Subjective and Objective Learning Outcomes With A Structured, Standardized Radiology Clerkship Curriculum

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Disclosure

- No disclosures from any author
Radiology in Medicine

- Radiology plays a critical role in patient care and clinical decision making for virtually all areas of medicine\(^1\)
- Basic radiology education at the medical school level significantly improves image interpretation skills\(^2\)
- Recent survey revealed that 93.4% of interns (PGY-1) felt that it was extremely important to know how to interpret chest radiographs\(^3\)
- A basic understanding of imaging and the role of radiology in clinical decision making is critical for all medical school graduates\(^1,4,5\)
Radiology Medical School Clerkships

- Radiology electives are not required by all medical schools in the United States.
- Curricula present often lack clear structure and goals.
- Difficulties in creating a radiology curricula include:
  - The highly specialized nature of the specialty.
  - Lack of radiology being considered “essential”.
  - Shift-work like nature of the profession.
The purpose of this study was to assess the effectiveness of supplementing traditional radiology reading room teaching methods with a structured, standardized 2 (or 4) week radiology elective curriculum for medical students.
108 students participated in a 2 or 4 week radiology rotation at University Hospitals Case Medical Center July 2013 – June 2014

37 subjects excluded
- 11 students returned for a second rotation
- 26 students did not complete both the pre- and post-rotation surveys

71 subjects included

32 completed the 2 week rotation
39 completed the 4 week rotation
Methods:
Traditional Radiology Teaching

- Attendance to twice daily resident conference
  - Lectures by attending faculty for the radiology residents
- Reading room and/or procedural suite teaching
  - One-on-one or small group teaching from attending faculty and residents primarily during read-out sessions
Methods:
Standardized Radiology Curriculum

- Integrated with traditional teaching methods
- 4-week curriculum divided into 1-week blocks (allowing the rotation to be tailored for those students doing 2 week rotations)
  - Week 1: Chest, Week 2: Abdomen, Week 3: MSK, Week 4: Neuro
1. Weekly medical student lectures
2. Pertinent assigned weekly articles
3. Weekly quiz pertaining to material covered in the lecture and assigned article
- Submission of an interesting case report during the rotation
Methods: Evaluation of learning outcomes

- Pre- and Post-rotation surveys and quizzes were administered to all medical students
  - **Surveys:** Questions regarding confidence with image interpretation, preferred methods of teaching, and preparation for residency
  - **Quizzes:** Questions directly from material covered in the lectures and assigned reading
- Surveys were collected and managed using REDCap electronic data capture tools hosted at University Hospitals, Case Western Reserve University, Cleveland, Ohio
- Data was anonymized and analyzed using IBM SPSS version 21.0 and Microsoft Excel, 2010
Results: Subjective Learning Outcomes

- Statistically significant increases in subject confidence levels across all imaging modalities (p < 0.001)
Results: Objective Learning Outcomes

- Statistically significant increase in objective quiz scores by 34% between the pre-rotation and post-rotation quiz (p < 0.001)
Results

Most Educational Aspect of the Rotation

- Weekly Medical Student Lectures: 54.00%
- Assigned Reading Articles: 38%
- Interesting Case Presentation: 4.00%
- Resident Conference: 1.00%
- Reading Room/Procedure Suite Teaching: 4.00%
Results

- 97% of the students evaluated were 4th year medical students with 20% of the students having already applied or planning on applying for a radiology residency
- 82% (58/71) of students believed that the weekly quizzes were a fair assessment of that week’s material
- 80% (57/71) students agreed or strongly agreed that the rotation overall prepared them for the future
- 100% of students would recommend this radiology rotation to their peers
Conclusion

- Standardized radiology curriculum in combination with traditional reading room teaching was well received by medical students.
- Structure and standardization led to increased confidence with image interpretation and improvement in objective quizzes.
- There was a higher perceived value of dedicated student lectures over traditional reading room teaching methods.
Limitations

- All students participated in both standardized and traditional teaching methods - the differences between these activities could not be assessed
  - There was significant improvement in subjective and objective outcomes with the combination of standardized and traditional teaching
  - Majority of students felt that medical student lectures were the most educational aspect of the rotation
  - 80% students agreed or strongly agreed that the rotation overall prepared them for the future
  - 100% of students would recommend the rotation to their peers
- Subjective self-perceived confidence in image interpretation may not correlate with accurate interpretation
  - Objective quiz scores demonstrated similar increases on the post-test
References


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