Redesign and Implementation of the Radiology Clerkship: From Traditional to Longitudinal and Integrative

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Purpose: The authors discuss the evolution and application of 3 radiology teaching methods—a fundamentals-of-imaging course, a combined clinical-radiology case conference, and a radiology objective structured clinical examination—to medical education at the Brigham and Women's Hospital site of Harvard Medical School.

Methods: The evolution of the medical student radiology teaching program from content needs assessment to blueprint creation, through implementation, is outlined.

Results: The 3 components of the teaching program are described. The changes in format in response to feedback and challenges faced in deploying this new curriculum are detailed. Results from student surveys and the radiology objective structured clinical examination scores from recent years are also presented.

Conclusions: As radiology assumes an increasingly central role in patient care and diagnosis, the need for effective integration of radiology teaching into medical education becomes more critical. The concepts presented here have been deemed to be successful by students and faculty members and may be applicable to other institutions.

Key Words: Medical education, radiology education, longitudinal radiology clerkship

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INTRODUCTION

In response to a directive from the dean of medical education, asking for greater incorporation of radiology teaching throughout the third-year medical school curriculum, we sought to restructure radiology education at our hospital. We were guided in our approach by the practical nature of radiology itself—that of an integrative, consultative discipline—and we welcomed the opportunity to expand our teaching beyond the bounds of our required 1-month clerkship.

Even for those schools that do offer a more structured radiology experience in the form of an independent clerkship, this immersion approach also has drawbacks: (1) students may not get exposure to this critical discipline early enough during their clinical year (depending on when during the third year the radiology clerkship assignment may fall), or (2) the "stand-alone" dedicated clerkship may be just that: an experience divorced from the clinical responsibilities that are part of nearly every other clerkship. For those schools without clerkships that attempt to integrate radiology into other clerkships through radiology lectures and conferences, two problems may arise: (1) poor attendance at such lectures when students have active clinical responsibilities or unexpected patient care needs in their "home" clerkship (radiology teaching is thus seen as an interruption by the student) or (2) extreme complexity in attempting to schedule radiology teaching within the confines of another clinical clerkship: given the busy schedules of attending radiologists and the limited time allotted for radiology teaching by other clinical clerkships, who often have their own curricula to administer, such integrative attempts may falter [1]. On a purely economic basis, radiology departments may have little incentive to teach when their efforts are inserted into other clerkships because the attending radiologists' time can be more profitably expended on direct examination interpretation [2]. A final challenge for radiology education, from the student perspective, is the lack of a nationally recognized radiology "shelf examination," which further dilutes students' perceptions of the importance of radiology as a necessary component of clinical competency.

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We faced many of these problems at our own institution, where we have a dedicated 4-week radiology clerkship in the third clinical year. An extra factor—a planned curricular reform to add a monthlong research project to the fourth year—threatened the very existence of the clerkship because that time was seen as potentially expendable. We thus attempted a revision of our radiology education program in an attempt to meet these challenges, keeping the immersion radiology experience of the dedicated clerkship and integrating radiology beyond the clerkship in 3 ways: creating an introductory course at the start of the third year for all students, introducing integrated cross-clerkship conferences between radiology and other disciplines throughout the year, and incorporating this new educational content into the radiology "station" at the end-of-year objective structured clinical examination (OSCE).

METHODS

Content Needs Assessment for the Introductory Course

We began by considering the fundamental types of studies students would be likely to encounter, using an organ-systems approach (ie, thoracic imaging, abdominal imaging, etc). Course content was further modified by directly asking clerkship directors in medicine, surgery, obstetrics and gynecology, pediatrics, neurology, and psychiatry the following question: "What types of imaging studies and clinical diagnoses do you believe students in your clerkship should be familiar with?" This was further refined by having one of the authors spend time rounding with each of the clinical services and observing the types of imaging clerkship students were encountering. These combined efforts formed the basis for curricular content as we gradually evolved from a radiology-centered to a clinical clerkship-centered approach.

Student input came from two sources: (1) assessments of plenary radiology lectures that had been given in previous years to the entering third-year students and (2) end-of-clerkship assessments from prior years, looking for specific perceived deficiencies in the dedicated radiology clerkship. These anonymous surveys are part of the regular postcourse assessments that all clerkships use. Response rates varied, but generally more than half of the class of approximately 50 students took part in the assessments.

Creating a Blueprint

We recognized from these two inputs that we needed to add content appropriate for all third-year students at the very beginning of their clinical year that would not disrupt their duties in respective clerkships. Specific recommendations were received from clerkship directors for the core clerkships. We also learned from the students that large-group PowerPoint-driven (Microsoft Corporation; Redmond, Washington) lectures were ineffective at delivering radiology content, especially when divorced from patient care. In terms of time allotment for this course, we recognized the opportunity presented to us by the unified third-year curriculum already in place at our institution (the principal clinical experience [PCE]) [3]. This overarching structure permitted time for 4 learning modules to be given within the first month of the third year, during afternoons when students were free of clinical responsibilities.

Student feedback specifically related to the dedicated radiology clerkship, although appreciative of the intensive teaching efforts of the faculty members, centered on their lack of patient care and contact during this month; students felt a lack of responsibility and regretted learning radiology "in a vacuum." To counteract this impression, we again approached the clerkship directors to see if radiology content could be incorporated in a practical manner within the confines of their own clerkships. Both surgery and obstetrics and gynecology already offered case-based conferences; we outlined the benefits to be gained by combining students from the radiology clerkship with their peers in each of these two clerkships to create a combined radiology-clinical case conference. The actual procedure in setting up a conference would occur as follows: students on the clinical service select two patients recently on their service whose workup included significant radiology input. These cases are then sent to radiology clerkship students, who review the images under the supervision of radiology faculty members. Subsequently, the two groups of students plus supervising faculty members come together for a lunchtime joint conference at which the cases are presented first by the clinical students, followed by radiology students: clinical findings are correlated with radiology findings, and a short discussion then ensues, centering on the clinical topic, from either a diagnostic or a management perspective, with appropriate reference as to how radiology can be best used, often with reference to ACR Appropriateness Criteria®.

The beginning fourth-year OSCE has been administered at our medical school for the past 13 years and consists of a practical 9-station examination, each station lasting 20 min [4]. The examination is given 3 times a week over a 2-week period to examine approximately the entire class of 150 students. The experience has afforded students the opportunity to demonstrate, and faculty members to evaluate, satisfactory skills in approaching commonly encountered clinical problems (eg, low back pain, acute anxiety). Radiology has been considered by the clinical examiners to be an important component of the examination and has been part of the overall structure from its initiation. One of the authors (P.D.C.), who is also the clerkship codirector, has overseen the revision of the examination to keep it aligned with changing radiology clerkship content; he selects the 6 cases to be shown and the questions to be asked. Examiners consist of vol-