Performance Outcome Measures in Medical Student Radiology Education

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Financial Disclosures:
None
I believe:

• Radiology is a fundamental component of any medical education – and –

• Needs to be vertically integrated into the 4 year curriculum – and –

• Needs to be a required clerkship in the third year (in some form).
Goals

• Examine current practice in Radiology Medical Student Education
• Review recommended models for performance assessment
• Discuss some techniques to improve outcome measures
The Traditional Radiology Rotation

- Observational Rotation
- Assigned Textbook
- Regular Didactics
- Final Exam
- +/- Presentation or Write-up
Great Advances in MS Radiology Education:

National Ultrasound Curriculum for Medical Students

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My Experience

• Limited correlation with performance on radiology related tasks
• Limited identification of students talented in radiology
• Limited inspiration for students to pursue radiology as a field
Alternative?
Modified Bloom’s Taxonomy:

- Remember
- Understanding
- Apply
- Analyze
- Evaluate
- Create
Levels of Skills Performance (Dreyfus):

- Novice
- Advanced Beginner
- Competent
- Proficient
- Expert
- Master
7 Principles of Clinical Skills Education
Modified from AAMC Skills Taskforce

• Improve patient outcomes
• Patient-centered care strategy
• Interactive, experience-based and learner centered
• Competency is dependent on self-directed habit
• Developmental in nature
• Medical schools responsible for skills teaching and assessment
• Continuous Quality Improvement part of design
Assessment Techniques:

- Written Test
- Supervising Clinicians
- Direct Observation/Video
- Clinical Simulation
- Multisource Assessment
- Portfolios
From AAMC skills taskforce:

<table>
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<th>Knows</th>
<th>Knows How</th>
<th>Shows How</th>
<th>Does</th>
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<tbody>
<tr>
<td>Multiple choice exam</td>
<td>Oral exam</td>
<td>Standardized patient examination;</td>
<td>Direct observation and/or videotaped performance with actual or</td>
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<td></td>
<td>Written Essay</td>
<td>Objective structured clinical examination (OSCE);</td>
<td>simulated patients;</td>
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<td>Simulation with model</td>
<td>Portfolios with reflection, 360 evaluation with patient, peers,</td>
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<td>medical record review.</td>
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“Remember when they were in reach, and all the teachers used to teach, you can anything if you put your mind to it.”

-Passenger, **Staring at the Stars**
Complete Change of Curriculum Design

- General Radiology Knowledge
- Imaging Selection
- Image Acquisition
- Image Interpretation
Development of a Radiology Education Lab

Critical Components:
- HD/Modifiable Images
- Organization/PACS
- Small Group Learning
- Access to Modalities - Ultrasound
- Video/Audio Transmitting/Recording
- Continuous Feedback
Methods - Audience Response

- Daily Pre- and Post-day tests
- MCQ covering 4 pillars
- Immediate Feedback
- Participation only grade
- Weekly Performance Report
Methods - Workshops

• ACR Appropriateness Criteria
  – Twice weekly
  – Scenarios (AMSER Resources)
  – Write-ups

• Ultrasound
  – Weekly
  – Ultrasound Quarterly
  – Transducer time on a real machine with a sonographer
  – Students as subjects
Methods- Video Testing

Design:

• Daily presentation sessions
• Weekly Tests
• Image Interpretation
• CXR’s only
• New Cases of practiced diagnoses
• Grading Rubric
The Rubric - 
Essential to Performance Assessment
“A standard of performance for a defined population”
- The National Science Education Standards (1996)

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Feedback

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Notes: ARS 108
Summary

• For true performance assessment, traditional model is likely inadequate
• Significant literature supports more advanced performance instruction and metrics
• Tools such as ARS, Video Testing and Hands-on Workshops are potential teaching and testing methods for performance measures and assessment
Image References:

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Thank you!

Questions?