

BREAST FELLOWSHIP - CURRICULUM

The goals of these fellowships are to provide comprehensive, multidisciplinary training to individuals committed to a career in breast surgical oncology. The fellowship training will provide a broad exposure to the full range of clinical problems encountered in a tertiary breast oncology practice. At the termination of a two-year fellowship, the candidate will have developed expertise to independently manage and treat breast cancer patients.

Training Program:

- a. Multidisciplinary management of breast cancer and evidence-based guidelines
- b. Appropriate stage-wise surgical management of breast cancer including conservative surgery
- c. Adjuvant systemic therapy and radiotherapy techniques
- d. Breast reconstruction – primary and late, latissimus dorsi, microvascular, oncoplasty and implant surgery
- e. Clinical care and counseling of women with breast cancer
- f. Clinical research methodology and its practical application in breast cancer research
- g. Basic Research Training: Introduction in concepts of basic laboratory research in breast cancer
- h. Management of metastatic breast cancer
- i. Supervised hands-on training in major and minor surgeries with maintenance of log book records
- j. Rotational posting in all related specialties in Radiotherapy, Radiology, Medical Oncology, Plastic Surgery, and Preventive Oncology.
- k. Palliative care and end-stage management of terminal patients

Project work: Every candidate will work on **one clinical (audit/research project) and one translational research** topic.

Training outline – 104 weeks – plan for **100 weeks**

50 – Didactic lectures (Syllabus below)

50 – Journal club / case presentations (Journals listed below)

General outline for training:

Every fellow will be allotted a **guide**.

The candidate will maintain a **log book** and get it signed by their respective teacher every month.

At the end of two years every fellow will have **at least two publications** in journals of repute and present at least one paper at a national and preferably at an international conference.

Outline training schedule:

First Six months: Fellow will attend a minimum of

Minor OT – 12 sessions – under supervision

OPD – 24 sessions

Major OT – Will assist for first three months

In next 3 months, will perform in major OT (assisted by a senior)

Modified radical mastectomy - 3

Breast conservation surgery – 3

Latissimus Dorsi Pedicle flap – 2

Will assist seniors in other cases and will maintain a log book which will be reviewed every month.

Second 6 months: Fellow will attend a minimum of Minor OT – 12 sessions

Will assist in supraclavicular lymph node dissection, Microdocheotomy, etc

OPD – Will work-up patients and present at a joint clinic.

Attend OPD with Medical Oncology consultant

Attend OPD with Radiation Oncology to learn planning and simulation.

In Major OT – will independently perform a minimum of (under supervision):

Breast conservation with reconstruction – 8-10 cases

Radical and Modified Radical Mastectomy – 8 cases

Oophorectomy – 2

Intravenous Port placement – 4

Final Year:

Minor OT: Will independently perform Microdocheotomy (at least 5) and all minor procedures in minor OT.

Major OT: Will independently perform all major surgeries (at least 20) including breast reconstruction with latissimus dorsi flap (at least 5), oncoplasty (at least 10) and assist in breast implant surgery.

Also assist the reconstructive surgeons in free microvascular flaps.

Will get acquainted with internal mammary cannulation, brachytherapy and high dose radiation brachytherapy implants

Out Patient Department (OPD):

Will work-up patients and present at the joint clinics (held 4 times in a week, 3 being multi-disciplinary)

Common Lectures or Course material or other training program during course curriculum:

1. Epidemiology and Biostatistics

1-5 September 2009

Introduction to computer environment and statistical computing

7-9 September 2009

Pubmed searching and basics of scientific writing

15-20 September 2009

Cancer epidemiology

12 Oct-12 November 2009

Biostatistics

July-Aug 2010

Clinical Research Methodology

2. Cancer Screening & Prevention

3. Oncosurg Course (June)

Course topics and Lectures: (Areas to cover)

1. Management of Early Breast Cancer including sentinel node biopsy
2. Locally advanced breast cancer
3. Recurrent breast cancer and Metastatic breast cancer
4. Evolution of breast cancer management

5. Systemic chemotherapy for breast cancer - principles governing use of chemotherapy, dose intensity & combinations, drug resistance, immune therapy etc
6. Neoadjuvant chemotherapy and hormonal therapy
7. Adjuvant hormonal therapy in breast cancer – premenopausal women, postmenopausal women
8. Radiation therapy for breast cancer
9. PET scan in breast cancer
10. Breast imaging and screening
11. Microarrays in breast cancer
12. Molecular biology – cell cycle, apoptosis, angiogenesis, invasion, metastasis, circulating tumor cells
13. Quality of life and breast cancer
14. Palliative care, pain management and Hospice
15. Targeted therapy – HER2neu, EGF, IGF, etc
16. Interventional Radiology
17. Biomarkers
18. Oncological emergency in breast cancer
19. Newer approaches – Stem cells, immune therapy, nanotechnology

Suggested Journals for reading:

New England Journal of Medicine (NEJM)
Journal of National Cancer Institute (JNCI)
Journal of Clinical Oncology (JCO)
Lancet Oncology
The Lancet
Cancer
Cancer Clinical Research
Breast
The Breast Journal
Mammology (Official Journal of IBG)
BMJ
British Journal of Cancer
Breast Cancer Research and Treatment

Suggested books for reading:

Sr. No	Title	Author	Publisher	Year
1.	Atlas of breast cancer	Hayes, Daniel F	Mosby	2000
2.	Atlas of breast imaging	Pant, C S	Jaypee	2002
3.	Benign disorders and diseases of the breast concepts and clinical management	Hughes, LE	W. B. Saunders Company	2000
4.	Breast cancer	Omar, Sherif	National Cancer Institute	2001
5.	Breast cancer - incidence, risk factors, and survival rates	Rao, DN	Tata Memorial Hospital	1999
6.	Breast cancer : cellular and molecular biology	Lippman, Marc E	Kluwer Academic Publishers	1988
7.	Breast cancer : present perspective of early diagnosis	Brunner, S	Springer Verlag	1987
8.	Breast cancer : treatment and prognosis	Stoll, BA	Blackwell Scientific Publications	1986
9.	Breast cancer management : application of clinical and translational evidence to patient care	Nabholtz, Jean-Marc	Lippincott Williams and Wilkins	2003
10.	Disease of the breast	Harris, Jay R	Lippincott Williams and Wilkins	2004
11.	The Oxford Textbook of Cancer			
12.	De Vita			
13.	Hospital cancer registry, Breast cancer incidence, Risk factors and Survival Rates	Dinshaw, K A	TMH	1999
14.	Breast imaging	Kopans, Daniel B	Lippincott Williams & Wilkins	2007
15.	Breast MRI: fundamentals and technical aspects	Hendrick R.E.	Springer	2008
16.	Diagnostic Imaging: breast	Berg, W.A.	Amirsys	2006
17.	Current perspectives in breast cancer	Mittra, I	Tata McGraw Hill Publications	1988
18.	The medical management of breast cancer	Williams, CJ	Castle House Publications	1987
19.	High-risk breast cancer : Diagnosis	Ragaz, J	Springer-Verlag	1989
20.	Early breast cancer from screening to multidisciplinary management	Morgan, MWE	Harwood Academic Publishers	1998
21.	Breast cancer screening	International Agency for Research on Cancer	International Agency for Research on Cancer	2002

Project work:

1. Clinical Research (audit/epidemiological study)
2. Translational Research (laboratory basic research)

Homi Bhabha National Institute (HBNI) Fellowship in Pulmonary Oncology

Duration: 2 years

Number of Fellowship Posts: One Fellow per Year (may be increased in subsequent years as per requirement and workloads)

Minimum Eligibility Criteria:

Indian National with Post graduate degree M.D. (Respiratory Medicine) or DNB (Respiratory Medicine). Candidates awaiting their results may also apply, however shortlisting would be subject to successful completion of the Postgraduate qualifying exam.

Aims:

To generate and fulfill the growing unmet need and demand across the country for Chest Physicians well trained in Pulmonary Oncology to work as a part of a Multi-Disciplinary Lung Cancer Team, as well as towards diagnosis and management of pulmonary complications arising as a result of all cancers and cancer therapy.

Outline of the Fellowship:

- Candidates will work in the Pulmonary Medicine Unit at Tata Memorial Hospital, rotate amongst the relevant Departments within Tata Memorial Hospital and ACTREC, Kharghar and participate in Multidisciplinary lung cancer Tumour Boards.
- The post will be a residential one with fellows having to attend to pulmonary references on an on-call basis
- The fellow will mandatorily have to undertake a research topic in respiratory medicine pertaining to cancer and final certification will be subject to completion of the same.
- The fellow will be expected to attend and participate in academic activities including clinical rounds, seminars, journal clubs, webcasts, didactic lectures as per the pulmonary oncology teaching programme schedule
- Periodic assessments will be conducted at the end of each 6 month term to assess theoretical and practical skills. This evaluation will be considered as internal assessment and will be proportionately incorporated in the final grading constituting 20 % of the same. The final fellowship certification will be issued after the successful completion of a theory and practical exit exam conducted at the end of 2 years.
- Leave will be granted as per HBNI guidelines for fellows

SCOPE of the Fellowship :

- To evaluate all patients referred to the Pulmonary Medical Unit
- To diagnose and manage pulmonary comorbidities in cancer patients.
- Diagnosis and management of pulmonary complications of cancer therapies.
- To stage and diagnose Lung Cancer and be well versed with the management of Lung Cancer
- Understand the indications and manage complications of chemotherapy and radiotherapy
- To diagnose and manage respiratory distress and respiratory failure in critically ill cancer patients in the ICU
- Diagnosis and management of respiratory Infections in the Immunocompromised Cancer patients including the Bone Marrow Transplant population.
- Train Fellows in the indications and interpretation of Thoracic Imaging and Bio-imaging modalities.
- Develop expertise in Interventional Pulmonology procedures like diagnostic and therapeutic adult and pediatric Bronchoscopy, Rigid Bronchoscopy, medical Thoracoscopy, EBUS and management of Central Airways Obstruction.
- Develop expertise in diagnosis and management of pleural pathologies related to malignancies including diagnostic pleurocentesis, medical thoracoscopy, insertion of intercostals drains, pig-tail catheters and indwelling pleural catheters, pleurodesis
- Develop experience and skills in the pre-operative pulmonary evaluation of high risk patients for major lung resection surgery. Understand the principles and role of surgical management of lung cancer and work in tandem with thoracic surgeons in assisting peri-operative respiratory care
- Gain an understanding of palliative and pain management of lung cancer and also ethical and end of life issues
- Tobacco cessation
- This Fellowship Programme does not meet requirements for a Certification in Medical Oncology

Proposed Syllabus and Curriculum :

1. General principles of the biology of thoracic cancers:
 - a. Carcinogenesis
 - b. Genetics, tumor suppressor and oncogenic genes and driver mutations in lung cancer
 - c. Tumor immunology
 - d. Tumor microenvironments
 - e. Mechanism involved in metastasis

2. Etiology and epidemiology
 - a. Epidemiology of lung cancer, global and in context with Indian subcontinent
 - b. Tobacco use and lung cancer
 - c. Asbestos related lung disease and cancers, industrial/occupational carcinogens
 - d. Air pollution (outdoor and indoor) and lung cancer
 - e. Chronic pulmonary inflammation and Precancerous/CIS lesions
 - f. Genetic susceptibility, gene-environment interactions

3. Pathology of intrathoracic tumours
 - a. Cytological and biopsy specimens for pathology/molecular analysis
 - b. Pre-invasive lesions for lung neoplasms
 - c. Pathology of lung neoplasm
 - d. Pathological classification and molecular pathology of nonsmall cell lung cancer
 - e. Pathology and molecular pathology of neuroendocrine and small cell lung cancer
 - f. Pathology and molecular pathology of mesothelioma
 - g. Mediastinal tumors
 - h. Interpretation of pathological reports

4. Clinical presentations
 - a. Signs and symptoms
 - b. Performance status
 - c. Syndromes and symptoms of locally advanced lung cancer
 - Airway obstruction
 - SVC syndrome, pancoast tumors
 - Pleural and pericardial effusions
 - Chest wall involvement
 - Lymphangitic spread
 - d. Lymphadenopathy
 - e. Paraneoplastic syndromes
 - f. Metastases
 - g. Co-existing / contributing diseases

5. Skills and Procedures

Skills to be acquired Mandatory	Preferable	Observed
Diagnostic bronchoscopy- a. Bronchial washings b. Broncho-alveolar lavage c. Biopsies including endo-bronchial and trans-bronchial lung biopsies d. Trans-bronchial needle aspiration e. EBUS -TBNA	Rigid bronchoscopy Airway management including therapeutic endoscopy Use of electrocautery, lasers, stent insertion	CT guided / USG guided biopsies Mediastinoscopy Open lung biopsies VATS Lobectomy Pneumonectomy
Pleurocentesis		
Intercostal drains		
In-dwelling/pig-tail pleural catheters		
Pleurodesis		
Medical thoracoscopy and pleurodesis		

6. Imaging and bio-imaging/ nuclear medicine

- Interpretation of Chest radiograph, Computed tomography, PET and PET-CT, Ultrasound, Bone scanning, Magnetic resonance imaging

7. Clinical and pathological staging

- TNM description
- T description
- N description
- M description
- Stage grouping

8. Functional and pre-operative respiratory evaluation

- Interpretation of pulmonary function tests, spirometry, diffusion capacity, lung volumes and their role in pre-operative respiratory fitness
- 6 minute and shuttle walk tests
- Ventilation –perfusion scan
- Cardio-pulmonary exercise tests
- Optimization of respiratory functions pre-operative and management of respiratory co-morbidities

9. Prognostic factors /predictive markers

- a. Clinical and staging
- b. Histopathological factors
- c. Molecular markers
- d. Co-morbidities

10. Principles of thoracic surgery

- a. Oncologic principles of surgery for lung tumours and surgery in the context of multi-modality treatment
- b. Indications, contra-indications pre-operative evaluation for lung cancer surgery
- c. Surgical procedures and techniques
- d. Peri-operative management of patients undergoing thoracic surgery
- e. Management of complications of lung surgery
- f. Palliative surgical procedures
- g. Surgery for synchronous and metachronous cancers,
- h. Surgery for oligo-metastatic lung cancer
- i. Diagnostic, curative and palliative surgery for mediastinal tumors
- j. Curative and palliative surgery of malignant mesothelioma
- k. Pulmonary metastases from other sites and its management

11. Management of surgical complications

- a. Pain control
- b. Post-operative pneumonia: diagnosis, treatment and prevention
- c. Empyema, space infections and broncho-pleural fistula

- d. Prolonged air leak
- e. Post operative bleeding
- f. ARDS
- g. Cardiac complications

12. Principles of radiation therapy

- a. Radiotherapy planning and techniques
- b. Indications and contraindications for radiotherapy
- c. Thoracic radiotherapy with curative intent for lung cancer
- d. Thoracic palliative radiotherapy
- e. Prophylactic, therapeutic and palliative cranial irradiation
- f. Stereotactic ablative radiosurgery
- g. Palliative radiotherapy for other metastatic sites
- h. Management of pulmonary side-effects of radiation therapy

13. Principles of systemic therapy

- a. Basis and principles of cytotoxic and biological therapy for lung cancer
- b. Indications, contraindications for systemic therapy chemo and targeted agents
- c. Chemotherapy and immuno / targeted therapy for NSCLC
- d. Chemotherapy and immuno/targeted therapy for SCLC
- e. Systemic therapy of mesothelioma
- f. Systemic therapy for mediastinal tumours
- g. Newer/novel agents

14. Side-effects of systemic therapy and their management

- a. side-effects of chemotherapy for lung cancer
- b. side effects of targeted agents
- c. quantification of side-effects and their management
- d. Diagnosis and management of pulmonary complications of chemotherapy/targeted therapy in patients with cancers other than lung

15. Opportunistic infections

- a. Symptomatology and clinical and radiological presentations of pulmonary opportunistic infections in the immunocompromised host in relation to cancer and cancer therapy
- b. Performance and interpretation of diagnostic tests for opportunistic respiratory infections
- c. Treatment and management of respiratory infections in lung and other cancer patients

16. Combined modality treatments
 - a. Adjuvant chemotherapy for early NSCLC
 - b. Neo-adjuvant chemotherapy for early NSCLC
 - c. Combined radio-chemotherapy for locally advanced NSCLC
 - d. Combined radio-chemotherapy for limited SCLC
 - e. Combined treatment for mesothelioma

17. Management of particular groups of patients
 - a. elderly
 - b. poor performance status
 - c. co-orbidities
 - d. co-existent HIV infection
 - e. Pre-cancerous and pre-invasive lesions

18. Treatment evaluation and follow-up of Solitary Pulmonary Nodule
 - a. definition and radiological features
 - b. Evaluation, diagnostic and risk algorithm
 - c. Management of SPN

19. Treatment evaluation and follow up
 - a. Survival/progression-free survival
 - b. Response assessment
 - c. Quality of life/symptom improvement
 - d. Follow up protocols

20. Management of specific condition in lung cancer
 - a. Management of dyspnoea and respiratory failure
 - b. Management of malignant airway obstruction
 - c. Management of superior vena cava syndrome
 - d. Management of paraneoplastic syndromes
 - e. Malignant pleural effusion
 - f. Malignant pericardial effusion
 - g. Management of bone metastases

21. Supportive care
 - a. Pain management
 - b. Nutritional support.
 - c. Indications and management of intervascular stent and catheters
 - d. Psychological support for the patient and family
 - e. Rehabilitation
 - f. End-of-life care
 - g. Communicating with the patient
 - h. Patient education

22. Intensive care
 - a. Management of the critically ill lung cancer patient
 - b. Assessment, diagnosis and management of respiratory conditions requiring critical care support in cancer patients

23. Preventive pulmonary oncology
 - a. Tobacco awareness and patient education
 - b. Tobacco cessation clinics
 - c. Industrial and occupational health and safety

24. Methodologies for clinical practice and research
 - a. Study design and phases
 - b. Statistical analysis
 - c. Evidence based decision
 - d. Guidelines assessment and application

25. Ethics
 - Ethical issues and conflicts of interest

26. Economic considerations in lung cancer treatment
 - a. Quality-adjusted life-year (QALY)
 - b. Principles of cost-effectiveness of chemotherapy, targeted therapy, surgical therapy and radiotherapy
 - c. Cancer registries

Faculty and Departments

1. Pulmonary Medical Unit, Tata Memorial Hospital(TMH)
2. Thoracic DMG, Department of Thoracic Surgery , Tata Memorial Hospital
3. Departments of Adult and Paediatric Medical Oncology, TMH and BMT, ACTREC
4. Department of General Medicine, TMH
5. Departments of Radiology and Interventional Radiology, TMH
6. Department of Nuclear medicine, TMH
7. Department of Radiation Oncology, TMH
8. Department of Anesthesia, Critical Care and Pain, TMH
9. Department of Pathology, TMH and ACTREC
10. Basic Sciences ACTREC
11. Department of Microbiology, TMH
12. Department of Palliative Medicine, TMH

Curriculum for Onco-Anaesthesia and Pain Fellowship

Anaesthesia

Theory and Practice of Anaesthesia and Pain in Cancer patients

Basic Sciences:

1. Impact of cancer on normal physiology
2. Anatomical characteristics of cancerous lesions with their implications for surgical dissection and anaesthesia management
3. Molecular mechanisms of cancer and impact of anaesthesia techniques and drugs on cancer pathophysiology
4. Pharmacology of chemotherapeutic agents and their anaesthetic implications and drug interactions

Clinical Anaesthesia

1. Preoperative assessment of cancer patients
2. Complications of cancer and cancer therapy i.e. chemotherapy, radiotherapy and surgery and their effect on perioperative care
3. Difficult airway management in patients with airway cancers including fiberoptic intubation and emergency airway techniques
4. Management of massive blood loss
5. Anaesthesia for diagnostic procedures e.g. direct laryngoscopy, bronchoscopy, gastrointestinal scopy, cystoscopy, bone marrow biopsies, etc
6. Anaesthesia for interventional radiological procedures e.g. radio frequency ablation, tumor angioembolisation, CT guided biopsies, etc
7. Anaesthesia for cancer surgeries at various anatomical sites
 - a. Head and neck : Commando procedure, total thyroidectomy, laser resections, etc
 - b. Thoracic e.g. oesophagectomy, lung resections, tracheal resection, etc
 - c. GI : Whipples procedure, radical cholecystectomy, gastrectomy, etc
 - d. Bone and soft tissue : Joint replacement, Pelvic orthopaedic resection, etc
 - e. Breast surgeries
 - f. Reconstruction surgeries including free tissue transfers
8. Anaesthesia for minimally invasive procedures such as laparoscopic resections, VATS, TURBT, endoscopic ENT resections, etc
9. Day care anaesthesia for radiotherapy procedures, short diagnostic and therapeutic surgical procedures.
10. Post anaesthesia care in cancer patients
 - a. Management of post-operative pain including use of epidural infusions of local anaesthetics, epidural opioids, patient-controlled epidural analgesia, intravenous patient-controlled analgesia and multi-modal therapy
 - b. Recognition and management of complications in the early post-operative period

- c. Management of fluid and electrolyte balance and blood and blood product therapy
 - d. Invasive and non-invasive monitoring of various systems like the respiratory, cardiovascular and central nervous system
 - e. Principles and practice of invasive and non-invasive mechanical ventilation
 - f. Prevention, recognition and management of post-operative organ dysfunction
11. Infection control techniques in OT and PACU

Skills :

Airway

- Fibre optic intubation, retrograde intubation, blind nasal intubation
- Use of airway aids such as gum elastic bougie, video laryngoscopes, various laryngeal mask airways

Regional anaesthesia techniques

- Use of nerve locator and ultrasound for localizing neural structures for regional blocks e.g. brachial plexus block, femoral and sciatic blocks
- Thoracic and lumbar epidural anaesthesia, combined spinal epidural anaesthesia

Vascular access

- Arterial cannulation with institution of continuous pressure monitoring and cardiac output monitoring
- Use of ultrasound for central venous access.

Pain

To understand theory and practice of acute and chronic pain

1. To know anatomy, physiology and psychology of pain and pain perception with special reference to cancer pain
2. To learn the advantages of and indications of postoperative pain management in cancer surgeries
3. To learn current pain management techniques, including physiology, pharmacology, modes of delivery, indications, benefits and contraindications of oral intramuscular, and intravenous narcotics and patient controlled analgesia.
4. Assess and manage patients with chronic cancer pain as per the WHO pain ladder
5. To learn the techniques, assessment, risks, benefits, complications and contraindications to bolus and continuous infusion of intrathecal and epidural narcotics and the signs and symptoms of overdose and side effects, including treatment of it.
6. To learn importance of available adjuvant for post operative pain relief including antidepressant therapy, hypnotic therapy and anxiolytic therapy

7. To learn the indications for consultation of multidisciplinary specialties e.g. neurosurgery, orthopedics, neurology, psychiatry, rehabilitation medicine and social services in the management and treatment of chronic pain
8. To learn techniques, indications, risks benefits and complications of sympathetic nervous system blockade, special consideration for sympathetically mediated pain
9. Knowledge of cancer pain syndromes, diagnostic and therapeutic interventions and interactions with other disciplines to manage chronic pain
10. To learn special consideration in the management of malignant pain viz. use of oral and transdermal opioids, use of neurolytic blocks and radiofrequency ablation in cancer pain syndromes, issue of death and dying
11. To learn in- patient management of cancer pain
12. To learn pain management in children with cancer
13. Understanding role of patient education and awareness in management of pain
14. Introduction to palliative care including symptom control, counselling and end-of-life issues
15. Planning home care, hospice and end of life care for terminally ill patients

Skills

1. To develop skill of assessment of cancer pain in acute pain setting
2. Neuroaxial catheters, perform regional anaesthesia and nerve blocks for post operative continuous pain control – use of ultrasound for blocks
3. Recognise the side effects and manage the side effects and complications of neuroaxial and IV administration of narcotics or LA.
4. Operate and program drug infusion pumps
5. Provide appropriate documentation of patient care
6. Conduct acute pain management rounds
7. Co-ordinate and operate an acute pain service through working with nursing, pharmacy and hospital administration

Academic Activities

1. Didactic Lectures : Once a week
2. Seminar : Once every fortnight
3. Case Presentation : Daily to OT consultant
4. Ward Round : Acute and chronic Pain Service

General

- Understand evidence –based medicine and critical appraisal of published papers
- Exposure to clinical research, ethical and legal aspects of anaesthesia practice.
- Participation in regional and national CME's, seminars and conference in anaesthesia

- Undertake at least one research project during the 2 year course period
- Atleast one presentation at national / international conferences and publication of at least 1 paper in a peer reviewed journal during the 2 year course period
- Affiliation with anaesthesia organizations is desirable

Syllabus Orthopedic Oncology fellowship HBNI

The HBNI accredited Musculoskeletal **Oncology** fellowship provides comprehensive training and skill development for managing benign, **malignant** and metastatic diseases affecting the musculoskeletal system. It is a surgical fellowship that **combines** clinical care of inpatient, outpatient, emergency and elective cases, didactic teaching **sessions**, exposure to regional, national and international conferences, opportunities for **basic science** and clinical research and guidance for peer reviewed publications.

Program objectives:

To instill the ethos of practicing **evidence based management** and to train the candidates in all relevant disciplines of orthopaedic **oncology including**

- Diagnosis
- Surgery
- Reconstruction and rehabilitation
- Radiation
- Chemotherapy
- Palliative care
- Clinical research methodologies
- Basic research
- Tissue Banking

Specific Learning Objectives:

- General principles of bone and soft tissue tumors including tumor **classification, staging and** prognosis and clinical evaluation
- General principles of epidemiology with specific emphasis on the epidemiology of bone and soft tissue tumors
- Principles of tumor biopsy and their applications
- Knowledge of specific tumor histology
- Outline of treatment plan for specific tumors including the selection of the surgical procedure, chemotherapy and radiotherapy
- Knowledge of the indication, benefits and complications of the different reconstruction alternatives used in tumor surgery.
- Surgical training to include the safe performance of the various surgical procedures relevant to orthopaedic oncology.
- Knowledge of the specific prognosis of bone and soft tissue tumors accounting to staging, treatment and complication.
- Management of the complications of cancer treatment relevant to orthopaedic oncology
- Reconstructive procedures in orthopaedic oncology
- Principles of treatment in metastatic bone disease including palliative care and pain control
- Knowledge about quality of life, function and health status for the bone and soft tissue tumors population
- Ability to identify and answer the specific needs of cancer patients including those at palliative stage
- Ability to show empathy, availability, support and compassion to patients and family.
- General principles of patient rehabilitation

- Principles and basics of tissue **banking** including graft harvest , processing, storage, usage and documentation

The above objectives are achieved by a **structured training program** as detailed below

Schedule:

- The week has 3 minimum **days for surgery** (Monday, Wednesday, Friday, every alternate Saturday) and 2 and a half **outpatient days** (Tuesdays, Thursdays and half day on Fridays)
- Biopsy OR is scheduled at the **end of each OPD** - Tuesday and Thursday
- Minor OR for biopsies and minor **inyerventions** is scheduled on Fridays.
- Daily clinical rounds
- Each Tuesday a multidisciplinary **joint outpatient clinic** for treatment decisions with participation from pathology, **radiology, nuclear medicine**, medical, radiation and surgical oncology.
- Thursday evenings a radiology, **pathology, surgeon joint clinic** for cases with diagnostic dilemmas
- Every alternate Saturday morning a **journal club**
- A panel session coordinated and conducted by residents is held frequently on Saturday mornings

Practical and Clinical Training:

Fellows regularly assist and perform major and minor surgeries under the supervision of the concerned consultants. They keep a log book of the procedures performed and assisted which are monitored by the consultant.

Conference presentations & publications:

various local, national and regional conferences date the calendar year. Fellows are encouraged to present work under the guidance of faculty at these. Tata Memorial Centre prides itself on high quality abstracts, a large proportion of them converting to publications and fellows are encouraged to actively participate in these efforts.

Evaluation:

The fellowship has periodic work based assessment, appraisal exams at regular intervals and a final exit exam at the end of 2 years.

DEPARTMENT OF RADIATION ONCOLOGY

Tata Memorial Hospital & Homi Bhabha National Institute

IMRT-IGRT Fellowship Programme

The Department of Radiation Oncology at the Tata Memorial Centre offers a **two-year fellowship for advanced training in high precision radiotherapy.**

Program Objective

To impart focused and specialized training in the use of high precision radiation techniques through evidence based Radiation Oncology.

Selection criteria:

- Candidate should have passed his/ her MD (RT)/ DNB (RT) course from a MCI recognized department.
- The candidate will have to be registered with the MMC/ MCI for the duration of the course.
- If employed, candidate should provide a 'No objection' certificate from the current employer.
- Candidates with one-year clinical experience post MD/DNB from an academic center will be preferred.

Should be committed to completing the course.

Course details:

The fellowship programme aims to develop core clinical competency in advanced radiation therapy techniques. Individualized modular rota is prepared for selected candidates to ensure adequate training in the management of various disease sites, keeping with the institutional mandate. During the course of the programme, fellows are provided opportunity to expand their aptitude in various processes of radiation therapy procedures. This includes developing knowledge and proficiency in (not limited to)-

- Modern treatment delivery hardware and software
- Patient setup and immobilization techniques
- Imaging modalities for target volume and organ-at-risk (OAR) determination and delineation
- Dose prescription for specific clinical sites
- Treatment planning and delivery Techniques
- Plan evaluation and quality assurance
- Treatment verification imaging/dosimetry
- Evidence based medicine and new technology

During the rotation, each candidate is assigned to a faculty member, to shadow him/her. In addition, a designated faculty member will act as mentor for the candidate for the duration of the programme. As part of the training, the candidate has to attend routine out-patient clinic, Joint clinics (tumour board meeting), observe and take part in the decision making for the use of radiation therapy in various disease sites. The hands-on training allows the candidates to examine and treat patients under the supervision of a staff member.

They are also encouraged to participate in academic activities carried out in the department as part of the routine post graduate training of the department and other academic activities (including workshops and conferences) in the Institute. Fellows are allowed access to the institutional library and digital library after due registration. Provision may be made to allow candidates to pursue a specific disease site or procedure, if they express interest, subject to availability.

Periodic appraisal meetings are conducted to evaluate progress and also to obtain feedback of any challenges that may be experienced by the candidate.

The candidate is also expected to pursue a project under the guidance of the mentor, and submit the same at the end of 2 years. They are also expected and encouraged to publish this work in a peer reviewed journal and present in National/ International meetings.

For the successful completion of the training programme, candidates are required to appear and clear a theory and practical assessment examination.

Selection process

Consideration of fellowship candidates occurs each year in July for a start date of first of August. The departmental selection interviews candidates and extends offers based on the outcomes from the interviews.

Duration: 24 months (2 years) starting August of each year.

Fees: 1st year: Rs. 100,000 per annum

2nd year: Rs. 80,000 per annum

Stipend: 1st year: Rs. 65,000 per month

2nd year: 67,000 per month

Boarding & Lodging:

No accommodation is provided. Candidates will have to make their own arrangements. They can make use of the cafeteria on campus on payment of monthly charges.

How to Apply

If you are interested in applying, visit the website: tmc.gov.in for more details.

SURGICAL ONCOPATHOLOGY FELLOWSHIP - CURRICULUM

The Department of Pathology offers a two-year fellowship in surgical oncopathology. The Tata Memorial Hospital, Parel, Mumbai (primary) and ACTREC, Navi Mumbai (secondary) are the sites of fellowship training.

GOAL:

The goal of this fellowship is to combine in-depth training in various subspecialties of surgical oncopathology with opportunities for conducting related research, and provide a basis for a future career in academic oncopathology. The two-year fellowship program provides broad exposure and experience in all aspects of surgical oncopathology with a focus on managing cases and communicating with clinicians while developing the confidence to tackle independently the day to day responsibility of a practicing surgical oncopathologist.

Training Program:

The training program encompasses:

1. Grossing of routine and complex surgical oncopathology resection specimens.
2. Reporting of surgical oncopathology biopsies, including bone marrow biopsies
3. Pathologic reporting of routine and complex surgical oncopathology resection specimens
4. Frozen section reporting
5. Reporting of fine needle aspiration cytology, included image-guided
6. Interpretation of immunohistochemistry
7. Rotational posting in Immunohistochemistry laboratory for quality assurance and standardisation
8. Histochemistry applications in oncopathology for quality assurance and standardisation
9. Rotational posting in molecular pathology laboratory for acquaintance with basic techniques
10. Clinical research methodology and its application in oncopathology research
11. Accreditation and quality assurance related programs

Training schedule outline:

Sequence	Rotation
3 months	JR posting
3 months	SR posting
3 months	Subspeciality 1
3 months	Subspeciality 2
1 month	Research
3 months	Subspeciality 3
3 months	Subspeciality 4
1 month	Research
1 month	IHC lab
2 month	Molecular lab

1 month	Completion
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JR posting entails rotation in grossing, frozen section, FNAC, biopsy reporting and resection specimen reporting.

SR posting entails rotation in grossing, frozen section, FNAC, biopsy reporting and resection specimen reporting and an additional handling of consultation cases, review cases, immunohistochemistry positive and negative controls and requisitions for molecular lab.

Graduated responsibility: In the last month of SR posting, the fellow will be give a 15 day period of supervised sign-out. During a sign-out weeks, the fellow would review cases and make diagnoses independently (reviewing with residents). The staff will review the cases during a one-on-one session and reassess the original diagnoses. This will amount to about 2 to 3 hours of didactic teaching. After evaluation of the progress of the fellow, she/he will be progressively allowed to sign out independently .While covering for SR posting, the fellow is expected to perform literature searches and review articles when appropriate to address questions about current reporting cases and also to develop ideas for projects.

The subspecialty1-4 will be allotted to the fellow by rotation by the HOD of department.

During the two year period, the fellow is expected to undertake a minimum (independent) sign-out in:

- Routine reporting 50 cases
- Biopsy reporting
 - (non-IHC) 50 cases
 - (IHC) 50 cases
- Frozen section 25 cases
- FNAC 25 cases

Rotation in histology lab, IHC lab and molecular lab is aimed at gaining firsthand experience in lab techniques and quality assurance.

Educational activities

The fellow will be expected to *attend all* educational activities of the department. This includes:

- Weekly class by JR

- Weekly seminars by SRs
- Weekly Journal clubs
- Weekly Slide meets
- Weekly Gross meets
- Invited Guest lectures
- Monthly senior surgical meets
- Monthly TPC meetings
- TMH conferences
- Annual EBM meeting

During the two year period, the fellow is expected to *undertake* a minimum of:

Gross meets (including museum specimens) 10

Journal clubs 5

Slide meets 5

Seminar 4

The fellow will be expected to participate in all educational activities of the subspecialty group when posted for a subspecialty rotation, including but not limited to academic meetings, journal clubs, and various conferences with clinicians.

The fellow has the opportunity to present cases or papers at local, national and international conferences. Fellows are expected to present a minimum of one paper at an annual national or international conference.

The fellow is expected to be involved in day-to-day teaching of residents.

Additional responsibilities of the fellow

- Preparing monthly rotation for JR and SR
- Ensuring smooth functioning of lab especially during periods of manpower crunch
- Archiving of gross specimen photographs
- Updating charts of museum specimens
- Assisting in preparing monthly assessment questionnaires for junior residents
- Assist in exam related activities

Research/Projects:

The fellow is actively expected to initiate research projects during subspecialty postings. The department offers ample opportunities for special studies including extensive availability of immunohistochemistry and molecular diagnostics. Translational and/or clinical research may also be undertaken as part of the ongoing investigative programs in the Department of Pathology.

A fellow is expected to have published in a reputed journal a minimum of one original paper and two case-reports/ brief studies at the end of fellowship.