Assessing Quality in Medical Physics Residency Education

Thanks to contributors:
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Two levels of assessment of quality of residency education

1. Individual resident: to assess their progress through your program, to measure their competency against expectations.
2. Program: to compare your program quality to national standards, to compare your program quality to other programs.
Individual resident assessments

- Competency checklist: yes/no, dated by faculty mentor

- Learning objectives checklist with scaling: end of rotation evaluation by faculty mentor or oversight committee
Individual resident assessments

- Feedback form from staff/faculty; aggregated for discussion with PD monthly

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<tr>
<th>Quality of completion</th>
<th>Inadequate</th>
<th>Average</th>
<th>Good</th>
<th>Exceptional</th>
<th>Comments</th>
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<td>Attention to detail</td>
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<td>Read patients without</td>
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<td>Read differential</td>
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<td>Understand physics</td>
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<td>Communicate well with</td>
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<td>If due to see improvement</td>
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ACGME Radiation Oncology Milestones
Example milestone for medical physics

**Basic Procedures**
- Knows how to operate the controls from within the room and from the console.
- Correctly uses of the mechanical and radiation test equipment.
- Familiar with safety precautions dealing with mechanical collision of gantry and table components and radiation exposure.

**Intermediate Procedures**
- Must understand the calibration principles involved with in-phantom measurements using a dose calibrated ion chamber.
- Must understand the calibration principles of diode or ion chamber array, and be able to operate the treatment unit in the QA mode to perform the tests and analyze the findings in accordance with the physics guidelines established (IMRT QA).
- Must be familiar with the TG-51 protocol for photon and electron dose specification for external beam machines including the concepts of temperature and pressure corrections, chamber calibration factor, and conversion from dose in plastic to dose in water.

**Advanced Procedures**
- When a QA check indicates a parameter is exceeding its tolerance, the resident performing the test is able to identify the issue and propose a solution.

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**Individual resident assessments**

**Oral exams or mock oral ABR exams**
- End of rotation presentations to oversight committee
- Oral questioning at the end of the presentation
- OR no presentation but trainee appears before oversight committee to answer questions related to the rotation topic (oral exam)
- Mock ABR exams annually or more frequently on all ABR topics

**Potential issues with individual assessment**
- Hesitation for honesty in critical feedback, potential for retaliation

**Possible solutions:**
- Become better at giving critical feedback; how to engage millennials in their own learning
- Aggregate feedback from multiple faculty members
- Milestones with explicit list of what defines each level of competence in each milestone category, minimizes subjectivity of assessment
Assessing quality of education at the program level

Metric of program quality: reputation

Track admissions numbers
• How many applicants?
• Perceived quality of applicants
• Success in filling positions with favored candidates

Feedback requests:
• Formal survey requests from current residents on rotations, workload, faculty mentors
• Likewise survey requests from faculty
• Open door policy for program director to be available for feedback on the program at any time

Follow up on feedback:
• Steering committee meets regularly (monthly or quarterly) to discuss collected feedback, propose and implement program changes/improvements
Exit Interviews
• Individual interview with each trainee
• Ask: looking back over the 2-3 years of their training, what was the best/worst of the educational program?

Follow up surveys
• 1-year survey of graduate: What aspects of your residency training prepared you well for your current job? What preparation for your current job was missing from your training program?
• 1-year survey of the employer

Graduates’ success
• Ability of trainees to secure their preferred job before graduating from your program
• ABR Part II and III pass rates
What’s missing?

- National standards for individual assessments, like ACGME milestones
- Metrics to compare quality of education with other residency programs

Thank you

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