Medical Physics Residency in Medical Imaging and Nuclear Medicine – Program Outline

The program helps to develop the appropriate clinical skills, technical skills, knowledge, confidence and clinical understanding of the application of Medical Physics in Medical Imaging and Nuclear Medicine. The resident will be part of a multidisciplinary team consisting of: clinical medical physicists, imaging/nuclear medicine scientists, technologists, quality coordinators (technologists), radiologists and biomedical engineers. Included in this program are rotations through clinical areas, including: general radiography, CT, fluoroscopy, angiography, operating rooms, outpatient clinics, nuclear medicine, and radiopharmacy (PET).

The program provides the minimum clinical experience for qualification for the Canadian College of Physicists in Medicine (CCPM) Membership examination and American Board of Radiology (ABR) certification exams in either Diagnostic Medical Physics or Nuclear Medical Physics.

Significant study in parallel with this training program is required to adequately prepare for membership/certification exams. There are opportunities for the resident to supplement their learning through Graduate Level Medical Physics courses (CAMPEP certified) offered at the University of British Columbia.

Medical Imaging and Nuclear Medicine is a consolidated service in the Lower Mainland of British Columbia. This VCH led program provides Medical Physics services in 28 hospitals and clinics across 4 Health Authorities: Vancouver Coastal Health (VCH), Providence Health Centres (PHC), Provincial Health Services Authority (PHSA) and Fraser Health (FH).

Training is centered at Vancouver General Hospital (VGH), the largest hospital in BC, an academic and teaching hospital, and a class 1 trauma centre. The resident will also gain experience at other hospitals, ranging from large academic centres to smaller community hospitals.

The residency program is designed such that initial training will occur at VGH, or in close in proximity to VGH. The training program exposes the resident to progressively increasing levels of responsibility. This ranges from Direct Supervision, where a Qualified Medical Physicist will work directly with the resident to teach them quality control and radiation safety specific tasks, to general supervision where the resident will independently perform tasks that are reviewed by a QMP. A program committee with representatives from, VCH, UBC and PHSA has been established to ensure training modules meet requirements set forth in AAPM Report 90.

Program Structure

The essentials of the program training curriculum include:

1. Clinical Training – Diagnostic Imaging (X-ray)
    - Working with technologists, service engineers and radiologists within the imaging department at Vancouver General Hospital to understand procedures, quality control and radiation safety related issues and hospital workflow.
2. Quality Control in CT
    - Understand CT theory and practical testing

3. Quality Control in Radiography
    - Understand Radiography theory (Direct Digital Imaging and Computed Radiography) and practical testing
4. Quality Control in Fluoroscopy and Angiography (Radioscopy)
    - Understand Radioscopy theory (X-Ray Imaging Intensifier and Flat Panel Detectors) and practical testing
5. Quality Control in Mammography
    - Understand mammography theory related to Full Field Digital Mammography (FFDM) systems and Digital Breast Tomosynthesis (DBT).
    - Additional training on Prone systems possible
6. Clinical Rotation in Nuclear Medicine
    - Understand the role the clinical importance of Nuclear Medicine, quality control and radiation safety protocols, as well as Nuclear Medicine procedures
7. Quality Control in Nuclear Medicine and Peripheral Devices
    - Understand the theory and quality control related to: Well Counters, Dose Calibrators, Thyroid Probes, SPECT and SPECT/CT systems
8. Quality Control in MRI
    - Understand annual test requirements, and coil testing
9. Radiation Protection – Shielding
    - Understand and implement NCRP 147 and NCRP 151 (applied the Nuclear Medicine and I-131 Therapy).
    - Understand how to design shielding for new technologies (e.g. Siemens Force CT Scanner, Digital Breast Tomosynthesis)
    - Inspect shielding for Deficiencies
10. Radiation Safety – Staff and Patients
    - Understand the theory and role of dosimetry for monitoring staff exposures,
    - Understand the theory and limitations of Patient dosimetry calculations.
11. Clinical Grand Rounds
    - Attend atleast 25% of grand rounds in Radiology and/or Nuclear Medicine
12. Education in professional aspects of Medical Physics.
13. Clinically relevant research project.

Program Staff

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