Educational Council Symposium on Residency Programs

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Residency Program at Washington University

- Minimum requirements for entry: M.S. in medical physics, physics, or other relevant physical science or engineering discipline (ABR board requirement)

- 1st year: intensive training in the following areas, i.e. "concentrations"
  - Treatment Planning
  - IMRT
  - Stereotactic Radiosurgery/Gamma Knife
  - Brachytherapy

- 2nd year: Continued training with more leadership-type responsibilities, mixed in with clinical support, and mentoring of incoming 1st year residents

- Includes assignments to QA of various equipment throughout 2 years

Residency Program at Washington University

- Training Essentials developed and documented for each area:
  - Hands-on experience: to master concepts and skills under the guidance of responsible physicist/dosimetrist/therapist
  - Didactic training: recommended reading (TG reports, articles), attendance of clinical teaching/QA conferences, physics course, radiation biology course:
  - Teaching experience: prepares and presents lectures for physics/physician/dosimetrist/therapist personnel

- Competency Evaluation Forms:
  - Treatment Planning, commissioning/AT, machine calibration and dosimetry, special procedures, brachytherapy, radiation safety and regulatory compliance

- Oral exam at end of first and second years:
  - Treatment machines/QA, calibration and radiation measurements/detectors, photon and electron beams, treatment planning and treatment planning systems, brachytherapy and radiation safety, and IMRT and special procedures

Hands-on Experience: First Year Concentrations
Hands-on Experience: Second Year Concentrations

<table>
<thead>
<tr>
<th>Month</th>
<th>Month 2: External Beam Concentration</th>
<th>Month 1: External Beam Concentration</th>
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<tbody>
<tr>
<td>July</td>
<td>chart checks</td>
<td>chart checks</td>
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<tr>
<td>August</td>
<td>chart checks</td>
<td>chart checks</td>
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“External beam concentration” refers to 2nd year resident’s responsibilities to provide clinical support, i.e., chart checks

Didactic Training: Coursework

- Physics course meets twice a week from September to March
- Physics course topics include
  - radiologic physics
  - radiation dosimetry and measurement
  - external beam clinical physics
  - brachytherapy physics
  - radiation safety and QA
    - special topics including IMRT, imaging for RT, stereotactic, proton therapy, etc.
- Followed by a 2 month radiation biology course

Teaching Experience: Resident Lectures

One lecture per month, assigned physicist serves as an advisor

Evaluation Forms: Treatment Planning Concentration

<table>
<thead>
<tr>
<th>Skill Description</th>
<th>Time</th>
<th>Physician/Faculty</th>
<th>Advisor</th>
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<tbody>
<tr>
<td>Prostate planning and image (MRI/MRA):</td>
<td>6 months</td>
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<tr>
<td>Prostate dose planning and optimization, outcomes, etc.</td>
<td>6 months</td>
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<tr>
<td>Conventional patient simulation</td>
<td>6 months</td>
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<tr>
<td>Non-treatment planning</td>
<td>6 months</td>
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<tr>
<td>Treatment planning, target volume definitions</td>
<td>6 months</td>
<td></td>
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<tr>
<td>Treatment planning, target volume delineations</td>
<td>6 months</td>
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<tr>
<td>Treatment planning, complete field arrangements</td>
<td>6 months</td>
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<tr>
<td>Field checking and reporting</td>
<td>6 months</td>
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<tr>
<td>All treatment control solutions, for beam calculations, specific field and contour checks</td>
<td>6 months</td>
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<tr>
<td>One-cross-time polymer-based and electron beam controls</td>
<td>6 months</td>
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Eligibility for taking the ABR certification exam includes "at least three years of active association with an approved department or division of the subfield in which certification is sought."

- Graduate study in a medical physics program up to half year of credit for Masters and one year of credit for Ph.D.
- Complete 2-year residency program → two years of credit
- Part I Physics and Clinical exams can be taken in the midst of satisfying experience requirement
- Experience requirement must be satisfied before taking Part II Therapy Written exam
- Must pass Part II written before taking Part II Oral exam, offered the next year

Residency Program and Beyond (For Me)
- Completed residency program at Washington University in August 2002
- Appointed to Instructor of Radiation Oncology at WUSM in August 2002
- ABR certified by June 2003
- Promoted to Assistant Professor of Radiation Oncology at WUSM in January 2005
- Responsibilities include
  - clinical support in various areas, especially in IMRT, brachytherapy, and portal/CR imaging
  - teaching responsibilities associated with various programs: physics and physician residency, dosimetry training program, and radiation therapist training program,
  - academic pursuits, thus far including film dosimetry, IMRT treatment planning, breast brachytherapy, and portal imaging

Residency Program and Beyond (In Total)

Since 1991:
17 people have completed the medical physics residency program at WU, and have continued on in the profession as...
  - Hospital physicists (6)
  - Academic clinical physicists (10, of which 2 are chiefs)
  - Chief imaging physicist (1)