MVR CANCER CENTRE AND RESEARCH INSTITUTE

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FELLOWSHIP IN HIGH PRECISION RADIATION ONCOLOGY (FHPRO)

INTRODUCTION

A fellowship in Precision Radiation Oncology is essential to train radiation oncology specialists in cutting-edge techniques like IMRT, VMAT, SRS/SBRT, image based brachytherapy and adaptive radiotherapy, ensuring precise tumour targeting while minimising toxicity. This has become the gold standard of care in radiotherapy today.

This program equips young radiation oncologists with the skills to optimise individualised treatment plans in a variety of challenging clinical situations and tumour sites, both benign and malignant, using cutting edge treatment platforms. It also provides a launchpad to the future of precision radiation oncology, which lies in AI-driven, real-time adaptive treatment, integrating molecular imaging for personalised ultra-precise treatment, Biology guided radiotherapy BgRT, FLASH radiotherapy and integration with immunotherapy and nanotechnology.

With this goal in mind, we have initiated an institutional fellowship by MVRCCRI academy, intended to guide the candidate on decision making and execution of high-end radiation treatments as per the current protocols, with utmost precision and confidence.

Name of the programme- FHPRO (Fellowship in High Precision Radiation Oncology)

Duration of programme - 1 year

Number of seats - Two

(This fellowship does not carry any recognition by any universities or regulatory bodies as yet.)

ELIGIBILITY

1. The candidate should possess an MD / DNB degree in Radiation Oncology
2. Candidate should have valid State Medical Council / NMC registration certificate

Eligible candidates should submit their Curriculum Vitae with relevant certificates, by Email to **academy@mvrccri.co** along with an Application Fee of **Rs 1500/-**. For any further clarification on the application process, please contact **+91 7012635146** during working hours. The selection will be based on an online screening test and/or personal interview.

ABOUT OUR INSTITUTE

The Department of Radiation Oncology at MVR Cancer Centre and Research Institute, Calicut is the premier stand-alone oncology institution in the private sector. Our institute is located at Chooloor, Kozhikode, Kerala in a tranquil, eco-friendly 17-acre campus with a scenic, hilly landscape.

Our institution was started in 2017 and caters to more than 1,00,000 patients annually. The Radiation Oncology Department alone has an outpatient footfall of more than 24,000 patients annually and offers radiation treatments to more than 2000 new patients every year

The modalities offered in the Radiation Oncology Department apart from regular 3DCRT /IMRT /IGRT are

1. SRS /SRT of brain lesions
2. SBRT for Liver, Prostate, Lung, Pancreas, Bone & Spine, Nodal, Coeliac plexus etc
3. TBI / TMLI
4. Radiotherapy for Benign Conditions
5. Brachytherapy: Image Guided Intra cavitary, ILRT, Contact and Interstitial Implants.

Fellowship Objectives

- Theoretical basis and biological rationale of high precision radiotherapy techniques.
- Exposure to a full time precision radiation oncology clinic
- Practical and finer aspects of modern radiotherapy treatment planning including immobilisation, simulation, image acquisition, co-registration and volume delineation.
- Protocols of image segmentation, including both organs and target volumes in accordance with the ICRU guidelines.
- Multi-disciplinary team related projects
- Stimulate clinical and translational research protocols in areas of high priority

Structural Orientation of the Fellowship

- Rotational Postings in site wise units.
- OP and IP consultations with guidance on decision making.
- Structured lectures by the faculty members.
- Journal Club.
- New trials watch.
- Contour review.
- Plan review and Plan approval strategies.
- Treatment execution and verification.
- Online/Offline Adaptive planning.
- Re-irradiation strategies.
- Chart rounds.
- Radiation Oncology Forum discussions.
- Multi-disciplinary tumor boards.
- Project Work: One or more projects/research work to be completed within a span of 1 year.
- Conference participation: at least 2 national or international with poster presentations.

CURRICULUM

Introduction to High Precision Radiation Oncology

- History of conformal radiotherapy, rationale behind high precision radiotherapy, potential advantages and limitations .
- Imaging modalities for High Precision Radiotherapy: Special points to note while imaging, MRI and special MRI sequences for treatment planning, PETCT and basics of PETCT based target delineation, Introduction to DICOM and DICOM-RT standards.

- Image manipulation for HPRO: Importing and exporting images for treatment planning, Creating 3D image datasets, Image registration principles and methods. Deformable and non-deformable image registration, Introduction to image registration algorithms.
- Patient positioning and immobilisation.
- Volume delineation in HPRO.
- Revision of the ICRU concepts in Radiotherapy treatment planning, Review of important ICRU reports - 50, 64 and 78, Tools for image segmentation, Choosing the appropriate window and MRI sequence for image delineation, Target volume and OAR delineation protocols according to established guidelines, Creating a PTV.

Practical Radiation Oncology Treatment Planning

- Preliminary steps and checks to be made prior to starting treatment planning, Image manipulation prior to treatment planning, Use of accessories and treatment aids (e.g. bolus).
- Fluence and intensity: Techniques for obtaining a modulated fluence in a treatment field, Concept of the BEV, Principles of optimisation in radiotherapy, Inverse planning and optimisation algorithms, Dose calculation algorithms .
- Plan evaluation techniques: Understanding the Dose Volume Histogram, Understanding VMAT treatment delivery and optimisation.
- Quality Assurance for HPRO.
- Machine quality assurance procedures for IMRT/3DCRT: Understanding principles and basics of patient specific QA, Absolute Dosimetry versus Relative Dosimetry, Gamma Analysis, Dosimetry Equipments for implementing patient QA in IMRT, AAPM guidelines for IMRT quality assurance.
- Verification of patient treatment and motion management.
- Understanding adaptive and image guided radiotherapy delivery.
- Starting a High Precision Radiation Oncology Program: Drawing up specifications for a machine, Regulatory approvals required for setting up a machine, Potential bottlenecks and pitfalls, Negotiating the contract and how to get the best out of the vendors, Designing and optimal workflow for successful implementation of the programme.
- Practical Demonstration Classes.

Suggested list of practical demonstration classes to be taken during the fellowships

- Patient selection - Explaining the cost benefits and risks.
- Patient immobilisation and positioning - demonstration of how to make a thermoplastic cast and immobilisation with vacuum cushions.
- Image registration of a CT with CT and CT with MRI for one or more sites (eg. brain, head & neck, pelvis.
- Contouring the target volumes and OAR for common situations following the latest consensus and institutional guidelines: Brain, Nasopharynx, Oropharynx, Postoperative Oral Cavity, Larynx, Lung, Breast - Post Mastectomy and BCS, Oesophagus, Stomach and GE Junction, Rectum, Cervix, Bladder, Extremity Soft Tissue Sarcoma.
- Complete IMRT and VMAT treatment planning from start to finish including optimisation.
- Plan export and creating a plan for QA.
- Participating in patient specific QA.
- Patient setup verification using On Board Imaging.
- Offline Adaptive radiotherapy planning .

Journal Club

A journal club will have to be conducted by each candidate every alternate week. During the Journal Club a scientific article will be critically appraised and presented to the faculty. The session will be conducted over a period of 1 hour and the candidate is expected to make a short presentation on the article.

Preference would be given to papers that deal with high precision radiotherapy including the clinical and physics aspects of the techniques. The selection and the appraisal will be the responsibility of the fellowship candidate, who is free to seek the help of the faculty. It is preferred that the faculty are informed about the journal club 2 weeks in advance.

Chart Rounds

The fellowship candidate is also expected to lead the chart rounds that will be conducted every Friday in the department. During the chart round, the candidate will review the clinical, pathological and radiology information of the listed cases, including checking the charts of the patients undergoing treatment in the department.

The radiation plan will be reviewed to critically analyze in terms of target volume coverage, organ at risk sparing etc. Verification imaging performed during the period will also be reviewed to identify setup and motion related errors.

In addition, follow up clinical and radiological evaluation of these patients can be presented at these chart rounds to evaluate for response assessments and a typical patterns of toxicity.

Performance Review and Fellowship Exit Examination

The fellows are expected to keep a Log book of all activities logged during the course of the fellowship and there will be a performance review every 3 months.

The exit examination will include a theory paper and a practical examination. The practical examination will include 2 treatment planning sessions where the candidates will be expected to plan two different patients with a given technique. Special emphasis will be given to image registration, target volume delineation and plan evaluation which the candidate is expected to perform independently.

Candidates are expected to pass all exams independently in order to qualify for the fellowship. The pass percentage will be 50%.

An exit interview will also be conducted after completion of the course to get feedback from the fellows on the course.

Rules and Regulations

- The course is full time.
- Candidates are expected to perform all types of clinical, research, academic and community based assignments, as prescribed by the institute.
- It is a resident program of post-graduate training; Our fellows will be paid a stipend equivalent to 1st year DRNB during the training period and there will be an annual fee for this program as prescribed by the academy.
- Candidates will be eligible for leave, duration of which will be according to institute regulations. Not more than 5 days of leave will be granted together. Candidates who avail for leave period more than the stipulated, will have extension for those additional days of leave. Holiday leave/holiday duty off will be given as per discretion of the Head of Department.
- Accommodation: Accommodation is the responsibility of the candidate. However, in-campus accommodation could be offered on availability basis and this will be charged as per hospital norms.
- Candidates should follow the rules and regulations of MVRCCRI.
- Any expenses for national or international conferences must be met by the candidate.