

## Clinical Medical Physics Residency - Program Description

### Program Mission & Objectives

With the continued demand increase for medical personnel, including medical physicists, the US Oncology Clinical Medical Physics Residency Program has as a primary mission to do our part in helping new graduates complete their training in active clinical environments, learning safe, effective, independent, professional practice in radiation oncology. The major goals and objectives of the program, to be achieved in the full-time two-year residency training include those listed below:

#### *Safety, Competency, Purpose, and Understanding*

- an understanding of the role of patient safety in the clinical practice of medical physics
- the technical knowledge, skills and competency required for the safe application of the technologies used in the practice of medical physics
- an appreciation of the clinical purpose and applications of sophisticated technologies
- an understanding of the protocols and practices essential to the employment of technologies to detect, diagnose, and treat various illnesses and injuries

#### *Independent Clinical Practice Preparedness*

- the ability to use analytical and research methods to solve problems arising in the clinical environment
- the ability to deploy new strategies within the clinical environment
- the ability to critically evaluate research and scholarship in medical physics
- board preparation for certification in therapeutic medical physics

#### *Communication, Professionalism, Ethics, and Continuing Education*

- the communication and interpersonal skills necessary to function in a collaborative, multidisciplinary environment
- the professional attributes, ethical conduct and actions required of medical physicists
- valuing career-long continuing education to keep professional knowledge and skills current

### Clinical Training

To realize the above goals and objectives, didactic training, followed by shadowing to observe procedure, and then as much hands-on clinical work as reasonably achievable, which will include work on department projects. Mentors will provide or direct any essential didactic education. Residents will fully participate in all aspects of physics clinical services with fulltime responsibilities, under the supervision of faculty, after sufficient training and observation for the area in question. Didactic training will include clinical conferences, seminars, small discussion groups, journal club and one-on-one instruction which are all an integral part of the program. Residents participate in medical physics journal club, medical physics conferences, dosimetry conferences, tumor boards, and assigned readings.

During the residency, residents have clinical rotations through the following topics:

1. Basic External Beam Treatment Planning & MU Calculations
2. Imaging and Simulators in Radiation Therapy

3. Linear Accelerator QA & Dosimetric Systems
4. External Beam Simulation, Treatment Planning, & Treatment Guidance
5. Stereotactic Radiosurgery & Radiotherapy
6. Proton Therapy
7. Special Procedures
8. Linear Accelerator Acceptance Test Protocol, Survey, & Commissioning
9. Brachytherapy
10. External Beam Treatment Planning System & Radiation Oncology Information System Commissioning
11. Radiation Safety & Shielding Design
12. Medical Physics Professional Issues

### **Clinical Competency**

Competency is evaluated through side-by-side clinical work with mentors, an oral presentation, and exam for each rotation.

### **Optional Rotations & Clinical Research Projects**

During the second year of training, optional design and execution of a clinical research project and/or rotation may be afforded to select residents, provided the rotation or research can be structured to augment primary training and does not interfere with completion of the primary clinical training. The project/rotation are not mandatory and are allowed if the resident shows sufficient progress and time management skills. Opportunities exist for collaborative research with staff members from Evansville, IN area clinics or other clinics in The US Oncology Network. Results of a research project should be suitable for presentation at a scientific meeting and/or preparation of a manuscript for publication in a scientific journal.

### **Residency Environment Detail**

Deaconess Chancellor Center for Oncology is equipped with two commissioned Linear accelerators, including one utilized for a very active stereotactic radiotherapy (SRS & SBRT) program. The department also houses a CT simulator, with 4D capability and an HDR, including a full array of applicators, utilized for a very active program. The center also has a variety of equipment including scanning systems, detector arrays, Phantoms, and other detectors. The nearby (< 4miles away) Evansville Cancer Center primarily houses an HDR Prostate program. Physics residents will have a desk in a shared office with physics and/or dosimetry, in the radiation oncology clinic, where they are directly immersed in clinical happenings. Residents are provided with work computers and full internet access. Conference space is available within the center as well.

Additional equipment such as 3D printers, anthropomorphic phantoms, and film dosimetry systems are available within The US Oncology Network. Residents will travel to other Network sites for training in areas not clinically supported at the primary sites, such as LDR, TBI, TSET, Radiopharmaceuticals, CyberKnife, Gamma Knife, Proton Therapy, and 3D printing. Training in most of these areas will take place, over the course of approximately 6 weeks, in the fall of the second year, at Texas Oncology sites.

## Appointments & Applications

The program will only select candidates with postgraduate medical physics degrees (MS, PhD, or certificate) from CAMPEP accredited institutions, who are interested in careers as clinical medical physicists, in radiation oncology. Successful applicants to the US Oncology Clinical Medical Physics Residency Program must demonstrate acquisition of a strong foundation in basic physics. Entering Residents must have an undergraduate or graduate degree in Physics, or an engineering or other physical sciences degree with coursework equivalent to a minor in physics (i.e. at least three upper-level undergraduate physics courses required for a physics major).

Note: ONLY those applicants meeting the aforementioned educational requirements, will be considered for entrance to the residency program. This program concentrates on the medical uses of physics in clinical treatment of cancer patients; it does not focus on core medical physics didactic training or basic research. The program's self-study was submitted to CAMPEP in 2023 and we hope to achieve accreditation in time for 2024 applications, with an initial resident starting in 2025.

The application cycle starts in early October. Applications must be completed by December 15 for entrance into the program the following July. Those considered for an appointment will be asked for an on-site interview, with the program director and selected faculty.

## Application Submission

Application is made through the AAPM common application website, which is at <http://www.aapm.org/mprap>.