculty

a) Dr. Anjali Jaydeep Kelkar, Oct.1, 2014, verification visit of Molecular Diagnostics Laboratory.

b) Mr. Irfan Allana, Chairman & Managing Director, Allana Sons, visited with the Terry Fox Committee members on Dec. 12, 2014

Students

a) Hospital Administration Students from Father Muller Medical College, Mangalore.

b) Students from Lords Universal Junior College of Commerce & Science.

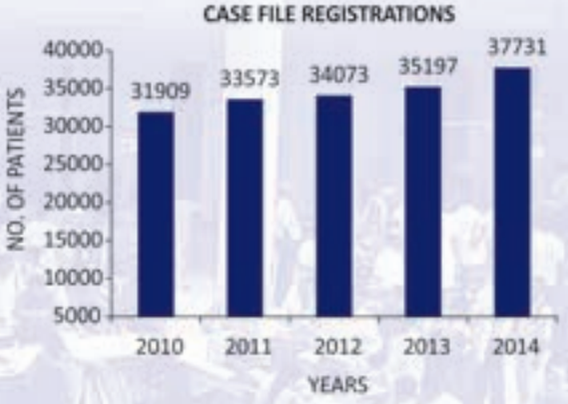
Other Visitors

a) Sr. Executive of GlaxoSmithKline Pharmaceuticals Limited. April 2, 2014

b) Medical Officers from Armed Forces Medical College, Pune. Sept. 16, 2014

c) Visitors from strategy office Germany. Sept. 3, 2014.

TRENDS


CASE FILE REGISTRATIONS
NO. OF PATIENTS
40000
35000
30000
25000
20000
15000
10000
5000
31909
33573
34073
35197
37731
2010
2011
2012
2013
2014
YEARS


REFERRAL FOR INVESTIGATIONS
NO. OF PATIENTS
25000
20000
15000
10000
5000
0
16444
17681
20077
20305
21687
2010
2011
2012
2013
2014
YEARS


PREVENTIVE ONCOLOGY
NO. OF PATIENTS
6000
5000
4000
3000
2000
1000
4904
5554
5030
5739
5441
2010
2011
2012
2013
2014
YEARS


NO OF ADMISSION
NO. OF PATIENTS
30000
25000
20000
15000
10000
5000
0
21477
21871
23019
23445
26224
2010
2011
2012
2013
2014
YEARS


TOTAL REGISTRATION
NO. OF PATIENTS
70000
60000
50000
40000
30000
20000
10000
0
53257
56808
59184
61241
64859
2010
2011
2012
2013
2014
YEARS

Performance Statistics

	2013	2014
Patient Chart Files- General	22035	23639
Patient Chart Files- Private	13162	14092
Patient Chart Files- Total (A)	35197	37731
Referrals for Investigations/ Second Opinion (B)	20305	21687
Preventive Oncology (C)	5739	5441
Total Registrations (A+B+C)	61241	64859
INPATIENT SERVICES		
Admissions	23445	26224
No. of Admissions		
Average Length of stay (Days)	7	6.3
Bed Occupancy %	89	88
SURGICAL ONCOLOGY		
Major OT Procedures	11104	8107
Minor OT Procedures [33484 Corrected]	18418	34305
MEDICAL ONCOLOGY		
Day Care		
Day Care- General	56249	62674
Day Care- Private	25312	28225
Bone Marrow Transplants at ACTREC	78	75
DIGESTIVE DISEASES AND CLINICAL NUTRITION		
Endoscopies [To be included in Min.O.T]	7040	6149
Nutrition Clinic	4781	14385
ANESTHESIOLOGY, CRITICAL CARE & PAIN		
No. of ICU Admissions	2592	2952
Patients in Recovery Ward	9267	9326
Pain Clinic	2975	3459
RADIATION ONCOLOGY		
External Beam Therapy	5700	5771
Brachytherapy	2589	3204
Treatment Planning / Beam Modification	13221	10999
Special Radiotherapy Techniques (IGRT, IMRT, SRS, SRT, TSET etc.)	3112	4820

	2013	2014
IMAGING SERVICES		
Radiology		
Conventional Radiography	56326	57556
Ultrasonography / colour Doppler	36274	40403
Mammography	9957	11384
C.T. Scan	20668	23883
M.R.I Scan	3994	4024
Interventional Radiology	3078	3444
NUCLEAR MEDICINE		
PET-CT	11211	13180
SPECT-CT	5191	5204
C.T. Scan	220	54
GENERAL MEDICINE		
ECG	29780	30484
Echo Cardiography	7446	8900
Pulmonary Function Tests	3459	3628
LABORATORY DIAGNOSTICS		
Pathology	91842	141788
Haemato Pathology	460936	429506
Biochemistry	1897758	2224118
Cyto Pathology	23920	24893
Molecular Pathology	1137	2102
Microbiology	157744	190375
TRANSFUSION MEDICINE		
Blood and Platelet Units Collected	21735	22765
Other Services	167866	183015
Cytogenetics	6500	6700
OTHER CLINICAL SERVICES		
Stoma Care	4213	4827
Occupational Therapy	13018	14606
Physiotherapy	8070	8438
Speech Therapy	3324	3499

	2013	2014
Psychiatry and Clinical Psychology	2511	3403
DENTAL SERVICES		
Prosthetic Services	1055	1273
Other Services	11121	15855
TISSUE BANK		
Allografts Produced	10003	10200
PALLIATIVE MEDICINE		
No. of Patients	7202	9062
Home Care Visits	1715	2765
MEDICAL SOCIAL WORK		
Guidance	23500	23573
Counselling	10216	11313
EDUCATION		
Residents	238	242
Fellows	15	11
Medical Observers	400	470
Nursing Trainees	6	14
Paramedical Students	23	35
RESEARCH PROFILE		
Extramural Projects	11	10
Institutional (Intramural/ No Funding Required)	66	81
Intramural + Extramural Projects	4	1
P.G. Thesis (Dissertation)	77	98
PUBLICATIONS		
International	169	256
National	123	132
Book Chapters	5	34
Conferences / Workshops/ Seminars	**74**	**50**

TATA MEMORIAL CENTRE
टाटा स्मारक केंद्र
SERVICE RESEARCH EDUCATION

services

Caring with Technology

Convener : Dr. Hari Menon
Secretary : Dr. Navin Khattry

The Adult Hemato-Lymphoid – DMG

MEDICAL ONCOLOGY
Dr. Hari Menon,
Dr. Navin Khatri,
Dr. Manju Sengar,
Dr. Bhausaheb Bagal,
Dr. Uma Dangi,
Dr. Hasmukh Jain

RADIOTHERAPY
Dr. Siddhartha Laskar,
Dr. Nehal Khanna,
Dr. Jayant Sastri Goda

PATHOLOGY
Dr. Tanuja Shet,
Dr. Sumeet Gujral,
Dr. Sridhar Epari,

HEMATO-PATHOLOGY
Dr. P. G. Subramanian,
Dr. Prashant Tembhare,
Dr. Nikhil Patkar,
Dr. Syed Hassan

CYTOGENETICS
Dr. Pratibha Kadam Amare,
Ms. Hemani Jain

RADIO-DIAGNOSIS
Dr. Suyash Kulkarni,
Dr. Nitin Shetty,
Dr. Nilesh Sable

NUCLEAR MEDICINE & MOLECULAR IMAGING
Dr. Venkatesh Rangarajan,
Dr. Archi Agrawal

CLINICAL PHARMACOLOGY
Dr. Vikram Gota

PSYCHIATRIST
Dr. Jayita Deodhar

Services

The AHL-DMG multidisciplinary group caters to the management of a variety of hematological malignancies in a comprehensive manner.

The management of hematological malignancies is based on evidence and protocol. The emphasis on personalized therapy was based on the cytogenetic and molecular profiling of hematolymphoid malignancies.

Emphasis was given to :

- Rapid diagnosis and early institution of therapy to immediately alleviate symptoms and life threatening problems at presentation,
- Identifying curable hematological malignancies and ensuring treatment completion by providing assistance,
- The dedicated hemato-pathology and molecular hematology laboratory facilities, enables comprehensive diagnosis including rare entities.

The Joint clinics (JC) screen patients before treatment is instituted. The purpose of JCs is to advice the best treatment options and also to scrutinize, approve or modify planned therapies.

The medical social workers support the JC activities, they identify funding agencies who financially support patients with curable malignancies needs to be funded. A general information booklet is provided to all patients.

To consolidate the efforts that the hospital has been making towards catering to Lymphoma/Leukemia patients and their families, a Lymphoma Leukemia Foundation has been established, wherein donors have a platform to contribute in the form of financial assistance. The corpus generated is used mostly in assisting in the initial treatment of the patient and at times sustaining therapy until such time that other aid starts flowing in.

Quality improvement measures

The DMG maintains ongoing quality improvement measures with continuous audits of treatment protocols, chemotherapy regimens, their morbidity and mortality, treatment compliance in long-term therapy and implementation of modifications derived from such audits.

Key Indicators

Volume Indicators

TABLE-1

Registration 2014	General	Private	Total
Hospital	23,493	14,160	37,653
New Cases	2,055	1,395	3,450
Second Opinion	-	469	469
OPD Follow ups	35,468	17,463	52,931

ACTREC – BMT Unit statistics

TABLE-2

ACTREC Registration 2014	
New Cases - TMH	143
BMT Referrals	248
OPD Follow ups	5,882
BMT OPD Follow Up	3,483
Autologous Transplant	41
Allogenic Transplants	35

The DMG registered 3,919 patients in 2014 as against 3,467 in 2013 and 2,836 in 2010. 52,931 patients on follow up were seen in the various outpatient departments during the year. The lymphoma/myeloma clinic and the leukemia clinic registered 1,119 and 357 patients respectively in 2014.

The outpatient service conducts four OPDs, 2 at TMC (Gen & Pvt.) and 2 at ACTREC (BMT & Chemotherapy). The OPDs for Leukemia, Lymphomas and Myeloma are run separately. Considering the steady increase in the outpatients the OPD timings have been sorted into two slots separating the new and follow-up patients respectively. The new CML patients are followed up at TMH and once they have achieved a stable response subsequent follow up is done at ACTREC. Besides the routine BMT OPD at ACTREC a separate BMT OPD at TMC is operational on Thursday and Friday by the BMT consultant to counsel potential patient for transplant.

Outcome indicators measured as 30-Day Mortality for January – December 2014 (actual numbers) is described as per disease in the table-3.

TABLE-3

	Morbidity/ Mortality (n=2360)
Febrile Neutropenia	Median – 80 % Range 5 % - 100 %
30 Days Mortality	3.8 % (n = 90 / 2360)

Process Indicator – Percentage compliance with evidence based clinical guidelines

TABLE-4

	Medical Oncology
Treated at TMH Referred at Local Place	2360 261
Average IN-Patients per month	266
Average Time to start Therapy	Median – 9 Range 3 days - * 3 Weeks
Compliance to guidelines	89.7 % (range 74.1% - 97.3 %)
Drop Out Rate On Therapy Before Starting Therapy	 6.2 % (n= 172 / 2759) 8.7 % (n= 301 / 3450)
Upfront Palliation Only	4% (n = 138)

Research

Research / Clinical Trials

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
28	9	1	1	28	9	5684

Publications

The DMG members contributed 21 scholarly communications of which 13 were published in international journals, and 4 in national journals. The rest four were contributed as book chapters.

Education

The DMG members have constantly been involved at the national and international level as faculty for various conferences, delivering lectures, presenting data and teaching postgraduates and junior colleagues who are in the field of oncology.

Several training programmes are organized for DM students and Visiting DM and non-DM trainees from other institutions and international fellows/ trainees for observership in the unit (clinical and laboratory). Lectures are also organized for oncology nursing staff/ trainees and BMT Fellowship of 1 year post DM. The DMG organized four CMEs and a national webcast for medical oncology trainees.

Patient Education

The DMG impart education to patients, through monthly meetings, patient advocacy and support group meetings, cancer awareness program for community and Lymphoma Awareness Program on occasion of World Lymphoma Awareness day.

Bone & Soft Tissue – DMG

Convener: Dr. Siddhartha Laskar
Secretary: Dr. Bharat Rekhi

SURGERY
Dr. Ajay Puri
Dr. Ashish Gulia

MEDICAL ONCOLOGY
Dr. Jyoti Bajpai
Dr. Jaya Ghosh
Dr. Girish Chinnaswamy
Dr. Tushar Vora

RADIATION ONCOLOGY
Dr. Siddhartha Laskar
Dr. Nehal Khanna

PATHOLOGY
Dr. Nirmala Jambhekar
Dr. Bharat Rekhi
Dr. Saral Desai

RADIO-DIAGNOSIS
Dr. Shashikant Juvekar
Dr. Subhash Desai
Dr. Amit Janu

NUCLEAR MEDICINE & MOLECULAR IMAGING
Dr. Venkatesh Rangarajan
Dr. Nilendu Purandare

PHYSIOTHERAPY
Dr. Ajeeta Hsabnis
Dr. Sarika Mahajan

PALLIATIVE CARE
Dr. Sunil Dhiliwal

The activities of the Bone & Soft Tissue Disease Management Group are guided by the institutional motto of Service, Research, & Education. It is the endeavour of the DMG to deliver comprehensive patient care in an effective & efficient manner besides conducting research directed towards optimising treatment for malignancies related to bone and soft tissue. It also focuses in building capacities in the management of bone and soft tissue malignancies through its training programmes.

Service

The DMG functions through three joint clinics viz., multidisciplinary clinics, joint clinico pathological meeting and joint clinic to ensure holistic management approach. The multidisciplinary joint clinic discusses vital issues to ensure optimizing integrated patient management, the clinico pathological meeting discuss diagnostic dilemmas and the joint clinic for physical rehabilitation of patients is addressed.

Key Indicators

Volume Indicators

Surgery	Radiation Oncology	Medical Oncology	Pathology	Radiology	Nuclear & Bio-Imaging	OccTh (OT) PhysioTh (PT)
Major: 687	EBRT: 352	Rad: 330	Spec: 476	XRay:1,500	PET-CT:435	OT: 4,051
Minor: 857	Brachy: 26	Pall: 32	Biop: 1,716	CT:1,452	SPECT: 210	OPD:1,401
				MRI:1,653		IPD: 2,650
				USG:151		PT: 510

Complications & Mortality

Modality	Morbidity/ Mortality		Pts./ Grade
Surgery (n=687)	Morbidity	Infection	Bone (6%)
			Prosthesis (11%)
		Vascular Inj	<1%
		Neural Com	<3%
	Mortality		1/189 (0.14%)
Radiotherapy (n=378)	Acute Toxicity		Grade I: 14% Grade II: 11% Grade III: 9%
	Mortality		Nil
Chemotherapy (n=362)	Morbidity (FN Requiring Admission)		140 (38%)
	Mortality		4 (1.1%)

5 Year survival rates (Updated Results of TOSS Data)

Diagnosis (Numbers)	Overall Survival	Disease Free Survival	Median follow up (months)
Entire Group (495)	57.3	48.2	65(43-105)
Ewing's Sa (94)	67.9	53.6	74 (46-102)
STS (137)	60.8	47.8	73 (51-102)
OGS (178)	48.3	39.1	50 (31-88)

Research

Members of the DMG are also involved in both clinical & basic research activities. The large majority of research conducted within the DMG has been investigator initiated prospective and retrospective studies. The primary focus of most research have been aimed at looking at treatment outcomes in terms of disease control, survival, treatment related complications & functional outcomes.

Development and refining of indigenous prosthesis and salvaging of limbs have been the thrust area of research, resulting in cost reduction of prosthetic surgeries for patients. In order to achieve comprehensive and holistic treatment, the efforts to study the efficacy of non-surgical treatment modalities and evolution of nutritional status. The use of Image Guidance (IGRT) and conformal techniques and optimal use of brachytherapy to improve local control of tumor continued to be the focus of research.

The department of Medical Oncology has been involved in evolving newer strategies to optimize chemotherapy for osteosarcomas e.g. the use of antiangiogenic agents and the use of dose dense regimens. Efforts have been made to evolve optimal sequencing strategies for chemotherapy and also to evaluate strategies for perioperative chemotherapy.

Research/ Clinical Trials

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued	
Inv. Initiated	Sponsored	Inv. Initiated	Sponsored	Inv. Initiated	Sponsored	Inv. Initiated	Sponsored
12	01	03	Nil	09	01	1,172	74

Education

Several continuing education programmes were organised in each sub-speciality to build capacity in the management of bone and soft tissue tumors. The training programs involved both clinical and non-clinical members of the DMG. Short term and long term training programmes were also conducted for visitors from within and outside the country.

Breast Oncology – DMG

Convener:
Dr. Vani Parmar

Secretary
Dr. Tanuja Shet

Clinicians:

SURGICAL ONCOLOGY
Dr. Rajendra Badwe
Dr. Vani Parmar
Dr. Indraneel Mittra (Prof. Emeritus)
Dr. Nita Nair
Dr. Prabha Yadav
Dr. Shalaka Joshi
Dr. Akshita Singh

MEDICAL ONCOLOGY
Dr. Sudeep Gupta
Dr. Jaya Ghosh
Dr. Jyoti Bajpai
Dr. Seema Gulia

RADIATION ONCOLOGY
Dr. Rajiv Sarin
Dr. Ashwini Budrukkar
Dr. Rakesh Jalali
Dr. T. Wadasadawala

PATHOLOGY
Dr. Sangeeta Desai
Dr. Tanuja Shet
Dr. Asawari Patil
Dr. Ayushi Sahay

RADIO-DIAGNOSIS
Dr. Meenakshi Thakur
Dr. Seema Kembhavi
Dr. Subhash Ramani

NUCLEAR MEDICINE & MOLECULAR IMAGING
Dr. Venkatesh Rangarajan
Dr. Sneha Shah

BASIC SCIENTISTS
Dr. Abhijit De
Dr. Narendra Joshi
Dr. Pradyumma Mishra
Dr. Ujjwala Warawdekar

The Breast DMG continues to strive towards improved quality patient care through research, service and education. In the year 2014, as compared to 2013, total registrations of new breast cancer cases went up by 8.6% (4,221 vs 3,857 respectively) and cases operated increased by 14%. This was not associated with any increase in morbidity or positive margins requiring revision surgery. The quality indicators were also checked to audit the procedures.

The Uniqueness of the DMG is manifest due to following attributes:

- As a single centre, the DMG treats the largest number of breast cancer patients from India and across the adjacent borders countries including the African continent.
- Oncoplasty and primary breast reconstructive procedures are offered by trained experts in the field, thereby extending the indications of breast conservation surgery.
- Hypofractionated Radiation therapy is being implemented to reduce the duration of Radiotherapy thereby making it more feasible to patients and facilitating better turnover.
- Accelerated Partial Breast Irradiation is offered as a service for those women that meet the ASTRO guidelines for the same.
- Evidence based management is undertaken with molecular-based personalized targeted therapy and chemotherapy.

Service

In all / a total of 4,221 cases registered with Breast DMG (4,095 at TMH and 126 at ACTREC); the General to Private category ratio being 52:48. 2,084 major, 2,018 were primary surgeries for malignancy and 2,700 minor OT procedures were performed by the DMG . Breast conservation surgery was offered to 990 patients (46%). The conservation rates were higher in early breast cancers (70%) versus 30% in locally advanced.

The overall morbidity was 7.5% (including wound re-exploration 0.5%, debridement and re-suturing), with positive resection margins requiring revision surgery after breast conservation in 4.2% cases.

Additional interventions included venous access port placement (50), bilateral salpingo-oophorectomy (33), neck node dissections (43), oncoplasty (58), and LD flaps (52) were also conducted.

Quality Indicators

a) Volume indicators

Category		Surgical Oncology Registrations		
Year	**2013**	**2014**		
		TMH	**ACTREC**	**Total**
General	1,933 (50.14%)	2,086	111	2,197 (52.05%)
Private	1,923 (49.86%)	2,009	15	2,024 (47.95%)
Total Registrations	**3,857**	**4,095**	**126**	**4,221**
Major Surgery	**1,829**	**1,402**	**682**	**2,084**
Minor Surgery	**3,179**	**3,045**	**–**	**3,045**

Radiation type	**2013**	**2014**
Adjuvant RT	814	797
Palliative RT	500	747
APBI	26	42
Total	1,340	1,586
Chemotherapy Type	**2,013**	**2,014**
Adjuvant Chemotherapy	1,463	1,876
Palliative Chemotherapy	1,500	1,600
Total	**2,963**	**3,476**
Referred outside	–	2,082

The minor OT registered 2700 minor procedures. There was a planned starting of core biopsy procedures at the private OPD since March 2014, on all afternoons, due to high volumes of the procedure and considering patients' convenience. This accounted for an additional 345 cases in minor procedures performed in the out-patient clinic (thus, total minor cases 3045).

Radiation therapy was offered to 1,586 (18% increase since 2013) and the Department of Medical Oncology administered systemic therapy to 3,476 women (compared to 2,963 in 2013) indicating a 17% decrease in absolute number of cases.

Other treatment policy decisions that have been incorporated into standard practice following updated evidence in literature, and after BCWG consideration and consensus in 2013-2014 are as follows:

- Revised radiation therapy protocols: adjuvant RT offered for all patients with 1-3 LN positive axilla; Hypo-fractionation regimens initiated to reduce duration of RT; delaying systemic chemotherapy therapy after HDR for 6 weeks to reduce wound morbidities.
- Adjuvant chemotherapy schedules for locally advanced cancers.
- Adjuvant Tamoxifen for 10 years in all age groups and menopausal status and
- Routine use of bisphosphonates in adjuvant therapy in postmenopausal women.

Financial Support:

Patients were financially supported for treatment through various funds namely Women's Cancer Initiative-TMH, Maina Foundation, Vasantha Trust and Madat Trust. Mahindra & Mahindra Pvt. Ltd., funded by provision of Postoperative Care and Counseling and Lymphoedema Kits. *Total amount Rs.21.16 L spent towards patients by support groups for surgery, chemotherapy, investigations (free or concessional) and supportive care.* V-care and Cancer Patients' Aids Association also supported patients financially for various requirements including prosthesis and drugs.

b) Outcome Indicators:

1. 30 day mortality and complication rates – There was no reported 30-day mortality. The overall surgical morbidity (including wound re-exploration in 0.5%, debridement and re-suturing) was seen in 7.5%.
2. Positive margin and re-excision rates - 4.2% (all positive margins re-excised)
3. Completion mastectomy rates = 2 of 922 (0.2%)
4. Median nodal yield for quality of

surgery: Axillary sampling= 5 LN; Clearance= 12 LN; >= 10 LN dissected in 87.1%

5. Lymphoedema Rates – Total 59 cases in 2014 (3%); reported only moderate lymphoedema, none with severe lymphoedema.

c) Outcome indicators for survival, and other early outcomes

Audits were conducted over the year, the treatment outcome indicators established in different groups of patients, are listed briefly as below:

1. Validation of Software Based Clinical Decision Support System for Breast Cancer Treatments in a Tertiary Care Cancer Center in India.

   Once prospectively validated, this System can support global access to evidence based clinical decision and can be extended to other cancer sites.

2. A study on Contralateral Breast Screening Mammography : theIndian Perspective indicated that with low breast cancer incidences in India mammography is neither useful nor cost effective in the diagnosis of contralateral breast cancer at the time of diagnosis.

3. Lymph node ratio as an alternative to pN staging in node positive breast cancer.

   The study showed that lymph node ratio may serve as a better prognostic marker as compared to the conventional pN staging and needs validation in larger studies.

4. Differential response to neoadjuvant chemotherapy in Hormone receptor positive large operable or locally advanced breast cancer was studied during the year.

   It is necessary to consider hormonal manipulation in addition to chemotherapy in the neoadjuvant setting for HR+VC breast cancer for women. The study indicated that specific molecular markers need to be evaluated to predict response to NACT or NAHT in the various subtypes.

5. Can we avoid axillary lymph node dissection in patients 1-2 positive sentinel lymph nodes in the Indian setting.

   Early breast cancer patients with 1-2 positive nodes in axillary sampling had 30.5% additional nodes elsewhere in the axilla (all macrometastases). The actual percentage may even be higher if multiple sections from the nodes are studied.

   Conclusions: It may not be appropriate to apply the results of not clearing the remaining axilla even if SN positive, to our general population. Possibly, only a select subset of patients who fit the inclusion criteria of the ACOSOG Z11 could be offered observation of the axilla in spite of 1-2 nodes positive.

6. Impact of age as an independent prognostic factor for lymph node metastasis and survival in breast cancer.

7. Women who presented with Oligometastatic disease were compared to those with locally advanced and wide spread metastatic disease. The audit showed that patients presenting with locally advanced breast cancer and diagnosed with oligometastases have better outcome as compared to women presenting with multiple metastatic disease at first presentation, and in fact their outcome is more similar to women with locally advanced non-metastatic breast cancer.

8. Results of patients who received Accelerated Partial Breast Irradiation from Aug 2000 to Dec 2011

   Median FU: 70 months (1-160); Recurrences: 177/506; 5-year DFS: 68%

9. **Retrospective analysis of Clinical Benefit Rate and Toxicity of Everolimus therapy in** Hormone Receptor Positive Metastatic Breast Cancer from March 2012 to June 2014.

   A retrospective analysis of everolimus in hormone receptor (HR) positive MBC, who had recurrence or progression while receiving previous therapy with a non-steroidal aromatase inhibitor (NSAI) in MBC, was conducted in patients treated from March 2012 to June 2014. For a Clinical Benefit Rate of 68%, there were 30% PRs, 38% SD, 32% PDs. Everolimus was active in all subgroups with no single statistical differences across subgroups. The mean PFS was 21.6 (3-76) weeks.

10. **Retrospective analysis of Clinical Benefit Rate and Toxicity of Eribulin therapy** in Metastatic Breast Cancer from November 2012 to July 2014.

11. **Taxane-Based Combination Chemotherapy in Breast Cancer** Experience from a Tertiary Care Cancer center in India.

d) Process Indicators:

Following are the results of Audits conducted for Surgical, Radiation and Medical Specialties. The Surgical Audit was carried out on cases operated in March and July 2014. All cases selected were with 2014 registration which summed up to 209 cases. Surgical timelines were evaluated in 51 upfront operated cases. Medical Oncology audit carried out in random 47 case files to check details and chemo-toxicity. Radiation Oncology audit was carried out in 164/209 cases where RT was advised.

1. **Compliance audit - Surgery**

Cases lost (not re-visited) immediately after registration	1.9%
Registration to First JC/first consult and then no further visits	3.3%
Lost (No re-visits) after first Joint Clinic and Investigations	7%
Lost after second JC and treatment planning	4%
Lost after surgery	0%
Overall drop-out rate	16.4%

2. **Timelines for Surgery**

	Private	**General**
Registration to First JC	Day 0	Day 1
First JC to Surgery	22 days(min 4 d)	23 days(min 6 d)
Last NACT to Surgery	27 days(min 14 d)	41 days(min 16d)

- Most of the delays beyond 3-4 weeks from JC were in patients with medical co-morbidity such as DM, HTN, Cardiac disease, etc requiring physician's opinion. Very few had no clear cause documented.
- Target set for surgery waiting time was 4 weeks: Target was achieved in 80% in 2014
- Audits for reasons for delays: Long waiting list, Medical co-morbidity and fitness issues, Counts low post NACT

3. **Compliance audit – Chemotherapy**
   - Chemotherapy 207/209 advised (99%);
   - 2 advised Neoadjuvant hormone therapy
   - All patients complied with advice.
   - Audited details in 47 patients (all types)
   - Completion of adjuvant chemotherapy in 75%
   - Reasons for discontinuing was primarily chemo toxicity especially neuropathy

4. **Compliance audit – RT**
   - Radiation therapy -164/209 advised (78.5%). Taken at TMC 34%; Referred out in 66%
   - 99% complied with advice.

5. **Breast related plastic procedures- audit for timelines**
   - JC decision to surgery: 18.1 days (1-39 d)
   - Waiting time average for free flaps: could vary with OT slot availability. Weekly one OT kept blocked for Breast WBR. Average of >6-8 weeks waiting.

- Waiting time average for pedicled flaps: varies with OT slot availability. Average waiting 2-4 weeks.

Quality improvement measures:

The DMG maintains ongoing quality improvement measures with continuous audits of specific subtypes and outcome indicators. Additionally a morbidity database is maintained for peri-operative infections and concerns. As per the results of the recent audit, the timelines appear to be reasonable, with scope for further improvement especially in reducing waiting times for surgery and expediting the surgical intervention in spite of large patient load.

Research:

There has been continued *interactive inter-disciplinary inputs* in research, dissertational and service improvements by all constituent department members during the year. In 2014, in all 97 studies and trials were listed as ongoing under supervision by various DMG members. These included 51 open and accruing studies, 25 closed and completed accrual on follow up or being analyzed, and 21 completed and reported studies. Of these, there are 43 active plus 10 closed investigator initiated studies as prospective, retrospective or observational trials/ studies and dissertations; 6 active and 12 closed but on follow up industry-supported studies; and 2 accruing 3 closed Collaborative Group studies in 2014.

Practice changing research:

Some of the original research carried out at TMC has resulted in practice changes in 2014, like role of *low axillary sampling* in cN0 operable breast cancer and role of *locoregional therapy in primary metastatic breast cancer*. *Proluton preoperatively* is being offered as routine care in all high risk node positive operable breast cancer before upfront surgery.

The potential practice changing studies ongoing are namely, Exercise Trial, Voltage Gated Sodium Channel(VGSC) study, TNBC study, Accelerated Partial Breast Irradiation, CONSET, Ethnic Research Initiative(ERI) Study for risk factors, Taxane toxicity and progesterone, and Perioperative Herceptin single dose study.

Further progress has been made on *translational and basic research* front with analysis of tumor tissue on RNA (and mRNA) sequencing being completed on the fresh tumor samples to assess effect of progesterone and to evaluate hypoxic modulation in the tumor to understand biology of cancer metastases and factors that might influence the same. The cell line studies have also made progress with early results suggesting specific alterations in some genes. The analysis is ongoing at ACTREC and NIBMG, Kolkata.

The *animal studies* are making steady progress, previously being delayed due to issues with viability of nude mice but the matter is being addressed proactively so as to enable the successful progress of studies planned in the nude mice, including understanding of biology of metastases and its modulation.

Research / Clinical Trials

Total No. of Clinical Trials			Completed			Ongoing			Patients Accrued in 2014
Investigator Initiated	Sponsored	Collaborative	Investigator Initiated	Sponsored	Collaborative	Investigator Initiated	Sponsored	Collaborative	Total
69	21	6	25	15	4	44	6	2	1996

Convener : Dr. Shailesh Shrikhande
Secretary : Dr. Shaesta Mehta

Gastrointestinal – DMG

SURGICAL ONCOLOGY
Dr. Shailesh Shrikhande
Dr. Mahesh Goel
Dr. Avanish Saklani

MEDICAL ONCOLOGY
Dr. Vikas Ostwal

RADIATION ONCOLOGY
Dr. Shyam Kishore Shrivastava
Dr. Reena Engineer
Dr. Supriya Chopra

PALLIATIVE MEDICINE
Dr. Mary Ann Muckaden

PATHOLOGY
Dr. Mukta Ramadwar
Dr. Kedar Deodhar
Dr. Munita Bal

DIGESTIVE DISEASES AND CLINICAL NUTRITION
Dr. Shaesta Mehta
Dr. Prachi Patil

ANAESTHESIOLOGY, CRITICAL CARE AND PAIN
Dr. Paramanand Jain

EPIDEMIOLOGY
Dr. Rajesh Dikshit

RADIO-DIAGNOSIS
Dr. Supreeta Arya
Dr. Suyash Kulkarni
Dr. Nitin Shetty
Dr. Ashwin Polnaya

NUCLEAR MEDICINE & MOLECULAR IMAGING
Dr. Venkatesh Rangarajan
Dr. Nilendu Purandare
Dr. Archi Agrawal

In the year 2014, DMG recorded highest number of major Hepato-pancreaticobiliary cancer resections and laparoscopic colorectal cancer resections, in the past decade.

The Robotic Colorectal/Gastric/ Pancreatic resections were initiated. Minimal Access and of Interventional radiology services were initiated at ATCREC. The DMG made efforts to improve patient follow up and consolidated the prospective databases of all organ systems.

Service

General Clinical Services

The DMG registered a total of 7,461 patients during the year, of which 4,132 were from general and 3,329 were from private category. The K-Ras testing in Colorectal Cancer (CRC) and c-kit mutation testing in Gastrointestinal stromal tumors (GIST) was established. The DMG achieved to regulate the treatment to 97.4% in compliance to the Evidence Based Management guidelines.

Surgical Services

Volume Indicators: Of the total of 1,306 surgeries performed during the year, 936 were performed at TMH (836 elective surgeries and 120 emergency operations) and the remaining 370 were performed at ACTREC. Patients were treated with radiotherapy (RT), chemotherapy (CT), application and clinical nutrition. The DMG performed endoscopic procedures on 6,149 patients, 903 patients were given chemotherapy (CT) and 14,385 and 19,192 patients were offered nutritional and OPD consultations respectively.

Medical Oncology

2,021 patients (1,155 general and 866 private category patients) received chemotherapy in the form of CTRT, adjuvant CT, non adjuvant CT for anal, colorectal, gastric, pancreas, renal and rectal, cancers. Complication rates of patients undergoing chemotherapy: Grade 1 – 81 %, Grade 2 – 64 %, Grade 3 – 16 %, Grade 4 – 2 %

Radiotherapy

A total of 534 patients received radical radiotherapy (337 patients) and palliative radiotherapy (197 patients). The highest being renal cancers patients (218). Intensity Modulated Radiotherapy (IMRT) (70), 3D Conformal Radiotherapy (213), Stereotactic radiotherapy (7) and conventional radiotherapy (54) were the common techniques used in providing the RT services.

Radio-Diagnosis

A total of 1,401 procedures were performed for the patients. The DMG offered large range of radiology services; the major radiology services comprised of CT guided biopsies / FNAC, USG guided biopsy (456) USG guided Fine Needle Aspiration Cytology (FNAC) (432), Percutaneous Transhepatic Biliary Drainage PTBD (589), and emergency angioembolisation (74). Interventional radiological procedures included Radiofrequency Ablation in Hepatocellular Cacinoma, Radio-frequency Ablation of Colo-Rectal Liver Metastases, Transarterial Radio-

embolisation for Unresectable Hepatocellular Carcinoma and, analysis of "Drug Eluting Beads for Hepatocellular Carcinoma"

Nuclear Medicine

Imaging procedures were conducted on a total of 1,790 patients of which, the major procedures were Tc HYNIC TOC SPECT-/CT (120), F FDG PET/CT (1,578).

Pathology

A pathological tests of 8,970 sample performed covering small biopsies on 2,247 samples, FNAC on 1,651 samples and exfoliate cytology on 1,015 samples. The K ras and c kit was performed on 30 and 24 samples respectively. The average turnaround time for all samples was six days.

Education

- § Live Transmission of Whipple Resection to Dubai was conducted for the UAE Cancer Congress, October 2014.
- § A live demonstration of Surgical Procedures: Whipple Resection, Hepatectomy, Radical Gastrectomy with D2 lymphadenectomy, Laparoscopic Anterior resection in November 2014, during the Oncosurg Conference at Tata Memorial Hospital.
- § The DMG hosted the 11th Annual Conference of the Indian Chapter of IHPBA, the highlights were cadaveric liver dissection course, medical writing workshop and live operative demonstration of complex HPB surgeries by renowned international faculty, January 2014.
- § The DMG conducted several educational programmes viz. CMRs, Workshops etc.
- § A handbook for Residents in Gastrointestinal Surgery was published and was edited by Doctors A Desouza, M Goel and Shrikhande S V.

Outcome Indicators:

Mortalities in Elective Surgeries:
25 / 816 (3.06%)

Mortalities in Emergency surgery:
7 / 120 (5.83%)

Morbidity: 20.3 %

Research

Research / Clinical Trials (basic and clinical research, investigator intiated, industry sponsored) 20 of which 2 are completed and rest ongoing important one to include.

No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
24 (Investigator initiated 14, Thesis 7 Extramural 3)	10	2	3	22	7	No of patients to be accrued 2,394. Overall patients accrued 1,210

Convener Dr. Sudeep Gupta
Secretary Dr. Amita Maheshwari

Gynaecology – DMG

Surgical Oncology
Dr. Amita Maheshwari
Dr. Rajendra Kerkar
Dr. Shylasree Thumkur

Medical Oncology
Dr. Sudeep Gupta
Dr. Jaya Ghosh
Dr. Jyoti Bajpai
Dr. Seema Gulia

Radiation Oncology
Dr. Shyam Shrivastava
Dr. Reena Engineer
Dr. Umesh Mahantshetty
Dr. Supriya Chopra

Pathology
Dr. Bharat Rekhi
Dr. Kedar Deodhar
Dr. Santosh Menon

Microbiology
Dr. Rohini Kelkar

Cytology
Dr. Swati Dighe

Radiodiagnosis
Dr. Meenakshi Thakur
Dr. Nilesh Sable
Dr. Palak Popat

Cancer Biology
Dr. Shubhada Chiplunkar
Dr. Tanuja Teni
Dr. Murali Chilakapati
Dr. Pritha Ray

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Sneha Shah

Preventive Onclogy
Dr. Surendra Shastri
Dr. Gauravi Mishra
Dr. Sharmila Patil

The Gynaecologic Oncology Working Group made significant progress in service, education and research in 2014. cervix Cancer continued to be to be the most common cancer, followed by ovarian cancer. One major trial (CRACx) reached maturity and is likely to impact clinical practice in the near future and another major trial (NACT cervix) is nearing complete accrual. The services of a nurse counselor were employed on a regular basis in the general medical oncology OPD. The surgical oncology unit successfully initiated Robotic Surgery services in the gynaecologic domain.

Key Indicators

A. Volume Indicators – Number of patients treated.

Number of new patients registered: 3,323; General: Private : 2,158:1,165 (65%: 35%)

Total number of major surgeries performed	**790 (TMH :704 / ACTREC : 086)**	
	TMH **General : Private** **321 (45.5%): 383(54.5%)**	**ACTREC** **086**
CA Cervix	**109**	**09**
• **Open**	074	05
RAH + Bil. PLND	060	03
Bil. PLND	011	01
RAH (Inoperable)	001	–
Pelvic exenteration	002	–
• **Laparoscopic**	035	–
Lap Type III TLRH + Bil. LPLND	022	–
Lap Bil. LPLND	012	–

Ca. Uterus • Endometrial carcinoma Open Laparoscopic Robotic • Uterine Sarcoma	096 079 048 024 007 **017**	**07**
Ovarian cancers • Primary Cytoreduction • Interval Cytoreduction Secondary Cytoreduction	**355** 098 247 010	**56** 16 40 00
Vulval cancers	20	01
Miscellaneous	124	13
Note: Of the 72 patients posted for radical hysterectomy for cervical cancer 18 were patients recruited in the NACT Trial and the remaining 56 were treated off-trial. Of these 56, 35 (62.5%) were successfully treated using the laparoscopic approach		
Total minor surgical procedures done	392	Nil
Patients receiving Radiotherapy • Private • General	**775** 171 604	
Patients receiving Radical RT	567	
Patients receiving Palliative RT	208	
Cervical Cancers • Radical • Post operative + Vault • Palliative	**667** 470 29 (Study patients at ACTREC) 168	
Endometrial Cancers	**50**	
• Radical/ Post operative	39	
• Palliative	11	
Vaginal Cancers + Vulval Cancers • Radical + Post Op • Palliative	**18** 13 05	
Ca Ovary	**17**	
• Post OP	03	
• Palliative	14	
Miscellaneous:		
(Unknown primary/Inguinal Nodes/Bone mets etc)	**23**	
No. of Brachytherapy procedures performed	Intracavitary : 1660 (554 Patients) Interstitial : 205 (52 Patients)	
Planned Chemotherapy	1,500	

Outcome Indicators: 30-day mortality and complication Rates

Surgery:

	TMH	**ACTREC**
Major surgical morbidity	038 (5.4%)	04 (4.6%)
Intra-Op	**017 (2.4%)**	00
• Unplanned visceral injury • Major hemorrhage	012 (1.7%) 005 (0.7%)	00 00
Post-Op • Major wound infection • Burst abdomen • Sepsis needing ICU admission • Other	**021 (3.2%)** 011 (1.5%) 003 (0.4%) 006 (0.14%) 001(0.14%)	04 00 02 00 00
Post-Surgical 30-day Mortality	**03 (0.42%)**	**Nil**
Septic shock ARDS with pneumonitis	02 01	00 00

Radiotherapy Toxicity

Radical RT	N = 567	
	Grade II	Grade III
Skin	40 (8-10%)	24 (4.5%)
GI (Mainly Diarrhea)	48 (9%)	35 (6.5%)
GU (Dysurial Frequency)	76 (13%)	26 (5%)

Chemotherapy Toxicity

Toxicities		Percentage
Haematological (Grade III/IV)	06	18.2%
Neuropathy (Any Grade)	11	33%

B. Outcome Indicators: 5 year survival rates

I. Gestational Trophoblastic Neoplasm : >95%

II. Cervical cancer Stage III B: 60%

III. Relapsed Ovarian Cancer: Median survival 22 months

IV. Endometrial cancer: 97%

Research

Research / Clinical Trials

Total No. of Clinical Trials (N=44)		Completed Trials (N=05)		Ongoing Trials (N=39)		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
41	03	04	01	37	02	Approx 6,910 (including 2,600 from the patterns of care study)

In addition to the above, two Gynaecology trials were submitted to IRB for approval and 4 trials were terminated during the year.

Another trial study, “Concomitant Chemo-Radiation in Advanced Stage Carcinoma Cervix : A Phase III Randomized Trial (CRACx Study)” reached maturity and the results are likely to impact clinical practice in the near future.

Convener Dr. J.P. Agarwal
Secretary Dr. Shubhada Kane

Head and Neck – DMG

Surgical Oncology
Dr. Anil K. D'cruz
Dr. Devendra Chaukar
Dr. Prathamesh Pai
Dr. Pankaj Chaturvedi
Dr. Gouri Pantvaidya
Dr. Anuja Deshmukh
Dr. Sudhir Nair
Dr. Deepa Nair

Medical Oncology
Dr. Kumar Prabhash
Dr. Vanita Noronha
Dr. Amit Joshi

Radiation Oncology
Dr. Rajiv Sarin
Dr. Jai Prakash Agarwal
Dr. Sarbani Ghosh Laskar
Dr. Ashwini Budrukkar
Dr. Tejpal Gupta
Dr. Vedang Murthy

Radiodiagnosis
Dr. Supreeta Arya
Dr. Shashikant Juvekar

Pathology
Dr. Shubhada Kane
Dr. Munita Bal
Dr. Rajiv Kumar
Dr. Asawari Patil

Plastic & Reconstructive Surgery
Dr. Prabha Yadav
Dr. Vinay Shankhadar
Dr. Dushyant Jaiswal

ENT Surgery
Dr. Chris Desouza

Dental & Prosthetic Surgery
Dr. Kanchan Dholam
Dr. Karthik Sadashiva

Speech Therapy
Dr. Gurmit Bachher

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Nilendru Purandare
Dr. Sneha Shah
Dr. Archi Agrawal

Cancer Biology
Dr. Shubhada Chiplunkar
Dr. Murali Chilakapati
Dr. Manoj Mahimkar
Dr. Tanuja Teni
Dr. Milind Vaidya

The Head and Neck DMG provides state of the art care in all phases of management for patients with head and neck cancer, using a multidisciplinary approach to ensure the best possible outcome for both common and not so common cancers of the head and neck region. It also promotes the importance of scientific research, responsible medical care, and a healthy environment through public education and anti-tobacco advocacy.

Head and Neck cancers are one of the major varieties of cancers in the Indian population. The Disease Management Group comprises all three major oncology specialists (surgical, radiation and medical oncology), and is effectively supported by other ancillary and rehabilitative services, providing effective, evidence based care for Head & Neck cancer.

Service

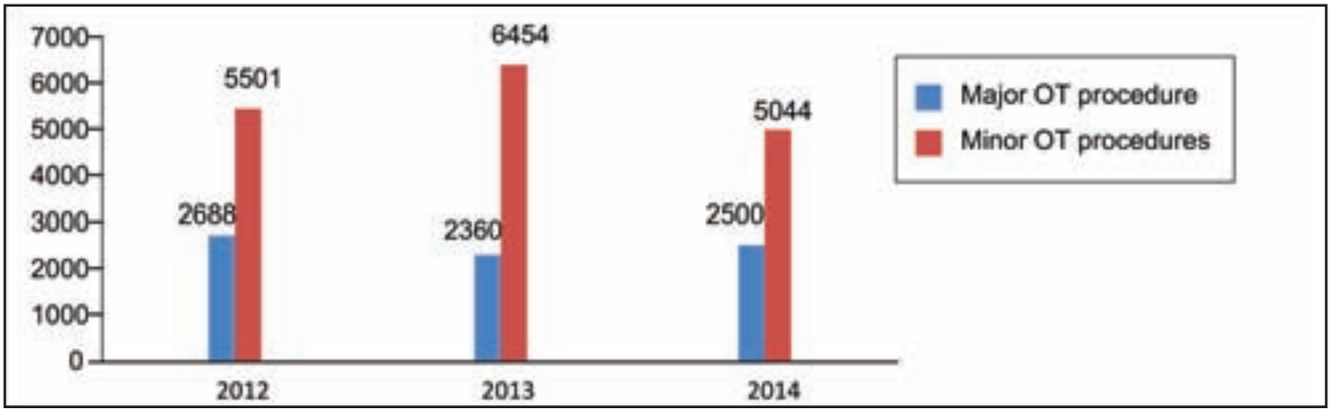
A team of experts from different specialties customize the management of patients by designing the most effective combination of Surgery, Radiation, and/or Chemotherapy to suit the individual patient's needs in a multi disciplinary Joint Clinic (JC). All newly diagnosed patients as well as patients who have undergone a complete staging evaluation are usually evaluated during this clinic. These treatment plans are based on the most up-to-date understanding of treating the cancer in general and the individual patient in particular.

Key Indicators

Workload

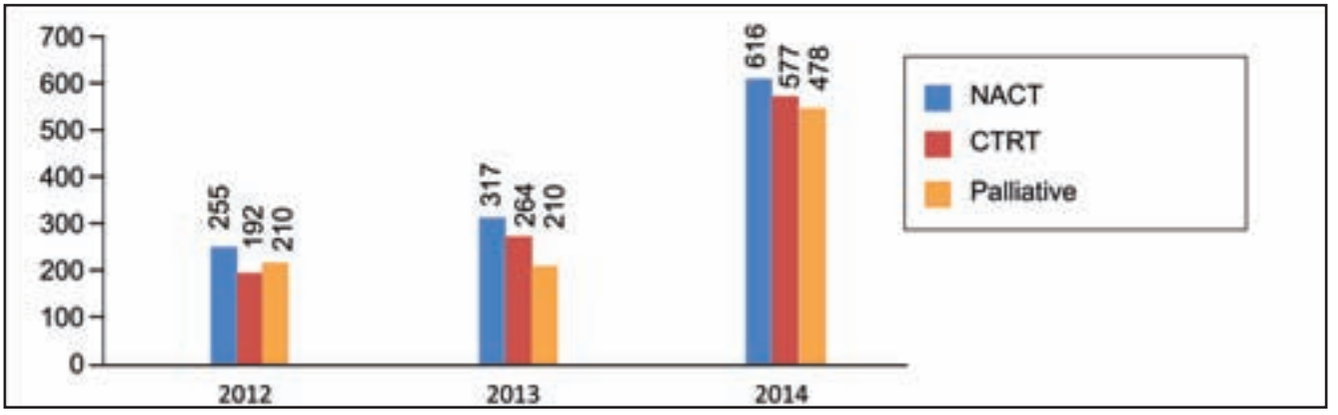
The DMG registered a total of 9,366 patients, a 8.23 % increase over the previous year. About 5,044 major and about 2,500 minor OT procedures were performed. An increase in major OT procedures by 5.6% over 2013 was observed.

No of patients undergone Surgery:



Radiotherapy

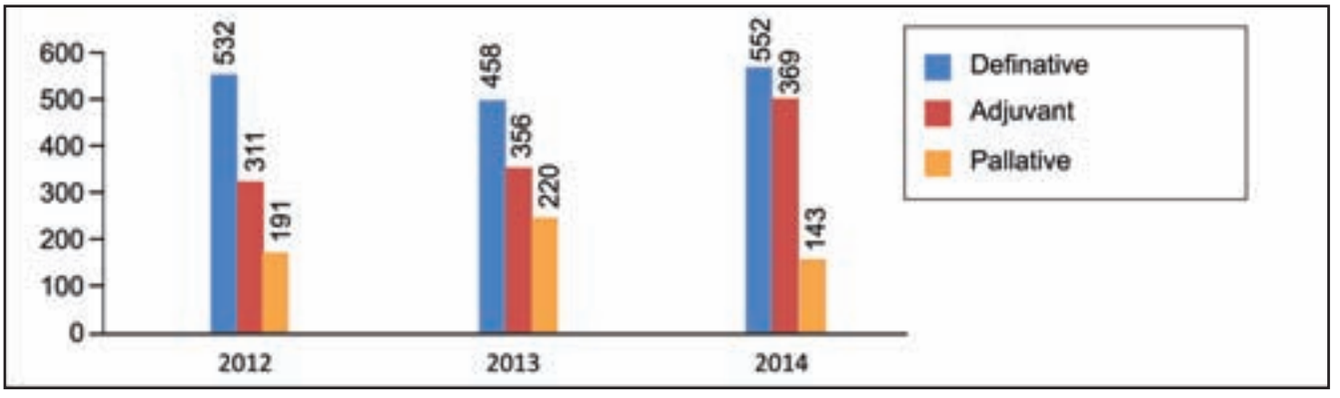
A total of 1064 patients were treated with radiotherapy, which includes 552 patients were offered definitive radiotherapy, where a 369 and 143 patients were offered adjuvant and palliative treatment respectively. About 20.50% more patients received definitive therapy.



No. of patients undergoing radiotherapy

Chemotherapy

A total of 1671 patients received chemotherapy. Among the different chemotherapy modalities, 616 patients were treated with Neo adjuvant chemotherapy, 577 patients were given chemo -radiation therapy (CTRT) and 478 were treated with



palliative therapy. Thus over the previous year 48.53 % more patients received Neo-adjuvant Chemotherapy (NACT). No of Patients treated with Chemotherapy

Dental services: The dental and prosthetic services offered 12,776 consultations, 1,247 prosthesis and 3,034 FGA. It also continued to offer routine dental services.

Speech Therapy: 1,960 new patients were offered speech rehabilitation services through 4,006 sittings.

Diagnostics

Pathology	Path specimens	14,095
	FNAC	4,066
	Exfoliative Cytology	692
	Frozen sections	2,492
Radiology	CT Scan	2,546
	MRI	1,975
	USG	4,114
	USG Guided Biopsy/FNAC	523

Outcome Indicators-30 Day mortality & complication rates

Surgery : TOTAL 2,162

Morbidity – 31% (major 34%, Minor 66%)

Mortality – 0.4%

Radiotherapy – TOTAL 1,098

95 % treatment completion

Mortality	0.7%
Complications	Dermatitis - Grade 0-2: 92%, Grade 3: 0.4%
	Mucositis - Grade 0-2: 92%, Grade 3 : 0.4%
	NGT placement : 21%
	Weight loss : Median: 2kg (range: 0-14
Chemotherapy	TOTAL -1,049,
	86.04% compelte3d NACT and 85.65% completed CTRT
Mortality :	0.55%
Complications	Toxicity(Grade 3-4) : 40%
	Febrile Neutroponia: 10%
	Mucositis: 5.6%

Outcome Indicators-5 year Survival rates

Stage 1 and 2 Oral cancers:	Two and five-year disease-free survival- 65% and 52%
Stage 3 and 4 Oral cancers:	Two and five-year disease-free survival: 63.8% and 53.3%,
Radical Radiotherapy:	5 year disease free survival - 53%
Chemo Radiotherapy:	5 year disease free survival - 58 %
Palliative Radiotherapy:	55% PFS at 12 months
NACT in oral cavity cancer:	Patient undergoing surgery had 2 year survival rate of 42% as compared to median survival of 10 months patients' not undergoing Surgery.
Palliative chemotherapy:	Median OS was 8 months
NACT(Hypopharynx /Larynx) :	The overall response rate was 66%, including 6% complete response and 60% partial response.
The median PFS :	20 months.
Organ preservation rate: 62%.	

Process Indicator

A data for 200 consecutive patients who were registered in the month of Feb 2014 were collected and analyzed. On the basis of this analysis following points were observed which are mentioned in the flow chart below.

166 patients reported to JC for consultation, of which 107 patients received treatment at TMH. Of the 166 patients, 143 patients were offered radical treatment and 23 were referred for palliative treatment.

Compliance to Evidence Based medicine Guidelines

Joint clinic decisions were reviewed by a panel of three head and neck oncologists and were compared with the available evidence based medicine guidelines published by the hospital. If the guidelines were not followed, the reasons for the same were also documented. A compliance of 87.5% was observed.

Research

Research within the DMG focuses on evaluating standards of care in randomized settings, challenging dogma and evaluating new technology/ drugs and has the potential of generating high quality evidence to support translation into standard of care. The DMG members actively participate in National and International multicentric trials and have been responsible for conceptualizing, designing and implementing several prospective trials with either intramural or extramural support. The DMG members also participate in trials supported by the pharma. The DMG also has several ongoing basic science and translational research studies.

Research / Clinical trials in the year 2014 at TMH & ACTREC

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
19	0	13	3	32	4	944

List of important clinical trials along with their significance and impact on patient care.

1. Phase II Study Of 3-Dimensional Conformal Radiotherapy (3D-CRT) Vs.Intensity Modulated Radiotherapy (IMRT) For Squamous Cell Carcinoma Of The Head & neck (HNSCC).
2. 3DCRT vs IMRT- Phase II Study Of 3-Dimensional Conformal Radiotherapy (3D-CRT) Vs.Intensity Modulated Radiotherapy (IMRT) For Squamous Cell Carcinoma Of The Head & neck (HNSCC)
3. Mandible Preservation - The role of neo adjuvant chemotherapy for mandibular preservation in locally advanced operable squamous cell carcinoma of the oral cavity.
4. Metronomic CT - A prospective randomized phase II Study comparing metronomic chemotherapy with chemotherapy (single agent cisplatin), in patients with metastatic, relapsed or inoperable squamous cell carcinoma of Head and Neck.
5. Bio-SMART- Biological imaging before, during, and after Simultaneous Modulated Accelerated Radiation Therapy in head and neck squamous cell carcinoma (Bio-SMART).
6. PRET RCT in Shoulder dysfunction – Effect of Progressive Resistive Exercise Training on shoulder joint range of motion operative Head and Neck cancer patients undergoing radiotherapy; a randomized trial.
7. HPV in India – Prevalence and Clinical impact of p16 positive head and neck cancer in India and its interaction with tobacco use.

Education

The DMG provides extensive training to post-graduate students, residents, fellows, National & International observers and the allied medical professionals in comprehensive head and neck cancer care. Education is provided through the activities like academic meetings, student thesis meetings, multidisciplinary clinic (joint Clinics), skull base clinics, and clinical ward grand rounds, teaching rounds, seminars and workshops. The DMG offers fellowships for professionals in head and Neck surgery, dental and prosthetic surgery and Speech rehabilitation units. The DMG trained 63 national and 4 international observer trainees during the year 2014. The M Ch programme enrolled four students in 2014.

Neuro-Oncology – DMG

Convener : Dr. Aliasgar Moiyadi
Secretary : Dr. Tejpal Gupta

Neuro-Surgery
Dr. Aliasgar Moiyadi
Dr. Prakash Shetty

Adult Medical Oncology
Dr. Hari Menon

Basic Neuro-Oncology
Dr. Neelam Shirsat

Radiodiagnosis
Dr. Nikhil Merchant
Dr. Supreeta Arya
Dr. Subhash Ramani
Dr. Ashwin Polnaya
Dr. Amit Janu
Dr. Abhishek Mahajan

Pediatric Medical Oncology
Dr. Purna Kurkure
Dr. Girish Chinnaswamy
Dr. Tushar Vora
Dr. Maya Prasad

Radiation Oncology
Dr. Tejpal Gupta
Dr. Rakesh Jalali
Dr. Goda Jayant Sastri

Pathology
Dr. Shubhada Kane
Dr. Epari Sridhar
Dr. Ayushi Sahay

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Nilendu Purandare

Psychiatry
Dr. Jayita Deodhar

Occupational Thearpy
Dr. Sanya Shroff

Neuro-Oncology Research Fellow
Dr. Abhishek Puri
Dr Siddharth Pant

COMPREHENSIVE CARE FOR PATIENTS WITH BRAIN AND SPINE TUMORS

Service

Neuro-oncology DMG provides comprehensive care for patients with brain and spine tumors. This includes outpatient as well as inpatient (elective and emergency services).

The DMG has made concerted efforts to enhance patient care. On the diagnostics side, new investigations introduced in pathology include IDH-mutation testing both Immuno Histo-Chemistry (IHC) as well as Polymerase Chain Reaction (PCR), 1p19q deletion Fluorescent in Situ Hybridization (FISH), EGFR mutation (FISH) and Methyl Guanine Methyl Transferase (MGMT) methylation (PCR). Further comprehensive preoperative imaging is done for most preoperative patients (at TMH and ACTREC) in order to plan surgery optimally as well as to create a database. This includes routine Magnetic Resonance (MR) sequences as well as special functional MR evaluations. Special surgical planning (navigation) MR sequences are used when necessary.

A randomized controlled trial, demonstrated the benefit of high-precision fractionated stereotactic conformal radiation therapy in preserving long term neuro-psychological and neuro-endocrine outcomes compared to conventional radiation therapy in children/young adults with benign/low-grade brain tumors. This has shown a potential in changing the practice.

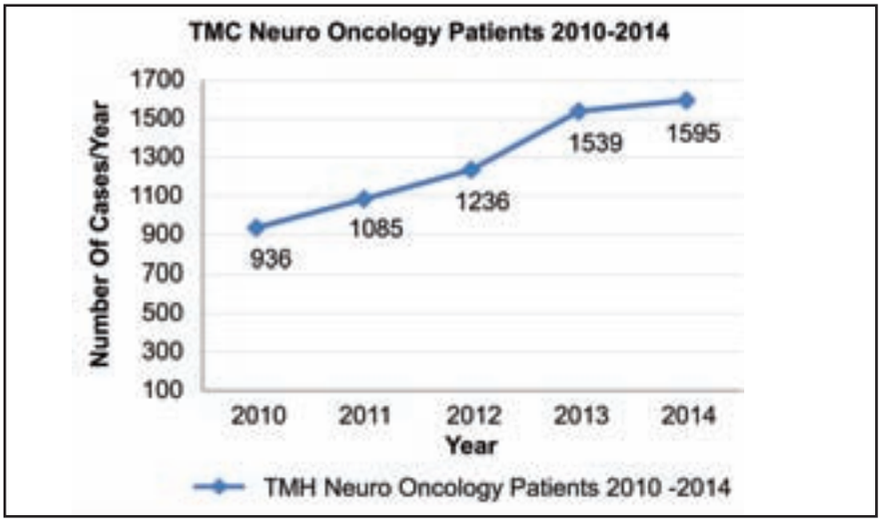
A separate 'Phakomatoses Clinic' for patients with neurocutaneous syndromes was initiated to improve the quality of care for these patients.

Key Indicators

Volume indicators

A steady increase in registration of patients was observed. The DMG registered 1,595 patients during the year which included 312 patients who sought second opinion.

Of the total registrations, 61.5% and 38.5% belonged to the general and private category respectively. The gender ratio was 65% male and 35% female patients. It was observed that the21 %, 31% and 34 % patients were in the age group of 1-20, 21-40 and 41-60 years respectively.



Neurosurgery Operations

		TMH	ACTREC	TOTAL
Demographics	Males	70	128	198
	Females	47	83	130
	Adult	88	178	266
	Paediatric	29	33	62
Surgery - type	Craniotomy (supratentorial)	68	165	233
	Posterior fossa	16 (4.87%)	23 (7.01%)	39 (11.89%)
	Retro-mastoid	8 (2.43%)	14 (4.26%)	22 (6.70%)
	Trans-sphenoidal	07 (2.13%)	0 (0.00%)	07 (2.13%)
	Others	18 (5.48%)	09 (2.74%)	27 (8.23%)
Nature of Surgery	Elective	96 (29.26%)	208 (63.41%)	304 (92.68%)
	Emergency	21 (6.04%)	3 (0.91%)	24 (7.31%)

Radiotherapy indicators

Radiation Therapy administered within the institute

Sr. No.	Technique of RT	TMH	ACTREC
1	Conventional RT	103	Nil
2	3D-CRT	169	Nil
3	IMRT/IGRT	74	72
4	Stereotactic Radiosurgery	2	Nil
	Total	348	72
Referred outside for radiation therapy			
		342	22
GRAND TOTAL		**690**	**94**

MEDICAL ONCOLOGY

Patients with high-grade gliomas and 'aggressive' low grade gliomas receive concurrent and adjuvant chemotherapy (Temozolomide) and patients with recurrent, progressive, transformed gliomas are treated with salvage chemotherapy (either temozolomide or PCV regimen). Around 200 patients received concurrent temozolomide during radiotherapy and over 500 patients received adjuvant temozolomide in 2014. Fifteen patients received Bevacizumab +/- Irinotecan and 20 patients with primary CNS lymphoma were treated with DeAngelis protocol.

Approximately 65 paediatric brain tumour patients received chemotherapy in 2014.

Outcome Indicators

30-day morbidity and mortality (for elective cases)

	MORBIDITY (MINOR)	MORBIDITY (MAJOR)	MORTALITY
TMH	18(15.4%)	22(18.8%)	14 (4.4%)
ACTREC	29(15.2%)	32(13.7%)	7 (3.3%)

Outcome Indicator- 5year survival rates

Sr. No.	Diagnosis		5-year overall survival
1	Craniopharyngioma		95% (using SCRT)
2	Meningioma	Benign/Low Grade	89%
3	Medulloblastoma	Average-Risk	85%
		High-Risk	65% (3-yr)
4	Glioblastoma	Median Survival	17 months
		2-year survival	29%
		5 year survival	11%

Research

Stereotactic conformal radiation therapy has resulted in significantly better preservation of long term neuro-psychological and neuro-endocrine outcomes compared to conventional radiation therapy in children and young adults with benign and low-grade brain tumors.

The use of hyperfractionated radiation therapy (1Gy twice daily, 6-8 hours apart) for craniospinal irradiation and tumor bed boost in children average-risk medulloblastoma without upfront chemotherapy has resulted in lesser incidence and severity of sensorineural hearing loss.

The addition of carboplatin concurrently with craniospinal irradiation in high-risk/metastatic embryonal CNS tumors improved 3-year outcomes from H”50% (historical data) to around 65% . and the regimen is now included as routine clinical practice.

The use of mage-guided intensity-modulated radiation therapy (IMRT) for benign/low-grade intracranial tumors has resulted in excellent local control and overall survival with minimal acute and medium-term morbidity. Given the improved therapeutic ratio, IMRT is increasingly being offered to patients with benign/low-grade tumors.

Resarch/Clinical Trails

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
13	0	3	3	10	3	359 (28%) of 1283 patients

Convener: **Dr.Brijesh Arora**
Secretary : **Dr.Gaurav Narula**

Paediatric Hematolymphoid – DMG

Surgical Oncology
Dr Sajid Qureshi

Pediatric Medical Oncology
Dr Shripad Banavali.
Dr.Brijesh Arora
Dr.Gaurav Narula

Clinical Pharmacology
Dr.Vikram Gota

Radiation Oncology
Dr. Siddhartha Laskar
Dr.Nehal Khanna

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Sneha Shah
Dr. Seema Medhi

Pathology
Dr. Sumeet Gujral
Dr. Tanuja Seth
Dr. P. G. Subramanian
Dr. Sridhar Epari
Dr. Prashant Tembhare
Dr. Nikhil Patkar

Psychiatry and Clinical Psychology
Dr. Jayita Deodhar
Ms. Savita Goswami

Molecular Hematology & Cytogenetics
Dr. Pratibha Amare Kadam
Dr. Anuradha Chougule

Occupational Therapy
Dr. Shruti Velaskar
Dr. Jagmohan Lal Meena

Medical Social Worker
Mrs. Neelima Dalvi
Mr. Chandu Parab

Every Child with Curable Cancer Should Get a Chance at Cure

Service

Paediatric Hematolymphoid provides contemporary, comprehensive and compassionate family-centred holistic clinical care focussing on the needs of both children and their families which includes socio- economic, financial, nutritional, transfusion help, accommodation, emotional, bereavement and also counsels the patient and the family. These services are well-coordinated by the social support group team and is facilitated through the childhood cancer foundation called "**ImPaCCT** - **Im**proving **P**aediatric **C**ancer **C**are &**T**reatment" Foundation.

Curable malignancies need to be funded in the initial period to decrease refusal rates through provision of Seed money. The team of social workers and volunteers works in tandem with TMH Medical Social Service Department, and several other trusts and NGOs. All young curable children are adopted by hospital and rest are supported through various governmental schemes and NGOs. They also need neat and clean accommodation at reasonable prices. A corpus under the "Pediatric cancer Foundation-ImPaCCT" funds has been created to support financial needs. With the help of St Jude Child Care Centre, Borges home and other organisations, most of pediatric patients stay in facility near TMH and in ACTREC. the nutritional assessment of patients is conducted by a team of nutritionists and are counselled . They provide guidance about diet especially low cost food supplements. A low cost enteral supplement along with dietetics department. This team has created many recipes from LCEF and their use have shown good response in patients. More than 75,000 midday meals with snack have been distributed.

A non formal education is provided to children with assistance from NGOs like "little-More", Cankids-Kidscan and Mindsprings. A drive called " Save a Life " was initiated with help from Nargis Dutt Foundation to recruit platelet donors from colleges & corporate houses in Mumbai. and has resulted in a volunteer platelet donor registry. This initiative has ensured provision of blood products to patients whenever required.

Key indicators

Key Cancer Benchmarks: The DMG registers epidemiological data for all patients, this data is audited to depict trends in disease volumes, treatment compliance and completion, treatment delivery, mortality and morbidity rates and survival of each disease subcategory in PHLG.

Volume Indicators

A total of 827 patients were registered during the year. The cumulative patient visit exceeds 35,000 as majority of these require intense, curative and prolonged therapies with multiple outpatient and inpatient visits. of the total of 827 / 671 (81%) belonged to General Category and 156 (19%) were Private category patients. The DMG saw a total of 35,210 patients as follow up cases. There were 610 new cases of acute leukemias and 186 new cases of lymphomas.

Outcome Indicators

The social support group consisting of social workers, data managers for patient tracking, counselors, psychologists, and multiple NGOs ensures holistic care of children and their family during treatment by providing support for accommodation, transfusion, education etc for the children. This has helped in dramatically decreasing the abandonment rates from >20% in 2009 to 4% in 2014. The current treatment refusal and abandonment (TRA)—is primarily observed diseases requiring expensive therapy with very poor outcome.

Currently, 86.8% patients are being treated as per TMH protocols at TMH and 8% at other hospitals under TMH guidance, a considerably improvement over the previous years with reduction in the rates of TRA.

No of paediatric patients treated

Disease sub types	Total No.	No. Of patients Treated At TMH	No of patients Treated under TMH guidance elsewhere
ALL	505	440	25
AML	105	83	4
CML	16	15	0
NHL	132	113	7
HL	54	47	4
LCH	11	11	0
JMML	4	3	1
Total	**827**	**712**	**41**

Mortality:

In year 2010, the mortality rates were very high. The overall induction mortality rates were 8% with approximately 10% patients dying in ALL and 16% in AML during induction period. Most of these deaths have been toxic deaths due to infection. This has been reduced to 4.1% in 2014 with 4.5% & 6% induction deaths in ALL & AML respectively. Similarly, the post induction mortality which represents late events of toxic deaths as well as relapses have been reduced from 18% to 1.2%.

The disease free survival amongst BMT patients is 70% and transplant related mortality is 6%.

DISEASE	TOTAL REGISTERED	TOTAL EXPIRED	Mortality in 2014					
			BEFORE RX		WITHIN 45 DAY'S		AFTER 45 DAY'S	
			NO.	(%)	NO.	(%)	NO.	(%)
ALL	505	36	7	1.38	23	4.55	6	1.18
AML	105	16	8	7.61	6	5.71	2	1.90
CML	16	0	0	0	0	0	0	0
NHL	132	4	1	0.75	3	2.27	0	0
HL	54	3	0	0	2	3.7	1	1.85
LCH	11	0	0	0	0	0	0	0
JMML	4	1	0	0	0	0	1	25
TOTAL	827	60	16	1.9	34	4.11	10	1.20

Survival: The current Survival rates in PHLG are among the best in the country and are comparable to the rest of the world in most disease subgroups.

5-yr overall survival of Pediatric hematological malignancies (TMH)

Cancer	Event-free survival(%)	Overall survival(%)
ALL (B-lineage)	73	76
ALL(T-lineage)	80	80
AML	40	44
NHL (T-lymphoblastic)	91	90
NHL (B-NHL)	74	82
NHL(ALCL)	50	71
Hodgkin's disease	90	94
Langerhans cell histiocytosis	72	82
Chronic Myeloid leukemia	84	100

Research

Apart from delivering exceptional care, DMG is active in basic, clinical and translational research targeted to understand disease biology, improve diagnosis & risk stratification, enhance treatment outcome, minimize adverse treatment complications, provide cost effective and regionally relevant curative therapy, and to develop a sustainable model for low middle income countries across the globe.

The DMG has undertaken a total of 61 research studies. Out of 61, 21 were student research (15 completed), 57 studies were initiated by investigators (26 completed) and 4 studies were sponsored clinical trials.

A) Acute Lymphoblastic Leukemia:

Development of indigenous scientifically designed locally feasible protocols: In this regard, PHLG has systematically developed and piloted 3 protocols in collaboration with National Cancer Institute, USA and INCTR, Brussels, Belgium. These include MCP-841, MCP-943 and INCTR-02-04. MCP-841 is the only indigenously developed and highly successful protocol from India and is currently being followed in most pediatric oncology units in the country. Currently, DMG is actively involved in developing the national protocol for treatment of acute lymphoblastic leukemia in India called "ICiCle"(Indian Childhood Collaborative Leukaemia Group) which has been successfully piloted in 2013. The protocol development meeting was held at Tata Memorial Hospital on December 23, 2012 & March 2014 which laid the foundation of the backbone of this protocol. This protocol is based on current state of art in ALL and includes risk stratification based on clinical and cytogenetic factors, response to therapy and minimal residual disease which is the first of its kind in whole country. In addition, cranial radiation has been dispensed with from more than 99% patients and high dose methotrexate would be integral part of systemic therapy. This

Research/Clinical Trials

Total No. of Clinical Trials		Completed Trials		Ongoing Trials	
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials
57	4	26	1	31	3

is likely to significantly decrease the treatment related morbidity, cost of therapy and improve the outcome across all risk groups with minimal therapy. Further this would answer 2 key questions related to duration of steroids in induction of ALL as well as choice of anthracycline in delayed intensification. This multicentric protocol involving more than 15 centres across the country has been submitted to ICMR for funding. The protocol has been piloted in TMH for last 2 years and has significantly improved the quality of ALL treatment through provision of optimal MRD based risk stratified therapy to maximize cure rates at least cost. DMG has also spearheaded the standardization of MRD and ALL cytogenetics across the country by organising national level investigator and technician training programs supported by DMG.

Novel approaches for High risk ALL:-

Many patients with B-Lineage ALL and most patients with T-ALL do not have good outcome with current protocols. Hence, PHLG continues to explore the use of high dose Cytarabine consolidation for improving the outcome of this sub group. This modified approach has An improvement in the outcome of ALL in more than 80% in both B & T-lineage ALL, are observed.

B) Acute Myeloid Leukemia:-

AML:-The group has been using oral metronomic maintenance therapy in AML patients with good outcome which are comparable to international outcomes despite higher initial toxic deaths.

APML:- DMG has also studied the role of indigenous metronomic chemotherapy along with ATRA, daunomycin and maintenance chemotherapy in patients with APML. This novel indigenous regimen has shown promising response with limited morbidity and mortality. It is being used in all sick APML patients in our DMG. This was presented in SIOP-2014.

The results of the evaluation of the role of Modified BFM-90 (with reduced methotrexate dose) in lymphoblastic lymphoma hav e been comparable to western studies. A pilot study for immunochemotherapy with rituximab added to MCP-842 for high risk B-NHL has been undertaken.

Prognostic markers: PHLG has prospectively studied the role of early metabolic response in B-NHL and ALCL has found it to be an important prognostic marker which has been presented in SIOP 2013. PHLG would be using early morphologic and metabolic response to delineate high risk group for using rituximab based MCP-842.

PHLG has also piloted modified LCH-III with addition of oral metronomic etoposide in high risk multisystem RO+ LCH with promising results. The group has shown that novel PSGA is a very good tool for nutritional assessment in children. It has been also observed that use of acyclovir, as secondary prophylaxis, in immune-compromised contacts of chicken pox, is highly efficacious and much cheaper compared to intravenous Varicella immunoglobulin.

Convener: Dr. Sajid Qureshi
Secretary: Dr. Seema Kembhavi

Paediatric Solid Tumor – DMG

Surgical Oncology
Dr. Sajid Qureshi

Medical Oncology
Dr. Purna Kurkure
Dr. Girish Chinnaswamy
Dr. Tushar Vora
Dr. Maya Prasad

Radiation Oncology
Dr. Siddharth Laskar
Dr. Nehal Khanna

Pathology
Dr. Mukta Ramadwar
Dr. Bharat Rekhi

Radiodiagnosis
Dr. Seema Kembhavi
Dr. Palak Popat

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Sneha Shah

Palliative Care
Dr. Maryann Muckaden
Dr. Navin Salins

Honorary Ophthalmologist
Dr. Nandan Shetye

Service

The Pediatrics solid tumor DMG consists of a mix of experts like pediatric oncologist, pediatric surgeon, pediatric radiation oncologist, pathologist and radiologist and meets regularly to address clinical, patient requirements, academic, scientific and administrative matters. The DMG treats patients at both campuses of the centre i.e. at TMH and ACTREC.

The Socio economic assessment of patients is conducted at their initial visit. This helps in identifying of emergency management and need of financial and social support. Patients are counseled and directed to social workers for facilitating support. A social support team interacts with and counsels patients to decrease abandonment of treatment and improve treatment compliance for better survival. These interactions are weekly to facilitate this support.

The DMG registered a total of 1,050 patients performed 315 surgeries including major, minor and vascular accesses. The DMG captures the data for patients with extra cranial and non-extremity osseous tumors. The DMG regularly conducts audits. The audits for the Retinoblastoma, hepatoblastoma, salivary gland tumors and rhabdomyosarcoma were completed during the year.

The joint clinics were regularly held for deciding on integrated treatment plan and meetings were also conducted to discuss diagnostic and treatment dilemmas. The paediatric patients are registered in the database, supported by the Indian Paediatric Oncology Initiative (IPOI) of the Jiv Daya Foundation.

The Clinical guidelines for individual solid tumors were reviewed and staging, risk stratification and treatment pathways were outlined based on the contemporary evidence in literature and proceedings from important paediatric world congresses. These clinical guidelines are reviewed and updated on a regular basis.

Key Indicators

Volume Indicators

A total of 1,050 pediatric patients were registered during the year

Diagnosis	General	Private	Total
STS	92	23	115
Neuroblastoma	60	17	77
GCT	53	4	57
Renal Tumor	42	12	54
Misc	79	18	97
No malignancy	14	5	19
Retinoblastoma	33	5	38
Hepatoblastoma	25	4	29
No investigation	16	11	27
Total	**414**	**99**	**513**

Surgery

A total of 315 surgical procedures were performed at TMH and ACTREC. These are -

Surgeries	TMH	ACTREC	Total
Major	98	47	145
Minor	19	31	50
Pediatric vascular access	48	4	52
Adult vascular access	0	68	68
Total	**165**	**150**	**315**

Chemotherapy

328 and 16 patients were offered radical and palliative chemotherapy, with 11.6% Morbidity and 5.2% Mortality.

Radiotherapy

177 patients were treated with various radiotherapy modalities viz., radical, palliative, ketlar, Ext Radiotherapy, brachytherapy and conventional radiotherapy. However about 4% did not complete the radiotherapy. Acute toxicity related to radiotherapy was observed namely, 14% in grade I, 11% in Grade Ii, and 09% in grade III.

112 new and 548 follow up patients attended the after completion therapy clinic.

Education

The DMG continues to conduct DM programme and 2-year fellowship in Pediatric Oncology under the aegis of HBNI. The DMG also organises a lecture series on all aspects of management of Pediatric solid tumors. Observers from various institutes in India were accepted in the Pediatric oncology service at Tata Memorial Hospital as part of training program. The members participated at various international and national workshops, meetings and conferences.

Research

Research/Clinical Trials

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
14	3	5	-	7	3	1417

Thoracic Oncology – DMG

Convener : Dr. C.S. Pramesh
Secretary : Dr. Sarbani Ghosh

Surgical Oncology
Dr. C S Pramesh
Dr. George Karimundackal
Dr. Sabita Jiwnani

Medical Oncology
Dr Kumar Prabhash
Dr Vanita Noronha
Dr Amit Joshi

Radiation Oncology
Dr. Jai Prakash Agarwal
Dr. Sarbani Ghosh

Medical Gastroenerology
Dr. Shaesta Mehta
Dr. Prachi Patil

Pulmonary Medicine
Dr Sandeep Tandon

Pathology
Dr Nirmala Jambhekar
Dr Rajeev Kaushal
Dr Neha Mittal

Nuclear Medicine & Molecular Imaging
Dr Venkatesh Rangarajan
Dr Nilendu Purandare

Radiology
Dr Subhash Ramani
Dr Abhishek Mahajan
Dr Amitkumar Janu

Interventional Radiology
Dr Suyash Kulkarni
Dr Ashwin Polnaya

Palliative care
Dr Jayita Deodhar

Epidemiology
Dr Atul Budukh

The Thoracic Oncology Disease Management Group (DMG)is a multidisciplinary team comprising of specialised surgeons, medical and radiation oncologists with active support from a pulmonary physician, specialized pathologists, radiologists, palliative care physicians and physiotherapists. Service in the DMG also involves the participation of cardiovascular surgeons, endocrine specialists, basic scientists and technology experts. In addition the DMG has a vibrant teaching/ training programme and is involved in several relevant research activities.

Service

The thoracic oncology DMG is amongst the few specialized multidisciplinary groups in the country treating a wide variety of lung, esophageal, chest wall and mediastinal tumors.

Specific unique strengths of the DMG include

- largest thoracoscopic surgery programme in the country
- increasing number of complex thoracic surgical procedures including the surgical treatment of tracheo bronchial tumors, advanced mediastinal and chest wall tumors
- management of complex airway problems including tracheobronchial stenting and laser therapy
- evidence based management of advanced lung and esophageal cancers with molecular-based personalized targeted therapy and chemotherapy
- state of the art radiotherapy services including tomotherapy, image-guided and stereotactic body radiotherapy
- Immediate postoperative, post chemotherapy and radiation therapy outcomes comparable with similar high volume centres in the world.
- In addition to the above the DMG also has a very effective programme for palliation of both advanced esophageal and lung cancers, with early involvement of the palliative care team

The initiation of the “high-risk” multidisciplinary meeting with thoracic surgeons, anesthesiologists, critical care specialists and pulmonary physicians, a unique feature of the DMG has led to increasing numbers of high-risk patients being considered for surgery and improved outcomes, optimizing the care of patients with multiple comorbidities prior to surgery. Active participation from the physiotherapy department on postoperative rounds ensures individualized attention to specific patients.

Another notable achievement was the initiation of the Esophageal and lung cancer support group, which has invited talks, discussions focusing on patient-centric problems. The involvement from patients has been encouraging and this provides them a forum for exchange of experiences, discussing their fears, concerns and closer interaction with other patients and their treating physicians. In addition, the

availability of dedicated counselors for patients with thoracic cancers and the institution of early palliative care into the treatment continuum are some more initiatives to improve the overall experience for patients.

Quality improvement measures

The DMG maintains ongoing quality improvement measures with continuous audits of peri-operative, post chemotherapy and post radiotherapy morbidity and mortality, estimation of postoperative infections and treatment compliance.

Key Indicators

Volume & Outcome indicators

The DMG is amongst the highest volume thoracic centres in the world. A total of 3,802 new patients, comprising over 10% of the hospital registrations were registered in the DMG in 2014, of which 2,263 (59.6%) were general and 1,537 (40.4%) were private patients. Lung cancers were the majority, 2,374 (62.4%) followed by esophageal cancer 1,070 (28.1%).

The thoracic surgical unit is the highest volume thoracic oncology centre in India and operated 197 patients with esophageal cancer, 104 patients with lung cancer, 145 patients with pulmonary metastases, 35 patients with mediastinal tumors and 32 patients with chest wall tumors. In addition, several minor procedures including diagnostic and therapeutic bronchoscopy, port insertions, intercostal drainage, pleurodesis etc were performed. Early post-operative outcomes are comparable with most high volume centres in the world. A large number of patients are operated by minimally invasive surgery including thoracoscopy, laparoscopy and robotic surgery.

The thoracic medical oncology unit has amongst the highest volumes in the country and treated 1,414 patients with lung cancer and 503 patients with esophageal cancer. These include neoadjuvant, adjuvant and palliative chemotherapy including targeted therapy. Overall response rates, toxicity and survival figures were similar to high quality thoracic oncology centres worldwide.

Thoracic radiation oncology treated 503 patients with lung cancer with compliance of 98% and 77 patients with esophageal cancer with a compliance rate of 91 percent. Short and medium term outcomes have been meticulously documented and periodic audits conducted to monitor performance critically. All modern techniques of radiation including IGRT, IMRT, 3DCRT and SBRT are available and used regularly to provide superior treatment outcomes.

Newer initiatives in the DMG

- Robotic surgery for thoracic cancers
- Stereotactic radiotherapy for lung cancers
- Lung and esophagus cancer patient support group
- Pharmacovigilance program for chemotherapy drugs
- Introduced early palliative care for lung cancer patients
- Dedicated counsellor for lung cancer patients
- Availability of 68Galium DOTA Peptide for neuro-endocrine tumors

Research

The thoracic DMG conducts several investigator-initiated and sponsored research studies. Some of the studies initiated earlier were published and presented in high impact journals and international conferences respectively. The randomized trial evaluating the role of perioperative erythromycin to prevent delayed gastric emptying in patients undergoing esophagectomy was presented in the biennial conference of the International Society for Diseases of the Esophagus in Vancouver. Ongoing randomized trials include the trials comparing radical three-field vs two field esophagectomy for operable esophageal cancer, and neoadjuvant chemotherapy with neoadjuvant chemoradiation for locoregionally advanced esophageal cancer. In addition, several new studies were initiated this year and planned for the next year.

The CHEST (Cancers of the Hypopharynx and Esophagus Trial) screening trial is underway in Ratnagiri district with over 33,000 individuals having been screened and given health awareness for upper aerodigestive tract cancers. Extensive health education and awareness of health hazards of tobacco use is an integral part of the programme. Several other randomized trials were initiated in advanced lung and esophageal cancers. Several articles were published by DMG members in various peer reviewed journals.

Research / Clinical Trails

Total No. of Clinical Trials		Completed Trials		Ongoing Trials		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
8	1	5	3	22	4	35,750 patients

Education

The DMG contributes dedicated teaching sessions and on-the job training for the MCh (Surgical Oncology), DM (Medical Oncology) and MD (Radiation Oncology) courses. In addition, a two-year fellowship in thoracic surgical oncology is offered under the Homi Bhabha National Institute and is the only one of its kind in the country. The teaching programme is highly structured and includes didactic lectures, seminars and case-presentations. Regular orientation lectures are taken for all new registrars and fellows working in thoracic surgery nine times a year. Two comprehensive CMEs were conducted covering the entire spectrum of lung cancer which was attended by postgraduates, residents and fellows from across the country. A lung practicum was conducted in the department of radiation oncology, a limited hands on course focusing especially on stereotactic radiotherapy in lung cancers.

The DMG participated in the annual surgical oncology workshop (Oncosurg 2014) for post-graduate students and practicing surgeons, which is a three-day operative workshop attended by more than 300 delegates. The DMG has several trainees - ten thoracic surgical fellows (two 2-year fellowships, two one-year fellowships and six 6-month fellowships);twelve senior M.Ch (Surg Onco) registrars, fifteen junior M.Ch (Surg Onco) registrars six medical and twelve radiation oncology registrars rotate through the DMG every year. In addition, training is provided in diagnostic bronchoscopy to 24 physicians from across the country annually

Achievements of members

Members of the DMG serve as faculty in several national and International meetings, serve on the editorial board and act as reviewers for several high-impact, indexed journals such as the Lancet Oncology, Annals of Thoracic Surgery, Annals of Surgery, IJMPO, IJC, Cancer, Clinical Oncology, etc., hold leadership positions in important societies like the International Society for Diseases of the Esophagus, ISMPO, ISES and ICON. They also serve as faculty and examiners for post graduate examinations for Universities within the country.

Urology – DMG

Convener : Dr. Umesh Mahantshetty
Secretary : Dr. Ganesh Bakshi

Surgical Oncology
Dr. Ganesh Bakshi
Dr. Gagan Prakash

Medical Oncology
Dr.Kumar Prabash
Dr.Vanita Noronha
Dr.Amit Joshi

Radiation Oncology
Dr. Shyam K Shrivastava
Dr. Umesh Mahantshetty
Dr. Vedang Murthy

Radiodiagnosis
Dr. Meenakshi Thakur
Dr. Suyash Kulkarni
Dr. Nilesh Sable

Nuclear Medicine & Molecular Imaging
Dr. Venkatesh Rangarajan
Dr. Nilendu Purandare
Dr. Archi Agrawal

Pathology
Dr Sangeeta Desai
Dr.Santosh Menon

Cancer Cytogenetics
Dr. Pratibha Kadam Amre

Basic Sciences, ACTREC
Dr. Shubhada Chiplunkar
Dr. Kishore Amin
Dr. Ashok Varma

Medical Records & Epidemiology
Dr. Ganesh Balasubramanium
Dr. Rajesh Dikshit

Service

The Urology Oncology DMG is a multi disciplinary group comprising of Uro-Oncologists, surgeons, pathologists, medical oncologists, radiation oncologists, radiologists, epidemiologists, basic and translational research scientists and staff from other supportive groups etc. and aims to deliver optimum patient care as well as bring all clinical and translational research under one umbrella to ensure optimum outcomes. The Urology Oncology Group members work actively with other DMG members and staff towards optimum patient care and outcome.

There has been a substantial increase in number of patients for renal, bladder, prostate, penile and testicular cancers with increasing numbers of patients with renal, bladder and Prostate cancers.

Key Indicators

Volume Indicators (Number of patients treated at each sub-site)

Two thousand one hundred and three patients (General- 1,097, and Private - 1,006) registered with the DMG. The DMG attended to 6,500 follow up patients and saw 345 patients as referral cases.

Outcome indicator

Complication rates (As per Clavien Dindo system)

Grade 1 – 5.8%
Grade 2 – 0.9%
Grade 3 – 0.7%
Grade 4 – 0.5%
Grade 5 – 0.1%

Outcome indicator (5 yr survival rates) The survival rates for all urological cancers are extremely good, most of them being highly curable neoplasms and are comparable with the figures reported from other reputed uro-oncology centres.

Process indicator Around 98% compliance with evidence based guidelines. 2% non compliance due to reasons concerned to patient and relatives.

Surgical Oncology

The Urologic Oncology Surgical Service offers the entire spectrum of the "state-of-the-art" surgical procedures for management of urological cancers and has in fact pioneered, standardized and popularized most of these procedures in the country

Minimal Access Surgery the form of laparoscopy and endourology is included in the repertoire as a routine.

The number of laparoscopic urological oncology surgeries almost doubled as compared to previous year. During the year, a total of 655 major surgeries and 3,677 minor surgical procedures were performed at TMH and ACTREC, apart from diagnostic and therapeutic endoscopic procedures. Robotic surgery was introduced during the year and since its installation, 14 robotic urological surgeries viz., Prostatectomy, radical Nephrectomy, and radical Cystectomy have been performed, of which 10 were Radical Prostatectomy.

Table showing Uro-Oncology Patients by sub-site and Intent of Treatment (TMH + ACTREC)

Diagnosis	Radical	Post-Op	Palliative	Grand Total
Prostate Cancers	67	10	130	207
Renal Cancers	1	-	45	46
Testicular Cancers	16	10	26	
Ureteral Cancers	1	-	-	1
Urethral Cancers	1	-	-	1
Urinary Bladder Cancers	13	4	20	37
Adrenal tumors	1	3	6	10
Penile Cancers	4	10	2	16
Miscellaneous	-	2	12	14
Grand Total	**104**	**29**	**225**	**358**

Radiation Oncology

The Radiotherapy OPD attended to 1,206 private and 1650 general category of patients which included new, follow up and referral patients. The RT compliance rate of 96.5% was observed. The patients received state-of-the art radiotherapy including conventional radiotherapy (RT) to a total 44 patients, 3D- CRT to 15 patients, IMRT 76, brachytherapy to 05 patients with cancers. A steady increase in use of high dose rate brachytherapy for penile (penile conservative therapy) and prostate cancers was observed.

Chemotherapy

A total of 380 patients were seen in Medical Oncology OPDs.

Pathology

The histopathology offered diagnostic services to about 685 cases of urethelail carcinomas, 402 prostate cancer, 227 Testis cancers, 92 penile cancer cases, and 227 renal tumors cases. The turn-around time of the pathology services for big specimens for 758 patients has been 9 days and 7 days for 428 small biopsies patients. The turnaround time for cytology services for 2,338 non gynecology patients was 1 day, and 3 days for other cytology services to 227 patients. A total of 236 TRUS Guided biopsies were conducted.

Outcome Indicator

Over the years the DMG achieved a low 30 day mortality and morbidity in the service. The DMG observed a 98% compliance to EBM guidelines. The treatment approaches have been developed with aim of organ and function preservation, based on the development of organ preservation surgeries and non surgical management protocols, the treatment results are continuously monitored.

Education

The CME for 2014 was held on 2012-2014 at Tata Memorial Hospital on 'Nuclear Imaging and Therapeutics in Uro-Oncological cancers'.

Continued Training of Surgical Oncologists and Surgeons in the basic practices of Urologic Oncology as a part of the comprehensive MCh Surgical Oncology programme.

Research

Research/Clinical Trials

Total No. of Clinical Trials (N=19)		Completed Trials (N=3)		Ongoing Trials (N=16)		Overall Patients Accrued
Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	Investigator Initiated	Sponsored Trials	
17	2	2	1	15	1	1111 pts

DMG Support Services

CLINICAL NUTRITION

Mrs. Anjali Nair, Chief Dietician

Dieticians take daily ward rounds, Assess, referred patients for Nutritional Intervention, Study their Nutritional requirements and Clinical profiles, examine their ability to consume and digest planned diet schedule and plan a Medical Nutrition Therapy. Keep regular follow-ups of all previously referred patients who are on Medical Nutrition Therapy, Monitor their prescribed diet compliance. Correct nutrient intakes as per the latest investigations / reports and other indications. Examine the patient's tolerance towards the Therapeutic feeds. Special care is given to the patients on Enteral and Parenteral feeds. Regular monitoring and assessment is done to know the compliance with feeds and their prognosis. Patients and their attendants are counseled, educated and trained to handle the Enteral and Parenteral feeding methods and to manage their associated complications. Provide guidelines to kitchen supervisors and kitchen staff and train them to prepare therapeutic feeds.

DENTAL AND PROSTHETIC SERVICES

Dr. Kanchan Dholam, Head
Dr. Karthik M.S,

Dental & Prosthetic Surgery unit is involved in dental care and maxillofacial prosthetic rehabilitation of head and neck cancer patients undergoing surgery, radiotherapy, chemotherapy. The main domain is to offer dental treatment with prosthetic rehabilitation (intra oral and extra oral) for patients undergoing oncology treatment. Maxillofacial Prosthetic care is offered to patient undergoing maxillectomy by fabrication of obturators.

Service

12,776 patients were seen in the Out Patients Department. 1,247 patients were treated with prosthetic rehabilitation following ablative surgery, 315 maxillary prosthesis which included immediate, intermediate and permanent maxillary obturators and palatal prosthesis following maxillectomy. 557 guide plane prosthesis following mandibulectomy, 11 tongue prosthesis following total glossectomy and 13 palatal augmentation prosthesis following partial glossectomy, 63 complete and partial dentures and 7 implant retained intra oral prosthesis. 1,013 patient were treated with Prophylaxis and 3,036 fluoride gel applications were provided to patients undergoing radiotherapy. A total of 5,858 extractions were done.

Research

The departmental research focuses on evaluation of responsiveness of head and neck cancer patients after oral rehabilitation and risk factors based on diet and oral hygiene in squamous cell carcinoma of the oral cavity and oro-pharynx

Education

Short training courses in Maxillofacial Prosthetics were organised for observers from various specialities and lectures were organized for students of physiotherapy, occupational therapy, speech therapy and Nursing.

OCCUPATIONAL THERAPY

Dr. Manjusha Vagal, OIC
Dr. Rebecca Marri
Dr. Shruti Velaskar
Dr. Jagmohan Lal Meena

Service

The aim of the department is to assist cancer patient to manage the limitations caused by cancer and maximize personal productivity and well being. These limitations include the physical, functional, psychological or emotional difficulties.

The department provides occupational services to patients from all cancer sites viz., breast, head and neck, bone and soft tissues, gynecology, and others. During the year, 9,121 out patients and 3,621 inpatients received occupational services including mobilization, functional training, gait training, lymphedema treatment, and orthosis and prosthesis. Fifteen patients received occupational therapy with palliative Home Care visits. The department prepared 187 orthoses, 39 prostheses and 37 temporary prosthesis for the patients. In all 220 lymphedema kits and 1,410 Jaw stretcher keys were prepared at Rehabilitation Research Centre (RRC), Ernest Borges Memorial Home (EBRH).

The RRC at EBRH is an extension of the department, which provides leisure and recreational activities to the paediatric patients through variety of craft/ creative activities. The centre aims at holistic rehabilitation of patients through social events. It coordinates with various NGOs to organize activities like sports, festivals celebrations and recreational trips for the patients.

Education

Occupational therapy Interns from various teaching and public hospitals within the city were trained. Awareness program were conducted for Observers from various faculties viz., Palliative Medicine, Dental services, and Nursing. A workshop on “Splinting Techniques Hands” was conducted.

PHYSIOTHERAPY DEPARTMENT

Dr. Anuradha Daptardar, O.I.C.
Dr. Vincent Singh
Dr. Ajeeta Hasabnis
Dr. Manali Kamat
Dr. Sarika Mahajan

Physiotherapy Department is committed to helping patients to attain highest level of function and independence through individualized therapeutic exercise program. Physiotherapy treatment is extended to patients of all categories, Intensive Care Unit patients and the patients attending the Out Patients Department. A total of 8,438 patients were offered Physiotherapy services during the year.

The department innovated a modification to the existing spirometer, to improve cardiopulmonary efficiency in laryngectomy patients and acquired an ‘Active Passive Trainer’ to improve mobility, endurance and strength in orthopedic cancer patients

Service

Respiratory optimization in 735 patients undergoing Thoracic Surgery was attained through Pulmonary Rehabilitation Program, and KIO Br-Ca Ph underwent post-operative group therapy rehabilitation program. Lymph edema treatment was offered to 344 patients as per the International Consensus of Lymph edema management. 302 head and neck and lung cancer patients were detected for cancer related fatigue. The other services include Rehabilitation of Shoulder and Neck Dysfunction (1,552), management of Trismus, Post operative respiratory care (2,919) following major surgeries, Mobilization and Ambulation (510) in Orthopedic Oncology, Pain relief (508) and Treatment of Sub mucous fibrosis (158) patients.

Research

The department’s research focuses on exercise based management of fatigue in lung cancer patients and role of exercise in women with breast cancer,

Education

Workshop on “Rehabilitation in Breast Cancer” and “Cancer Rehabilitation” and a CME on Rehabilitation in Orthopedic Oncology - ”Orthoncorehab” were organized during this year. Orientation and training programs were organized for students of Physiotherapy from BPT, Physiotherapy colleges, trainee nurses, dentists and others were organized during the year.

PULMONARY MEDICAL UNIT

Dr. S.Tandon, Head

Service

The Pulmonary Unit which is a part of the Thoracic DMG assesses referred patient for respiratory evaluation and management. It also works in collaboration with the Rehabilitation Services to ensure an optimum preoperative pulmonary evaluation respiratory optimization and exercise schedule to reduce pulmonary morbidity. The unit offered consultation to more than 5,000 cross - referrals patient in the Pulmonary Medical OPD, and a significant and steady increase in referrals has been observed over the past few years. in order to facilitate Thoracic and Anesthesia Services the "Six minute Walk Test" was introduced to assess effort tolerance for fitness in patients with borderline high-risk respiratory function.

Education

The unit's constant efforts in raising awareness in diagnosing and treating respiratory co-morbidity for pre-existent or iatrogenic (post-therapy) in cancer patients, has resulted in a steady increase of referrals from all clinicians.

Research

Currently the unit focuses on increasing its contribution to the Thoracic DMG clinical research activities through clinically relevant joint research projects.

SPEECH THERAPY

Dr.(Mrs.) Gurmit Kaur Bachher, Head

The department deals with the management of disorders of speech, language, hearing, communication and swallowing in children and adults. Speech therapists work closely with caretakers and other professionals, such as ENTs, head & neck surgeons, neurologists, pediatricians, radiation Oncologists, nurses, maxillo-facial surgeons and general physicians to enhance patients' functional abilities.

Service

The department provided services to a total of 3,499 patients which included 1960 new registrations. It supported 914 patients with laryngeal cancers, and 1,544 patients with oral cancers. It also attended to 1,034 patients from other cancer sites. The department activities include assessment of impact of disease on speech, and other vegetative functions and hearing acuity, and voice analysis to qualify the degree of severity in speech. The rehabilitative process starts with pre-operative counseling. Patients with oral and ablative surgeries are taught deglutition exercises. Patients with head and neck cancer undergoing RT have difficulty in swallowing and loss of voice. Such patients are evaluated at regular intervals, to maintain good voice quality and avoid adverse effects caused during and after radiation therapy.

Research

The departmental research focused on quality of life in patients with soft tissue or free fibular graft reconstruction and tongue cancers, and conducts evaluation studies like the evaluation of prosthetic rehabilitation with obturator.

Education

The department initiated two courses viz., Rehabilitation after oral cancers, and Rehabilitation after laryngeal cancers.

Anaesthesiology, Critical Care and Pain

Dr. Jigeeshu Divatia,
Head

Dr. Kailash Sharma,
Director (Academics)
Dr. Parmanand Jain
Dr. Raghubir Gehdoo
Dr. Atul Kulkarni
Dr. Vijaya Patil
Dr. Aparna Chatterjee
Dr. Sheila Myatra

Dr. Madhavi Shetmahajan
Dr. Nayana Amin
Dr. Vandana Agarwal
Dr. Sumitra Bakshi
Dr. Priya Ranganathan
Dr. Reshma Ambulkar
Dr. Madhavi Desai
Dr. Raghu Thota

Dr. Bhakti Trivedi
Dr. Shilpushp Bhosale
Dr. Amol Kothekar
Dr. Malini Joshi
Dr. Jeson Doctor
Dr. Swapnil Parab
Dr. Sohanlal Solanki
Dr. Raman Sareen
(Professor Emeritus)

The Department comprising of the Divisions of Critical Care and the Division of Pain, support all operating facilities at TMH and ACTREC. The department consists of 24 permanent staff, 1 ad-hoc lecturer, 31 senior residents (including fellows), 5 DM (Critical Care) candidates, 1 trainee and 50 post-graduate students.

The department introduced anaesthesia services for GI endoscopy procedures at TMH and interventional radiology and MRI procedures at ACTREC, during the year under report. Pre-anaesthesia check-up, anaesthesia notes and ICU notes are now electronically maintained. Over 200 hospital nurses have been trained in basic cardio-pulmonary resuscitation through the "Train the Trainer" programme.

Factual data for 2014

Anaesthesia Services 2014	**2013**	
Tata Memorial Hospital		
Elective Major OT cases (OTs 1 – 12A and HBB OT 22 & 23)	7,281	7,756
Emergency cases	826	630
Minor OT cases	4,914 (GA cases only)	18,418 (GA + cases under local)
Bone Marrow OT cases	1,570	1,000
Radiotherapy OT cases	1,650	1,391
Paediatric radiotherapy cases	341	214
CT scan and Interventional Radiology cases	591	454

Critical Care services		
ICU admissions	2,638 (1,046 ventilated admissions)	2,292 (902 ventilated admissions)
Recovery Room admissions	7,344	7,323
Pain Services		
Patients seen by Acute Pain Services	2,550	1,975
Chronic Pain OPD	6,920	
ACTREC		
Major OT	2,317	2,143
Radiotherapy OT	195	174
MRI	99	Not applicable
Interventional Radiology	57	Not applicable
Critical Care services		
Recovery Room admissions	1,982	1,944
ICU admissions	314 (106 ventilated)	300 (100 ventilated)

Service

The department provides the following services at TMH AND ACTREC.

Anaesthesia service including pre-anaesthesia check up is provided at both campuses viz. TMH (25 locations) and ACTREC (7 locations). The pre anaesthesia check up was provided to 18291 patients at both campuses. A high-risk joint clinic for surgical patients is also conducted. Critical Care division maintains a 14 bedded ICU and 23 bedded PACU at TMH and a 7 bedded ICU/ PACU at ACTREC. The Pain Division provided acute pain services to a total of 2,550 patients and a total of 6920 patients were treated at the chronic pain clinics, of which 3,459 were new patients.

Research

The department has more than 35 clinical studies which were either completed or ongoing in 2014. More than 2800 patients were accrued on these studies. Project discussion meetings are held at regular intervals to discuss projects before submission for IRB approval.

Education

The department continued with the MCI recognized MD (Anaesthesia) course. Several conferences, courses and seminars as part of Continuing Education activity for PG students, intensivists, and Nurses were organized. Few of these are – "Anesthesia Review Course", National Airway Conference, annual two-day workshop on hemodynamic monitoring (THEMATICC), and two-day annual conference – "Education in Cancer Pain" (ECAP).

The department also conducted two short terms courses, viz., ICU technicians' course and the hospital CPR Course for nurses and doctors respectively and organized an orientation lecture series in pain management for hospital nurses. Members of the department have been invited as faculty at several national and international conferences in 2014. Some of the department staff serves on the Institutional Ethics Committee and the Data and Safety Monitoring Sub-committee.

Plastic and Reconstructive Surgery

Dr. Prabha Yadav,
Head

Dr. Dushyant Jaiswal

Dr. Vinay Kant Shankhdhar

The Department of Plastic and Reconstructive Surgery provides its services to various surgical oncology specialties and DMG's. We work to provide our patients the best of primary reconstruction, secondary reconstruction and a variety of problem solving and salvage surgeries.

Service

Plastic &Reconstructive services operated 1,100 major cases and 230 minor procedures in 2014. Free micro vascular tissue transfers (Free Flaps) our USP, continues to be our main operative workload. We performed 600 free flaps (20% increases from 2013, 70% increases from 2012) with a 95.5 % success rate. These numbers are by far the largest in the country and possibly in the world for a single centre. 85% of these free flaps were performed on Head & Neck cases. Breast reconstruction accounted 48 (9%) of these cases, which is a very positive trend considering the state of breast reconstruction in our country. Take back to operation theatre was required for 71 (11.83 %) patients, 59 (10%) of these cases were explored for a thrombosis event, 34 (57.62%) of these were salvaged successfully. 500 pedicle flaps and other major surgeries were performed.

Research

The department has initiated setting up an anatomy laboratory for cadaveric dissection at ACTREC and is in its formative stage. The basic construction has been completed. The lab would be be functional by end of 2015. The department members are also engaged in multiple clinical studies in association with Head & Neck and Breast DMG's.

Education

1) ONCORECON 2014 - is the fourth in series. This five day ONCORECON workshops with the aim of training and sensitizing, plastic surgeons and oncosurgeons was organized during the year. It was conducted in 5 batches in March, April, July, September and November benefiting a total of 20 delegates from across the country. First four days were devoted to observing surgeries in operation theatres along with case capsules and discussion, relevant detailed PowerPoint and edited videos presentation. On the fifth day hands on cadaveric dissection was demonstrated.
2) M. Ch.(Plastic & Reconstructive Surgery) program has generated enormous interest amongst surgeons across the country, planning to pursue the plastic surgery specialty . This program entered in to its second academic year and registered second batch of students.

Palliative Medicine

Dr. Mary Ann Muckaden,
Head

Dr. Jayita Deodhar

Dr. Naveen Salins

YEAR OF EDUCATION AND ADVOCACY.

The department was instrumental in creating end of life care consortium, involving members of Indian Association of Palliative Care (IAPC) and Indian Society of Critical Care Medicine (ISCCM) to realize a common vision of providing best end of life care for the dying. The consortium outcomes were a) Consensus position statement of IAPC on End of Life Care. b) Joint Society Guidelines on End of Life Care c) End of Life Care Education through CME and webinars conducted and d) Impleadement in the Supreme Court of India for an unambiguous End of Life Care policy.

Service

In comparison to 2013, there was 19.99% increase in new OPD registrations, 22.27% increase in outpatient visits, 10.40% increase in new home based palliative care registrations and 61.22% increase in home care visits.

Outpatient services of the department registered 3,692 new adult patients and 256 new pediatric patients. There were 5,114 follow up visits. Out of the 3,692 newly registered adult patients, 1,077 were from Mumbai, 628 were from rest of Maharashtra and 1,987 were from out of Maharashtra.

538 new patients were registered for palliative home care, and made 2,765 home visits in 283 working days. Among the visits 938 were doctor visits, 1868 were nurse visits and 2,484 were medical social worker visits. Specialist palliative care Consultation Liaison services were also offered during 2,029 inpatient visits.

Research

The department staff is engaged in about 18 new ongoing studies, and five research projects. Five clinical audits were conducted. The department is also engaged in interdisciplinary studies.

Education

The department imparts education to doctors, nurses, social workers and trainees through several programs like conferences, CMEs, and short term courses. During the year the department conducted training through NCD-NRHM program for doctors, family physician training and conducting IAPC certificate course in Essentials of Palliative Care. Pediatric Palliative Care training, Certificate Course in Palliative Care for doctors and nurses, a CME on End of life Care, National Fellowship in Palliative Medicine Program. The training program on Essential of Palliative care was also conducted at different centres across the country viz., Bengaluru, Ahmedabad, and Indore.

The department hosted the first international conference of International Children's Palliative Care (ICPCN) attended by 235 delegates from 38 countries. This conference concluded in an International Declaration – ICPCN Declaration of Mumbai 2014 that highlighted on pediatric palliative care, euthanasia and child protection.

Psychiatric Unit

Dr. Jayita Deodhar,
Head

Mrs. Savita Goswami

Ms. Lekhika Sonkusare

The Psychiatric Unit is committed to provide comprehensive psychological and psychiatric assessment and care of cancer patients with a definitive or suspected diagnosis of cancer. Psychological or emotional distress is seen in about 50% of cancer patients. There is a high prevalence of psychiatric disorders like adjustment disorder, depression and delirium. The service caters to patients at any point in their 'cancer journey' and their relatives. The unit also recognizes the need for understanding psychological issues and concerns of the staff working in a stress intensive environment and provides care and support as appropriate.

Services

The Psychiatric Unit conducts psychological assessment of all cancer patients in both adults and children. The services of the unit include psychometric and neuropsychological testing, and IQ assessments. The services are also extended to the staff providing patient care. The unit also liaisons with specialized clinics like Survivors Clinic (After Completion of Therapy) and Palliative Care. Individual and group psychotherapeutic sessions are conducted. The unit conducts sessions for mentoring and capacity building for Brain Tumour Foundation and Childhood Cancer Survivors Group (Ugam).

A total number of 3,403 patients were seen in 2014, including 1,668 new referrals and 1,735 reviews.

The unit adopted several methods to impact quality in patient care viz., monitoring of medication and investigations, standardized assessment using clinical global impression scale and using standardized proforma for care givers' assessment for coping styles.

Research

The research focuses on efficacy of psychosocial interventions in patients, quality of life in patients with Low Grade Gliomas, depression in patients under palliative care, and other aspect like domiciliary in palliative care.

Education

The Psychiatric Unit participated in education programs for postgraduate nursing, palliative care and rehabilitation services. Psychiatric Unit is also engaged in academic activity in association with DMGs and other institutes like TISS. Staff members were invited as speakers at various regional and national academic meets.

The unit observed the World Mental Health Day, which deliberated on 'Caring for patients' and participated in panel discussion on the World Lymphoma Awareness Day.

Psychiatric Unit conducted a special session on "Issues regarding diagnosis of advanced cancer" for Support Group for Thoracic cancer patients during the year under report.

Pathology

Dr. Nirmala Jambhekar,
Head

Dr. Santosh Menon
Dr. Rajiv Kumar
Dr. Ayushi Sahay
Dr. Neha Mittal
Dr. Asawari Patil,
OIC ACTREC Pathology
Dr. E. Sridhar
Dr. Saral Desai
Dr. Ujjwala Joshi, OIC,
Anatomic Path Lab
Mrs. Manisha Kulkarni, OIC
Pathology Academic Program
Mrs. Neelam Prabhudesai
Mr. Nitin Shinde
Dr. Omshree Shetty

Dr. Shubhada Kane,
Head Dept. of Cytopathology
Dr. Sangeeta Desai,
OIC Molecular Pathology
Dr. Sumeet Gujral,
Dr. Tanuja Shet

Dr. P. G. Subramanian,
OIC , Haematopathalogy
Dr. Mukta Ramadwar
Dr. Kedar Deodhar
Dr. Bharat Rekhi
Dr. Munita Bal

Service

The department of pathology with the help of its team of experts provide wide range of diagnostic services namely, surgical pathology, fine needle aspiration cytology, exfoliative cytology, and molecular pathology tests of the solid tumours, biochemistry and hematopathology. These diagnostic services are offered to inhouse patients and the expertise is extended to patients throughout the country. It also maintains an ICMR Funded National Tumor Tissue Repository to facilitate samples for research in pathology.

The department offered diagnostic services to a total of 55,121 cases during the year. Over all there has been a rise in all services mainly in, frozen section (6,228), small biopsy (25,160 tests) and Immunohistochemistry (IHC) tests (80,348). The scope of work and accruals of the surgical pathology has escalated by 7.5% over the previous year and the maximum rise of 20% is noted in the small biopsy category. The number of tests performed in the Immunohistochemistry laboratory increased by 18% and the number of tests offered has risen by 5% over the previous year. The automation for IHC staining, has significantly improved qualitative of stained slides with reduced staining time and repeat testing. A considerable increase of 12% is also observed in Referral cases.

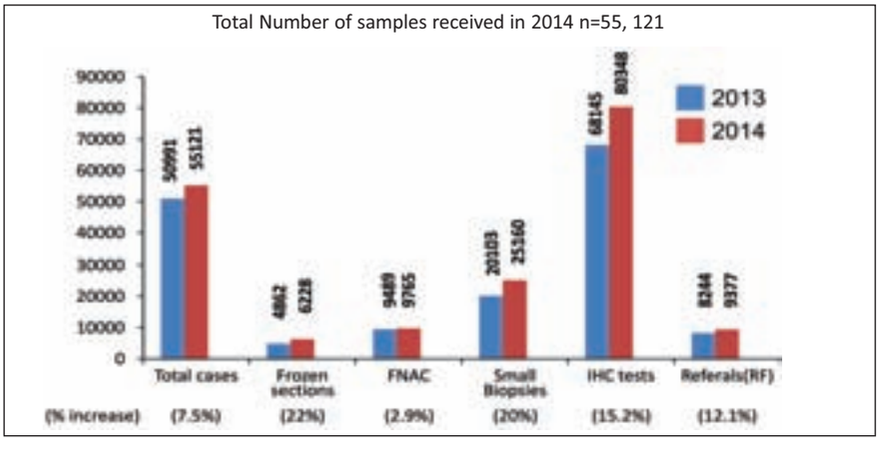
The department workflow was automated. The indigenous software "Diagnostic Information System" with application of barcode technology was developed in-house, which enabled tracking of slides at each workstation. This enabled computerized tracking of the tissue at every subsequent station, reducing. Transcriptional errors and helped in tracking progress of the slide making process.

Education

The department continued its educational activities through its recognized MD Courses, training programs in onco-pathology for doctors and technicians, and post graduate observers from across the country. The department regularly organized / conducted workshops, CMEs and conferences as a part of continuing education for staff and providing a platform to share and update knowledge.

All diagnostic laboratories are NABL accredited.

Total Number of samples received in 2014 n=55, 121



Biochemistry

Dr. (Mrs.) Meera Ghadge,
OIC

Dr. Nitin Inamdar
Dr. Pranab Sadhukhan
Mrs. Purva Naik
Dr. (Mrs.) Geeta Rathnakumar
Dr. Bhoopal Shinde
Mr. Tanaji Matle
Mrs. Madhuri Godambe

Service

The department is engaged in routine biochemistry diagnostic and Tumor Marker Services and follows good laboratory practices. The Diagnostic Information Systems facilitates services in timely and cost effective manner. The equipment are bi-directionally interfaced.

The department performed a total of 22,21,230 investigations including routine biochemistry, tumor marker, protein electrophoresis and immunofixation .

The department participated in international Quality Control Programme.

Research

The departmental research focuses on studying Prognostic Factors in Multiple Myeloma Patients.

Education

The department conducts Advanced Clinical Biochemistry Technologist Training Course and also arranges lectures for the staff on various topics, supports clinical trials and conducts M.D. (Pathology) practical exams. The department is recognized and affiliated to University of Mumbai for M.Sc (Biochemistry) and has enrolled two students.

The department organized a CME and Workshop in Clinical Biochemistry in November 2014.

Cytopathology

Dr. Shubhada Kane,
Head

Mrs. Dulhan Ajit
Mrs. Maya Uke
Mrs. Swati Dighe
Mrs. Bilkis Patel

The department offers diagnostic services in cytopathology and immunocytochemistry for the primary diagnosis of precancer and cancer. The department also caters to the needs of patients from various other hospitals all over India. The diagnostic services of the laboratory are NABL accredited.

Service

The workload of the department comprised of 24,893 cases consisting 16,880 exfoliative and 8,013 fine needle aspirations. An overall increase of 4.1% in the workload was observed across all the sites. Major increase was noted in non-gynaecological sites especially oral (52.6%) and Cereberal Spinal Fluid (CSF) (24%) specimens. The detection rate of oral dysplasia has increased by 45% as compared to previous year.

The department adopted several quality control measures including monitoring of smear adequacy, staining quality, 3-tier screening and turnaround time. In addition, the diagnostic proficiency test for staff, and clinical audits were performed. The department initiated Synoptic Reporting to ensure a uniform and unambiguous format for reporting. Service of Immunocytochemistry on smears was expanded with validation of 27 immunomarkers, providing accurate diagnosis and obviates the need for biopsy in most of these cases.

On-site adequacy testing on imprint cytology was provided on image-guided biopsies of difficult lesions in the Radiology OPD, facilitating early diagnosis and ensuring representative biopsy, reducing diagnostic time to two hours in critical cases.

Research

The important research activities focused to study efficacy of Liquid Based Cytology (LBC) in diagnosing thyroid tumours, cytomorphology in poorly differentiated cancer of thyroid and salivary glands, and microarray technique for validation of multiple immunocytochemistry Markers.

Education

The department trains MD Pathology and Dentistry students, and Cytotecnicians in technical, diagnostic and quality control aspects of cytopathology. A Continuel Medical Eduction (CME) on Grey Zones in Cytopathology and Hands on Workshop in Liquid Based Cytology was organized.

The annual External Quality Assurance Scheme (EQAS) program in Diagnostic Cytology showed an increase of 30.6% participation over the previous year The department staff participated in DMG meetings, CMEs, Conferences and Workshops held in and outside TMH.

Haematopathology

Dr. P.G. Subramanian,
OIC

Dr. Sumeet Gujral
Dr. Nikhil Patkar

Dr. Prashant Tembhare
Dr. Ashok Kumar

Mr. Yajamanam Badrinath
Dr. Shruti Chaudhary
Mr. Shashikant Mahadik

Service

The services of Hematopathology Laboratory include diagnostics services for hematological malignancies, monitoring of patients while on therapy for all malignancies and preoperative & postoperative hematological workup of surgical patients.

The state of the art hematology analysers and coagulation analysers are interfaced with hospital information system. Quality control checks are performed to provide results with minimal errors.

The laboratory does immunophenotyping of blood, bone marrow and body fluids hematolymphoid malignancies by flow cytometry. Investigations like detection of Minimal residual disease for Acute Leukemias and Multiple Myelomas and involvement of hematolymphoid malignancies in cerebrospinal fluid and other rare sites are also conducted.

Molecular testing for diagnosis, sub typing and monitoring of hematolymphoid malignancies are routinely performed.

The laboratory initiated testing of Minimal residual disease in Acute Lymphoblastic leukemia in children. Acute Myeloid leukemia which is used routinely to tailor the treatment for individual patient based on response to initial treatment. This helps in preventing intensive treatment in good responders, reduces treatment side effects and, costs as well. The molecular testing is done to personalize treatment for patients so that there is better outcome.

Molecular diagnostics service was provided to more than 3,500 patients. As national referred laboratory, it received samples from all over the country.

Name of the Tests	Total No. of Tests performed
Routine Hematology	3,22,915
Coagulation studies	98,105
Bone Marrow Aspiration Smears and body fluids	8,276
Cytochemistry	3,799
Flow cytometric Immunophenotyping	5,158
Molecular Hematopathology	3,988

Research

The laboratory is involved in following major research projects:

- The genetics of hematological malignancies and their influence on prognosis of disease and response to cancer chemotherapy.
- Gene mutations in acute myeloid leukemia and their influence in outcome,
- Immunogenetics of chronic lymphocytic leukemia,
- Role of CD116 in MRD detection in acute myeloid leukemia.

Education

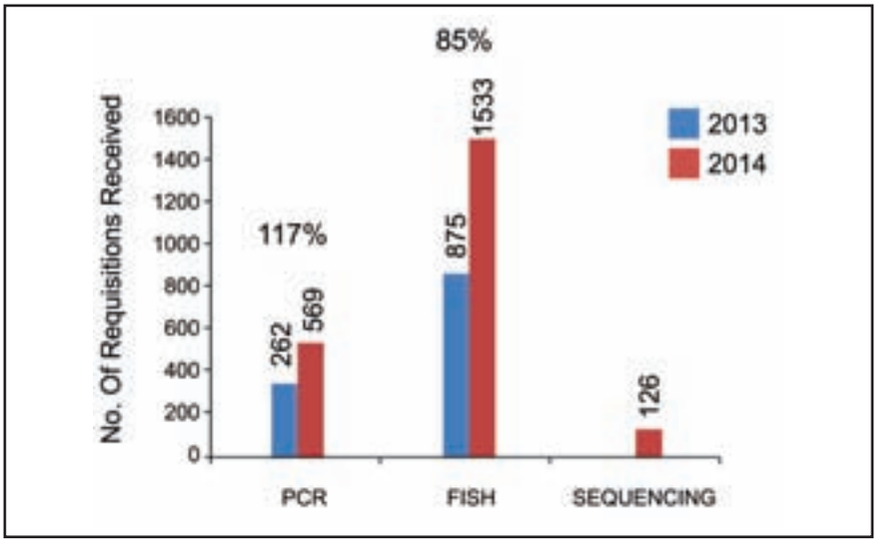
The laboratory continued with MD, DM, and fellowship program in hematopathology. A course on molecular diagnostics was initiated for technicians inducting four students. The laboratory continued to conduct several short term courses and advanced training courses in oncologic pathology for technicians and pathologists like complete blood count and Immunophenotyping, flow cytometry and molecular hematology. Thirty M.D. Pathologists from various parts of the country, joined the department as Observers and were trained in morphology, cytochemistry and flow cytometry.

Molecular Pathology

Dr. Sangeeta Desai,
OIC

Dr. Omshree Shetty

Routine Molecular Diagnostics of solid tumors by Polymerase Chain Reaction (PCR), Reverse Transcriptase Polymerase Chain Reaction (RTPCR), Gene sequencing, and Fluorescence in situ Hybridization (FISH), are some of the tests performed in this laboratory. Molecular Pathology is one of the well recognized referral laboratories for both PCR and FISH tests. Tests viz. HER2/Neu gene amplification in breast cancer, Alk1 gene rearrangement in Lung cancer help in determining target based therapies. Detection of sarcoma translocations by qualitative PCR is one of the cheapest and the reliable tests in management of pediatric soft tissue tumors. The division recently introduced Methylation specific PCR for Glioblastomas and Oligodendrogliomas, and FISH test for TFE3 gene rearrangement, as routine diagnostics services. the newly acquired Genetic analyzer ABI3500 (Gene sequencer) facilitated several new tests viz. Gene sequencing for BRAFV600E, IDH1 and IDH2 for Gliomas, C-KIT mutation analysis for Exon 9, 11, 13 and 17 for Gastrointestinal Stromal Tumors (GIST) were standardized and introduced as routine diagnostic services. These helped predicting response to a specific drug and prognostic implications. The unit introduced FISH test for TFE3 gene rearrangement to analyze translocations in renal cell carcinomas. The diagnostic reports generated by the laboratory are available on the electronic medical records.



Service

The lab observed increase in the number of requisitions raised for molecular diagnostics tests. It observed 117% increase in PCR requisitions and 85% increase in FISH requisitions as compared to previous year.

The laboratory participated in the College of American Pathologists (CAP) External Laboratory Improvement Survey program on routine basis as well as UK NEQUAS proficiency tests. The monthly trend analysis for the routine diagnostic tests are conducted to identify shortcomings and assesses the progress and helps in accordingly amending the routine work flow.

Research

Several research projects are going on in the facility. Currently eight translational research related projects are going on in the laboratory with the dedicated project staff working on each one of them. The research is focused on several topics like breast cancer subtype, marker identification Recurrence prediction ANXA1 expression in Human Papilloma Virus (HPV) positive penile carcinoma, microRNA (miRNA) as a Potential Biomarker in Breast Cancer and such others.

Education

One year fellowship is offered to postgraduates under the Molecular Pathology Academic program. The fellowship program provides rigorous training for performing PCR, FISH, Primer designing, Gene sequencing, Data Analysis, and interpretation.

The laboratory staff or research fellow participate in the weekly CMEs to present and discuss papers pertaining to the molecular diagnostics and recent advances in molecular oncology.

Emergency Laboratory

Mr. Deepak Birwatkar, OIC

Service

The Lab provides common diagnostic tests in biochemistry & hematology to support the needs of all cancer patients in evening and night shift & 24 hrs on Sundays & Holidays in minimum turnaround time.

The department has the state of art equipments in biochemistry, hematology & coagulation profile with bidirectional interface and online reporting.

The motive of the lab is to issue accurate & quick report to critically ill patients mainly from casualty and ICU.

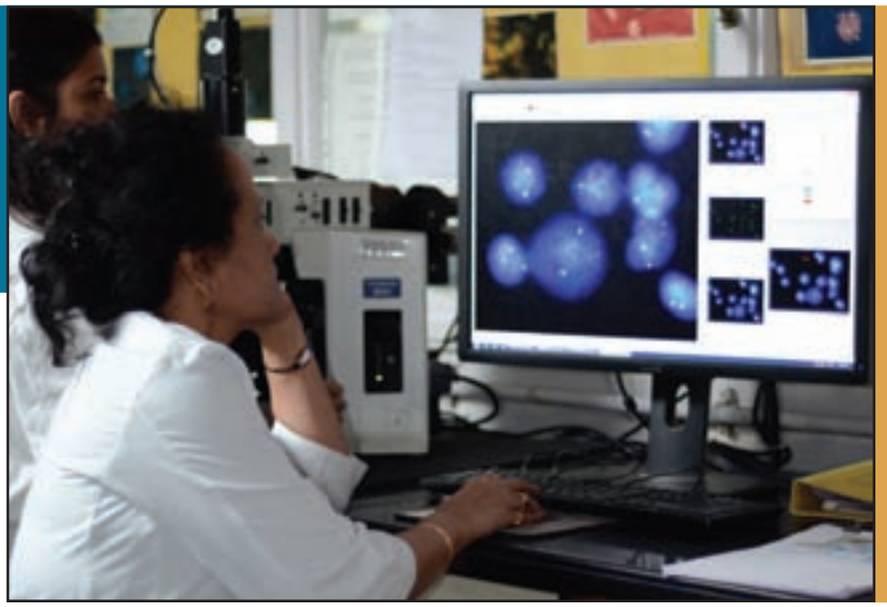
The department observed a rise of 11.41% in the services offered during the year.

During the year 2014 department added CRP, Methotrexate, CSF Biochemistry & Urine biochemistry on clinician's request.

Education

The department conducts in- house CME's for the staff & all staff also participates in outside conferences.

Type	No. of investigations
Biochemistry	4,48,608
CBC	47,246
Coagulation	25,640
Total	**5,21,494**



Cancer Cytogenetics

Dr. Pratibha Kadam Amare,
Head

Mrs Sharayu Kabre
Ms. Hemani Jain

Service

Laboratory is a recognized referral laboratory for Cancer Cytogenetics tests which include molecular cytogenetics and conventional karyotyping. In year 2014, total 6,700 cases were referred for cancer cytogenetics studies. Laboratory performed total 11,336 tests, which included 2,243 tests referred from outside centres . The department observed an overall increase of 15% in services, with significant increase in molecular cytogenetics services for myeloid malignancies. A comprehensive profile of 8-14 FISH markers in AML, MDS, Myeloproliferative disorders, ALL, CLL and Multiple Myeloma were developed by the laboratory. External Proficiency program, CAP evaluation showed excellent performance of six cycles of cytogenetic tests.

Research

The deparment particaptes in two translation research projects, focusing on Multiple Myeloma and Acute Myeloid Leukemia (AML) and continues with eleven other clinical research trial projects focusing on AML, Chronic Myeloid Leukemia (CML), Acute Lymphoblastic Leukemia (ALL) L and lymphoma.

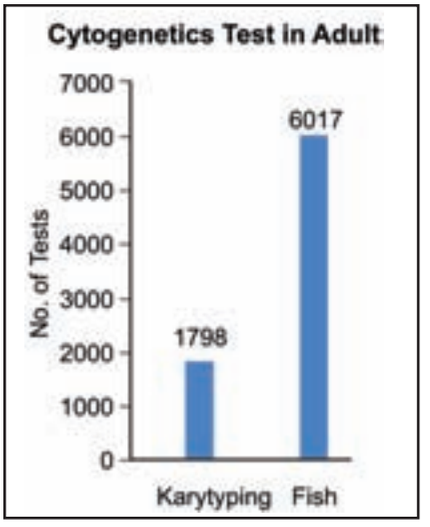
Education

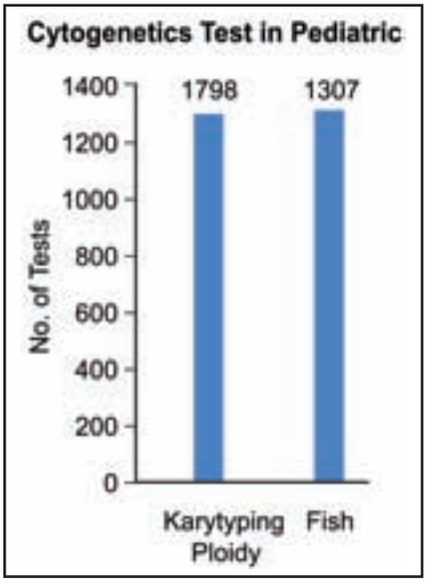
The department is involved in Post graduate teaching Programs namely, M.Sc. Biotechnology, Applied Medical Sciences and Post-graduate Oncology Nursing program. The department is also associated with the DM Medical Oncology program, and Hematopathology Research Fellow training program. Orientation program in Cancer Cytogenetics for consultants, registrars and students are routinely conducted. .

Laboratory offered training in Cancer Cytogenetics, Molecular Genetics to 25 Lab Scientists, clinicians, Pathologists and post-graduate students. Three students completed one year Advanced Cancer Cytogenetics training program.

Test Modality	No. Test	Turn around time
Fluorescence in situ Hybridization (FISH)	8,781	2-4 days
Conventional karyotyping	2,555	10-12 days

The faculty were as invited and guest speaker at various conferences and institutions within the country and abroad.





Microbiology

Dr. Rohini Kelkar,
Head

Dr. Sanjay Biswas
Dr. Vivek Bhat
Mrs. Hema Rajpal
Mrs. Priyanka Dixit

The introduction of automation in molecular diagnostics has significantly improved the accuracy of results and reduced the turnaround time for reporting results.

The introduction of galactomannan assay has augmented the early and rapid diagnosis of aspergillosis in critically ill patients. The introduction of automated minimum inhibitory concentrations of antibiotics has assisted in improved accuracy and quality of results for bacterial infections in patients with sepsis.

Service

A 21 % increase in workload has been recorded during the year. The department restarted the services on holidays to cater to the increasing needs of critically ill patients other emergencies.

The department has performed a total of 1, 90,375 tests, an increase of 21 % in the workload as compared to 1, 57,744 tests in 2013. This includes 33,930 tests in bacteriology, 1, 28,562 tests in serology, 4,983 tests in mycology, 10,949 tests in mycobacteriology, 8,567 tests in clinical microbiology and 3,384 tests in molecular microbiology.

Source of data: Departmental registers.

Research

Focus is on in vitro studies on susceptibility pattern of new antibiotic combinations, microbiology of healthcare associated infections like ventilator associated pneumonias, the role of copper in reducing the microbial bio-burden on touch surfaces in the critical care unit and the molecular epidemiology of mycobacterial infections in cancer.

Education

Continuing educational activities in infection control (certificate course), postgraduate students for the MD degree in Microbiology and other educational activities for hospital hygiene and healthcare worker safety.

Transfusion Medicine

Dr. Sunil Rajadhyaksha,
Head

Dr. Anita Tendulkar
Dr. Priti Desai
Dr. Meenakshi Singh

The Department of Transfusion Medicine strives to respond to the ever increasing and specialized transfusion requirements of patients, with a focus on providing safe blood components. The department observes quality system norms and high technical standards.

Service

The blood collection was augmented by increasing the number of outdoor blood donation camps by about 50%. The department organized 123 outdoor blood donation and 7 platelet donation camps during the year. The department achieved 98.5% componentization. The pheresis donation increased by 16% over the previous year. A total of 5,413 voluntary platelet donors were registered through platelet donation awareness camps and collected about 3,105 platelet through donations and observed a six fold increase in collection over the previous year. The department performed irradiation of 26,882 blood products. Several other specialized therapeutic procedures like – therapeutic phlebectomy (8), leukapheresis, and plasma exchange were also performed. The department issued 307 units of whole blood, 19,482 units of packed cells

Blood Collection:

Total No. of donors registered	25,154
Total No. of donors deferred	5,494
Total Donors	19,660
Blood brought from outside blood banks	1,133
Total Blood availablefor issue	20,793

The Platelet Donation Recruitment Programmes were organized in association with Nargis Dutt Memorial Charitable Trust (NDMCT) and a Walkathon helped in promoting blood donation. The Platelet Donation Recruitment Drive was organized in association with Past Students Association of Borivli Education Society.

Automation of immunohaemtological techniques improved the quality and resulted in better throughput and accurate results.

	2013	2014
Blood & Platelet Units collected	21,735	22,765
Blood Grouping	52,341	56,901
Cross Matching	32,191	35,371
Blood Components	56,106	60,126
Plateletpheresis	3,150	3,722
Specialised Procedures	24,078	26,895

Research

Research focused on Single Donor Platelets on (SDPs) with Platelet Additive Solution which may potentially help transfuse SDP across ABO group barriers. An audit of platelet transfusion practices in Medical Oncology patients was carried out.

Education

Besides offering MD course in Immunohematology and Blood Transfusion, the department is recognized as training centre by Ministry of Health and Family Welfare, Government of India for training of blood bank officers and technicians. The Department participates in academic exchange programme with other teaching institutes.

The faculty participated in national and international meetings and as experts in decision making activities of National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare, Government of India.

The Department continues to receive observers for training in specialized areas including aphaeresis and component separation. A Wet workshop on “Red Cell Antibody Screening and identification”, was organized for the department staff.

Nuclear Medicine & Molecular Imaging

Dr. Venkatesh Rangarajan,
Head

Dr. Nilendu Purandare
Dr. Sneha Shah
Dr. Archi Agrawal
Mrs. Bhakti Shetye
Ms. Priya Monterio

The Nuclear imaging department is engaged in providing comprehensive nuclear diagnostic services.

Service

The diagnostics services of the department include functional hybrid imaging that includes PET/CT & SPECT/CT, planar and dynamic isotope studies and uptake studies with thyroid Probe. The PET/CT scans using four 18F labelled radiopharmaceuticals and two 68Ga labelled radiopharmaceuticals, Nine technetium labelled and two iodine 131 labelled radiopharmaceuticals fifteen planar and SPECT studies are routinely performed. Low dose 131 I, 153 samarium EDTMP, 177Lutetium EDTMP are administered to appropriate patients. Post therapy scans are performed after 131I,153 Samarium EDTMP and 90Y microspheres therapy using SPECT/CT & PET/CT. The department performed 13,180 PET/CT scans, 5,204Planar, SPECT, and ISOTOPE STUDIES and 54 CTs.

Interaction with other departments facilitated understanding of individual requirements of cancer patients.

Research

The department is engaged in audit of radiation field and burden in high volume planar studies especially bone scans, radiation burden in high volume PET radio pharmacy and radiopharmaceuticals using QA / WC test; and Finger dosimetry.

Education

The department trained four imaging specialist in PET/CT. The department is engaged in inter-institutional Training of Post Graduates during the year. Trainees for National Board of Nuclear Medicine affiliated to K.E.M. Hospital and Jaslok Hospital were trained for 4 weeks is a part of external rotation.

Dr V Rangarajan is co-author of a IAEA technical document on current indications and impact of SPECT/CT in oncology.

Radiodiagnosis

Dr. Meenakshi Thakur,
Head

Dr. Supreeta Arya
Dr. Shashikant Juvekar
Dr. Subhash Desai
Dr. Subhash Ramani
Dr. Suyash Kulkarni
Dr. Nitin Shetty
Dr. Abhishek Mahajan
Dr. Nilesh Sable
Dr. Palak Popat
Dr. Nikhil Merchant
Dr. Seema Kembhavi
Dr. Ashwin Polnaya
Dr. Amit Janu
Mr. Trilokinath Mishra
Mr. Wadiraj Kulkarni
Mr. Prandurang Wagh
Mr. Shripad Kulkarni
Mr. Mahadeo Salunke
Mr. Sathish Pandit
Mr. Bhausaheb Sangle
Mr. Ajay Girdhar

Service

Images from the digital imaging modalities i.e. CT, MRI, Ultrasound, Computerized Radiography, DSA and Digital Mammography, are now all stored in the PACS and transmitted across the hospital network so that as soon as the images are acquired by each of these modalities, they can be viewed by the referring clinicians without any delay on the computer in their office, OPD, or any other site in the hospital.

The department has thus become completely filmless and the radiology report of each examination is stored in the Radiology Information System (RIS) so that they can be viewed along with the corresponding studies.

With the integration of voice recognition, advanced visualization, as well as accreditation and compliance software, it has helped us better complement the use of our existing PACS solution by sharing all patient data between systems.

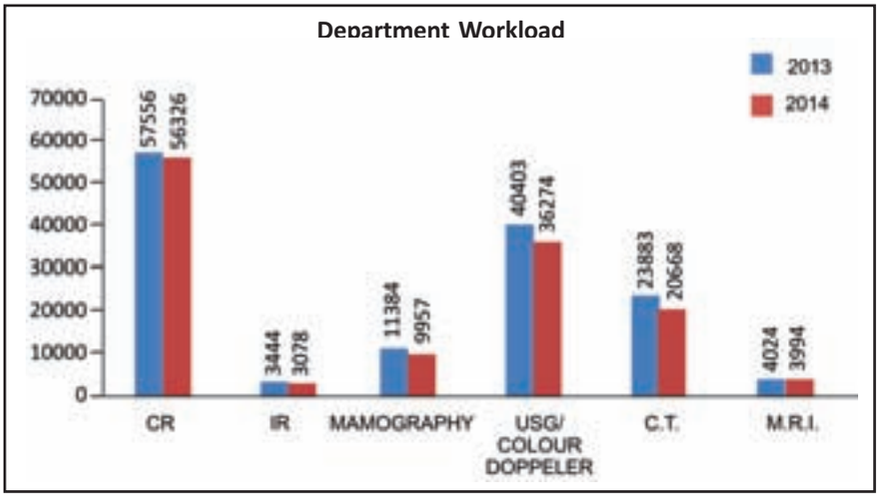
New equipments installed in 2014 inaugurated by Maharashtra Chief Minister, Mr. Devendra Fadnavis include:

1. The new Philips Ingenia 1.5 T MRI
2. Siemens' Luminos dRF - Fluoroscopy System
3. LOGIQ* E9 with XDclear ultrasound equipment
4. MyLab™25Gold Mobile Ultrasound (portable)
5. Hyperion X7 digital OPG machine
6. Portable Digital Radiography system "Optima XR220amx"

Research

The department was part of the 12th Annual Evidence based conference of TMC in February 2014 with sessions on "Oncologic Imaging: A Multidisciplinary Perspective". The Department Contributed and Released a book on – "Evidence based Guidelines on Imaging in various common Cancers".

A CME was organized on MRI, CT Scan, Radiation Protection, Computed Radiography and Digital Radiography by our technologists.



An International CME Programme was held on Fusion of Imaging and Therapy with recent Advances in Technology (FITRAT).

Dr. S.M. Desai was actively involved with BARC - Mumbai and RRCAT - Indore with medical application of synchrotron radiation and laser optics. With IGCAR - Kalpakkam, he is involved in magnetoencephalography.

Education

From this year our P.G. Students shifted from Mumbai University of Health Science (MUHS) to Homi Bhabha National Institute (HBNI).

Department has post MD superspeciality programs; 2 - year Fellowship in Cancer Imaging and Fellowship in OncoIntervention.

The department currently has 11 Senior Registrars, 3 Fellows (1 in Interventional Radiology & 2 in Cancer imaging) and 20 Junior Registrars.

Two year "Advanced Diploma in Medical Imaging Technology" course for the radiology technologist under Maharashtra State Board of Technical Education is in place along with a training program for Radiology Technologist in CT, MRI, Interventional Radiology and Mammography (only for females).

Medical Physics

Dr. Deepak Deshpande,
Head

Mr. Rajesh Kinhikar
Ms. Swamidas Jamema
Mr. Rituraj Upreti
Mr. Suresh Chaudhari
Mrs. Vijaya Somesan

The Department of Medical Physics with a team of 12 Medical Physicists and other technical staff works in close association with department of Radiation Oncology. Calibration, Quality Assurance, maintenance of teletherapy and brachytherapy machines, procurements of radioactive sources, treatment planning and dosimetry for treatment of radiotherapy patients, and radiation safety of the staff are some of its important functions. The department is equipped with state of art facilities and equipment.

Service

The department is equipped with many sophisticated equipment like treatment planning systems TPS (Eclipse, Oncentra, i-Plan), dosimeters & calibration instruments (DOSE1, Unidos,), 3-D Water Phantom (Blue Phantom, Scanditronix), In Vivo Dosimetry System (DPD12), TLD reader (Rexon), Film Dosimetry System (Omnipro), Gafchromic Film dosimetry system etc.

The department is actively involved in dosimetry, data acquisition of various Telecobalt machines, Linear Accelerators and brachytherapy machines. The physicist are engaged in planning and execution of sophisticated techniques like 3D Conformal treatment with Multi-leaf collimator (MLC), Stereotactic (SRT/SRS) and Intensity Modulated Radiotherapy (IMRT), Image Guided Radiotherapy (IGRT) treatments. The department also advises other departments like Diagnostic Radiology, Transfusion Medicine, Tissue Bank, Bio-imaging and ACTREC (CRI) for their requirements of radiation protection, QA, source procurement and disposal as per AERB guidelines.

The Médical physicists are responsible for treatment planning for external and brachytherapy and calculate treatment time and ensure administration of accurate dose to patients. The département planned for 1,414 cases of external therapy with 1,123 TPS plans for complex techniques like 3DCRT, IMR etc. and 764 cases of brachytherapy in 2014. Radiation Oncology Information System (ROIS) is effectively used for calculations and quality assurance of various machines.

The department collaborated with MD Anderson Cancer Center for OSL – irradiation for various photon and electron machines and dosimeter were performed for machines like Trilogy-Photons and Electrons, 2,100 C/D-Photons and Electrons, etc. It also collaborated with Virginia Commonwealth University, to study feasibility for cloud based information exchange program.

Research

The departmental_staff is involved in many other clinical projects along with Department of Radiation Oncology. Several audits, evaluation, validation and comparative studies on intensity modulated radiotherapy, USG based IGRT in radiotherapeutic management of cervical cancers, and dosimetric characteristics of flattening filter free and Hi-Art II Tomotherapy were conducted.

Education

The department is recognized for Ph D program for medical physics under HBNI. The department continued to conduct post-graduate diploma (PGDRTT) training course for Radiotherapy technologists, and is also engaged in training doctors, medical physicists and technologists. Several short term training programs were also conducted. The staff is encouraged to update their knowledge through participation in national and international conferences.

General Medicine

Dr. Aruna Alahari,
Head

Dr. Sheela Sawant
Dr. PTV Nair
Dr. Anuprita Daddi
Mrs. Kalpana Adke
Mrs. Manjiri Mirwankar

The Department of General Medicine is an important clinical service of the Hospital offering medical consultation to patients with pre-existing co-morbidities and for treatment induced medical complications. The Department consists of a dedicated medical team as well as trained technicians.

Patients are evaluated and treated for cancer related and unrelated co-morbidities like hypertension, diabetes, respiratory and thyroid diseases, and ischemic heart disease through its three super specialty clinics. it also supports management of patients, management of emergencies and medical events in the peri-treatment course and facilitates bedside portable echocardiography for patients in the wards.

Service

The Department provides investigational and clinical services namely, 2D and 3 D echocardiography with Colour Doppler for evaluation of cardiac and valvular function for patients in wards and ICU, Cardiopulmonary stress test, Pulmonary Function testing and Electrocardiography services. A comprehensive cardio-respiratory risk assessment is conducted for high risk lung cancer patients.

The department provided a total of 11,563 consultations during the year. It performed 8,900 echocardiography tests, 3,628 pulmonary function test, 30,484 electrocardiograms and conducted 62 cardio-pulmonary exercise test during the year.

Super specialty clinics :

A. AIDS Malignancy clinic enrolled 86 new cases and had 167 follow up consultations, and were offered multi disciplinary treatment.

B. Cancer Thrombosis clinic manages cancer patients with venous thrombo-embolism. It registered 184 cases and had 971 patients for follow-up consultations.

C. Cardio- oncology clinic Adjuvant therapies can potentially cause a wide range of acute and late cardiac complications. This clinic focuses on prevention, early detection and management of cardiovascular complications associated with cancer therapy. Fifty three new cases and 296 follow up cases of chemotherapy induced LV dysfunction were evaluated during the year. Two hundred and forty cases of after Completion Treatment (ACT) underwent cardiac evaluation. Point of care testing of BNP and Troponin-I was initiated and has been helpful in early detection and monitoring of cardiotoxicity.

Research

The departmental research focused on early detection of cardiotoxicity in cancer patients, HIV related lymphomas and head and neck cancers, and Metabolic syndrome in childhood cancer survivors.

Education

The department staff participated and were invited as speakers at various national and international conference and seminars.

Nursing

Mrs. Swapna Joshi,
Nursing Superintendent

Mrs. S. Retnamony
Mrs. Manorama Anilkumar
Mrs. Sindhu Nair

Mrs. Carmine Lasrado
Mrs. Shweta Ghag
Ms. Maria Carvalho,
(Professor & Principal)

Ms. Anita D'Souza,
(Professor & Vice Principal)
Mrs. Prathepa Jagdish,
(Lecturer)

Service

The Nursing department focuses on care and patient safety. The department strives to provide quality services through efficient nursing and has enhanced its efforts for patient experience. The clinical nurse specialist is committed to providing exceptional service and safe care to patients and their families and improves outcomes. A special team of nurses deal with central venous access device and treated 110 cases during the year. A team of nurses provided stoma therapy to a total of 4,827 OPD cases. Patients were also were counseled and trained on usage of stoma bags.

Implementation of bar code system at workstations in patient care areas, ensured safety in drugs administered methods and procedures. Wrist bands are provided to patients in the out-patient procedure room and in-patients, ensuring complete procedures. Occupational safety is ensured with provision of cytotoxic cabinets in wards and other areas of chemotherapy preparation and administration.

Education

The staff members of the department attended CMEs, training courses, national and international workshops and have presented papers, posters at different forum. Operation Theater Nurses were trained to assist for robotic surgery. The department also provides training and observer ship opportunities in the clinical wards. 40 Nurses from Punjab and Vishakhapattanam were trained in chemotherapy administration and patient care. The Nursing department in collaboration with Oncology Nurses Association of India (ONAI) organized 16th National and 3rd International conference on "Moving on with changing dimension in oncology nursing". Two certificate courses on 'central venous assess devices' for trained nurses and Enterostomal therapy were successfully conducted.

Nurses are encouraged to develop academic expertise and qualifications in oncologic nursing through post graduate and short term training programs.

Staff Clinic

Dr. Sandeep Tandon,
Head

Dr. Pankaj Rajput

The routine activities of the staff clinic is to look after the well being of the TMH staff, which include clinical and medical. It is also concerned with occupational health of the staff. Thus, managing and reporting Needle stick Injuries, Vaccinating staff against Hepatitis B, conducting pre-employment examination, preparing health-related policies and guidelines are part of its activity. Positive health is encouraging and regular checkups are conducted for early detection of modifiable and treatable risk factors for lifestyle Diseases like Hypertension, Diabetes, Dyslipidemias etc.

Service

The Staff Clinic provided medical treatment to 3,306 TMH staff including 1,872 super staff , 993 labour staff and their dependents and 441 temporary project staff for their day to day ailments. In 2014, the clinic had approximately 42,627 consultations 367 pre-employment examinations, 442 Hepatitis B vaccinations and 112 Needle stick injuries were treated and reported.

The clinic initiated automation of clinical notes linked to prescription and employee numbers on the Central Information System (CIS) / Electronic Medical Records (EMR) ensuring computerized records.

The health related data of all TMH staff was documented the risk factors of various occupational, communicable and lifestyle Diseases. This facilitated timely execution of interventional policies and reducing long-term disease morbidity of individuals.

Tissue Bank

Dr. Astrid Lobo Gajiwala,
Head

Ms. Urmila Samant
Ms. Cynthia D'Lima

The Tissue Bank is a unique facility in the country that provides processed, gamma-sterilized human bone, amnion and chorion for the treatment and rehabilitation of patients with a wide variety of disease conditions. The Bank caters to the needs of patients, both in TMC as well as across the country. Its activities cover conducting public and professional awareness programmes to promote the donation of tissues and utilization of allografts, liaising with regulatory bodies, networking with donor hospitals and tissue retrieval centres in Mumbai and outside for the donation of tissues, processing and radiation sterilisation of tissues in compliance with international standards, and the distribution of grafts.

Service

In 2014 the Tissue Bank motivated 1,119 amnion donors and 1,122 bone donors, resulting in an increase in the number of grafts produced from 10,003 in 2013 to 10,200 in 2014. These included 4,759 bone grafts, 2,837 amnion dressings and 2,604 chorion grafts.

In TMH 132 bone grafts were used in 50 patients, for biological reconstruction of the defects produced by ablative surgery for cancer. 2,160 amnion dressings were used in 364 patients for the management of radiation ulcers, bedsores and surgical wounds to improve radiotherapy outcomes and quality of life.

Of the total products of 10,200, 4,479 vials of bone granules, 1,203 bone grafts and 2 tendons, 916 amnion dressings 1,646 chorion grafts were used for patients outside TMH.

Number and Type of Allografts Produced and Utilized

Sr. No.	Grafts	Produced		Utilized	
		2013	2014	2013	2014
1.	Amnion	2,347	2,837	2,699	3,076
2.	Chorion	1,377	2,604	782	1,646
3.	Bone Granules	1,464	1,200	1,193	1,075
4.	Demineralised Freeze-Dried Bone Granules	3,465	2,395	2,719	3,404
5.	Freeze-Dried Bone	1,117	1,054	968	1,131
6.	Demineralised Freeze-Dried Bone	91	48	152	140
7.	Frozen Bone	142	62	145	64
8.	Tendon	0	0	02	02
	TOTAL	**10,003**	**10,200**	**8,660**	**10,538**

10,538 grafts were used in TMH and 684 hospitals and nursing homes across the country.

Research

Research activities focused on the clinical efficacy of the Tissue Bank products including new indications for existing grafts and the development of new and/or customized grafts for specific surgical and medical requirements. Audits to validate and improve tissue banking practices were also conducted. Results were presented at national and international conferences and published in an international journal.

The department continued to support IAEA project on assessing efficacy of irradiation of amnion dressings. The bank collaborated with IIT, TIFR, and UB-DAE, CBS to develop bone substitute scaffolds. The department supported student research.

Education

Public and professional awareness programmes were organized at TMH and other venues to promote tissue donation and utilization. Observers to the Tissue Bank were introduced to the regulatory requirements and basics of Tissue Banking. The staff participated in skill enhancing meetings, seminars and conferences and served as reviewers to journals.

Digital Library

Dr. Medha Joshi,
Head

The Digital Library was established with the objective of effectively using state of art technology for communication and distribution of information resources and services with the aim of providing speedy and timely access across campus and facilitate single login.

Over the decade the library managed to fulfill these aims. It strengthened its electronic collection along with print publications. The library continues to support information needs of clinical and other staff of TMC, walk- in visitors and also supported several online requests.

The Library Webpage facilitates quick outreach support providing details of collection, links to full text for both subscribed and open access free contents on the web. The use of online form feeds helping users to directly and quickly communicate with library has increased considerably. About 83% of the requests for articles were supported in soft formats, providing immediate support and minimizing use of the paper.

Services

The library collection focuses on Oncology and its various specialties to support organizational activities of clinical service, research and education. The library has a collection of over 7,837 printed books and more than 20,000 bound journals. More than 700 articles (staff publications and articles from Indian Journals) were indexed during the year. The library continued subscription to 177 journals which included 135 e-journals and renewed subscription of four e-databases. To further facilitate evidence based service, research and education, 'Up To Date' and 'Clinical Keys' were made available.

The library resources are often used remotely via web access using library webpage. Document supply is the most used service of the library and is availed by TMC members, libraries across country, industry and individual visitors. Seven hundred and seventy three (24% rise over previous year) document supply requests for a total of 2,248 scholarly articles were received by the library. Of these, 47 % requests were received through web-based form feeds and of the total request, 83% request were electronically satisfied, improving the response time. The library supported 1,464 articles (96%) requests from its collection and 51 articles (4%) through inter library loan service, which indicates our self sufficiency.

The usage data of Electronic resources for subscribed and on trial access were collected, monitored and analyzed. This helped in deciding on the utility, continuation for subscription and addition of new databases.

Education

The library tutorials for information literacy skills focusing on search techniques to end users citation management tools and CINHAL were continued through-out the year. More than 80 end-users benefited from these tutorials. The library inducted one library trainee for practical knowledge.

Information Technology

Mr. Mahesh Mangrulkar,
IT Manager, TMC

Mr. Vivek Marathe
Mr. Sanjay Sinha
Mr. Pravin Kalsekar
Mr. Sandhya Joshi

The department ensures uninterrupted network and system. Software development and maintenance, hardware maintenance, network monitoring, user training, trouble shooting procedures, solving day-to-day user problems, data analysis, conducting meetings with users etc. are the major departmental activities. It plays a pivotal role through automated systems and network services and new functionalities are added regularly to support the functioning of Tata Memorial Centre in the thrust areas of the hospital. Hospital Information System runs 24x7 on a DB2 Database with IBM power Server with High Availability & Disaster Recovery features. The front end software is developed in Visual Basic & .NET. The main features of the system are modularity, scalability, built in security and flexibility to timely address unforeseen situations. Many applications were developed during the year to support patient services.

Service

The department coordinated with ECIL for the development of web based clinical information system for breast Disease Management Group (DMG) and Radiation Oncology Information system. Several existing laboratory and departmental systems and modules are modified routinely to add new features and fine tune existing ones, namely the CIS, tumor tissue repository, RIS, Patient Admin module, Operation theatre, reports from laboratories ROIS, to include doctors and nurses notes, dose calculations in MOIS, final diagnosis, and several others. Laboratory instruments/machines in Hemato-pathology and biochemistry laboratories were interfaced with Diagnostics Information system to provide coagulation profile and automated labeling. The medical oncology information system (MOIS) was implemented during the year. The department's SMS broadcasting services facilitates alerting messages to patients for appointments, smart card balances, reports, etc. About 12 lakhs SMS alerts were sent during the year.

The software and hardware requirement for administrative activities of the centre were also supported. Systems for accounts, HRD and general administration were developed, modified to satisfy newer requirements like bank transfers, billing, In-patient bills, assets managements, deputation leave system, reimbursement and similar others. A File tracking system was introduced on trial basis, to control the movements of patient files. PABR smart card forms were synchronized between ACTREC and TMH. KIOSKs were placed in patient waiting areas to facilitate easy access to patient reports, smart card statements and other related information. The generates reports and data for systems like Clinical Information System, Patient Admin, billing & receipting system, Diagnostic Information system, Radiology Information system, Operation Theatre module etc for comparison and utility. Nurses were trained Hospital Information System, and Microsoft office.

Medical Graphics

Mr. Nilesh N. Ganthade,
OIC

Medical Graphics Department supports your visual communication and printing needs of medical and non medical professionals. The visualization specialists create imagery that advances medical science knowledge and empowers health literacy for patients and the public.

The Department is a fully equipped with latest digital technologies such as digital DSLR cameras, full HD specialised surgical audio-video recorder, LIVE surgical broadcasting facility over internet using latest hi-definition video codec, High resolution scanning and printing equipments to facilitate archival of images and videos, and enable their usability training, scientific publications and presentations.

The department's digital expertise creates graphical presentations of accurate medical illustrations, images, and clinical photography with audio visual contents, supporting clinical, academic, research requirements in healthcare communications. The pre and post treatment clinical images of 1089 patients provided a visual clue to clinicians, facilitating evaluation of clinical treatment and direct further decisions. Fifty five surgeries were video recorded, enabling archival of surgery techniques for educational and demonstrative use.

Forty national and international meetings, symposiums, conferences workshops were audio- video recorded during the year.

Clinical Photography	1,089
Scientific Poster Preparation	165
D.T.P / Artwork of Various conferences poster, banners, Leaflets etc.	2 40
Surgical Videos in O.T.	55
Illustration work for the clinical papers	65

Medical Administration

Dr. Narayan H.K.V.,
Medical Superintendent, TMC

Dr. Sarita Khobrekar
Dr. S. Tandon
Mrs. Swapna Joshi

Mr. Rajeev Sawant
Dr. Sandeep Sawakare
Mrs. Neelima Dalvi

Dr. Anuradha Daptadar
Dr. Manjusha Vagal
Mrs. Chitra Hingnekar

The Medical Administration is responsible for supervision and facilitation of patient care activities. These activities include registration and evaluation of patients, ambulatory care, wait listing and admission, patient grievance redressal and patient safety and quality assurance.

The functioning of the following departments is facilitated:

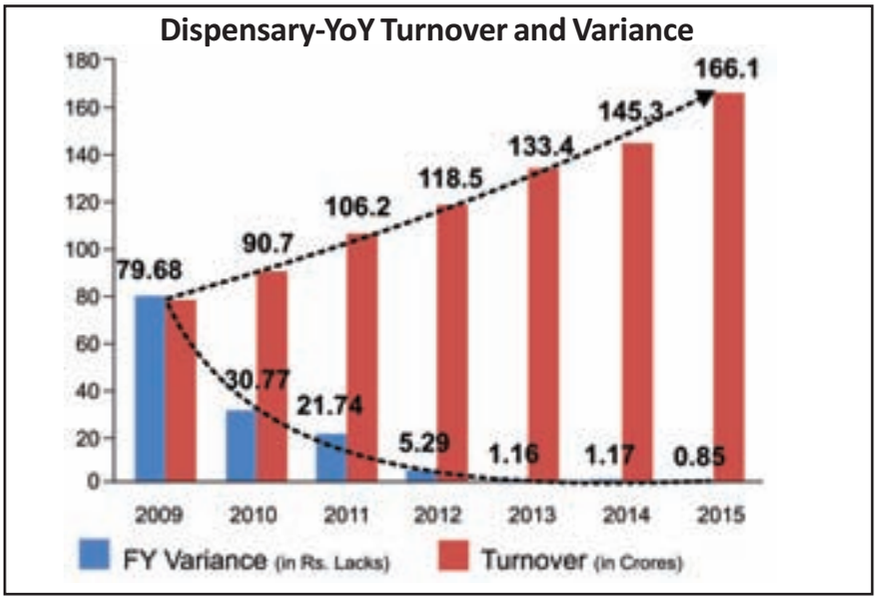
Central Sterile Supplies Department

Mr. Rajeev Sawant, Head

The department supports the entire hospital including the 23 operation theatres with sterile equipment and supplies. The department is well equipped with five state-of-the-art Steam Sterilizers, one Ethylene Oxide Sterilizer, one plasma sterilizer, two Washer Disinfectors and one Ultrasonic Cleaning Machine. The department provides uninterrupted service for patient care needs with twenty loads of steam sterilizers, 30 Cubic Feet Materials, one load of 5 Cubic Feet of Gas Sterilizer per day and 6-8 loads of 5 Cubic Feet of Plasma Sterilizer per day. Several other items like gowns, linen packs, gauze gloves etc. are all sterilized and are provided as per the needs of the hospital. The department initiated the processing and packing of all surgical instruments including MIS and Robotic Surgeries.

Pharmacy

- The total turnover of the Dispensary for the year 2014-15 increased by 14.28%



- The Average No. of Transactions per day was 2,309 as against 1,993 in the previous year- an increase of 15.82%
- The implementation of Smart Card for dispensary transactions has facilitated the above performance with only 0.5% of the transactions being done by cash payment over the counter, thereby reducing the turnaround time (TAT).

Medical Social Services

Mrs. Neelima Dalvi, Medical Social Worker

Medical Social Services Unit with its team of eight trained social workers makes significant contribution towards alleviation, suffering and improving quality of life of a large number of cancer patients, by providing social support.

The hospital patients come from varied social strata and need social and economic support the challenge of the Medical Social Service unit supports patients through counseling, explaining treatment procedures, extends financial support and facilitates accommodation, to meet the challenges of illiteracy, lack of resources, low health budget and high treatment cost, minimizing dropout and facilitating treatment compliance.

The department builds funds to facilitate treatment expenses of patients through networking and advocacy activity usually with individuals and Trusts.

During the year, 34,886 patients benefitted through its services. It counselled 11,313 patients and guided 23,573 patients for treatment. Needy patients were provided with drugs worth Rs 118,53,668.

The department extends support at the palliative and lymphomas clinics for adult and pediatric patients and organizes fun filled events for patients on occasions of women day, and celebrates festivals.

Dr. Venkata V.P.R.P.
Chief Administrative Officer, TMC

General Administration

Mr. G.S. Dhanoa
Chief Engineer, TMC
Mr. A.N. Sathe
Senior Administrative Officer
Mr. S.H. Jafri
Senior Public Relations Officer
Mr. R.P. Jaiswar
Senior Personnel Officer

Mr. P.K. Sukumaran
H.R.D. Officer
Mrs. Indira Pasupathy
Joint Controller [F&A], TMC
Mrs. S.E. Brid
Purchase Officer
Mr. Johnson Lukose
Deputy Chief Security Officer

Mr. Raju Kotian
Administrative Officer
Mrs. Rajlaxmi K. Naik
OIC House Keeping Department
Mr. A.L. Kuvalekar
Stores Officer

Administration

Tata Memorial Hospital being premier cancer centre, the prime task of the administration is to function in unison with medical administration to facilitate simplified patient service procedures and ensure overall smooth functioning of the Tata Memorial Centre.

The **Chief Administrative Officer i**s ably supported by a team of officers such as Chief Engineer and his team, Sr. Public Relations Officer, Sr. Administrative Officer, Sr. Personnel Officer, HRD Officer, Joint Controller of [F&A], Purchase Officer, Dy. Chief Security Officer, Administrative Officer and Stores Officer.

An approximate amount of Rs.16 lacs was disbursed to employees as advance towards housing, motor cycle, motor car and computers. The Administration supported 1,239 employees for National Deputation and 355 employees for International Deputation during the year. The administration added 221 members, received 689 claims of which 398 were sanctioned under Contributory Health Service Scheme [CHSS]. During the year 2014, a total 100 requests were received under Right to Information Act 2005 and information was provided within the stipulated period. During the year, the First **Appellate Authority** received 13 appeals which were resolved within the stipulated time.

The goal of **Human Resource Development Department (HR)** is to ensure optimum utilization of manpower by placement of right persons at right places. Recruitment actions for various posts, after following all procedures have been taken and 58 personnel were appointed during this year. Special Recruitment drive for filling up backlog vacancies reserved for SC/ ST/OBC/PH through direct recruitment was conducted. A total of 15 disabled persons in different categories are employed in TMH.

The department conducted staff promotional activities and promoted 68 employees. 32 employees superannuated / voluntarily retired during the year. The department facilitates recruitment of trainees for various short term and long term training programmes. These are advanced specialized skill courses for Doctors, Nurses and Technicians across the country. About 165 trainees were benefitted during the year.

Skills of in house employees were developed through various training programmes and workshops. Staff members were deputed for training programmes conducted by ATI, DAE and ISTM, New Delhi. As part of Green HR initiatives, submission of Immovable Property Return was converted to online process.

The **Accounts Department** is responsible for patient billing, receipting and settling accounts of different categories of patients i.e smart card, cash paying, trust and company referred. The department is also responsible for budgeting, utilisation of the plan and non-plan grants, submission of various reports to DAE regarding utilisation of funds and status of plan projects.

During the financial year 2014-15, Rs.217 Crore received as Non-Plan grant was utilized completely. The Plan grant sanctioned was Rs.175.60 Crore and the proposed targets were achieved.

Smart card services were implemented across the hospital for all categories of patients, resulting in ease in transacting services in TMC.

Personnel Department organized training program for labour staff through Central Board for Worker's Education, Ministry of Labour & Employment, Govt. of India. The Centre has the backing of 852 number of labour staff governed under Brihanmumbai Municipal Corporation [BMC], who plays an important role in the areas of Cleanliness, Transport of Specimens, documents etc., which are important functions in delivery of care. All the labour staff were trained on behavioural aspects, communication, family budget, dignity of labour, absenteeism, etc. Weekly meetings

were conducted with the recognized Union to resolve the common issues for smooth functioning of the hospital work including patient care. Allocation of man power to different wards, departments and sections was fulfilled to maintain a high standard of cleanliness and hygiene. The Personnel department continued to provide mediclaim cashless benefit to labour staff. As per the revised BMC circular, re-fixation of the pension was adopted for 217 pensioners.

The **Purchase Department** facilitates procurement of consumables and capital equipments. Total purchase orders worth around Rs.260 crores were released during the year. The department's import cell facilitated acquisition of capital equipments, consumables, spare parts, worth Rs.200 crores. It also ensured rates contracts for regularly required consumables. Consumables, spares, worth Rs.50 crores from Non Rate Contract cell and other essential services for the hospital worth Rs.10,89,68,519 were procured. Global tendering was initiated for establishment of Hadron Beam Therapy equipment worth 300 crores.

The **Centralized Stores Department** ensured environment friendly disposal method for empty cartridges. Physical verification and tagging of assets was conducted routinely. No discrepancy was observed in ledger and physical balance during the annual stock taking.

During the financial year, the store monitored receipt and issue of consumables worth Rs.444 lacs to cater routine requirements of the various departments.

The main function of Stores is to stock and support regular requirements of the various Wards / OPDs / Labs / Departments, as and when required. The stores stocks consumable and non consumable items except drugs and surgical items. Presently it holds stocks of 351 items. The inventory of the department is computerized supporting timely supply of requested items and is completely a paperless activity.

The main activity of the **Engineering Department** is maintenance of the hospital buildings, equipments and machines. Its maintenance measures ensure prevention of destruction to infrastructure due to high usage and also to ensure down time of equipments to the minimum. This enables smooth functioning of the hospital and avoids inconvenience to care givers and patients.

The department plays a major role in expanding the patient care facilities of TMC with in-house project management. It facilitates and monitors the construction of environmental friendly buildings of - Centre for Cancer Epidemiology (built-up area 60,000 sqft), Hematolymphoid Block (built up area 1,40,000 sq.ft) and Archive and Record Storage (built up area 15,000 sq.ft) at ACTREC.

The department coordinates with the Engineering Procurement and Construction (EPC) Consultants for the upcoming projects at Haffkine's plot (5 acres) for construction of Hadron Beam Therapy facility, Woman and Children Wing, hostels for doctors and dormitory for patients.

The **Maintenance and Verification Cell** shoulders main responsibility of the M and V Cell and extended in-house help for Repairs and Maintenance of Medical equipments in critical areas like Operating theatres, Intensive Care Unit, Recovery Ward, Central Sterile Supplies Department and Laboratories and calibration of all laboratory equipments. It also coordinated to maintain the supply of medical gas lines throughout the year. The cell also looked after disposal of obsolete items.

Condemnation and Disposal Cell has disposed off routine scrap of 400 Kg. per day tunes to 146 tonnes approx. amounting to approx. Rs.16 lakhs.

The **Security Department** ensures safety of department, staff and patients and safe guards the property. Major theft incidents were promptly detected. The department facilitates transport service to staff and patients. Vigilance Awareness Week was observed from 27.10.2014 to 01.11.2014. Shri. Ahmad Javed, IPS, Director General Home Guards, Maharashtra delivered a lecture on "Combating Corruption – Technology as an enabler" during the awareness week. The protocols of Security arrangements for Heads of States and Nations were meticulously followed. Fires fighting training and emergency evacuation mock drills were organized for staff.

The **Food Services** department caters to needs of patients, and TMH staff and also offers catering services during conferences, meetings and other events. The patient food is prepared in consultation with dietitian. It caters to around 1500 people (doctors, nurses and patients) daily. It served approximately 37 national and international conferences and meetings of dignitaries during the year.

The **Housekeeping Department (HKD)** strives to provide a clean, infection free and pleasant atmosphere to support speedy recovery of patients.

The high standards of cleanliness and hygiene are ensured using latest

equipment, materials and techniques. The premises are kept pest-free through regular pest control services. The other activities include relocation of Equipment and furniture, Flower arrangements, Garden maintenance, Green Waste Recycling (organic manure plant), Coordinating complaints of Electrical, Civil, Linen and laundry with their respective departments, implementing allocation of Doctor's Quarters, and Foyer & Stage arrangement. This huge task is achieved through meticulously planning & scheduling of its activities.

Regular in-house training programme for effective performance and including motivating and mentoring is organized for staff.

The aim of the **Public Relations (PR)** Department is to interact with patients, identify difficulties and facilitate and improve the patient facilities in the hospital. The PR Staff regularly interacts with the patients to identify their needs on the premises, and co-ordinate with competent authorities for correction, improvement and satisfying the requirements.

The Helpline initiated under the Dept continues to co-ordinate and streamline the activities of 16 NGO's and individual volunteers, who offer help to the patients in the form of finance, offer guidance and distribute food, clothes, toys and other necessities received as donations. Free lunch and cloak room services are also facilitated through NGOs, individual trust and Corporate. The railway counter continued to facilitate reservations for cancer patients.

Several programmes like outings, cultural programmes, yoga sessions, movie shows etc were organized in association with NGOs as recreational activities for the patients.

Life Insurance Policy Claims for patients are processed by the PR Department. 179 deaths claims were processed during the year.

During the visits of national and international personalities, the PR department facilitates to showcase the specialized activities of various departments in the hospital. The department facilitated delegates with accommodations, tours and travel, etc. for attending the various national and international conferences, meetings and seminars of the Hospital.

'Hindi Fortnight' an annual event was celebrated. . Various competitions in Hindi like essay writing, debate, spelling, knowledge of Official words, singing etc were organized for the staff. Tata Memorial Centre was awarded the 'Rajbhasha Shield' for 10th consecutive year.

Patient Support Services

TMC patients receive support from a large number of non-governmental organizations. This support helps in the delivery of holistic care of patient. The following is a brief account of these organizations.

V-care Foundation: Helps supervise the toy room in the pediatric ward, provides infection control kits for all general patients in the in the pediatric ward. Distributes gifts to children at the time of discharge, cancer survivor day and on the Divali festival to enlighten their sprit to fight with cancer and live happily.

CPAA [Cancer Patients Aid Association] : Provides complan energy drink throughout the year to pediatric patients, also provides ration to support the patients families. Celebrates a week in month of September with Rose day, Fun & Magic moments in wards, showers gifts like goody bags and announce a Winner-in-life Awards to the patient during this week.

Cankids : provides emergency medical assistance, adoption of children for non formal education at the "Chattal" Clinics held in OPD, formal education at "CanShalla", which is a special school for cancer children, parent support group forum and awareness and advocacy initiatives.

Cuddles Foundation : provides nutrition support by giving a constant supply of nutrition products to both indoor patients and out patients. Full time dieticians support and supply of infection control products are provided.

Love & Care : provides ration to the patients families as a support and care. Distributes gifts to elevate sprit to live and fight the disease.

Indian Cancer Society : provides emergency funds for treatment initiation, and complete financial adoption of many patients for the timely treatment and care. Provides ration to the cancer patients. It also offers counseling and rehabilitation services to the patients.

Make-A-Wish Foundation : Identifies and helps children suffering from life threatening diseases and fulfills a special dream wished by them to unleash the experience of a life time dream. The wishes involve giving them a simple toys or travel to a desired destination with beloved ones or arranging a visit of favorite celebrity of the children.

JASCAP : provides financial assistance and maintains a book stall at the hospital in which they provides books on cancer information in various languages

Little More : helps with birthday celebrations of the children and extends educational support, arranges musical programs and gift distributions for children, also provides ration to support the families.

Sadbhavana Foundation : provides counseling, financial support planning, funds for treatment, and most importantly bereavement support to the patients and their families whose child is suffering from cancer. Also arranges cancer detection camps in rural areas and in Mumbai. Provides blood and platelet and distributes gifts to the patients.

JACAF : Arranges detection and cancer awareness camps in rural areas. Distributes toys, fruits and nutritional food products to the patients, also arranges for blood and platelets.

St. Jude India Childcare Centre : Provides the children a clean and secure place to stay in while on treatment at the hospital. Their "Home away from home" concept has been a big support to the department over the years. They also arrange to take children on outing as short one day trips and arranges different entertaining programs.

Women's Cancer Initiative : Arranges one day conference on the information of latest technology transfer in Breast Cancer for the Doctor.

Sanjivani Life beyond Cancer : Arranges cancer detection and awareness camps and makes documentary films on breast cancer and also arranges conference for the cancer survivors to share their experience for the patients.

Gurnani Sati Charitable Trust : Distribution of Tea and Biscuits daily in morning through the Helpline of TMH.

Gunvati Kapoor Charitable Trust : Arranges cancer detection camps and provides ration for the support to the family of cancer patient.

Braj Gauri Trust : Provides support to the patients with free clock room service at TMH

Vasantha Memorial Trust : provides counseling to the families and also helps with financial assistance to leukemia and breast patients.

All these and many more organizations help us ensure that each and every child coming to the hospital is given proper care from the beginning to the entire period of the treatment.

ImPaCCT Foundation :

"ImPaCCT Foundation", an acronym for "Improving Paediatric Cancer Care and Treatment Foundation", was established in October 2010 to ensure that every child with cancer coming to TMH receives treatment and other support regardless of the family background. Since childhood cancers are highly curable but the treatment is intensive and prolonged, it takes more than just finances to treat a child with cancer. Therefore the activities of ImPaCCT Foundation are structured in order to meet these needs.

Activities of ImPaCCT Foundation:

1. The foundation helps raise funds for the treatment of poor patients without them having to approach multiple organizations.
2. The foundation arranges accommodation for the families who are coming from out of town and cannot provide for their own accommodation.
3. Nutrition support is provided to every child coming to the hospital by way of mid-day meals and healthy snacks.
4. The foundation helps to organize blood and platelet donors for the patients, without which it would not be able to take intensive treatment.
5. Non-formal education is provided to the children while they are away from school for long periods of time.
6. Foundation organizes Art therapy workshops to help the children forget about their aches and pains and to keep their minds occupied.
7. The foundation also organizes birthdays of every child taking treatment at the hospital. This is to give children happy memories of the hospital when they go back home after getting cured.
8. The foundation organizes "HOPE", the celebration of "Victory over Cancer" which is biggest Paediatric social event of the hospital.
9. Part of the funds, also goes towards supporting the families who have lost their children fighting the battle of cancer, as bereavement funds.
10. The foundation also enhances delivery of cancer care by supporting salaries of social workers, dieticians, infection control officers, pharmacists and nurses for giving better quality care to children.

ImPaCCT Foundation thus provides Holistic care to every child coming to the hospital, because "Every child with curable cancer deserves a chance at cure".

After Completion of Treatment (ACT) Clinic

Improvement in therapy for childhood cancer over last several decade has led to excellent survival in developed countries. Studies of large cohorts of childhood cancer survivor in Europe and North America have well documented the probability of various late effects & there adverse impact on

Quality of Life (QOL). The potential public health implications such large number of high risk individuals in society have thus become evident. There is an increasingly perceived need for optimal delivery of life-long health care to this growing, vulnerable population. Pediatric oncologists in developing countries are currently preoccupied with refilling delivery of care to attain survival rates which are comparable to developed world. However, they have an obligation to actively build long term follow up & survivorship programme as integral part of pediatric Oncology initiative. Childhood cancer survivor receive highest quality care during the active phase of their treatment, but can be lost in transition to the more passive follow up phase of survivorship.

A long term follow up clinic for survivor of childhood cancer was initiated at Tata Memorial Hospital in February 1991 drawing inspiration from the model of care established at St. Jude Children research Hospital, USA. This clinic was appropriately named *A*fter *C*ompletion of *T*reatment (ACT) Clinic to emphasize that ACTs are needed beyond treatment to achieve "CURE" in its full dimensions. The aims of the clinic are

- To monitor growth, development & sexual maturation of survivor.
- To monitor late effects of therapy.
- To address psycho-social problem of the survivor.
- Rehabilitation for useful productive adulthood.
- To provide feedback for future protocol modification to obviate/ minimize late effects.

From Feb 1991 to December 2014 cohort of 1,706 survivors (off therapy and disease free for >2 years) has been created in ACT Clinic. These survivors are followed up in a longitudinal manner at the frequency depending on probability of risk of late effects. 111 survivors were enrolled & added to this cohort while 654 survivors were followed up in ACT clinic from Jan 2014 – Dec 2014.

UGAM

Vision-

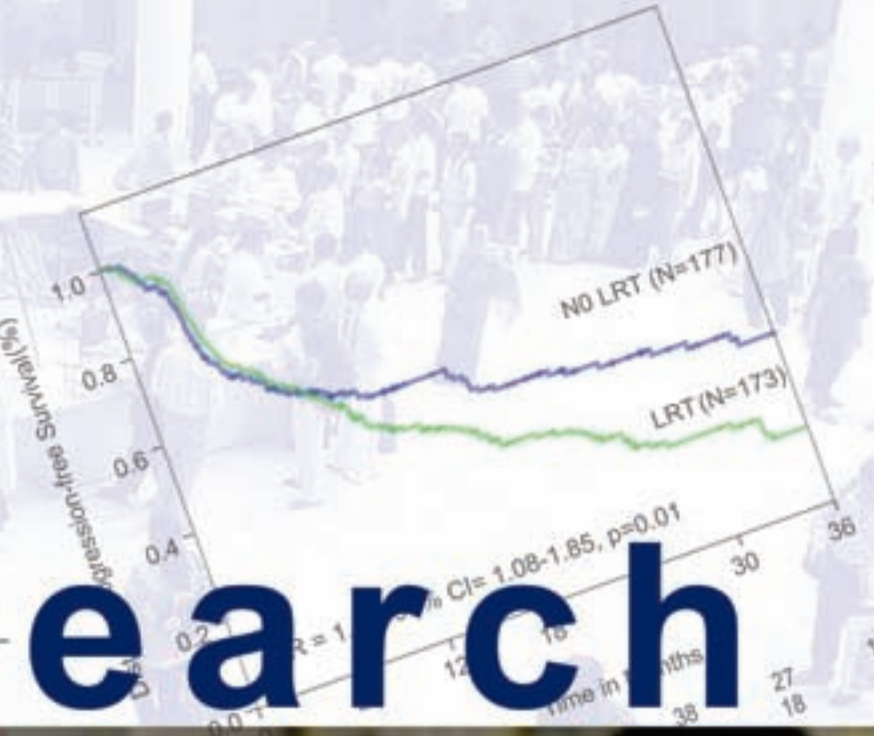
- To ensure that every childhood cancer survivor finds his/her way to celebrate life after winning battle with cancer.
- To facilitate their life's journey on correct path & in right direction.

Mission-

- Self-empowerment of the young survivors.
- Helping children with cancer currently undergoing treatment.
- Social awareness and re-bonding with society.

Adolescent & Young Adult Mumbai based survivors from ACT clinic, inspired by survivor from across the globe with whom they interacted during International Society of pediatric Oncology (SIOP) Meeting in October 2007, came together on 7th June 2009, (First Sunday of June), celebrated as Cancer survivor day by the National Coalition for cancer survivorship (NCCS). They formed a voluntary support group, UGAM under the survivorship programme of Indian Cancer Society & have made pioneering efforts in bringing Cancer Survivorship issues from the closet to the public domain. UGAM means "To Rise" underscoring determination of childhood cancer survivor to rise above all obstacles in life & be VICTORS. They are functioning with following vision and mission.

TATA MEMORIAL CENTRE
टाटा स्मारक केंद्र
SERVICE RESEARCH EDUCATION



research

Caring with Technology

Ms. Rohini Hawaldar,
TRAC Administrator

TMC Research Administrative Council (TRAC)

TRAC was constituted with the broad mandate to maintain and improve basic, translational and clinical research. The main activity focuses on implementation of human research protection program, identify thrust areas for research, support and encourage collaborative national and international research, review pre-proposals, and provide and review utilization of financial provisions.

The TRAC members met on two occasions during the year. The council emphasized revision of SOP for IEC and CRS to ensure conduct of scientifically and ethically sound research. It provided continuous support for preparation of Association for the Accreditation of Human Research Protection Programs (AAHRPP) accreditation. The centre was AAHRPP accredited with "Gold Seal" assuring research participants, researchers, sponsors, government regulators, and the general public of excellence and protection of the research participants. The Institutional Insurance policy for investigator initiated research studies was implemented.

The TRAC was also involved in Development and implementation of software for IEC administration, preparation of HRPP manual, conducts regular audits of functioning, Beta testing of software (OVERTURE from Allegro Systems) for research studies. The council focuses its future activities on quality control and develope online submission system for research projects.

Clinical Research Secretariat and Department of Atomic Energy Clinical Trials Co-ordinator

Dr. Ashwini Budrukkar
Officer In Charge

Clinical Research Secretariat (CRS) along with Department of Atomic Energy Clinical trials unit (DAE-CTC) facilitates research at Tata Memorial Hospital for over a decade. The DAE-CTC unit and CRS supports clinical research in order to propagate practice of evidence based medicine. It also builds capacity of researchers and trial coordinators through several education and training programs Several path breaking clinical trials in various spheres of oncology have been supported by the CRS/DAE-CTC. This support has been in the form of infrastructure, trained manpower, study design, statistical assistance, data management and analyses, data monitoring, and co-ordination of clinical trials, etc In 2014 10 new clinical trials were financially supported through DAE-CTC funds. CRS provided statistical assistance to 102 new studies and extended, help in Informed Consent translations to forty nine studies.

The Annual Evidence Based Medicine meeting was organized as continued efforts towards promoting Evidence based medical practice. The 2014 Evidence Based Medicine meeting focused on "Perioperative Care: Improving Outcomes after Surgery" and "Oncologic Imaging: A Multidisciplinary Perspective". The meeting was attended by 376 participants. Two Evidence Based Medicine books were released during this conference. These comprehensive books cover all cancer sites and are useful as pocket reference guide for clinicians and residents in training.

In its endeavor to disseminate knowledge and to promote evidence based practices, DAE-CTC unit and Clinical Research Secretariat (CRS) provides organizational support for conferences. Assistance was provided to organize eight conferences in various specialties and National Cancer Grid meetings during the year. CRS/ DAE-CTC, also trains clinicians and students in research methods. A "Clinical Research Methodology Course" covering research methodology, statistical analysis and research ethics was conducted and was attended by 280 participants. Two workshops on "Good Clinical Practice" were also organized and attended by about 250 participants.

Institutional Ethics Committee (IEC)

Dr. George Karimundackal,
Member Secretary,
Institutional Ethics Committee-I

Dr. Siddhartha Laskar,
Member Secretary,
Institutional Ethics Committee-II

The Institutional Ethics Committees-I & II (IECs) are constituted by the Director, Tata Memorial Centre (TMC) under authority vested by the Governing Council of the TMC. IECs are appointed for duration of 2 years. Both Institutional Ethics Committees function with the same purpose and SOPs.

Tata Memorial Centre- IECs are registered with Drug Controller General India. IEC-I has Ethic Committee Registration No. ECR/170/Inst/MH/2013 issued under Rule 122DD of the Drugs & Cosmetic Rules 1945. IEC-II has Ethic Committee Registration No. ECR/414/Inst/MH/2013 issued under Rule 122DD of the Drugs & Cosmetic Rules 1945. Institution has a Federal Wide Assurance (FWA) with the Department of Health and Human Services (DHHS) through the Office for Human Research Protections (OHRP) and is periodically renewed. The assurance number is FWA00006143.

IECs are also registered with HHS and have IORG Nos. IRB00003414, IRB00007802 for IEC-I & IEC-II respectively and is renewed periodically.

The mandate of the IEC is to establish, formalize and reaffirm the Institution's commitment to promotion of high ethical standards in clinical research, professional education and to safeguard the dignity, rights & well-being of potential research participants. The IEC also provides a forum for discussing and analyzing ethical issues in all research activities of TMC.

The Terms of Reference and revised versions of SOPs are published on the TMC website. IEC ensures highest scientific and ethical standards of research at TMC. It is the endeavor of IECs to provide guidance on bioethical aspects of broad range of topics such as disclosures of diagnosis, diagnosis of brain death, indications for stopping resuscitation, true informed consent, etc. However IECs do not participate in administrative matters, nor does it function as a grievance cell.

The two committees namely TMC - Institutional Ethics Committees- I and II (TMC-IECs) are involved in the review of industry sponsored, investigator initiated research proposals and student research projects. The two committees meet once every month to facilitate timely and accurate ethical reviews. The strength of each of Ethics Committees consists of 15 members and has both in-house staff and experts from outside the institution.

The committees are constituted as per the DGCGI / CDSCO guidelines and schedule Y and the membership has representation from a wide range of experts and stakeholders.

The membership for the year 2014-2016 is listed below:

Institutional Ethics Committee-I w.e.f April 2014, Registration No. ECR/170/Inst/MH/2013

Sr. No.	Names & Position	Affiliation	Expertise
1.	Dr. Tapan Saikia, Chairperson	Head of Medical Oncology & Research Director, Prince Aly Khan Hospital, Mazagaon, Mumbai	Medical Oncologist
2.	Dr. Nithya Gogtay, Co- Chairperson	Professor, Clinical Pharmacology, KEM Hospital	Clinical Pharmacologist
3.	Dr. George Karimundackal, Member Secretary	Associate Professor, Dept. of Surgical Oncology, Tata Memorial Hospital	Surgeon
4.	Mrs. Manisha Naikdalal, Member	Member of Ethics Committees at KEM Hospital(ECRHS) & Hinduja Hospital(CREC)	Lay Person
5.	Ms. Sandhya Vora, Member	Managing Trustee V Care Foundation	Social scientist/ NGO representative
6.	Dr. Pradnya Talawadeker, Member	Country Coordinator for India Association Children Pallative Care Project	Medico-legal expert
7.	Dr. Sanjay Gupta, Member	Scientific Officer, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC)	Basic Scientist
8.	Dr. Sarbani Ghosh Laskar, Member	Professor, Dept. of Radiation Oncology, TMH & Member-Secretary, Data Safety and Monitoring Subcommittee, Tata Memorial Hospital	Radiation Oncologist
9.	Dr. J. V. Divatia, Member	Professor and Head, Department of Anaesthesia, Critical Care & Pain, Tata Memorial Hospital	Anaesthetist
10.	Dr. Vani Parmar, Member	Professor, Dept. of Surgical Oncology , Tata Memorial Hospital	Surgeon
11.	Dr. Umesh Mahanshetty, Member	Professor, Dept. of Radiation Oncology, Tata Memorial Hospital	Radiation Oncologist
12.	Dr. Girish Chinnaswamy, Member	Associate Professor, Dept. of Medical Oncology, Tata Memorial Hospital	Medical Oncologist
13.	Dr. Manju Sengar, Member	Professor, Dept. of Medical Oncology, Tata Memorial Hospital	Medical Oncologist
14.	Dr. Mukta Ramadwar, Member	Professor, Dept. of Pathology, Tata Memorial Hospital	Pathologist
15.	Dr. Seema Kembhavi, Member	Associate Professor, Dept of Radiodiagnosis, Tata Memorial Hospital	Radiologist

Institutional Ethics Committee-II w.e.f April 2014 Registration No. ECR/414/Inst/MH/2013

Sr. No.	Name & Position	Affiliation	Expertise
1.	Dr.(Mrs) Urmila Thatte Chairperson	Professor & Head, Dept. of Clinical Pharmacology, KEM Hospital	Clinical Pharmacologist
2.	Dr. Vinay Deshmane Co-Chairperson	Consultant in Surgical Oncology & Breast Diseases, P.D. Hinduja National Hospital & Medical Research Centre	Surgeon
3.	Dr. Siddhartha Laskar Member Secretary	Professor, Dept. of Radiation Oncology, Tata Memorial Hospital	Radiation Oncologist
4.	Mr. P. K. Rao Member	Founder/ Trustee of JASCAP, Jeet Association for Support to Cancer Patients since 1996	Lay person
5.	Dr. A. Lobo Gajiwala Member	Head, Dept. of Tissue Bank, Tata Memorial Hospital	Theologian
6.	Dr. Swati Gadgil Member (till Oct 2014) Dr. Leena V. Gangolli Member (wef Nov 2014)	Anaesthesiologist & Medico-legal Consultant, Director, Ishwar Hospitals Member, Institutional Ethics Committee, Nirmala Niketan College of Home Science, Consultant, Children's Palliative Care Program, Consultant, Silver Innings Foundation	Medico-legal Expert Medico-legal Expert
7.	Dr. Renuka Munshi Member	Head, Dept. of Clinical Pharmacology TN Medical College & BYL Nair Hospital,	Clinical Pharmacologist
8.	Dr. Rajiv Kalraiya Member	Scientific Officer, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC)	Basic Scientist
9.	Dr. Prachi Patil Member	Associate Professor, Dept. of Digestive Diseases and Clinical Nutrition, Jt. Secretary, Data Safety and Monitoring Subcommittee, Tata Memorial Hospital	Gastroenterologist
10.	Dr. Devendra Chaukar Member	Professor, Dept. of Surgical Oncology, Tata Memorial Hospital	Surgeon
11.	Dr. Hari Menon Member	Professor, Dept of Medical Oncology, Tata Memorial Hospital	Medical Oncologist
12.	Dr. Priya Ranganathan Member	Associate Professor, Dept. of Anaesthesia, Tata Memorial Hospital	Anesthesiologist
13.	Dr. Kedar Deodhar Member	Professor, Dept. of Pathology, Tata Memorial Hospital	Pathologist
14.	Dr. M H Thakur Member	Professor & Head, Dept. of Radio-diagnosis, Tata Memorial Hospital	Radiologist
15.	Ms. Rohini Hawaldar Member	Scientific Officer, Tata Memorial Hospital	Statistician

IEC PROCESS

The IEC functions as per the SOPs laid down for this institution. All research projects/clinical trials involving human subjects are processed through the IEC. IEC ensures the scientific and ethical validity of the research and the protection of safety, rights and confidentiality of the research subjects. Submitted projects are assigned to the IEC – I or IEC – Ii as per their date of submissions. Each project is allocated a unique "IEC Identification Number".

The review process is as per the SOP. Each project is reviewed for its scientific, ethical, and statistical aspects. Independent consultants are invited for expert comments whenever necessary. Decisions are arrived at by consensus or by voting if the members fail to reach a consensus. Intramurallly funded projects are scored by the members as per the IEC scoring sheet.

Continuing review applications, amendments and completion reports for each projects are also reviewed.

The Data Monitoring & Safety Committee (DSMSC), subcommittee of the IEC, monitors the conduct of approved projects and reviews the deviations/ violations and serious adverse events (SAE) . It recommends compensations for research participants for trial related injuries.

IEC PERFORMANCE IN 2014:

IEC I

The committee conducted **11** full board committee meetings and reviewed a total of **101** research projects. Of these, a total of **68** projects were approved, **33** projects were subjected to modifications/ resubmission/ or are awaiting approval. In addition to these, the committee reviewed and discussed **229** amendments, **83** violations/ waivers/ deviations, **149** status reports, **492** letters.

IEC II

The committee conducted **11** full board committee meetings and reviewed a total of **79** research projects. Of these, a total of **50** projects were approved, **28** projects were subjected to modifications/ resubmission/ and are awaiting approval. **1** project was exempted from review.

In addition to these, the ICE – II also reviewed and discussed **175** amendments, **104** violations/ waivers/ deviations, **148** status reports, **294** letters during the year. .

Seven subcommittee meetings were conducted by the IEC-I. discussed **26** projects. Of these, 21 projects were approved and **five** projects are awaiting approval for fulfilling committee's recommendations for modifications and resubmission. **36** projects submitted in 2013, were approved on re submission with revisions.

The average duration from IEC submission to decision was **11.5 weeks.**

Summary

IEC- I

Project discussed		Approved		Approved with modifications		Resubmit/ Not approved		Pending for meeting
2013	2014	2013	2014	2013	2014	2013	2014	2014
69	101	40	68	23	25	06	06	01

IEC- II

Project discussed		Approved		Approved with modifications		Resubmit/ Not approved		Pending for meeting
2013	2014	2013	2014	2013	2014	2013	2014	2014
82	79	55	50	24	19	03	05	04

IEC- I expedited review

Projects discussed		Approved		Approved with modifications		Resubmit	
2013	2014	2013	2014	2013	2014	2013	2014
12	26	12	21	0	05	0	0

IEC- I & II

Projects Discussed		Extramural		Institutional* (Intra Mural / No Funding)		Sponsored (Pharma / Trade)		Thesis	
2013	2014	2013	2014	2013	2014	2013	2014	2013	2014
163	180	07	07	53	69	27	15	76	89

* Includes projects approved for funding, awaiting funding and short research conducted without funds.

The SOPs were revised to incorporate the requirements of Schedule Y, , Association for the Accreditation of Human Research Protection Program (AAHRPP) recommendations, adopt changes to comply with USA 45 CFR, and suggestions from members. An automated system for IEC administration was developed in-house and implemented.

Tata Memorial Centre -IEC was awarded Full Accreditation by the Association for the Accreditation of Human Research Protection Programs (AAHRPP) in June 2014. AAHRPP is an independent, non-profit accrediting body, which uses a voluntary, peer-driven, educational model to ensure that IECs meet rigorous standards of Human Research Protection Program (HRPP) for quality and protection in research.

Education

The TMC IEC organized SOP training for all the departments, DMGs, IEC/DSMSC members, researchers and research staff at TMH and ACTREC.

The IEC s would continue with its efforts for comprehensive Human Research Protection Program and increase awareness about AAHRPP policies and procedures; conduct audits and introduce online submission of research protocols.

Data Safety Monitoring Subcomittee

Dr. Sarbani Ghosh Laskar,
Secretary DSMSC

The Data Safety Monitoring Sub-Committee (DSMSC), a subcommittee of the TMC Institutional Ethics Committee (IEC) I & II, is responsible for monitoring patient safety during the course of the study to ensure the scientific and ethical integrity of the study**.** The primary responsibility of the DSMSC is to review and address Serious Adverse Event (SAE) and unexpected events involving all trials. It is also required to regularly monitor institutional studies and other studies as and when required or referred to by the IECs. The DSMSC, through its monthly meetings continuously over sees the studies, identifies and addresses various safety issues.

The composition of the DSMSC for the year 2014-2016 is as follows

Composition of DSMSC w.e.f. April 2014

Sr. No.	Names	Affiliation	Expertise
1.	Dr. Sarbani Laskar, Secretary, DSMSC Member, IEC-I	Professor, Dept of Radiation Oncology, Tata Memorial Hospital	Radiation Oncologist
2.	Dr. Prachi Patil, Jt. Secretary, DSMSC Member, IEC-II	Associate Professor & Assistant Gastroenterologist, Dept of Digestive diseases & Clinical Nutrition, Tata Memorial Hospital	Medical Gastroenterologist
3.	Dr. Tabassum Wadasadawalla, Member	Assistant Professor, Dept of Radiation Oncology, Tata Memorial Hospital	Radiation Oncologist
4.	Dr. Sabita Jiwnani, Member	Assistant Professor , Dept of Surgical Oncology, Tata Memorial Hospital	Surgeon
5.	Dr. Nita Nair, Member	Assistant Professor, Dept of Surgical Oncology, Tata Memorial Hospital	Surgeon
6.	Dr. Santosh Menon, Member	Assistant Professor, Dept of pathology, Tata Memorial Hospital	Pathologist
7.	Dr. Sneha Shah, Member	Assistant Radiologist, Bio-imaging Unit, Tata Memorial Hospital	Radiologist
8.	Dr. Madhavi Desai, Member	Assistant Anesthetist 'E' Dept of Anesthesia, Tata Memorial Hospital	Anesthetist
9.	Dr. Jaya Ghosh, Member	Assistant Professor, dept of Medical Oncology, Tata Memorial Hospital,	Medical Oncologist
10.	Dr. Supriya Sastri, Member	Assistant Professor & assistant Radiation Oncologist, Dept of Radiation Oncology, Advanced Centre for Treatment, Research & education in cancer (ACTREC)	Radiation Oncologist
11.	Mr. Sanjay Talole, Member	Scientific Officer 'D', Dept of Medical Records, Biostatistics & Epidemiology, Tata Memorial Hospital	Statistician
12.	Dr. Vanita Noronha, Member	Assistant Professor, Dept of Medical Oncology, Tata Memorial Hospital	Medical Oncologist
13.	Dr. Gauravi Mishra, Member	Additional Professor, Dept. of Preventive Oncology, Tata Memorial Hospital	Preventive Oncologist

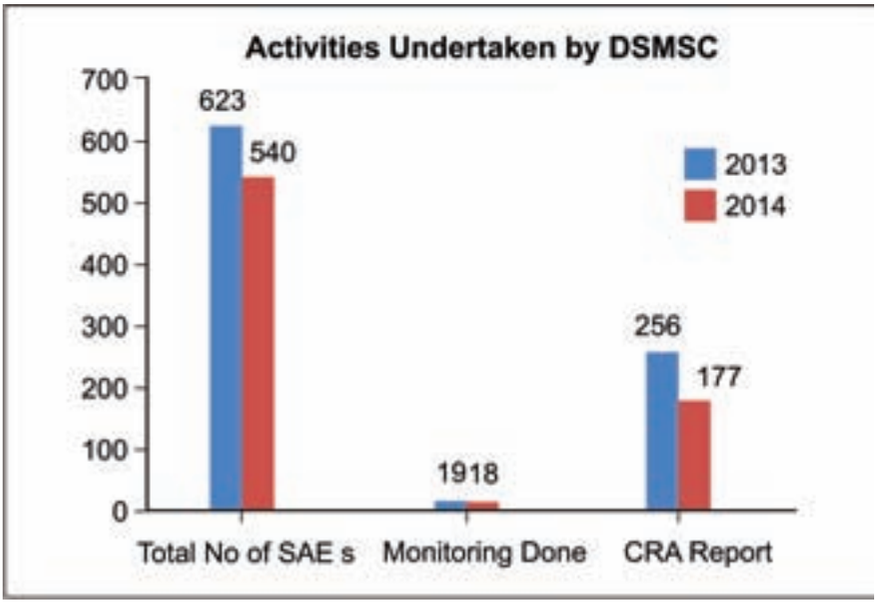
Sr. No.	Names	Affiliation	Expertise
14.	Dr. Sheela Sawant, Member	Associate Professor, Dept. of General Medicine, Tata Memorial Hospital	Physician
15.	Dr. Gouri Pantvaidya, Member	Associate Professor, Dept. of Surgery, Tata Memorial Hospital	Surgeon
16.	Dr. K Manjunath N, Member	Associate Professor, Dept of Pharmacology, Advanced Centre for Treatment, Research & Education in cancer (ACTREC)	Pharmacologist
17.	Dr. Sumitra Bakshi, Member	Associate Professor, Dept of Anesthesia, Tata Memorial Hospital	Anesthetist
18.	Dr. Tushar Vora, Member	Associate Professor, Dept of Medical Oncology, Tata Memorial Hospital	Medical Oncologist

Service

The committee conducted 12 meetings during the year to review, SAEs reported, Annual Status Reports/ Continuing Review Application for all studies and the observations with comments are forwarded to IEC for discussion. To maintain the 21 day timeline of DCGI/ CDSCO, the SAEs on regulatory trials were evaluated continuously through e- mail group of 6 members consisting of the secretaries of the IEC 1 and 2, two lead discussants, and the two secretaries of the DSMSC.

The committee receives an average of 50 SAE reports per month. A total of 540 SAE reports on 47 clinical trials were received and reviewed during the year. A total of 177 Status report were received and reviewed. In addition the DSMSC also received 65 off site safety reports for SAEs for other sites. The DSMSC monitored 18 trials during the year.

The Continuing review form, SAE reporting form and the Monitoring form were revised to include extensive details of the different aspects of the trial. It continued to maintain database for SAEs occurring at TMH, to support tracking follow-up on significant events and monitor the current status on the study events occurring on a trial. An automated system for DSMSC functioning has been developed in-house which facilitates tracking all SAE report for ongoing trials and generating reminders of Continuing Review Applications.



Tata Memorial Centre –IEC/DSMSC was awarded Full Accreditation by the Association for the Accreditation of Human Research Protection Programs (AAHRPP)

The DSMSC plans to Outsource trial monitoring to external monitors in order to increase the scope of this exercise and improve the coverage, revise SOPs and flag events in real time during the next year.

Research Projects

Principle Investigator	Project Title
Mrs. Achrekar, Meera	Developing an information booklet about sexual dysfunction and its measures and assessing its effect on knowledge of male patient's undergone surgery for urological cancer at tertiary care center.
Dr. Agarwal, Jai Prakash	Correlation of functional tumour volume of primary lung cancer with histopathological tumour size in early stage NSCLC : Primer to contouring in high dose high precision radiotherapy
Dr. Alahari, Aruna	Study of Metabolic Syndrome in Adult survivors of childhood cancers
Dr. Ambulkar, Reshma	A questionnaire survey of knowledge and practice of evidence-based medicine among peri-operative physicians in India
Dr. Amin, Nayana	Audit On Compliance Of Pre-Operative Fasting Guidelines Among Peadiatric Population In A Tertiary Cancer Hospital
	Audit on perioperative mortality and morbidity in paediatric patients undergoing oncosurgical procedures
Dr. Arora, Brijesh	A collaborative, multicentre, national trial for newly diagnosed patients with acute lymphoblastic leukaemia (ICiCLe-2014)
	A prospective observational study to assess the side effects of Imatinib in pediatric patients with chronic myeloid leukemia
Dr. Arya, Supreeta	Laryngeal squamous carcinoma: A retrospective study to evaluate accuracy of MDCT to aid decision between laryngeal conservation and total laryngectomy.
Dr. Badwe, Rajendra	A prospective study to determine concordance rate between intraoperative clinical assessment of level III axillary lymph node and histo-pathological node status in primary breast cancer
	An Audit of HER2 Positive Tumors - Is Hormone Positivity A Potential Differentiating Factor?
Dr. Bajpai, Jyoti	A Double Blind Randomized Controlled Trial of Renal Protective Effects of Normal saline plus Placebo Versus Normal Saline Plus Mannitol Prior to Cisplatin Containing Chemotherapy Regimens in Solid Tumors
	CLR_12_10 "A Randomized, Open Label, Two Period, Single Dose, Two Way Crossover, Bio availability Study of Paclitaxel Injection Concentrate for Nano-dispersion (PICN) and Abraxane in Patients with Locally Recurrent or Metastatic Breast Cancer".
	Osteosarcoma: Targeting Microenvironment in Perioperative period by Antiangiogenic drugs Celecoxib and Propranolol
	Protocol No. SB3-G31-BC- "A Phase III Randomised, Double-Blind, Parallel Group, Multicentre Study to Compare the Efficacy, Safety, Pharmacokinetics and Immunogenicity between SB3 (proposed trastuzumab biosimilar) and Herceptin® in Women with Newly Diagnosed HER2 Positive Early or Locally Advanced Breast Cancer in Neoadjuvant Setting".
	Validation of EORTC QLQ-BM 22 module into Indian language (Marathi) to study Quality of Life of osteosarcoma patients from a tertiary care cancer centre.
	Validation of EORTC QLQ-OV28 module into Indian languages (Hindi and Marathi) to study Quality of Life of Ca ovary patients from a tertiary care cancer centre

Principle Investigator	Project Title
Dr. Bakshi, Sumitra	A prospective, randomized trial to evaluate role of McGrath MAC videolaryngoscope in placement of double lumen tubes
	Audit of pain management following emergency laparotomy: A prospective observational study from an Indian tertiary cancer hospital.
	Prospective trial evaluating role of McGrath MAC blade in insertion of Double lumen tube in patients with limited glottis view with standard MacIntosh scope.
Dr. Bakshi, Ganesh	Retrospective audit of nephron sparing surgeries for renal masses at TATA MEMORIAL CENTRE
	Retrospective study to evaluate prognostic value of Lymph node density in carcinoma urinary bladder in patient undergoing radical cystectomy.
Dr. Bal, Munita	To study clinicopathological spectrum of pleomorphic adenoma: benign, recurrent and malignant transformation
Dr. Banavali, Shripad	A retrospective analysis of clinical characteristics, treatment and outcome of children with Burkitt lymphoma treated with modified MCP 842 protocol at Tata Memorial Centre from 1997-2013.
	Advancing Cancer-care through CANScriptTM Enabled Personalized Treatment (ACCEPT): A non-randomized, investigator initiated, observational trial to measure predictive power of CANScriptTM for chemotherapeutics and targeted therapy in patients with newly diagnosed, locally advanced head & neck cancer and refractory / relapsed triple negative breast cancer.
Dr. Budrukkar, Ashwini	ENT-COBRA: Multicenter data collection system to increase the visibility of Head and neck brachytherapy (ENT-BT)contribution in cancer treatment by the analysis of homogeneous and heterogeneous extended series of patients with long follow-up and to validation of high technology by learning machine
	Prospective observational study for quantification of volumetric and geometric changes in the target volume and parotid during intensity modulated radiotherapy in locally advanced oropharyngeal cancers.
Dr. Chatterjee, Aparna	Does a Supreme Laryngeal Mask Airway (SLMA) selected on the basis of a patient's weight provide an optimal fit in Indian population?
	Pattern of patient referral to the pain clinic of a tertiary cancer centre: a retrospective observational study
Dr. Chaukar, Devendra	Utility of pectoralis major myofascial flap in reducing pharyngocutaneous fistula rates after salvage total laryngectomy.
Dr. Chougule, Anuradha	Genomic Profiling in Thyroid Carcinoma
	Study to evaluate the prevalence of epidermal growth factor receptor (EGFR) mutation status in small cell lung cancer (SCLC) in india
Dr. D Cruz, Anil	Analysis of quality of life in tongue cancer patients
	Maxillectomies: a 10 year experience from a single institution
	Sequential Multifunctional MRI (Mf-MRI: DWI, MRS, DCE-MRI) In Squamous Head and Neck Tumours: Can These Parameters Act as the Markers To Predict Clinical Response To neoadjuvant chemotherapy?
Dr. Dangi, Uma	Protocol No. RI-02-002 - A multicenter, retrospective medical record review study to describe real-world treatment patterns and safety among patients receiving rituximab (MabThera® or Reditux™) to treat B-cell non-Hodgkin's lymphoma in India
Mrs. De O Carvalho, Maria	A study to assess the problems faced and coping strategies adopted by patients who have undergone radiation therapy for cancer of cervix at Tertiary cancer care centre.

Principle Investigator	Project Title
Dr. Deodhar, Jayita	Adolescents with Bone & Soft Tissue Cancer : Efficacy of psychosocial interventions for patients and their siblings
Dr. Deodhar, Kedar	Anal canal melanoma: A retrospective histomorphological review with clinicopathological correlation
	Immunohistochemical evaluation of novel biomarkers in cervix cancer: a tissue microarray based study
Dr. Deshpande, Deepak	Dose Accumulation using deformable image registration for Adaptive Radiotherapy (ART).
	Dosimetric characteristics of flattening filter free (FFF) beams from True Beam linear accelerator and Hi-Art II Tomotherapy.
Dr. Dholam, Kanchan	Squamous cell carcinoma of the oral cavity and oro-pharynx in patients aged 18-45 years:A Case- Control study to evaluate the risk factors with emphasis on stress,diet, oral hygiene and family history
Dr. Divatia, Jigeeshu	A multicentric, observational, prospective drug utilization study of antibacterial agents with special focus on vancomycin and colistin in patients admitted to the Medicine Intensive Care units (MICU) of major hospitals.
	Audit of consumption of inhaled anaesthetic agents using nitrous oxide versus medical air as a carrier gas.
Dr. Engineer, Reena	USG based brachytherapy in carcinoma cervix
Dr. Gehdoo, Raghuveersingh	Post operative analgesia following thoracic surgery- a retrospective comparison between epidural and IVPCA based analgesia
Dr. Ghadge, Meera	5-Hydroxyindoleacetic acid and serotonin in 24 hours urine of patients with neuroendocrine tumors.
Dr. Ghosh, Sarbani	A Cross sectional study to estimate the incidence of Second primary Cancers in patients with locally advanced non-nasopharyngeal Head and Neck Squamous Cell Carcinoma (HNSCC) treated with radical, non-surgical methods.
	A retrospective analysis of adult nasopharyngeal carcinoma treated with Intensity Modulated RadioTherapy (IMRT) at Tata Memorial Hospital (TMH).
Dr. Ghosh, Jaya	A retrospective audit of breast cancer patients who have received short course adjuvant or neo adjuvant trastuzumab through patient assistance program
	Protocol No. B3271002 - A Phase 3, randomized, double-blind study of PF-05280014 plus Paclitaxel versus Trastuzumab plus Paclitaxel for the first-line treatment of patients with HER2-Positive Metastatic Breast Cancer
Dr. Ghosh, Sarbani	Correlation of Metabolic and Anatomic Imaging in Patients with Nasopharyngeal Carcinoma and Evaluation of their Impact on Clinical Outcomes
Dr. Gota, Vikram	An open label, non-randomized, single dose, parallel, bioequivalence study of two formulations of Erlotinib (Innovator - Tarceva and generic - Tyrokinin) or Gefitinib (Innovator - Iressa and generic - Xefta) in adult non-small cell lung cancer (NSCLC) patients with non-squamous histology, who have undergone atleast one previous chemotherapy
	Protocol No. RLS/0314/020- A two stage, randomized, multicentric, open label, multiple dose, two-treatment, twosequence, two-period, crossover, steady state bioequivalence study of test Nilutamide 150 Mg tablets (from EirGen Pharma Ltd.,Ireland) with reference Nilandron 150 mg tablets of Sanofiaventis U.S. LLC in prostate cancer patients under fasting condition.
Dr. Gujral, Sumeet	Flow cytometric study of TCR Vß antigen expression patterns in healthy individuals and its application in T cell clonality evaluation

Principle Investigator	Project Title
Dr. Gulia, Seema	Protocol No. MYL-Her 3001- A Multicenter, Double-Blind, Randomized, Parallel-Group Phase III Studyof the Efficacy and the Safety of Hercules Plus Taxane Versus Herceptin® Plus Taxane as First Line Therapy in Patients With Her2-Positive Metastatic Breast Cancer
	Protocol No. TRA.12.001.02.1- A prospective, randomized, multi-centric clinical study to compare Trastuzumab (Test Product, Zydus) with Trastuzumab (Reference Product, Roche/Genentech) in patients with metastatic breast cancer.
	Protocol Number CT-P6 3.2 -"A phase 3,Double-Blind, Randomized, Parallel-Group,Active-Controlled Study to Compare the Efficacy and Safety of CT-P6 and Herceptin as Neo adjuvant and Adjuvant Treatment in Patients with HER2-Positive Early Breat Cancer"
Dr. Gupta, Sudeep	A prospective observational study of Chemotherapy Induced Nausea Vomiting (CINV) in patients receiving Anthracycline based chemotherapy for Breast Cancer"
	A Prospective Study To Evaluate The Incidence Of Peripheral Neuropathy In Taxane Based Chemotherapy In Epithelial Ovarian Carcinoma
	Protocol No. MO28231- A Multicentre , Single Arm Study of Trastuzumab Emtansine (T-Dm1) In Her2-Positive Locally Advanced or Metatstatic Breast Cancer Patients Who have Received Prior Anti-Her2 And Chemotherapy-Based Treatment
	Retrospective and anonymized study on breast tumors for identification of markers predictive of risk of recurrence.
	Risk factors in carcinoma breast: A questionnaire based FOGSI project of endocrinology and study of breast committees.
Dr. Hampapur, Venkat Narayan	Ease of accessibility to quality 'Public Tertiary healthcare services' in Mumbai
Dr. Jain, Parmanand	A prospective observational study to assess the efficacy of the meniscus test in predicting the correct epidural catheter placement
	An Observational study of prevalence of depression and anxiety among cancer pain clinic patients
Dr. Jalali, Rakesh	Dose Constraint Model to Predict Neuroendocrine Dysfunction in Young Patients With Benign And Low Grade Brain Tumours Treated With Stereotactic Conformal Radiotherapy
	Prospective Evaluation Of Quality Of Life In Patients With Recurrent High Grade Glioma Treated With Re-Irradiation
Dr. Jiwnani, Sabita	Feasibility and implications of thoracoscopic dissection of internal mammary nodes in central and inner quadrant breast cancer
	Protocol No. CLDK378A2301-A phase III multicenter, randomized study of oral LDK378 versus standard chemotherapy in previously untreated adult patients with ALK rearranged (ALK-positive), stage IIIB or IV, non-squamous non-small cell lung cancer.
Dr. Joshi, Amit	An Observational Study to evaluate factors predicting survival in patients of NSCLC with compromised PS.
	Germ Cell tumor outcome and long term follow up study (GTOF)
	Longitudinal Assessment of Quality of Life among Stage IV Non Small Cell Lung Cancer Patients in India
	Patient support program for metastatic castration resistant prostate cancer patients who have been prescribed Taxotere (Docetaxel) and Jevtana (Cabazitaxel) at Tata Memorial Centre, Mumbai.
	Prospective observational study of thromboembolic events in patients of advanced stage non small cell lung cancer (NSCLC) treated with platinum based chemotherapy

Principle Investigator	Project Title
Dr. Joshi, Malini	Effect of Prophylactic Dexmedetomidine on Haemodynamic Response To Double Lumen Tube Intubation Under General Anaesthesia.
Dr. Kadam Amare, Pratibha	Cytogenetic analysis helps identification of prognostic groups in multiple myeloma: the experience from India.
Ms. Kalaivani	Effect of Structured Teaching Program on Knowledge related to Self Identification and Management of Hand Foot Syndrome among patients receiving chemotherapy for colon cancer at Tertiary Cancer Care Centre
Dr. Karimundackal, George	Effectiveness of MRI brain in detecting asymptomatic brain metastases in operable NSCLC
	Patient participation in oncological decision making - How much do Indian patients understand?
	Patient participation in oncological decision making - What do Indian patients expect?
	Pattern of mediastinal lymph node involvement in resected NSCLC according to tumor location. A retrospective study
	Pleural lavage cytology as a prognostic marker in patients undergoing pulmonary metastasectomy
	Role of skeletal muscle index in predicting early postoperative complications following oesophageal cancer surgery.
Dr. Kelkar, Rohini	Microbiology of Ventilator Associated Pneumonia in a tertiary care cancer centre.
	Molecular epidemiology and resistance patterns of mycobacterial isolates from a cancer hospital
Dr. Kembhavi, Seema	Imaging Spectrum of liver tumors in children
Dr. Khattry, Navin	An Open-Label Bosutinib Treatment Extension Study For Subjects With Chronic Myeloid Leukemia (CML) Who Have Previously Participated In Bosutinib Studies B1871006 or B1871008.
Dr. Kulkarni, Suyash	Retrospective analysis of Safety & Efficacy of Percutaneous radiofrequency ablation in treatment of unresectable colorectal liver metastases.
Dr. Kulkarni, Atul	Evaluation and validation of the four scoring systems; the acute physiology and chronic health evaluation (APACHE) IV, simplified acute physiology score (SAPS) III, mortality probability model (MPM) 0-III and Cancer Mortality Model (CMM) in critically ill cancer patients
	The Fluid-Translation of Research into Practice Study (Fluid-TRIPS)
	Validation of MACOCHA score in predicting difficult intubations in cancer patients in the ICU and A prospective audit of airway management and its complications in ICU
Dr. Kumar, Rajiv	Assesment of Human Papilloma Virus in Oesophageal Cancer
	Detection and Standardization of MET, ROS and RET by Fluorescent In Situ Hybridization (FISH) in Lung Adenocarcinoma
	Detection Of Fibroblast Growth Factor Receptor (FGFR) In Squamous Carcinoma And Neuroendocrine Tumours Of The Lung
Dr. Kurkure, Purna	A prospective study to investigate the impact of malnutrition on the pharmacokinetics of anticancer drugs in young children
	Outcome of childhood acute promyelocytic leukemia treated with sequential arsenic trioxide(ATO), and all trans retinoic acid (ATRA) based therapy: A retrospective study from a tertiary care centre.

Principle Investigator	Project Title
Dr. Laskar, Siddhartha	A retrospective study to evaluate long term outcomes in paediatric patients of Nasopharyngeal Carcinoma treated with high precision radiotherapy in Tata Memorial Centre
Dr. Mahantshetty, Umesh	Patterns of Relapse, Salvage Therapy and its Outcome in Locally Advanced Cervical Cancer treated with Radical Radio (Chemo) therapy - A retrospective analysis.
Dr. Maheshwari, Amita	Preoperative and intraoperative assessment of myometrial invasion and histological grade in endometrial cancer:Role of MRI and frozen section
Dr. Manjunath K	Protocol No.RLS/0314/021- A multicentre, randomized, open-label, single dose, two-treatment, three-period, three sequence, partial replicate, crossover, pivotal bioequivalence study of Test capecitabine 500 mg tablet manufactured by Reliance Life Sciences Pvt. Ltd., India with Xeloda® (capecitabine 500 mg) manufactured by Roche Pharma AG, Germany in adult, human, cancer patients under fed condition.
Dr. Menon, Hari	Analysis of outcomes from a retrospective analysis of T-Lymphoblastic lymphoma patients (Age >=15) from 2005 - 2012
	Incidence of invasive fungal infection in patients undergoing chemotherapy for acute myeloid leukemia - impact of antifungal prophylaxis. A prospective, multicenter, observational study in India
	Outcomes of chronic myeloid leukemia in early chronic phase receiving Imatinib therapy - A retrospective analysis
Dr. Menon, Santosh	Prognostic index scoring as a tool for predicting risk of lymph nodal metastasis in penile squamous cell carcinoma
Dr. Menon, Hari	Protocol CINC424AIC01 Myeloproliferative neoplasms Epidemiological Registry in Growing and Emerging markets. The MERGE Study.
	Retrospective Analysis of patients with Acute Myeloid Leukemiawith t (8,21) cytogenetics-survival outcomes and predictive factors- A single centre study.
	Study of trough plasma imatinib levels and its correlation with early responses in Chronic Myeloid leukemia in chronic phase.
Dr. Mishra, Gauravi	A Pilot Study on Comparative Evaluation of Results of Pap Smears and HPV Hybrid Capture 2 performed on Cervical Samples before and after Application of Acetic Acid
	Comparative Evaluation of Efficacy of Different Methods of Tobacco Cessation Interventions among BEST Employees in Mumbai : A Randomized Controlled Trial
	Impact of smoke free cabs (as part of smoke free public places) on cab drivers in Mumbai, India
Dr. Muckaden, Mary	Assessment of prevalence of dyspnoea in advanced cancer and its impact on quality of life: a prospective randomized study
	Role of Megestrol acetate versus Dexamethasone for improvement in appetite and fatigue in patients with cancer associated anorexia cachexia: A prospective single blinded randomized controlled trial
Dr. Myatra, Sheila	Can transiently increasing tidal volume to 8 ml/Kg PBW and measuring PPV improve the reliability of PPV in patients receiving low tidal volume ventilation?
	Prospective Study To Determine the Incidence And Risk Factors Associated With ICU Delirium In Indian Cancer Patients.
Mrs. Nair, Reena	A study to find out the problems faced by young adult survivors of childhood malignancies at a tertiary cancer centre.
Dr. Nair, Deepa	Prophylactic antibiotics in operable oral cancer: short course versus prolonged course - a randomized control trial

Principle Investigator	Project Title
Dr. Noronha, Vanita	Retrospective analysis of patients who have received docetaxel, platinum and 5-fluorouracil as induction chemotherapy for ca esophagus and gastroesophageal junction.
	Retrospective analysis of patients with small cell lung cancer with compromised performance status.
Dr. Ostwal, Vikas	PROTOCOL NUMBER: BEVZ92-A-01-13- Open label randomized bioequivalence study to evaluate the pharmacokinetic (PK) and safety profile of Bevacizumab Biosimilar (BEVZ92) in combination with FOLFOX or FOLFIRI versus Bevacizumab (AVASTIN®) in combination with FOLFOX or FOLFIRI as first-line treatment in patients with metastatic ColoRectal Cancer (mCRC)
Dr. Pai, Prathamesh	To determine chief patient concerns at outpatient clinics after diagnosis and treatment of their head and neck cancers using Patient Concern Inventory(PCI) questionnaire at Tata Memorial Hospital-Mumbai
Dr. Parekh, Amrita	Agreement between noninvasive blood pressure (NIBP) measured at the arm and ankle
Dr. Parmar, Vani	Observational study to compare accuracy of clinical examination under anaesthesia, Axillary ultrasound and Histo-pathological examination for axillary nodal staging in women with clinically N0 Carcinoma Breast.
	Retrospective audit to assess the impact of tumour biology on locoregional treatment in breast cancer
	Retrospective review of outcomes of breast cancer patients with oligometastases
	To assess the cosmetic outcome in patients undergoing breast conservation surgery (BCS) with or without deep suture approximation of the primary surgical cavity
Dr. Patil, Prachi	A hospital based registry to study the distribution, patterns of care and outcomes of rare tumors of the digestive tract
Dr. Patil, Vijaya	Changes in coagulation profile and epidural catheter safety for liver resection in malignancy.
	Eosinophilia in surgical patient & its impact on perioperative management
Dr. Patil, Prachi	Patterns of care for biliary tract cancers: a single center experience
	Prevalence and predictors of malnutrition and its impact on quality of life in patients with Gastric cancer - a single centre prospective study
	Prevalence and predictors of malnutrition in patients with esophageal cancer- a single centre prospective study.
Dr. Patil, Asawari	Prognostic significance of histological tumor regression in primary tumor and nodal metastases in patients with oral squamous cell carcinoma, treated by neo adjuvant chemotherapy followed by surgery: A retrospective study
Dr. Patil, Vijaya	Ultrasound Confirmation of Endotracheal tube placement with the saline filled cuff technique and comparison of depth of insertion with chest X-ray
Dr. Patil, Prachi	Yield of esophagogastroduodenoscopy and colonoscopy in cancer of unknown primary: a prospective single centre study
Dr. Pimple, Sharmila	Compliance, perceptions and attitudes of Bus employees and commuters towards smoke free bus policy (as part of smoke free public places) in Mumbai, India
Dr. Prabhash, Kumar	A randomized trial to compare skin toxicity of Gefitinib versus Erlotinib in patients with unresectable locally advanced or metastatic Non Small Cell Lung Cancer (NSCLC) who failed previous platinum based chemotherapy
	Comparative study of QOL of patients on Pemetrexed versus Erlotinib in Maintenance therapy for Advanced NSCLC (Other than Squamous Cell Carcinoma)
	Retrospective analysis of efficacy of Gefitinib in Non Small Cell Lung Cancer

Principle Investigator	Project Title
Dr. Pramesh C.S.	Effect of screening with low-dose CT scan and visual examination on lung and oral cancer mortality - a pilot survey prior to initiating a randomized trial
	Hand sewn versus stapled esophago gastric anastomosis - Does the type of anastomosis influence quality of life in long term survivors?
	Validation of the clavien dindo classification in esophageal surgery
Dr. Purandare, Nilendu	A pilot project to evaluate PET-CT as predictive factor for response and resection of tumor in oral cavity cancer
	Prediction of tumor response to neo-adjuvant therapy in adenocarcinomas of the gastroeosphageal junction (AEG) using FDG PET/CT.
Dr. Puri, Ajay	Retrospective audit - Treatment Of Non Metastatic Primary Sacral Tumors
	Vascular Resections in Extremity Sarcomas : Retrospective audit of survival and surgical morbidity
Dr. Rajadhyaksha, Sunil	A study of hemolysis in red cell concentrates during transportation
Dr. Rangarajan, Venkatesh	Evaluation of radioimmunoconjugate (131I and Rituximab) SPECT imaging for staging of CD-20 positive Non-Hodgkin Lymphomas
	Standardizing interpretation criteria for early Response evaluation with 18f-FDG PET/CT in pediatric lymphoma
Dr. Rekhi, Bharat	Clinicopathological Spectrum of Pseudosarcomatous Lesions of Soft Tissues
	Differential expression of specific skeletal muscle markers in rhabdomyosarcomas
Dr. Saklani, Avanish	A Comparison between Laparoscopic and Open Surgery for Colorectal Cancer
	Peritoneal cytology in operable colorectal cancers - a prospective study
Dr. Sareen, Raman	Audit of Postoperative pain management practices in Children in a tertiary cancer hospital: A prospective observational study.
Dr. Sengar, Manju	The molecular landscape of diffuse large B-cell lymphomas on the Indian sub-continent
	Therapeutic Drug Monitoring Of Posaconazole In Adult Patients Receiving Posaconzole Prophylaxis During AML Induction: A Feasibility Study.
Dr. Shah, Sneha	Interim treatment response assessment in lymphoma by using different criteria on FDG PET CT
Dr. Sharma, Kailash	A prospective randomized controlled study to compare between clinical assessment methods and lung ultrasonography to confirm position of double lumen tube in elective thoracic surgeries involving one lung ventilation, at Tata Memorial Hospital
	Evaluation of Success Rate of Cobra PLA and LMA Supreme in Novices, our experience from a teaching hospital.
Dr. Shet, Tanuja	Histopathologic grading system in Phyllodes Tumors (PTs) - In search of a prognostically relevant system
Dr. Shetty, Omshree	Association of ANXA1 expression in HPV positive Penile Carcinoma
	Granulomas in draining nodes in Breast Cancer: Tuberculosis or resolved metastasis?
	Study of circulating microRNA (miRNA) as a Potential Biomarker in Breast Cancer
Dr. Shrikhande, Shailesh	A retrospective analysis of clinical characteristics, treatment and outcome of patients with locally advanced or metastatic gall bladder cancer treated at Tata Memorial Centre, Mumbai from January 2012 to Oct 2013
	Perihilar and intrahepatic cholangiocarcinoma : challenges and future perspectives
Dr. Shrivastava, Shyam Kishore	Radiation Incidents And Contributing Factors In External Beam Radiotherapy-Audit In Department Of Radiation Oncology

Principle Investigator	Project Title
Dr. Shylasree, TS	Surgery in young women (=/ <40 years) in gynaecological oncology, retrospective analysis of clinical practice at a tertiary referral centre
Dr. Singh, Vincent	Exercise for the management of cancer-related fatigue in advanced lung cancer planned for systemic palliative therapy: randomized controlled trial.
Dr. Solanki, Sohan	Comparison of actual and ideal body weight on appropriateness of ProSeal laryngeal mask airway in Indian overweight patients - a randomized open label study.
	Ultrasonographic assessment of cross-sectional area of internal jugular vein and relationship of internal jugular vein and carotid artery
Ms. Sunder, Irene	An audit of practice followed by nurses while handling peripherally inserted central catheter (PICC) at Tertiary Cancer Care Centre.
Dr. Tendulkar, Anita	High hemoglobin in blood donores:Validating portable hemoglobinometer
Dr. Thakur, Meenakshi	Retrospective audit and radiopathological correlation of breast lesions excised by hook wire localisation method
	Role of MDCT in pre operative staging of the urinary bladder cancers
	Role of MRI in Evaluation of Malignant Lesions of the Breast
Dr. Thota, Raghu	A survey on approach to anticipated difficult airway management among anaesthesiologists with a focused interest in Airway management .
	Postoperative residual curarization and critical respiratory events in post anaesthesia care unit: an observational study
Ms. Vagal, Manjusha	Vaginal stenosis following treatment of cervical cancers and the effectiveness of rehabilitation interventions: A retrospective study
Dr. Wadasadawala, Tabassum	Pattern of Loco-Regional Recurrences in breast cancer, its retreatment and clinical outcomes

TATA MEMORIAL CENTRE
टाटा स्मारक केंद्र
SERVICE RESEARCH EDUCATION

education

Caring with Technology

Dr. Kailash Sharma,
Director (Academics)

Academics

Tata Memorial Centre is affiliated to Homi Bhabha National Institute (HBNI) Mumbai, a Deemed University, for PG training in oncology and other broad specialty. The institution is a "Grant in Aid Institution" affiliated to Homi Bhabha National Institute under the Department of Atomic Energy.

The academic division of the centre over looks and facilitates all educational activities under Tata Memorial Hospital (TMH), the Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), and Centre for Cancer Epidemiology (CCE).

Tata Memorial Centre is a recognized training centre in cancer education and research by several national and International organizations, including WHO, IAEA and INCTR. The TMC – Academics continued to build capacities by imparting knowledge through various educational activities and research.

Academic Activities

The Hospital offers education through various activities like PG courses, and training through short term observer ship and other training programs. About 110 post graduate medical students were registered in 2014 for PG courses in various disciplines. Two major post graduate courses viz. "M.Sc. - Clinical Research and diploma in Fusion Technology", was approved by HBNI and initiated during the year.

Six months training programme at Tata Memorial Centre

The training programs are in the form of short term courses and observerships. The primary aim of such short term training programs is to train various specialists on sponsorship basis in oncology and other supportive branches.

Observership programme at Tata Memorial Centre

- Approximately 470 specialist including dental surgeons have visited Tata Memorial Centre as Observer from all over India in the year 2014.
- In the year 2014, 17 overseas specialists as observer and approximately 35-40 Oncology trainees have visited TMC for 06 Month training.
- Various specialist and dental surgeons from all over the country visits under observership program every year around 350 – 400

Collaborative Exchange Programme

The centre is engaged in collaborative educational exchange programme with Seth G.S. Medical College & KEM Hospital, Children Wadia Hospital and Lokmanya Tilak Municipal General Hospital. Under this program students from these institutes are posted for practice and wider experience and knowledge.

Superspeciality Courses

Sr.No	Name of the Postgraduate Course	Approved by	Affiliated To	Duration in Years	No. of intake capacity Year 2014
1	M.Ch.(Surgical Oncology)	Medical Council of India, New Delhi Approved	Homi Bhabha National Institute (Deemed University) (HBNI)	3	16
2	M.Ch.(Gynecological Oncology)			3	02
3	M.Ch (Plastic Surgery)			3	02
4	M.Ch. (Head & Neck Oncology)			3	04
5	D.M.(Medical Oncology)			3	14
6	D.M. (Critical Care)			3	02
7	D.M. (Paediatric Oncology			3	02
8	D.M. (Gastroenterology)			3	02
9	MD (Pathology)			3	12
10	MD (Anesthesiology)			3	20
11	MD (Radio-diagnosis)			3	10
12	MD (Radiotherapy)			3	16
13	MD (Microbiology)			3	01
14	MD (Immuno Hematology & Blood Transfusion)			3	03
15	MD (Nuclear Medicine)			3	02
16	MD (Palliative Medicine)			3	02
17	P.hD (Medical Physics) (04 Internal TMC Employee & 05 External BARC Employee)	HBNI		3	—
18	P.hD (Epidemiology) (Out of Total 06, 01 Sponsored Candidate)			3	06
19	DNB (Nuclear Medicine)	NBE		3	02
20	02 Yrs Certified Fellowship	HBNI	National Board of Examination	2	11
21	M.Sc Nursing (Oncology)	MAHARSHTRA NURSING COUNCIL & INDIAN NURSING COUNCIL	MAHARSHTRA NURSING COUNCIL & INDIAN NURSING COUNCIL	2	06
22	Advance Diploma in Radiotherapy Technology	DTE & MSBTE, Mumbai	Maharashtra State Board of Technical Education (MSBTE)	2	07
23	Advance Diploma in Medical Imaging Technology			2	15
	Total				155

Training Programme From January 2014 To December, 2014

SR. NO.	NAME OF THE TRAINING PROGRAMME	DEPARTMENT	No. of Trainees
1	Certificate course in Hospital Infection control	Nursing Department	16
2	Certificate course in Preventive Oncology	Preventive Oncology	12
3	Six months Advanced Hematology Training Course for Technologists	Haematology	4
4	Six Months Molecular Haematology Training Course for Technologists		4
5	Six months training course in Flow Cytometry		4
6	Advanced Clinical Biochemistry Technologist Training Course	Biochemistry	4
7	Advanced Cancer Cytogenetic Training Course	Cancer cytogenetics	4
8	Advanced MRI Imaging Training Course for Technologists	Radiodiagnosis	2
9	Train the Trainers Program in Palliative Care	Palliative Medicine	11
10	PB Desai / UICC Fellowship	Onco - Pathology, Surgical Oncology, Radiation Oncology	2
11	Certified Training in Oncology for Doctors	—	24
12	Oncology Speech Rehabilitation for Graduate Speech Therapists	Head & Neck Oncology	1
13	Post Basic Diploma in Oncology Nursing	Nursing Department	11
14	Certificate Course for Medical Secretary	M.S. Office	2
15	Library Trainees	Library Sciences, TMH	1
16	Certificate course in Intensive Care Nursing	Nursing Department	20
17	Certificate Course in Enterostomal Therapy	Nursing Department	7
18	Certificate course for CVAD	Nursing Department	14
19	Apprenticeship Trg. Programme for PET/CT	Nuclear Medicine	4
20	Apprenticeship Training (BOAT)	Pathology, Cytology	7
21	Oncology Training (Defence Doctor)	Anaesthesiology	3
	Total		157

Conferences/Workshop/Seminars in the year 2014

Name of Conference	Date	Department
	January	
IHPBA Conference	9th	Surgical Oncology
Training Programme for super & labour staff	20th to 22th	General Administration
Nurses Annual Day	24th	Nursing
ONCORECON Workshop	20th to 24th	Surgical Oncology
CME On challenges in Radiation Protection In Radiology	25th	Radio-Diagnosis
	February	
Cytopathology Conference	1st & 2nd	Cytopathology
1st Intern. Children's Pall. Care Network (ICPCN) Conference	9th to 12th	Palliative Care
Workshop & Symposium On " Complex Neurosurgery" & Live Surgical Workshop	20th to 22nd	Neurosurgery
Evidence based management conference 2014	27th & 28th	CRS
	March	
EBM 2014	1st & 2nd	CRS
Echocardiography Workshop	8th & 9th	Anaes., Critical Care & Pain
Training Programme for super & labour staff	10th to 12th	General Administration
ONCORECON Workshop	10th to 14th	Surgical Oncology
Children Palliative Care Training	12th to 14th	Palliative Care
Paediatric Oncology Workshop	15th	Medical Oncology
Comprehensive Rehabilitation in Bone & Soft Tissue Tumors	22nd	Physiotherapy
TEP Conference	22nd & 23rd	Head & Neck Oncology
	April	
Workshop (ONAI)	4th & 5th	Infecttion Control Office
Teaching Pathologist Conference	12th	Pathology
Anaesthesia Review Course 2014	18th to 20th	Anaes., Critical Care & Pain
Oncorecon Workshop	21st to 25th	Surgical Oncology
Molecular Epidemiology Workshop	21st to 25th	Centre for cancer Epidemilogy
	MAY	
Cloud Based Collaboration For Radiotherapy Clinical Trials & Training	6th to 8th	Radiation Oncology
4th Basic Haematology Course	30th & 31st	Pathology

Name of Conference	Date	Department
	June	
Ugam, Childhood cancer survivor support group-Annual Function	1st	Medical Oncology
CVAD Workshop	2nd	Nursing
CET & VIVa for ADMIT Course	25th	Academic Office
Rehabilitation in Breast Cancer	28th	Physiotherapy
	July	
4th Postgraduate training programme in oncology for occupational therapist	17th to 20th	Occupational Therapy
	August	
Comprehensive Critical Care	2nd & 3rd	Anaes., Critical Care & Pain
	September	
OTP Course & Ortho Onco Meet	6th & 7th	Surgical Oncology
CRM Workshop 2014	13th & 14th	CRS
International Pediatric Oncology Nutrition Workshop	27th & 28th	Medical Oncology
	October	
CPR Workshop	10th	Anaes., Critical Care & Pain
World Hospice & Palliative Care Day	11th	Palliative Medicine
THEMATIC 2014	18th & 19th	Anaes., Critical Care & Pain
CME in Surgical Pathology	31st	Pathology
	November	
CME in Surgical Pathology	1st	Pathology
Workshop Nursing Education	5th	Nursing
AAHRPP Workshop	7th & 9th	IRB
15th National Conference ONAI	13th to 15th	Nursing
1st CME & Workshop in clinical Biochemistry	16th	Biochemistry
ONCOSURG 2014	21st to 23rd	Head & Neck Oncology
TMC National Conference	21st To 25th	Anaes., Critical Care & Pain
TMC National Conference on the Difficult Airway	28th to 30th	Anaes., Critical Care & Pain
	December	
CME Programme a(All India Level)	6th & 7th	Radio-Dignosis
3rd National Conference on Tabacco or Health	13th & 16th	Preventive Oncology
11th Annual Workshop on “Cancer Rehabilitation”	19th & 20th	Physiotherophy
4th CME for medical Lab Technologiest	20th & 21st	Haematopathology
8th CME on Histotechnology	26th & 27th	Pathology

Staff Achievements

Dr Vandana Agrawal	Member Secretary to National Body - Indian Society of Critical Care Medicine since Feb 2014, re-elected for 2nd term (Feb 2015-2016).
Dr Reshma Ambulkar	Appointed Treasurer, Mumbai branch of Indian Society of Critical Care Medicine for the period 2013 - 2014
Dr. R.A. Badwe	Honored with 'Praman Patra' for his services in the field of medicine from Government of Punjab.
Dr Ganesh Balasubramaniam	Nominated, Expert Committee member of Board for Research in Nuclear Science(BRNS), DAE for various health Survey Projects.
Dr Shilpushp Bhosale	Selected for one-year paediatric critical care fellowship at Sick Kids Hospital, Toronto
Dr. Pankaj Chatuvedi	Awarded, BMJ award for health
	Awarded, Oral Cancer Foundation award for contribution in the field of oral cancer.
	Awarded, Sushrut Award 2015, National Oral health program by Dr. A.P.J Abdul Kalam.
Dr. Gauraiya Chinchalker	Bruce Davis Gold Medal in Palliative Care.
Dr. S Chopra	Awarded, Best Paper Award in Young Radiation Oncologists Conference , YROC, AROI
Ms. Pooja Dalvi	Awarded, 1st Prize in oral paper presentation on Annual The Cytometry Society Meeting and 15th Indo-US Clinical Cytometry workshop 2014 at AIIMS , New Delhi.
Dr. Anuradha. A. Daptardar	Awarded, Significant Achievement Award, by the Indian Association of Physiotherapists for contribution in the field of Oncology Physiotherapy.
Dr. J Deodhar	Office bearer**,** Indian Psychiatric Society- West Zonal Branch (2012 – 2014)
Dr. Anuja Deshmukh	Awarded, Best Poster prize with Gold Medal, "Retrospective study of Major glossectomy in tertiary cancer centre", organized by 14th National Conference of FHNO.
Dr. D.D. Deshpande	Invited expert (Chairman), Committee of Department of Scientific and Industrial Research (DSIR), Govt. of India, Delhi for review of project of developing indigenous Simulator
Mr. Nilesh Deshpande	Awarded, 2nd Prize for poster (Flow cytometric assessment of T-cell clonality using T-Cell receptor Vâ analysis is a sensitive & rapid method for the diagnosis of T-CLPDs) on 15th Indo US Flow Cytometry Workshop in Lucknow.
Dr J V Divatia	Dr. E. Tambe oration: "Anaesthesia and Patient Outcomes" Annual Meeting of ISA Nagpur, Nagpur, January 25, 2014
	International Guest Editor, Intensive Care Medicine (Journal of the European society of Intensive Care Medicine)
	MahaCriticon 2014 oration: "Errors in the ICU" Maharashtra State ISCCM Conference, Aurangabad, September 19-21, 2014.
	Member, ICMR Expert Group on Antimicrobial Resistance
	Oration : "End of Life Care in Indian ICUs" Criticare CME at Kochi, ISCCM Cochin: May 17-18, 2014
	President, All-India Difficult Airway Association
Dr Jeson Doctor	Awarded, 2nd prize in the "Young Talent Search" Competition organized by ISCCM Mumbai Branch for Criticon Mumbai 2014. Presentation on "5 most important points to improve intensive care in India"
	Member, National Executive Committee and Treasurer of All India Difficult Airway Association (AIDiAA) since June 2014.

Dr. R. P. Gehdoo	Awarded 'Fellow' Indian College of Anesthesiologists (FICA), 28-29th June 2014.
Mr. Sampat Godage	Awarded, 1st Prize for poster [P6/D1-PANDA-pattern on ADVIA2120i is highly Sensitive and very specific tool in the identification of Acute Promyelocytic Leukemia (APML)] on 4th CME for Medical Lab. Technologists 2014 at Tata Memorial Hospital, Mumbai.
Dr. S. Gujral	Member, ICMR task force for guidelines on immunophenotyping
Dr. Ashish Gulia	Awarded, S.S. Yadav Gold Medal for best scientific presentation at 59th annual national orthopedic conference of Indian Orthopedic Association at IOACON 2014 (Hyderabad, India).
Ms. H. Jain	Awarded, 1st Poster award, "Chromosome 5, 7 and 8 aberrations study in newly diagnosed adult and pediatric AML: A single institution study."37th Ann Conference of Mumbai Hematology Group MHG Group ,22nd-23rd March, 2014 Poster Presentation."
Dr. Puneet Jain	Awarded, 2nd Prize for case presentation titled "A case of multiple alloantibodies in a patient of primitive neuro-ectodermal tumour (PNET)" during the CME organized at PD Hinduja Hospital, Mumbai on 22nd August 2014.
	Awarded, 3rd prize for oral presentation titled "antibody titres in group O donors by microplate method" during 3rd Annual conference of ISTM (TRANSMEDCON 2014), Ahmedabad, 14-16th November 2014.
Dr. P. N. Jain	Bamacharan Hemlata Dhar oration : National conference of geriatric society of India, GSICON , Nagpur, on 8th Nov 2014
	Member, Executive body in International Association for the Study of Pain (IASP) in developing countries chapter (2014-16) at Buenos Aires, 6th October, 2014
Dr. R. Jalali	Gen Secretary, Indian Society of Neuro Oncology and Convener, Mumbai Award for Excellence in Pediatric Clinical Research in SNO for Neuro-Oncology (SNO)
	Awarded, SNO Excellence in Pediatric Clinical Research in Neuro-Oncology
Ms. Swapna Joshi	President, TNAI Maharashtra State Branch
	Chairperson, Paediatric Nursing, TNAI(National Level)
Dr. P. S. Kadam Amare	Awarded, 2nd Poster award, "CLL with IgH translocation is a distinct subclass, further subtyped into IgH-BCL2 and IgH-BCL3 with unique clinicopathologic and genetic features" 37th Ann Conference of Mumbai Hematology Group MHG Group ,22nd-23rd March, 2014
Dr. S.S. Kulkarni	Secretary, Indian Society of Vascular and Interventional Radiology (ISVIR)
Dr. S.S. Kulkarni	Founding Member of Indian Society of Interventional Oncology
Dr. A. P. Kulkarni	President Elect, National Executive body of Indian Society of Critical Care Medicine (2014-2016)
Dr. S. Laskar	Elected President of the Forum for Young Radiation Oncologists of India, AROI, India
Dr. S. Laskar	Elected Vice President (Junior) of the Association of Radiation Oncologists of India (AROI), AROI, India
Ms. Carmine Lazarado	President AORN
Dr. Abhishek Mahajan	Awarded, Distinction in the MRes Program at King's college London.
Dr. U Mahantshetty	Associate Editor, IJROBP.
Dr. Santosh Menon	Awarded, Best Poster Award 'Spermatocytic Seminoma: Clinico-pathologic case series from a tertiary oncology cancer institute in India", London Uropathology 2014 conference.
Mr. Trilokinath Mishra	President, Society of Indian Radiographers (Regd)-(A National Association of Radiographers)
Mr. Trilokinath Mishra	Special Executive Officer (SEO) – Govt. of Maharashtra.
Dr. Mary Ann Muckaden	Chair, International Children's Palliative Care Network, Lead in Indo-American Cancer Association for Palliative Care Training and Lead for the End of Life Care Consortium (joint association of Indian Association of Palliative Care and Indian Journal of Palliative Care)

Dr. Sheila Myatra	Awarded, Fellowship of the American College of Critical Care Medicine (FCCM) 2014 to be awarded at ACCM Convocation in January 2015
	Member Organizing committee, World Airway Management Meeting, Dublin 2015
Dr. Swapnil Parab	Awarded, 1st Prize for Video Presentation at National Airway Conference (NAC-2014) at Mumbai.
	Awarded, 2nd prize for Free Paper Presentation at National Conference (ISACON 2014), Madurai, India.
Dr. Vijaya Patil	KN Shah oration : GISACON, Annual Anaesthesia meeting by Gujarat ISA, 12th October 2014
Dr. Ajay Puri	President-Elect, Asia Pacific Musculoskeletal Oncology Society.
Dr. S.B. Rajadhyaksha	Oration: King George Medical University, Lucknow.
Dr. V. Rangarajan	Principle lead country coordinator, IAEA-RCA project on hybrid imaging in Oncology.
Dr. Bharat Rekhi	Member, subcommittee for development of management guidelines for Epithelial Ovarian Cancer, Indian Council of Medical Research
	Elected Member, Executive Committee of the Indian Academy of Cytology for 2015-17
Mrs. Sulochana Retnamony	President ONAI
Dr. R. Sarin	Chairperson, ICMR Expert group meeting for Stem Cell Research & Therapy, New Delhi, ICMR, New Delhi
	ICMR Task Force for National Guidelines for Evidence Based Management Guidelines - Breast Cancer, ICMR
	Scientific Advisory Committee, ICPO, ICMR New Delhi
Dr. Aekta Shah	Awarded, Second prize, "Retrospective audit of the results of ALK gene rearrangement by FISH in lung adenocarcinoma and correlation with histopathology subtypes", XXXth ICON meeting, Ahemedabad, April 2014.
Dr. S. S. Shastri	Chair Committee, Development of Resource Stratified Screening Guidelines for Cervical Cancer.
	Expert, Committee on Regional Control of Non-Communicable Diseases.WHO-SEARO
	Expert, Development of Breast Cancer Screening Guidelines Handbook, IARC.
	Expert, Guidelines Committee for WHO Position paper on Mammography, Geneva.
	Humanitarian Award, American Society of Clinical Oncology (ASCO) on June 1, 2014 at the 50th Annual Conference of ASCO in Chicago, Illinois, USA.
	Oration: Hugh Barber Oration, Annual meeting of the American Society of Gynecologic Oncology, March 2014.
Dr. S. V. Shrikhande	Honorary fellowship, Royal College of Surgeons of England - FRCS (Ad Eundem).
Dr. S. K. Shrivastava	Awarded, SCRAC Award, Nanavati Hospital, Mumbai
	Oration: AMPI Oration, Association of Medical Physicist's of India
	Oration: Clinical Perspective & Safety during Advanced Radiation Therapy Treatment, at AMPICON, Association of Medical Physicist's of India
	Oration: Dr GN Agarwal Oration, 28thFoundation day celebration KGM University, Lucknow
	Oration:Dr TB Patel Oration Gujarat Cancer & Research Institute, Ahmedabad
Dr. Sohanlal Solanki	Editor, Global Journal of Anesthesiology, Italy
Dr. P. G. Subramanian	Coordinator, Multicentric Minimal residual disease based risk stratification therapy trial for pediatric ALL under ICICLE group
Dr. T. Wadasadawalla	Gold Medal, Best paper presentation, Kochi

.

Centre for Cancer Epidemiology (CCE)

Annual Report
2014-2015

Caring with Technology

Cancer Epidemiology

Dr. Rajesh Dikshit
Dr. Atul Budukh

Service

The objective of Centre for Cancer Epidemiology (CCE) established in 2009 under the TMC is to conduct cancer epidemiological research and build capacity through education. The new building for the centre is housed at ACTREC campus will be operational by end of 2015.

The centre aims at studying cancer burden, identifying the role of genetics and lifestyle related cancer causing factors, and building capacity through education and training in the field of cancer epidemiology and public health.

The activities focus around two main aspects namely, descriptive epidemiology and analytical epidemiology and, it also extended its expertise for education and training.

As a part of IARC Regional Hub, a new cancer registry was established in Bhutan and the cross sectional survey for CHSS beneficiaries at NPICL sites was completed. A migration tool for easy data porting of cancer registry called Cancer Registry software (CANREG-5) was developed.

Research

Some of the ongoing research focused on identifying causes of gall bladder cancer, lung cancer in non smokers and brain tumours due to mobile phone usage. The project to develop low cost and feasible technology to detect HPV from menstrual pad is also ongoing. The cohort study at Barshi continued.

Education

The education and training programme consists of short term and long term training and doctoral degree programmes in epidemiology. The educational programmes are affiliated to faculty of Health Sciences, HBNI. A doctoral research on risk factors for breast cancer in rural and urban India by a student was completed during the year. Several training programmes and workshops were organized, namely, Cancer Registration in collaboration with IARC, Molecular Epidemiology workshop in collaboration with US-NCI and a training programme on improve quality of cause of death certification and coding was also organised in collaboration with to US-CDC.

Preventive Oncology

Dr Surendra S. Shastri,
Head

Dr Sharmila A. Pimple
Dr Gauravi A. Mishra

Service

The objective of the department of Preventive Oncology is to conduct hospital and community based clinics for the prevention, screening and early detection of common cancers.

5,441 new patients and 4,626 follow up cases were registered in the Preventive Oncology clinic at TMH in 2014 and registered 1703 new patients at the quit tobacco clinic. The department is recognized as a WHO Collaborating Centre for Cancer Prevention, Screening and Early Detection.

During the same period over 1,50,000 patients continued to be followed up in the TMC Urban Outreach Programme and 1,10,000 were registered under the TMHMOP programme which covers affected population near BARC.

Education

The department conducted 6 certified training courses for medical and paramedical personnel. The department also trained Medical Officers and Paramedical staff of the Directorate of Health Services, Government of Maharashtra. The 3rd National Conference on Tobacco or Health was organised in the month of December . Over 50 public lectures, exhibitions and awareness programmes were arranged by the department in Mumbai, Navi Mumbai, Sangrur and Mullanpur.

Research

The department continued the follow-up observations in 2 large randomized controlled trials in Mumbai and one in Barshi. Five case control/ cross-sectional observational studies, one biomarker development/ validation study and one health economics study are also being conducted in the department.

Nine papers were published in international peer-reviewed journals including in Nature, Lancet Oncology and JNCI. Four books chapters were authored by departmental staff in 2014.

Dr B Ganesh,
Head

Medical Records, Biostatistics and Epidemiology

The department is responsible for issuance patient case files and scanning of previous case files to maintain medical records of the institution in electronic format. The department is also the custodian of the Clinical Information System (CIS) and it involved in its design and implementation at various Disease Management Group clinics.

The Hospital Based Cancer Registry is one of the major activities of the Department and collects demographic and clinical data of the patients registered in TMH. In the year 2014, the department abstracted data from approx. 35,000 case file records, of which about 21,500 were cancer cases.

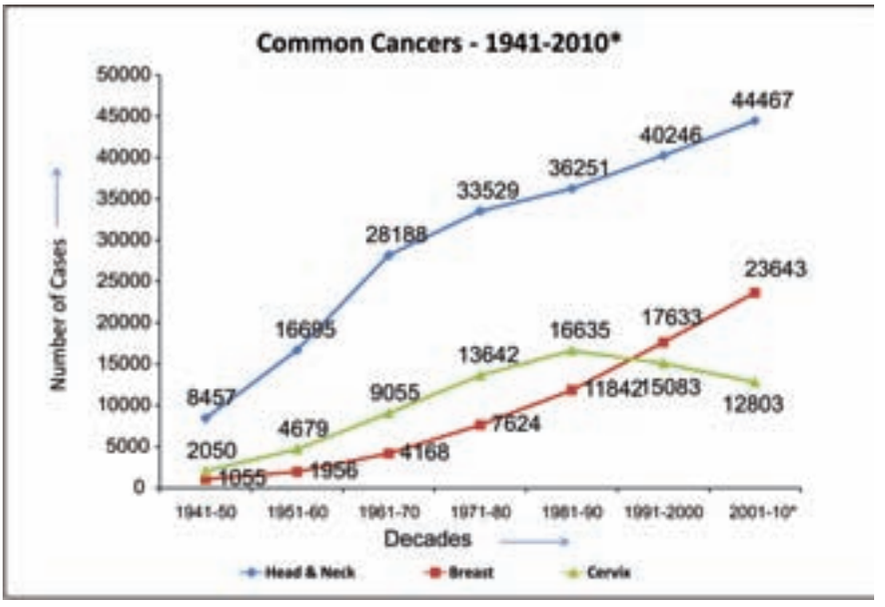
The department continued the survival study for Cancer Breast, Cancer Cervix and Head and Neck Cancers cases under the "Patterns of Care & Survival Studies (POCSS) Project. The Project has collected data from 6,074 Breast cancer, 2,640 Cervix cancer and 8,600 Head and Neck cancer cases. The department also supports research activity by designing, analysis and interpretation of Clinical Data.

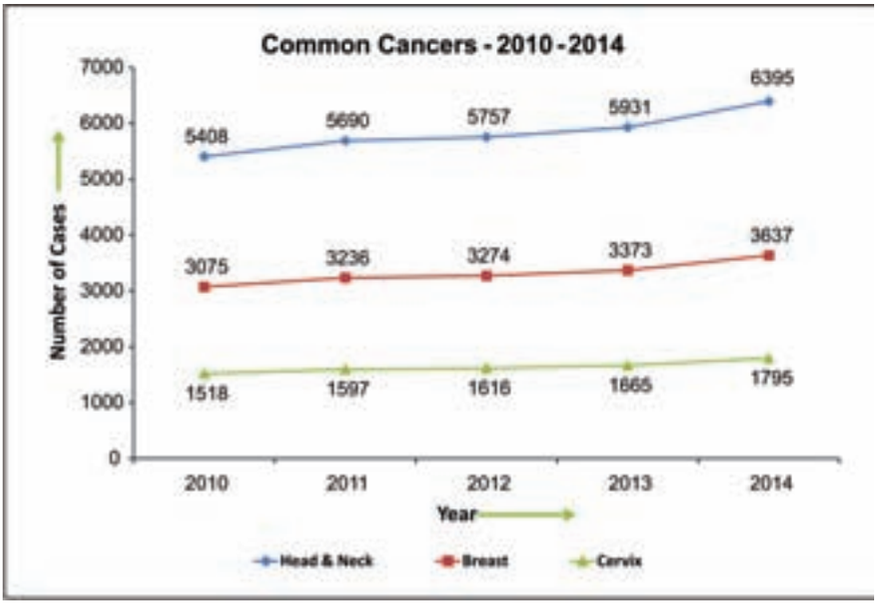
It has set up a new Population Based Cancer Registry (PBCR). The Department runs PBCR registries in Ratnagiri, Sindhudurgh, Tarapur, Karwar, Rawatbhata, Kakrapar, Kalpakkam, Kudankullam and Visakhapatnam.

Health Checkup activities for the population in Kaiga, Rawatbhata and Kota have also been initiated.

Regular data entry training programmes are organized for medical transcriptionists and the data captured is routinely monitored. To enable easy and real time data capturing to registry data base, a tablet based PBCR system is under development.

Cancer Trend in TMH





Education

The department is actively involved in teaching Nurses, Ph. D. and Research Students in epidemiology and infection control. It also trains cancer registry personnel in other cancer centres run by Department of Atomic Energy.

ACTREC

Advanced Centre for Treatment, Research and Education in Cancer (ACTREC)

Annual Report 2014-2015

Caring with Technology

Message from the Director, ACTREC

ACTREC (Advanced Centre for Treatment, Research & Education in Cancer), TMC has evolved to become a comprehensive cancer Centre dedicated to patient care and has provided leadership in areas of cancer research and clinical care. The Centre has embarked on developing new areas in basic and clinical research that will be a step towards personalized and integrative medicine.

The Centre continued to receive the NABL accreditation for its diagnostic services. In May 2014, a 22 bed ward for Pediatric surgery and interventional radiology was commissioned. Over 400 new direct registrations and 4854 patients were referred to ACTREC. State-of-art intraoperative image guided neurosurgery and navigable 3D fluorescence ultrasound based surgery guided resections of malignant gliomas have led to improved treatment outcomes. Bone marrow transplant unit performed over 70 allogenic/autologous/unrelated donor bone marrow transplants and cord transplants during 2014. Eleven haploidentical transplant procedures were also performed with good success rate. The Clinical Pharmacology Lab has developed pharmacokinetics guided optimization of cancer drugs. Biodistribution studies are being conducted for radioimmunotherapies developed in collaboration with BARC.

The research programs at Cancer Research Institute integrate both basic and clinical approaches to address questions related to cancer biology, cancer prevention and development of newer therapeutic modalities. The innovative partnership between ACTREC scientists and clinicians at ACTREC and TMH facilitated through several intramural and extramural supported projects has helped in exploring newer avenues in cancer research.

Department of Biotechnology, Govt of India, has recognized ACTREC as a nodal Centre for training scientists from North Eastern Region in Bioinformatics and Biotechnology areas. These training programs will be conducted in various disciplines for students and teachers involving the expertise available at ACTREC.

The Academic Program at ACTREC continues to attract young talent from all over the country. This year thirteen students received Ph.D. (Life Science) degree under Homi Bhabha National Institute. The Centre has become a hub for several workshops and training programs.

ACTREC staff has enthusiastically conducted several Cancer Awareness programs and cultural events with active participation from patients and their family members.

In the years to come ACTREC will develop innovative research programs that will help understand the complexities of cancer and offer state-of-art personalized care to our patients.

S Chiplunkar

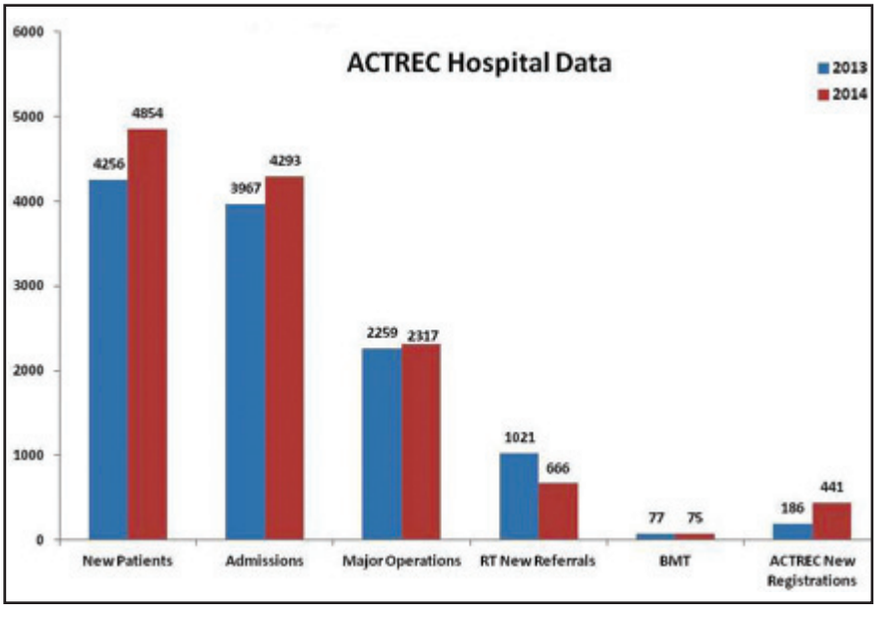
Shubhada Chiplunkar

Overview of ACTREC

The **Advanced Centre for Treatment, Research and Education in Cancer** (ACTREC), located in Kharghar, Navi Mumbai, is a constituent unit of the Tata Memorial Centre. ACTREC comprises of the Clinical Research Centre mandated to perform clinical research, conduct clinical trials and develop indigenous technology, a 108 bed Research Hospital where cancer patients enrolled on various protocols receive radiotherapy, surgery, chemotherapy or bone marrow transplantation, and the Cancer Research Institute which focuses on basic and applied research on cancer. Under its education program, the Centre inducts research scholars into its Ph.D. program, provides short term/ summer training, and conducts workshops, symposia, conferences and seminars on varied aspects of biology and cancer.

The Centre's basic, applied and clinical research projects drive towards the translational platform for cancer patients. The Centre's clinicians and scientists engage in collaborative projects within ACTREC, with the Tata Memorial Hospital (TMH) as well as with national/ international partners from Academia and Industry. The Centre's research projects receive institutional, intramural or extramural funding. During the year 2014, 182 projects were on-going at the Centre. A sum of Rs. 8.30 crore was received from governmental agencies (DBT, DST, ICMR, LTMT, etc) to meet the expenditure on 43 of these on-going projects. In addition, 10 new extramurally funded projects to the tune of Rs. 3.18 crore for a three year period were sanctioned by the above mentioned funding agencies, of which Rs.1.55 crore was received during the calendar year 2014. A total of 97 indexed publications accrued from research conducted by faculty of the Centre, during 2014. Of these, 63 articles were on basic/ applied research while 34 covered clinical/ translational research and medical technology. During 2014, 27 regular staff members were appointed at the Centre in the medical, scientific, nursing, technical and auxiliary cadres, while five employees superannuated and one employee took voluntary retirement.

During the year, several developments took place at the **Clinical Research Centre (CRC)** and the **Hospital** of the Centre. Continuation of NABL accreditation was granted in June 2014 for Tata Memorial Centre's Diagnostic Services - Clinical Biochemistry, Clinical Pathology, Haematology & Immunohaematology, Microbiology & Serology, Histopathology, Cytopathology and Genetics in accordance to ISO 15189:2007. A new 22-bed ward for Pediatric, Surgery, Solid Tumor and Interventional Radiology patients was commissioned in May 2014. The current bed strength at the ACTREC Hospital is 82 admission beds, 10 beds for ICU and recovery, 13 beds for day care, and three beds for MRI recovery. During 2014, 4854 new patients were referred to ACTREC and 441 new direct registrations took place here. In all, there were 4293 admissions, 2317 major operations, 666 new radiotherapy referrals and 75 bone marrow transplants at ACTREC (see figure).



Continuation of NABL accreditation was granted in June 2014 for medical testing facility of Tata Memorial Centre's Diagnostic Services in the disciplines - Clinical Biochemistry, Clinical Pathology, Haematology & Immunohaematology, Microbiology & Serology, Histopathology, Cytopathology and Genetics in accordance to ISO 15189:2007.

The department of Surgical Oncology performed over 2300 major procedures in its four operation theatres during the calendar year, and conducted outpatient clinics for newly registered and follow-up cases. State-of-the-art intraoperative image-guided neurosurgery techniques, specifically navigable 3D ultrasound based surgery and fluorescence guided-resections of malignant glioma have led to improved patient outcomes. Minimally invasive laparoscopic GI surgery commenced at the Centre from mid 2014. The Bone Marrow Transplant Division of Hemato-Lymphoid Unit (Adult) performed over 75 allogeneic/ autologous/ unrelated donor bone marrow transplants and cord transplants during 2014. Eleven haplo-identical transplant procedures were also performed during the year; ~65% of these are alive without disease. This year almost 1000 in-patients were admitted in the 17-bed Leukemia/ Lymphoma Ward and around 50 outpatients/ day were seen in the adult hematolymphoid OPD. The department of Transfusion Medicine conducted outdoor blood collection camps and indoor voluntary blood donations to collect, process and issue blood/ blood components to patients requiring transfusion support. Research findings from the Translational Research Lab clearly indicated that chromatin fragments from dead cells induce epigenetic changes, stemness and cancer in living cells.

The **Cancer Research Institute** is engaged in research on normal, stem cell, cancer cell & molecular biology, structural biology, cell signalling & macromolecular interactions, genetics & epigenetics, immunology & chemoprevention. Interactions between proteins involved in cell cycle checkpoint control are under study in a bid to identify novel therapeutic strategies for cancer treatment. One of the studies examines the desmosome plaque protein - plakophilin3, and how its expression or loss modulates transformation and metastasis. The role of the proteins 14-3-3σ and 14-3-3γ in regulating cell cycle progression and neoplastic progression is also being studied. Identification of the functions of keratins, vimentin and their associated proteins in epithelial homeostasis/ cancer and their use as biomarkers in oral cancer is being attempted. Loss of K5/ gain of K1 and K8/18 correlated significantly with the degree of dysplasia, fibrosis, and recurrence. Findings indicate a tissue specific role of K8/K18 in malignant transformation/ progression of carcinomas. 3D co-cultures of oral tumour epithelial cells and fibroblasts are being set up to study epithelial-mesenchymal interactions during oral carcinogenesis.

Novel functions of two key proteasomal assembly chaperones PSMD9 and PSMD10 were discovered by predicting and identifying their interacting partners, and validating the relevance of these interactions for functions in normal physiology and cancer. A novel ATPase activity in 14-3-3 protein was identified. The structure, function and specificity of pro-apoptotic proteins and their role in cancer are being studied. A unique N-terminal mediated dual allosteric regulatory activation network of the protease HtrA2 was elucidated, its activator and binding partner were identified and characterized, and 2.0Å resolution crystals of a pathological mutant were obtained. The mechanism of human papillomavirus E2 mediated activation of the extrinsic apoptotic pathway was also established. Raman spectroscopy is being investigated as a cancer screening tool with emphasis on oral and cervical cancers. *In vivo* studies on over 300 subjects revealed that the technology could be used for oral cancer diagnosis. The technology also helped classify normal and malignant cervical cancers. Exfoliated cells and body fluids were explored successfully for oral and cervical cancer diagnosis.

Genetic studies focussed on two major aspects of oral cancer biology - genomic alterations at the level of copy number across the genome, and identification of genes/ gene clusters underlying altered genomic loci. Array comparative genomic hybridization analyses of advanced stage oral cancers revealed chromosomal gain of region 11q22.1-q22.2 associated with nodal metastasis, loco-regional recurrence and shorter survival. Putative driver genes associated with oral carcinogenesis have been identified. The significance of epigenetics is under investigation in gastric cancer and hepatocarcinoma. The genome-wide alteration in histone acetylation pattern signifies the importance of using HDAC inhibitor in conjunction with standard chemotherapy. Reversible reduction of H3Ser10 phosphorylation only in G1 phase cells in response to ionizing radiation-induced DNA damage raises the possibility of using specific inhibitors to achieve efficient cell death during radiotherapy.

Immunological studies focussed on understanding the immune scenario and reasons for immune dysfunction in cancer patients, and on the development of cell based immunotherapy for cancer treatment. Several studies examined the molecular mechanisms and potential modulation of the cytotoxic action of γδ T cells in breast, oral and gall bladder cancer and in leukemia. A simple and non-invasive real time PCR-based method was developed to detect Epstein Barr virus DNA in plasma/ urine of nasopharyngeal carcinoma patients. Under the Science Initiative Program in *Ayurveda*, the mode of action of *bhasmas* is being examined. In the chemoprevention arena, identification

and delineation of the mechanisms of action of chemopreventive agents from Indian foods/ beverages [curcumin, black tea polyphenols (PBPs), crude polyphenolic extracts of grapes] is receiving attention. Curcumin, PBPs and grape extract exhibited anti-initiating and anti-promoting activities, by modulating carcinogen metabolism by phase I and phase II enzymes and also carcinogen/ tumor promoter-induced inflammation, cell proliferation and apoptosis. A detailed study of signal transduction pathways showed that polyphenols modulated kinase functions.

Molecular profiling of BCR/ABL – induced chronic myeloid leukemia in chronic phase and blast crisis (lymphoid and myeloid) and in acute lymphoid leukemia is being undertaken, in a bid to stratify patients and correlate with the clinical behavior of their disease, for identification of therapeutic targets and for better disease management. Another study examines the effect of neutrophilic proteases on membrane proteome of tumor cells and on their behavior, which could unravel the role of inflammation in cancer progression. Over the past year, the fly lab (*Drosophila melanogaster* – fruit fly*)* lab was established at ACTREC and requisite methodologies were standardized. With the help of *Drosophila* genetics, cellular, molecular and biochemical analysis of signaling molecules, coupled with confocal and live imaging microscopy, the mechanisms underpinning glia development and growth control will be elucidated, in order to define the relationship between growth and patterning in developing tissues, and its relevance to cancer.

The **Academic Programs** of the Centre include the Doctoral program in the Life Sciences under the Homi Bhabha National Institute, a deemed University. During 2014, a total of 108 graduate students were working towards the Ph.D. degree at ACTREC. A new batch of 13 junior research fellows joined the Centre in July 2014. Under the Centre's Training program, 246 trainees from colleges, universities, academic/ research institutions and hospitals from across the country were accepted in various labs in CRI and departments in CRC. During the year 2014, 21 local, national and international conferences, workshops, symposia, etc. were organized at ACTREC, beginning with the DBT-sponsored Workshop on 'Applications in Bioinformatics' held in January, and ending with the 10th National Research Scholars Meet in Life Sciences 2014 in December. The Centre also hosted 14 experts from India and abroad who delivered research seminars on a variety of topics pertaining to biology and cancer. The Centre also conducted a number of Cancer Awareness Programs for the general public as a social responsibility initiative.

CLINICAL RESEARCH CENTRE

Dr. Shubhada Chiplunkar (Director, ACTREC)

Dr. Sudeep Gupta (Dy. Director, CRC-ACTREC)

Anaesthesiology, Critical Care & Pain
Dr. Reshma Ambulkar *(OIC)*
Dr. Bhakti Trivedi
Dr. Amol Kothekar
Dr. Malini Joshi
Dr. Raghu Thota

Biomedical Engineering
Dr. Amit Sengupta *(Technical Consultant)*

Cancer Genetics
Dr. Rajiv Sarin

Clinical Pharmacology
Dr. Vikram Gota
Dr. NK Manjunath

Clinical Research Secretariat, ACTREC
Dr. Tejpal Gupta
Mrs. Sadhana Kannan

General Medicine
Dr. Prafulla Parikh

Hematopathology - Molecular
Dr. Nikhil Patkar *(Clinician Scientist)*
Dr. Prashant Tembhare *(Clinician Scientist)*

Medical Administration
Dr. Prashant Bhat *(Asst. Med. Suptdt)*
Mrs. Chital Naresh

Medical Oncology
Dr. Sudeep Gupta
Dr. Navin Khattry *(OIC)*
Dr. Manju Sengar
Dr. Amit Joshi
Dr. Jaya Ghosh
Dr. Tushar Vora
Dr. Hasmukh Jain

Medical Physics
Ms. SV Jamema
Ms. Reena Phurailatpam

Microbiology & Composite Lab
Dr. Vivek Bhat *(OIC)*
Dr. Preeti Chavan *(OIC)*

Nursing

Mrs. Meera Achrekar *(Asst. Nursing Suptdt)*

Pathology

Dr. Asawari Patil *(OIC)*
Dr. Epari Sridhar
Dr. Saral Desai*

Radiation Oncology

Dr. Tejpal Gupta *(OIC)*
Dr. Vedang Murthy
Dr. Supriya Sastri
Dr. Jayant Sastri Goda *(Clinician Scientist)*
Dr. Tabassum Wadasadawala

Radiodiagnosis

Dr. Seema Kembhavi
Dr. Ashwin Polnaya
Dr. Amit Kumar Janu

Surgical Oncology

Dr. MS Qureshi
Dr. Aliasgar Moiyadi *(OIC)*
Dr. Vinayak Shankhdhar
Dr. Sudhir Nair *(Clinician Scientist)*
Dr. Deepa Nair
Dr. Prakash Shetty

Transfusion Medicine

Dr. Shashank Ojha *(OIC)*
Dr. Minal Poojary
Mrs. Manda Kamble

Translational Research

Dr. Indraneel Mittra *(Dr. Ernest Borges Chair)*
Dr. Ranjan Basak

**Resigned in 2014*

Department of Medical Oncology

Dr. Navin Khattry
Officer-in-Charge

Medical Oncologists
Dr. Sudeep Gupta
Dr. Manju Sengar
Dr. Amit Joshi
Dr. Jaya Ghosh
Dr. Tushar Vora
Dr. Hasmukh Jain
Dr. Bhausaheb Bagal
Dr. Kumar Prabhash

Overview

The department of Medical Oncology started its services in ACTREC in 2006. Initially it was restricted to administering concomitant chemo-therapy with radiotherapy for head and neck cancers and cancer of cervix but, over the last 3 years, chemotherapy in neoadjuvant, adjuvant and palliative setting is being administered for various other solid tumours. The Bone Marrow Transplant unit shifted to ACTREC in 2007 due to the rising incidence of life threatening infections in the old unit at the Tata Memorial Hospital (TMH). Since then, around 400 autologous and allogeneic transplants have been performed with overall transplant related mortality of 7-8% (2% in autologous, 12% in allogeneic), comparable to the best centres across the world. Since October 2011, adult patients with hematolymphoid neoplasms not undergoing transplant are also being treated at ACTREC.

Service

Bone Marrow Transplantation: Seventy five transplants were performed in ACTREC in 2014. Encouraged by the initial success and in order to cater to the needs of those who do not have an HLA-matched sibling, an ambitious program of matched unrelated donor transplant was successfully initiated in November 2009, using HLA matched stem cells from international Unrelated Donor Registries. An unrelated cord transplant program was also started in April 2010. Since January 2013, haplo-identical transplants are being done for patients who do not have a fully matched related or unrelated donor. These are the most challenging transplants and, over the last 2 years, ~20 such transplants have been performed; disease free survival is 65%. This hospital is one of the largest centres doing these challenging transplants. A funding mechanism was initiated in 2009 to offer free or greatly subsidized BMT as a life saving measure for deserving poor patients. Since then, 75 such autologous and allogeneic transplants have been performed under this scheme.

Adult Hematolymphoid Unit: A 17-bed leukemia/ lymphoma ward and adult hematolymphoid OPD was also set up in 2011. During 2014, around 1000 patients were treated as in-patients, and daily ~50 patients were seen as out-patients, from Monday to Friday.

Adult Solid Tumour Unit: The number of patients with solid tumours seen in the outpatient department has steadily increased and, in the year 2014, approximately 4,500 patient visits took place. Tumours pertaining to Head and Neck region, breast, ovary, cervix and gastrointestinal region comprise the bulk of cancers treated by the Department at ACTREC. The five in-patient beds dedicated to solid tumours, in the new second floor ward in Paymaster Shodhika, are always occupied.

Clinical Research

Faculty members of the Department are involved in several collaborative research projects, both in the hematolymphoid and the solid tumour units. A phase I trial unit with two beds commissioned a few years ago have patients from the Department at all times.

Education

The department of Medical Oncology at ACTREC has an active education program, which encompasses daily academic sessions pertaining to transplantation and hematolymphoid neoplasms for the DM students posted in ACTREC, and a fortnightly Journal club that covers faculty and students from the departments of medical, radiation and surgical oncology. During 2014, faculty and four students from the BMT and solid tumour units presented their research findings at major international meetings. This year, six students with projects on bone marrow transplantation and hematolymphoid neoplasms as also one faculty and two students with projects on solid tumours were selected for the Australia and Asia Pacific Clinical Oncology Research Development Workshop (ACORD) held in Australia.

Department of Radiation Oncology

Dr. Tejpal Gupta
Officer-in-Charge

Radiation Oncologists
Dr. Vedang Murthy
Dr. Supriya Sastri
Dr. Jayant Sastri Goda
Dr. Tabassum Wadasadawala

Medical Physicists
Ms. SV Jamema
Ms. Reena Phurailatpam

Overview

The department of Radiation Oncology, besides providing quality service and education, also conducts translational and clinical research in collaboration with colleagues from site-specific disease management groups at TMH as well as scientists at Cancer Research Institute. In keeping with ACTREC's emphasis on technology development and assessment, an indigenously developed multi-leaf collimator system was installed on the Bhabhatron-II telecobalt unit which is awaiting commissioning approval. The old linear accelerator (Siemens Primus) was decommissioned and the existing bunker modified to install a state-of-the-art linear accelerator (Varian TrueBeam). The year also witnessed the replacement of the old 4-slice CT-scanner with an integrated PET/CT scanner, which is now being used routinely for radiotherapy planning.

Service

During 2014, 364 patients were treated with radiotherapy as compared to ~ 900 patients per year in the past; this drop was largely due to non-availability of the Bhabhatron-II and the linear accelerator. The majority of patients were planned and treated on the Tomotherapy machine using contemporary high-precision delivery and verification techniques (IMRT with volumetric image-guidance) either on Institutional Ethics Committee-approved research protocols or as residents of Navi Mumbai who can now register directly at ACTREC.

Clinical Research

Over the years, the Department has laid emphasis on cutting-edge research with the potential to inform or change practice. Faculty members are actively engaged in several collaborative translational/ clinical research projects as Principal Investigators or Co-Investigators.

Education

Apart from the informal education and training to residents and fellows in the OPDs and Joint Clinics, the Department runs an active educational program involving ward rounds, seminars, journal club, and planning meeting, most of which are held jointly with other departments of ACTREC and TMH. In 2014, faculty members of the Department actively participated in local, national, and international conferences/ meetings as organizers, invited faculty and delegates. Technical staff members too were encouraged to participate in local and national meetings/ training courses.

Department of Surgical Oncology

Dr. Aliasgar Moiyadi
Officer-in-Charge

Surgical Oncologists
Dr. M. S. Qureshi
Dr. Vinay Shankhdhar
Dr. Sudhir Nair
Dr. Deepa Nair
Dr. Prakash Shetty

Overview

The department of Surgical Oncology has been providing continued care to a wide range of cancer patients. The service runs four regular operating theatres, five days a week, and provides inpatient care. The department also runs regular outpatient OPDs for newly registered and follow-up cases.

Service

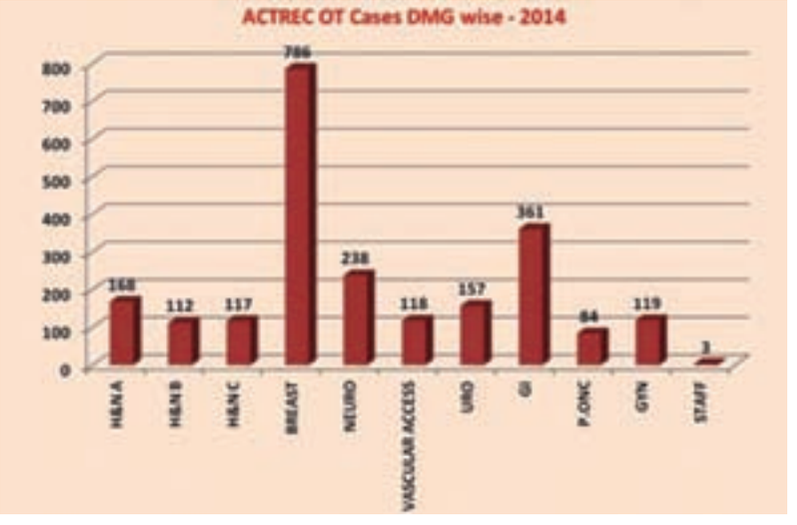
During the report year 2014, over 2300 major procedures were performed at ACTREC, including major surgeries in pediatrics, head-neck, breast, gastro-intestinal, gynecology, urology and neurosurgery (see figure). The inpatient bed strength was increased to 35 (from 28 in 2013). In a bid to streamline pre- and postoperative care, two new OPDs (postoperative follow-up OPD and presurgical evaluation OPD) were started in late 2014. The neurosurgery service continued the use of state-of-the-art intraoperative image-guided surgery techniques, specifically navigable 3D ultrasound based surgery and fluorescence guided-resections of malignant gliomas, both of which have improved patient outcomes. Minimally invasive laparoscopic GI surgery has commenced since mid 2014 and is being implemented regularly with plans for further expansion.

Research

Faculty members of the Department are involved in various DMG coordinated research projects in collaboration with their counterparts at TMH, and with IIT-B and BARC. Neurosurgery services are presently conducting a randomized trial comparing the use of sononavigation in malignant gliomas. This is the first such study anywhere in the world, and is expected to conclude in 2017.

Education

During 2014, faculty members of the Department presented their clinical and research findings at over 25 national/ international conferences. Dr. Gauri Pantvaidya of TMH's Surgical Oncology department, jointly with Dr. Rukmini Govekar of CRI, ACTREC, co-ordinated the conduct of three quarterly sessions of the training program in 'Laboratory techniques in translational research' for M.Ch. surgical oncology students.



Department of Anaesthesiology, Critical Care and Pain

Dr. Reshma Ambulkar
Officer-in-Charge

Anaesthesiologists
Dr. Bhakti Trivedi
Dr. Malini Joshi
Dr. Raghu Thota

Intensivist
Dr. Amol Kothekar

Overview

The department of Anaesthesiology, Critical Care and Pain at ACTREC provides anaesthesia, critical care and pain management services to the patients at this centre. The Department has five permanent staff members and eight senior residents at ACTREC, besides full-time consultants and residents from TMH who visit the centre.

Service

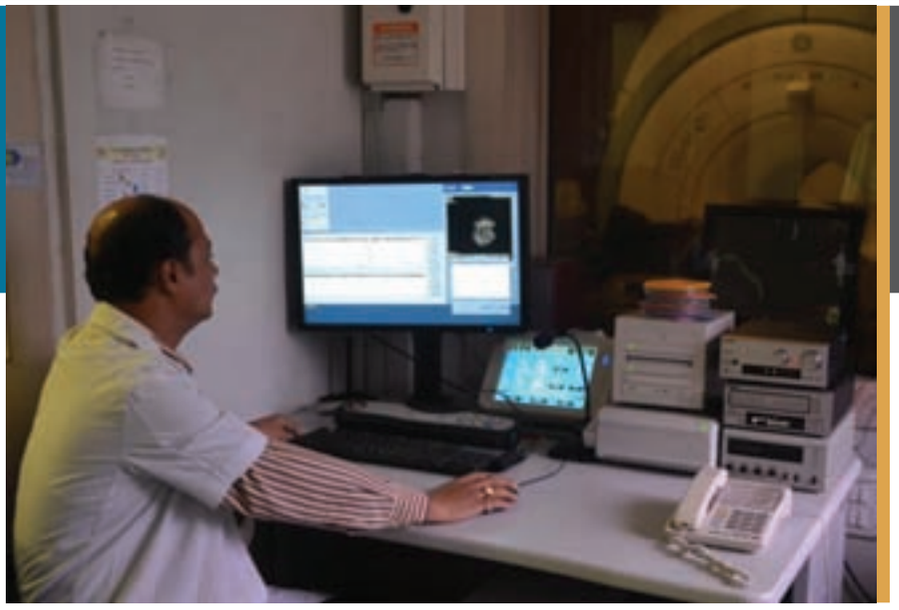
During 2014, the Department provided services during 2317 major OT procedures and 195 procedures in the radiotherapy OT; these figures were marginally higher than the 2013 figures. The Department introduced anaesthesia for interventional radiology and MRI procedures at ACTREC for the first time in 2014, and provided support for 57 interventional radiology and 99 MRI procedures. Critical care services were provided for 1982 recovery room admissions and 314 ICU admissions (106 of which were ventilated).

Research

All the faculty members of the Department are principal investigators of clinical studies, some of which were completed in 2014 while others are on-going. Before submitting planned projects to the Institutional Review Board (IRB), the investigators routinely engage in project discussion meetings.

Education

The Department at ACTREC, in concert with that at TMH, conducted a three-day annual Anaesthesia Review Course, in which over 300 postgraduate students participated. The department also organized a National Airway Conference in November 2014. The Critical Care division held an annual two-day workshop on Hemodynamic Monitoring in which a large number of intensivists from all over India took part. The Pain division organized an annual two-day Conference on 'Education in Cancer Pain'. Departmental faculty served as invited faculty at many national conferences in 2014.



Department of Radiodiagnosis

Radiologists
Dr. Shashikant Juvekar
Dr. Seema Kembhavi
Dr. Ashwin Polnaya
Dr. Amit Kumar Janu

Overview

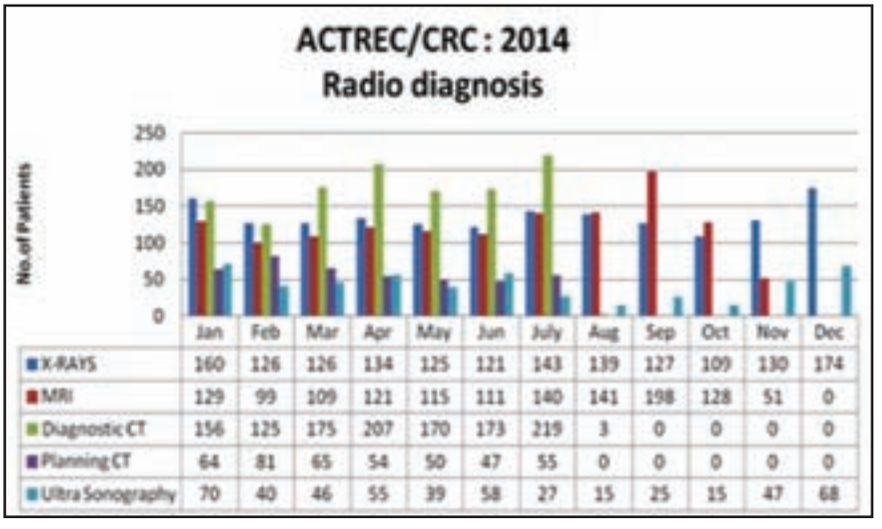
The department provides diagnostic imaging services in the form of conventional radiography, sonography (USG - transabdominal, endocavitatory and small parts), colour Doppler, diagnostic and planning CT (computed tomography) and MRI (magnetic resonance imaging) scans with and without intravenous contrast, and interventional radiological procedures like image-guided fine needle aspirage cytology (FNAC), biopsies and drainage procedures. The CT scan machine was decommissioned during the year. The PET-CT installation was initiated in August 2014, with a view to make it functional in January 2015. The MRI unit had an incident on 8th November 2014, after which it was shut down for repairs. Emergency services such as urgent x-rays, sonography, doppler studies, CT/ MRI scans are available 24 hrs a day as well as on weekends and holidays.

Service

During 2014, 1614 conventional radiological investigations were performed, that included 1455 chest, 95 bone, and 64 abdomen and pelvis X-rays. The average figure for diagnostic X-rays/ month showed a 17% increase (135 in 2014 vs. 115 in 2013). A total of 505 USG/ colour Dopplers were performed in 2014. In all, 2248 diagnostic CT scans performed; the monthly average increased by 19.8% (175 in 2014 vs. 146 in 2013). In addition, 416 radiotherapy planning CT scans were performed; the average monthly patient number showed a 15.7% decrease (59 in 2014 vs. 70 in 2013). In all, 1445 MRI scans were performed: 878 brain, 175 spine, 19 PNS, 85 neck, 52 extremities, 97 abdomen, 127 pelvis and 18 breast scans. In case of MRI scans, a 47.3% increase was noted in the average patients/ month (134 in 2014 vs. 91 in 2013). Advanced MR imaging including diffusion tractography and functional MR imaging was also performed at ACTREC. Computed tomography and MRI examination of animals were also performed as a part of animal research projects.

Education

Senior faculty of the department presented their findings as oral presentation/ posters / scientific exhibits at eight international and six national conferences during the report year. Six staff members of the department were deputed to attend continuing medical education programs.



	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
X-RAYS	160	126	126	134	125	121	143	139	127	109	130	174
MRI	129	99	109	121	115	111	140	141	198	128	51	0
Diagnostic CT	156	125	175	207	170	173	219	3	0	0	0	0
Planning CT	64	81	65	54	50	47	55	0	0	0	0	0
Ultra Sonography	70	40	46	55	39	58	27	15	25	15	47	68

Department of Transfusion Medicine

Dr. Shashank Ojha
Officer-in-Charge

Blood Bank Officer
Dr. Minal Poojary

Scientific Officer
Mrs. Manda Kamble

Overview

The department of Transfusion Medicine (DTM) continually strives to maintain high standards in the provision of safe blood and blood components. The major donor and lab services offered by DTM include blood collection, blood grouping and cross-matching, transfusion transmitted infection (TTI) testing, plateletpheresis, peripheral blood stem cell harvest, component preparation, cryopreservation and storage of components and stem cells, and issue of blood/ blood products. The Department proactively maintains a quality check over collected hematopoietic stem cells, their processing, cryopreservation, storage, inventory maintenance and issue. DTM has introduced a 'Voluntary Donor Club' to tide over the crisis of platelet donors and rare group donors. By increasing blood donation camps, a 100% switch over to voluntary blood donation and improved the blood bank inventory has been achieved, ensuring timely provision of blood to end users.

Service

During the year 2014, a total of 2126 blood units were collected, from which 3897 components (packed cells, platelets, plasma) were prepared. In all, 1325 leucodepleted products, and 2281 irradiated blood products (apheresis platelets, RDPs and packed cells) were also prepared. In all, 3667 blood grouping and 4517cross matching were also performed. A total of 112 stem cell preparations (69 autologous, 43 allogeneic) were achieved during 2014.

Research

Senior faculty members of the group are involved in a research project involving the determination of select biochemical reference intervals in Indian voluntary blood donors.

Education

Lab members participated in weekly journal club, data presentation, and lectures. Faculty and staff members participated in nine national conferences/ scientific meetings and underwent training to keep abreast with the latest developments in the field. DTM also imparted specialized training in hematopoietic stem cell harvesting and transplant, blood banking and apheresis. In March 2014, DTM and diagnostic laboratories of ACTREC jointly organized a 'Quality conclave of diagnostic laboratories and transfusion medicine services'.

Department of Nursing

Mrs. Meera Achrekar
Asst. Nursing Superintendent

Overview

The Nursing department is an integral part of the healthcare system at ACTREC, and provides comprehensive nursing care to cancer patients of all ages. Nurses at ACTREC are provided the opportunity to develop the ability to deliver therapeutic care, and are involved in augmenting nursing practice through implementation of patient safety goals, continuing education and research.

Service

The Nursing department provides quality nursing care to the ACTREC hospital's outpatient departments, operation theatres, recovery rooms, intensive care units, day care wards (for patients requiring short term chemotherapy infusions, transfusion of blood/ blood products and hydrations), and all the inpatient wards. Nursing services are also provided to the enhanced OPD services and new 23-bed ward for pediatrics, surgical and medical oncology patients commissioned during 2014. Internal audits on drug administration, thrombophlebitis, pain management, pressure ulcers and waste management were conducted in 2014. The SBAR (situation background assessment recommendation) form was introduced for communication of shift handover between nurses in a written form, thus ensuring patient safety. An audit using simple random sampling was undertaken to verify if all the patient related information is documented.

Education

On-going advancements in cancer care require that the knowledge skills of nurses are updated regularly. Newly recruited nurses go through an intensive induction program, while in-service programs, clinical teaching and weekly case presentations are conducted regularly for the nursing staff. Nurses were encouraged to attend local/ national conferences, workshops and certification programs in Central Venous Access Device, chemotherapy administration, infection control, etc. On request, four nurses from various local/ national hospitals were provided specialized training in bone marrow transplant nursing. The department organized a one day Workshop on 'Making nursing visible: imperatives and strategies' at ACTREC in August 2014, in collaboration with the state branch of the Trained Nurses Association of India.

Pathology Lab

Dr. Asawari Patil
Officer-in-Charge

Pathologists
Dr. Epari Sridhar
Dr. Saral Desai (resigned in May 2014)
TMC staff pathologists on rotation

Overview

The Pathology lab at ACTREC is a constituent part of the Department of Pathology, TMC. The lab provides diagnostic services including histopathology, frozen section, immunohistochemistry and cytology for patients treated at ACTREC as well as outside referral cases. The mandate is to provide accurate, reliable reports in time. The lab is accredited by NABL for all services except cytology. The laboratory participates in EQAS (External Quality Assessment Scheme) offered by national and international agencies.

Service

The lab processes an average of 200 paraffin blocks every day, and carefully archives all the slides and blocks for future retrieval and issue to pathologists, scientists and clinicians for their research projects. During 2014, the lab processed 2491 surgical pathology samples, 1952 frozen section samples, 287 cytology samples, and performed 2950 immunohisto-chemistry (IHC) tests. The lab also performed validation of over 100 antibodies for IHC testing.

Research

The faculty members are engaged as principal investigator or co-investigator in various funded/ non-funded DMG projects and have research collaborations with ACTREC scientists. Thesis projects of 11 junior residents (MD students) were completed during 2014.

Education

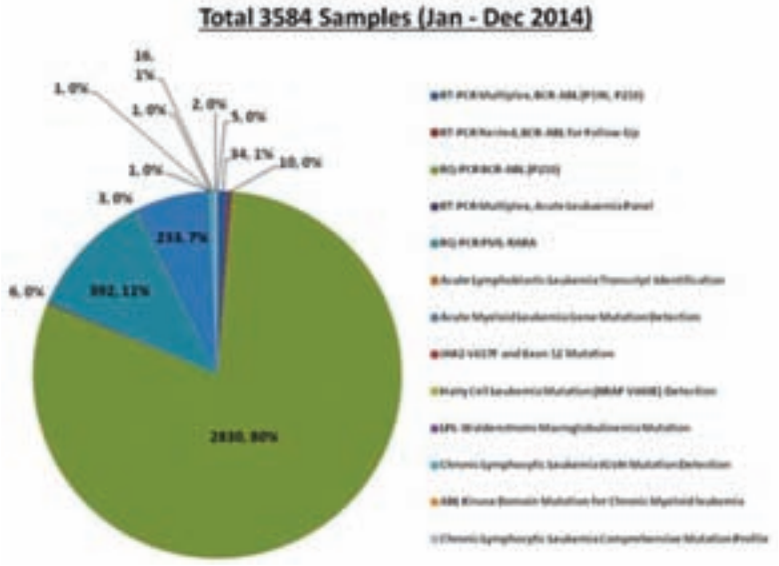
The pathologists participated in many local/ national/ international conferences as faculty/panelist and to present their findings (oral presentations/ posters). Technical staff members were encouraged to participate in continuing medical education activities.

Hematopathology Lab

Hematopathologists
Dr. Sumeet Gujral
Dr. PG Subramanian
Dr. Nikhil Patkar
Dr. Prashant Tembhare

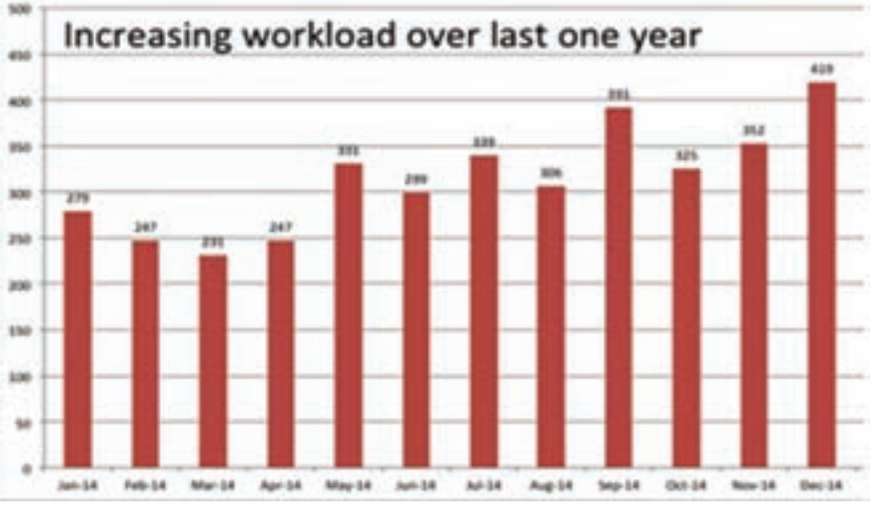
Overview

The Hematopathology Lab – Molecular Division, is a referral diagnostic lab for molecular testing of hematolymphoid neoplasms, established formally in August 2013 as a patient service and translational research lab for the Tata Memorial Centre (TMC). Since then, the lab has witnessed an exponential growth in samples received for molecular testing. This lab probably has the highest workload for molecular hemato-oncology in India (accompanying figures); yet it is very quality conscious and participates in EQAS programs of the College of American Pathologists as well as UK NEQAS.



Service

The laboratory performs molecular testing for a wide range of hematological malignancies. Some of the tests are not available in India - such as testing for somatic hypermutations in lymphomas as well as CCAT/ enhancer binding protein alpha gene mutations (CEBPA).



Education

The lab conducts an Advanced Molecular Hematology Training Course every year, in which four technologists are provided the requisite training.

Microbiology Lab

Dr. Vivek Bhat
Officer-in-Charge

Overview

The Microbiology lab at ACTREC is a constituent part of the Department of Microbiology, TMC. It is NABL accredited, and provides patient and hospital related services towards bacteriological culture and susceptibility testing. Reports of isolates are generally provided within 24 hours, and susceptibility results within 48 hours. Critical reports are immediately conveyed to the clinicians, facilitating early specific treatment and/or antibiotic de-escalation when required. Clinical microbiology testing, rapid serological testing and manual/ automated antifungal susceptibility testing and fungal identification from clinical material are also offered by the lab. Sterility testing is provided for Blood Bank products and for bone marrow transplant patients, besides surveillance activity for OT/ ICU/ BMT/ Brachytherapy units. The lab also provides infection control and waste management support to the hospital, assists in investigating outbreaks, monitors the emergence of multidrug resistant organisms and provides comprehensive antimicrobial susceptibility data to clinicians.

Service

During 2014, 9127 samples were processed for bacteriology, culture and susceptibility testing (blood, body fluids, pus, urine, feces, etc), serology (HBsAg, HIV, HCV, PCT, RMA, etc) and clinical microbiology testing (urine, feces). Sterility testing services were provided for Blood Bank services (PBSC, SDP, RDP, etc) and also for the OT/ICU/ Brachytherapy/ BMT unit. The lab also helped identify fungi in clinical material, and performed susceptibility testing for yeasts. SWOT (Strengths, Weaknesses, Opportunities, Threats) of the sample collection area was carried out. Based on the findings, corrective actions were taken, leading to a considerable reduction in the waiting time for the patients.

Research

The faculty is involved in five on-going research projects. The on-going study on 'Oral cavity flora in patients receiving chemo-radiotherapy for head & neck cancer' seeks to identify Candida spp, and select bacteria in post operative cancer patients undergoing CT-RT and RT, and study their susceptibility to certain drugs. Initial findings suggest Candida infections to be common amongst these patients. Another study examines 'Central line associated infections in bone marrow transplant and hematolymphoid cancer patients'. *Pseudomonas aeruginosa, E. coli*, coagulase negative staphylococci are common isolates in these patients. The other projects involve determination of select biochemical reference intervals In Indian voluntary blood donors; correlation between colistin disc diffusion and MIC breakpoints in Enterobacteriaceae; and role of PCT, CRP and ANC in culture confirmed infections.

Education

The lab participates in the training program of the Centre and, during 2014, one trainee worked under Dr. Bhat's supervision on her MSc dissertation. The faculty is involved in teaching and case discussion sessions for students of MD Microbiology, and lectures for Master of Hospital Administration and PG Diploma in Hospital Administration course at TISS, Mumbai. During the year, training sessions on infection control and waste management were conducted for TMC nurses/ other staff, and regular CME for laboratory staff. The faculty also made oral/ poster presentations at national/ international conferences.

Composite Lab

Dr. Preeti Chavan
Officer-in-Charge

Overview

The Composite lab is NABL accredited, and provides 24 hours medical laboratory services to the ACTREC hospital. It consists of clearly demarcated sections for sample collection (blood, urine, stool, etc), haematology, biochemistry, molecular hematology and cytology.

Service

CBC, peripheral blood smear examination and coagulation tests are carried out routinely in the hematology section. Routine biochemistry tests such as LFT, RFT, electrolytes, cardiac enzymes, osmolality, immunoglobulins, tumor markers, vitamin assays, thyroid function tests, drug assays, ferritin, etc and immunoassays for TFT, vitamins, drugs and tumor markers are routinely carried out. Cytology involves slide processing and staining of cytology and FNAC specimens. Blood samples from mice and dogs are also processed hematology and biochemistry, as a part of research studies. SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis of the sample collection area was carried out during 2014. Based on the findings, corrective actions were taken, which led to a considerable reduction in the waiting time for patients.

Research

The lab is involved in research studies involving the determination of select biochemical reference intervals In Indian voluntary blood donors; identification of oral cavity flora in patients receiving chemo-radiotherapy for head and neck cancer; evaluation of hematological and biochemical parameters in post-transplant patients, and evaluation of deferred donors for platelet apheresis. A study to examine the role of procalcitonin, C-reactive protein and absolute neutrophil count in culture confirmed infections was also conducted. Data revealed that C-reactive protein - although a non-specific marker of infection, is a more reliable indicator. Another study involved a comparison of chemiluminescence and immunoassay technique for cyclosporine drug estimation. Both provided comparable results, and can be used interchangeably for cyclosporine assessment.

Education

The lab participates in the Centre's training program and during the year, four trainees - one undergraduate, two master's and one DMLT, worked on small projects in the lab. In house training sessions on sample collection and interpretation of laboratory values were conducted for ACTREC nurses and regular CMEs for laboratory staff.

Clinical Pharmacology Lab

Clinical Pharmacologists
Dr. Vikram Gota
Dr. NK Manjunath

Overview

Research in this lab encompasses (a) drug development, and (b) clinical pharmacokinetics studies. This lab has generated very interesting data on pharmacokinetics guided optimization of treatment for drugs such as imatinib in CML and 13-cis-retinoic acid in neuroblastoma. Biodistribution studies were conducted for radioimmuno-therapies developed by BARC for NHL (^{131}I-Rituximab and ^{177}Lu-Rituximab) and breast cancer (^{131}I-Trastuzumab). Clinical studies are now being planned for these compounds. The lab is also engaged in two industry sponsored phase I development of new chemical entities. The bioanalytical capability of this department increased treme-ndously with the installation of a LC/MS/MS system in 2014.

Service

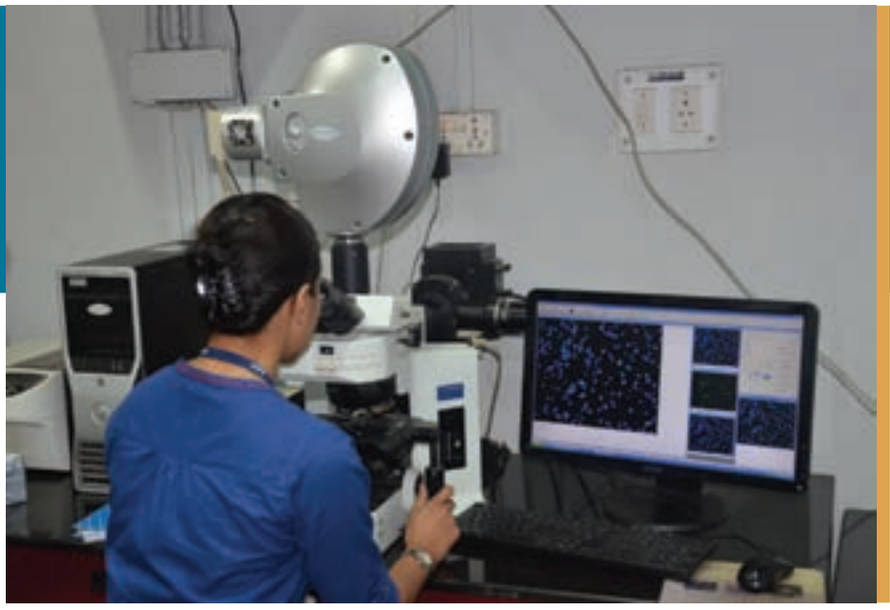
The lab offers services in the form of therapeutic drug monitoring of antifungal agents including voriconazole and posaconazole. While the service was offered to BMT patients till last year, it was extended to pediatric and adult hematolymphoid units this year. Over 200 BMT and hematolymphoid patients benefitted from this service.

Research

Clinical pharmacokinetic studies yielded very interesting data on pemetrexed pharmacokinetics and hyponatremia in NSCLC patients. The severity of hyponatremia on treatment correlated positively with the area under plasma concentration-time curve (AUC) of pemetrexed. Another notable finding was in a pediatric study of neuroblastoma where very young children in whom 13-cis-retinoic acid (13-cisRA) was administered after cutting open the capsule had significantly lower exposure to 13-cisRA and inferior outcomes compared to others who could swallow capsule as a whole. It makes a strong case for developing pediatric friendly liquid formulations.

Education

Group members meet at a weekly journal club. The lab accepted thirteen trainees during 2014 – eleven for their Master's dissertation. Dr. Gota participated in four national and three international meetings during 2014; three members of his group won awards at national meetings. The group organized the 2nd ACTREC Symposium in Clinical Pharmacology in October 2014. The department also contributed to the 'Advanced Techniques in Anti Cancer Drug Evaluation Workshop' held at ACTREC in November 2014.



Translational Research Lab

Dr. Ernest Borges Chair
Dr. Indraneel Mittra

Overview

The main focus of research in the Translational Research Lab is examination of the role of circulating chromatin in cancer and chronic degenerative diseases. Several hundred billion cells die in the adult human body daily due to normal physiology. A considerable amount of fragmented chromatin (Cfs) enters into the circulation in healthy individuals, and in higher quantities in disease pathologies including ageing and cancer. Research from this lab has shown that Cfs isolated from the blood of cancer patients and healthy individuals can freely enter into healthy cells, integrate into their genomes, trigger a DNA-damage-repair-response and activate apoptotic pathways. Furthermore, Cfs from cancer patients, but not from healthy individuals, can oncogenically transform recipient cells. On the other hand, DNAfs isolated from the same cancer patients are inactive even when applied at 10X higher doses. This finding suggests the involvement of tumour-derived histones present in cancer Cfs in the oncogenic process.

Research

Work on this project continued during 2014, wherein research focused on examining how chromatin from dead cells induces epigenetic changes, stemness, and cancer in living cells. When dead cancer cells are co-cultured with healthy cells, the Cfs emanating from the dead cells can oncogenically transform recipient cells. Cells transformed by Cfs from both these sources show marked activation of genes that impart stemness and form spheroid-like structures when grown under defined conditions suggesting that they have acquired properties of cancer stem cells. These findings have generated the hypothesis that apoptotic chromatin fragments, especially those derived from cancerous cells, have uniquely modified histones which upon integration into healthy cell genomes bring about major epigenetic re-programming in the recipients, leading to stemness and cancer.

Education

The senior faculty participated in the Cold Spring Harbor Laboratory meeting on 'Epigenetics and Chromatin' in September 2014. Lab members participated in regular in house academic sessions, and were encouraged to attend scientific meetings, and workshops.

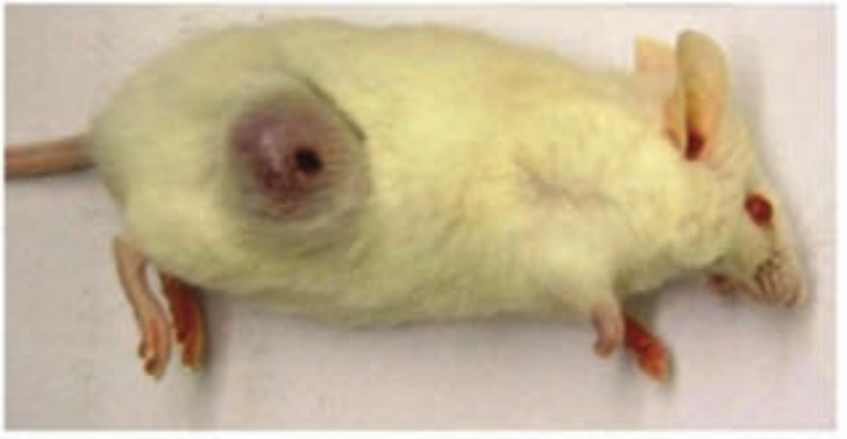


Figure: Tumor development in immuno-deficient (SCID) mice inoculated with mouse cells treated with chromatin fragments (Cfs) isolated from a breast cancer patient. This finding shows that Cfs from cancer patients can transform normal mouse cells into cancerous cells.

Biomedical Engineering Lab

Technical Consultant
Dr. Amit Sengupta

Overview

The task entrusted to this lab is to set up interdisciplinary bioengineering and gynecology research facilities in relation to cancer research. The thrust area of bioengineering is cancer theranostics - the development of newer, affordable, label free diagnostic tools, imaging techniques and analytical software, and treatment protocols through the amalgamation of clinical, experimental, theoretical, and engineering research techniques. The ultimate aim is to improve the quality of life of cancer patients who are diagnosed late and for whom the main line treatment may not be affordable or useful.

Clinical Research

Published findings of the lab's study on the effect of hyperbaric oxygen in control of mammary tumor growth in C3H mice using experimental and mathematical models are receiving good reviews from across the world. While hyperbaric oxygen therapy successfully controlled cancer progression, it impacted overall survival due to its genotoxicity and other deleterious effects; it may therefore not be useful as a radio-chemo sensitizer. These findings underline the need for a better genetically modified pre clinical model to study cancer. Another study examines the usefulness of metronomic therapy on terminally ill cancer patients, by checking for any modulatory effect/s on blood vessels, vascular dynamics, biorheology, stem cell expression and pharmacokinetics, with a view to remove any ambiguity in protocol and identify prognostic markers. Primary and secondary end points, overall survival, and quality of life are also being examined. Search is also on for affordable and sensitive screening methods/ techniques to diagnose cancer at an early stage. Exploiting the laws of thermodynamics, efforts are on to develop a label free bio-sensor for early cancer screening and therapy. The possibility of using Raman spectroscopy as a sensitive, molecular biophysical, bedside diagnostic tool is also being explored. While the *ex vivo* study generated useful data, classifiers and clinical protocol to discriminate sentinel metastatic lymph nodes in breast cancer patients, translation of the emerging protocol into a bedside smart diagnostic system is still a distant goal.

Education

The lab participates in the Centre's training program and, during the year, accepted nine trainees – seven for their Master's dissertation and two for research experience.

CANCER RESEARCH INSTITUTE

Dr. Shubhada Chiplunkar (Director, ACTREC)

Basic Research Team

- Dr. Kishore Amin
- **Dr. Dibyendu Bhattacharyya**
- **Dr. Kakoli Bose**
- Dr. Pradip Chaudhari
- **Dr. Murali Krishna Chilakapati**
- **Dr. Shubhada Chiplunkar**
- **Dr. Sorab Dalal**
- **Dr. Abhijit De**
- **Dr. Amit Dutt**
- **Dr. Shilpee Dutt**
- Mr. Nikhil Gadewal
- Dr. Poonam Gera
- **Dr. Rukmini Govekar**
- **Dr. Rajiv Gude***
- **Dr. Sanjay Gupta**
- Dr. Syed Hasan
- Dr. Arvind Ingle
- Dr. Narendra Joshi
- Dr. Aarti Juvekar*
- **Dr. Rajiv Kalraiya**
- Dr. Jyoti Kode
- Dr. Pradnya Kowtal
- **Dr. Manoj Mahimkar**
- **Dr. Girish Maru***
- **Dr. Rita Mulherkar***
- Dr. Asha Ramchandani*
- **Dr. Pritha Ray**
- **Dr. Rajiv Sarin**
- Mrs. Sharada Sawant
- **Dr. Neelam Shirsat**
- **Dr. Tanuja Teni**
- **Dr. Milind Vaidya**
- **Dr. Ashok Varma**
- **Dr. Prasanna Venkatraman**
- **Dr. BV Venugopalareddy**
- **Dr. Sanjeev Waghmare**
- Dr. Ujjwala Warawdekar

Principal Investigators (PIs) are shown in bold

* Retired during 2014

Bhattacharyya Lab

Dr. Dibyendu Bhattacharyya
Principal Investigator

Overview

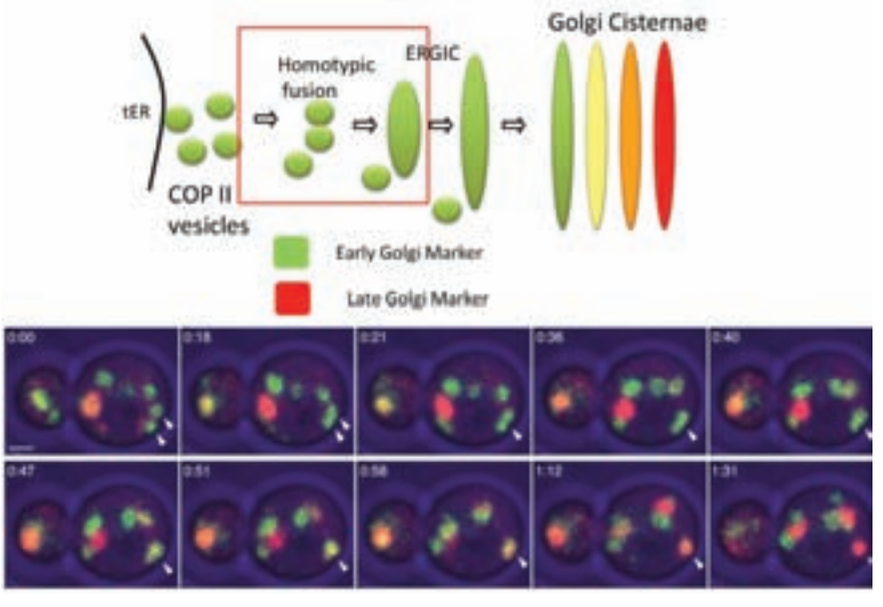
The focus of work in Bhattacharyya lab is on intracellular organelle biogenesis and dynamics primarily with a focus on the size control mechanism of such compartments. Organelles' size and shapes are greatly altered in cancer and such alteration is a hallmark of cancerous cells. Using basic cell biological approach along with advanced microscopic techniques, attempts are being made to understand the underlying mechanisms that govern the size control mechanism of Golgi and nucleus. Yeast and cell lines are the model systems being used, and in the near future culturing of neurons will be initiated.

Research

Recent findings from this lab show that the GTPase ARFI is capable of controlling Golgi size by altering cisternal maturation kinetics. The important roles of nuclear import for size control of nucleus of human cells have also been discovered.

Education

The Principal Investigator is a recognized guide for Ph.D. in the Life Sciences of Homi Bhabha National Institute. Presently, five research scholars (Ms. Madhura Bhave, Ms. Abira Ganguly, Ms. Prasanna Iyer, Mr. Bhawik Kumar Jain, Mr. Praveen Marathe) are working on their doctoral dissertation under his guidance. The lab also participates in the training program of the Centre, wherein one post doc and two trainees were accepted in the lab during 2014. Lab members participated in weekly data presentation sessions, and presented their work findings at four local/ national conferences.



Bose Lab

Dr. Kakoli Bose
Principal Investigator

Overview

The long-term objective of Bose Lab is to achieve a broad understanding of structure, function and specificity of proapoptotic proteins involved in alternate apoptotic pathways and their role in cancer utilizing multidisciplinary approach. The lab currently focuses on two major proteins: human HtrA2/Omi (high temperature requirement protease A2) and human papillomavirus regulatory E2 protein. HtrA2/Omi is a unique trimeric serine protease that performs critical cellular functions the mechanisms of which still remain elusive. It is also associated with several critical diseases such as cancer and neurodegenerative disorders, making it an important therapeutic target. Therefore, intricate dissection of its structure and dynamics is being performed using structural tools and identification of its novel partners is being attempted, which will shed light on its biological role and thus provide a means to manipulate it with desired characteristics. Currently, other members of this protease family such as HtrA1, -3 and -4 are also being studied. This research also encompasses understanding the mechanism of interaction between high-risk papillomavirus (HPV) regulatory E2 protein and proteins of the extrinsic apoptotic pathway. This information will unravel a novel adapter-independent cell death pathway and will further the understanding of papillomavirus E2 protein in general.

Research

Highlights of the research findings of this lab include establishment of the model of HtrA2 activation via its N-terminal domain. The dual regulatory switch for HtrA2 activation has also been identified. Crystals at 2.0 Å resolution of a pathological mutant of HtrA2 have been obtained and currently the structure is being solved. The interaction of HtrA2 with two of its known binding partners has been characterized and its interaction with a putative ligand has been established. Hax-1 has been established as an activator of HtrA2 - *not a* substrate, which is contrary to the available information in the literature. DUSP-9 has been identified and characterized as an HtrA2 binding partner. The mechanism of human papillomavirus E2 mediated activation of the extrinsic apoptotic pathway has been established and it has been compared with the classical pathway of cell death.

Education

The lab is recognized for the Ph.D. degree in Life Sciences of the Homi Bhabha National Institute, and currently there are six graduate students (Ms. Nitu Singh, Mr. Lalith K. Chaganti, Mr. Raja Reddy Kuppili, Ms. Saujanya Acharya, Mr. Ajay Wagh, Mr. K. Raghupati) working on their doctoral dissertation. The lab also participates actively in the Centre's training program, wherein eleven trainees worked either for their Master's dissertation or for research experience during 2014. The lab members meet once a week for data presentation and journal club. Faculty and students of the lab visited seven local/ national conferences and workshops to present their research findings in poster or oral presentations.

Chilakapati Lab

Dr. Murali Krishna Chilakapati
Principal Investigator

Overview

Cancer has gained the epidemic proportions in recent years and will soon be the leading cause of death. Screening and early detection are important tools to reduce cancer morbidity/ mortality. Thus, there is an urgent need to develop sensitive, preferably-non invasive methods for early diagnosis. Optical spectroscopic methods like infra red absorption, Raman and fluorescence spectroscopy are being contemplated as adjunct/ alternative approaches. Among these, Raman is best suited for non-invasive and online applications. Chilakapati lab is actively pursuing the development of Raman based methods, with a focus on the development of *in vivo/ in situ* methods for routine screening and diagnosis, developing minimally invasive microspectroscopy methods using body fluids and cell smears, and exploration of 1H NMR, Raman and infrared spectroscopy for oral cancer diagnosis using saliva. Raman imaging is also being used for correlation of spectral and biomolecules/ cancer biology. Other research areas include synthesis, optical and photothermal characterization of metallic nanoparticles for biomedical applications, and experimental carcinogenesis investigations in animal models.

Research

In vivo studies on over 300 patients have indicated feasibility of non-invasive delineation of oral cancer, pre-cancer, age-related effects and early events like CFE/ MAC. Recently a correlation of spectral and biomarkers has been demonstrated. In a study of 100 patients, Raman spectroscopic classification of healthy and cervical cancer subjects was demonstrated, and the vagina has been identified as a suitable internal control; the latter would be useful in screening camps where colposcopy is unavailable. On site instrument and stringent experimental conditions are hurdles for *in vivo* applications. Hence, studies on exfoliated cells and body fluids have been indicated. Serum based classification of healthy buccal mucosa and tongue cancer was shown in 150 subjects. Discrimination of tissues from healthy subjects, tobacco habitues, premalignant and malignant tissues using buccal exfoliated cells was also demonstrated on 100 subjects, in line with earlier studies on cervical exfoliated cells. Hamster buccal pouch cancer model was used to study cancer progression by Raman, and correlated with histopathology and immunohistochemistry. The ability to distinguish normal, pre-fibroadenoma and fibroadenoma breast conditions *in vivo* was shown in Sprague-Dawley rat model. Urine based classification of adenocarcinoma and pre-adenocarcinoma conditions in rat breast was demonstrated. Other studies include detection of drug resistance, prediction of recurrence and measuring therapeutic drug levels of Imatinib. These leads are now being actively pursued for clinical applications.

Education

The lab is recognized for the Ph.D. program in Life Sciences of the Homi Bhabha National Institute (a deemed University). At present four graduate students - Ms. Rubina Shaikh, Mr. Piyush Kumar, Ms. Aditi Sahu and Mr. Tanmoy Bhattacharjee are working on their Ph.D. dissertation. The lab also participates in the training program of the Centre; five trainees worked on their M.Sc dissertation in 2014. Lab members also attended five national/ international conferences to present their research findings.

Chiplunkar Lab

Dr. Shubhada Chiplunkar
Principal Investigator

Co-Investigator
Dr. Jyoti Kode

Overview

The focus of research in Chiplunkar lab is on understanding the immune scenario and reasons for immune dysfunction in cancer patients, with the long term goal of developing cell based immunotherapy approaches for cancer treatment. Basic areas focus on understanding the cross talk between bisphosphonate-stimulated tumor cells/ γδ T cells and osteoclasts, role of Notch in regulation of γδ T cells and regulatory T cells, and epigenetic regulation and anti-tumor effector functions of γδ T cells. Work on cancer includes understanding of the role of Th17 and regulatory T cells in gall bladder cancer, and genomic and functional studies in TCR γδ T-ALL patients. Other projects study the role of galectin-3 in modulating tumor-specific immunity and lung metastasis in mice, and development of a simple and non-invasive method for prognostication and monitoring of treatment response based on analysis of EBV DNA. Under the 'Science Initiative Program in Ayurveda', the immune scenario generated in mice treated with Bhasmas and anupans (vehicle) is being investigated.

Research

Various projects undertaken in this lab investigate the molecular mechanisms underlying the ability of γδ T cells to kill bisphosphonate treated breast/ oral tumor cells and leukemic (T-ALL) blasts. Studies demonstrated that Notch signaling plays a key role in regulation of effector functions of γδ T cells through transcriptional and epigenetic mechanisms. In gall bladder cancer patients, γδ Th17 was identified as a new subtype that contributed to inflammation and was associated with poor survival. $\gamma\delta^{+}$ RANKL+ subset was increased in peripheral blood of breast cancer patients compared to that of healthy individuals indicating their ability to home to the bone. For the first time, a potentially important function for 2', 5', oligoadenylate synthase (OAS2 - antiviral gene) as a paracrine negative regulator of T-cell function was established in oral cancer (OC) patients. Further in these patients, increased frequency of MDSCs and Tregs resulted in T cell tolerance and induction of chronic inflammation which may facilitate tumour growth. Studies demonstrated that absence of Galectin-3 facilitated lung metastasis in B16F10 murine melanoma model which may be due to immune dysfunction contributed by attenuated IFN-γ signalling.

Education

The Principal Investigator is a recognized Ph.D. guide in Life Sciences under the Homi Bhabha National Institute (deemed University). During 2014, one student – Mr. Dimpu Gogoi was awarded the Ph.D. degree, while seven students – Ms. Swati Phalke, Ms. Aparna Chaudhari, Mr. Asif Amin Dar, Mr. Rushikesh Patil, Ms. Gauri Mirji, Mr. Sajad Bhat and Ms. Shalini KS worked on their Ph.D. dissertation under her guidance. The lab also actively participated in the Centre's training program, wherein ten trainees (nine with the PI and one with the Co-I) undertook training here. Weekly data presentations form a part of the in house academic activity of the lab. Lab members participated in five international and seven national conferences during 2014.

De Lab

Dr. Abhijit De
Principal Investigator

Overview

The mandate of the lab is translating diverse experimental therapeutics and cancer *diagnostics developed through research for the patient benefit*. The research focus of De Lab is preclinical molecular functional imaging and cancer, involving real time visualization and quantitative measurement of cellular/ physiological processes at the molecular/ genetic level. Research involves miniaturized medical imaging guided methodologies to test multiple facets of experimental medicine and concept therapeutics in live cells and small animal models. A major focus is on the use of preclinical imaging for therapeutic evaluation of human sodium iodide symporter (hNIS) gene targeted radio-iodine therapy for breast cancer. A phase I trial has been initiated at TMH to evaluate the feasibility of performing NIS based targeted radio-iodine therapy. In another line of research, synthetic nano-scale translational medicines are being developed for breast and oral cancer. Organo-metallic nano-material consisting of gold nanoparticles and thermolabile biodegradable liposome has been developed and tested for photo-thermal therapy using preclinical imaging guidance in tumor xenograft model. Optical imaging sensor technology is also being developed to monitor breast cancer target proteins such as STAT3 and EpCAM, which can facilitate functional screening of gene mutations and inhibitor compounds against specific cancer proteins/ pathways.

Research

hNIS over-expression was in >80% of over 200 breast cancer samples studied, indicating its potential use in radioactive I-131/ I-125/ I-124 compatible radioiodine therapy/ SPECT/ PET based diagnostic imaging. A software IHC Profiler was developed in-house for automated IHC staining analysis of digital IHC images. Experimental approaches are being developed to study modulation of endogenous hNIS expression using cell and preclinical mouse models. hNIS promoter-reporter vector and engineered BC cells have been developed to study regulation of hNIS function. A couple of HDAC inhibitors showing preferential elevation of endogenous hNIS expression in breast cancer cells have been identified, and on-going work with these pharmacological targets shows promise. p53 protein has been identified as a negative regulator of hNIS transcription in breast cancer cells. Several novel findings will help in devising clinically relevant protocols for application in the breast cancer clinic in the future. In the cancer nano-therapeutics program, gold nanoparticles were tested for laser mediated photo-thermal therapy in breast cancer cells; these findings have been published in Nanoscale (IF 6.8). A lymph targeted nanoparticle carrying Tamoxifen was developed as a common breast cancer medicine. A nano-formulation is being developed for siRNA delivery to cancer cells. In breast cancer cells, EpCAM status during the development of radiation resistance was evaluated, and EpCAM targeted RNA/ DNA aptamer is being tested as a candidate breast cancer imaging probe.

In the imaging guided cancer drug screening program, bioluminescence resonance energy transfer (BRET) based sensor strategy is being developed to study protein-protein interactions *in vivo*. This will enable functional screening *in vitro* in live cells, with lead testing in physiologic mouse model. The multiplexed BRET systems developed and validated in this lab can monitor functional responses of signaling pathways, such as STAT3 post-translational modifications in breast cancer.

Education

The Principal Investigator is a recognized guide for Ph.D. in Life Sciences of the Homi Bhabha National Institute. At present, there are five research scholars – Ms. Sushmita Chatterjee, Ms. Madhura Kelkar, Ms. Shalini Dimri, Mr. Arijit Mal and Ms. Maitreyi Rathord working on their doctoral dissertation and two postdoctoral research associates in the lab. The lab also participates in the Centre's training program and, during the year, four trainees worked in the lab – one for her Master's dissertation and three for research experience. The faculty and lab members also participate in weekly data presentation and journal club, and presented their research findings in oral/ poster presentations at local/national/ international conferences and meetings.

Dutt Lab

Dr. Amit Dutt
Principal Investigator

Overview

The overall aim of Dutt lab is to understand the biological basis of various human cancers to guide development of clinical therapeutics. Research efforts involve integrated characterization of somatic alterations of cancer-specimens by performing genome-wide analysis of copy number changes using SNP arrays, genomic re-sequencing using next generation sequencing platforms, and low throughput loss-of-function pooled RNAi mediated genetic screen using tumor derived cell lines established in house. Considerable efforts also focus on experimental evaluation of functional relevance of somatic alterations identified by genomic approaches, using molecular and cellular approaches.

Research

Prime among the research investigations conducted in Dutt lab is the one that aims to define the cancer genome of head and neck squamous cell carcinoma (HNSCC) using SNP arrays and next generation sequencing technology, in a bid to identify activating mutations in HNSCC genomes that could represent therapeutic vulnerabilities. Genome-wide RNAi screen with human pooled tyrosine kinase shRNA libraries in HNSCC cell lines is being run to discover vulnerabilities among multiple cell lines established in house from Indian tongue cancer patients. In the area of progestogenomics, the goal is to identify transcriptional targets of progesterone in human breast cancer in order to understand the mechanism by which progesterone exerts its biological effect through transcriptional targets in human breast cancer cells. Human lung cancer is being profiled to discover additional mutationally activated oncogenes besides *EGFR* and *ALK*, which could provide novel therapeutic targets for this deadly disease. Attempts are also being made to generate the first landscape of genetic alterations in human retroperitoneal liposarcoma and to characterize the functional relevance of activated oncogenic tyrosine kinases in tongue squamous cell carcinoma in a bid to identify genetic vulnerabilities and potential targets for new therapies.

Education

Dutt lab is recognized for Ph.D. in Life Sciences from the Homi Bhabha National Institute. At present there are 6 research scholars – Mr. Pawan Upadhyay, Mr. Pratik Chandrani, Mr. Prajish Iyer, Mr. Mukul Godbole, Ms. Trupti Togar and Ms. Vidyalakshmi Sethunath working for their doctoral dissertation. Two trainees worked in the lab during 2014 for research experience. The lab has a regular in house data presentation and journal club program in which all the members of the lab participate. A weekly joint meeting with other research groups at ACTREC is also conducted. During 2014, lab members participated in several national conferences and presented their findings through oral or poster presentations.

Gupta Lab

Dr. Sanjay Gupta
Principal Investigator

Overview

Every cell in an organism contains same genes, but different genes are expressed in different cell types. This genetic information is competently managed by epigenetic mechanisms - epigenome for facilitating the expression of specific genes. Partly, it relies on a DNA-histone protein complex called chromatin. Histones are emerging as key players in human health and are known to be altered in different physiological states. Research performed in the lab focuses on epigenetics and chromatin biology, with an emphasis on understanding how cell cycle specific alteration in histones affects their role in DNA damage response; the clinical significance of alteration in covalent modification of histones in human cancers; transcriptional regulation of histone variants, variant-specific PTMs and their binding partners during carcinogenesis; how structure and function of chromatin fiber is altered with the replacement of canonical histones by histone variants; and finally, the question of how to translate the information into diagnostic and therapeutic tools for better management of cancer.

Research

An on-going study in gastric cancer suggests that histone modification pattern - H3 Serine10 phosphorylation, is altered in malignancy and is regulated by the enzyme, MSK1. Further, genome-wide hypo-acetylation in gastric tumor tissue with increase in HDAC enzymes signifies the importance of HDAC inhibitor with standard chemotherapy. Also, the reversible reduction of H3 Serine10 phosphorylation in only G1 phase cells in response to ionizing radiation induced DNA damage raises the possibility of its modulation by specific inhibitors for efficient cell death during radiotherapy. The histone variants story unfolds further and suggests that altered transcription factor interactions with the key co-repressors p53 and Sox9 partly contribute to the differential expression of histone variants, H2A.1 and H2A.2 in hepato-carcinogenesis. Further, studies show non-redundant roles of H2A.1 and H2A.2 isoforms which differ in only three amino acid residues. The H2A.2/H2B dimer is more stable compared to H2A.1/H2B dimer and this contributes to more stable H2A.1 containing nucleosome. Also, H2A.1 over expression leads to higher proliferation, without affecting the migratory potential of cells.

Education

The lab is recognized for Ph.D. in Life Sciences of the Homi Bhabha National Institute. At present, there are six doctoral students – Ms. Monica Tyagi, Mr. Shafqat Ali Khan, Mr. Saikat Bhattacharya, Ms. Divya Velga Reddy, Ms. Asmita Sharda and Mr. Ramchandra Amnekar. Dr. Gupta is also a co-guide for Mr. Suresh Subramanian, Scientific Officer at BARC. Eight trainees worked in the lab during 2014 for their Master's dissertation and three as collaborative trainees. Faculty and lab members meet twice a week for data presentation, abstract and journal club, and participate in national/ international conferences to present their research findings through invited, oral or poster presentation.

Kalraiya Lab

Dr. Rajiv Kalraiya
Principal Investigator

Overview

The research focus of Kalraiya lab is to understand the role of altered glycosylation on proteins at the cell surface in two important processes in cancer, viz., invasion and metastasis. The lab has demonstrated how the highly branched N-oligosaccharides expressed on cancer cells alter the properties and localization of key molecules like integrin receptors into specialized membrane microdomains and alter their properties, in turn facilitating cancer cell invasion. The terminal substitutions on these N-glycans in the form of poly N-acetyl lactosamine (polyLacNAc) substitutions have been shown to serve as anchor for circulating melanoma cells to get arrested on the lung vascular endothelium expressing galectin-3 constitutively on its surface. The mechanism and modes to inhibit these interactions and thus metastasis are being explored. The lab also investigates the role of a novel type of glycosylation (O-glcNAcylation) seen on nuclear and cytoplasmic proteins in regulating the properties of keratin 8/18, and its impact on the cellular properties important for malignant progression. The mechanism by which a single depot injection of progesterone provides survival advantage to breast cancer patients, especially those bearing receptor negative breast cancer is being explored using an animal model.

Research

With reference to glycobiology and its relevance to malignant progression, sialic acids (α 2,6) on highly branched N-oligosaccharides on melanoma cells were seen to promote adhesion and induce secretion of MMP-9. Activation of MMP-9 at the invading front was facilitated by co-localization of membrane tethered form of MMP (MT-1 MMP), with integrin receptors carrying such oligosaccharides. Their role in regulating movement and degradation of basement membrane was also demonstrated. Terminal substitutions in the form of poly-N-acetyl-lactosamine (polyLacNAc) were shown to serve as high affinity ligand for galectin-3, expressed in highest amounts on all the major tissue compartments of the lung including the surface of its vascular endothelium. PolyLacNAc/ galectin-3 pair was shown to participate in the arrest and extravasation of melanoma cells in the lungs. Inhibition of polyLacNAc synthesis or the competitive inhibitors for endogenous galectin-3 both inhibited lung metastasis. The proteins carrying polyLacNAc on melanoma cells have been identified using mass spectrometry and the mechanism by which one such carrier protein LAMP1 facilitates metastasis has been elucidated. The role of the novel glycosylation (O-glcNAcylation) in regulating keratin 8/18 function and its relevance to cellular properties has been elucidated. As opposed to reciprocal regulation, the lab has demonstrated for the first time that glycosylation at serine-30 (S30) on K18 positively regulates phosphorylation at an adjacent S33. Mutation at S30 has the same effect on solubility and stability of K18 and on filament architecture as that of S33 mutation. Assays to explore the mechanisms involved in progesterone (PG) mediated survival advantage to breast cancer patients showed that it affected adhesion, movement and secretion of MMPs in receptor negative breast cancer (4T1) cells *in vitro*. A single depot injection of PG at half the dose used for humans (normalized for mice, based on body surface area), prevented lung metastasis significantly.

Education

The lab is recognized for the Ph.D. degree in Life Sciences of the Homi Bhabha National Institute (a deemed university). During 2014, one student – Mr. Amit Ranjan was awarded PhD degree, two students Mr. Akhil Kumar Agarwal and Mr. Manohar Dange submitted their PhD thesis, while Mr. Shyam More and Ms. Poonam Kakade are in the final stages of their PhD program. The lab also participated in the training program of the Centre and accepted nine trainees in the lab – six for the Master's dissertation, one for research experience and two as collaborative trainees, during the report period.

Mahimkar Lab

Dr. Manoj Mahimkar
Principal Investigator

Overview

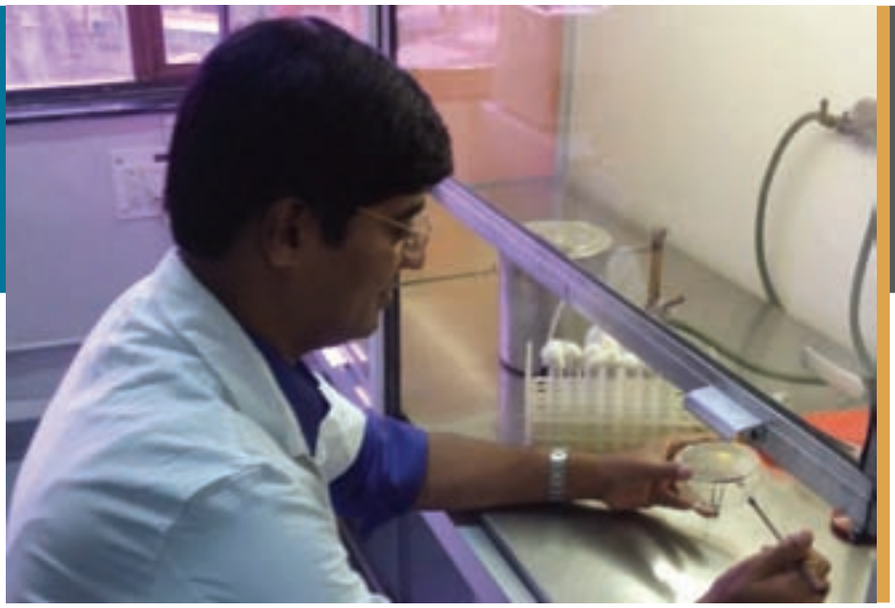
Research activities of this lab focus on understanding the genetic basis of tobacco related cancers, specifically the identification of putative genomic biomarkers responsible for oral carcinogenesis. Cancer progresses through the accumulation of genetic and epigenetic changes, ultimately resulting in gross genomic instability and changes in gene expression. Non-random copy number alterations are one of the key mechanisms responsible for changes in gene expression. Therefore investigations of this lab focus on two major aspects of oral cancer biology: (a) Genomic alterations at the level of copy number across the genome, and (b) Identification of genes/ gene clusters underlying these altered genomic loci using microarray. Microarray based global transcriptomic analysis is also being used to study sequential development of lung adenomas in A/J mice induced with the tobacco smoke carcinogens - benzo(a)pyrene [B(a)P] and 4-(methylnitro-samino)-1-(3-pyridyl)-1-butanone (NNK). Chemoprevention using phytochemicals is a promising approach for lung cancer management. The chemopreventive efficacy of polymeric black tea polyphenols (PBPs), abundantly found in black tea, to inhibit [B(a)P] and NNK induced lung adenoma is also being examined.

Research

Analysis of chromosomal alterations and gene expression changes reportedly are better predictors of clinical outcome. Array comparative genomic hybridization analysis of advanced stage oral cancers revealed chromosomal gain of 11q22.1-q22.2 region associated with loco-regional recurrence and shorter survival. These observations are being validated by FISH; preliminary data indicate that amplification of this locus is associated with nodal metastasis. Putative driver genes associated with oral carcinogenesis have been identified by integrating DNA copy number and gene expression data. Extensive genomic analysis of oral precancerous lesions is on-going. Comprehensive evaluation of biomarkers such as epidermal growth factor receptor (EGFR), hypoxia inducing factor α (HIF-α), HPV and their correlation with the clinical outcome of patients singly or in combination is also under way. In the chemoprevention studies, the PBP rich fraction of black tea down-regulated B(a)P and NNK induced cell proliferation (diminished PCNA and Bcl-2 expression) and enhanced apoptosis (increased Bax expression) through phosphorylation of p38 and Akt. Anti-inflammatory action of PBP was evident from reduced Cox-2 expression. The protective effects of PBP fractions could be through inhibition of proliferation and induction of apoptosis.

Education

The lab is recognized for the Ph.D. program of the Homi Bhabha National Institute. Presently there are three research scholars working on their Ph.D. thesis – Ms. Priyanka Bhosale, Ms. Rasika Hudlikar and Ms. Usha Patel. The lab participates in the Centre's training program and, during this year, nine trainees worked on small projects under the PI for their B.Tech./M.Sc. dissertation.



Maru Lab

Dr. Girish Maru*
Principal Investigator
***superannuated in May 2014**

Co-Investigator
Dr. Asha Ramchandani*
*superannuated in July 2014

Overview of Research

During the year, efforts were directed at collating the findings of the on-going research programs on chemo-modulation of carcinogenesis directed towards the identification and delineation of the mechanisms of action of chemopreventive agents from Indian foods and beverages, and development of surrogate endpoint biomarkers. The anti-initiating and anti-promoting activities of curcumin, polymeric black tea polyphenols (PBPs) and crude grape polyphenolic extracts had been clearly demonstrated in several experimental models. Chemoprotection resulted from modulation of carcinogen metabolism by phase I and phase II enzymes, carcinogen/ tumor promoter-induced inflammation, cell proliferation and apoptosis. Evaluation of signal transduction pathways revealed that modulation of kinase functions by polyphenols was responsible for the chemoprotective effects.

Education

The lab participated in the Centre's training program and three trainees (two with the PI, and one with the Co-I) worked in the lab during 2014.

Prasanna Lab

Dr. Prasanna Venkatraman
Principal Investigator

Overview

The research focus of Prasanna Lab is in understanding some basic, hitherto unanswered questions on the structural, mechanistic and cell biological aspects of protein degradation by the proteasome. Advances made in the lab on two proteasomal chaperones PSMD9 and PSMD10 have led the way to a system wide study employing novel computational approaches to deduce novel functions to identify bottlenecks in the protein interaction and regulatory networks using ex vivo model systems. This could serve as a paradigm to characterize differences between normal and cancer samples and identify/ recognize therapeutically vulnerable nodes and edges in the network. Building on the observed novel ATPase activity of 14-3-3 proteins, studies are on to see if this activity is necessary for the ex vivo and in vivo functions of this phospho protein binding and scaffold protein. The program PNSAS - developed in house, has helped identify desmoglein 2 (Dsg-2) as an authentic substrate of matriptase and led to the prediction that steady state levels of Dsg-2 regulated by matriptase may be important in controlling cell adhesion/ invasive properties of some epithelial cancers. Testing this possibility on primary tissues of recurrent/ non recurrent breast cancer patients has indicated that the levels of the enzyme could be a predictive marker for relapse. The study will be extended to a larger cohort of blinded samples. In an independent effort towards crystallizing biological information from voluminous data in high throughput studies, a method has been developed to validate experimentally determined phosphorylation sites using structural principles. It has identified allowed/ disallowed regions of phosphorylation. Using buried information on conformational dynamics, a whole body of novel genes/ proteins can be tested for 'druggability'.

Research

On-going research projects involve dissection of the fine structure and domain motif specificity of PSMD9 with its interacting partners using high resolution biophysical approach, and solving the structure at atomic resolution. These would pave way for the design of small molecule inhibitors of PSMD9 that can inhibit NFκB activity. Identification of the minimal motif involved in binding of the proteasome will be studied using site directed mutagenesis and functional assays. The role of PSMD9-RPS14 interaction in p53 regulation during ribosomal stress and possible role of PSMD9 in transcriptional control of protein translation/ degradation such as in non-sense mediated mRNA decay is being identified. In collaboration with IIT-B, Mumbai, an integrated computational and experimental approach is being taken to discovering and analyzing regulatory networks in systems biology. It is proposed to build and test a network model to examine the cell fate decisions regulated by the proteasomal chaperones PSMD9 and PSMD10 in a well-defined cellular model system. Using micro array data and network approach, a putative novel role for PSMD10 in neuronal differentiation has been identified and experimentally validated using a stem cell model. Limited low throughput screening using siRNA against putative interacting partners of gankyrin has led identified bottle necks in cell growth and viability of cancer cells. This will be validated in a robust assay and rescue experiments by ectopic expression of the wt protein and non interacting mutant.

Education

The Principal Investigator is a recognized guide for Ph.D. in Life Sciences for Homi Bhabha National Institute. Of the seven research scholars in the lab, Ms. Padma Nanaware and Mr. Manoj Ramteke obtained the PhD degree in 2014, Mr Nikhil Sangith submitted his thesis, while Mr. Indrajit Sahu, Ms. Mahalakshmi Ramachandran, Mr. Sheikh Burhan ud din Farooqee and Mr. Saim Mulla are working on their dissertation. Three postdoctoral fellows worked on various projects of the lab during 2014. The lab also participates in the centre's training program and ten trainees worked under her supervision for six for M.Sc. dissertation and four for research experience. The lab has an active in house data presentation and journal club program, and several lab members presented their research findings as oral or poster presentations at national/ international conferences in 2014.

Ray Lab

Dr. Pritha Ray
Principal Investigator

Overview

Ovarian cancer, commonly known as "silent lady killer" is a challenging disease worldwide due to late diagnosis and acquisition of resistance to standard chemotherapeutic molecules. Research in the Lab focuses majorly on three aspects of epithelial ovarian cancer: Understanding the major signaling pathways responsible for acquired chemoresistance for an endeavor to early detection of chemoresistant ovarian cancer; Assessing association of cancer stem cell with chemoresistant ovarian cancer; Investigating molecular heterogeneity in epithelial ovarian cancer. Research in this lab involves cellular and molecular biological, proteomics, phage display screening approaches and *in vivo* preclinical imaging techniques, using indigenously developed various drug resistant models of ovarian cancer cells and patient samples.

Research

Recently published research from this lab indicates that expression of insulin like growth factor receptor (IGF-1R), a receptor tyrosine kinase and activator of PIK3CA/Akt and MAPK/ERK signaling is upregulated at early stages of resistance and decreased when the cells are highly resistant to Cisplatin or Paclitaxel or both. Oscillation of IGF-1R expression involves both transcriptional and post-translational regulation. A small cohort of ovarian cancer patients who have undergone 3-4 cycles of platinum/taxane therapy demonstrated upregulated IGF-1R expression in primary tumors. Picropodophyllin, a small and specific inhibitor of IGF-1R shows maximal reversal of chemo resistance at early stages. In a separate study, a novel series of di-fluorinated propanedione derivatives were seen to synergistically augment paclitaxel mediated caspase 3 activation in ovarian cancer cells. Besides these, investigations are on to determine how PIK3CA/Akt signaling escapes p53 repression in chemo resistant cells, the molecular regulation of IGF-1R expression in chemoresistant cells and the association of Hox genes with heterogeneity of epithelial ovarian cancer and other aspects of drug resistant ovarian cancer.

Education

The Principal Investigator is a recognized guide for Ph.D. in Life Sciences under the Homi Bhabha National Institute (a deemed University). At present, five students- Ms. Snehal Gaikwad, Mr. Ram K Singh, Ms. Subhoshree Chatterjee, Mr. Bhushan Thakur and Mr. Ajit Dhadve, are working on their doctoral dissertation. The lab also participates in the Centre's training program, wherein one research associate and four trainees worked under her supervision. Lab members participate regularly in the in house data presentation, and during 2014 they attended two national and one international conference.

Rukmini Lab

Dr. Rukmini Govekar
Principal Investigator

Overview

The research focus of Rukmini Lab is to understand the molecular basis of lineage decisions in hemopoiesis using Philadelphia chromosome positive lymphoid and myeloid leukemia as a model system. In this set of leukemias, the pluripotent hemopoietic stem cell harbors a chromosomal translocation and the product of this transgene is a constitutively active tyrosine kinase. Chronic myeloid leukemia (CML) from this group progresses either to lymphoid or myeloid blast crisis. A subsection of patients with acute lymphoid leukemia are Philadelphia chromosome positive. Comparative proteomic profiling of these leukemias which harbor a common chromosomal aberration but progress to distinct hemopoitic lineages would throw light on the molecular basis of lineage decisions in hemopoiesis. Further the profiles can assist in an understanding of the resistance of CML blasts to the currently used tyrosine kinase inhibitor therapy and also in the identification of an alternate therapeutic target. Another area of focus of the lab has evolved from previous studies on anemia in CML, which highlighted the unforeseen contribution of neutrophilic protease to the premature senescence of erythrocytes in CML. Taking clue from these observations, the effect of proteases secreted by tumor infiltrating neutrophilic on membrane proteome of tumor cells and on their behavior is presently being investigated.

Research

The lab is presently involved in two research projects. In the first one entitled 'Proteomic and phosphoproteomic profiling of BCR/ABL positive leukemias', mass spectrometry is being used to determine the proteomic profiling of cell lines representing lymphoid and myeloid blast crisis of CML. In the second project examines 'The effect of cathepsin G - a neutrophilic protease, on the membrane proteome of MCF 7 cells'. A comparison of proteomic profile of cathepsin G treated/ untreated cells has identified substrates of cathepsin G in the membrane fraction of MCF 7 cells. These results will be further validated in patient samples.

Education

The lab is recognized for PhD in Life Sciences of the Homi Bhabha National Institute. Two research scholars, Ms. Mythreyi Narasimhan and Mr. Rahul Mojidra, are working on their doctoral dissertation. Fourteen students underwent training in the lab as a part of their Master's degree dissertation program. Lab members regularly engage in data presentation as well as presentation of published articles in an in-house journal club. During 2014, the PI co-ordinated (along with Dr. Gauri Pantvaidya of TMH) co-ordinated the conduct of three quarterly sessions of the training program in laboratory techniques in translational research for M.Ch. surgical oncology students.. She was also invited to deliver lectures at local/ national workshops.

Sarin Lab

Dr. Rajiv Sarin
Principal Investigator

Co-Investigator
Dr. Pradnya Kowtal

Overview

The research focus of Sarin Lab is to understand the molecular basis of inherited and somatic cancers, and develop translational algorithms through molecular biology and functional genomics. The lab is interrogating these questions through three projects: a large cohort of 3000 families with various inherited cancer syndromes along with their DNA and EBV lymphoblastoid cell line bank; BRCAGEL case-control study of 2800 breast cancer cases/ matched healthy controls; and oral cancer patients with full clinical and pathological annotation, follow-up and exome/ whole genome sequenced as part of the International Cancer Genome Consortium (ICGC) project, in collaboration with NIBMG, Kolkata.

Service

The lab provided genetic counselling, genetic testing and risk management guidance as appropriate for 650 new hereditary cancer families.

Research

In 2014, over 650 new hereditary cancer families were enrolled and counselled with DNA banking. Molecular genetic analysis and reporting along with risk management of mutation carriers was done for over 100 families. Novel mutations in BRCA1 were characterized using comprehensive *in-silico* and functional studies. Haplotype analysis of hereditary colorectal cancer families harboring the same genetic defect in a mismatch repair gene showed shared haplotypes amongst the families indicating common ancestry. In the BRCAGEL case control study, 600 new subjects were enrolled in 2014. Association of clock genes and chronotype with breast cancer risk was reported. Clinical correlation of the exome sequencing data for gingivo buccal cancers form the ICGC cohort pooled with TCGA data showed the survival advantage in tumors with somatic mutations in the lipid metabolism pathways. Novel BRCA1 mutations were characterized using comprehensive *in-silico* and functional studies. Haplotype analysis of hereditary colorectal cancer families confirmed founder effect of a common germline mutation in MLH1 gene.

Education

The Principal Investigator is a recognized guide for Ph.D. in Life Sciences of the Homi Bhabha National Institute. With two post doctoral fellows, three graduate students (Ms. Nikhat Khan, Mr. Moquitul Haque, Ms. Vasudha Mishra) working on their Ph.D. dissertation, fifteen trainees (14 with the PI and one with the Co-I), the lab has an active weekly academic program of data presentation/ journal club. Three parallel one week hands on training workshops were conducted in October 2014: Workshop I: Cancer Genetics Counselling, Workshop II: Basic Techniques in Molecular Biology; Workshop III: Advanced Techniques in Molecular and Genetic analysis.

Shilpee Lab

Dr. Shilpee Dutt
Principal Investigator

Overview

The long term goal of Shilpee lab is to gain insights into the molecular basis of radiation and chemo resistance in cancer. Initial efforts are directed towards understanding epigenetic regulation of chromatin structure and the DNA damage response (DDR) of a cell. DDR pathway is a well appreciated key player in conferring chemo and radiation resistance to the cancer cells. However, how epigenetics and chromatin structure are regulated and contribute in modulating DNA repair of therapy resistant cancer cells is unclear. Attempts are being made to understand therapy related molecular mechanisms that link chromatin and DNA damage repair. Furthermore, to get a comprehensive understanding of different intracellular signaling pathways, crosstalk between them, and their contribution towards conferring therapeutic resistance, the total transcriptome and proteome of the sensitive and resistant cancer cells is also being analyzed to identify key signaling pathways that could provide novel targets for therapeutic intervention. Towards this end, in vitro resistance models primary patient samples of glioblastoma and leukemia have been generated, and we employ cell biology, molecular biology, biochemistry and microscopy based approaches. We are collaborating with clinicians at ACTREC and TMH to extend the findings from *in vitro* model system to patient samples, and lead to possible translational benefits of these studies.

Research

The lab has an active research program that encompasses four major projects: Chromatin regulation of DNA damage repair (DDR) pathway in radiation resistant Glioblastoma; Dynamics of double strand break repair in chemoresistant leukemias and Glioblastoma; Omics approach to elucidate the molecular mechanisms of resistance to cancer therapy; Role of cancer stem cells in cancer therapeutics. Radiation induced homotypic cell fusions of resistant Glioma cells have been identified as a novel non-genetic mechanism to sustain survival and relapse. This is the first study to show that radiation resistant Glioma cells acquire a reversible non-proliferative phenotype by phosphorylating Cdk1 (Y15) to undergo cell-cell fusion, an otherwise rare event between two cancer cells to form multinucleated giant cells (MNGCs). Cell fusions induce senescence, high expression of senescence associated secretory proteins (SASPs) and activation of pro-survival signals (pAKT, BIRC3 and Bcl-xL) in MNGCs. For the first time, the importance of cell to cell fusions during Glioma recurrence has been shown. Data from this lab provides novel insights into an unexplored multi-step process of radiation survival and relapse in glioblastoma that can be exploited for therapeutic interventions for glioblastoma and generate rationales for novel combinational targeted therapies.

Education

The lab is recognized for Ph.D in Life Sciences from the Homi Bhabha National Institute. At present there are four research scholars - Ms Ekjot Kaur, Mr. Sameer Salunkhe, Ms. Jacinth Rajendra and Ms. Jyothi Nair, working for their doctoral dissertation. The lab participated in the Centre's training program with nine trainees working for their M. Sc dissertation. Lab also participated in the 'open day' conducted by ACTREC. The lab has regular in house data presentation and journal club program in which all the members of the lab participate. A weekly joint lab meeting with other research groups at ACTREC is also conducted. Lab members participated in a number of national conferences during the year and presented their findings through oral or poster presentations.

Shirsat Lab

Dr. Neelam Shirsat
Principal Investigator

Overview

Brain tumours are the leading cause of cancer related deaths, particularly in children and young adults. Exome sequencing of oligodendroglioma, an adult brain tumour that is often difficult to distinguish from an astrocytoma, identified a number of novel genetic alterations and indicated the need of molecular characterization for accurate diagnosis. Medulloblastoma is a common malignant brain tumour in children. Genome wide expression profiling studies have demonstrated that it is comprised of 4 core molecular subgroups. Molecular subgrouping of over 200 medulloblastomas has been done using a miRNA based assay that was developed last year. The functional role of a number of miRNAs differentially expressed in the molecular subgroups of medulloblastomas has been investigated. Mir-148a and miR-193a have been identified as miRNAs having therapeutic potential.

Research

MicroRNA profiling of medulloblastomas identified a number of miRNAs to be differentially expressed in the four molecular subgroups of medulloblastomas, with the WNT subgroup having the most distinctive miRNA profile. WNT subgroup specific, miR-193a expression inhibited anchorage-independent growth of medulloblastoma cell lines. MiR-224 expression increased radiation sensitivity of both medulloblastoma and glioblastoma cells, and down-regulated the apoptosis inhibitor 5 gene. MiR-148a expression inhibited tumorigenic and invasive potential of medulloblastoma cells lines. Neuropilin 1 (NRP1) was identified as a novel miR-148a target. NRP1 expression in medulloblastomas was associated with poor survival, with little or no expression in majority of the WNT tumours. This observation is consistent with high miR-148a expression, low incidence of metastasis, and excellent survival of the WNT subgroup tumours. The tumour suppressive effect of miR-148a expression in medulloblastoma cells accompanied by the down-regulation of NRP1, ROCK1 and DNMT1 expression makes miR-148a an attractive therapeutic agent for the treatment of non-WNT medulloblastomas. In another study, exome sequencing of 11 tumours diagnosed histopathologically as oligodendrogliomas identified chromosome 1p/19q co-deletion in 9 tumours. One tumour was identified as an astrocytoma based on the lack of chr 1p/19q codeletion and the presence of ATRX and TP53 mutation, while another tumour lacking IDH1/IDH2 mutation was found to be closer to glioblastoma based on the presence characteristic genetic alterations (Figure). Thus, besides histopathological characterization, molecular characterization of adult gliomas is necessary for accurate diagnosis.

Education

The Principal Investigator is recognized as a guide for Ph.D. in Life Sciences of the Homi Bhabha National Institute. During 2014, the lab had seven graduate students – Ms. Ratika Kunder was awarded the Ph. D. degree in May 2014, while Mr. Kedar Yogi, Ms. Pooja Panwalkar, Mr. Satish Kumar Singh, Mr. Vijay Padul, Ms. Shalaka Masurkar and Ms. Raikamal Paul are working on their doctoral dissertation. The lab also participates in the Centre's training program and during 2014 took four trainees. Lab members participate in weekly journal club and data presentation.

Sorab Lab

Dr. Sorab Dalal
Principal Investigator

Overview

The lab has two specific goals: the first is to understand the mechanisms preventing cell cycle progression in response to DNA damage, and exploit these pathways as targets for therapeutic intervention; the second is to understand the biogenesis of the cell-cell adhesion junction, the desmosome and determine the consequences of desmosome dysfunction to development, tumor progression and metastasis.

Research

Work during the past year has demonstrated that loss of 14-3-3γ leads to defects in desmosome formation in cell lines in vitro and in the testis in vivo, resulting in sterility in male mice. Experiments to determine whether loss of 14-3-3γ in other tissues leads to a disruption in desmosome formation are now being performed. Work from this lab has also demonstrated that loss of 14-3-3γ leads to an increase in centrosome number, perhaps due to an increase in the activity of the cdk1 kinase. Attempts are now being made to exploit these observations to identify targets for therapeutic intervention. It has also been demonstrated that loss of plakophilin3, a desmosomal plaque protein, leads to an increase in the expression of LCN2 and MMP7, and that this increase in gene expression is required for invasion, tumor progression and metastasis. The observations suggest that these molecules could be further developed as prognostic markers or as targets for therapeutic intervention. Finally, it has been determined that loss of 14-3-3σ leads to induction of the Epithelial Mesenchymal Transition, because of an increase in the levels of c-Jun, a transcription factor required for the expression of EMT transcription factors such as slug.

Education

The Principal Investigator is a guide for Ph.D. in Life Sciences of the Homi Bhabha National Institute. At present, six graduate students (Ms. Mansa Gurjar, Mr. Srikanta Basu, Mr. Kumarkrishna Raychaudhari, Ms. Sonali Vishal, Ms. Arunabha Bose and Mr. Akash Dubey) are working on their Ph.D. dissertation. The lab accepted ten trainees in 2014. Lab members participate in weekly data presentation/ journal club, and attended three local/ national conferences in 2014.

Teni Lab

Dr. Tanuja Teni
Principal Investigator

Overview

The research focus of Teni Lab is on gaining insight into the molecular basis of oral and cervical tumorigenesis. The projects undertaken in this lab aim to: (1) understand the mechanisms underlying altered expression of select apoptosis pathway genes: Mcl-1, survivin and clusterin, as also p53 family members in oral cancers; (2) identify radioresistance-related genes and proteins using FIR regimens in vitro and genomic and proteomic approaches in oral cancers; (3) assess prevalence of human papilloma virus (HPV) in head and neck cancers, significance of HPV viral load analysis as an indicator of treatment response in cervical cancers, diagnostic performance of HPV-E6/E7 mRNA versus oncogenic HPV DNA as a secondary triage test for VIA positive women in cervical cancer screening program, and association of HPV with Bak and Bax protein expression in head and neck cancers; (4) role of activins/ inhibins, members of the TGFβ family in oral cancers.

Research

Among the three interacting partners of Mcl-1 studied, USP9X and TCTP exhibited a strong positive correlation with Mcl-1, and the role of USP9X in Mcl-1 stabilization in oral cancers was also confirmed. Targeting of Mcl-1 with BH3 mimetic obatoclax induced autophagy-dependent but caspase-independent cell death in oral cancer cells. Studies also demonstrated over expression of all six survivin isoforms, with survivin wt and DeltaEx3 as the predominant expressed splice variants and downregulation of secretory clusterin in oral cancer cells. Differentially expressed proteins in radioresistant versus parental oral cancer cell lines namely prohibitin, moesin, PCNA, vimentin, HSP-70, keratin 8 and 14-3-3 sigma were validated by Western blotting. The overall prevalence of HPV DNA in head and neck tumors was 39.4%, and 495 VIA positive women out of the total 3839 women screened for cervical cancer have consented and been enrolled for diagnostic HPV DNA or E6/ E7 mRNA testing.

Education

Teni Lab is recognized for Ph.D. degree in Life Sciences of Homi Bhabha National Institute and five doctoral students – Ms. Rupa Vishwanathraman, Mr. Prasad Sulkhshane, Mr. Mohd. Yasser, Ms. Rajashree Kadam and Ms. Dhanashree Mundhe, are presently working on their doctoral theses. The lab also participates in the training program of the Centre where four trainees worked in the lab for masters dissertation or research experience in 2014. The lab also has an in-house weekly program of data presentation and journal club. Faculty and students of the lab attended various conferences/ workshops and presented their research findings in the form of oral or poster presentations.

Vaidya Lab

Dr. Milind Vaidya
Principal Investigator

Co-Investigator
Mrs. Sharada Sawant

Overview

The main research focus of Vaidya Lab is to investigate the functions of keratin, vimentin and their associated proteins in epithelial homeostasis/ cancer, and their use as biomarkers in oral cancer. Several projects examine the use of keratins as prognostic markers in human oral precancer and cancer; the role of keratin 8 phosphorylation in neoplastic progression of squamous cell carcinomas (SCC); role of linker proteins in keratin mediated regulation of beta-4 integrin signaling in neoplastic progression of SCC; role of keratin 8, 18 and vimentin during epithelial mesenchymal transition (EMT) using oral organotypic co-culture model; and the significance of aberrant vimentin expression during early and late events of human oral oncogenesis. The lab is also engaged in projects involving global protein profiling of sequential changes during rat lingual carcinogenesis and different stages of tongue cancer in humans, as also on the enrichment and characterization of cancer stem like cells and their possible role in human oral cancer.

Research

Data from the lab revealed a significant correlation between loss of K5/ gain of K1, K8/18 and histological grade of dysplasia/fibrosis as well as recurrence free survival (Figure); these could serve as surrogate markers for diagnosing oral potentially malignant disorders and could aid prognostication in oral cancer patients. Findings were also suggestive of a tissue specific role for K8/K18 in malignant transformation/ progression of carcinomas. For transgenic model development, keratin 8 phosphomutants were cloned under K14 promoter and introduced into lentiviral vector (pCCL), followed by virus production and injection in testes of mice. 3D co-cultures of normal oral epithelial cells and fibroblasts are being developed to study EMT during oral carcinogenesis. For the first time, aberrant vimentin expression was noted in human oral precancerous lesions. Up/ down regulation of vimentin expression in cell lines derived from dysplasia and oral SCC led to changes in cell motility, invasion and quantitative alterations in K14 and beta4 integrin expression. I-TRAQ analysis during sequential stages of rat lingual carcinogenesis revealed alterations in known and novel proteins; these were validated in rat and human tissues. Global protein profiling of rat tongue tissues at various stages of oral carcinogenesis led to the identification of a novel marker - Tenascin N involved in oral cancer development. To study the role of cancer stem cells, $CD44^{+}$ enriched population and parental AW13516 cells were injected in nude mice. Mice injected with the former showed tumour recurrence, with the tumour cells expressing stem cell markers (ABCG2, vimentin, EGFR, etc).

Education

The lab is recognized for Ph.D. in Life Sciences of the Homi Bhabha National Institute. Four graduate students – Mr. Biharilal Soni (submitted thesis), Ms. Richa Tiwari, Ms. Crismita Demello, and Mr. Pratik Chaudhari are presently working on their doctoral theses. Eighteen students (15 with the PI, three with the Co-I) underwent training in the lab during 2014. The lab members meet regularly for data presentation and journal club. Faculty and students attended six national/ international meetings and presented their findings as oral/ poster presentation.

Varma Lab

Dr. Ashok Varma
Principal Investigator

Overview

Varma Lab integrates genomics, proteomics, biophysical, structure biology and bioinformatics based approaches to unravel the structure based functional activities of cancer associated proteins. The group also targets druggable targets for better inhibitor designing. The lab is well equipped with state-of-the-art facility for macromolecular crystallography, protein-protein interactions study. X-ray diffractometer and isothermal titration calorimetry are being used to determine three dimensional structures of proteins and protein-protein interactions respectively. Diffraction data is also being collected from synchrotron facility using remote data collection facility. Proteomics based approach is being explored for early diagnosis, prognosis and cancer biomarker discovery.

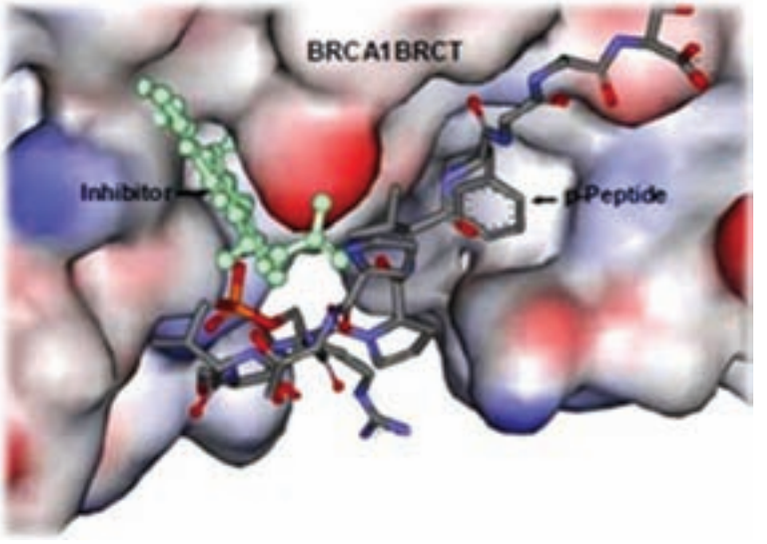
Research

There are several on-going projects of the lab, one of which is on BRCA1/2, wherein different functional domains of BRCA1 and 2 have been expressed and purified using bacterial systems. Crystallization is under way; the transactivation domain and BRCT domain could crystallize as a native protein and also with complexes. The complex crystals of BRCA1 BRCT with different phospho-peptide like Abraxas, NCoA2, RNA binding domains and NUP153 proteins were crystallized. In another project, MERIT-40, RAP80 and its mutant protein have been purified and functionally characterized using in-silico and in-vitro approach. The molecular model of RAP80 and MERIT 40 could unravel the pathogenicity associated with the reported mutations. Protein-protein interaction studies of different cellular proteins like BARD1, BAP1, MERIT40, RAP80, CsTF, ZBRK1, FANCI and FANCD2 are also under way to understand the genomic integrity of complex molecules. Other on-going projects include structural studies of MAPKs family responsible for different human cancers; and identification of protein biomarkers in head and neck squamous cell carcinoma treated with radiotherapy, and aiming further for urine proteomics in cancer biomarker discovery.

Education

The Principal Investigator is a recognized guide for Ph.D. in Life Sciences under the Homi Bhabha National Institute. During 2014, two research scholars – Mr. Dilip Badgujar and Mr. Vikrant undertook work on their doctoral dissertation under the PI's guidance. The lab participated in the Centre's training program and accepted 12 trainees to work in the lab during 2014. Lab members also participate in the in house journal club/ data presentation twice a week.

Identification of small molecule inhibitors for drug-leads



Venu Lab

Dr. BV Venugopalareddy
Principal Investigator

Overview

The research focus of Venu Lab is on elucidating the mechanisms underpinning glia development and growth control, with the long term goal to define the relationship between growth and patterning in developing tissues and its relevance to cancer. Much of the research takes benefit of the genetic model organism -*Drosophila Melanogaster* (Fruit fly), and *in-vitro* human cell line models to study how tissue growth/ homeostasis is achieved. The technical approaches include *Drosophila* genetics, cellular, molecular and biochemical analysis of signaling molecules, coupled with confocal and live imaging microscopy. Glial cells along with the neurons constitute the central nervous system (CNS) and are fundamental to CNS development. Hippo signaling is a relatively novel tumor suppressor pathway that controls organ growth and size from flies to humans. Furthermore, Hippo signaling inactivation has been reported in several human cancers. Using genetic and proteomic approaches, it is proposed to harness the mechanisms that define Hippo signaling in *Drosophila* glia growth control.

Research

Currently the lab is actively engaged in two projects involving Hippo pathway regulation in glia growth control and development, and Hippo pathway regulation by post translational modifications. Over the past year, the fly lab has been successfully established at ACTREC and several methodologies involving fly genetics and experiments, and *Drosophila* tissue staining and imaging have been standardized. This lab has recently discovered a role for tumor suppressor- Merlin (human homologue -Neurofibromatosis type-2, NF2), in *Drosophila* glia development and growth through Hippo signaling.

Education

The Principal Investigator is recognized for Ph.D. in Life Sciences of the Homi Bhabha National Institute, and has one graduate student – Mr. Mukund Sudharsan. The lab also participates in the Centre's training program wherein ten trainees worked either for their Master's dissertation or for research experience. The lab members meet twice a week for data presentation/ journal club. Lab members attended local/ national conferences to present their research findings.

Waghmare Lab

Dr. Sanjeev Waghmare
Principal Investigator

Overview

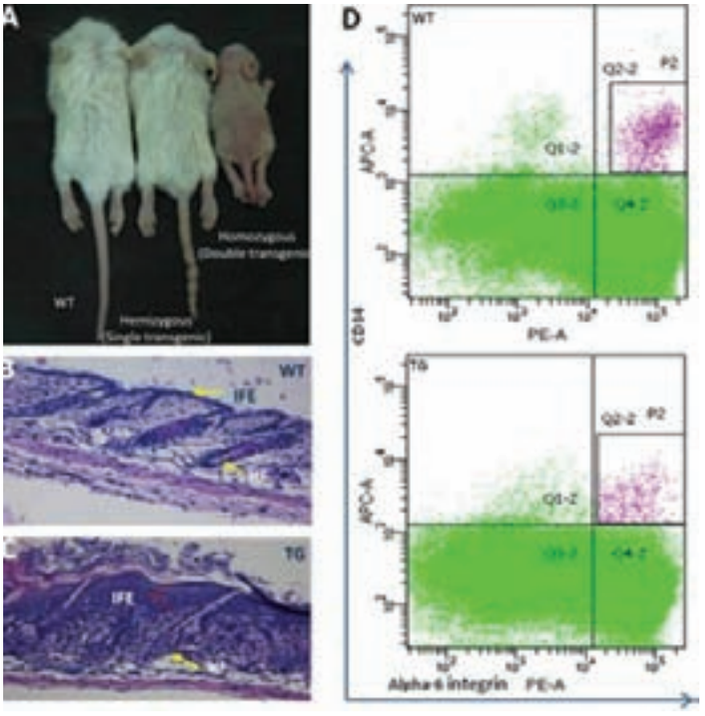
Waghmare Lab focusses on studying the molecular and cellular mechanisms that govern stem cell regulation, and how perturbations in these mechanisms lead to cancer. Signaling pathways such as Wnt/ Notch/ Sonic hedgehog, TGF-β, EGFR, etc. regulate stem cell renewal, and genes affected in these pathways are associated with cancer. Therefore, it is very crucial to study the genes involved in signaling pathways that control self-renewal of normal stem cells and their malignant counterparts, cancer stem cells. Mouse skin and human epithelial cancers such as head and neck cancer are being used as models to unravel the mechanisms that govern adult stem cell regulation and cancer. These studies will allow the identification of genes involved in stem cell regulation and cancer, and explain how these genes work at the cellular level to develop normal tissue and also repair injured tissue to maintain homeostasis. The findings could also be useful in cancer therapeutics.

Research

Research projects of this lab involve elucidation of the role of enhancing factor/ secretory phospholipaseA2-IIA in hair follicle stem cells and cancer; dissecting the role of Sfrp1 (secreted frizzled-related protein) in hair follicle stem cell regulation and cancer; molecular signaling in human oral cancer stem cell regulation for potential cancer therapeutics; and defining the role of signaling pathways in novel tumor-initiating cells from human breast cancer lines.

Education

The lab is recognized for the PhD program in Life Sciences of Homi Bhabha National Institute. Presently there are four graduate students – Mr. Rahul Sarate, Mr. Gopal Chovatiya, Ms. Sweta Dash and Mr. Raghava Reddy Sunkara working on their doctoral dissertation. The lab also participated in the training program of the Centre, wherein four trainees worked for research experience. Lab members participate in weekly in-house lab presentation/ journal club, and presented posters at national meetings.



K14-sPLA2 mice showing loss of hair follicle stem cells

A) Phenotype; B & C) H & E staining; D) FACS analysis of hair follicle stem cells (a6+/CD34+). WT – Wild-type; TG – Transfenic; IFE 0 Interfollicular epidermis; HF – hair follicle

Dr. Narendra Joshi
Scientific Officer 'F'

Other Projects - I

Overview of Research

The year 2014 saw initiation of a study to examine the effects of vitamin D3 and progesterone on the immune-modulatory phenotypes of breast cancer cell lines. Four cell lines with different phenotypes were procured from ATCC, and their culturing was initiated. Experimental methods/ protocols were standardized. Gene expression data in breast cancer tissues was analysed to enable preparation of two manuscripts. Meta-analysis of data on IL-6 -174G/C polymorphism in various cancers was completed and published in Human Immunology. Efforts to clone HLA-B*4006 and beta-2 microglobulin genes were continued with a new vector.

Service

The lab performed chimerism analysis on 750 follow up specimens, and baseline STR analysis for 100 donor/ recipients of bone transplants performed in the BMT unit of ACTREC and at other Centres. During 2014, two vital changes were implemented in STR analysis: A shift to using DNA isolation kits, which reduced the reporting time from a fortnight to a week, and charges were implemented for the tests performed to recover the cost of consumables.

Education

The lab participates in the Centre's training program; one trainee worked under Dr. Joshi's supervision during 2014. Lab members participate in weekly group discussions/ journal club.

Dr. Ujjwala Warawdekar
Scientific Officer 'E'

Other Projects - II

Overview of Research

This lab focuses on assessing minimal residual disease in solid tumours, to gauge the efficacy of therapy and outcome of the disease. The prognosis of cancer patients is largely determined by blood borne dissemination of tumour cells from the primary site to distant organs like bone and lung, and the subsequent outgrowth of these cells in the new microenvironment. The levels of circulating tumour cells (CTCs) in the peripheral blood of breast cancer patients are being monitored. In the pre-operative depot progesterone administration trial, 38 new patients were accrued this year taking the total to 65. CTC isolation involves density centrifugation and immunomagnetic enrichment, detection and enumeration using multicolour flow cytometry, followed by validation of the data with quantitative RT-PCR and microscopy. CTCs were detected in both test and control arms, and clinically relevant analysis is in progress. A systematic review of the utility of extracellular matrix proteins as diagnostic/ prognostic markers in solid tumours is under way.

Education

One trainee worked under Dr. Warawdekar's supervision during 2014.

CRI - Research Support Facilities

Anti-Cancer Drug Screening Facility

Dr. Aarti Juvekar[1] / Dr. Jyoti Kode[2]
Officer-in-Charge

1 Superannuated in November
2 Took charge in December

The Anti-Cancer Drug Screening Facility (ACDSF) supports the efforts of anti-cancer drug development in India, with *in vitro* and *in vivo* anti-cancer drug screening assays developed in-house. ACDSF has over 45 human tumor cell lines, 10 murine tumor models and 28 xenograft models for carrying out drug screening. During the report year, 1972 compounds were received from 241 customers for testing anti-cancer activity. Of these, 1916 compounds were tested *in vitro* on cell lines, while 56 compounds were tested *in-vivo* in normal mice. Interesting leads were identified during the screening of 105 compounds on 12 cell lines under a multicentric CSIR funded project on 'Affordable cancer therapeutics'. A 5-day hands-on workshop on 'Advanced techniques in anti-cancer drug evaluation' was conducted by ACDSF in November 2014 at ACTREC.

Bioinformatics Centre (BTIS)

Dr. Ashok Varma
Officer-in-Charge

Scientific Officer 'D'
Mr. Nikhil Gadewal

The DBT supported Bioinformatics Centre (BTIS), which is equipped with excellent computational facilities and infrastructure, provides bioinformatics support to the scientists, clinicians and students of the Centre. Different software are used to train scientists in molecular modeling, microarray expression analysis, and structure guided inhibitor design. Major projects in which BTIS is involved include: protein-protein docking for BRCA1, MERIT40, RAP80, ABRAXAS and WNT signaling pathways; in-silico approach to categorize the pathogenicity of mutations in cancer associated proteins; structure based inhibitor designing of CHK1, CHK2, WEE1 kinases. BTIS has provided services to analyze Next Gen deep sequencing data with software like bcl2fastq, FASTQC Burrows-Wheeler Aligner, etc. BTIS faculty members have close collaborations within ACTREC and other academic institutions, and are invited to deliver lectures in academic institutions. Two Ph.D. students of the Coordinator have submitted their thesis; other PhD students of ACTREC too have utilized the facility. In 2014, four publications accrued in peer reviewed international journal acknowledging the contributions of this centre. BTIS is funded by DBT in support of staff/ contingency, etc, and to organize training programs for the faculty/ research scholars from the North-East Region in January 2014, BTIS conducted a 2-day Bioinformatics Training Workshop targeting the faculty and research scholars of colleges/ universities. BTIS has its dedicated website:

http://www.actrec.gov.in/basic_main.htm(ii)http://www.actrec.gov.in/bioinformatics/index.htm

Biorepository

Dr. Kishore Amin
Scientific Officer 'F'

The Biorepository facility is designed to promote the safe handling, receipt, processing, storage, inventory control and distribution of all types of biological specimens, surplus tumour, adjoining normal tissues and blood from cancer patients, and to provide them on request to scientists and clinicians for their Institutional Review Board - approved research projects. Patient consent is procured initially. Tumour samples are collected from operation theatres and snap frozen in liquid nitrogen for further downstream processing. The facility houses ultra-low mechanical freezers, vapor-phase liquid nitrogen freezers and modern equipment. Of the tissue samples accrued in the Biorepository during 2014, the majority were head and neck (H&N – sub sites were buccal mucosa, tongue, alveolus, gingivo buccal sulcus, retro molar trigone and lip) and breast tumour samples. Other tumour types included neurological, gastrointestinal, genitourinary, gynecological, etc. Cryopreserved tissue samples were provided to eight Principal Investigators with approved projects depending on various protocols in Tata Memorial Centre. Attempts were also made to generate cell lines from tumour tissue samples from different sites. Thus, the ACTREC Biorepository facilitates cancer researchers to dissect tumour tissues for intricate research challenges; the data procured could serve as opening avenues for discovering novel therapies, and early cancer diagnosis.

Common Facilities

Dr. Sanjay Gupta
Officer-in-Charge

The Common Facilities (CF) provide a variety of services like X-ray developing machine, ultra-pure water purification system, radioactive handling room for ^{32}P and ^{125}I, bacterial culture hoods, ice making machines and cold room facility to all the research groups of the Centre. All the CF are well-equipped with high-end research equipment and are located on different floors and wings of Khanolkar Shodhika (KS). The isotope research facility has state-of-art equipment like biohazard hoods, radioactivity monitors, incubators, centrifuges, and gamma/ beta counters. In addition, autoclaves and ovens of all the research labs in KS are also maintained by the CF technicians. A new x-ray developing machine (Promax ADC from Prognosys) was purchased in 2014. All the major CF equipment are covered under annual maintenance contract, with the mandate of providing safe, sustainable, efficient and reliable facilities.

Common Instrument Room

Mr. Uday Dandekar
Officer-in-Charge

Over the past 37 years, the Cancer Research Institute has maintained Common Instruments Room (CIR) - a facility which houses routinely required scientific equipment, with a view to optimize their utilization and make them available for the use to all the staff and students, round the clock - even on holidays. A bioruptor, cell electroporator, sonicator and tabletop high speed centrifuges were newly procured and installed in this facility during 2014, taking the total equipment count to 84. With a view to reduce breakdowns and subsequent downtime of the instruments, requisite spares for centrifuges, low temperature freezers, CO2 incubators, etc. and consumables like centrifuge tubes, thermal paper rolls, etc. are procured on a regular basis and kept in stock in the CIR. Qualified technical staff members attached to the CIR handle routine maintenance and render help to the end users, thus ensuring proper use of the equipment. CIR also provides technical support to other research laboratories in the procurement and maintenance of capital equipment.

Comparative Oncology Program & Small Animal Imaging Facility

Dr. Pradip Chaudhari
Scientific Officer 'F'

The major focus of this facility during 2014 was on its Comparative Oncology program involving small animal spontaneous cancer care and management, and its further utility for translational research. Pet animals suffering from spontaneous cancer are being referred to the ACTREC animal oncology clinic for diagnosis and further management. The most common spontaneous animal cancers are mammary gland carcinoma, canine transvenereal tumor, lymphoma, soft tissue sarcoma and osteosarcoma. During the year, 141 referral cases were received at this clinic where 39 CT scans were performed on these patients for diagnostic purposes, five animals were treated using radiation therapy, and nine cases received single/ combination agent chemotherapy. An animal cancer tissue repository has been started to preserve the biological samples for basic cancer research. In all, 39 fresh tumor tissue samples have been accrued and kept at -196°C while 75 formalin-fixed tissues obtained from animal cancer biopsies and surgeries have been stored in the repository for their use in comparative oncology research. The second aspect of this program focuses on preclinical small animal imaging and research on radiopharmaceuticals, where diagnostic radionuclides such as Technetium-99m, Iodine-125, Lutetium-177 and Fluorine-18 complexes are being evaluated for their utility in cancer diagnosis and treatment. The Small Animal Imaging facility focuses on radioisotopic imaging of rodents – both mice and rats, using microPET/ SPECT-CT scanner, for various in housel and external research projects.

Digital Imaging Facility

Dr. Dibyendu Bhattacharyya
Officer-in-Charge

The ACTREC Digital Imaging facility (ADIF) is a state of the art imaging facility housing several advanced imaging platforms. At present, the facility boasts of the following instrumentation: (1) LSM510 confocal microscope, (2) Multiphoton confocal LSM780 microscope, (3) 3i Mariana spinning disk confocal microscope, (4) Leica SP8 confocal microscope with STED super resolution system, (5) Leica DMI600B microscope - from Bhattacharyya lab, (6) Axio Imager .Z1, and (7) Axio Vert 200M. The facility provides microscopic acquisition and analysis services for wide-field and the different confocal platforms listed above, to the entire ACTREC community as well as to many outsider users.

DNA Sequencing Facility

Dr. Pradnya Kowtal
Officer-in-Charge

The DNA sequencing facility at ACTREC caters to the needs for capillary electrophoresis and DNA sequencing of researchers from the Centre, other DAE institutes and a few colleges from Mumbai. The facility is used to detect germline and somatic mutations in cancer, to confirm data generated by site directed mutagenesis or obtained from other sequencing technologies like Next Generation Sequencing (NGS). The facility has two automated DNA sequencers from Applied Biosystems – one has eight capillaries and the other 48 capillaries. Both the sequencers are used for DNA sequencing, fragment analysis and single nucleotide polymorphism analysis, and are operated by two scientific assistants. Since the last five year, the facility has been working six days per week. The average turnaround time from receiving the samples to depositing data on the server is 36 hours. Users of this facility are charged minimally per sequencing reaction. The facility carried out ~28,260 reactions (sequencing + fragment analysis + single nucleotide polymorphisms) during the current year.

Electron Microscopy Facility

Mrs. Sharada Sawant
Officer-in-Charge

In May 2014, the Centre procured a new Transmission Electron Microscope (JEM 1400 Plus from JEOL Asia), which is the latest, most advanced model of EM with one nanometer resolution and magnification range between 50 x and 12,00,000 x. Along with the microscope, the Centre has also procured EM related accessories such as Scanning Transmission Electron Microscope mode, Tomography module and Energy Dispersive Spectroscope (EDS). After installation and research training, it was functionally available from September 2014. Presently, the EM facility is accepting samples for EM processing from in-house users at a minimal charge of Rs. 500/sample. The facility processes mainly biological samples in the form of solid tissue, monolayer cell cultures and single cell suspension. During the last three months of the year, the facility has processed 60 samples for ultrathin sectioning, scanning and imaging for eight working groups of the Centre.

Flow Cytometry Facility

Dr. Shubhada Chiplunkar
Officer-in-Charge

Flow Cytometry (FCM) is a centralized facility which is used by scientists and clinicians from ACTREC and other outside institutes. FCM houses two flow cytometers (FACSAria and FACSCalibur from Becton Dickinson). FACSAria is equipped with 3 lasers (633 nm, 488 nm and 405 nm) and can perform 11 color analysis and sorting (4 way). FACSCalibur is equipped with one 488 nm laser and can perform 3 color analysis. Software used include FACSDiva, CellQuest Pro, FlowJo, FCAP Array and Modfit. Facility staff train users in data analysis, and provide assistance in data interpretation or experimental designing, when required. Research applications include immunophenotyping, multicolor analysis, DNA content and cell cycle analysis, ploidy determination, apoptosis studies by Annexin V staining, stem cell analysis, side cell population, detection of circulating tumor cells, cell proliferation by CFSE, measurement of calcium flux, intracellular antigen measurement, mitochondrial membrane potential, drug resistance, reactive oxygen species, intracellular cytokine detection, cytometric bead array for cytokine analysis and live cell sorting. During 2014, 67 users used FACSCalibur and 44 used FACSAria. The facility also offers services to outside users on payment basis, and provides demonstrations/ training for visiting clinicians, scientists and students on request. A two-day Basic Course in Flow Cytometry - Hands-on Workshop-II was conducted at the Centre in July 2014 under the auspices of the Mumbai Immunology Group.

Histology Facility

Dr. Arvind Ingle
Officer-in-Charge

Histology is a service facility that provides slides of unstained as well as haematoxylin and eosin (H&E) stained histology sections of animal tissue samples including bone and tumour tissues to different laboratories of CRI-ACTREC. During 2014, this lab received 5312 tissue samples in fixative and, after processing, supplied 4544 stained and 14726 unstained slides to 22 in-house user labs. The facility also provided logistic support for frozen sectioning of human/ animal tissue samples. During the report period, 932 tissues were processed for cryo-sectioning and 442 H&E stained and 1326 unstained slides were supplied to eight research labs. Histology also provides blocks of multiple tissues by pecking method using a microarray machine.

Laboratory Animal Facility

Dr. Arvind Ingle
Officer-in-Charge

The main objective of the Laboratory Animal Facility (LAF) is to breed, maintain and supply laboratory animals to institutional scientists. Breeding and experimentation of all Nude and SCID mice is undertaken in IVC cages. During the year 2014, LAF undertook planned breeding of 25 different strains of mice, 2 strain of rat, and 2 strains of hamsters; and supplied 3858 normal mice, 411 Nude mice, 725 NOD SCID mice, 54 rats, and 31 hamsters to 25 institutional researchers against 76 IAEC sanctioned research proposals. LAF also supplied 12436 normal mice, 1204 rats, and 82 hamsters as either breeding nuclei or experimental animals to 18 different CPCSEA registered outside organizations in the country. During 2014, LAF routinely tested animal samples, food, water, bedding material and room air samples for microbiological, clinico-pathological, and serological detection of 13 rodent pathogens, and carried out PCR based tests for infectious agents and viruses using 60 random samples from 15 strains. The facility provided services of rodent pathogen testing by PCR method to an outside organization. Genetic purity was checked by skin grafting and biochemical marker testing in rat and mouse strains. LAF also undertook PCR based tests for genetic purity using 10 microsatellite markers in 12 mouse strains. Using flow cytometry, the T- and B-cell profile was assessed in 28 blood samples of Nude/ SCID and in control BALB/c and Swiss mice. LAF also undertook genotyping of 146 *ptch* KO mice. As a part of the embryo freezing program, LAF collected 1396 embryos at the 8-cell to morula stage from 249 mice of 9 strains (A/J, C3H/J, CD1, Swiss, Swiss/ba, smo/smo, C57BL/6, EGFP, and NOD SCID) and froze the embryos in cryo-vials under liquid nitrogen by vitrification using the cryo-protectant ethylene glycol.

Education

The facility participates in the Centre's training program; one trainee worked here on her B.Tech. thesis in 2014.

Macromolecular Crystallography and X-Ray Diffraction Facility

Dr. Ashok Varma
Officer-in-Charge

This facility has been inducted in ACTREC during 2012. The dedicated facility has a Microstar Microfocus Rotating Anode and an integrated computer controller motorized Image Plate Detector. Remote data collection facility is available to get access to the Synchrotron facility located in different parts of the world. Prof. MV Hosur, Raja Ramanna Fellow attached to the Centre, helps in the smooth functioning of the facility. The focus of the facility is to help users in crystallization of different macromolecules, and further studies of X-ray diffraction to get the three dimensional structure. So far, 53 crystals have been analyzed using the facility. Different groups from the Centre use the facility and two students' theses from Varma lab contain diffraction data collected from this facility. Faculty from this facility teach basics of diffraction to visiting scientists, provide training to scientists from different institutions and to participants to the Bioinformatics and ACDS workshops, and offer diffraction services to scientists from IIT-B, BARC, etc.

Mass Spectrometry Facility

Dr. Rukmini Govekar
Officer-in-Charge

The Mass Spectrometry facility at ACTREC has a MALDI-TOF/TOF (Bruker Ultraflex II) platform which was extensively used during 2014 to analyze over 540 samples from in-house users primarily for identification of proteins by peptide mass fingerprinting, sequencing and molecular weight determination of small molecules such as polyethylene glycol. The facility was also used by scientists from institutes of repute in and around Mumbai, such as BARC, QbD Research and Development Lab Pvt. Ltd., and by graduate students from KLE College, Nipani and Modern College, Pune. The facility also has a system for off-line analysis of liquid chromatography (LC) -separated samples, wherein the LC system (Agilent 1200 series micro LC) is coupled to a robotic MALDI-plate spotter (Bruker Proteineer). This year, the scope of MS- applications in the facility expanded by the addition of a new Nano-LC-MS-MS platform (ABSCIEX 5600 plus). The facility is now better equipped to handle several other applications such as MS-based differential quantification and analysis of post-translational modifications, etc.

General Administration

Administrative & Core Infrastructure Groups

Sr. Administrative Officer	Mr. M.Y. Shaikh
Administrative Officer (II)	Ms. M.A. Sharma
Jr. Administrative Officer	Mr. Vilas Pimpalkhare
DCA, ACTREC	Mrs. P. Kamala
Accounts Officer II	Mrs. Sandhya Patil
OIC, Engineering section	Mr. P.B. Baburaj
Purchase Officer	Mr. S.C. Kirkase
Jr. Stores Officer	Ms. P. Kotenkar
DCSO, ACTREC	Mr. R.M. Chavan

Within the Administrative group, **Human Resource Development** carries out the functions of entire manpower planning, recruitment of staff (regular as well as on contract) and training the human resources of the Centre. In 2014, **27 regular staff members** were appointed in different grades in the Medical, Scientific, Nursing, Technical and Auxiliary cadres, adhering to the reservation policies of the Government of India. Around 100 contract staff members were also deployed this year through M/s. G.A. Digital, TMC, to distribute the work load because of the increased inflow of cancer patients and direct registration facility initiated at the Centre.

The department also ensured **merit based review and promotions of employees by holding yearly DPC** in respect of all the above cadres. Day to day administrative functions encompassed e-attendance control, maintenance of leave records, updation of staff records with regard to pay fixation/ re-fixation matters, settlement of personal claims, release of retirement/ terminal benefits becoming due on superannuation/ death cases, and payment in time of staff, time to time performance appraisal/ monthly attendance reports, proper follow-up of matters/ decisions taken during various meetings, diplomatic and amicable handling and settling of inquiry matters, etc. It has provided timely welfare measures and facilities necessary for maintaining an excellent working atmosphere, imparted training by deputing 32 staff within and outside Mumbai, convened in-house weekly administration lectures to update the knowledge of the staff. **Periodical training/ demonstration of computer software like LTC, national/ international deputation, Time-keeping, Leave Module, Contributory Health Service Scheme (CHSS)**, Employee Portal and implementation of the same for facilitation of staff members was carried out. One Computer Programmer was deployed on contract basis to assist the HRD programs.

Timely payment of **PRIS, update allowance to eligible employees**, providing duplicate Service Book to staff, service verification of staff those completed 25 years of service, are other activities carried by HRD. Implementation of the **Reservation Policy** of the Govt. of India duly adopted by TMC in respect of SC/ ST/ OBC/ PWD/ Ex-Serviceman is carried out regularly and systematically, and all efforts have been made to ensure and achieve the prescribed percentage of reserved posts. **TMC merit scholarships** were awarded to three children of ACTREC staff members. During 2014, five staff members achieved superannuation, while one staff member took voluntary retirement from 31.1.2014.

Administration (Estate Management): The department controlled and managed all the outsourced activities aimed at the effective functioning of various systems, viz., Hostels, Guest House and Faculty Club, Staff and Patient Canteens, Retreat, Cafeteria, Transportation, Horticulture, Pest Control services, Photocopier machines, Courier/ Post & Telegraph services, clearing of service bills, as well as refilling of gas cylinders in laboratories/ BMT/ Patient Hostels, Guest House at Faculty club. Disposal of biodegradable/ bio-medical waste is done in compliance with highest standards set as per the government norms. Arrangement of accommodation for patient's families at Lords & Melbourne Hostel and effective functioning of Railway Reservation system are effectively handled by the department.

The Centre takes pride in the large variety of flora on its campus. A garden covering an area of ~1500 sq. mtrs, a plant nursery for in-house needs, and lawns at different locations in the campus are well maintained by a professionally trained horticulturist and team of gardeners. A ***'Nisarg-Runa* Biogas Plant'** is running successfully on the campus, and ensures the disposal of organic/ kitchen waste in an eco friendly manner. **Housekeeping services** maintain cleanliness, good sanitation and hygienic conditions on the campus. During the year, a number of training sessions were organized for housekeeping and horticulture workers. ACTREC received a Garbage Tipper vehicle this year as a donation under the **Swachh Bharat Abhiyaan** program. The Garbage ground was revamped this year for segregation of wet and dry garbage. The CRC entrance was renovated this year. **Signage** at different locations on the campus was refurbished for better guidance. Neon signage of ACTREC has been installed on top of Khanolkar Shodhika; it is visible from a distance at night enabling easy location of the Centre.

Finance and Accounts

The focus of the **Finance and Accounts department** has been effective management of funds, judicious budgetary controls, and review of financial outflow. Maintenance of requisite documentation and other relevant records was done in conformity with the instructions issued by Department of Atomic Energy, Govt. of India from time to time. Procurement of various supplies, material and equipment required for the Centre was undertaken, by following the relevant financial provisions, viz. General Finance Rules, Purchase Procedure, besides Fundamental Rules and Supplementary Rules in respect of manpower/ salary expenditure. New Payroll System and Financial Management System (FMS) were implemented during 2014. Hospital and other income to the extent of Rs.11.50 crore was generated. A total of 182 projects are on-going in various laboratories at ACTREC during the report year. A sum of Rs. 8.30 crore was received for 43 projects from government agencies, viz., DBT, DST, ICMR, LTMT, etc. In addition, funds for 10 new projects to the tune of Rs. 3.18 crore were sanctioned, of which Rs. 1.55 crore were received in ACTREC accounts during the calendar year 2014.

Engineering

Engineering services comprising of Civil, Electrical, Mechanical and Air conditioning, facilitate the requirements of research laboratories and hospital wing of the Centre. The scope of works include operation and maintenance of 33 KV receiving station, 11 KV substations, transformers, lighting and power distribution, DG sets, central air-conditioning plants, Medical Gas System, LPG distribution system through pipe lines, supply of liquid nitrogen, hospital and lab furniture, pumping stations, low temperature facilities, laboratory equipment. Engineering also handles building maintenance including additions, alterations and modifications in a constructed area of ~5,00,000 sq.ft. area on a 60 acre plot. Engineering also looks after water management of the campus, sewer waste management, water distribution system for horticulture, storm water drain of campus, liaison work with local authorities, etc. The Centre is further expanding by addition of five more buildings in the XIIth Five Year Plan. This department is coordinating with Architects/ Consultants for designing

the buildings by providing inputs about all requirements through regular meetings. Construction is in progress for two buildings - Centre For Cancer Epidemiology and Archive bldg and further the design of Hematolymphoid Block frozen for inviting tender.

Purchase

Purchase department aims to provide efficient services to the entire Centre by way of arranging and delivering goods as per the approved quality, and minimizing the supply time. Processing indents, enquiries, comparative statements, purchase orders and reminders are executed through in-house Material Management System (MMS) developed in house by the Information Technology department. Implementation of MMS assisted in efficient functioning of procurement activities and obtaining the materials with ease. During the report year, **Purchase department initiated E-tendering process**, one of the important and requisite protocols as per DAE norms. Till date, Purchase section was able to call three E- tenders on a trial basis. During 2013-14, goods and equipment worth value of Rs. 33.8 crore, consumables worth Rs. 22.5 crore and contract for supply of spares/ AMC worth Rs. 3.5 crore were delivered by the department.

Stores

The main function of the Stores department is to receive stock and non-stock material such as chemicals/ reagents, consumables, surgical items, printing/ stationery items, miscellaneous items, engineering items, cash purchase and imprest items, major and minor equipment, refilled CO_2 and N_2 cylinders, and consignments arriving after office hours and on holidays, and issue these to the end users at the Centre in fulfillment of the indents received. Stores also checks and follows up on the installation of equipment, computer peripherals, furniture. An Asset Register is maintained and updated regularly to record asset numbers and ensure physical asset verification for audit inspection/ insurance purpose, etc. Equipment details are fed in the newly developed Equipment Program. In all, 316 major/ minor equipment, laptops, computers, printers, ACs, office equipment, furniture, etc were acquired during 2014. On an average, ~400 stock/ non-stock indents are received monthly. Coding of items is done regularly. Physical stock verification by internal and external committees was done in September and March; physical verification of assets was also done. Online PSNs for non-stock material are placed for approval before the MMC every week. Non-stock material is received after thorough checking, follow up is done with the vendor, and a discrepancy register is maintained. A total of 7495 GRINs pertaining to complete/ partial supply of stock, non-stock, cash and imprest purchases, equipment and cylinders were generated during 2014. GRINs were immediately prepared on receipt of the material, inspected, listed and sent within a week to vendors to avoid hardship in payment matters. All GRINs were properly documented and filed for future reference.

Security

Regulation of the movement of men, material and vehicles on campus, and ensuring the safety and security of ACTREC property, personnel and students round the clock is the prime responsibility of this section. To improve on-campus security, increasing the height of the boundary walls, increasing lighting at designated areas, surveillance system at the entrance and other vital areas, and revamping of the fire alarm system have been proposed. Ceremonial Parades were performed at ACTREC on Republic Day and Independence Day by the Security and Fire Office staff of ACTREC. Proper liaison was maintained with the local Police, RTO, CIDCO, Municipal authorities, and other outside agencies. Security section also assists Administration in managing the Centre's Transportation activities, viz. efficient running of the shuttle bus services, condemnation of old vehicles, obtaining RTO licenses for newly procured vehicles, etc.

A **Security Audit** of ACTREC was carried out by officials of the Intelligence Bureau and the Office of the Commissioner of Police, Navi Mumbai on 3rd September 2014. The queries of the team were satisfactorily dealt with. **Vigilance Awareness Week** was observed at ACTREC from 27th October to 1st November 2014. Shri KL Prasad, IPS, Commissioner of Police, Navi Mumbai, was the Chief Guest at the function organized on the first day of vigilance week. Shri Prasad shared his thoughts and expertise on curbing corruption at all levels. Shri Anil Kumar, IPS, Inspector General of Security, Department of Atomic Energy, visited ACTREC on 1st December 2014 to **review the present Security scenario at ACTREC.** He was briefed about the present security set up and measures proposed to improve the system. Security section efficiently coordinated the visit of Ms. Swati Pandey, Director Administration, Department of Atomic Energy, on 24th December 2014.

Medical Administration

Dr. Prashant Bhat
Asst. Medical Superintendent

Quality Manager
Ms. Chital Naresh

Overview

The mandate of Medical Administration is to ensure provision of quality, uninterrupted healthcare to all the patients attending ACTREC's in outpatient, inpatient, diagnostic, and clinical support services, achieved through close coordination with the faculty and staff of CRC. The AMS' office oversees Medical Administration and actively encourages feedback from patients, and pursues improvement as an on-going process. Incident reporting is handled by the office and appropriate process of root cause analysis is carried out in order to track the causes for the incident and incorporate remedial measures. Medical administration also monitors patient service billing and services provided under research protocols. It also co-ordinates material procurement including capital equipment, medicines and surgicals for the Pharmacy, and also chairs the material management committee. This office also coordinates major and minor projects being undertaken for infrastructure development. As a part of the Infection Control Committee, Medical Administration implements plans and processes to prevent infections and also oversees the compliance of the Biomedical Waste Management according to the regional requirements.

Service

During 2014, Medical Administration contributed significantly towards initiating measures for the continual improvement in all the patient services with a focus on better patient care. Since August 2013, ACTREC services have been opened to cancer patients from Navi Mumbai and Raigad districts. New registrations in select specialties are now being handled directly at ACTREC. During 2014, a total of 4854 new patients were referred to ACTREC and 441 new direct registrations took place here. In all, there were 4293 admissions, 2317 major operations, 666 new radiotherapy referrals and 75 bone marrow transplants at ACTREC.

Medical Administration oversaw the planning and commissioning of the 2nd floor 22-bed ward for Pediatrics, Surgery, Solid Tumors and Interventional Radiology; the ward was inaugurated in May 2014. The department also coordinated the beta testing of PET CT in collaboration with WIPRO GE; the project is in the final stages of installation. Turnkey work for installation of a new Linear accelerator at ACTREC was initiated during the year.

Based on Desktop Surveillance conducted in June 2014, NABL granted continuation of accreditation for the medical testing facility of Tata Memorial Centre – Diagnostic Services in the disciplines of Clinical Biochemistry, Clinical Pathology, Haematology and Immunohaematology, Microbiology and Serology, Histopathology, Cyto-pathology and Genetics, in accordance to ISO 15189:2007 as per the existing scope and authorized signatories. The office also oversaw preparation of the Hematopathology laboratory (set up in August 2013) for NABL accreditation in the forthcoming year.

Medical Administration proactively seeks patient feedback through strategically located 'Patient Feedback Redressal' boxes that are freely accessible to the patients, and feedback from the patients is analyzed regularly. During 2014, feedback was obtained from 153 patients. Patients' suggestions were put up for consideration whenever found feasible and practicable, while complaints received from the patients were communicated to the respective departments for corrective action. Several patients also appreciated the services of staff member/s who had served them during their treatment at ACTREC. Medical Administration also analyzed incidents through the Incident Reporting system. The office received 17 reported incidents during the year, and root cause analysis of these incidents was conducted and preventive measures were initiated.

Education

Dr. Bhat is visiting faculty for the MHA and Executive PGDHA program at TISS, and is the internship supervisor for MHA students and project guide for two TISS students' dissertation. As per the calendar plan for 2014, Medical Administration conducted several training programs on Basic safety in laboratories, Orientation on the revised Quality Management System, Infection control and safety practices, Pre-analytical errors and trouble shooting, and Waste management for the laboratory and nursing staff. In addition, Medical Administration also coordinated and conducted the NABL Assessors Training program.

Information Technology

Mr. Prasad Kanvinde
IT Co-ordinator

Officers
Mr. Padmakar Nagle
Mr. M. Sriram
Mr. Anand Jadhav

In fulfilment of its mandate, the Information Technology (IT) department of ACTREC provides computational facility, infrastructure and support for information access, processing, printing, archiving, dissemination, etc. ACTREC has a campus wide 100 Mbps LAN with copper/ fiber cable, embellished with ~600 LAN nodes, eight servers and a secured wifi network. The campus is connected to the Internet through a 50 Mbps National Knowledge Network (NKN) information gateway with a redundant 20 Mbps Reliance connectivity. The Centre has a live mail server that holds over 300 email accounts of staff and students. Redundant/ fail safe configuration on the firewall ensures 99% uptime of internet and mail facilities. A dedicated point to point leased circuit of 12 Mbps between ACTREC and TMH facilitates sharing of patient information, PACS images, etc. Under the NKN project, the Centre has successfully established seamless connectivity to the NKN grid at gigabit per second speed. Under ANUNET network, the Centre has established successful connectivity with UTKARSH a high end cluster of servers for bio-informatics data processing. The hospital information system (HIS) is maintained on a newly acquired state of the art IBM power6 - 520 server class machine that runs on 24x7 mode and provides information processing facility to various user departments. A summation of the activities of IT department during 2014 is provided below.

Networking

Day-to-day support, upkeep, administration and maintenance of passive and active network components constitute vital networking activities. The Centre is in process of upgrading the network back bone connectivity on 10 Gbps, and in accordance upgraded various networking devices including firewall, switches and routers in phase 1. The 2nd phase will be started sooner. The centre has also acquired state of art, latest wireless network devices on new standards with 600Mbps bandwidth with high availability configuration of wireless controller ensuring 99.9% uptime of the network.

Hardware

The major activity during 2014 was procurement of around 150 PCs, 20 printers, a midsized Internet application server, Smart card system for patients, information/application kiosks, etc.

Software

Patient information processing at the Centre is essentially online, multi-location and round-the-clock. In 2014, updates for PABR, DIS, RIS, OT, Accounts, Pharmacy, Purchase, and Stores modules were made available, which enabled end users to make seamless transactions on the remote server of TMH for patient services. The earlier integrated ROIS module was updated and deployed successfully along with seamless data migration across TMH and ACTREC. Major changes/ updates in the web based EMR were carried out in tandem with the paperless drive. The Clinical Information System module was also updated with modifications to achieve paperless service. Smart card system has been introduced for limited number of patients in ACTREC.

Library

Mr. Satish Munnolli
Librarian

The ACTREC library proactively acquires and delivers scientific and clinical information to its users to support on-going learning activities, research and quality patient care. The fully automated library has a spacious reading area and its Wi-Fi enabled environment facilitates access to scientific information on the library's desktop consoles, as well as users' laptops and other computing devices.

The library subscribes to over 90 core journals in the cancer domain, and users at the Centre have unlimited access to over 2350 journals on ScienceDirect under the DAE - Elsevier consortia. Clinical Key and UpToDate are two new online sources incorporated in the current year. The library updated bibliographic management application - EndNote from the previous version to X7. Sources enabled on a trial basis during the report year include Web of Science, Wiley online, World e-Book library, Conference Proceedings, Citation Index, Biochemistry and Cell Biology, and Genome. The library maintains a record of staff publications, and offers services with respect to citations, h-index, Impact Factor. The Library provided 914 articles against the request of 1282 during 2014.

Photography

Mr. Shivner Sawant
Officer-in-Charge

The Photography section provides pivotal support to the scientific and medical staff and students of the Centre in photo-recording of experimental results (gels, animal experiments, patients, etc), preparing posters and slide presentations, as well as designing and printing of flyers, brochures, banners, programs, certificates, badges, invitation cards, envelopes, letterheads, workshop protocols, etc, using advanced computing and desktop publishing equipment and software. The section is also responsible for taking photographs of the campus, infrastructure, staff members and all major events on the campus, carefully archiving them, and making them available for use in the Centre's print publications and website. During 2014, the section provided photographic support for 27 events held at ACTREC, including 10 national and 3 international conferences. The section also undertakes identity card printing on the data card printer for Security and Administration. The section also takes care of the presentation equipment and assists users during audiovisual presentations in the Centre's auditoria and meeting venues.

Science Communication and Professional Education (SCOPE) Cell

Dr. Aparna Bagwe
Officer-in-Charge

The SCOPE Cell has been mandated to oversee two vital programs of ACTREC - science communication and professional education. During 2014, in fulfilment of its commitment to the science communication programs of the Centre, the Cell edited and compiled ACTREC's 2013 annual report that forms a component of the Tata Memorial Centre's 2013-14 report. On request, Dr. Bagwe provided editing services for manuscripts and conference material. The Cell assisted by the Steno Pool handled information dissemination about lectures, seminars, conferences and meetings in ACTREC through emails and circulars. Staff of the Cell helped design and upload webpages for conferences and workshops held at the Centre, and handled routine uploads of tenders/ advertisements on to the website. The Cell also provided vital support for the Centre's Cancer Awareness Program.

In support of the Centre's doctoral program, SCOPE Cell handled the JRF2014 intake beginning with the call for projects, prescreening applications (1241 applications for 13 JRF projects), conduct of written entrance exam and interviews, up to selection of the JRFs. The Cell also oversaw the year long academic coursework for the fresh recruits; this included schedule preparation and conduct of orientation, lab visits, lab allotment, core course/ elective lectures and exams, correcting objectives, collating marks, preparing transcripts, and DC formation. The Cell also coordinated the short term and summer training program of the Centre, in which 246 UG and PG students from colleges/ universities across the country were allocated for training to faculty of the Centre (225 short term trainees, 12 summer trainees, six observers and three postdocs). As a part of her academic responsibilities, Dr. Bagwe delivered lectures on 'Laboratory Safety at ACTREC' to the new trainees. During 2014, the Cell also provided logistic support for eight educational visits from students of colleges, institutes and universities from across the country and newly recruited scientific officers from the Atomic Energy Review Board, members of the BARC Officers Association, and contestants of the DAE's All India Essay Contest on Nuclear Energy. The Cell, jointly with the Events Committee, also conducted the Centre's Open Day in December 2014.

Scientific Resources: Core Committees in ACTREC

ACTREC Apex Committee for Research and Academics (AACRA)

AACRA, which was established in April 2006, acts as the apex research and academics committee to: carry out the mandate given to ACTREC by the Scientific Advisory Committee, promote basic, interdisciplinary, translational and disease oriented research, recommend and coordinate measures for achieving excellence in research and academics.

Chairperson	Dr. SV Chiplunkar, Director, ACTREC
Co-Chairperson	Dr. Sudeep Gupta, Dy. Director, CRC-ACTREC
Members	Dr. Neelam Shirsat Dr. Rajiv Sarin Dr. Rajiv Kalraiya

Basic Sciences Research Group

BSRG is a forum of basic scientists at ACTREC where scientific issues related to academic and research programs, infrastructure development, organization of symposia and meetings, updates on research support facilities, opportunities for extramural and intramural funding support and related matters are discussed.

Chairperson	Dr. SV Chiplunkar, Director, ACTREC
Co-Chairperson	Dr. Sudeep Gupta, Dy Director, CRC - ACTREC
Member Secretary	Dr. Tanuja Teni
Members	All Principal Investigators & Co-Investigators All Officers-in-Charge, CRI Facilities

ACTREC Institutional Ethics Committee

ACTREC IEC, constituted as per the ICMR guidelines for Ethics Committees, has the mandate for combined scientific and ethics review of research projects being conducted at ACTREC. This committee monitors research studies involving human subjects and use of tissues collected/ banked during diagnostic or therapeutic procedures.

Chairperson	Dr. Rita Mulherkar, Basic Scientist, (Retired) ACTREC
Co-Chairperson	Dr. Nobhojit Roy, Surgeon, BARC Hospital
Member-Secretary	Dr. Vedang Murthy, Radiation Oncologist, ACTREC
Members	Dr. Vikram Gota, Clinical Pharmacologist, ACTREC Dr. Aliasgar Moiyadi, Surgeon, ACTREC Dr. Tejpal Gupta, Radiation Oncologist, ACTREC Dr. Kumar Prabhash, Medical Oncologist, TMH Dr. Navin Khattry, Medical Oncologist, ACTREC Dr. Bharat Reiki, Pathologist, TMH Dr. Prasanna Venkatraman, Basic Scientist, ACTREC Dr. BB Singh, Legal expert – Advocate, Mumbai High Court Dr. Manoj Mahimkar, Basic Scientist, ACTREC Mrs. Sadhana Kannan, Biostatistician, ACTREC Ms. Lakshmi R., Social Scientist Mrs. Deepa Ramani, Lay person

Institutional Animal Ethics Committee

IAEC fulfills the requirements of the Committee for the Purpose and Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Environment and Forests, Govt. of India. IAEC reviews animal study proposals and advises the investigators to ensure optimal use of the animals as per CPCSEA guidelines.

Chairperson	Dr. SV Chiplunkar
Secretary	Dr. Arvind Ingle
Members	Dr. Manoj Mahimkar
	Dr. Pradip Chaudhari
	Dr. Pritha Ray
	Dr. Renuka Munshi, Scientist from outside
	Mrs. Ranjana Baburao, Non-scientific socially aware member
CPCSEA Main Nominee	Dr. DD Manjramkar
CPCSEA Link Nominee	Dr. HD Sarma

Institutional Biosafety Committee

IBSC serves as the nodal point for implementation of the biosafety guidelines for recombinant DNA research, their production and release into the environment, and setting up containment conditions for certain experiments as set by the Recombinant DNA Advisory Committee of DBT. Research projects involving the use or production of microorganisms or biologically active molecules that might cause a biohazard must be notified to the IBSC in the DBT-prescribed format. The IBSC permits genetic engineering activity on classified organisms only at places where such work should be performed. The committee members are empowered to subject the storage facility, work place, etc. to inspection.

Chairperson	Dr. Rajiv Kalraiya
Member Secretary	Dr. Manoj Mahimkar
Members	Dr. Sanjay Gupta
	Dr. Pritha Ray
	Dr. BV Venugopala Reddy
	Dr. Shashank Ojha
DBT-Nominee	Dr. Shubha Tole, TIFR
Outside Expert	Dr. Geetanjali Sachdeva, BARC

Institutional Radiation Safety Committee

IRSC is mandated to ensure that the guidelines of the Atomic Energy Regulatory Board for the use, storage, handling and disposal of radioactivity are followed in the respective areas by the designated officers, along with guidelines defined by IRSC. At ACTREC, radioactive sources are used for in-vitro assays, radiation treatment and radiodiagnosis procedures in clinical and preclinical setup. IRSC monitors the safe handling, use and disposal of radioactive sources, and occupation safety aspects while working in the radiation areas.

Chairperson	Dr. Shubhada Chiplunkar, Director, ACTREC
Member Secretary	Dr. Pradip Chaudhari, Radiation Safety Officer, CRI
Members	Dr. DD Deshpande, Head, Medical Physics Div., TMH
	Dr. JP Agarwal, Dept of Radiation Oncology, TMH
	Dr. SL Juvekar, Radiodiagnosis Dept, ACTREC
	Dr. Shashank Ojha, Dept of Transfusion Medicine, ACTREC
	Ms. Reena Devi, CRC, ACTREC
	Ms. Siji Nojin Paul, CRC, ACTREC
	Ms. Sneha Mithun, Dept of Nuclear Medicine, TMC

Academic Committee

The Academic Committee oversees all matters pertaining to the JRF program and coordinates the academic coursework (core course and electives), JRF entrance exam paper setting, and ensures the smooth conduct of the course exams.

Convenor	Dr. Neelam Shirsat
Members	Dr. Manoj Mahimkar
	Dr. Sanjay Gupta
	Dr. Kakoli Bose
	Dr. C. Muralikrishna
	Dr. Pritha Ray
	Dr. Sanjeev Waghmare

Internal Complaints Committee

In pursuance of section 4 read with its applicable subclauses of the aforesaid act, the Internal Complaints Committee (ICC) at TMC-ACTREC is empowered to enquire into the complaints related to the sexual harassment of women at the workplace.

Presiding Officer	Dr. Tanuja Teni
Members	Mrs. Meera Achrekar
	Mrs. Bhagyashree Tillu
	Mr. Mushtaq Shaikh
Outside Expert	Mrs. Usha Banerji

Anti-Ragging Committee

In May 2014, an Anti-Ragging Committee was constituted at ACTREC in terms of the decision taken by the Government of India, duly notified through the Homi Bhabha National Institute (HBNI) under whose affiliation the Centre conducts its Ph.D. program in Life Sciences. This committee looks into the matter of complaints of ragging at ACTREC.

Chairperson	Dr. Sanjay Gupta
Members	Dr. Prasanna Venkatraman
	Dr. Rukmini Govekar
	Dr. Sanjeev Waghmare
Student Members	Ms. Abira Ganguly
	Mr. Raja Reddy Kuppili

New Projects approved by the ACTREC Institutional Ethics Committee during 2014

Principal Investigator	Name of the Project/ Trial
Dr. Tanuja Teni	Role of anti-apoptotic McL-1 gene in human oral cancers
Dr. Shailesh Shrikhande	Phase III randomised controlled trial comparing D2 versus D3 lymphadenectomy on outcomes of non-metastatic, resectable, but locally advanced, gastric cancer following neoadjuvant (perioperative) chemotherapy (ELANCe trial)
Dr. Sudhir Nair	Human papilloma virus in head and neck squamous cell carcinoma - prevalence and molecular studies
Ms. Reena Devi Phuraliatpam	To study characteristics of optically stimulated luminesecence dosimeters (OSLD) and establish the dosimetry system for in-vivo patient dosimetry
Dr. Tanuja Teni	Expression of survivin isoforms and p53 family members in tobacco chewing-associated oral cancers
Dr. Amit Dutt	Whole genome sequencing for identification of oncogenic mutations in cervical adenocarcinoma
Dr. Ujjwala Warawdekar	Enrichment, isolation and culture of circulating tumour cells
Dr. Jaya Ghosh	Study evaluating the activity of methotrexate, 6 mercaptopurine, 6 thioguanine and propranolol in ovarian cancer cell lines
Dr. Vedang Murthy	Evaluation of HPV association with proapoptic proteins BAK and BAX in HNSCC patients
Dr. Tejpal Gupta	A randomized multicenter trial of accelerated hypo - vs. normo-fractionated radiotherapy for head and neck squamous cell carcinoma (IAEA-HYPNO trial)
Dr. Preeti Chavan	Determination of select biochemical reference intervals in Indian voluntary blood donors
Dr. Sorab Dalal	Regulation of the epithelial mesenchymal transition (EMT) by 14-3-3σ
Dr. Vikram Gota	CSF distribution of high dose versus standard dose Geftinib and Erlotinib in lung cancer patients with brain metastases
Dr. Vivek Bhat	Prospective observational study of oral caity flora in patients receiving chemo-radio-therapy for head and neck cancer
Dr. Vikram Gota	Targetting deacetylases and methytransferases to improve outcomes after allogeneic bone marrow transplantation in chemo-conditioning based murine model of acute graft versus host disease
Dr. Pritha Ray	A genome wide screen for molecular mechanisms underlying the Cisplatin - Paclitaxel dual chemoresistant phenotype in late-stage ovarian carcinomas
Dr. Rakesh Jalali	Correlation of clinical and radiological parameters with various molecular subtypes of medulloblastoma

Principal Investigator	Name of the Project/ Trial
Dr. Kakoli Bose	Elucidating allosteric activation mechanism of proapoptotic serine protease HtrA2
Dr. Pradeep Chaudhari	Immunohistochemistry profiling of canine neoplasms
Dr. Epari Sridhar	Gliomas in children and young adults: BRAF, FGFR1 and MYB gene alterations-diagnostic, prognostic and clinical relevance
Dr. Vikram Gota	Evaluating the potential of dabigatran etexilate in treatment of metastatic colon cancer
Dr. Narendra Joshi	Identification of endogenous control gene for normalization of gene expression data of oral tumors
Dr. Vikram Gota	Phase I clinical trial of Bioplatin an oral therapeutic nano particle in patients with advanced solid tumors
Dr. Kumar Prabhash	Comparative study evaluating quality of life of chemotherapy versus oral TKI in third line and beyond setting for advanced non-small cell lung cancer
Dr. Tejpal Gupta	Clinical utility of 18-F-FDG-PET/CT for diagnosis, staging, response evaluation, and prognostication in patients with primary central nervous system lymphoma (PCNSL)
Dr. Prasanna Venkataraman	Regulatory network of PSMD9 a proteasomal chaperone
Dr. SB Rajadhyaksha	Flow cytometric platelet crossmatching approach for selection of platelets for transfusion in hematopoietic stem cell transplant patients

Academics at ACTREC

Education is the third vital mandate of ACTREC, and is given due impetus. The formal academic programs of the Centre encompass an active doctoral program, a training program, and a training course on laboratory techniques in translational research. Other educational activities include its Open Day, educational visits, and outreach programs to create cancer awareness.

Doctoral Program

The Academic and Training Programs Office, chaired by Dr. SV Chiplunkar, oversees the Ph.D. (Life Sciences) program at ACTREC. This program is affiliated to the Homi Bhabha National Institute (HBNI), a deemed university established in 2006 under the aegis of the University Grants Commission and which encompasses all the units of the Department of Atomic Energy. Intake of Junior Research Fellows and the year-long formal academic coursework is handled by the SCOPE Cell, and all the matters post registration are handled jointly by ACTREC Administration and ATP Office. During the year 2014, a total of 108 graduate students were enrolled into the Centre's Ph.D. program. In May 2014, an Anti-Ragging Committee was constituted at ACTREC in terms of the decision taken by the Government of India, duly notified through HBNI.

In July 2014, a new batch of 13 students joined the Centre and started their one year HBNI academic coursework, successful completion of which is mandatory for registration.

During the report year, 13 doctoral students who had completed work towards their doctoral dissertation were awarded the Ph.D. (Life Sciences) degree of the Homi Bhabha National Institute; their details are given below.

Award of the Ph.D. Degree in Life Sciences

(Homi Bhabha National Institute)

- **Ms. Pallavi Goel**: Characteri-zation of HHV-6 using an Indian isolate: an in-vitro study. (Guide: Dr. Robin Mukhopadhyaya)
- **Mr. Amit Ranjan**: Role of b1,6 branched N-linked oligosaccha-rides in regulating key cellular processes involved in cancer cell invasion. (Guide: Dr. Rajiv Kalraiya)
- **Mr. Surya Pratap Singh**: Development of *in vivo* Raman diagnostic methodologies for oral pre-cancers and cancers. (Guide: Dr. Murali Krishna Chilakapati)
- **Ms. Ratika Kunder**: MicroRNA profile of medulloblastomas. (Guide: Dr. Neelam Shirsat)
- **Mr. Ajit Kumar Sharma**: Histone, chromatin structure and their role in DNA repair during carcinogenesis. (Guide: Dr. Sanjay Gupta)
- **Mr. Dilip Badgujar**: Structural and functional characterization of BRCTs domain. (Guide: Dr. Ashok Varma)
- **Mr. Dimpu Gogoi**: Role of notch in regulation of gamma delta T lymphocytes and regulatory T cell functions. (Guide: Dr. Shubhada Chiplunkar)
- **Mr. Hemant Dhamne**: Lentiviral vector mediated long term expression of therapeutic proteins. (Guide: Dr. Rajiv Kalraiya)
- **Mr. Sumeer Raina**: Lentiviral vector mediated gene transfer as an antiviral and antitumoral intervention strategy. (Guide: Dr. Rajiv Kalraiya)
- **Mr. Peeyush Goel**: Effect of a methylxanthine compound and anticancer agent on integrin mediated adhesion and induced apoptosis in breast cancer cells. (Guide: Dr. Shubhada Chiplunkar)
- **Mr. Manoj Ramteke**: Identification of a novel ATP binding site and demonstration of ATP hydrolysis by mammalian 14-3-3 isoforms. (Guide: Dr. Prasanna Venkatraman)
- **Mr. Mohd. Zahid Kamran**: Effects of methylxanthine on STAT3 mediated regulation of cytokines involved in tumor development and tumor induced angiogenesis in melanoma cells. (Guide: Dr. Shubhada Chiplunkar)
- **Ms. Padma Nanaware**: Identification of protein interaction networks of Gankyrin in cancer. (Guide Dr. Prasanna Venkatraman)

Training Program

ACTREC has an active training program that accepts (a) students or staff of academic/research institutions who come to learn a specific technique (observers), (b) undergraduate students seeking research exposure during the college's summer break (summer trainees), (c) graduate students seeking to work on their Master's dissertation (dissertation trainees), and (d) individuals who have completed academic study who wish to gain research experience (short term trainees). During 2014, a total of 246 trainees were assigned to senior faculty - scientists and clinicians of the Centre - 129 were for six month dissertation, 96 trainees for experience, 12 were summer trainees, 6 observers, and 3 postdocs.

Basic Program in Translational Research

This training program in 'Laboratory techniques in translational research' for M.Ch. students of TMH is coordinated jointly by Dr. Rukmini Govekar of ACTREC and Dr. Gouri Pantvaidya of TMH. Teaching sessions are held on alternate Saturdays every month during the surgical residents' three month rotation at ACTREC. This structured program includes lectures and demonstrations on topics like DNA extraction, amplification, electrophoresis, CGH, IHC, western blotting, immune dysfunction, etc and is a good forum for interaction between clinicians and scientists. After each session, the participants present papers on translational research topics covered in that particular session.

Open Day

Open Day 2014 was conducted on 4th and 5th December 2014. Around 520 students and faculty from science, medical, and related colleges/ institutions from Mumbai and Navi Mumbai participated in this educational event. Batches of twelve students and an accompanying faculty member from ten different colleges visited ACTREC in the morning/ afternoon session on each of the two days. The program included a poster session, introductory talk about ACTREC, and visits to ten demonstrating labs where varied aspects of cancer research/ diagnosis or treatment were highlighted. ACTREC's Open Day is a popular event amongst local college students.

Educational Visits

ACTREC regularly accepts educational visits from students of science degree colleges and universities from across the country. The students and accompanying faculty are shown around select labs of the Centre. Besides student groups, this year also saw visits from newly recruited scientific officers of the Atomic Energy Regulation Board and members of the BARC Officers Association. A total of eight educational visits took place during 2014.

Cancer Awareness Program (CAP)

Since the past three years, ACTREC has been conducting outreach programs for the general public and focused groups like school or college students, neighborhoods, parishes, etc in a bid to create awareness about cancer. Two CAP lecture series were conducted at SIES College, Navi Mumbai – Dr. Supriya Chopra was the lead speaker on 18th February 2014 and Dr. Sudhir Nair on 21st July 2014.

Conferences, Workshops, Symposia organized at ACTREC during 2014

January to March	SCA Software Learning Workshop 2013-14 Coordinator: Students Council of ACTREC
23-24 January	DBT-sponsored Workshop on 'Applications in Bioinformatics' Coordinator: Dr. Ashok Varma
30 January	Half Day Symposium to appreciate the work of Dr. Rita Mulherkar & Dr. Rajiv Gude Coordinator: Director's Office & Dr. Neelam Shirsat
February to December	Training Program on 'Laboratory Techniques in Translational Research' – 3 sessions Coordinators: Dr. Rukmini Govekar, ACTREC & Dr. Gouri Pantvaidya, TMH
8 March	National CME on 'Quality Conclave of Laboratory and Transfusion Services' Chairperson: Dr. Vivek Bhat
22-23 March	37th annual Mumbai Hematology Group Conference Organizing Secretary: Dr. Bhausaheb Bagal, TMC & Mumbai Hematology Group
21-22 April	Course in 'Molecular Epidemiology' Organizer: Dr. Rajesh Dikshit, TMC
22-23 May	Internal Audit Training on ISO 15189:2012 and NABL 112 Coordinator: Ms. Chital Naresh
23-27 June	NABL Assessor's Training Course Coordinator: Ms. Chital Naresh
10-11 July	MIG 'Basic Course in Flow Cytometry-II' 2014 Organizing Secretary: Dr. Jyoti Kode & Mumbai Immunology Group
7 August	TNAI Workshop on 'Making Nursing Visible: Imperatives and Strategies' Organizer: Mrs. Meera Achrekar & Trained Nurses Association of India
13 September	Biophysics Paschim Meeting (BPP 7) - One-day Symposium Organizer: Dr. Kakoli Bose & Biophysics Paschim
16-18 September	MAMB Undergraduate Workshop on 'Cancer Research' Jt. Organizers: ACTREC & Dr. MG Deo, Moving Academy of Medicine & Biomedicine
19-20 September	ACTREC Monsoon Retreat Coordinator: Dr. Tanuja Teni
16-18 October	The 2nd ACTREC Symposium on Clinical Pharmacology - 'Application of PK-PD Modeling in Clinical Research' Organizing Secretary: Dr. Vikram Gota

27-31 October	Pre ICGC Workshops on Cancer Genetics Counselling; Basic Techniques in Molecular Biology; Advanced Techniques in Molecular and Genetic Analysis Organizer: Dr. Rajiv Sarin
1-2 November	2nd Indian Cancer Genetics Conference (ICGC 2014) Organizer: Dr. Rajiv Sarin
3-7 November	Hands-on Workshop on 'Advanced Techniques in Anti-Cancer Drug Evaluation' Organizing Secretaries: Dr. Aarti Juvekar & Dr. Jyoti Kode
4-5 December	Open Day 2014 Coordinator: Dr. Aparna Bagwe
8-9 December	12th Meeting of DST's Program Advisory Committee on 'Health Sciences' Coordinators: Dr. Sudeep Gupta & Dr. Vikram Gota
18-19 December	10th National Research Scholars Meet in Life Sciences - 2014 Organizers: GSM Committee

Guest Seminars

22 January	Targeted therapies in AML Dr. Satyananda Patel, Hospital St. Louis, Paris, France
22 January	Living healthy without medicines Dr. RN Varma, Retd. Scientist & Arya Jitendra, Acharya Swadeshi Gurukulam, Ujjain
30 January	Immunobiology of multiple myeloma Dr. Prabhala Rao, Harvard Medical School & VA Boston Healthcare System, Boston, USA
6 February	Biology of mammalian prions Prof. Adriano Aguzzi, Institute of Neuropathology, University Hospital Zurich, Switzerland
25 February	Empowering normal cells to trigger cancer cell apoptosis Dr. Vivek Rangnekar, Markey Cancer Centre, University of Kentucky, Lexington, USA
25 March	Circulating tumour cells as prognostic markers of treatment response in melanoma Dr. Mel Ziman, Edith Cowan Univ. & University of Western Australia, Perth, Australia
8 April	Functional role of S100A16 in oral carcinogenesis Dr. Dipak Sapkota, Gade Laboratory for Pathology, University of Bergen, Norway
13 April	Fine-tuning bone and colon cancer - two tales of microRNAs Dr. Subree Subramanian, University of Minnesota, Minneapolis, USA
24 June	Targeting inflammation in metabolism and cancer Dr. Vinay Tergaonkar, Institute of Molecular and Cell Biology, Singapore
18 July	Functional epigenomics of melanoma progression Dr. Kunal Rai, MD Anderson Cancer Center, Houston, USA

26 September	Deciphering metastasis - unraveling the molecular circuitry of tumor cells and the metastatic niche Dr. Radhika Nair, Kinghorn Cancer Centre & Garvan Instt. of Medical Research, Sydney, Australia
7 October	Pathogenomics: computational methods for pathogen identification in human diseases Dr. Chandra Sekhar Pedamallu, Broad Institute of MIT and Harvard, Cambridge, USA
30 October	Disentangling galectin-1-based patterning functions in organogenesis Dr. Ramray Bhat, Lawrence Berkeley National Laboratory, Berkeley, USA
31 October	Stromal cells promote resistance to death signals in mantle cell lymphoma Dr. Lalit Sehgal, Postdoctoral Fellow, MD Anderson Cancer Center, Houston, USA
13 November	Breaching the barrier of plasma membrane with a protein needle Dr. Nusrat Sanghamitra, Institute of Integrated Cell Material Science, Kyoto University, Japan

Patient Support Programs

30 January	Entertainment program for cancer patients and their care givers Co-ordinators: Mrs. Bhagyashree Tillu & The Greater Bombay Co-operative Bank Ltd
22 March	Meeting with parents of cancer patients Co-ordinators: Dr. Sripad Banavali, TMH & St. Jude India Childcare Centers
11 April	Reiki Attunement Session for patients and their relatives Co-ordinator: Mrs. Bhagyashree Tillu
21 June	CML and CIST Support Group Meeting of ACTREC and TMH patients Co-ordinators: Dr. Navin Khattry & The Max Foundation
22 September	National Cancer Rose Day Co-ordinator: Mrs. Bhagyashree Tillu

Staff Achievements

Dr. Reshma Ambulkar

- Treasurer: Indian Society of Critical Care Medicine, Mumbai branch

Mr. Srikanta Basu

- First Prize in Oral Presentation: 10th National Research Scholars' Meet, ACTREC, Navi Mumbai: December 2014.

Mr. Amir Ali Bukhari

- Award for Best Oral Presentation: Symposium on Advances in Breast Cancer, Goa: October 2014.

Mr. Pratik Chaudhari

- Prof. VC Shah Award for Best Platform Presentation: All India Cell Biology Conference, Lucknow: December 2014

Dr. Shubhada Chiplunkar

- Chairperson: Scientific Advisory Committee, MGM Institute of Health Sciences, Navi Mumbai
- Co-Chairperson: Steering Committee, Task Force on Translational Immunology, Indian Council of Medical Research
- Member: Review Committee on Genetic Manipulation, Department of Biotechnology
- Member: Project Review Committee, Division of Non-communicable Diseases (Oncology), Indian Council of Medical Research
- Member: Scientific Advisory Committee, Indian Council of Medical Research
- Member, Subcommittee on Control of Cervical Cancer, Indian Council of Medical Research
- Member, Advisory Committee & Basic Sciences Committee, Board of Research in Nuclear Sciences, Department of Atomic Energy
- Member: Board of Radiation and Isotope Technology
- Member: Academic Council and Board of Studies in Life Sciences, Homi Bhabha National Institute
- President, Indian Association for Cancer Research (till March 2014)
- Secretary: Mumbai Immunology Group
- Chairperson: Mumbai Immunology Group's Hands on Workshop-II - Basic Course in Flow Cytometry, ACTREC, Navi Mumbai: July 2014
- Chairperson: Hands on Workshop –III - Advanced Techniques in Anti-Cancer Drug Evaluation, ACTREC, Navi Mumbai: November 2014
- Presidential Oration: 33rd Annual Convention of Indian Association for Cancer Research, Thiruvnathpuiram: February 2014

Dr. Sorab Dalal

- Secretary: Indian Association of Cancer Research (till March 2014)

Dr. Kartik Doshi

- JC Patel and HM Bhatia Award as first prize for oral presentation: 37th Annual Conference of the Mumbai Hematology Group, Mumbai: March 2014

Ms. Poonam Gamre

- ARTTI - Young Technologist 2014: 18th National Conference of the Association of Radiation Therapy Technologists of India (ARTTICON-2014), Regional Cancer Centre, Indira Gandhi Medical College, Shimla: October 2014.

Dr. Sanjay Gupta

- Associate Editor: Journal of Integrated-Omics – a methodological journal.

Dr. Tejpal Gupta

- Treasurer: Indian Society of Neuro-Oncology

Dr. Arvind Ingle

- TurnKey Facility Leader of the Year- 2014 Award of the ALN Magazine, USA.
- President: Laboratory Animal Scientists Association (LASA) of India.

Mr. Prajish Iyer

- Best Poster Award (sponsored by Nature Reviews Cancer): Next Gen Genomics and Bioinformatics Technologies Conference, NIMHANS, Bangalore: November 2014

Dr. Rajiv Kalraiya

- Liverpool-India Fellowship: Institute of Translational Medicine, University of Liverpool, UK

Ms. Ekjot Kaur

- Sitaram Joglekar Award for best oral presentation: 33rd Annual Convention of Indian Association for Cancer Research, Kollam: February 2014.

Mr. Krunal Kavathiya

- Dr. GB Parulkar Award as first prize for poster presentation: 7th International Conference of South Asian Chapter of American College of Clinical Pharmacology, Mumbai: April 2014

Ms. Padma Nanaware

- Best Poster Award: Annual meeting of the Proteomics Society, India, IIT-Bombay, Mumbai: December 2014

Mr. Rushikesh Patil

- Dr. GP Talwar Young Scientist Award for Oral Presentation: 41st annual conference of Indian Immunology Society, Madurai Kamaraj University, Madurai: December 2014.

Ms. Sanhita Rath

- Dr. SM Karandikar Award at third prize for oral presentation: 7th International Conference of South Asian Chapter of American College of Clinical Pharmacology, Mumbai: April 2014

Dr. Supriya Sastri

- Best Paper Award: Young Radiation Oncologists Conference, Visakhapatnam: January 2014

Mr. Vimal Sathyan

- First Prize in Transfusion Medicine Quiz: 39th Annual Conference of the Indian Society of Blood Transfusion & Immunohematology (Transcon -2014), Patiala: October 2014

Mr. Bhushan Thakur

- Director's Prize for Best Participant among the Ph.D. students in Oral session: All India Cell Biology Conference, Lucknow: December 2014

Dr. Ashok Varma

- Coordinator: Establishment of DBT Biotechnology/ Bioinformatics training centre for teachers and research scholars from the North Eastern Region and other underserved regions of India: BTIS, ACTREC: 2014-19.

Dr. Tabassum Wadasadawala

- Gold Medal for Best Oral Presentation: International Conference on Multidisciplinary Management of Breast Cancer (Breast Oncology-2014), Kochi: March 2014.

Mr. Mohd. Yasser

- Award for Best Essay: 6th annual meeting of Proteomic Society, India, IIT-B, Mumbai: December 2014.

TMC Staff Publications

International

1 Adhikary A, Chakraborty S, Mazumdar M, Ghosh S, Mukherjee S, Manna A, Mohanty S, Nakka KK, Joshi S, De A, Chattopadhyay S, Sa G, Das T (2014) - Inhibition of epithelial to mesenchymal transition by E-cadherin up-regulation via repression of slug transcription and inhibition of E-cadherin degradation: Dual role of SMAR1 in breast cancer cells. Journal of Biological Chemistry. 289: 25431-25444. PMID: 25086032.

2 Agarwal AK, Gude RP, Kalraiya RD (2014) - Regulation of melanoma metastasis to lungs by cell surface Lysosome Associated Membrane Protein- 1 (LAMP1) via galectin-3. Biochemical and Biophysical Research Communications. 449(3):332-337. PMID: 24845565

3 Agarwal AK, Kalraiya RD (2014) - Glycosylation regulates the expression of Lysosome Associated Membrane Protein-1 (LAMP1) on the cell surface. Journal of Bioscience and Technology. 5(3):556-563.

4 Aggarwal A, Chopra S, Paul SN, Engineer R, Srivastava SK (2014) - Evaluation of internal target volume in patients undergoing image guided intensity modulated adjuvant radiation for gastric cancers. British Journal of Radiology. 87(1033): 20130583. PMID: 24288401

5 Amit M, Yen TC, Liao CT, Chaturvedi P, Agarwal JP, Kowalski LP, Kohler HF, Ebrahimi A, Clark JR, Cernea CR, Brandao JS, Kreppel M, Zöller JE, Bachar G, Shpitzer T, Bolzoni AV, Patel RP, Jonnalagadda S, Robbins TK, Shah JP, Patel SG, Gil Z, Leider-Trejo L (2014) - The origin of regional failure in oral cavity squamous cell carcinoma with pathologically negative neck metastases. JAMA Otolaryngology Head and Neck Surgery. 140(12):1130-7. PMID:25074731

6 Anantharaman D, Chabrier A, Gaborieau V, Franceschi S, Herrero R, Rajkumar T, Sawant T, Mahimkar MB, Brennan P, Mckay JD (2014) - Genetic Variants in Nicotine Addiction and Alcohol Metabolism Genes, Oral Cancer Risk and the Propensity to Smoke and Drink Alcohol: A replication study in India. PLoS ONE. 9(2):e88240. PMID: 24505444

7 Arora B, Banavali S, Vora T, Chinnaswamy G, Prasad M, Paradkar A, Kurkure PA, Havaldar R, Narula G, Talole S (2014) - A randomized open labeled parallel group phase iii study of antibiotics alone vs. antibiotics plus g-csf in pediatric cancer patients with febrile neutropenia in a low-income setting. Pediatric Blood and Cancer. 61(s2):s117.

8 Arya S, Rane P, Deshmukh A (2014) - Oral cavity squamous cell carcinoma: Role of pretreatment imaging and its influence on management. Clinical Radiology. 69(9):916-30. PMID:24908285

9 Asbun HJ, Conlon K, Fernandez-Cruz L, Friess H, Shrikhande SV, Adham M, Bassi C, Bockhorn M, Büchler M, Charnley RM, Dervenis C, Fingerhutt A, Gouma DJ Hartwig W, Imrie C, Izbicki JR, Lillemoe KD, Milicevic M, Montorsi M, Neoptolemos C, Yeo CJ, Traverso LW (2014) - When to perform a pancreatoduodenectomy in the absence of positive histology? A consensus statement by the International Study Group of Pancreatic Surgery. Surgery. 155(5):887-892. PMID: 24661765

10 Athawale RB, Jain DS, Singh KK, Gude RP (2014) - Etoposide loaded solid lipid nanoparticles for curtailing B16F10 melanoma colonization in lung. Biomedicine and Pharmacotherapy. 68(2):231-240, 2014. PMID:24560352

11 Babu D, Bhamre R, Katna R (2014) - Intramuscular haemangioma of the tongue. Annals of the Royal College of Surgeons of England. 96(6):15-17. PMID:25198963

12 Babu KG, Prabhash K, Vaid AK, Sirohi B, Diwakar RB, Rao R,Babu KG, Prabhash K, Vaid AK,Sirohi B, Diwakar RB, Rao R,Kar M, Malhotra H, Nag S, Goswami C, Raina V, Mohan R (2014) - Nimotuzumab plus chemotherapy versus chemotherapy alone in advanced non-small-cell lung cancer: a multicenter randomized open-label Phase II study. Onco Targets and Therapy. 7:1051-1060. PMID:24966687

13 Badwe RA, Dikshit R, Laversanne M, Bray F (2014) - Cancer incidence trends in India. Japanese Journal of Clinical Oncology. 44(5):401-407.

14 Balakrishnan B, Chiplunkar SV, Indap MM (2014) - Methanol Extract of Euchelus asper prevents bone resorption in ovaryectomised mice model.

Journal of Osteoporosis. vol. 2014, Article ID 348189, 9 pages.

15 Balakrishnan B, Indap MM, Singh SP, Krishna CM, Chiplunkar SV (2014) - Turbomethanol extract inhibits bone resorption through regulation of T cell function. Bone. 58:114-125. PMID:24140785

16 Bancroft EK, Page EC, Castro E, Lilja H, Vickers A, Sjoberg D, Assel M, Foster CS, Mitchell G, Drew K, Mæhle L, Axcrona K, Evans DG, Bulman B, Eccles D, McBride D, Asperen C, Vasen H,. Kiemeney LA, Ringelberg J, Cybulski C, Wokolorczyk D, Selkirk C, Hulick PJ, Bojesen A, Skytte A, Lam J, Taylor L, Oldenburg R, Cremers R, Verhaegh G, van Zelst-Stams WA, Oosterwijk JC, Blanco I, Salinas M, Cook J, Rosario DJ, Buys S, Conner T, Ausems MG, Ong K, Hoffman J, Domchek S, Powers J, Teixeira MR, Maia S, Foulkes WD, Taherian N, Ruijs M, Helderman-van den Enden AT, Izatt L, Davidson R, Adank MA, Walker L, Schmutzler R, Tucker K, Kirk J, Hodgson S, Harris M , Douglas F, Lindeman GJ, Zgajnar J, Tischkowitz M, Clowes VE, Susman R, Cajal T, Patcher N, Gadea N, Spigelman A, van Os T, Liljegren Al, Side L, Brewer C, Brady AF, Donaldson A, Stefansdottir V, Friedman E, Chen-Shtoyerman R, Amor DJ, Copakova L, Barwell J, Giri VN, Murthy V, Nicolai N, Teo S,Greenhalgh L,Strom S, Henderson A, McGrath J, Gallagher D, Aaronson N, Ardern-Jones A, Bangma C, Dearnaley D, Costello P, Eyfjord J, Rothwell J, Falconer A, Gronberg H, Hamdy FC, Johannsson O, Khoo V, Kote-Jarai Z, Lubinski J, Melia AU, McKinley J, Mitra AV, Moynihan C, Rennert G, Suri M, Wilson P, Killick E, The IMPACT Collaborators, Moss S, Eeles RA (2014) - Targeted prostate cancer screening in BRCA1 and BRCA2 mutation carriers: Results from the Initial screening round of the IMPACT study. European Urology. 66:489-499. PMID: 24484606.

17 Banerjee S, Mahantshetty U, Shrivastava S (2014) - Brachytherapy in India - a long road ahead. Journal of Contemporary Brachytherapy. 6(3):331-335. PMID:25337139

18 Barreto SG, Dutt A, Chaudhary A (2014) - A genetic model for gallbladder carcinogenesis and its dissemination. Annals of Oncology. 25(6):1086-1097. PMID: 24705974

19 Barreto SG, Pawar S, Shah S, Talole S, Goel M, SV Shrikhande (2014) - Patterns of failure and determinants of outcomes following radical re-resection for incidental gallbladder cancer. World Journal of Surgery. 38(2):484-489. PMID: 24196171

20 Basu S, Joshi A (2014) - 99mTc HYNIC-TOC imaging and 177Lu DOTA-octreotate treatment in non-iodine-concentrating dedifferentiated thyroid carcinoma alternative diagnosis metastases: an unusual. Clinical Nuclear Medicine. 39(7):632-634. PMID:24873792

21 Basu S, Sirohi B, Shrikhande SV (2014) - Dual tracer imaging approach in assessing tumor biology and heterogeneity in neuroendocrine tumors: its correlation with tumor multifaceted implications for personalized clinicalcorrelation with tumor proliferation index and possible management decisions, with focus on PRRT. European Journal of Nuclear Medicine and Molecular Imaging. 41(8):1492-1496. PMID:24863431

22 Behl I, Kukreja L, Deshmukh A, Singh SP, Mamgain H, Hole AR, Krishna CM (2014) - Raman mapping of oral buccal mucosa: a spectral histopathology approach. Journal of Biomedical Optics. 19(12):126005. PMID: 25478870

23 Bhagat M, Qureshi S, Kembhavi S, Ramadwar M, Desai S, Chinnaswamy G, Vora T, Laskar S, Khanna N (2014) - Non hepatoblastoma liver tumors in children - a single centre experience. Pediatric Blood and Cancer. 61(s2):s105-433.

24 Bhagat M, Qureshi S, Ramadwar M, Shetty N, Chinnaswamy G, Vora T, Kurkure P (2014) - The impact of optic nerve resection length on survival in Retinoblastoma. Pediatric Blood and Cancer. 61(S2):S379.

25 Bhargava A, Bunkar N, Khare NK, Mishra PK, Mishra DK (2014) - Nanoengineered strategies to optimize dendritic cells for gastrointestinal tumor immunotherapy: from biology to translational medicine. Nanomedicine. 9(14):2187-2202. PMID: 25405796

26 Bhat V, Kelkar R, Biswas S, Natarajan G (2014) - Ventilator-associated pneumonia: Survey of infection control practices in intensive care units of 15 tertiary care hospitals in Mumbai. American Journal of Infection Control. 42:935-940. PMID: 25087150

27 Bhattacharjee T, Kumar P, Maru G, Ingle A, Krishna CM (2014) - Swiss bare mice: A suitable model for transcutaneous in vivo Raman spectroscopic studies of breast cancer. Lasers in Medical Science. 29(1):325-333. PMID: 23708992

28 Bhattacharyya A, Krishnan S, Dalvi Mitra S, Tiwari R, Ghosh D, Ferdousi S, Saha V, Bhattacharya S (2014) - Prevalence and outcome of multidrug resistant bacterial sepsis in children on chemotherapy. Pediatric Blood and Cancer. 61(S2):S389.

29 Bhave M, Papanikou E, Iyper P, Pandya K, Jain BK, Ganguly A, Sharma C, Pawar K, Austin II J, Day KJ, Rossanese OW, Glick BS, Bhattacharyya D (2014) - Golgi enlargement in Arf-depleted yeast cells is due to altered dynamics of cisternal maturation. Journal of Cell Science. 127(Pt1):250-257. PMID: 24190882

30 Biswas NK, Das S, Maitra A, Sarin R, Majumder PP (2014) - Somatic mutations in arachidonic acid metabolism pathway genes enhance oral cancer post-treatment disease-free survival. Nature Communications. 5:5835. PMID: 25517499

31 Bockhorn M, Uzunoglu FG, Adham M, Imrie C, Milicevic M, Sandberg AA, Asbun HJ, Bassi C, Büchler M, Charnley RM, Conlon K, Cruz LF, Dervenis C, Fingerhutt A, Friess H, Gouma DJ, Hartwig W, Lillemoe KD, Montorsi M, Neoptolemos JP, Shrikhande SV, Takaor K, Traverso W, Vashist YK, Vollmer C, Yeo CJ, Izbicki JR (2014) - Borderline resectable pancreatic cancer: A consensus statement by the International Study Group of Pancreatic Surgery (ISGPS). Surgery. 155(6):977-988. PMID:24856119

32 Bouche G, André N, Banavali S, Berruti A, Bocci G, Brandi G, Cavallaro U, Colleoni M, Curigliano G, Desidero TD, Eniu A, Fazio N, Kerbel R, Hutchinson L, Ledzewicz U, Munzone e, Pasquier E, Graciela Scharovsky O, Shaked Y, Stìrba J,Villalba M, Bertolini F, Cinieri S (2014) - Lessons from the fourth metronomic and anti-angiogenic therapy meeting, 24-25 June 2014, Milan. Ecancermedicalscience. 8:463. PMID:25228919

33 Budyal S, Lila AR, Jalali R, Gupta T, Kasliwal R, Jagtap VS, Bandgar T, Menon P, Shah NS (2014) - Encouraging efficacy of modern conformal fractionated radiotherapy in patients with uncured cushings disease. Pituitary. 17(1):60-67. PMID:23381232

34 Carr R, Fanti S, Paez D, Cerci J, Györke T, Redondo F, Morris TP, Meneghetti C, Auewarakul C, Nair R, Gorospe C, Chung JK, Kuzu I, Celli M, Gujral S, Padua RA, Dondi M (2014) - Prospective international cohort study demonstrates inability of interim PET to predict treatment failure in diffuse large B-cell lymphoma. Journal of Nuclear Medicine. 55(12):1936-1944. PMID:25429159

35 Cerci JJ, Györke T, Fanti S, Paez D, Meneghetti JC, Redondo F, Celli M, Auewarakul C, Rangarajan V, Gujral S, Gorospe C, Campo MV Chung JK, Morris TP, Dondi M, Carr R (2014) - Combined PET and biopsy evidence of marrow involvement improves prognostic prediction in diffuse large B-cell lymphoma. Journal of Nuclear Medicine. 55(10):1591-1597. PMID:25214642

36 Chandarana M, Jiwnani S, Karimundackal G, Pramesh CS (2014) - Lymphadenectomy in esophageal cancer: the real issues. Annals of Thoracic Surgery. 98(1):389-390. PMID:24996739

37 Chatterjee S, De A (2014) - Applications of lentiviral vectors in molecular imaging. Frontiers in Bioscience (Landmark Ed). 19:835-853. PMID:24896320

38 Chaturvedi P, Datta S, Nair S, Nair D, Pawar P, Vaishampayan S, Patil A, Kane S (2014) - Gross examination by the surgeon as an alternative to frozen section for assessment of adequacy of surgical margin in head and neck squamous cell carcinoma. Head and Neck. 36(4):557-563. PMID: 23765548

39 Chaturvedi P, Lerra S, Gupta P, Pai PS, Chaukar DA, Agarwal JP, DCruz AK (2014) - A study of mucosal melanoma of the oral cavity in India: a rare tumor. Ear, Nose and Throat Journal. 93(8):E4-7. PMID:25181674

40 Chaudhari UK, Metkari SM, Manjaramkar DD, Sachdeva G, Katkam R, Bandivdekar AH, Mahajan A, Thakur MH, Kholkute SD (2014) - Echography of the cervix and uterus during the proliferative and secretory phases of the menstrual cycle in bonnet monkeys (Macaca radiata) Journal of the American Association for Laboratory Animal Science JAALAS. 53(1):18-23. PMID:24411775

42 Chaudhury S, Thakur B, Chatterjee S, Ray P (2014) - Molecular imaging aided improvement in drug discovery and development. Current Biotechnology. 3(3):218-237.

43 Chavan P, Chauhan B, Joshi A, Ojha S, Bhat V (2014) - Differential diagnosis of thrombocytopenia in hematopoietic stem cell transplant patients. Journal of Hematology & Thromboembolic Diseases. 2(6):168.

44 Chavarri-Guerra Y, Liedke PE, Pramesh CS,Badovinac-Crnjevic Goss PE, Strasser-Weippl K, Lee-Bychkovsky BL, Fan L, Li J,T, Sheikine Y, Chen Z, Qiao YL, Shao Z12, Wu YL, Fan D, Chow, LW, Wang J, Zhang Q, Yu S, Shen G, He J (2014) - Challenges to effective cancer control in China, India, and Russia. The Lancet Oncology. 15(5):489-538. PMID:24731404

45 Chawre S, Jha S, Rawat-Pawar E, Chaudhari D, Deshmukh A, Goswami S, Dalvi N, Prasad M, Dhanmankar V, Kurkure P (2014) - Rediscovering the joy of learning -YCMOU initiative for childhood cancer survivors. Pediatric Blood and Cancer. 61(s2):s159.

46 Chinnaswamy G, Prasad M, Dhamankar V, Vora T, Gupta T, Moiyadi A, Sridhar E, Banavali S, Jalali R, Kurkure P (2014) - Combat (combined oral metronomic biodifferentiating antiangiogenic treatment) therapy in poor prognosis pediatric malignant brain tumors-is there a role? Pediatric Blood and Cancer. 61(s2):s185.

47 Chopra S, Dora T, Chinnachamy AN, Thomas B, Engineer R, Kannan S, Mahantshetty U, Phurailatpam R, Paul SN, Shrivastava SK (2014) - Predictors of grade 3 or higher late bowel toxicity in patients undergoing pelvic radiation for cervical cancer: results from a prospective study. International Journal of Radiation Oncology Biology Physics. 88(3):630-635. PMID:24521678

48 Chopra S, Patidar A, Dora T, Moirangthem N, Paul SN, Engineer R, Mahantshetty U, Shrivastava SK (2014) - Vaginal displacement during course of adjuvant radiation for cervical cancer: Results from a prospective IG-IMRT study. British Journal of Radiology. 87(1042):20140428. PMID:25135439

49 Choughule A, Sharma R, Trivedi V (2014) - Coexistence of KRAS mutation with mutant but not wild-type EGFR predicts response to tyrosine-kinase inhibitors in human lung cancer. British Journal of Cancer. 111(11):2203-2204. PMID:25117816

50 Dange MC, Srinivasan N, More SK, Bane SM, Upadhya A, Ingle AD, Gude RP, Mukhopadhyaya R, Kalraiya RD (2014) - Galectin-3 expressed on different lung compartments promotes organ specific metastasis by facilitating arrest, extravasation and organ colonization via high affinity ligands on melanoma cells. Clinical and Experimental Metastasis. 31(6): 661-673. PMID: 24952269

51 Daniel A, Prakasarao A, David B, Joseph L, Krishna CM, Koteeswaran D, Ganesan S (2014) - Raman mapping of oral tissues for cancer diagnosis. Journal of Raman Spectroscopy. 45(7): 541-549.

52 Dar AA, Patil RS, Chiplunkar SV (2014) - Insights into the relationship between toll like receptors and gamma delta T cell responses. Frontiers in Immunology. 5(2):Art 366. PMID: 25132835

53 Dawood S, Lei X, Dent R, Gupta S, Sirohi B, Cortes J, Cristofanilli M, Buchholz T, Gonzalez-Angulo AM (2014) - Survival of women with inflammatory breast cancer: a large population-based study. Annals of Oncology. 25(6):1143-1151. PMID:24669011

54 Desai S, Kumar A, Laskar S, Pandey BN (2014) - Differential roles of ATF-2 in survival and DNA repair contributing to radioresistance induced by autocrine soluble factors in A549 lung cancer cells. Cellular Signalling. 26(11):2424-2435. PMID:25041846

55 Dhamne H, Chande AG, Mukhopadhyaya R (2014) - Lentiviral vector platform for improved erythropoietin expression concomitant with shRNA mediated host cell elastase down regulation. Plasmid. 71:1-7. PMID: 24325878

56 Dhanda S, Thakur M, Kerkar R, Jagmohan P (2014) - Diffusion-weighted imaging of gynecologic tumors: diagnostic pearls and potential pitfalls. RadioGraphics. 34(5):1393-1416. PMID:25208287

57 Dhar H, Dabholkar JP, Kandalkar BM, Ghodke R (2014) - Primary thyroid schwannoma masquerading as a thyroid nodule. Journal of Surgical Case Reports. 2014(9). pii: rju094

58 Dhawan VV, Joshi GV, Jain AS, Nikam YP, Gude RP, Mulherkar R, Nagarsenkar MS (2014) - Apoptosis induction and anti-cancer activity of LeciPlex formulations. Cellular Oncology. 37:339-351. PMID: 25204961

59 Divatia JV, Ambulkar R (2014) - Anesthesia and cancer recurrence: what is the. Journal of Anaesthesiology. 30(2):147-150. PMID:24803747

60 Divatia JV, Jog S (2014) - Intensive care research and publication in India: quo vadis?. Intensive Care Medicine. 40(3):445-447. PMID: 24441668

61 Divya R, Bhattacharya S, Gupta S (2014) - Histone chaperones: functions beyond nucleosome deposition. Advances in Bioscience and Biotechnology. 5(6):546-556.

62 Dugad JA, Dholam KP, Chougule AT (2014) - Vacuum form sheet as a guide for fabrication of orbital prosthesis. Journal of Prosthetic Dentistry. 112(2):390-392. PMID:24445029

63 Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F (2014) - Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. International Journal of Cancer. 136(5):E359-86. PMID:25220842

64 Fu SH, Jha P, Gupta PC, Kumar R, Dikshit R, Sinha D (2014) - Geospatial analysis on the distributions of tobacco smoking and alcohol drinking in India. PLoS ONE. 9(7):e102416. PMID:25025379

65 Garon EB, Ciuleanu TE, Prabhash K, Syrigos KN, Goksel T, Park k, Garbunova V,Kowalyszyn RD, Pikiel J, Czyewicz G, Orlov SV, Lewanski CR, Thomas M, Bidoli P, Dakhil S, Gans S, Kim JH, Grigorescu A,Karaseva N, Reck M,

Cappuzza F, Alexandris E, Sashegyi A, Yurasov S, Perol M (2014) - Ramucirumab plus docetaxel versus placebo plus docetaxel for second-line treatment of stage IV non-small-cell lung cancer after disease progression on platinum-based therapy (REVEL): a multicentre, double-blind, randomised phase 3 trial. The Lancet. 84(9944):665-73. PMID:24933332

66 Ghoshal A, Dighe M, Deodhar J, Dhiliwal S, Damani A, Muckaden MA (2014) - Relevance of canadian health care evaluation project (canhelp) questionnaire for patients on homecare in Mumbai. BMJ Spportive & Palliative Care. 4(Suppl 1):A83-A84.

67 Goda JS, Dutta D, Raut N, Juvekar SL, Purandare N, Rangarajan V, Arora B, Gupta T, Kurkure P, Jalali R (2014) - Can multiparametric MRI and FDG-PET predict outcome in diffuse brainstem glioma? a report from a prospective phase-II study. Pediatric Neurosurgery. 49(5):274-81. PMID:25277867

68 Goel PN, Gude RP (2014) - Pentoxifylline regulates the cellular adhesion and its allied receptors to 4 extracellular matrix components in breast cancer cells. Biomed Pharmacother. 68: 93-99. PMID: 24269001

69 Gogoi D, Dar AA, Chiplunkar SV (2014) - Involvement of Notch in activation and effector functions of ³′ T cells. Journal of Immunology. 192(5): 2054-62. PMID: 24489102

70 Gokhale PS, Sonawani A, Idicula-Thomas S, Kerkar S,Tongaonkar H, Mania-Pramanik J (2014) - HPV16 E6 variants: Frequency, association with HPV types and in silico analysis of the identified novel variants. Journal of Medical Virology. 86(6):968-974. PMID:24610458

71 Gomes RM, Kumar RK, Desouza A, Saklani A (2014) - Implantation metastasis from adenocarcinoma of the sigmoid colon into a perianal fistula: a case report. Annals of Gastroenterology. 27(3):276-279. PMID:24975988

72 Gota V, Kavathiya K, Doshi K, Gurjar M, Prabhash K (2014) - High plasma exposure to pemetrexed leads to severe hyponatremia in patients with advanced non small cell lung cancer receiving platinum doublet chemotherapy pemetrexed. Cancer Management and Research. 6:261-265. PMID:24940080

73 Gota V, Kavathiya K, Doshi K, Gurjar M, Damodaran SE, Noronha V, Joshi A, Prabhash K (2014) - High plasma exposure to pemetrexed leads to severe hyponatremia in patients with advanced non small cell lung cancer receiving pemetrexed-platinum doublet chemotherapy. Cancer Management Research. 6: 261-265. PMID: 24940080

74 Gridelli C, de Marinis F, Thomas M, Prabhash K, El Kouri C, Blackhall F, Bustin F, Pujol JL, John WJ, San Antonio B,Zimmermann A, Visseren-Grul C, Paz-Ares LGChouaki N, (2014) - Final efficacy and safety results of pemetrexed continuation maintenance therapy in the elderly from the. Journal of Thoracic Oncology. 9(7):991-997. PMID:24926544

75 Gulia A, Puri A, Kulkarni S (2014) - Radiofrequency ablation for epiphyseal chondroblastomas in children emergence of a new modality of treatment. Pediatric Blood and Cancer. 61(s2):S272. PMID:24960541

76 Gulia A, Puri A, Laskar S (2014) - Oncological and functional outcome with multimodality management of malignant pediatric musculoskeletal tumors of he pelvis at a tertiary cancer center in india. Pediatric Blood and Cancer. 61(s2):s148. PMID:24932034

77 Gulia A, Puri A, Ramanujan V (2014) - Non operative management of aneurysmal bone cyst with percutaneous sclerosant injections in children - early results from a prospective observational study. Pediatric Blood and Cancer. 61(s2):s273.

78 Gulia A, Puri A, Ramanujan V (2014) - Oncological outcome of pediatric extremity skeletal chondrosarcomas at a tertiary sarcoma treatment centre. Pediatric Blood and Cancer. 61(s2):s148.

79 Gulia S, Bajpai J, Gupta S, Maheshwari A, Deodhar K, Kerkar RA, Seth V, Rekhi B, Menon S (2014) - Outcome of gestational trophoblastic neoplasia: experience from a Tertiary Cancer Centre in India. Clinical Radiology. 26(1):39-44. PMID: 24051171

80 Gulia S, Dangi U, Biswas S,Kelkar R, Menon H, Sengar M (2014) - Prevalence and patterns of cytomegalovirus DNAemia in adult patients with acute lymphoblastic leukemia on chemotherapy. Leukemia and Lymphoma. 55(5):1209-1211. PMID:23865832

81 Gulia S, Arora B, Narula G, Chinnaswamy G, Subramamanium PG, Banavali SD (2014) - A prospective randomized trial of L-asparaginase versus prednisolone in prevention of tumour lysis syndrome in acute lymphoblastic leukemia patients with hyperleucocytosis. Pediatric Blood and Cancer. 61(s2):S258.

82 Gupta P, Giri J, Srivastav S, Chande AG, Mukhopadhyaya R, Das PK, Ukil A (2014) - Leishmania donovani targets tumor necrosis factor receptor-associated factor (TRAF) 3 for impairing TLR4-

mediated host response. The FASEB Journal. 28(4): 1756-68. PMID: 24391131

83 Gupta S, Kerkar RA, Dikshit R, Badwe RA (2014) - Authors reply (to Is human papillomavirus vaccination likely to be a useful strategy in India? South Asian J Cancer(South Asian Journal of Cancer) 2(4):193-7.) (3(1):94-95). PMID: 24665459

84 Gupta T, Mohanty S, Kannan S, Jalali R (2014) - Prospective longitudinal assessment of sensorineural hearing loss with hyperfractionated radiation therapy alone in patients with average-risk medulloblastoma. Neuro–Oncology Practice. 1(3):86-93.

85 Gupta T, Nair V, Jalali R (2014) - Stem cell niche irradiation in glioblastoma: providing a ray of hope? CNS Oncology. 3(5):367-376. PMID:25363009

86 Hajare SN, Gautam S, Nair AB, Sharma A (2014) - Formulation of a nasogastric liquid feed and shelf-life extension using gamma radiation. Journal of Food Protection. 77(8):1308-1316. PMID: 5198591

87 Hartwig W, Vollmer CM, Fingerhut A, Yeo CJ, Neoptolemos JP, Adham M, Andrén-Sandberg A, Asbun HJ, Bassi C, Bockhorn M, Charnley R, Conlon KC, Dervenis C, Fernandez-Cruz L, Friess H, Gouma DJ, Imrie CW, Lillemoe KD, Miliæeviæ MN, Montorsi M, Shrikhande SV, Vashist YK, Izbicki JR, Büchler MW (2014) - Extended pancreatectomy in pancreatic ductal adenocarcinoma: Definition and consensus of the International Study Group for Pancreatic Surgery (ISGPS). Surgery. 156(1):1-14. PMID:24856668

88 Jacob S, Nayak S, Fernandes G, Barai RS, Menon S, Chaudhari UK, Kholkute SD, Sachdeva G (2014) - Androgen receptor as a regulator of ZEB2 expression and its implications in epithelial to mesenchymal transition in prostate cancer. Endocrine related cancer. 21(3):473-486. PMID:24812058

89 Jadhav S, Kasaliwal R, lele V, Rangarajan V, Chandra P,Shah H, Malhotra G, Jagtap VS, Budyal S, Lila AR, Bandgar T,Shah NS (2014) - Functional imaging in primary tumour-induced osteomalacia: relative performance of FDG PET/CT vs somatostatin receptor-based functional scans: a series of nine patients. Clinical Endocrinology. 81(1):31-37. PMID:24528172.

90 Jadhav S, Kasaliwal R, Shetty NS, Kulkarni S, Rathod K, Popat B, Kakade H, Bukan A, Khare S, Budyal S, Jagtap VS, Lila AR, Bandgar T, Shah NS (2014) - Radiofrequency ablation, an effective modality of treatment in tumor-induced osteomalacia: a case series of three patients. The Journal of Clinical Endocrinology and Metabolism. 99(9):3049-3054. PMID:24960541

91 Jain AS, Goel PN, Shah SM, Dhawan VV, Nikam Y, Gude RP, Nagarsenker MS (2014) - Tamoxifen guided liposomes for targeting encapsulated anticancer agent to estrogen receptor positive breast cancer cells: In vitro and in vivo evaluation. Biomedicine & Pharmacotherapy. 68: 429-438. PMID: 24721327

92 Jain D, Athavale RB, Bajaj A, Shrikhande S, Goel P, Nikam Y, Gude R (2014) - Unraveling the cytotoxic potential of Temozolomide loaded into PLGA nanoparticles. DARU Journal of Pharmaceutical Sciences 22(1): 18. PMID: 24410831

93 Jain D, Mathur R, Lahoti B, Sharma S (2014) - Colorectal carcinoma in pediatric age group - epidemiological paradigm. Pediatric Blood and Cancer. 61(s2):s290-s295. PMID:

94 Jain H, Sengar M, Menon H, Chandrakanth MV (2014) - Blastic plasmacytoid dendritic cell neoplasm: a rare subtype of myeloid leukemia. Hematology Oncology and Stem Cell Therapy. 7(2):97-98. PMID:24785508

95 Jain H, Sengar M, Menon H, Dangi U, Biswas S, Chandrakanth MV (2014) - Dengue fever as a cause of febrile neutropenia in adult acute lymphoblastic leukemia: a single center experience. Hematology Oncology and Stem Cell Therapy. 7(3):125-126. PMID:24793316

96 Jha S, Rawat-Pawar E, Goswami S, Dhamankar V, Prasad M, Kurkure P, Jalali R, Nagrulkar A, Joshi S, Garware A (2014) - Rehabilitation of childhood cancer patients- collaborative efforts of srcc -centre for child development (ccd) with tata memorial hospital (tmh), & ugam-childhood cancer survivors support group. Pediatric Blood and Cancer. 61(s2):s105-433.

97 Jindal A, Mathur A, Pandey U, Sarma HD, Chaudhari P, Dash A (2014) - Development of 68 Ga-labeled fatty acids for their potential use in cardiac metabolic imaging. al of Labelled Compounds and Radiopharmaceuticals. 57(7): 463-469. PMID: 24966158

98 Joh J, Jenson JB, Ingle AD, Sundberg JP, Ghim SJ (2014) - Searching for the initiating site of the major capsid protein to generate virus-like particles for a novel laboratory mouse papillomavirus. Experimental and Molecular Pathology. 96:155-161. PMID: 24389228

99 Joshi M, Ali Anwar M, Ullah M, Kuruppu C (2014) - International trends in health

science librarianship part 12: South Asia (India, Pakistan and Sri Lanka) Health Information and Libraries Journal. 31(4):318-324. PMID:25443029

100 Joshi NN, Bhat S, Hake S, Kale M, and Kannan S (2014) - Opposing effects of pro- and anti-inflammatory cytokine gene polymorphisms on the risk for breast cancer in western Indian women: a pilot study. International Journal of Immunogenetics. 41(3):242-249. PMID: 2416486

101 Joshi NN, Kannan S, Kotian N, Bhat S, Kale M, Hake S (2014) - Interleukin 6 -174G>C polymorphism and cancer risk: Meta-analysis reveals a site dependent differential influence in ancestral north Indians. Human Immunology. 75(8):901-908. PMID: 24994460

102 Joshi P, Nair S, Chaturvedi P, Shivakumar T, DCruz AK, Nair D (2014) - Thyroid gland involvement in carcinoma of the hypopharynx. Journal of Laryngology and Otology. 128(1):64-67. PMID:24429057

103 Kane SV, Prabhudesai NM, Ojha SS, Shetty NS, Kulkarni SS, Kulkarni AV (2014) - The role of squash cytology in rapid on-site adequacy checking and rapid diagnosis in image-guided gun biopsy at a tertiary cancer center. Acta Cytologica. 58(1):33-41. PMID: 24296489

104 Kaur E, Gupta S, Dutt S (2014) - Clinical implications of MTA proteins in human cancer. Cancer Metastasis Reviews. 33(4):1017-24. PMID:25374266

105 Kembhavi SA, Rangarajan V, Shah S, Qureshi S, Arora B, Juvekar S, Laskar S, Vora T, Chinnaswamy G, Ramadwar M, Kurkure P (2014) - Prospective observational study on diagnostic accuracy of whole-body MRI in solid small round cell tumours. Clinical Radiology. 69(9):900-8. PMID:24863003

106 Khan SA, Tyagi M, Sharma AK, Barreto SG, Sirohi B, Ramadwar M, Shrikhande SV, Gupta S (2014) - Cell-type specificity of â-actin expression and its clinicopathological correlation in gastric adenocarcinoma. World Journal of Gastroenterology. 20(34):12202-12211. PMID:25232253

107 Khan TH, Srivastava N, Srivastava A, Sareen A, Mathur RK, Chande AG, Musti KV, Roy S, Mukhopadhyaya R, Saha B (2014) - SHP-1 plays a crucial role in CD40 signaling reciprocity. Journal of Immunology. 193(7): 3644-3653. PMID: 25187664

108 Kim H, Jesena A, Parmar V, Sato N,Wang HC, Lokejaroenlarb S, Shin E, Noguchi S (2014) - An open label randomised parallel group multicentre study to compare goserelin 10.8 mg given every 12 weeks with goserelin 3.6 mg given every 4 weeks in premenopausal women with estrogen receptor positive advanced breast cancer (PRESTIGE study). European Journal of Cancer. 50(S2):164.

109 Kinhikar RA, Tambe CM, Patil K, Mandavkar M, Deshpande DD, Gujjalanavar R, Yadav P, Budrukkar A (2014) - Estimation of dose enhancement to soft tissue due to backscatter radiation near metal interfaces during head and neck radiothearpy-a phantom dosimetric study with radiochromic film. Journal of Medical Physics. 39(1):40-43. PMID: 24600171

110 Kirchheiner K, Nout RA, Tanderup K, Lindegaard JC, Westerveld H,Haie-Meder C, Petriè P, Mahantshetty U, Dörr W, Pötter R (2014) - Manifestation Pattern of Early-Late Vaginal Morbidity After Definitive Radiation (Chemo)Therapy and Image-Guided Adaptive Cervical Cancer: An Analysis From the EMBRACE Study Brachytherapy for Locally Advanced. International Journal of Radiation Oncology Biology Physics. 89(1):88-95. PMID:24725693.

111 Krishna H, Majumdar SK, Chaturvedi P, Sidramesh M, Gupta PK (2014) - In vivo raman spectroscopy for detection of oral neoplasia: a pilot clinical study. Journal of Biophotonics. 7(9):690-702. PMID:23821433

112 Kumar G, Tajpara P, Bukhari AB, Ramchandani AG, De A, Maru GB (2014) - Dietary curcumin post-treatment enhances the disappearance of B(a)P-derived DNA adducts in mouse liver and lungs. Toxicol Rep. 1: 1181-1191. PMID: 19817699

113 Kumar R, Desai S, Pai T, Pramesh CS, Jambhekar NA (2014) - Pulmonary adenofibroma: clinicopathological study of 3 cases of a rare benign lung lesion and review of the literature. Annals of Diagnostic Pathology. 18(4):238-243. PMID:24908371

114 Kumar S, Jena L, Galande S, Daf S, Mohod K, Varma AK (2014) - Elucidating molecular interactions of natural inhibitors with HPV-16 E6 oncoprotein through docking analysis. Genomics and Informatics. 12(2):64-70. PMID: 25031569

115 Kumar S, Jena L, Galande S, Daf S, Varma AK (2014) - Molecular docking explains atomic interaction between plant-originated ligands and oncogenic E7 protein of high risk human papillomavirus type 16. International Journal Bioautomation. 18(4):315-324

116 Kumar S, Dongre A, Arora B, Kurkure P, Chinnaswamy G, Rekhi B (2014) - Retrospective analysis of outcomes of patients with relapsed, refractory and metastatic sarcomas who have received metronomic

chemotherapy. Pediatric Blood and Cancer. 61(S2):S236-S237.

117 Kurkure P, Prasad M, Dhamankar V, Goswami S, Dalvi N (2014) - Adolescent and young adult (AYA) survivors of childhood cancers- a challenge in after completion of therapy (ACT) clinic. Pediatric Blood and Cancer. 61(s2):s105-433.

118 Laskar S, Khanna N, Puri A, Qureshi S, Gulia A, Vora T, Rekhi B, Medhi S, Desai S, Chinnaswamy G Juvekar S, Desai S, Ramadwar M, Jambhekar N, Muckaden M (2014) - Interstitial brachytherapy for childhood soft tissue sarcomas: long-term disease outcome and late effects. International Journal of Radiation Oncology Biology Physics. 90(1):S113-114.

119 Laskar S, Kumar DP, Khanna N, Menon H, Sengar M, Arora B, Rangarajan V, Muckaden MA, Nair R, Banavali S (2014) - Radiation therapy for early stage unfavorable hodgkin lymphoma: is dose reduction feasible? Leukemia and Lymphoma. 55(10):2356-2361. PMID:24354681

120 Laskar S, Kalyani N, Khanna N, Vora T, Qureshi S, Chinnaswami G, Kembhavi S, Ramadwar M, Upreti R, Kurkure P (2014) - Helical tomotherapy for askins tumor of chest wall: clinical outcomes. Pediatric Blood and Cancer. 61(s2):s165.

121 Lo-Coco F, Hasan SK (2014) - Understanding the molecular pathogenesis of acute promyelocytic leukemia. Best Practice and Research Clinical Haematology. 27(1):3-9 PMID: 24907012

122 Mahajan A, Kadavigere R, Sripathi S, Rodrigues GS, Rao VR, Koteshwar P (2014) - Utility of serum pancreatic enzyme levels in diagnosing blunt trauma to the pancreas: A prospective study with systematic review. Injury. 45(9):1384-93. PMID:24702828

123 Mahantshetty U, Kalyani N, Engineer R, Chopra S, Jamema S, Ghadi Y, Deshpande D, Shrivastava S (2014) - Reirradiation using high-dose-rate brachytherapy in recurrent carcinoma of uterine cervix. Brachytherapy. 13(6):548-53.

124 Mahantshetty U, Shrivastava S, Kalyani N, Banerjee S, Engineer R, Chopra S (2014) - Template-based high-dose-rate interstitial brachytherapy in gynecologic cancers: a single institutional experience. Brachytherapy. 13(4):337-342. PMID:24176863

125 Mahore A, Ramdasi RV, Pauranik A, Epari S (2014) - Tumour bleed manifesting as spontaneous extradural haematoma in posterior fossa. BMJ Case Reports. Bcr2014205175. PMID:25008340

126 Maiers M, Halagan M, Joshi S, Ballal HS, Jagannatthan L, Damodar S, Srinivasan P, Narayan S, Khattry N, Malhotra P, Minz RW, Shah SA, Rajagopal R, Cereb N, Yang SY, Parekh S, Mammen J, Daniels D, Weisdorf D (2014) - HLA match likelihoods for Indian patients seeking unrelated donor transplantation grafts: a population-based study. Lancet Haematology. 1(2):e57-e63.

127 Mallath MK, Taylor DG, Badwe RA, Rath GK, Shanta V, Pramesh CS, Digumarti R, Sebastian P, Borthakur BB, Kalwar A, Kapoor S, Kumar S, Gill JL, Kuriakose MA, Malhotra H, Sharma SC, Shukla S, Viswanath L, Chacko RT, Pautu JL (2014) - The growing burden of cancer in India: epidemiology and social context. The Lancet Oncology. 15(6):e205-e212. PMID:24731885

128 Manjappa AS, Goel PN, Gude RP, Murthy RSR (2014) - Anti-neuropilin antibody Fab2 fragment conjugated liposomal docetaxel for active targeting of tumours. Journal Of Drug Targeting. 22(8): 698-711. PMID: 24766186

129 Manoharan Y, Kanniyappan U, Vadivel J, Prakasa Rao A, Ganesan B, Dornadula K, Munusamy B D, Krishna CM, Ganesan S (2014) - Fluorescence spectroscopic characterization of salivary metabolites of oral cancer patients. Journal of Photochemistry and Photobiology B.130: 153-160. PMID: 24333763

130 Maru G (2014) - An update on cancer prevention approaches. Biomedical Research Journal. 1(2): 146-172.

131 Mhatre D, Mahaleb SD, Khatkhatayc MI, Desai SS, Jagtap DD, Dhabalia JV, Tongaonkar HB, Desai MP, Dandekar SP, Varadkar AM (2014) - Development of an ELISA for sPSP94 and utility of the sPSP94sPSA ratio as a diagnostic indicator to differentiate between benign prostatic hyperplasia and prostate cancer. Clinica Chimica Acta. 436:256-262. PMID:24952364

132 Mishra PK, Raghuram GV, Jain D, Jain SK, Khare NK, Pathak N (2014) - Mitochondrial oxidative stress induced epigenetic modifications in pancreatic epithelial cells. International Journal of Toxicology. 33(2):116-129. PMID: 24563415

133 Mitra A, Sirohi B, Shrikhande SV (2014) - Neoadjuvant therapy in pancreatic cancer. Current Medicine Research and Practice. 4(2):56-61.

134 Moiyadi A, Shetty P (2014) - Navigable intraoperative ultrasound and fluorescence-guided resections are complementary in resection

control of malignant gliomas: one size does not fit all. Journal of Neurological Surgery. Part A, Central European Neurosurgery. 75(6):434-441. PMID:24971685

135 Moiyadi A, Syed P, Srivastava S (2014) - Fluorescence-guided surgery of malignant gliomas based on 5-aminolevulinic acid: paradigm shifts but not a panacea. Nature Reviews Cancer. 14(2):146. PMID: 24457418

136 Moiyadi AV (2014) - Objective assessment of intraoperative ultrasound in brain tumors. Acta Neurochirurgica. 156(4):703-704. PMID:24499993

137 More Y, Sharma S, Chaturvedi P, DCruz AK (2014) - Gingivobuccal mucosal cancers: resection to reconstruction. Current Oinion in Otolaryngology and Head and Neck Surgery. 22(2):95-100. PMID:24406686

138 Mummudi N, Jalali R (2014) - Palliative care and quality of life in neuro-oncology. F1000Prime Reports. (E-Collection). 6:21 PMID:25165570

139 Murthy V, Narang K, Ghosh-Laskar S, Gupta T, Budrukkar A, Agrawal JP (2014) - Hypothyroidism after 3-dimensional conformal radiotherapy and intensity modulated radiotherapy for head and neck cancers: Prospective data from two randomized controlled trials. Head and Neck. 36(11): 1573-1580. PMID: 23996654

140 Muwonge R, Wesley RS, Nene BM, Shastri SS, Jayant K, Malvi SG, Thara S, Sankaranarayanan R (2014) - Evaluation of cytology and visual triage of human papillomavirus-positive women in cervical cancer prevention in India. International Journal of Cancer. 134(12):2902-2909. PMID:24272364

141 Nair PK, Bhat VG, Vaz MK (2014) - Prosthetic joint infections- a clinico-microbiological perspective: Review article. Prosthetic joint infections- a clinico-microbiological perspective: Review article. World Journal of Clinical Infectious Diseases. 4(3):9-15

142 Nair SV, Rathod SN, Nikam S, Gupta T, Chaturvedi P, Sarin R, Agarwal J (2014) - Impact of radical treatments in the quality of life for patients with advanced buccal mucosa cancers: a one-year longitudinal study. Journal of Clinical Oncology. 32:Suppl; abstr e17034

143 Nanaware P, Ramteke M, Somavarapu AK, Venkatraman P (2014) - Discovery of multiple interacting partners of gankyrin, a proteasomal chaperone and an oncoprotein –Evidence for a common hot spot site at the interface and its functional relevance. Proteins. 82(7): 1283-1300. PMID: 24338975

144 Narula G, Wanve B A, Arora B, Banavali S D (2014) - Impact on outcome of a modified langerhans cell histiocytosis (lch) protocol with intensified high risk induction and augmented prolonged maintenance-a single institution experience. Pediatric Blood and Cancer. 61(s2):s105-433

145 Nebhnani D, Fernandes G, Menon S, Naik L (2014) - Primary renal synovial sarcoma presenting in the first trimester of pregnancy. Journal of Obstetrics and Gynaecology of India. 64(Suppl 1):22-3. PMID:25404798

146 Noronha V, Joshi A, Jandyal S, Jambhekar N, Prabhash K (2014) - High pathologic complete remission rate from induction docetaxel, platinum and fluorouracil (DCF) combination chemotherapy for locally advanced esophageal and junctional cancer. Medical Oncology. 31(9):188. PMID:25148898

147 Noronha V, Patil VM, Joshi A, Krishna MV, Dhumal S, Juvekar S, Pai P, Chatturvedi P, Chaukar DA, Agarwal JP, Ghosh S, Murthy V, D'cruz A, Prabhash K (2014) - Induction chemotherapy in technically unresectable locally advanced carcinoma of maxillary sinus. Chemotherapy Research and Practice. Vol.(2014), Article ID 487872, 6 pages PMID: 24900922

148 Pai S, Qureshi S, Singhal N, Banavali S, Ramdwar M, Chinnaswami G, Prasad M, Vora T, Aurora B, Narula G (2014) - Extrarenal rhabdoid tumor: rare but clinicians scare. Pediatric Blood and Cancer. 61(s2):s105-433.

149 Palve V, Mallick S, Ghaisas G, Kannan S, Teni T (2014) - Overexpression of Mcl-1L splice variant is associated with poor prognosis and chemoresistance in oral cancers. PLoS One. 9(11):e111927. PMID: 25409302

150 Pandey R, Mehrotra D, Kowtal P, Mahdi AA, Sarin R (2014) - Mitochondrial DNA from archived tissue samples kept in formalin for forensic odontology studies. Journal of Oral Biology and Craniofacial Research. 4(2):109-113.

151 Pandey R, Mehrotra D, Mahdi AA, Sarin R, Kowtal P (2014) - Additional cytosine inside mitochondrial C-tract D-loop as a progression risk factor in oral precancer cases. Journal of Oral Biology and Craniofacial Research. 4(1):3-7.

152 Pantvaidya GH, Pal P, Vaidya AD, Pai PS, DCruz AK (2014) - Prospective study of 583 neck dissections in oral cancers: implications for clinical practice. Head and Neck. 36(10):1503-1507. PMID: 23996343

153 Panwar H, Raghuram GV, Jain D, Ahirwar AK, Khan S, Jain SK, Pathak N, Banerjee S, Maudar KK, Mishra PK (2014) - Cell cycle deregulation by methyl isocyanate: Implications in liver carcinogenesis. Environmental Toxicology. 29(3): 284-297. PMID: 22223508

154 Paramanandam VS, Roberts D (2014) - Weight training is not harmful for women with breast cancer-related lymphoedema: a systematic review. Journal of Physiotherapy. 60(3):136-143. PMID:25086730

155 Patel K, Patil A, Mehta M, Gota V, Vavia P (2014) - Oral delivery of paclitaxel nanocrystal (PNC) with a dual Pgp-CYP3A4 inhibitor: Preparation, characterization and antitumor activity. International Journal of Pharmaceutics. 472(1-2):214-223. PMID: 24954663

156 Patel K, Tyagi M, Monpara J, Vora L, Gupta S, Vavia P (2014) - Arginoplexes: An arginine-anchored nanoliposomal carrier for gene delivery. Journal of Nanoparticle Research. 16:2345.

157 Patil T, Kowtal PK, Nikam A, Barkume MS, Patil A, Kane SV, Juvekar AS, Mahimkar MB, Kayal J (2014) - Establishment of a tongue squamous cell carcinoma cell line from Indian gutka chewer. Journal of Oral Oncology. vol. 2014, Article ID 286013, 9 pages.

158 Patil V, Prabhash K, Marfatia S, Patel M, Gupta K, Kamble S (2014) - PCN157 Health related quality of life in patients with metastatic, relapsed, or inoperable squamous cell carcinoma of the head and neck in India. Value in Health. 17(3):A95.

159 Patil VM, Noronha V, Prabhash K, Muddu V, Bhosale B, Bakshi G, Joshi A (2014) - Palliative chemotherapy in carcinoma penis: does platinum and taxane combination holds a promise? Urology Annals. 6(1):18-22. PMID:24669116

160 Patil VM, Prabhash K, Noronha V, Joshi A, Muddu V, Dhumal S, Arya S, Juvekar S,Chaturvedi P, Chaukar D, Pai P, Kane S, Patil A Agarwal JP, Ghosh-Lashkar S, DCruz AK (2014) - Neoadjuvant chemotherapy followed by surgery in very locally advanced technically unresectable oral cavity cancers. Oral Oncology. 50(10):1000-1004. PMID:25130412

161 Patkar N, Subramanian PG, Deshpande P, Ghodke K, Tembhare, P, Mascarenhas R, Muranjan A, Chaudhary S, Bagal B, Gujral S, Sengar M, Menon H (2014) - MYD88 Mutant Lymphoplasmacytic Lymphoma / Waldenstroms Macroglobulinemia has distinct clinical and pathological features as compared to its mutation negative counterpart. Leukemia Lymphoma. 56(2):420–425. PMID: 24828863

162 Pawar S, Mahantshetty U, Deodhar K, Teni T (2014) - A simple cost-effective modification improves the quality of immunocytochemical staining in cervical scrape samples characterized by presence of excess mucus. Journal of Histotechnology. 37(1):3-8. PMID: 25620823

163 Prabhakar V, Balasubramanian R, Sathe P, Krishna CM, Juvekar A (2014) - In vitro anticancer activity of monosubstituted chalcone derivatives. International Journal of Tumor Therapy. 3(1):1-9.

164 Pradhan N, Punatar S, Panda S, Gupta A, Prasad M, Narula G, Vora T, Chinnaswamy G, Arora B, Banavali S, Kurkure P, Quereshi S (2014) - Epidemiology and outcome of rare renal tumors in pediatric population in a single tertiary care centre in India. Pediatric Blood and Cancer. 61(s2):231.

165 Pramesh C, Rangarajan V, Shah S, Laskar S, Karimundackal G, Jiwnani S (2014) - A phase II parallel group randomized trial of the impact of perioperative oral erythromycin gastric tube motility in patients undergoing esophagectomy. Diseases of the Esophagus. 27(S1):3A-168A.

166 Pramesh CS, Badwe RA, Borthakur BB, Chandra M, Raj EH, Kannan T, Kalwar A, Kapoor S, Malhotra H, Nayak S, Rath GK, Sagar TG, Sebastian P, Sarin R, Shanta V, Sharma SC, Shukla S, Vijayakumar M, Vijaykumar DK, Aggarwal A, Purushotham A, Sullivan R (2014) - Delivery of affordable and equitable cancer care in India. Lancet Oncology. 15(6): e223-e233. PMID: 24731888

167 Prasad M, Dhamankar V, Goswami S, Dalvi N, Arora B, Narula G, Banavali S D, Kurkure P (2014) - Late effects in longterm survivors of childhood hodgkin lymphoma: a single centre experience. Pediatric Blood and Cancer. 61(s2):s310.

168 Puntillo KA, Max A, Timsit JF, Vignoud L, Chanques G, Robleda G, Roche-Campo F,Mancebo J , Divatia JV, Soares M, Ionescu DC, Maggiore SM, Rusinova K, Owczuk R, Egerod I,Grintescu IM, Vasiliu IL, Papathanassoglou ED, Kyranou M, Joynt GM, Burghi GF, Freebairn RC, Ho KM, Kaarlola A,Gerritsen RT, Kesecioglu J, Sulaj MM, Norrenberg M, Benoit DD, Seha MS, Hennein A, Periera FJ, Benbenishty JS, Abroug F, Aquilina A,Monte JR, An Y, Azoulay E (2014) - Determinants of procedural pain intensity in the intensive care unit. The Europain® study. American Journal of Respiratory and Critical Care Medicine. 189(1):39-47. PMID:24262016

169 Purandare NC, Pramesh CS,Karimundackal G, Jiwnani S, Agrawal A, Shah S, Kulkarni M, Laskar SG, Rangarajan V (2014) - Incremental value of 18F-FDG PET/CT in therapeutic decision-making of potentially curable esophageal adenocarcinoma. Nuclear Medicine Communications. 35(8):864-869. PMID:24751701

170 Puranik AD, Purandare N, Agrawal A, Shah S, Rangarajan V (2014) - Bone marrow metastases in an otherwise operable gall bladder cancer: rare site of distant metastases detected on FDG PET/CT. Clinical Nuclear Medicine. 39(2):e169-e172. PMID: 23877515

171 Puranik AD, Purandare NC, Agrawal A, Shah S, Rangarajan V (2014) - Imaging spectrum of peritoneal carcinomatosis on FDG PET/CT. Japanese Journal of Radiology. 32(10):571-578. PMID:25120221

172 Puranik AD, Purandare NC, Agrawal A, Shah S, Rangarajan V (2014) - Segmental misty mesentery on FDG PET/CT: an uncommon manifestation of mesenteric lymphoma. Clinical Nuclear Medicine. 39(1):84-90. PMID:23797224

173 Puri A (2014) - Extending the frontiers of limb salvage-geographically and surgically. Operative Techniques in Orthopaedics. 24(2):135-142.

174 Puri A, Pruthi M, Gulia A (2014) - Outcomes after limb sparing resection in primary malignant pelvic tumors. European Journal of Surgical Oncology. 40(1):27-33. PMID: 24239184

175 Puri A, Gulia A, Crasto S (2014) - Chemotherapy induced necrosis as a prognostic marker in osteosarcoma do we need to raise the bar? Pediatric Blood and Cancer. 61(s2):s275. PMID:25114467

176 Puri A, Gulia A, Desai S, Chorge S (2014) - Intramedullary extension in periosteal osteosarcoma - does it portend aggressive biology? Pediatric Blood and Cancer. 61(s2):s274-s275.

177 Puri A, Gulia A, Hawaldar R, Ranganathan P, Badwe RA (2014) - Does intensity of surveillance affect survival after surgery for sarcomas? results of a randomized noninferiority trial. Clinical Orthopeadics and Related Research. 472(5):1568-1575. PMID: 24249538

178 Puri A, Gulia A, Khanna N, Laskar S (2014) - Should percentage necrosis influence the decision for adjuvant radiotherapy after surgical excision in ewing sarcoma? Pediatric Blood and Cancer. 61(s2):S224.

179 Puri A, Gulia A, Suman MB (2014) - Does the addition of topical vancomycin decrease the incidence of surgical site infection in bone tumors? Pediatric Blood and Cancer. 61(s2):S248-249.

180 Puri A, Sharma V, Gulia A, Sharma S, Verma AK (2014) - Management of giant cell tumour radius in a three year old child with an improvised technique. Journal of Clinical and Diagnostic Research. 8(14):QD04-6. PMID:25654002

181 Purwar P, Bambarkar S, Jiwnani S, Pramesh CS (2014) - Prognostic significance of lymph node counts in operable esophageal cancer. Annals of Thoracic Surgery. 97(6):2229. PMID:24882321

182 Qureshi S, Kembhavi S, Bhagat M, Vora T, Chinnaswamy G, Laskar S, Khanna N, Ramadwar M, Kurkure P (2014) - Prognostic implications of mulifocality in hepatoblastoma. Pediatric Blood and Cancer. 61(s2):s145-146

183 Qureshi SS, Kembhavi S, Bhagat M, Laskar S, Chinnaswamy G,Vora T, Prasad M, Ramadwar M, Desai S, Khanna N, Kurkure P, Shah S, Shankdhar V, Yadav P (2014) - Primary non-metastatic Ewing sarcoma of the jaw in children: Results of surgical resection and primary reconstruction. Journal of Surgical Oncology. 110(6):689-695. PMID:24963839

184 Qureshi SS, Kembhavi S, Ramadwar M, Chinnaswamy G, Laskar S, Talole S, Desai S, Khanna N, Vora T, Kurkure P (2014) - Outcome and morbidity of surgical resection of primary cervical and cervicothoracic neuroblastoma in children: a comparative analysis. Pediatric Surgery International. 30(3): 267-73. PMID: 24264427

185 Ramteke MP, Shelke P, Ramamoorthy V, Kumar A, Gautam AKS, Nanaware PP, Karanam S, Mukhopadhyay S, Venkatraman P (2014) - Identification of a novel ATPase activity in 14-3-3 proteins-evidence from enzyme Kinetics, structure guided modeling and mutagenesis studies. FEBS Lett. 588(1):71-78. PMID: 24269678

186 Ranganathan P (2014) - The (mis)use of statistics: Which test where? Perspectives in Clinical Research. 5(4):197. PMID:25276632

187 Ranjan A, Bane SM, Kalraiya RD (2014) - Glycosylation of the laminin receptor (±3²1) regulates its association with tetraspanin CD151: Impact on cell spreading, motility, degradation and invasion of basement membrane by tumor cells. Experimental Cell Research. 322(2):249-64. PMID: 24530578

188 Ranjan A, Kalraiya RD (2014) - Invasive potential of melanoma cells correlates with the expression of MT1-MMP and regulated by modulating its association with motility receptors via N-Glycosylation the receptor. BioMed Research

International. Vol. (2014), Article ID 804680, 10 pages.

189 Rastogi S, Qureshi S, Vora T, Chinnaswamy G, Prasad MAYA, Laskar S, Khanna N, Ramadwar M, Medhi S, Kurkure P (2014) - Is three drug chemotherapy protocol for all stages of wilms tumor a practical compromise for suboptimal staging in developing country? Is it worth & safe? Pediatric Blood and Cancer. 61(s2):S232.

190 Rekhi B, Qureshi SS, Narula G, Gujral S, Kurkure P (2014) - Rapidly progressive congenital rhabdomyosarcoma presenting with multiple cutaneous lesions: an uncommon diagnosis and a therapeutic challenge. Pathology, Research and Practice. 210(5):328-333. PMID: 24635971

191 Rekhi B, Singhvi T (2014) - Histopathological, immunohistochemical and molecular cytogenetic analysis of 21 spindle cell/sclerosing rhabdomyosarcomas. APMIS. 122(11):1144-1145. PMID: 24730567

192 Rekhi B, Vogel U, Basak R, Desai SB, Jambhekar NA (2014) - Clinicopathological and molecular spectrum of Ewing Sarcomas/ PNETs, including validation of EWSR1 rearrangement by conventional and array FISH technique in certain cases. Pathology Oncology Research. 20(3):503-516. PMID: 24293381

193 Rengan AK, Jagtap M, De A, Banerjee R, Srivastava R (2014) - Multifunctional gold coated thermo-sensitive liposomes for multimodal imaging and photo-thermal therapy of breast cancer cells. Nanoscales. 6(2):916-923. PMID: 24281647

194 Rent E, Qureshi S, Rent P, Bhagat M, Singhal N (2014) - Chyle leak following surgical management of neuroblastoma: an underrated complication. Pediatric Blood and Cancer. 61(s2):105-433.

195 Rent P, Qureshi S, Rent E, Puri A, Gulia A, Bhagat M, Moiyadi A, Chinnaswamy G, Arora B, Banavali S (2014) - Epidemiology of pediatric malignancies in India. Pediatric Blood and Cancer. 61(s2):s105-433.

196 Rubina S, Sathe P, Dora TK, Chopra S, Maheshwari A, Murali Krishna C (2014) -In vivo raman spectroscopy of human uterine cervix: exploring the utility of vagina as an internal control. Journal of Biomedical Optics. 0001;19(8):087001.

197 Sadetzki S, Langer CE, Bruchim R, Kundi M, Merletti F, Vermeulen R, Kromhout H, Lee AK, Maslanyj M, Sim MR, Taki M, Wiart J, Armstrong B, Milne E, Benke G, Schattner R, Hutter HP, Woehrer A, Spinelli J, Lacour B, Delmas D, Remen T, Radon K, Weinmann T,Klostermann S, Heinrich S, Petridou E, Bouka E, Panagopoulou P, Dikshit R, Nagrani R, Even-Nir H, Chetrit A, Maule M, Migliore E, Filippini G, Miligi L, Mattioli S, Yamaguchi N, Kojimahara N, Ha M, Choi KH, Mannetje A, Eng A, Woodward A, Carretero G, Alguacil J, Aragones N, Suare-Varela MM, Goedhart G, Schouten-van (2014) - The MOBI kids study protocol: challenges in assessing childhood and adolescent exposure to electromagnetic fields from wireless telecommunication Technologies and possible association with brain tumor risk. Frontiers in Public Health. 2:124 PMID:25295243

198 Sahani G, Sharma SD, Sharma PK (2014) - Acceptance criteria for flattening filter-free photon beam from standard medical electron linear accelerator: AERB task group recommendations. Journal of Medical Physics. 39(4):206-211. PMID:25525307

199 Sahu I, Sangith N, Ramteke M,Gadre R, Venkatraman P (2014) - A novel role for the Proteasomal Chaperone PSMD9 and hnRNPA1 in enhancing IºB± degradation and NF-ºB activation–Functional Relevance of predicted PDZ domain-motif interaction. FEBS Journal. 281(11): 2688-2709. PMID: 247207

200 Sakhavalkar PU, Bhoosreddy AR, Agarwal JP, Upasani MN (2014) - Mouth wash a survey on utility perception and awareness among physicians treatin head neck cancer. Unique Journal of Medical and Dental Sciences. 2(1):15-21.

201 Sangith N, Srinivasaraghavan K, Sahu I, Desai A, Medipally S, Somavarappu AK, Verma C, Venkatraman P (2014) - Discovery of novel interacting partners of PSMD9, a proteasomal chaperone: Role of an unusual and versatile PDZ-domain motif interaction and identification of putative functional modules. FEBS Open Bio. (4):571-583. PMID: 25009700

202 Savanur MA, Eligar SM, Pujari R, Chen C, Mahajan P, Borges A, Shastry P, Ingle A, Kalraiya RD, Swamy BM, Rhodes JM, Yu LG, Inamdar SR (2014) - Sclerotium rolfsii lectin induces stronger inhibition of proliferation in human breast cancer cells than normal human mammary epithelial cells by induction of cell apoptosis. PLoS One. 9(11): e110107. PMID: 24364905

203 Sawant S, Vaidya M, Chaukar D, Alam H, Dmello C, Gangadaran P, Kannan S, Kane S, Dange P, Dey N, Ranganathan K, DCruz AK (2014) - Clinical significance of aberrant vimentin expression in oral premalignant lesions and carcinomas. Oral Diseases. 20(5):453-465. PMID: 23865921

204 Sawant SS, Vaidya MM, Chaukar DA, Gangadaran P,Singh A,Rajadhyax S, Kannan S, Padmavathi A, Kane S, Pagare S, Kannan R, D'cruz AK (2014) - Clinicopathological features and prognostic implications of loss of K5 and gain of K1, K8 and K18 in oral potentially malignant lesions and squamous cell carcinomas: Immunohistochemical analysis. Edorium Journal of Tumor Biology. 1: 1-22.

205 Sehgal L, Mukhopadhyay A, Rajan A, Khapre N, Sawant M, Vishal SS, Bhatt K, Ambatipudi S, Antao N, Alam H, Gurjar M, Basu S, Mathur R, Borde L, Hosing AS, Vaidya MM, Thorat R, Samaniego F, Kolthur-Seetharam U, Dalal SN (2014) - 14-3-3^{3} meditated transport of plakoglobin to the cell border is required for the initiation of desmosome assembly in vitro and in vivo. Journal of Cell Science. 127(Pt10):2174-2188. PMID: 24610948

206 Shah SM, Goel P, Jain AS, Pathak PO, Padhye SG, Govindarajan S, Ghosh SS, Chaudhary P, Gude RP, Gopal V, Nagarsenker MS (2014) - Liposomes for targeting hepatocellular carcinoma: Use of conjugated arabinogalactan as targeting ligand. International Journal of Pharmaceutics. 477(1-2): 128-139. PMID:25311181

207 Shaikh R, Dora TK, Chopra S, Maheshwari A, Kedar K D, Bharat R, Krishna CM (2014) - In vivo raman spectroscopy of human uterine cervix: exploring the utility of vagina as an internal control. Journal of Biomedical Optics. 19(8). PMID:25104415

208 Sharma PK, Sharma PK, Swamidas JV, Mahantshetty U, Deshpande DD, Manjhi J, Rai DV (2014) - Dose optimization in gynecological 3D image based interstitial brachytherapy using martinez universal perineal interstitial template (MUPIT) -an institutional experience. Journal of Medical Physics. 39(3):197-202. PMID:25190999

209 Sharma S, Punjabi V, Zingde SM, Gokhale SM (2014) - A comparative protein profile of Mammalian erythrocyte membranes identified by mass spectrometry. Journal of Membrane Biology. 247(11): 1181-9. PMID: 25150706

210 Sharma S, Ray S, Moiyadi A, Sridhar E, Srivastava S (2014) - Quantitative proteomic analysis of meningiomas for the identification of surrogate protein markers. Scientific Reports. 4: 7140. PMID: 25413266

211 Shastri A, Shastri SS (2014) - Cancer screening and prevention in low-resource settings. Nature Review Cancer. 14(12):822-9. PMID:25355377

212 Shastri SS, Mittra I, Mishra GA, Gupta S, Dikshit R, Singh S, Badwe RA (2014) - Effect of VIA screening by primary health workers: Randomized controlled study in Mumbai, India. Journal of National Cancer Institue. 106:(3):dju009. PMID: 24563518

213 Shet T (2014) - Time to change the way we diagnose mucinous carcinomas of breast. Human Pathology. 45(2):434-435. PMID:24439233

214 Shetty N, Noronha V, Joshi A, Rangarajan V, Purandare N, Mohapatra PR, Prabhash K (2014) - Diagnostic and treatment dilemma of dual pathology of lung cancer and disseminated tuberculosis. Journal of Clinical Oncology. 32(6):e7-e9. PMID:24395843

215 Shivakumar T, Nair S, Gupta T, Kannan S (2014) - Concurrent chemoradiotherapy with weekly versus three-weekly cisplatin in locally advanced head and neck squamous cell carcinoma. Cochrane Database Syst Rev. 1: CD010906.

216 Shrikhande SV, Pai E (2014) - Enhanced recovery after surgery in laparoscopic gastric cancer surgery: many questions, few answers. Journal of Minimal Access Surgery. 10(3):105-106. PMID:25013324

217 Shylasree TS, Bryant A, Howells REJ (2014) - Chemoradiation for advanced primary vulval cancer. The Cochrane Database of Systematic Reviews. CD003752. PMID:21491387

218 Simha V, Patel FD, Sharma SC, Rai B, Oinam AS, Krishnatry R, Dhanireddy B (2014) - Evaluation of intrafraction motion of the organs at risk in image-based brachytherapy of cervical cancer. Brachytherapy. 13(6):562-567. PMID:25030951.

219 Singh N, D'Souza A, Cholleti A, Sastry MG, Bose K (2014) - Dual regulatory switch confers tighter control on HtrA2 proteolytic activity. FEBS Journal. 281(10): 2456-2470. PMID: 24698088

220 Singh RK, Gaikwad SM, Jinager A (2014) - IGF-1R inhibition potentiates cytotoxic effects of chemotherapeutic agents in early stages of chemoresistant ovarian cancer cells. Cancer Letter. 354(2):254-262. PMID:25157649

221 Singh RK, Gaikwad SM, Jinager A, Chaudhury S, Maheshwari A, Ray P (2014) - IGF-1R inhibition potentiates cytotoxic effects of chemotherapeutic agents in early stages of chemoresistant ovarian cancer cells. Cancer Lett. 354:254-262. PMID: 25157649

222 Singh SP, Krishna CM (2014) - Raman spectroscopy of oral tissues: Correlation of spectral and biochemical markers. Anal Methods. 6:8613-8620.

223 Singhal N, Qureshi S, Chinnaswami G, Kembhavi S, Rangarajan V, Desai S, Shah S, Kurkure P, Agrawal A, Bhagat M (2014) - Role of PET- CT in staging

of pediatric round cell tumors. can it eliminate the need for bone marrow biopsy? Pediatric Blood and Cancer. 61(s2):S246.

224 Sinha RK, Bojjireddy N, Kanojia D, Subrahmanyam G (2014) - Type II PtdIns 4-kinase ² associates with CD4–p56lck complex and is involved in CD4 receptor signaling. Molecular and Cellular Biochemistry. 395(1-2): 231-9. PMID: 24972704

225 Sinukumar S, Patil P, Engineer R, Desouza A, Saklani A (2014) - Clinical outcome of patients with complete pathological response to neoadjuvant chemoradiotherapy for locally advanced rectal cancers: the Indian scenario. Gastroenterology Research and Practice. 21(1):76-78. PMID: 25610460

226 Sirohi B, Philip DS, Shrikhande SV (2014) - Regorafenib in gastrointestinal stromal tumors. Future Oncology. 10(9):1581-1587. PMID:25145429

227 Sirohi B, Rastogi S, Dawood S, Talole S, Ramadwar M, Shetty N, Shrikhande SV (2014) - Treatment of patients with advanced gastric cancer: experience from an Indian tertiary cancer center. Medical Oncology. 31(10):138. PMID:25228200

228 Solanki SL, Doctor JR, Patil VP (2014) - Positive end-expiratory pressure valve malfunctioning detected by capnography and airway pressure waveform. Annals of Cardiac Anaesthesia. 17(3):255-257. PMID:24994745

229 Somavarapu AK, Balakrishnan S, Gautam AK, Palmer DS, Venkatraman P (2014) - Structural interrogation of phosphoproteome identified by mass spectrometry reveals allowed and disallowed regions of phosphoconformation. BMS Structural Biology. 14: 9. PMID: 24618394

230 Soni BL, Marimuthu A, Pawar H, Sawant SS, Borges A, Kannan R, Pandey A, Ingle AD, Harsha HC, Vaidya MM (2014) - Quantitative proteomic analysis of different stages of rat lingual carcinogenesis. Clinical Communication Oncology. 1(1):2.

231 Soon SS, Chia WK, Chan ML, Ho GF, Jian X, Deng YH, Tan CS, Sharma A, Segelov E, Mehta S, Ali R, Toh HC, Wee HL (2014) - Cost-effectiveness of aspirin adjuvant therapy in early stage colorectal cancer in older patients. PLoS One. 9(9):e107866. PMID:25250815

232 Stupp R, Hegi ME, Gorlia T, Erridge SC , Perry J, Hong Yong, Aldape, Benoit Lhermitte Kenneth D Pietsch T, Grujicic D, Steinbach JP, Wick W, Tarnawski R, Nam D, Hau P, Weyerbrock A, Taphoorn MJB, Shen C, Rao N, Thurzo L, Herrlinger U, Gupta T, Kortmann R, Adamska K, McBain C, Brandes AA, Tonn JC, Schnell O, Wiegel T, Kim CY, Nabors LB, Reardon DA, van den Bent MJ, Hicking C, Markivskyy A, Picard M, Weller M, for the European Organisation for Research and Treatment of Cancer (EORTC), the Canadian Brain Tumor Consortium, and the CENTRIC study team, Cilengitide combined with standard treatment for patients with newly diagnosed glioblastoma with methylated MGMT promoter (CENTRIC EORTC 26071-22072 study): a multicentre, randomised, open-label, phase 3 trial. Lancet Oncology. 15(10):1100-1108. PMID: 25163906

233 Sullivan R, Badwe RA, Rath GK, Pramesh CS, Shanta V, Digumarti R, D'Cruz A, Sharma SC, Viswanath L, Shet A, Vijayakumar M, Lewison G, Chandy M, Kulkarni P, Bardia MR, Kumar S, Sarin R, Sebastian P, Dhillon PK, Rajaraman P, Trimble EL, Aggarwal A, Vijaykumar DK, Purushotham AD (2014) - Cancer research in India: National priorities, global results. Lancet Oncology. e213-e222. PMID:24731887

234 Sundberg JP, Stearns TM, Joh J, Proctor M, Ingle A, Silva KA, Dadras SS, Jenson AB, Ghim SJ (2014) - Immune status, strain background, and anatomic site of inoculation affect mouse papillomavirus (MmuPV1) induction of exophytic papillomas or endophytic trichoblastomas. PLoS One. 9(12): e113582. PMID: 25474466

235 Tandon N, Banavali S, Arora B, Kembhavi S (2014) - Baseline high resolution ct scan (HRCT) thorax for detecting respiratory infection in patients with acute myeloid leukemia (AML) at presentation. Pediatric Blood and Cancer. 61(s2):s203.

236 Tendulkar A, Shah S, Patil D, Tambe M (2014) - Platelet donation drives: a novel initiative to recruit platelet donors. Transfusion and Apheresis Science. 50(3):407-410. PMID:24793425.

237 Thiagarajan S, Nair S, Nair D, Chaturvedi P,Kane SV, Agarwal JP, DCruz AK (2014) - Predictors of prognosis for squamous cell carcinoma of oral tongue. Journal of Surgical Oncology. 109(7):639-644. PMID:24619660

238 Thompson BA, Spurdle AB, Plazzer JP, Greenblatt MS, Akagi K, Al-Mulla F, Bapat B, Bernstein I, Capellá G, den Dunnen JT, du Sart D, Fabre A, Farrell MP, Farrington SM, Frayling IM, Frebourg T, Goldgar DE, Heinen CD, Holinski-Feder E, Kohonen-Corish M, Robinson KL, Leung SY, Martins A, Moller P, Morak M, Nystrom M, Peltomaki P, Pineda M, Qi M, Ramesar R, Rasmussen LJ, Royer-Pokora B, Scott RJ, Sijmons R, Tavtigian SV, Tops CM, Weber T, Wijnen J, Woods MO, Macrae F,

Genuardi M; on behalf of InSiGHT; The InSiGHT collaborators are as follows:, Castillejo A, Sexton A, Chan AK, Viel A, Blanco A, French A, Laner A, Wagner A, van den Ouweland A, Mensenkamp A, Payá A, Betz B, Redeker B, Smith B, Espenschied C, Cummings C, Engel C, Fornes C, Valenzuela C, Alenda C, Buchanan D, Barana D, Konstantinova D, Cairns D, Glaser E, Silva F, Lalloo F, Crucianelli F, Hogervorst F, Casey G, Tomlinson I, Blanco I, Villar IL, Garcia-Planells J, Bigler J, Shia J, Martinez-Lopez J, Gille JJ, Hopper J, Potter J, Soto JL, Kantelinen J, Ellis K, Mann K, Varesco L, Zhang L, Le Marchand L, Marafie MJ, Nordling M, Tibiletti MG, Kahan MA, Ligtenberg M, Clendenning M, Jenkins M, Speevak M, Digweed M, Kloor M, Hitchins M, Myers M, Aronson M, Valentin MD, Kutsche M, Parsons M, Walsh M, Kansikas M, Zahary MN, Pedroni M, Heider N, Poplawski N, Rahner N, Lindor NM, Sala P, Nan P, Propping P, Newcomb P, Sarin R, Haile R, Hofstra R, Ward R, Tricarico R, Bacares R, Young S, Chialina S, Kovalenko S, Gunawardena SR, Moreno S, Ho SL, Yuen ST, Thibodeau SN, Gallinger S, Burnett T, Teitsch T, Chan TL, Smyrk T, Cranston T, Psofaki V, Steinke-Lange V, Barbera VM (2014) - Application of a 5-tiered scheme for standardized classification of 2,360 unique mismatch repair gene variants in the InSiGHT locus-specific database. Nature Genetics. 46(2):107-117. PMID: 24362816

239 Tol JA, Gouma DJ, Bassi C, Dervenis C, Montorsi M, Adham M, Andrén-Sandberg A, Asbun HJ, Bockhorn M, Büchler MW, ConlonKC, Fernández-Cruz L, Fingerhut A, Friess H, Hartwig W, Izbicki JR, Lillemoe KD, Milicevic MN,Izbicki JR, Lillemoe KD, Milicevic MN, Neoptolemos JP, Shrikhande SV, Vollmer CM, Yeo CJ, Charnley RM (2014) - Definition of a standard lymphadenectomy in surgery for pancreatic ductal adenocarcinoma: A consensus statement by the International Study Group on Pancreatic. Surgery. 156(3):591-600. PMID:25061003

240 Tyagi M, Khade B, Khan SA, Ingle A, Gupta S (2014) - Expression of histone variant, H2A.1 is associated with the undifferentiated state of hepatocyte. Experimental Biology and Medicine . 239(10):1335-1339. PMID: 24764240

241 Upraity S, Shaikh S, Padul V, Shirsat NV (2014) - miR-224 expression increases radiation sensitivity of glioblastoma cells. Biochemical and Biophysical Research Communications. 448(2):225-230. PMID: 24785373

242 Varghese F, Bukhari AB, Malhotra R, De A (2014) - IHC Profiler: An open source plugin for the quantitative evaluation and automated scoring of immunohistochemistry images of human tissue samples. PLoS One. 9(5):e96801. PMID: 24802416

243 Vasanth Karthik R, Ranganathan P, Kulkarni AP, Sharma KS (2014) - Does cuff pressure monitoring reduce postoperative pharyngolaryngeal adverse events after LMA-ProSeal insertion? A parallel group randomised trial. Journal of Anesthesia. 28(5):662-667. PMID:24643810

244 Vikrant, Nakhwa P, Badgujar DC, Kumar R, Rathore KK, Varma AK (2014) - Structural and functional characterization of the MERIT40 to understand its role in DNA repair. Journal of Biomolecular Structure and Dynamics. 32(12): 2017-2032. PMID: 24125081

245 Vikrant, Sawant UU, Varma AK (2014) - Role of MERIT40 in stabilization of BRCA1 complex: a protein-protein interaction study. Biochem Biophys Res Commun. 446(4):1139-44. PMID: 24667604

246 Vora L, Tyagi M, Patel K, Gupta S, Vavia P (2014) - Self-assembled nanocomplexes of anionic pullulan and polyallylamine for DNA and pH-sensitive intracellular drug delivery. Journal of Nanoparticals Research. 16:2781

247 Vora T, Surwade G, Shah N, Tandon S, Prasad M, Chinnaswamy G, Arora B, Banavali S (2014) - Time-trend, over 10 years, of increasing multi-drug resistant superbugs in pediatric oncology unit of a tertiary. Pediatric Blood and Cancer. 61(s2):s105-433.

248 Wirth MD, Burch JB, Hébert JR, Kowtal P, Mehrotra-Kapoor A, Steck SE, Hurley TG, Gupta PC, Pednekar MS, Youngstedt SD, Zhang H, Sarin R (2014) - Case–control study of breast cancer in India: Role of PERIOD3 clock gene length polymorphism and chronotype. Cancer Investigation. 32(7):321-329. PMID: 24903750

249 Yadav K, Bakshi G, Prakash G (2014) - Simultaneous bilateral adrenelectomy for pheochromocytoma in MEN syndrome: case report with review literature. International Journal of Surgery Case Report. 5(8):487-490. PMID:24981168

250 Yadav K, Bakshi G, Prakash G, Tamhankar A, Verma K (2014) - Simultaneous bilateral laparoscopic adrenalectomy for pheochromocytoma in multiple endocrine neoplasia (MEN) syndrome: case report with review literature. International Journal of Surgery Case Reports. 5(8):487-490. PMID:24981168

251 Yadav K, Shrikhande S, Goel M (2014) - Post hepatectomy liver

failure: concept of management. Journal of Gastrointestinal Cancer. 149(5):713-724. PMID:25104504

252 Yadav LR, Biswal MN, Vikrant, Hosur MV, Varma AK (2014) - Tetrameric ZBRK1 DNA binding domain has affinity towards cognate DNA in absence of Zinc ions. Biochemical and Biophysical Research Communications . 450(1):283-288. PMID: 24924633

253 Yarnold J, Offersen BV, Olivotto I, Poortmans P, Sarin R (2014) - Radiotherapy for breast cancer, the TARGIT-A trial. Lancet. 383(9930):1717-1718. PMID: 24835613

254 Yaseer M, Shaikh R, Krishna CM, Teni T (2014) - Raman spectroscopic study of radioresistant oral cancer sublines established by fractionated ionizing radiation. PLoS ONE 9(5):e97777. PMID: 24841281

255 Yathiraj PH, Ghosh-Laskar S, Datta D, Rangarajan V, Purandare N, Gupta T, Budrukkar A, Murthy V, Kannan S, Agarwal JP (2014) - Randomized controlled trial to compare3-dimensional conformal radiation therapy (3DCRT) to intensity modulated radiation therapy (IMRT) in head and neck squamous cell carcinoma. International Journal of Radiation Oncology Biology Physics. 90(s1):S98.

256 Yuvaraj M, Udayakumar K, Jayanth V, Aruna PR, Bharanidharan G, Koteeswaran D, David BM, Murali Krishna C, Ganesan S (2014) - Fluorescence spectroscopic characterization of salivary metabolites of oral cancer patients. Journal of Photochemistry and Photobiology. B, Biology. 130:153-160.

National

1 Agarwal JP, Upasani MN, Ghadi Y, Munshi A (2014) - Postradiation hypertrichosis: A paradox. Journal of Cancer Research and Therapeutics. 10(1):203-206.

2 Agrawal A, Jatale P, Purandare N, Shah S, Rangarajan V (2014) - Rare splenic metastasis of renal cell carcinoma detected on (99m)Tc-MDP Rare splenic metastasis of renal cell carcinoma detected on (99m)Tc-MDP bone scan. Indian Journal of Nuclear Medicine. 29(1):60-61. PMID:24591791

3 Agrawal A, Kembhavi S, Purandare N, Shah S, Rangarajan V (2014) - Report of two cases of fluorodeoxyglucose positron emission tomography/computed tomography appearance of hibernoma: A rare benign tumor. Indian Journal of Nuclear Medicine. 29(1):40-2. PMID: 24591783

4 Agrawal A, Purandare N, Shah S, Puranik A, Banavali S, Rangarajan V (2014) - Response assessment in metronomic chemotherapy:RECIST or PERCIST?. Indian Journal of Nuclear Medicine. 29(2):74-80. PMID:24761057

5 Ahmad QG, Yadav PS, Shankhdhar VK, Nambi GI (2014) - Anterolateral thigh twin free flaps from a single donor site-a modification based on the oblique branch of the lateral circumflex femoral artery. Indian Journal of Surgery. 76(2):165-168. PMID:24891789

6 Bakshi SG, Jain PN, Kannan S (2014) - An assessment of basic pain knowledge and impact of pain education on Indian Anaesthesiologists-a pre and post questionnaire study. Indian Journal of Anaesthesia. 58(2): 127-31. PMID: 24963174

7 Bal MM, Goel M, Ramadwar M, Deodhar K (2014) - Intraductal papillary neoplasm of the bile duct : a rarity. Indian Journal of Pathology and Microbiology. 57(1):144-145. PMID:24739857

8 Barreto SG, Chaubal GN, Talole S, Desouza A, Suradkar K, Gaikwad V, Goel M, Shrikhande SV (2014) - Rectal cancer in young Indians-Are these cancers different compared to their older counterparts?. Indian Journal of Gastroenterology. 33(2):146-150. PMID:24048679

9 Bhandare S, Shrikhande S, Bakshi G, Deodhar KK (2014) - Isolated adrenal metastasis: a case report. Indian Journal of Pathology and Microbiology. 57(1):150-151. PMID:24739860

10 Bhargava A, Pathak N, Varshney S, Shrivastava M, Mishra PK (2014) - Molecular detection of window phase hepatitis C virus infection in voluntary blood donors and health care workers in a Cohort from central India. Indian Journal of Community Medicine. 39(1):51-52. PMID: 24696542

11 Bhatnagar S, Devi S, Vinod N, Jain P, , Durgaprasad G, Maroo SH, Patel KR (2014) - Safety and efficacy of oral transmucosal fentanyl citrate compared to morphine sulphate immediate release tablet in management of breakthrough cancer pain. Indian Journal of Palliative Care. 20(3):182-187. PMID:25191003

12 Bhukal I, Thimmarayan G, Bala I, Solanki SL, Samra T (2014) - Comparison of serum triglyceride levels with propofol in long chain triglyceride and propofol in medium and long chain triglyceride after short term anesthesia in pediatric patients. Saudi Journal of Anaesthesia. 8(s1):s53-s56. PMID:25579522

13 Chandarana MN, Raghu S, Bhagat M, Qureshi S (2014) - Embryonal rhabdomyosarcoma of the broad ligament. Indian Journal of

Medical and Paediatric Oncology. 35(1):103-105. PMID:25006297

14 Chaudhury S, Maheshwari A, Ray P (2014) - Ovarian cancer: An ever challenging malady. Biomedical Research Journal. 1(1):34-55.

15 Chavan CA, Kaore MP, Ingle AD, Kurkure NV, Akhare SB, Bhandarkar AG (2014) - Immunohistochemical study of a rare case of bovine ameloblastoma. Indian Journal of Veterinary Pathology. 38(4):275-277.

16 Chawla R, Myatra SN, Ramakrishnan N, Todi S, Kansal S, Dash SK (2014) - Current practices of mobilization, analgesia, relaxants and sedation in Indian ICUs: a survey conducted by the Indian society of critical care medicine. Indian of Critical Care Medicine. 18(9):575-584. PMID:25249742

17 Chopra S, Mathew AS, Engineer R, Shrivastava SK (2014) - Positioning high-dose radiation in multidisciplinary management of unresectable cholangio-carcinomas: review of current evidence. Indian Journal of Gastroenterology. 33(5):401-407. PMID:25135161

18 Dandekar M, DCruz AK (2014) - Organ preservation strategies: review of literature and their applicability in developing nations. South Asian Journal of Cancer. 3(3):147-50. PMID:25136519

19 Datta S, Chaturvedi P, Mishra A, Pawar P (2014) - A review of Indian literature for association of smokeless tobacco with malignant and premalignant diseases of head and neck region. Indian Journal of Cancer. 51(3):200-208. PMID:25494105

20 Deodhar J (2014) - Commentary. Indian Journal of Palliative Care. 20(3):187-188. PMID:25191004

21 Deodhar JK, Prabhash K, Agarwal JP, Chaturvedi P (2014) - Clozapine and cancer treatment: adding to the experience and evidence. Indian Journal of Psychiatry. 56(2):191-193. PMID:24891711

22 Deshpande SS, Kane S, Arya S (2014) - Extramedullary plasmacytoma in the carotid space: expanding the differential diagnosis. Indian Journal of Radiology Imaging. 24(4):410-414. PMID:25489135

23 Dhir AA, Sawant SP, Daddi A (2014) - Management and outcome of anthracycline cardiomyopathy. Indian Heart Journal. 66(2):s78-s79.

24 Dholam KP, Gurav S, Dugad J, Banavali S (2014) - Correlation of oral health of children with acute leukemia during the induction phase. Indian Journal of Medical and Paediatric Oncology. 35(1):36-39. PMID:25006282

25 Divatia J (2014) - Blood transfusion in anaesthesia and critical care: Less is more. Indian Journal of Anaesthesia. 58(5):511-514. PMID: 25535410

26 Divatia JV (2014) - Burnout in the ICU: Playing with fire?. Indian Journal of Critical Care Medicine. 18(3):127-128. PMID:24701060

27 Doctor JR, Ranganathan P, Divatia JV (2014) - Paraplegia following epidural analgesia: a potentially avoidable cause? Saudi Journal of Anaesthesiology. 8(2):284-286. PMID:24843349

28 Epari S, Bhatkar R, Moyaidi A, Shetty P, Gupta T, Kane S, Jalali R (2014) - Histomorphological spectrum and immunohistochemical characterization of hemangioblastomas: an entity of unclear histogenesis. Indian Journal of Pathology and Microbiology. 57(4):542-548. PMID:25308004

29 Garg A, Chaturvedi P, Gupta PC (2014) - A review of the systemic adverse effects of areca nut or betel nut. Indian Journal of Medical and Paediatric Oncology. 35(1):3-9.

30 Goel M, Gaikwad V, Dharia T, Kulkarni S, Shetty N, Shrikhande SV (2014) - Preresection transarterial chemoembolization for hepatocellular carcinoma: an experience with 23 patients. Indian Journal of Gastroenterology. 33(5):432-439. PMID:25037076

31 Gole P, Madke B, Khopkar U, Kumar P, Noronha V, Yadav M (2014) - Side effects of sorafenib and sunitinib: a new concern for dermatologist and oncologist. Indian Dermatology Online Journal. 5(1):89-91. PMID:24616870

32 Gore M and Govekar R (2014) - Preliminary assessment on choice of matrix based on hydrophobicity/hydrophilicity of proteins in analysis by MALDI-Tof-Tof mass spectrometry. Bionano Frontier. 7(2):7-9.

33 Gota VS, Patial P (2014) - Toward better quality of anticancer generics in India. Indian Journal of Cancer. 51(3): 366-368. PMID: 25494140

34 Goyal VK, Solanki SL (2014) - Anesthetic management of a case of spontaneous rupture of diaphragm. Saudi Journal of Anaesthesia. 8(Suppl.1):s128-s129. PMID: 2538512

35 Gulia A, Puri A, Pruthi M, Desai S (2014) - Oncological and functional outcome of periosteal osteosarcoma. Indian Journal of Orthopaedics. 49(3):279-284. PMID:24932034

36 Gupta A, Khattry N (2014) - Current status of hematopoietic stem cell transplant in chronic myeloid leukemia. Indian Journal of Medical and Paediatric

Oncology. 35(3): 207-10. PMID: 25336791

37 Gupta H, Kane S, Balasubramaniam V (2014) - Bilateral dacryoceles associated with bilateral alacrimia with punctal and canalicular agenesis. Saudi Journal of Ophthalmology. 28(1):72-75. PMID:24526864

38 Hada M S, Sable M, Kane S V, Pai PS, Juvekar SL (2014) - Calcifying epithelial odontogenic tumor: a clinico-radio-pathological dilemma. Journal of Cancer Research and Therapeutics. 10(1):194-196. PMID:24762511

39 Ingle AD, Shinde A (2014) - Microbiological assessment of laboratory rodents: Perspectives from laboratory animal facility of ACTREC. Journal of the American Association for Laboratory Animal Science. 2(1): 1-9.

40 Jain P, Padole D, Bakshi S (2014) - Prevalence of acute neuropathic pain after cancer surgery: a prospective study. Indian Journal of Anesthesia. 58(1):36-42. PMID:24700897

41 Jain R, Choudhury N, Chudgar U, Harimoorthy V, Desai P, Perkins J, Johnson ST (2014) - Detection and identification of red cell alloantibodies in multiply transfused thalassemia major patients a prospective study. Indian Journal of Hematology and Blood Transfusion. 30(4):291-296. PMID:25435730

42 Jha AK, Purandare NC, Shah S, Agrawal A, Puranik AD, Rangarajan V (2014) - PET reconstruction artifact can be minimized by using sinogram correction and filtered back-projection technique. Indian Journal of Radiology Imaging. 24(2):103-106. PMID:25024515

43 Jha AK, Singh AM, Shetye B, Shah S, Agrawal A, Purandare NC, Monteiro P, Rangarajan V (2014) - Radiation safety audit of a high volume Nuclear Medicine Department. Indian Journal of Nuclear Medicine. 29(4):227-234. PMID:25400361

44 Joshi A, Agarwala V, Noronha V, Dhumal S, Juvekar S, Prabhash K (2014) - Response to oral metronomic chemotherapy in carcinoma of the buccal mucosa: a case report. Indian Journal of Cancer. 51(3):400-401. PMID:25494166

45 Joshi A, Dhumal SB, Manickam DR, Noronha V, Bal M, Patil VM, Prabhash K (2014) - Recurrent sinonasal teratocarcinosarcoma with intracranial extension: case report. Indian Journal of Cancer. 51(3):398-400. PMID:25494165

46 Joshi A, Dhumal SB, Noronha V, Bonda A, Pandey A, Pandey A, Raja Manickam DK, Prabhash K (2014) - Oral cutaneous leishmaniasis mimicking carcinoma of tongue: a case report. Indian Journal of Cancer. 51(3):401-402. PMID:25494167

47 Joshi NN (2014) - Single nucleotide polymorphisms in human health and disease: Towards resolution of a conundrum. Journal of Biomedical Research. 1(1):56-70.

48 Joshi P, Dutta S, Chaturvedi P, Nair S (2014) - Head and neck cancers in developing countries. Rambam Maimonides Medical Journal. 5(2):e0009. PMID:24808947

49 Joshi P, Nair S, Chaturvedi P, Nair D, Agarwal JP, DCruz AK (2014) - Delay in seeking specialized care for oral cancers: experience from a tertiary cancer center. Indian Journal of Cancer. 51(2):95-97. PMID:25104185

50 Joshi P, Nair S, Nair D, Chaturvedi P (2014) - Incidence of occult papillary carcinoma of thyroid in Indian population: case series and review of literature. Journal of Cancer Research and Therapeutics. 10(3):693-695. PMID:25313762

51 Kapre NM, Dabholkar JP (2014) - PET scan in head and neck tumours PET scan in head and neck tumours in a developing country like India: is it a must? Indian Journal of Otolaryngology Head and Neck Surgery. 66(1):97-101. PMID:24605310

52 Khobagade KH, Bakshi GK, Prakash G (2014) - Tongue trail to kidney. Indian Journal of Medical and Paediatric Oncology. 35(1):106-108. PMID:25006298

53 Kinhikar RA, Pawar AB, Mahantshetty U, Murthy V, Dheshpande DD, Shrivastava SK (2014) - Rapid arc, helical tomotherapy, sliding window intensity modulated radiotherapy and three dimensional conformal radiation for localized prostate cancer: a dosimetric comparison. Journal of Cancer Research and Therapeutics. 10(3):575-582. PMID: 25313742

54 Kode J, Taur P, Gulia A, Jambhekar N, Agarwal M, Puri A (2014) - Pasteurization of bone for tumour eradication prior to reimplantation - an in vitro & pre-clinical efficacy study. Indian Journal of Medical Research. 139(4):585-597. PMID:24927346

55 Kotnis A, Mulherkar R (2014) - Novel inhibitor of DNA ligase IV with a promising cancer therapeutic potential. Current Science. 39(3):339-340. PMID: 24845497

56 Krishnatry R, Gupta T, Murthy V, Ghosh-Laskar S, Budrukkar A, Chaturvedi P, Nair S, Nair D, Kumar P, Joshi A, Agarwal JP (2014) - Factors predicting time to distant metastasis in radically treated head and neck cancer. Indian Journal of Cancer. 51(3):231-235. PMID:25494111

57 Kumar DS, Naronha V, Joshi A (2014) - Carcinomatous

meningitis in non-small cell lung cancer: palliation with intrathecal treatment. Indian Journal of Medical and Paediatric Oncology. 35(1):75-78. PMID:25006289

58 Laskar SG, Lewis S (2014) - Is quality of life the heart of the issue in head and neck cancers?. Indian Journal of Palliative Care. 20(3):169-170. PMID:25191001

59 Laskar SG, Lewis S (2014) - Pathology of radiation toxicity and its implication on quality of life. South Asian Journal of Cancer. 3(3):145-146. PMID:25136518

60 Laskar SG, Yathiraj PH (2014) - Acute radiation toxicity in head and neck and lung malignancies. South Asian Journal of Cancer. 3(1):5-7. PMID:24665437

61 Lewis S, Salins N, Rao MR, Kadam A (2014) - Spiritual well being and its influence on fatigue in patients undergoing active cancer directed treatment: a orrelational study. Journal of Cancer Research and Therapeutics. 10(3):676-680. PMID:25313759

62 Linga VG, Ganta RR, Kalpathi KI, Gundeti S, Rajappa SJ, Digumarti R, Paul TR, Tandon A (2014) - Response to imatinib mesylate in childhood chronic myeloid leukemia in chronic phase. South Asian Journal of Cancer. 3(4):203-205. PMID:25422804

63 Linga VG, Patchva DB, Mallavarapu KM, Tulasi V, Kalpathi KI, Pillai A, Gundeti S, Rajappa SJ, Digumarti R (2014) - Thiopurine methyltransferase polymorphisms in children with acute lymphoblastic leukemia. Indian Journal of Medical and Paediatric Oncology. 35(4):276-280. PMID: 25538405

64 Macaden SC, Salins N, Muckaden M, Kulkarni P, Joad A, Nirabhawane V, Simha S (2014) - End of life care policy for the dying: consensus position statement of Indian association of palliative care. Indian Journal of Palliative Care. 20(3):171-181. PMID:25191002

65 Macaden SC, Salins N, Muckaden M, Kulkarni P, Joad A, Nirabhawane V, Simha S (2014) - Guidelines for prevention of hospital acquired infections. Indian Journal of Critical Care Medicine. 18(3):149-163. PMID: 24701065

66 Madke B, Gole P, Kumar P, Khopkar U (2014) - Dermatological side effects of epidermal growth factor receptor inhibitors: PRIDE complex. Indian Journal of Dermatology. 59(3):271-274. PMID:24891659

67 Menon S, Goyal P, Suryawanshi P, Tongaonkar H, Joshi A, Bakshi G, Desai S (2014) - Paraganglioma of the urinary bladder: A clinicopathologic spectrum of a series of 14 cases emphasizing diagnostic dilemmas. Indian Journal of Pathology and Microbiology. 57(1):19-23. PMID:24739826

68 Mishra GA, Kulkarni SV, Majmudar PV, Gupta SD, Shastri SS (2014) - Community-based tobacco cessation program among women in Mumbai, India. Indian Journal of Cancer. 51(5):S54-S59. PMID: 25526250

69 Mukherjee A, Sarma H, Saxena S, Kumar Y, Chaudhari P, Goda JS, Adurkar P, Dash A, Samuel G (2014) - Bioevaluation of (125) I Ocu-Prosta seeds for application in prostate cancer brachytherapy. Indian Journal of Medical Research. 139(4): 555-560. PMID: 24927341

70 Myatra S (2014) - Dexmedetomidine: toward a paradigm shift in ICU sedation. Indian Journal of Critical Care Medicine. 18(5):271-272. PMID:24914253

71 Nagraj J, Chatterjee S, Pal T, Sakpal AS, Gota V, Ramaa CS, Ray P (2014) - A novel series of di-fluorinated propanedione derivatives synergistically augment Paclitaxel mediated caspase 3 activation in ovarian cancer cells. Journal of Cancer Research Therapeutics. 10(3):701-709. PMID: 25313764

72 Nagrani RT, Budukh A, Koyande S, Panse NS, Mhatre SS, Badwe R (2014) - Rural urban differences in breast cancer in India. Indian Journal of Cancer. 51(3):277-281 PMID:25494122

73 Noronha V, Joshi A, Prabhash K (2014) - Beyond ten cycles of cabazitaxel for castrate-resistant prostate cancer. Indian Journal of Cancer. 51(3):363-365. PMID:25494139

74 Pandey A, Bhosale B, Pandita V, Singh A, Ghosh J, Ghosh J, Bajpai J (2014) - Carboplatin hypersensitivity in relapsed ovarian carcinoma: a therapeutic challenge. Indian Journal of Medical and Paediatric Oncology. 35(1):17-20. PMID:25006278

75 Parikh P M, Prabhash K, Govind K B, Digumarti R, Pandit S, Banerjee I, Biyani R, Deshmukh A Doval D, Bhattacharyya G S, Gupta S (2014) - Standard operating procedure for audio visual recording of informed consent: an initiative to facilitate regulatory compliance. Indian Journal of Cancer. 51(2):113-116. PMID:25104190.

76 Parikh P, Patil V, Agarwal JP, Chaturvedi P, Vaidya A, Rathod S, Noronha V, Joshi A, Jamshed A, Bhattacharya GS, Gupta S, Desai C, Advani SH, Pai P, Laskar S, Ramesh A, Mohapatra PN, Vaid AK, Deshpande M, Ranade AA PN, Vaid AK, Deshpande M, Ranade AA Vora A, Baral R, Hussain MA, Rajan B, DCruz AK, Prabhash K (2014) - Guidelines for treatment

of recurrent or metastatic head and neck cancer. Indian Journal of Cancer. 51(2):89-94. PMID:25104184

77 Parikh PM, Prabhash K, Bhattacharyya GS, (2014) - Ignore molecular oncology at your peril. Indian Journal of Cancer. 51(2):150-153. PMID:25104198

78 Patel KA, Rajderkar SS, Naik JD, Behere VS (2014) - A study of certain correlates of job satisfaction among judicial personnel, in a district of Western Maharashtra. Indian Journal of Occupational and Environmental Medicine. 18(2):68-74. PMID: 25568601

79 Patil PS, Mohandas KM, Bhatia SJ, Mehta SA (2014) - Serum ferritin and the risk of hepatocellular carcinoma in chronic liver disease of viral etiology: a case-control study. Indian Journal of Gastroenterology. 33(1):12-18. PMID: 24006121

80 Patil V M, Noronha V, Joshi A, Krishna V M, Dhumal S,Chaudhary V, Juvekar S, Pai P S, Pankaj C, Chaukar D, Dcruz AK, Prabhash K (2014) - Referral pattern for neoadjuvant chemotherapy in the head and neck cancers in a tertiary care center. Indian Journal of Cancer. 51(2):100-103. PMID:25104187

81 Patil V, Shetmahajan M (2014) - Massive transfusion and massive transfusion protocol. Indian Journal of Anaesthesia. 58(5):590-595. PMID: 25535421

82 Patil VM, Noronha V, Joshi A, Kumar P, Muddu VK, Dhumal S, Arya S, Juvekar S, Pai P, Chatturvedi P, Devendra AC, Ghosh S,DCruz AK (2014) - Weekly chemotherapy as Induction chemotherapy in locally advanced head and neck cancer for patients ineligible for 3 weekly maximum tolerable dose chemotherapy. Indian Journal of Cancer. 51(1):20-24. PMID:24947091

83 Patwardhan S, Jalili NG, Thatte U, Pramesh CS (2014) - Quality and completeness of data documentation in an investigator-initiated trial versus an industry-sponsored trial. Indian Journal of Medical Ethics. 11(1):19-24. PMID:24509104

84 Pimple S, Shastri SS (2014) - Comparative evaluation of human papilloma virus DNA test verses colposcopy as secondary cervical cancer screening test to triage screen positive women on primary screening by visual inspection with 5% acetic acid. Indian Journal of Cancer. 51(2):117-123. PMID:25104191

85 Pimple S, Gunjal S, Mishra GA, Pednekar MS, Majmudar P, Shastri SS (2014) - Compliance to gutka ban and other provisons of COTPA in Mumbai . Indian Journal of Cancer. 51(5):S60-S66. PMID: 25526251

86 Pramesh CS, Badwe RA, Sinha RK (2014) - The national cancer grid of India. Indian Journal of Medical and Paediatric Oncololgy. 35(3):226-227. PMID:25336795

87 Purandare NC, Gandhi A, Puranik AD, Agrawal A, Shah S,Patil A, Rangarajan V (2014) - Use of FDG/PET CT to diagnose malignancy as the cause of mucocele of the appendix. Indian Journal of Gastroenterology. 33(1):79-81. PMID: 23982705

88 Purandare NC, Puranik AD, Shah S, Agrawal A, Rangarajan V (2014) - Post-treatment appearances, pitfalls, and patterns of failure in head and neck cancer on FDG PET/CT imaging. Indian Journal of Nuclear Medicine. 29(3):151-157. PMID:25210280

89 Puranik AD, Purandare NC, Bal MM, Shah S, Agrawal A, (2014) - Extraskeletal osteosarcoma: An uncommon variant with rare metastatic sites detected with FDG PET/CT. Indian Journal of Medical and Paediatric Oncology. 35(1):96-98. PMID:25006295

90 Puranik AD, Purandare NC, Shah S, Agrawal A, Rangarajan V (2014) - Unilateral vocal cord paralysis: An unusual cause and rare imaging pattern seen on FDG PET/CT in a case of oropharyngeal cancer. Indian Journal of Nuclear Medicine. 29(2):125-127. PMID: 4761073

91 Puri A (2014) - Limb salvage in musculoskeletal oncology: recent advances. Indian Journal of Plastic Surgery. 47(2):175-184. PMID:25190911

92 Puri A, Gulia A, Pruthi M (2014) - Outcome of surgical resection of pelvic osteosarcoma. Indian Journal of Orthopaedics. 48(3):273-278. PMID: 24932033

93 Purwar P, Bambarkar S, Jiwnani S, Karimundackal G, Laskar SG, Pramesh CS (2014) - Multimodality management of esophageal cancer. Indian Journal of Surgery. 76(6):496-503.

94 Raina S, Chande AG, Baba M, Mukhopadhyaya R (2014) - A reporter based single step assay for evaluation of inhibitors targeting HIV-1 Rev–RRE interaction. Indian Journal of Virology. 25: 101-106. PMID: 24426316

95 Ramani CV, Kundagulwar GK, Prabha YS, Dushyanth J (2014) - Anomalous superficial ulnar artery based flap Indian Journal of Plastic Surgery. 47(1):124-126. PMID:24987217

96 Rane SU, Menon S, Desai S, Bakshi G, Joshi A (2014) - Granulosa cell tumor of testis: clinicopathological correlation of a rare tumor. Indian Journal of Pathology and Microbiology. 57(4):564-573. PMID:25308008

97 Rane SU, Shet T, Sridhar E, Bhele S, Gaikwad V, Agale S, Shinde S, Prabhat D, Fernandes G, Hastak M, Tampi C, Narurkar S, Patel

K, Madiwale C, Shah K, Shah L, Sawaimoon S, Lad P (2014) - Interobserver variation is a significant limitation in the diagnosis of Burkitt lymphoma. Indian Journal of Medical and Paediatric Oncology. 35(1):44-53. PMID :25006284

98 Ranganathan P (2014) - Meta-analysis: Adding apples and oranges? Indian Journal of Critical Care Medicine. 18(1):50-51. PMID:24550619

99 Rangarajan B, Binoy V, Hingmire SS, Noronha V (2014) - Tolvaptan. South Asian Journal of Cancer. 3(3):182-184. PMID:25136528

100 Rastogi S, Gulia S, Bajpai J, Ghosh J, Gupta S (2014) - Oligometastatic breast cancer: a mini review. Indian Journal of Medical and Paediatric Oncololgy. 35(3):203-206. PMID:25336790

101 Rath S, Nathani A, Patel D, Kulkarni P, Gota V (2014) - Status of technology transfer in India – The much needed magic remedy. Current Science. 106(8): 1058-1060.

102 Rathod S, Munshi A, Paul S, Ganesh B, Prabhash K, Agarwal JP (2014) - Thymoma: first large Indian experience. Indian Journal of Cancer. 51(2):109-112. PMID:25104189

103 Rekhi B, Adamane S (2014) - Myxoinflammatory fibroblastic sarcoma with areas resembling hemosiderotic fibrolipomatous tumor: a rare case indicating proximity between the two tumors. Indian Journal of Pathology Microbiology. 57(4):647-8. 57(4):647-648. PMID:25308033

104 Rekhi B, Desai SS, Gulia A, Puri A, Jambhekar NA (2014) - Intraosseous myoepithelioma: a rare, distinct tumor entity. Indian Journal of Pathology and Microbiology. 57(2):269-271. PMID:24943762

105 Rekhi B, Motghare P (2014) - Cyclin D1 and p16INK4 positive endometrial stromal sarcoma: a case report with new insights. Indian Journal of Pathology and Microbiology. 57(4):606-608. PMID:25308017

106 Rekhi B, Rangwalla H, Chinoy RF (2014) - Curious case of a primary intranodal kaposi sarcoma, confirmed by immunohistochemistry, in an HIV-positive African male. Journal of Cancer Research and Therapeutics. 10(1):2013-2014. PMID:24762522

107 Rekhi B, Thorat S, Parikh G, Jambhekar NA (2014) - Malignant ossifying fibromyxoid tumors: a report of two rare cases displaying retained INI1/SMARCB1 expression. Indian Journal of Pathology and Microbiology. 57(4):652-653. PMID:25308036

108 Rekhi B, Vinarkar S, Shylasree ST (2014) - Bilateral ovarian serous cystadenofibromas coexisting with an incidental unilateral Brenner tumor and Walthard cell rests in bilateral Fallopian tubes: an unusual case with diagnostic implications and histogenesis. Indian Journal of Pathology and Microbiolgy. 57(2):347-348. PMID:24943791

109 Salins N (2014) - Time for change: integrating palliative medicine to mainstream medicine. Indian Journal of Palliative Care. 20(2):97-98. PMID:25125862

110 Sankaranarayanan R, Nene BM, Shastri S, Rajkumar R, Muwonge R, Swaminathan R, Malvi SG, Desai S, Kelkar R, Hingmire SJayant K, Kane SV (2014) - Response to article titled "US-funded measurements of cervical cancer death rates in India: scientific and ethical concerns" by Eric J Suba. Indian Journal of Medical Ethics. 11(3):175-8. PMID:25101550

111 Sarin R (2014) - Big Data V4 for integrating patient reported outcomes and quality-of-life indices in clinical practice. Journal of Cancer Research Therapeutics. 10(3):453-455. PMID: 25313720

112 Shankar R, Qureshi SS, Sugoor P, Kembhavi S, Yadav PS, Mukta R (2014) - Colossal squamous cell carcinoma of the face in a child with Xeroderma Pigmentosum. Journal of the Indian Association of Pediatric Surgeons. 19(3):185-186. PMID: 25197203

113 Sharma S, Chaukar DA (2014) - International Federation of Head Neck Oncology Society 5(th) World Congress/American Head Neck Society 2014 update. Indian Journal of Medical and Paediatric Oncololgy. 35(3):228-230. PMID:25336796

114 Shetty N, Gupta S (2014) - Eribulin drug review. South Asian Journal of Cancer. 3(1):57-59. PMID: 24665449

115 Shome D, Kalita D, Jain V, Sarin R, Maru GB, Bellare JR (2014) - Carboplatin loaded polymethylmethacrylate nano-particles in an adjunctive role in retinoblastoma: an animal trial. Indian Journal of Ophthalmology. 62(5):585-589. PMID: 24881606

116 Shrikhande SV, Gaikwad V, Purohit D, Goel M (2014) - Major abdominal cancer resections in cirrhotic patients: How frequent is postoperative hepatocellular decompensation?. Indian Journal of Gastroenterology. 33(3):258-264. PMID:24214581

117 Shrikhande SV, Gaikwad V, Desouza A, Goel M (2014) - Is laparoscopic surgery the standard of care for GI luminal cancer?. Indian Journal of Surgery. 76(6):444-452. PMID: 25614719

118 Shrikhande SV, Sirohi B, Barreto SG, Chacko RT, Parikh PM, Pautu J, Arya S, Patil P, Chilukuri SC, Ganesh B, Kaur T, Shukla

D, Rath GS (2014) - Indian Council of Medical Research consensus document for the management of gastric cancer. Indian Journal of Medical and Paediatric Oncology. 35(4):239-243. PMID: 25538398

119 Shrikhande SV, Sirohi B, Barreto SG, Chacko RT, Parikh PM, Pautu J, Arya S, Patil P, Chilukuri SC, Ganesh B, Kaur T, Shukla D, Rath GS (2014) - Indian Council of Medical Research consensus document for the management of gastrointestinal stromal tumors. Indian Journal of Medical Paediatric Oncology. 35(4):244-248. PMID: 25538399

120 Siddiqui SS, Jha A, Konar N, Ranganathan P, Deshpande DD, Divatia JV (2014) - Radiation exposure among medical professionals working in the Intensive care unit. Indian Journal of Critical Care Medicine. 18(9):591-595. PMID:25249743

121 Singh R, Gupta S, Pawar SB, Pawar RS, Gandham S V, Prabhudesai S (2014) - Evaluation of ER, PR and HER 2 receptor expression in breast cancer patients presenting to a semi urban cancer centre in Western India. Journal of Cancer Research and Therapeutics. 10(1):26-28. PMID:24762482

122 Sinukumar S, Gomes RM, Kumar RK, Desouza A, Saklani A (2014) - Sporadic giant mesenteric fibromatosis. Indian Journal of Surgical Oncology. 5(3):242-245. PMID:25419076

123 Sirohi B, Gupta S, Raghunadharao D, Shrikhande SV (2014) - Clinical trials in India: At uncertain crossroads? Indian Journal of Medical Paediatric and Oncology. 35(2):133-5. PMID: 25197173

124 Sirohi B, Shrikhande SV, Perakath B, Julka PK, lele V, Kaur T, Shukla DK, Rath GK, Raghunandharao D, Chaturvedi A, Nandakumar A, Ramadwar M, Bhatia V, Mittal R, (2014) - Indian Council of Medical Research consensus document for the management of colorectal cancer. Indian Journal of Medical and Paediatric Oncololgy. 35(3):192-196. PMID:25336788

125 Sirohi B, Singh A, Jagannath P, Shrikhande SV (2014) - Chemotherapy and targeted therapy for gall bladder cancer. Indian Journal of Surgical Oncology. 5(2):134-141. PMID:25114467

126 Sirohi B, Barreto SG, Singh A, Batra S, Mittra A, Rastogia S, Ramadwar M, Shetty N, Goel M, Shrikhande SV (2014) - Epirubicin, oxaliplatin, and capectabine is just as “MAGIC”al as epirubicin, cisplatin, and fluorouracil perioperative chemotherapy for resectable locally advanced gastro-oesophageal cancer. Journal of Cancer Research and Therapeutics. 10(4):866-870. PMID:25579520

127 Sonavane S, Rani D, Asopa R, Upadhye T, Pawar D (2014) - Postoperative distal ureteric and bladder cuff recurrence in a Grade I renal transitional cell carcinoma. Indian Journal of Nuclear Medicine. 29(4):264-266. PMID:25400371

128 Srivastava D, Solanki SL, Singh PK (2014) - Dexmedetomidine in upper gastrointestinal endoscopy of a patient with ejection fraction 25%. Saudi Journal of Anaesthesia. 8(4):571-572. PMID: 25422626

129 Upadhyay P, Dwivedi R, Dutt A (2014) - Applications of next-generation sequencing in cancer. Current Science. 107(5): 795-802.

130 Vaidyanathan V, Nair D, Juvekar SL, D’Souza C (2014) - Jugular foramen chondrosarcoma (Case report). Indian Journal of Otology. 20(2):86-88.

131 Wani M A, Jan F A, Khan N A, Pandita K K, Khurshid R, Khan S H Mishra GA1, Gunjal SS, Pimple SA, Majmudar PV, Gupta SD, Shastri SS (2014) - Impact of gutkha and pan masala ban in the state Maharashtra on users and vendors. Indian Journal of Cancer. 51(2):129-132. PMID:25104193

132 Yadav P (2014) - Recent advances in head and neck cancer reconstruction. Indian Journal of Plastic Surgery. 47(2):185-190. PMID:25190912

Publications in Proceedings / Newsletters

1 Behl I, Mamgain H, Deshmukh A, Kukreja L, Hole AR, Krishna CM (2014) - Raman microspectroscopic study of oral buccal mucosa. Proceedings of SPIE:BIOS 89400D-89400D -7.

2 Munnolli SS, Pujar SM (2014) - Impact of highly cited Indian Cancer research papers on altmetric explorer: An exploratory study. In: Sangam SL, Biradar BS, editors. Third National Conference on Scientometrics, Big Data Analytics (BDA) and Libraries Shankaragahatta. Department of PG Studies and Research in Library and Information Science. Kuvempu University; 2014. 72-80.

3 Rubina S, Sathe P, Dora TK, Chopra S, Maheshwari A, Murali Krishna C (2014) - In vivo Raman spectroscopy of cervix cancers. Proceedings of SPIE: BIOS 89400E-89400E-6.

4 Sahu A, Shah N, Mahimkar M, Garud M, Pagare S, Nair S, Krishna CM (2014) - Raman spectroscopy and oral exfoliative cytology. Proceedings of SPIE:BIOS 89262N-89262N-4.

5 Sahu A, Talathi S, Sawant S, Krishna CM (2014) - Classification of oral cancers using raman spectroscopy of serum. Proceedings of SPIE:BIOS 89390E-89390E-7.

6 Shaikh R, Sathe P, Dora TK, Chopra S, Maheshwari A, Krishna CM (2014) - In vivo Raman spectroscopy of cervix cancers. Proceedings of SPIE: SPIE; 2014.

7 Shenoy M, Hole AR, Shridhar E, Moiyadi AV, Krishna CM (2014) - Raman spectroscopy of gliomas: An exploratory study. Proceedings of SPIE:892808-892808-6.

8 Singh SP, Krishna CM (2014) - Raman spectroscopy of oral tissues: Correlation of spectral and biochemical markers. Proceedings of SPIE: BIOS 8926O-8926O-5.

9 Tyagi M, Khan SA, Gupta S (2014) - Histone post-translational modifications as biomarks in cancer: Dream or reality? Proteomics Society, India (PSI) News Letter 2(1):7-10, 2014.

Patents (Applied)

1 Mittra I, Samant UC, Modi GK, Mishra PK, Bhuvaneshwar GS. Method for ex-vivo separation of apoptotic chromatin fragments from blood or plasma for prevention and treatment of diverse human diseases. Application No: 14/100, 950 Publication No. US 2014/0099293 A1

Books

1 Deodhar KK, Chitale A. Diagnostic problems of tumors of female genital tract: Selected Topics. (DIAGNOSTIC PROBLEMS IN TUMOR PATHOLOGY SERIES) (Volume 3) Chitale Publications. 2014

2 Engineer R, Chopra S, Shrivastava SK. Role of Radiotherapy In Rectal Cancer. Elsevier Health Sciences. 2014

3 Juvekar S. Evidence based Management of Cancers In India: Guidelines for Imaging in Oncology. Mumbai: Tata Memorial Centre. 2014

4 Ranganathan P, Shetmahajan M, Divatia J. Evidence based Management of Cancers In India: Peri-Operative care Improving Outcomes After Surgery. Mumbai: Tata Memorial Centre. 2014

Book chapters

1 Agarwal JP, Kalyani N. Management of Skeletal Metastasis. In: Desai P, editor. Clinical Perspectives in Oncology. New Delhi: Jaypee Brothers Medical. 2014.

2 Agarwal S, Krishnatry R, Prabhash K, Agarwal JP. Non Surgical Treatment Plan for Organ Preservation. In: Pradhan S A, Monnier P, Pai PS editor. Surgery in treatment of larynx & Hypopharynx. New Delhi: Lloyds Publishing House. 2014

3 Arora B, Sodhi V. Lymphomas in Children. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 624-643.

4 Badwe R, Gupta S, Goyal G. Hormonal Dependence of Malignant Cell. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 74-83.

5 Balasubramaniam G. Geographic Variations in Frequency and Incidence: a Global Perspective. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 9-14

6 Chandrani P, Dutt A. Domain Specific Targeting of Cancer. In: Kumar R, editor. Nuclear Signaling Pathways and Targeting Transcription in Cancer. New York: Springer. 2014. Pp 299-310.

7 De A, Arora R, Jasani A. Engineering Aspects of Bioluminescence Resonance Energy Transfer Systems. In: Cai W, editor. Engineering in Translational Medicine. London: Springer; 2014. Pp 257-300.

8 De A. Bioluminescence. In: eLS . Chichester: John Wiley & Sons Ltd; 2014.

9 Desai P, Balasubramaniam G. Cancer of the Esophagus. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 222-232

10 Desai P, Parikh B, Huilgol N, Balasubramaniam G. Carcinoma Stomach. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 233-244.

11 Desai P, Patel K, Parikh B, Huilgol NG, Balasubramaniam G. Carcinoma of the Cervix. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 379-393.

12 Desai P, Patel K, Parikh B, Huilgol NG, Balasubramaniam G. Endometrial Cancer. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 394-402

13 Engineer R. Radiotherapy for Uterine sarcomas. In: Rajaram S, Chitrathara K, Maheshwari A, editor. Uterine Cancer: Diagnosis & Treatment. London: Springer. 2014

14 Jalali R, Krishna U. Management of Brain Metastasis. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 577-584

15 Jalali R, Krishna U. Management of Primary Brain Tumors In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 560-576

16 Kelkar R. Microbial Pathogens and Infection Control in Immunocompromised cancer Patients. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 685-705.

17 Kurkure P. Pediatric Oncology: A Journey From Nihilism to Cautious Optimism. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 614-623.

18 Maru GB, Gandhi K, Ramchandani A. The Role of Inflammation in Skin Cancer. In: Aggarwal BB, Sung B, editors. Inflammation and Cancer. New York: Springer. 2014. 437-479.

19 Maru GB, Kumar G, Ghantasala S, Tajpara P. Polyphenol-Mediated In Vivo Cellular Responses during Carcinogenesis. In: Watson RR, Preedy VR, Zibadi S, editors. Polyphenols in Human Health and Disease. Amsterdam: Academic; 2014. 1141-179.

20 Moiyadi AV. Intraoperative Ultrasound in Neurosurgical Oncology Scope and Utility. In: Hayat E, editor. Tumors of the Central Nervous system. Netherlands: Springer; 2014. 149-158.

21 Muckaden MA, Deodhar J, Atreya S. Palliative care and Quality of life in advanced cancer. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 674-684.

22 Parikh R, Desai P, Balasubramaniam G, Parikh B, Arneja SK. Ovarian Cancer. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 363-378.

23 Parikh R, Desai P, Borges A, Patel K, Arneja SK, Huilgol NG, Jankharia B, Parikh B, Balasubramaniam G. Breast Cancer. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 325-362.

24 Patil V, Sharma K. Emergencies in Oncology. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 609-613.

25 Pramesh CS, Badwe R. Translational Research in Oncology. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 112-119.

26 Puri A, Jambhekar N. Bone Tumors and Soft Tissue Sarcomas. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 536-549.

27 Sarin R. Genetics and Cancer. In: Desai P, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical (P); 2014. 84-97.

28 Sehgal L, Usmani A, Dalal SN, SS Majumdar. Generation of Transgenic Mice by Exploiting Spermatogonial Stem Cells In vivo. In: Singh SR, Coppola V, editors. Mouse Genetics: Methods and Protocol. New York: Springer; 2014. 327-37.

29 Sengar M. Adult Lymphomas. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 644-652.

30 Sharma KS, Jain PN. Cancer Pain Management. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 666-673.

31 Shastri S, Shastri A. Primary and Secondary Prevention of Common Cancers. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 15-23.

32 Shrikhande SV, Jagannath P. Pancreatic Malignancies. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 310-324.

33 Singh RK, Gaikwad SM, Chatterjee S, Ray P. Stem Cells: The Holy Grail of Regenerative Medicine. In: Cai W, editor. Engineering in Translational Medicine. London: Springer; 2014. 19-69.

34 Tongaonkar HB, Bakshi GK, Menon S, Prabhash K, Joshi A. Renal Cell Carcinoma. In: Desai PB, editor. Practical Clinical Oncology. New Delhi: Jaypee Brothers Medical Publishers. 2014. Pp 454-473.

ACTION TAKEN REPORT ON AUDITOR'S OBSERVATIONS

ON

ANNUAL STATEMENT OF ACCOUNTS FOR 2014-15

NAME OF INSTITUTION : **TATA MEMORIAL CENTRE**

Parel, Mumbai 400 012

Paragraph No. of Auditors Report	Auditors Comments (to be reproduced in full)	Action Taken	Expected month and year for completion of Action
(1)	(3)	(4)	(5)
1.	We have audited the attached financial statements of Tata Memorial Centre (the Centre) which comprises Balance Sheet as at 31st March, 2015 and the Statement of Income and Expenditure Account for the year ended on that date, as required by the Bombay Public Trusts Act, 1950 (the Act), and a summary of significant accounting policies and other explanatory information.	This is a statement of fact. No action.	
2	The trustees are responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance and receipts and payments of the Centre in accordance with the Accounting principles and Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.	This is a statement of fact. No action.	
3.	Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with the ethical requirements plan and perform the audit to obtain reasonable assurance about whether the financial statements are fee of any material misstatement. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Centre's preparation and fair	This is a statement of fact. No action.	

Paragraph No. of Auditors Report	Auditors Comments (to be reproduced in full)	Action Taken	Expected month and year for completion of Action
(1)	(3)	(4)	(5)
	presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Centre's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by trustees as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.		
4.	In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required, we report that : (a) In the case of the Balance Sheet, of the state of affairs of the Centre as at 31st March, 2015. (b) In the case of income and Expenditure Account of the Excess of income over expenditure of the Centre for the year ended on that date.	This is a statement of fact. No action.	

INDEPENDENT AUDITOR'S REPORT

The Chairman,
Governing Council of Tata Memorial Centre,

Report on Financial Statements

We have audited the attached Financial Statements of **Tata Memorial Centre (the Centre)** which comprises Balance Sheet as at 31st March, 2015 and the Statement of Income and Expenditure Account for the year ended on that date, as required by the Bombay Public Trusts Act, 1950 (the Act), and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

The trustees are responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance and receipts and payments of the Centre in accordance with the Accounting principles and Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with the ethical requirements plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of any material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Centre's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the

Pune Office: GDA House, Plot No. 85, Bhusari Colony (Right), Paud Road, Pune – 411 038, Phone – 020 – 25280081, Fax – 020 - 25280275
Email – audit@gdaca.com
Mumbai Office: Office No. 1,2,& 3, 4th Floor, Rahimtoola House, 7th Homji Street, Off P.M.Road, Fort Mumbai – 400 001, Phone – 022 – 4922 0555, Fax – 022 – 4922 0504
Email – chetan.sapre@gdaca.com

Centre's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by trustees as well as evaluating the overall presentation of the financial statements.
We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required, we report that:

(a) In the case of the Balance Sheet, of the state of affairs of the Centre as at 31st March, 2015.
(b) In the case of Income and Expenditure Account, of the Excess of Loss over Income of the Centre for the year ended on that date.

For G.D.Apte & Co

Chartered Accountants

(Firm Regn No. 100515W)

Chetan R. Sapre

(Partner)

Membership No. 116952

Date: 14-8-2015

Place: Mumbai

Pune Office: GDA House, Plot No. 85, Bhusari Colony (Right), Paud Road, Pune – 411 038, Phone – 020 – 25280081, Fax – 020 - 25280275
Email – audit@gdaca.com
Mumbai Office: Office No. 1,2,& 3, 4th Floor, Rahimtoola House, 7th Homji Street, Off P.M.Road, Fort Mumbai – 400 001, Phone – 022 – 4922 0555, Fax – 022 – 4922 0504
Email – chetan.sapre@gdaca.com

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

BALANCE SHEEET AS AT 31 ST MARCH, 2015

in ₹

PARTICULARS	Schedule	As at 31.03.2015	As at 31.03.2014
SOURCES OF FUND			
CAPITAL FUND AND LIABILITIES			
Capital Fund	1	-	-
Science and Research Fund	2	18,29,98,083	16,82,41,282
Earmarked / Endowment Fund	3	1,05,12,52,459	87,64,00,566
Academic Fund	4	5,90,21,160	6,18,74,750
Secured Loan	5	-	3,42,235
Current Liabilities & Provisions	6	11,61,23,94,702	9,39,62,33,481
TOTAL		12,90,56,66,404	10,50,30,92,314
APPLICATION OF FUND			
ASSETS			
Fixed Assets	7		
Gross Block		6,55,39,94,046	5,74,10,21,221
Less:Provision for Depreciation		2,56,20,81,863	2,28,15,40,823
Net Block		3,99,19,12,183	3,45,94,80,398
Capital Work - in - Progress		1,72,38,38,526	91,56,98,057
Total		**5,71,57,50,709**	**4,37,51,78,455**
Current Assets, Loans and Advances	8	4,33,78,07,632	4,04,02,12,560
Capital Fund	1	2,85,21,08,063	2,08,77,01,300
TOTAL		12,90,56,66,404	10,50,30,92,314
Significant Accounting Policies	A		
Notes on Accounts	B		

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Panapathy
Jt. Controller (Finance & Accounts)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 MARCH 2015

in ₹

	Schedule		Year Ended 31.03.2015	Year Ended 31.03.2014
A) INCOME				
Grant in Aid - Govt of India	9		2,16,42,91,633	2,00,16,20,462
Hospital Income			1,61,03,40,343	1,47,54,47,300
Sale of Drugs and Surgical Goods			1,87,97,68,417	1,61,60,57,709
Interest Income	10		24,51,17,737	27,69,43,474
Other Income	11		5,99,43,671	6,34,88,743
TOTAL (A)			5,95,94,61,802	5,43,35,57,686
B) EXPENDITURE				
Academic Expenses			4,06,66,979	3,57,39,790
Consumption of drugs and Surgical Goods	12		1,79,24,65,928	1,54,32,75,810
Consumables			66,43,15,365	58,92,86,467
Staff Cost / Salaries	13		2,85,27,10,415	2,52,01,89,633
Other Administrative Expenses	14		74,93,70,912	73,22,29,020
Interest on HDFC Loan			64,620	1,28,388
TOTAL (B)			6,09,95,94,219	5,42,08,49,108
Excess of Expenditure over Income before Depreciation and Provisions on retirement benefits of employees (B-A)			14,01,32,417	(1,27,08,579)
Less : Depreciation	7		31,60,91,213	30,14,54,275
Less : Provision for Retirement Benefits				
Gratuity		7,35,08,684		6,15,269
Pension		1,84,79,42,207		3,24,85,081
Leave Encashment		14,62,67,627	2,06,77,18,518	6,32,02,979
Balance being deficit / (surplus) for the year trf to Balance Sheet			**2,52,39,42,148**	**38,50,49,025**

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Panapathy
Jt. Controller (Finance & Accounts)

Dr. Vedula V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE I – CAPITAL FUND

PARTICULARS	As at 31.03.2015		As at 31.03.2014	
CAPITAL FUND				
Balance at the beginning of the Year				
Add: Non Recurring Grant Utilised during the year for Capital Expenditure				
Add: Recurring Grant utilised for Capital Expenditure				
Add: Assets purchased from Donation				
Add: Assets purchased out of Sponsored Project Fund				
				-
Less: Deficit (surplus) Transferred from the Income & Expenditure Account				
Total				

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Panguluy
Jt. Controller (Finance & Accounts)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 2 - SCIENCE AND RESEARCH FUND

PARTICULARS	As at 31.03.2015	As at 31.03.2014
SCIENCE AND RESEARCH FUND		
Balance at the beginning of the Year	16,82,41,282	15,40,80,801
Add: Interest on Investment / FD	93,18,317	98,57,999
Add: Interest on Saving Bank A/c		
Add: Interest Accrued	60,70,484	43,02,640
Add: Other Additions		
Total (A)	**18,36,30,083**	**16,82,41,440**
Less: Revenue Expenditure	6,32,000	158
Less: Capital Expenditure		-
Total (B)	**6,32,000**	**158**
Balance at the Year end (A-B)	**18,29,98,083**	**16,82,41,282**

Balance at the end of the year represented by :

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Parapathy
Jt. Controller (Finance & Accounts)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

EDULE 3- EARMARKED OR ENDOWMENT FUND

in Rs.

PARTICULARS	As at 31.03.2015					As at 31.03.2014				
MARKED / ENDOWMENT FUND	DONATION	SAMJAL MISTRY	WORKSHOP & DMG	PROJECTS	TOTAL	DONATION	SAMJAL MISTRY	WORKSHOP & DMG	PROJECTS	TOTAL
e at the beginning of the Year	379,432,106	18,882,445	39,273,879	438,812,136	876,400,566	320,590,561	25,660,681	31,307,135	379,103,396	756,661,773
ns during the year	284,609,067		37,272,094	193,181,743	515,062,904	92,428,632		36,990,419	196,858,312	326,286,363
st on Saving / Bank FD received		1,057,802			1,057,882		1,775,659			1,775,659
ual		2,059			2,059		2,150			2,158
rojects				1,456,460	1,456,460				1,669,467	1,669,467
st on FD										
(A)	664,041,173	19,942,306	76,545,973	633,450,339	1,393,979,791	413,019,193	27,438,298	68,306,554	577,631,375	1,086,395,411
lisation / Expenditure towards objective of fund										
ue Expenditure	101,400,331	81	34,086,284	198,187,539	333,674,235	33,587,087	1,001,106	29,032,675	38,819,239	282,440,107
al Expenditure	7,516,954				7,516,954					
fer to Samjal Scholarship Account		768,072			768,072		2,603,082			2,603,082
fer to Samjal Patient welfare		768,071			768,071		4,951,656			4,951,656
(B)	108,917,285	1,536,224	34,086,284	198,187,539	342,727,332	33,587,087	8,555,845	29,032,675	138,819,239	289,994,845
g Balance at the end of the year (A-B)	555,123,888	18,406,082	42,459,689	435,262,800	1,051,252,459	379,432,106	18,882,445	39,273,879	438,812,136	876,400,566

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

SCHEDULE 4 - ACADEMIC FUND

in ₹

PARTICULARS	As at 31.03.2015	As at 31.03.2014
Opening Balance	6,18,74,750	6,40,63,937
Add :- Addition During the year	4,06,66,979	3,57,39,790
	10,25,41,729	**9,98,03,727**
Less : Deduction During the year	4,35,20,569	3,79,28,977
Total	5,90,21,160	6,18,74,750

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

SCHEDULE 5 - SECURED LOANS

in ₹

PARTICULARS	As at 31.03.2015	As at 31.03.2014
Loan from Housing Development Finance Corporation Limited (HDFC) (Secured by mortgage of dwelling units of the TMC's employees)	-	3,42,235
TOTAL	-	3,42,235

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Parupathy
Jt. Controller (Finance & Accounts)

Dr. Vedula V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 6 - CURRENT LIABILITIES AND PROVISIONS

in ₹

PARTICULARS		Year Ended 31.03.2015		Year Ended 31.03.2014
A) CURRENT LIABILITES & DEPOSITS				
Deposits				
- From Student	2,55,43,852		2,33,59,613	
- From Patient	90,85,77,138		75,78,47,946	
- From Suppliers & Contract	8,83,61,338	1,02,24,82,328	14,39,94,757	92,52,02,316
Other Current Liabilities				
Undisbursed and Unclaimed Salaries		21,36,446		37,84,455
New pension scheme liability		95,81,648		1,55,94,849
Sundry Creditors-Capital		2,42,23,152		16,97,05,167
Other Liabilities		6,39,58,430		4,50,83,998
Outstanding Expenses		72,02,65,575		54,57,74,091
Unutilised Grant from Govt of India c/f		37,60,56,000		36,51,16,000
TOTAL (A)		**2,21,87,03,579**		2,07,02,60,876
B) PROVISIONS(for retirement benefits of employee)				
Gratuity		67,70,33,382		60,35,24,698
Leave Encashment		87,52,75,584		72,90,07,957
Pension		7,84,13,82,157		5,99,34,39,950
TOTAL (B)		**9,39,36,91,123**		**7,32,59,72,605**
TOTAL (A+B)		11,61,23,94,702		9,39,62,33,481

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 7 - FIXED ASSETS

in ₹

DESCRIPTION	GROSS BLOCK				DEPRECIATION						NET BLOCK	
	Cost / Valuation as at the beginning of the year (01/04/2014)	Total Additions / adjustments during the year	Deletions / Adjustments	Cost / Valuation at the end of the year (31/03/2015)	As at the beginning of the year (01/04/2014)	Depreciation on the opening balance	Depreciation on Additions during the year	Total Depreciation during the year	On Deletion / Adjustment	Total upto the year end (31/03/2015)	As at the Current year-Ended 31/03/2015	As at the Previous year-Ended 31/03/2014
A. FIXED ASSETS :												
1. LAND:												
a) Freehold	1,97,608	-	-	1,97,608	-	-	-	-		-	1,97,608	1,97,608
2. BUILDINGS :												
a) On Freehold Land	1,49,10,62,340	5,90,68,246	9,21,63,564	1,45,85,67,031	15,21,55,285	1,15,43,050	85,29,860	2,00,72,910	-	17,22,28,301	1,28,63,38,730	1,33,89,06,965
3. PLANT MACHINERY & EQUIPMENT	3,69,53,90,316	86,61,97,360	9,53,91,571	4,46,61,96,105	1,72,80,58,440	15,83,80,456	10,07,72,120	26,91,61,596	3,25,64,557	1,96,46,56,487	2,50,15,39,619	1,96,73,30,866
4. VEHICLES	3,07,18,325	25,40,369	23,06,573	3,10,71,121	1,57,01,655	27,71,253	2,22,610	29,93,863	22,01,974	1,64,92,544	1,45,78,577	1,50,17,669
5. FURNITURE, FIXTURES	14,60,35,982	94,75,247	6,62,900	15,48,48,329	11,06,79,687	39,11,350	10,03,409	49,14,069	6,48,604	11,49,46,052	3,99,02,277	3,53,56,296
6. OFFICE EQUIPMENT	4,27,16,491	31,29,912	3,29,000	4,55,17,403	98,45,439	33,07,619	2,42,608	35,50,227	1,04,041	1,28,91,625	3,26,25,778	3,30,71,053
7. COMPUTER/ PERIPHERALS	33,40,00,150	6,27,22,299	33,000	39,75,98,449	26,55,00,207	60,36,422	95,61,221	1,55,97,643	50,997	28,08,66,854	11,67,29,595	6,85,00,943
TOTAL (A)	5,74,10,21,221	1,00,39,47,433	19,08,54,608	6,55,39,94,046	2,28,15,40,823	18,67,59,371	12,93,31,842	31,60,91,213	3,55,50,175	2,56,20,83,863	3,98,19,12,184	3,45,94,80,599
CWIP	91,65,03,427	1,91,42,97,928	1,10,61,55,459	1,72,46,40,896							1,72,46,40,896	91,65,03,427
LESS: PROVISION FOR DOUBTFUL CAPITAL ADV (LAND)	8,02,370			8,02,370							8,02,370	8,02,370
NET CAPITAL WIP (B)	91,56,98,057	1,91,42,97,928	1,10,61,55,459	1,72,38,38,526							1,72,38,38,526	91,56,98,057
TOTAL (A + B)	6,65,67,19,278	2,91,82,45,361	1,29,71,22,067	8,27,78,32,572	2,28,15,40,823	18,67,59,371	12,93,31,842	31,60,91,213	3,55,50,175	2,56,20,81,863	5,71,57,50,709	4,37,51,78,456
PREVIOUS YEAR (TMC)	5,69,36,54,447	1,26,41,65,273	26,51,00,442	6,65,47,19,278	2,09,17,78,388	19,98,06,894	3,15,63,000	30,14,54,279	2,16,91,833	2,28,15,40,823	4,37,51,78,455	3,60,18,76,…

1) Capital Work in Progress also includes freehold land amounting to Rs. 802,370 (previous year Rs. 802,370) which is disputed and hence provided for as doubtful in the financial year 2009-2010

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 8 - CURRENT ASSETS, LOANS AND ADVANCES

in ₹

PARTICULARS	As at 31.03.2015		As at 31.03.2014	
A. CURRENT ASSETS				
1. Inventories				
Stock of Drugs, Medical and Surgical Goods	19,16,89,298		15,09,57,010	
Stores & stationery	41,21,628	**19,58,10,926**		**15,09,57,010**
2. Sundry Debtors				
a) Outstanding more than six months				
Considered Good	4,67,51,081		3,43,33,003	
Considered Doubtful	3,30,07,425		3,90,92,555	
	7,97,58,506		7,34,25,558	
Outstanding less than six months				
Considered Good	19,29,08,706		31,03,25,780	
Considered Doubtful	-		-	
	27,26,67,210		38,37,51,338	
b) Less: Provision for Doubtful Debts	3,30,07,425	**23,96,59,785**	3,90,92,555	**34,46,58,783**
3. Cash Balances				
Cash in Hand	36,58,105		59,38,916	
Cheques on Hand	1,97,85,672			
Franking Balance	25,005	**2,34,68,782**	12,508	**59,51,424**
4. Bank Balances				
With Scheduled Banks :				
- Current Accounts	53,29,21,718		5,26,03,507	
- Fixed Deposit Accounts	2,33,34,83,067		2,55,79,85,060	
- Margin Money Deposit Accounts	36,66,04,000		25,63,00,000	
- Fixed Deposits Projects	43,05,28,902		45,71,36,328	
- On Savings Accounts	56,38,115	**3,66,91,75,801**	2,75,70,914	**3,35,15,95,809**
TOTAL (A)		**4,12,81,15,295**		**3,85,31,63,026**

contd....

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 8 - CURRENT ASSETS, LOANS AND ADVANCES

in ₹

PARTICULARS	As at 31.3.2015		As at 31.3.2014	
B. LOANS AND ADVANCES				
1. Advances recoverable in cash or in kind or for value to be received (unsecured, considered good)				
Considered Good	13,74,063		21,10,295	
Considered Doubtful	-		-	
	13,74,063		21,10,295	
Less: Provision for Doubtful Advances	-	**13,74,063**	-	21,10,295
b) Prepaid expenses		**1,84,54,922**		**1,88,07,262**
c) Other Deposits		**2,85,86,791**		**1,07,36,513**
c) Receivable from Govt of India				**4,43,000**
2. Loans & Advances to staff				
Interest Bearing Advances	**1,26,20,757**		1,60,51,158	
Non Interest Bearing Advances	**42,49,949**	**1,68,70,706**	88,30,532	**2,48,81,690**
3. Interest Accured				
Interest Accured on Fixed Deposits	9,66,68,827		10,30,18,794	
Interest Accured on Corpus Deposits	60,70,484		43,02,640	
Interest Accured on Sam Jal Deposits	9,44,537	**10,36,83,848**	16,61,643	**10,89,83,077**
4. Interest Accured but not due		**1,34,77,769**		
5. Tax Deducted at Source		**2,72,44,238**		**2,10,87,697**
TOTAL (B)		**20,96,92,337**		**18,70,49,534**
TOTAL (A+B)		4,33,78,07,632		4,04,02,12,560

G.D.APTE & CO. Chartered Accountants

31/7/2015

TATA MEMORIAL HOSPITAL ACCOUNTS DEPT. DATE- PAREL MUMBAI-12

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

SCHEDULE 9 - RECURRING GRANT

in ₹

PARTICULARS	As at 31.03.2015		As at 31.03.2014	
Balance at the beginning of the Year	(4,43,000)		-	
Add: Grant Received During the year	2,17,00,00,000		2,00,93,00,000	
Total	**2,16,95,57,000**		**2,00,93,00,000**	
Less: Grant Utilised for Captial Expenditure (A)	50,58,367		81,22,538	
Balance	**2,16,44,98,633**		**2,00,11,77,462**	
Less: Grant Utilised for Revenue Expenditure (B)	2,16,42,91,633		2,00,16,20,462	
Unspent Balance c/f		2,07,000		(4,43,000)

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 10 - INTEREST INCOME

in ₹

PARTICULARS		Year Ended 31.03.2015		Year Ended 31.03.2014
Interest : (gross) (includes tax deducted at source) from banks :				
on fixed deposits/ margin money deposits	22,71,25,500		27,23,13,458	
on saving accounts	1,31,088		90,059	
		22,72,56,589		27,24,03,517
from others :				
On mobilisation advance	4,69,521		5,21,096	
on Vehicle Advances	1,59,082		1,36,219	
on House Building Advances	34,82,402		36,58,665	
on Computer Advances	2,72,374		2,25,977	
		43,83,379		45,39,957
Interest accrued but not Due on staff Advances		1,34,77,769		
Income Tax Refund		-		-
Total		24,51,17,737		27,69,43,474

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

SCHEDULE 11 - OTHER INCOME

in ₹

PARTICULARS	Year Ended 31.03.2015	Year Ended 31.03.2014
Miscellaneous Receipts	4,73,12,328	5,16,40,358
Animal House Receipts	48,15,592	67,43,047
Project Overheads	74,02,483	51,12,904
Sundry balances written back(net)	-	-
Effect of exchange fluctuation (net)	(56,253)	(7,566)
Mobilisation Interest	469521	
TOTAL	5,99,43,671	6,34,88,743

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 12 - CONSUMPTION OF DRUGS & SURGICAL GOODS

in Rs.

PARTICULARS	Year Ended 31.03.2015	Year Ended 31.03.2014
Opening stock of Drugs / Surgical goods	150,957,010	144,062,810
Add: Purchases	1,843,975,489	1,558,562,328
Less: Closing stock of Drugs / Surgical goods	191,689,298	150,957,010
Less: Return/ Rejected / Expired Drugs / Surgical goods	10,777,273	8,392,318
TOTAL	1,792,465,928	1,543,275,810

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

Indira Panapathy
Jt. Controller (Finance & Accounts)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER.

SCHEDULE 13 - STAFF COST / SALARIES

in ₹

PARTICULARS	Year Ended 31.03.2015	Year Ended 31.03.2014
a) Salaries and Wages	89,89,71,078	81,39,39,626
b) Allowances and Bonus	1,39,91,42,174	1,27,87,44,589
c) Expenses on Employee's Retirement and Terminal Benefits	6,29,29,753	6,21,85,751
d) Pension scheme	24,68,97,767	20,86,48,855
e) Fellowships	24,47,69,643	15,66,70,812
TOTAL	2,85,27,10,415	2,52,01,89,633

TATA MEMORIAL CENTRE

TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

SCHEDULE 14 - OTHER ADMINISTRATIVE EXPENSES

in ₹

PARTICULARS		Year Ended 31.03.2015		Year Ended 31.03.2014
a) Linen and Laundry		4,11,93,420		3,43,40,254
b) Library Expenses		2,51,67,384		2,65,69,924
c) Electricity		29,03,43,556		24,58,59,031
d) Water Charges		1,47,15,135		1,28,88,114
e) Repairs and Maintenance		23,16,21,083		21,78,33,565
f) Animal House Expenses		26,90,194		29,95,966
g) Rates and Taxes		39,48,907		22,22,026
h) Minor Equipments and Replacement of Capital Equipments		5,06,799		16,32,446
i) Postage, Telephone and Communication Charges		64,57,960		62,19,399
j) Printing and Stationery		1,61,43,736		1,45,04,412
k) Travelling and Conveyance Expenses		2,07,93,775		2,61,95,659
l) Intra Mural Research Expenses		1,31,02,999		4,18,14,239
m) Cancer Registry Expenses		29,30,443		30,58,314
n) Auditors Remuneration				
Audit fees	3,00,000		3,00,000	
Service tax	56,000	3,56,000	49,440	3,49,440
o) Symposium and Training		22,29,137		30,12,930
p) Professional Charges		33,68,771		24,96,749
q) Advertisement Expenses		1,42,92,374		1,58,78,571
r) Provision for Doubtful Debts		(60,85,130)		4,42,493
s) Hostel maintenance expenses		1,25,11,644		1,01,92,837
t) Miscellaneous Expenses		5,30,82,725		6,29,78,819
u) Bad debts written off		-		7,43,831
TOTAL		74,93,70,912		73,22,29,020

As per our report of even date attached
For G. D. Apte & Co.
Chartered Accountants
ICAI Registration No. : 100515W

Partner : CA. Chetan R. Sapre
Membership No. : 116952
Mumbai

For and on behalf of the Governing Council

31/7/2015

Indira Parupathy
Jt. Controller (Finance & Accounts)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

TATA MEMORIAL CENTRE

[TATA MEMORIAL HOSPITAL AND ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER]

The Tata Memorial Centre (TMC), herein after called as the Centre, comprising of the Tata Memorial Hospital (TMH) and the Advance Centre for Treatment, Research& Education in Cancer (ACTREC) functions as a grant- in- aid Institute under the administrative control of the Department of Atomic Energy, Government of India and recognized as the national cancer centre with a mandate for Service, Education and Research in Cancer. Two new hospitals of the Centre in Vizag, Andhra Pradesh and Mullanpur District Punjab and one satellite centre in Sangrur District Punjab are being established. It is registered under the Societies Registration Act (1860) and the Bombay Public Trust Act (1950).

SCHEDULE A: SIGNIFICANT ACCOUNTING POLICIES

1. Basis of Preparation of Financial Statements

The financial statements are prepared on historical cost convention, unless otherwise specifically stated, on the accrual basis of accounting and comply with the framework and format laid down by the Controller General of Accounts, Government of India and applicable accounting standards issued by the Institute of Chartered Accountants of India (ICAI) to the extent applicable and in the manner so required.

Revenues and costs are accrued, that is, recognized as they are earned or incurred and recorded in the financial statements of the periods to which they relate. The Centre follows accrual basis of accounting, except for Grants, Donations, Workshops /Projects and Commuted Pensions (in case of existing pensioners), which are accounted for on cash basis

2. Use of Estimates

The preparation of the financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amount of assets and liabilities as of the Balance Sheet, reported amounts of revenues and expenses for the year ended and disclosure of contingent liabilities as of the balance sheet date. The estimates and assumptions used in these financial statements are based upon management's evaluation of the relevant facts and circumstances as on the date of the financial statements. Actual results may differ from those estimates. Any revision to accounting estimates is recognized prospectively.

3. Revenue Recognition

i) Hospital income from services rendered to patients is recognized as and when the bills for the services are generated.

ii) Interest income is recognized on a time proportion basis taking into account the amount invested and the rate of interest.

iii) Interest on employee advances are recognized in the year of its receipt where principal has been recovered. In respect of other cases they are recognized on accrual basis

iv) Other Revenue items are recognized only when it is reasonably certain that the ultimate collection will be made.

4. Fixed Assets and Depreciation

i) Fixed assets are capitalized at acquisition cost (net of duty / tax credits availed, if any), including directly attributable costs such as freight, insurance and specific installation charges for bringing the assets to working condition for use.

ii) Expenditure relating to existing fixed assets is added to the cost of the assets, where it increases the performance / life of the asset as assessed earlier.

iii) Fixed Assets are stated at cost less accumulated depreciation.

iv) Fixed assets purchased on Non government funded projects and from donations are transferred to the assets of the centre at purchase price.

v) Fixed assets are eliminated from financial statements only on disposal.

Depreciation on fixed assets is provided under straight line method based on useful life of the asset determined by the management at the following rates :

Asset	Rate of depreciation
Buildings	1.63%
Electrical & Gas Installation	4.75%
Plant & Machinery	7.07%
Furniture and Fixtures	9.50%
Office Equipment	4.75%
Computers and peripherals	16.21%
Vehicles - Buses	11.31%
- Car, Jeep	9.50%

i) Depreciation on assets purchased during the year is provided from the date of its purchase / installation

iii) Individual assets costing less than Rs.5, 000/- are expensed out in the year of purchase / WDV.

iii) Where any asset has been sold, the depreciation on such asset is calculated on pro-rata basis up to the date, on which such asset has been sold.

5. Inventories

i) Inventories consist of Drugs and Surgical meant for sale purpose are valued at lower of cost or Net Realisable Value. Cost is determined on first-in-first-out basis.

ii) Stock of consumables, stationery are valued at cost

ii) Stock of linen, laundry, cutlery and crockery, and spares are treated as consumed as and when purchased

6. **Government Grant**

i) Recurring grant related to the revenue are recognized on systematic basis in the income and expenditure account over the period, necessary to match them with the related costs which they are intended to compensate.

ii) Non recurring grants related to depreciable fixed assets are treated as deferred income, which is recognized in the income and expenditure account on systematic and rational basis over the useful life of the asset, i.e. such grants are allocated to income and expenditure over the periods and in the proportions in which depreciation on those asset is charged.

7. **Donation**

Donations in kind received prior to 1st April, 2003 are included under 'Earmarked / Endowment Funds' at comparable purchase price. With effect from 1st April, 2003 Donations received in kind are being recorded in the books at nominal value.

8. **Foreign Exchange Transactions**

a. Transactions in foreign currencies are recorded at the exchange rates prevailing on the transaction dates.
b. Monetary items denominated in foreign currencies remaining unsettled at the year end are translated at the year end exchange rates.
c. All exchange gains / losses on settlement / translation, are recognized in the Profit and Loss account

9. **Employee Benefits**

Short Term Employee Benefits:
All employee benefits wholly payable within twelve months of rendering the service are classified as short term employee benefits. Benefits such as salaries, wages, bonus, etc are recognized in the period in which the employee renders the related service.

Post Employment Benefits:

i) **Defined Contribution Plans:**
Employee benefits in the form of Contributory Provident Fund and New Pension Scheme (for employees joined from 1st January, 2004) are considered as defined contribution plans. The contribution paid / payable under the scheme is recognized in the period in which the employee renders the related service.

ii) **Defined Benefit Plans:**

Retirement benefits in the form of gratuity to eligible employees, leave encashment and pension scheme (other than employees covered in (i) above) are considered as defined benefit plans. The present value of the obligation under such defined benefit plans is determined based on actuarial valuation using the Projected Unit Credit Method, which recognizes each period of service as giving rise to additional unit of employee benefit entitlement and measures each unit separately to build up the final obligation.

The obligation is measured using at the present value of the estimated future cash flows. The discount rates used for determining the present value of the obligation under defined benefit plans, is based on the market yields on Government securities as at the Balance Sheet date, having maturity periods approximating to the terms of related obligations.

10. Provision, Contingent Liabilities and Contingent Assets

a. Provisions are recognized for liabilities that can be measured only by using a substantial degree of estimation, if

1. The Centre has a present obligation as a result of past event.
2. A probable outflow of resources is expected to settle the obligation.
3. The amount of obligation can be reliably estimated.

b. Contingent liability is disclosed in the case of :

1. A present obligation arising from past event, when it is not probable that an outflow of resources will be required to settle the obligation.
2. A possible obligation, unless the probability of outflow of resources is remote.

c. Provisions, Contingent Liabilities are reviewed at each Balance Sheet date.

11. Events occurring After the Balance sheet Date

Where material, events occurring after the date of the Balance Sheet are considered upto the date of approval of accounts by the members of the Governing Council.

12. Academic Fund

A percentage as prescribed by the Governing Council of Tata Memorial Centre is transferred from the Hospital Income to a separate fund named as the "Academic Fund". The expenditure incurred towards fulfillment of the objectives is debited to the said fund.

SCHEDULES FORMING PART OF ACCOUNTS

SCHEDULE B: NOTES ON ACCOUNTS

1. Contingent liabilities not provided for in respect of :
   Claims against the hospital made by patients are not acknowledged as debts, since the same are not quantifiable.

2. Estimated amount of contracts remaining to be executed on capital account and not provided for (net of advances) Rs. 2,42,23,152/- (Previous year Rs. 16,97,05,167/-)

3. Sundry debtors, and creditors' balances, and balances of certain liabilities are subject to confirmation, reconciliation and consequent adjustments, if any.

4. Fixed Deposits of the Centre includes an amount of Rs 3,666.04 Lakhs which represents Earmarked Funds kept aside for the immediate commitments for the next financial year.

5. **Change in accounting policy**
   - Centre has changed its accounting policy with respect to valuation of its inventory. Stores items which were treated as revenue items till previous year are included in closing stock due to which the expenses of Centre has been reduced by Rs 41,21,628/- and corresponding increase in the closing stock.
   - Centre has started recognizing "Interest Accrued but not Due" on employee advances. Accordingly the income of Centre has increased by Rs 2,08,04,680/- as Interest Accrued but not Due and corresponding increase in Current assets.
   - Fixed assets purchased on projects and donations during the year have been included in fixed assets at purchase value.
   - Accounts for Sam Mistry Fund and Science and Research fund which were treated separately have been included in the accounts of Centre from the current year

6. **Expenditure incurred for the projects under construction are as follows**

Name of Centre	Total expenditure incurred during the year	Total Income booked during the year
Homi Bhabha Cancer Hospital & Res. Centre, Vizag	69,11,43,168	13,00,541
Homi Bhabha Cancer Hospital & Res. Centre, Punjab	2,02,27,738	Nil
Homi Bhabha Cancer Hospital, Sangrur	14,10,91,796	Nil

7. Due to heavy rains on 19th June 2015 the stock of drugs and surgical goods amounting to Rs 1, 78, 23,571/- was damaged. However the Centre is claiming the same from the insurance company.

8. The Centre is covered by a system of internal audit conducted by the Department of Atomic Energy and Indian Audit and Accounts Department.

9. The Centre has filed a writ petition in the Honorable High Court Bombay for non-applicability of Bombay Labour Fund Act, 1956 in the year 2001-02, the final verdict for which is still pending. Each year the centre recovers the LWF amount from employees and also 5contributes towards the said liability amounting to Rs.49, 92,005/- respectively which is disclosed under current liabilities in the financial statement. The centre has also kept as deposit Rs.5, 50,000/- each with Maharashtra Labour Welfare Board and Hon'ble Bombay High Court.

10. The disclosures pursuant to Accounting Standard 15 (Revised) on "Employee Benefits" are as follows:

(in Rs.)
Defined Contribution Plan :
Contribution to Defined Contribution Plan, recognised as an expense and included in "Staff and Welfare" – Schedule 10 in the Income and Expenditure Account are as under : - Employers contribution to Provident Fund – Rs.28,01,295/- - Employer's Contribution to New Pension Scheme – Rs.3,71,21,859/-

			Gratuity	
			31-3-2015	31-3-2014
I	Change in obligation during the year			
	1	Liability at the beginning of the year	60,35,24,698	60,29,09,429
	2	Interest Cost	5,18,24,006	4,60,52,070
	3	Current Service Cost	1,25,66,990	1,48,00,969
	4	Past Service Cost	0	0
	5	Benefit Paid	(4,24,66,194)	(4,25,56,724)
	6	Actuarial (Gain)/Loss	5,15,83,882	(1,76,81,046)
	7	Liability at the end of the year	67,70,33,382	60,35,24,698
II	Net asset / (liability) recognised in the Balance Sheet			
	1	Liability at the end of the year	67,70,33,382	60,35,24,698
	2	Plan assets at the end of the year	0	0
	3	Liability recognised in the Balance sheet	67,70,33,382	60,35,24,698
III	Expenses recognized in the Income and Expenditure account			
	1	Current Service Cost	1,25,66,990	1,48,00,969

	2	Interest Cost	5,18,24,006	4,60,52,070
	3	Expected Return on Plan Assets	0	0
	4	Actuarial (Gain)/Loss	5,15,83,882	(1,76,81,046)
	5	Past service cost	0	0
	6	Total expenses recognised in the Income and Expenditure Account	11,59,74,878	4,31,71,993
IV	Principal actuarial assumptions at the Balance Sheet date:			
	1	Discount rate at	7.95%	9.05%
	2	Expected return on plan assets	0.00%	0.00%
	3	Salary escalation	7.00%	7.00%

General description of the defined benefit plan :

1	The Centre operates a gratuity scheme, which is a unfunded scheme for qualifying employees. The Scheme provides for lump sum payment to employees on retirement, death while in employment or termination of employment of an amount equivalent to 15 days salary for every completed year of service or part thereof in excess of six months, provided the employee has completed five years in service.
2	The Centre operates a leave encashment scheme, which is an unfunded scheme. The present value of obligation under this scheme is based on an actuarial valuation, using the Projected Unit Credit Method, which recognizes each period of service as giving rise to additional unit of employee benefit entitlement and measures each unit separately to build up the final obligation. Based on the actuarial valuation, the liability as at 31st March, 2015 works out to Rs. 87,52,75,584/-.
3	The Centre operates a Pension scheme which is an unfunded scheme for employees, who have joined prior to 1st January, 2004. The benefit is payable at the time of superannuation or voluntary retirement after completion of minimum of 20 years service. Based on the actuarial valuation, the liability as at 31st March, 2015 works out to Rs. 784,13,82,157/-.

11. Figures for the previous year have been regrouped / reclassified wherever necessary to make them comparable with those of the present year.

For G.D Apte & Co
Chartered Accountants
ICAI Registration No. : 100515W

Chetan Sapre
Partner
Membership No.116952

Date:
Place

For Tata Memorial Centre

Indira Pasupathy
Jt. Controller of Accounts (F & A)

Dr. Venkata V.P.R.P.
Chief Administrative Officer

Participation in 102nd Indian Science Congress held on 6th January, 2015,
at Bandra Kurla Complex, Mumbai.

Caring with Technology

TATA MEMORIAL HOSPITAL

E. Borges Marg, Parel, Mumbai - 400012, INDIA
Tel: 91-22-24177000, **Fax:** 91-22- 24146937

Email: medimail@gov.in
Website : http://tmh.gov.in

ADVANCED CENTRE FOR TREATMENT, RESEARCH AND EDUCATION IN CANCER

Kharghar, Navi Mumbai - 410210, INDIA
Tel: 91-22-27405000, **Fax:** 91-22- 27405085

Email: office@actrec.gov.in
Website : http://actrec.gov.in