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Cross-specialty Integrated Resident Conferences:

An Educational Approach to Bridging the Gap

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Rationale and Objectives: Radiologists play a pivotal role in patient management, primarily through interacting with referring clinicians. Despite this extensive cross-specialty interaction, radiology resident education rarely involves direct education from clinicians outside the department. We surveyed resident attitudes toward integrated conferences with subspecialty referring physicians both before and after a pilot lecture series at our institution.

Materials and Methods: Three thoracic-themed multidisciplinary conferences were organized, which involved a variety of clinicians lecturing during normal resident conference times. Resident surveys were administered before and after the complete lectures series as well as immediately after each individual lecture.

Results: The prelecture series survey indicated residents felt neutral about their confidence in knowing what clinicians want from radiology reports and the current level of “clinician-focus” in the curriculum. Residents indicated a desire for more clinician involvement in lectures. After completion of the series, residents expressed that the integrated conferences were useful and that they had greater confidence in understanding the clinicians’ expectation of reports. Resident interest in clinician participation in lectures was higher after series completion. Most residents indicated that prespecified, self-identified learning objectives were met by the lectures. After the completion of the series, most residents indicated that they wanted the series to continue, with the most commonly indicated desired frequency being once or twice a month.

Conclusion: Subspecialty clinician participation in a cross-specialty integrated resident lecture series was highly favored and well received. An “Integrated Clinical Lecture Series” may be a beneficial addition to radiology residency curriculums.

Key Words: Clinicians; residents; education; radiology reports; lectures.

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INTRODUCTION

The interaction between referring clinicians and radiologists is critical to effective patient care because many clinical decisions stem from radiologic interpretation. Educating referring clinicians with respect to appropriate study ordering, and radiologists with respect to communication of key diagnostic information, is essential to optimizing care for the patient. The majority of the radiology-clinician interaction occurs via radiology’s main product, the radiology report (1). With notable exceptions, including in ultrasound, breast imaging, nuclear medicine, and procedure-based subfields, radiologists’ in-person and telephone interactions tend to be with clinicians more than patients.

Despite the central role played by clinicians, the mainstay of radiology resident education is lectures given by attending radiologists. Further, didactic lectures tend to focus most on

imaging findings and interpretation with relatively less attention paid to the clinical implications.

Most radiology resident curricula currently have some involvement of clinicians in resident education. First, all radiology residents complete a year of clinical internship, providing a base of clinical experience. After beginning radiology residency proper, residents interact with clinicians in the reading rooms, mainly regarding clinical cases. Also, clinical concerns and clinician perspectives are often taught through senior radiologists who usually have had more extensive interaction with their clinical colleagues. Multidisciplinary conferences (eg, tumor boards, morbidity and mortality conferences, quality assurance conferences) may be the most direct interactions with clinicians in many residency curricula. These experiences overall are quite limited, however, and few allow for time dedicated solely to the purpose of educating radiology residents.

We describe a novel cross-specialty, Integrated Clinical Lecture Series, in which clinicians directly participate in didactic teaching sessions with the intent of addressing topics that occur at the interface of radiology and the clinical field. Before the lecture series, we surveyed residents’ attitudes toward the current level of “clinician-focus” in the curriculum as well as their preferences for clinician involvement in lectures.

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After the implementation, we resurveyed residents as to their attitudes as well as the perceived effectiveness of the series.

MATERIALS AND METHODS

Integrated Clinical Lecture Series

A pilot "Integrated Clinical Lecture Series" was developed. A single subfield, cardiothoracic imaging, was chosen to ensure full involvement of subspecialty radiology faculty and to have an identifiable theme for the series. The initial pilot involved three lectures. A more extensive lecture series, involving all sections and a yearlong curriculum, was deferred until after an in-depth evaluation of this pilot series.

Carefully selected clinicians in the fields of radiation oncology, pulmonary medicine, pathology, and infectious diseases were invited to participate in the lecture series. The stated intent was to discuss topics at the interface between radiology and the clinical discipline, including:

- Clinical scenarios commonly associated with imaging requests.
- The influence of radiology results in clinical decision-making.
- Perceived gaps in communication and understanding between radiology and referring clinicians.
- Reporting style and communication changes that would enhance the radiology service and patient care.

The three integrated lectures had the following titles and formats:

- "Radiation Oncology and Radiology" was presented by a radiation oncologist in conjunction with a panel of cardiothoracic radiologists who were available for discussion. The talk focused on the available radiation treatments options, how individual treatment plans are chosen (in part based on imaging), and the imaging manifestations of the various treatments. The conference was primarily didactic with several cases used to illustrate key points.
- "A Multidisciplinary Approach to Interstitial Lung Disease (ILD)" was presented jointly by a pulmonologist, a pulmonary pathologist, and a cardiothoracic radiologist. The first half of the conference was didactic and the second half was case interpretation. Cases were discussed among the different specialists, as occurs at our institution's clinical ILD interdisciplinary conference. The cases were specifically selected to highlight the potential contributions each field makes to the evaluation of ILD patients.
- "A Multidisciplinary Approach to Pulmonary Infections" was presented jointly by three in-patient infectious disease attendings and a cardiothoracic radiologist. The first half of the conference was didactic, and the second half was case interpretation.

Lectures were scheduled on successive Tuesdays during normal resident conference times. Announcements were made before each lecture to generate excitement. Interested fellows were also encouraged to attend. The number of

residents attending each lecture was recorded via the usual attendance recording system.

Surveys

Institution Review Board approval was granted to administer surveys. Four resident surveys were given in total: one pre-series survey and three postlecture surveys. The last survey included additional questions about the lecture series overall. Five answer choices were provided for most questions to allow for multiple answer gradations. The complete list of survey questions and answer choices are listed in Tables 1–3. Surveys were designed to take no more than 3 minutes to complete. Participation was voluntary. Institution Review Board–approved language explained that completed surveys constituted anonymous informed consent. Surveys with some unanswered questions were still included in the data analysis; this accounted for small variations in the number of responses between questions on any given survey.

Statistical Analysis

Answers to survey questions were summarized with means and standard deviations. Comparisons between pre- and post-lecture survey questions answers were made with the Wilcoxon rank sum test. A *P* value of .05 was defined as being statistically significant.

RESULTS

A total of 23, 23, 22, and 22 surveys were completed for the pre-lecture series survey and the three immediate postlecture surveys, respectively, for a total of 90 completed surveys. The last postlecture survey included questions about the lecture series overall. A total of 3, 3, 3, and 0 residents declined to fill out the surveys, respectively, determined by comparing the number of completed surveys to the official lecture attendance record. The response rates were therefore 88%, 88%, 88%, and 100%, respectively.

Prelecture Series Survey

Prelecture series survey answers are summarized in Table 1. Residents indicated an overall "neutral" response to the current level of "clinician-focus" in our curriculum and a neutral response to their confidence in knowing of what clinicians want from radiology reports. Second- through fourth-year radiology residents (PGY-3 through PGY-5) indicated more confidence in knowing what clinicians want than first-year (PGY-2) radiology residents (*P* = .04). Residents indicated they believed lectures should overall be more clinician-focused, and that they wanted clinicians to participate in radiology resident lectures.

Postlecture Surveys

The results from surveys administered immediately after each of the three lectures are summarized together in Table 2. Of note, residents strongly indicated they found the conferences

TABLE 1. Prelecture Series Survey Questions, Answer Choices, and Responses

Question	Answer Choices	Responses, Mean (SD) (Unless Otherwise Indicated)
What year in training are you?	First year (PGY-2) Second year (PGY-3) Third year (PGY-4) Fourth year (PGY-5)	First years = 7 Second years = 7 Third years = 4 Fourth years = 4 (Number of respondents)
IN GENERAL, how clinician-focused are radiology residency lectures? (meaning, focused on what clinicians want from reports and how they use the information provided)	1 "Not clinician-focused at all" 2 "Not very clinician-focused" 3 "Neutral" 4 "Somewhat clinician-focused" 5 "Very clinician-focused"	3.0 (1.0)
Do radiology residency lectures need a different level of clinician focus?	1 "Should be much less clinician-focused" 2 "Should be a little less clinician-focused" 3 "Should stay the same level clinician-focused" 4 "Should be a little more clinician-focused" 5 "Should be much more clinician-focused"	4.0 (0.7)
Do you want clinicians to participate in radiology residency lectures?	1 "No, I do not want clinicians to participate at all" 2 "No, clinicians participation should be minimal" 3 "Neutral" 4 "Yes, I want clinicians to participate a little" 5 "Yes, I wanted clinicians to participate"	3.9 (0.9)
IN GENERAL, do you feel you know what clinicians want from your reports?	1 "No, I have no idea what clinicians want from my reports" 2 "I have very little idea" 3 "Neutral" 4 "I have some idea" 5 "Yes, I know very well what clinicians want from my reports"	Mean (all): 3.0 (0.7) Mean (PGY-2): 2.6 (0.8) Mean (PGY 3-5): 3.3 (0.6) Wilcoxon rank-sum test, <i>P</i> = .04
Specifically, do you feel you know what clinicians want in reports regarding the following topic: "Post radiation lung cancer f/u"?	1 "No, I have no idea what clinicians want in reports regarding this topic" 2 "I have very little idea" 3 "Neutral" 4 "I have some idea" 5 "Yes, I know very well what clinicians want in reports regarding this topic"	2.9 (0.7)
Specifically, do you feel you know what clinicians want in reports regarding the following topic: "Interstitial Lung Disease"?	1 "No, I have no idea what clinicians want in reports regarding this topic," 2 "I have very little idea" 3 "Neutral" 4 "I have some idea" 5 "Yes, I know very well what clinicians want in reports regarding this topic"	3.4 (0.9)
Specifically, do you feel you know what clinicians want in reports regarding the following topic: "Pulmonary Infections"?	1 "No, I have no idea what clinicians want in reports regarding this topic" 2 "I have very little idea" 3 "Neutral" 4 "I have some idea" 5 "Yes, I know very well what clinicians want in reports regarding this topic"	3.6 (0.8)

useful (average score 4.3), and that they wished clinicians to participate in residency lectures (average score 4.3).

Residents found the lecture series educational (average score 4.4) and favored them to continue (average score 4.4).

Postlecture Series Survey

Comparisons between the Pre- and Postlecture Surveys

The results from surveys administered at the end of the complete lecture series are summarized in Table 3. Resi-

Mean responses to the prelecture question, "Specifically, do you feel you know what clinicians want in reports regarding

TABLE 2. Post-Individual Lecture Survey Questions, Answer Choices, and Responses

Question	Answer Choices	Responses, Mean (SD) (Unless Otherwise Indicated)
What year in training are you?	First year (PGY-2) Second year (PGY-3) Third year (PGY-4) Fourth year (PGY-5)	Rad Onc: First years = 7 Second years = 8 Third years = 3 Fourth years = 5 ILD: First years = 9 Second years = 6 Third years = 4 Fourth years = 3 PI: First years = 10 Second years = 7 Third years = 5 Fourth years = 0 (Number of respondents)
Was this conference useful?	1 "Not useful" 2 "Minimal use" 3 "Neutral" 4 "Some use" 5 "Very useful"	Rad Onc: 4.3 (0.8) ILD: 4.5 (0.7) PI: 4.1 (0.6) Total: 4.3 (0.7)
Will this conference change how you interpret and/or dictate studies?	1 "No, this will not change how I interpret and/or dictate studies" 2 "Minimal impact" 3 "Moderate impact" 4 "More than moderate impact" 5 "Yes, this will definitely change how I interpret and/or dictate studies."	Rad Onc: 3.7 (1.1) ILD: 3.8 (1.0) PI: 3.2 (0.9) Total: 3.6 (1.0)
Do you feel you know what clinicians want in reports regarding the topic reviewed today?	1 "No, I have no idea what clinicians want from my reports" 2 "I have very little idea" 3 "Neutral" 4 "I have some idea" 5 "Yes, I know very well what clinicians want from my reports"	Rad Onc: 4.1 (0.6) ILD: 4.1 (0.7) PI: 3.5 (0.8) Total: 3.9 (0.7)
Do you want clinicians to participate in radiology residency lectures?	1 "No, I do not want clinicians to participate at all" 2 "No, clinicians participation should be minimal" 3 "Neutral" 4 "Yes, I want clinicians to participate a little" 5 "Yes, I wanted clinicians to participate"	Rad Onc: 4.3 (0.8) ILD: 4.5 (1.0) PI: 4.0 (1.1) Total: 4.3 (1.0)
In the pre-conference survey, you indicated one topic you would like to learn today. Did you learn about this topic?	- "I cannot remember the topic I indicated" 1 "I did not at all learn about the topic at all" 2 "I mostly did not learn about the topic" 3 "Neutral" 4 "I learned about the topic somewhat" 5 "I learned about the topic I indicated."	Rad Onc: 4 (0.9) ILD: 4.1 (1.1) PI: 3.3 (1.0) Total: 3.8 (1.0)

ILD, A Multidisciplinary Approach to Interstitial Lung Disease lecture; Rad Onc, Radiology Oncology and Radiology lecture; PI, A Multidisciplinary Approach to Pulmonary Infections lecture.

the following topics?" were 2.9, 3.4, and 3.6, respectively, for each of the three lecture topics. Corresponding postlecture mean responses were 4.1 ($P < .001$), 4.1 ($P = .008$), and 3.5 ($P = .4$).

The mean responses to the question, "Do you want clinicians to participate in radiology residency lectures?" were 3.9 before the lecture series and 4.3, 4.5, and 4.0 after each individual lecture,

respectively. The averaged postlecture response, 4.3, was statistically significantly higher than the preseries score ($P = .042$).

DISCUSSION

We describe a novel integrated radiology-clinical subspecialty lecture series in which referring clinicians jointly lectured

TABLE 3. Postlecture Series Survey Questions, Answer Choices, and Responses

Question	Answer Choices	Responses, Mean (SD) (Unless Otherwise Indicated)
How many of the clinical lecture series conferences did you attend (Tuesdays at noon this month)?	1 Conference 2 Conferences 3 Conferences	1 Conference = 1 (6%) 2 Conferences = 6 (35%) 3 Conferences = 10 (59%) Number of respondents (%)
Was the integrated clinical lecture series educational?	1 "Not at all" 2 "Mostly not" 3 "Neutral" 4 "Somewhat" 5 "Very much so"	Mean 4.4 (SD 0.7)
Would you recommend continuation of the clinical lecture series?	1 "Not at all" 2 "Mostly not" 3 "Neutral" 4 "Somewhat" 5 "Very much so"	Mean 4.4 (SD 0.7)
In your opinion, what would be the ideal frequency for conferences such as this?	"Never" "Few times a year" "Once to twice a month" "Once a week" "Multiple times a week"	0 (0%) 3 (18%) 11 (65%) 3 (18%) 0 (0%) Number of respondents (%)

radiology residents, often with other clinical colleagues and subspecialty radiologists. The lectures focused on the interface between radiology and the clinical discipline, including what clinical scenarios bring patients to radiology and how the radiologic results impact clinical decision-making.

Residents indicated our current curriculum was limited in its "clinician-focus" and that they desired more clinician involvement in lectures. This preference for more involvement increased after the lecture series, implying the experience further reinforced their belief that the conferences would be of value. When specifically asked, residents generally described the series as educational and indicated they would prefer the conference series to continue.

Residents' self-reported confidence in knowing what clinicians want from radiology reports generally increased after the lecture series; most had indicated only a "neutral" degree of confidence before the lecture series. Interestingly, residents less strongly indicated that the conferences would alter how they interpret or dictate studies. Subjectively, the lectures seemed to provide a great deal of context for radiology's role in the clinical enterprise, but were limited in providing specific changes or alterations in practice. Though asked, the participating clinician lecturers provided very few suggestions for changes or improvements in reporting style. Our request for feedback was admittedly very general; questions about specific phrases or topics may have elicited more feedback. With well-established practice patterns, the near ubiquitous use of expert-created templates, and increasing medicolegal requirements, there may actually be little room for significant changes. Improved confidence through a greater understanding of referring clinician expectations, even in the absence of significant changes in reporting

practices, may still be a worthy goal (resident confidence is generally regarded as desirable in the medical literature, though usually reported in the context of on-call/independent practice confidence) (2).

On the surface, clinician involvement in resident lectures seems desirable. We generally interact with referring clinicians more than with patients, so understanding clinician perspectives would seem valuable (3). Anecdotally, radiologists are frequently invited to lecture in grand rounds and conferences held by clinical departments, presumably because understanding imaging helps clinicians do their job. The reverse (clinicians lecturing to radiologists) seems much less common, though also would likely be valuable. Interdisciplinary interaction has a history of being somewhat valued in medical education, for example, in case conferences, tumor boards, quality assurance conferences, and morbidity and mortality conferences. Research on adult education also suggests any type of variety in learning can be beneficial, including varying the type and number of lecturers, as was done here (4,5).

Didactics involving clinicians would be well suited to address many of the Accreditation Council for Graduate Medical Education core competencies (6,7). The "Medical Knowledge" component described within the Radiology Residency Review Committee requirements mandates subspecialty didactic content be presented; the involvement of subspecialty clinicians in lectures would meet this requirement, and would be particularly helpful in programs with a smaller faculty size or limited subspecialization. The "Interpersonal and Communication Skills" and "Systems-Based Practice" components require education and assessment in the realm of communication between physicians and working as part of a health care team.

The importance of communication between radiologists and clinicians has been thoroughly addressed in the literature and by radiology societies (1,8–12). Many authors now consider communication directly with the patient, either through newly structured reports or other means, to be the newest frontier of communication (13–16). If true, further educational involvement of our clinical colleagues can only help towards this goal.

There are several limitations to our study, some arising from the limited scope of this pilot lecture series. A total of three sessions comprised the pilot series; therefore, the success or failure was heavily influenced by a small number of individual lecturers and the chosen formats. A broader series with more lecturers may be received differently. The trial lecture series was restricted to one subfield for ease and clarity of organization; a clinical lecture series involving multiple subfields may be received differently. Finally, this was a single institution study; attitudes and preferences are likely to widely differ between institutions' residents, based in part on the current involvement of clinicians in the various curricula. Our curriculum before this series provided very limited clinician participation in lectures, and a moderate exposure to clinicians via tumor boards and multidisciplinary conferences.

Some limitations arise from limited data. For the sake of survey anonymity, data were not linked to specific individuals so pairwise data could not be analyzed; this limitation would generally bias the statistics towards the null. Given the broad guidelines given to lecturers, fact-based learning objectives could not be easily defined and were not assessed; we did however ask residents to self-identify a single learning objective for each lecture and assess if it was met. Finally, resident attitudes and opinions were assessed shortly after the series; long-term opinions may differ.

Based on our experience with this pilot lecture series, we plan to develop a more comprehensive Integrated Clinical Lecture Series. We would like to acknowledge that the application of this model may be prove challenging in some settings. A broad base of willing clinicians is required which may be more available at larger institutions. Additionally, coordinating multiple lecturers, particularly from outside the department, takes considerable effort, which may be prohibitive. In situations where establishing a Clinical Lecture Series proves difficult, residents can be reminded that extensive learning can come from friendly and collegial interactions with clinicians on the phone and in the reading rooms. Also, attending multidisciplinary conferences, including those not traditionally attended by radiologists, can be immensely educational.

CONCLUSIONS

We developed a novel Integrated Clinical Lecture Series, which was desired, well-received, and generally perceived as valuable. Based on our experience and the data presented within, we intend to permanently incorporate such lectures into our resident curriculum. The lectures serve many goals, not least of which is building interdepartmental relationships and improving resident confidence. Each section will be asked to invite highly regarded speakers from among their clinical colleagues. We intend to report on long-term results from this series. We think our experience may be relevant to other radiology residency programs, which may also benefit from more clinician involvement in lectures. Lectures given side by side with radiologists during normal resident conference times may be the most feasible.

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