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The Value of Radiology Resident Participation in Internal Medicine Morbidity and Mortality Conferences at a Small Center of Graduate Medical Education

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Introduction

As healthcare continues to evolve in the United States, radiologists can better market their value by serving as educators of ordering providers and promoting appropriate ordering practices while teaching common principles regarding radiation safety and cost. Despite initiatives on behalf of radiologists to encourage widespread utilization of the American College of Radiology (ACR) Appropriateness Criteria,[1] physician trainees continue to demonstrate knowledge gaps regarding appropriate examination selection, radiation risk,[2] and cost of imaging services.[3,4]

Larger academic centers typically offer a wide variety of residency and fellowship training opportunities which can spawn many occasions for cross-specialty collaboration and congregation. Likewise, large academic radiology departments typically have subspecialty radiologists who participate in specialty-specific conferences (eg, grand rounds, tumor boards, morbidity/mortality, etc.) on their campuses. Smaller community-based centers of graduate medical education, however, are more likely to focus on primary care training including internal medicine. Smaller radiology residency programs are common and often serve these community-based centers of graduate medical education. Approximately one-third of all radiology residency programs have 4 or fewer residents per class.[5]

Previous studies[6–8] have shown that elective rotations in radiology can have a positive effect on general radiology education regarding appropriate exam selection among medical students. As internal medicine trainees move onward to the phase of supervised practice, it becomes more important that they understand basic principles of radiologic appropriateness to avoid wasteful practices. Since radiology electives are not typically required components of internal medicine residency training, radiologists must find alternate means to integrate this education into their curricula.

The purpose of this study was to evaluate the integration of a radiology resident into the monthly morbidity and mortality conference of a community-based internal medicine program. The goal was to assess the value that radiologist inclusion can bring to improving basic radiology knowledge among internal medicine specialists.

Intervention

The internal medicine program at a community-based center of graduate medical education was utilized for this study. This center also hosts a small radiology residency program with 3 or 4 residents per class. A needs assessment was performed in which the chief radiology resident met with the program director and chief residents of the internal medicine program to develop a leadership consensus regarding the best means to integrate the radiologist into the didactic training components of the internal medicine program. The internal medicine leadership concluded that case-based training was preferred and that inviting a radiology resident to monthly morbidity and mortality conferences to preside over a portion of each presentation would be ideal. The consensus among the internal medicine leaders was that the radiology resident would emphasize on appropriateness of exam ordering, teach basic imaging findings, and discuss how imaging is performed including the risks and benefits associated with available modalities.

The intervention was carried out over the course of a 12-month academic year from July through June. The morbidity and mortality conferences included medical students, internal medicine residents of all levels, internal medicine faculty, and occasional medical subspecialists. Each hour-long conference included a short segment (range = 8-13 minutes) in which a third-year radiology resident led that portion of the discussion. The radiology resident described the ACR Appropriateness Criteria to the audience, described the imaging findings, suggested differential diagnoses for the findings, and discussed alternative examinations with respect to cost and radiation exposure while referencing the ACR Appropriateness Criteria. Each case was discussed with a faculty radiologist prior to the conference.

At the end of the year, attendees who had attended at least 1 radiology-resident-included conference and at least 1 conference without radiologist participation (n = 34, 17 residents, 4 medical students, 1 faculty member, 1 visiting professor, and 11 undeclared) were surveyed using a Likert scale. The results are summarized in Table 1.

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TABLE 1
Average survey results of internal medicine morbidity and mortality conference attendees (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree)

	Medical Students	Residents	Undeclared	Overall
I have an improved understanding of how to use the ACR Appropriateness Criteria.	3.25	4.12	4.18	4.03
I have an improved understanding of basic imaging findings.	4.5	4.12	4.18	4.18
I have an improved understanding of how examinations are ordered.	3.75	3.94	4	3.91
I have an improved understanding of how examinations are performed.	4	3.94	3.72	3.85
The images help me understand the disease process being described.	4.75	4.41	4.55	4.47
	Medical Students	Residents	Undeclared	Overall
The resident uses appropriate terms for my level of training.	5	4.53	4.82	4.67
Enough time is available to describe the imaging findings.	4.75	4.59	4.64	4.61
The resident is open to questions from the audience.	5	4.65	4.72	4.73
I am more likely to discuss exams with radiology before the exam.	4	4.53	4.18	4.33
I am more likely to discuss results with a radiologist.	4.5	4.65	4.18	4.45

Outcome

Radiology resident participation in internal medicine morbidity and mortality conferences was well-received. Conference participants endorsed improved understanding of the ACR Appropriateness Criteria, basic imaging findings, and how radiologic imaging is performed. Attendees furthermore expressed increased likelihood to discuss imaging with a radiologist both before the exam is ordered and after it is performed. All independent comments provided on the submitted surveys were positive.

Discussion

This study demonstrates that despite many years of existence, the ACR Appropriateness Criteria remain relatively foreign to ordering clinicians. For radiology to remain vital in the future climate of value-based medicine, much effort should be invested in overcoming this barrier.

Prior to the above interventions, radiology participation at the described internal medicine morbidity and mortality conferences was minimal and only involved a brief review of the images in the rare instances in which radiologists were invited. Expanding the concept of radiologist involvement to a more significant portion of the hour was valuable in terms of appreciation for the role of radiology and radiologists from study acquisition to report. It is postulated that given the fact that these conferences are chiefly comprised of resident and medical student attendees, having a radiology trainee teaching the concepts projects a more approachable image of the radiologist. The radiology resident is often a former preliminary year intern who once worked alongside the local internal medicine residents. This pre-existing relationship can serve as a catalyst for collaboration.

Though instruction of imaging interpretation was only a minor objective, internal medicine trainees endorsed improvements to their perceived ability to interpret imaging findings. Previous work by Collins et al. suggested that medical students and residents were capable of similar knowledge gains from a similar set of teaching cases.[8] Additional research has shown that medical students benefit from expsoure to the ACR Appropriateness Criteria.[9] Data presented here shows that while medical students were less improved in their understanding of the ACR Appropriateness Criteria than internal medicine residents, they equally benefited from the lecture series with respect to comprehension of basic imaging findings. Radiology residents should thus consider integrating their services into internal medicine conferences like the one presented here given the fact that dedicated radiology training is not required at most medical schools.[10]

It is peripherally noted that based on the results of this internal medicine collaboration, a lecture series was later implemented for 2 large family medicine residencies at the same community-based center of graduate medical education as the internal medicine program. While these residents were not formally surveyed, 1 upper-level radiology resident was awarded a teaching honor by 1 of these family medicine programs.

A few qualifications to this study are noteworthy. Evaluating improvement in appropriate ordering as a clinical practice is an arduous undertaking, as it is often problematic to assess which member of a teaching service has ordered a study given current trends in shift changes and patient hand-offs, nor is it clear as to what clinical information was available at the time the exam was ordered. As such, it is difficult to translate quality initiatives like these into measurable improvements in imaging utilization.

Significant challenges to implementing this program are (1) generating interest in radiology trainees, (2) maintaining continuity over several years, and (3) ensuring that radiology trainees are appropriately qualified to provide lectures. The first challenge can be alleviated via the effective teaching to radiology trainees that this sort of a consultant role is important to establishing the diagnostic radiologist's role as a valuable clinician. Nonetheless, the movement toward fourth-year mini-fellowships[11] may limit interest among the most experienced residents. Continuity over several years is only possible if there is faculty buy-in from both the internal medicine and radiology departments. Program officials could consider a program like the one described here as means to ensure appropriate milestone[12] progression regarding interpersonal and communication skills. While not encountered in this study, it is possible that radiology trainees may not feel qualified to undertake the required tasks. As such, radiology faculty back-up should always be available.

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