DREXEL UNIVERSITY COLLEGE OF MEDICINE/
HAHNEMANN UNIVERSITY HOSPITAL
DEPARTMENT OF RADIATION ONCOLOGY

CHRISTIANA CARE RADIATION ONCOLOGY

Physics Rotation for the Radiation Oncology Residents
PGY-4 ONLY

Teaching Methods and Supervision

- The resident on the Physics Rotation will shadow the physicist(s) on a daily basis.
- The resident will observe and participate in all physics related activities.
- Additionally, the resident will spend at least one entire day with the therapists on the treatment machine observing all the nuances of treatment setups and delivery.
- Primary areas of participation will include involvement in all quality assurance procedures for both external beam treatments and brachytherapy procedures, treatment planning for both external beam and brachytherapy, following patient flow from the time of the treatment planning CT through the first treatment, checking treatment plans and treatment charts, performing independent calculations, and measuring, reviewing, and/or submitting physics data for patients enrolled on national protocols.
- Additionally each resident on the physics rotation will be required to give a one hour presentation to the department (attending physicians, resident physicians, physicists, students) on a mutually agreed upon clinical physics topic.

Details of the above activities are outlined on the appended pages.

Assessment Methods
Residents will be evaluated by the physics staff based on participation in and demonstrated knowledge of all the physics activities going on in the department at the time of the rotation. Additionally the clinical physics talk evaluation will be based on preparation, demonstrated knowledge of the material, and the actual presentation.

Rotation Assessment by the Residents
Each resident will be required to submit a rotation evaluation upon completing the rotation.

Educational Resources
The residents already have the physics text books that are required for the didactic class. They should reference these books for clarification of the theoretical basis for this practical rotation. Additionally they will be given references (i.e., task group reports published by the American Association of Physicists in Medicine) for any other material that will help clarify, explain, or otherwise help in their understanding of the clinical physics activities going on in the department.

Residents may choose this rotation at Christiana or Hahnemann or may split 2 weeks at each institution.
Observe and participate in quality assurance procedures

Linear Accelerator
- Daily quality assurance – at least once in each location.
- Monthly quality assurance – at least once, preferably once in each location.
- Annual quality assurance – in either location, as applicable.
- Stereotactic (SRS, SRT, SBRT) – in each location, as applicable.
- Patient specific IMRT QA – in both locations.

HDR Brachytherapy Afterloader
- Daily quality assurance – each time it is performed, in each location.
- Quality assurance following a source change – at least once, preferably once in each location, as applicable.

LDR Brachytherapy Sources
- Receiving process for $^{125}$I eye plaque seeds in radiation safety – each time they are received at DUCoM.
- Assay the $^{125}$I eye plaque seeds – each time they are received at DUCoM.
- Assay any other LDR sources – in each location, as applicable.
- Wipe Tests – in each location, as applicable.
- Log files – in each location as applicable.

Treatment Planning system
- Monitor Unit Calculation Accuracy
- Homogenous / Inhomogeneous
- Geometry

Observe and participate in brachytherapy planning, quality assurance, and associated applications

Eye plaques – all plans and procedures for at least 2 weeks
- Participate in the planning process.
- Participate in building eye plaques.
- Go to Wills Eye Institute for plaque implantation procedure.
- Go to Wills Eye Institute for plaque explant procedure.

Other low dose rate brachytherapy procedures – in each location, as applicable
- Participate in the planning process.
- Participate in the implantation process.
- Participate in the explant process.
- Perform any Post Implant dosimetry required for LDR cases.
High dose rate applications – all procedures in each location, as applicable
- Participate in CT.
- Participate in treatment planning.
- Participate in treatment delivery and post treatment procedures.
- Observe, and understand emergency procedures, and participate in emergency drills.
- Review operation of HDR.

Observe and participate in external beam treatment planning and delivery procedures for as many clinical sites as possible at each location.
- Participate in the initial CT scan, positioning, immobilization, etc.
- Participate in treatment planning.
- Observe the fabrication and alteration of blocks and cutouts (if applicable).
- Design of and use of compensators.
- Port filming and/or imaging.
- Guidance procedures using imaging or markers.
- Spend an entire day with the therapists on the treatment machine.

Observe and participate in plan checking and chart checking at both locations
- Initial checks.
- Weekly checks.
- End of treatment checks.
- Eye plaque plans.
- Perform independent hand calculations, and review independent MU calculation system.

Participate in all before and after hours physics activities (including, but not limited to relevant clinical activities, quality assurance procedures, patient specific IMRT QA, etc.) at each location, as applicable.

Prepare a one-hour long presentation on a mutually agreeable physics topic to be presented to the faculty and residents of both Departments.

Copy and review pertinent physics reports. Suggested reports include:
- AAPM Task Group 51 Report
- AAPM Task Group 40 Report
- AAPM Task Group 142 Report
- AAPM Task Group 43 Report
- International Commission on Radiation Units and Measurement Report 50

Participate in the measurement (or review the data) of data for RTOG study protocols, as necessary.