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When the Reading Room Meets the Team Room: Resident Perspectives From Radiology and Internal Medicine on the Effect of Personal Communication After Implementing a Resident-Led Radiology Rounds

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Objective: Current radiology and internal medicine (IM) residents have trained to varying degrees depending on program in the post picture archiving and communication systems implementation era and thus have largely missed out on the benefits of in-person, 2-way communication between radiologists and consulting clinicians. The purpose of this study is to broadly explore resident perspectives from these groups on the desire for personal contact between radiologists and referring physicians and the effect of improved contact on clinical practice.
Materials and Methods: A radiology rounds was implemented in which radiology residents travel to the IM teaching service teams to discuss their inpatients and review ordered imaging biweekly. Surveys were given to both cohorts following 9 months of implementation.
Results: A total of 23/49 diagnostic radiology (DR) and 72/197 IM residents responded. In all, 83% of DR and 96% of IM residents desired more personal contact between radiologists and clinicians. Of all, 92% of DR residents agree that contact with referring clinicians changes their approach to a study, 96% of IM residents agree that personal contact with a radiologist has changed patient management in a way that they otherwise would not have done having simply read a report, 85% of DR residents report that more clinician contact will improve resource use, and 96% report that it will improve care quality. Furthermore, 99% of IM residents report that increased access to a radiologist would make selecting the most appropriate imaging study easier in various clinical scenarios. A majority of IM residents prefer radiology reports that provide specific next-step recommendations and that include arrows/key-image series.
Conclusion: We conclude that the newest generation of physicians is already attuned to the value of a radiologist who plays an active, in-person role in the clinical decision-making process.

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Introduction

The American College of Radiology (ACR) launched its Imaging 3.0 campaign in 2013 in response to shifts by government and private insurers from a fee-for-service model of health care delivery to a value based system with the advent of Accountable Care Organizations (ACOs). According to the ACR, "Coordination with primary care and other providers will be increasingly essential in ensuring the appropriate use of imaging and in the longitudinal care of patients with chronic illnesses."[1,2]

Despite this emphasis on coordination by the ACR, direct contact between radiologists and referring physicians, either in-person or via phone, has dramatically decreased since the widespread adoption of picture archiving and communication systems (PACS).[3-5] The older "film rounds" that predated the PACS era were marked by a 2-way exchange of information between radiologists and consulting clinicians.[6] Radiologists had the opportunity to ask questions about patients' clinical presentations while clinicians were able to appreciate how a detailed history assists radiologists in prioritizing a broad differential in cases with nonspecific or nuanced findings. Discussion of appropriate next steps in imaging diagnosis and follow-up was easily carried out in this setting.

Recapturing this "clinical presence," specifically in-person consultation with our referring colleagues is widely recognized by radiology leaders as a key in once-again demonstrating radiology's value to patient care in the eyes of our clinical colleagues. The thoughts of current radiology and internal medicine (IM) trainees regarding the utility of in-person communication in this modern era have yet to be thoroughly investigated.[7] Our goal for this study was to broadly explore resident perspectives from these groups on the desire for personal contact between radiologists and referring physicians and its effect on clinical practice. We also wanted to investigate how improved in-person, telephone, and written communication is perceived to affect patient care by these 2 groups of residents.

Although many older physicians readily recall the days of film rounds, the current generation of residents has completely trained in

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the post-PACS implementation era where such practices have largely vanished. Various methods of restoring some degree of contact between radiologists and referring physicians have been described in the literature including radiology consult pagers, imaging consultation services, and embedded reading rooms.[8,9] At our large academic medical center, we have approached this gap in training experience by creating a resident-driven program entitled "Radiology Rounds." This project was started as a collaborative idea by radiology and IM residents to bring both groups together regularly to meet face-to-face and discuss clinical cases. Although the concept of a resident-driven imaging rounds is not a novel one, this was the first program of its kind to be implemented at our institution.

Methods

The general IM teaching service at our institution is made up of 7 inpatient teams, each comprised of 2 medical students, 2 interns, 1 senior resident, and 1 attending. Each medicine team was asked to submit 3-4 patients from their service with recent imaging studies or diagnostic dilemmas to a group of radiology resident volunteers for review. This process was coordinated via e-mail by the respective chief residents. Radiology volunteers were recruited from the R2 through R4 classes on a first-come, first-served basis. Each radiology resident was then assigned 2-3 medicine teams and received a list of patients and studies to review from the medicine team senior at least 24 hours in advance.

The radiology volunteers would then travel to individual medicine team rooms and review each case with the entire team. This was carried out in the afternoon during dedicated educational time. Radiology residents were asked to emphasize key images, discuss the utility of various imaging studies in answering the given clinical questions, and to review basics such as when to order intravenous contrast. Medicine residents were asked to share how the imaging findings and report verbiage impacted their decision making and ultimately to describe what happened during the patients' episodes of care.

Our radiology-medicine rounds was instituted on a biweekly basis starting in July of 2015. After obtaining IRB approval and informed consent from all participants, separate but related surveys were given to all radiology and IM (including preliminary medicine and transitional year) residents for the 2015-2016 academic year (Table). The surveys were administered in April of 2016 after 9 months of program participation. The surveys were administered on paper during noon conference for both groups with an additional online version distributed via e-mail to those unable to attend in person.

The surveys were designed with Likert-type, open-ended, closed-ended, and dichotomous questions to broadly assess general preferences regarding type, quantity, and styles of radiology-IM communication as well as the effect of the radiology rounds program on education and clinical care.

Qualitative and quantitative survey results are provided. Nonparametric statistical analysis was performed using Mann-Whitney *U* testing to analyze differences in survey responses when stratifying radiology respondents into 2 groups: those expressing an interest in interventional radiology (IR) compared with those who did not.

Results

A total of 24/49 (49%) diagnostic radiology (DR) and 72/197 (36%) IM residents responded. One DR resident only partially completed the survey. This individual's responses to survey questions are included when answered and the denominator of respondents adjusted accordingly to 23 when omitted. Of DR respondents, 9 were in postgraduate year (PGY)-2, 7 in PGY-3, 3 in PGY-4, and 5 in PGY-5 during the year of implementation. Of IM respondents, 28 were in PGY-1, 17 in PGY-2, 25 in PGY-3, and 2 in PGY-4 during the year of implementation. Of them, 14 of 24 DR residents and 33 of 71 IM residents had participated in formal radiology rounds as part of a clinical team while in medical school. These prior experiences occurred overwhelmingly during medical school IM rotations. Fellowship interests among DR and IM residents are shown in Figures 1 and 2. Areas of subspecialty interest were widely distributed with the most popular responses among DR residents including IR ($n = 11$) and musculoskeletal radiology ($n = 10$). The most popular responses among IM residents included hospitalist practice ($n = 19$), primary care ($n = 16$), and cardiology ($n = 14$).

A total of 92% of DR residents and 79% of IM residents agree or strongly agree that radiologists should have regular face-to-face meetings with referring clinicians to discuss cases (Fig 3). In all, 96% of both DR and IM residents would like more personal contact with referring clinicians and radiologists, respectively, in their day-to-day practice (Fig 4).Of those, 92% of DR residents report that contact with referring clinicians (either via phone or in-person) changes their approach for reading a study (Fig 5), 96% of IM residents report that personal contact with a radiologist has on any occasion changed their management for a patient in a way that they would otherwise not have done having simply read the radiology report (Fig 5).

When asked to compare their current vs desired amount of time spent speaking directly (either via phone or in-person) with referring clinicians, a majority of DR residents report currently spending only 5-15 minutes in direct communication during a typical diagnostic work day. This is contrasted with the majority desiring 15-60 minutes during a typical day (Fig 6). When asked to consider the effect of spending more time speaking directly with and answering questions from referring clinicians, the majority of DR residents responded that increased contact would improve proper ordering of imaging studies by referring clinicians (83%), improve appropriate resource use (83%), improve their sense of satisfaction with the role of consultant (88%), and improve the quality of patient care (96%). Of all, 42% of DR residents felt that increased contact would negatively affect workflow (Fig 7).

A total of 78% of DR residents agree or strongly agree that participation in interdisciplinary conferences is an important part of a radiologist's role (Fig 8). When stratifying DR respondents by fellowship preference, residents interested in IR viewed interdisciplinary conference participation as significantly more important than those who did not indicate an interest in IR (Mann-Whitney U, $P < 0.03$).

For IM residents, when queried regarding their approach to reading a radiology report, the majority (74%) reported reading the impression first and usually referring to the body for more details (Fig 9). When asked to select their preferences for radiology report styles and features, the most popular preferences were for reports that include arrows or a key image series (82%), and reports that provide recommendations for appropriate next steps in imaging diagnosis or follow-up (78%). Reports that contain a findings section structured by organ system (36%) and short reports that describe abnormal findings and pertinent negatives only (38%) were not as strongly desired options (Fig 10).

A total of 99% of IM residents agreed that having increased access to a radiologist (either via phone or in-person) would make it easier to ask questions related to selecting the most appropriate imaging study as well as questions about individual radiology reports. Of all, 92% indicated that increased access would make it easier to obtain a preliminary read on a study, 79% indicated that it would help with avoiding unnecessary studies or multiple studies that provide similar information, and 78% indicated that increased access would be helpful in ordering the specific study desired using the electronic medical record (EMR) (Fig 11). In a related question, 99% of IM residents agreed or strongly agreed that having a telephone directory of the various radiology subspecialty reading room phone numbers would be helpful during their clinical work-flow (Fig 12). When ordering studies, the majority (56%) of IM residents report providing a detailed clinical history to address a specific clinical question as well as providing more history for cross-sectional examinations than for plain

TABLE
Survey questions

Radiology (DR)	Both	Internal medicine (IM)
Contact with referring clinicians (either via phone or in-person) changes my approach for reading a study. ■ (1-5, strongly disagree to strongly agree)	What is your PGY-level? ■ Free response	Personal contact (either via phone or in-person) with a radiologist has on ANY occasion changed my management for a patient in a way that I otherwise would not have done had I simply read their report. ■ (1-5, strongly disagree to strongly agree)
Generally speaking, would you like to have more personal contact with referring clinicians in your day-to-day practice than you do currently? ■ (Y/N)	Did you participate in formal radiology rounds as part of a clinical team while in medical school? ■ (Y/N)	Generally speaking, would you like to have more personal contact with radiologists in your day-to-day practice than you do currently? ■ (Y/N)
I currently spend approximately what amount of time during a typical diagnostic work day speaking directly (either via phone or in-person) with referring clinicians, (choose 1): ■ 5 min or less ■ 5-15 min ■ 15-30 min ■ 30 min-1 h ■ > 1 h	If yes to the above question, on what rotations? ■ Free response	When reading a radiology report I… (choose one): ■ Always read just the impression ■ Always read the body of the report AND the impression ■ Read the impression first and USUALLY refer to the body for more details ■ Read the impression first and ONLY refer to the body if I'm unsure of any details
Generally speaking, I prefer what amount of time during a typical diagnostic work day to be spent speaking directly with referring clinicians (either via phone or in-person), (choose 1): ■ 5 min or less ■ 5-15 min ■ 15-30 min ■ 30 min-1 h ■ > 1 h	Radiologists should have regular face-to-face meetings with referring clinicians to discuss cases. ■ (1-5, strongly disagree to strongly agree)	Select the style(s) of radiology report that you would find most helpful in your clinical practice…(select all that apply): ■ A short report that describes abnormal findings and pertinent negatives only ■ A detailed report that enumerates both normal and abnormal findings ■ A report that directly answers my clinical question ■ A report that includes arrows or a key image series ■ A report with a findings section structured by organ system ■ A report that provides recommendations for appropriate next steps in imaging diagnosis or follow-up
Spending more time than I currently do speaking with and answering questions from referring clinicians (either via phone or in-person) will… (select all that apply): ■ Negatively affect my workflow ■ Improve the quality of patient care ■ Improve resource use ■ Improve my sense of satisfaction with my role as a consultant	Have you participated in resident-run radiology rounds? ■ (Y/N)	In ordering an imaging study I… (select all that apply): ■ Meaningfully withhold clinical history so as to not bias the radiologist's search pattern ■ Provide a detailed clinical history in order to have a specific question answered ■ Often provide only minimal history or a symptom ■ Usually provide more history for CT and MRI examinations than for plain films
Participation in interdisciplinary conferences is an important part of my role as a radiologist. ■ (1-5, strongly disagree to strongly agree)	Participation in resident-run radiology rounds has/would improve my competency in which of the following ACGME milestones? (choose all that apply): ■ Patient care and technical skills ■ Medical knowledge ■ Systems-based practice ■ Practice-based learning and improvement ■ Professionalism ■ Interpersonal and communication skills	Having a telephone directory of the various radiology subspecialty reading room phone numbers would be helpful during my clinical work-flow. ■ (1-5, strongly disagree to strongly agree).
Participating in resident-run radiology rounds with internal medicine has improved my skill set as a consultant. ■ (1-5, strongly disagree to strongly agree)	I am interested in… (choose all that apply): <u>Radiology</u> ■ Abdominal imaging ■ Cardiovascular and Thoracic radiology ■ Emergency radiology ■ Interventional radiology ■ Musculoskeletal radiology ■ Neuroradiology ■ Nuclear medicine ■ Pediatric radiology ■ Women's imaging and mammography	Having increased access to a radiologist (either via phone or in-person) would make it easier to… (select all that apply): ■ Ask questions about individual radiology reports ■ Ask questions related to selecting the most appropriate imaging study ■ Avoid ordering unnecessary studies or multiple studies that provide similar information ■ Order the specific study that I have in mind using the EMR ■ Obtain a preliminary read on a study

(*continued*)

TABLE (*Continued*)

Radiology (DR)	Both	Internal medicine (IM)
	Internal medicine ▪ Allergy and immunology ▪ Cardiology ▪ Endocrinology ▪ Gastroenterology ▪ Geriatrics ▪ Hematology-oncology ▪ Hospitalist practice ▪ Infectious disease ▪ Med-peds ▪ Nephrology ▪ Palliative care ▪ Primary care ▪ Pulmonology and critical care Medicine ▪ Rheumatology ▪ Sports medicine ▪ Other (free response)	
Do you feel your interaction with the internal medicine residents will better enable them to order the most appropriate imaging studies (roughly keeping in mind ACR appropriateness criteria) in common clinical scenarios? ▪ (1-5, strongly disagree to strongly agree)		Participating in resident-run radiology rounds has increased my comfort level with identifying anatomical structures on imaging studies. ▪ (1-5, strongly disagree to strongly agree)
Did you learn anything from the internal medicine residents while on radiology rounds that will change your day-to-day clinical practice? ▪ Free response		Participation in radiology rounds has increased my knowledge of ACR appropriateness criteria for choosing the most appropriate imaging study in any given clinical scenario. ▪ (1-5, strongly disagree to strongly agree) Participation in radiology rounds has increased my comfort level with knowing when it's helpful to order a contrast-enhanced study for either CT or MRI imaging as opposed to a noncontrast study. ▪ (1-5, strongly disagree to strongly agree) Participation in radiology rounds has increased my comfort level with correctly ordering premedication for contrast-allergic patients. ▪ (1-5, strongly disagree to strongly agree) Participation in radiology rounds has increased my confidence in my ability to select the correct orders for various imaging studies in PowerChart. ▪ (1-5, strongly disagree to strongly agree) Do you have any suggestions for improving the radiology rounds program? ▪ Free response

films, 36% responded that they will often provide only minimal history or a symptom, and 7% meaningfully withhold clinical history so as to not bias the radiologist's search pattern (Fig 13).

For those who participated in the radiology rounds program, 42% of IM residents were neutral when considering if participation increased their knowledge of ACR appropriateness criteria, 24% disagreed or strongly disagreed, and 33% agreed or strongly agreed. Of the 6 radiology residents who responded to this question, 3 strongly agreed that their interactions better enabled the medicine residents to order appropriate imaging studies according to ACR appropriateness criteria, 2 were neutral, and 1 disagreed (Fig 14). A total of 52% of IM residents agreed or strongly agreed that participating in radiology rounds increased their comfort level with identifying anatomical structures on imaging studies, 50% of IM residents agreed or strongly agreed that participation increased their comfort level with knowing when it's helpful to order a contrast-enhanced study for CT or MRI examinations. The majority of IM residents were either neutral or disagreed that radiology rounds increased their comfort level with correctly ordering premedication for contrast-allergic patients or increased their confidence in selecting the correct orders for various imaging studies in the EMR (Fig 15). For those DR residents having participated in radiology rounds, 3 strongly agreed that participation improved their skill as a consultant, 2 agreed, and 3 were neutral (Fig 16).

When asked to consider which Accreditation Council for Graduate Medical Education (ACGME) milestones participation in radiology rounds improved, the most popular responses by DR residents included interpersonal and communication skills (100%), professionalism (82%), and medical knowledge (82%). The most popular responses by IM residents included medical knowledge (96%), and patient care and technical skills (70%) (Fig 17).

Free text responses from DR residents regarding what they learned from IM residents include: "How reads affect management," "Their thought processes when ordering studies," and "More interest from IM in protocols than I expected." Free text responses from IM residents regarding suggestions for improvement of the program largely focused on not having sufficient time for the sessions and wanting to schedule them more frequently.

Discussion

Radiology and IM residents are in near unanimous agreement that regular face-to-face meetings between radiologists and referrers

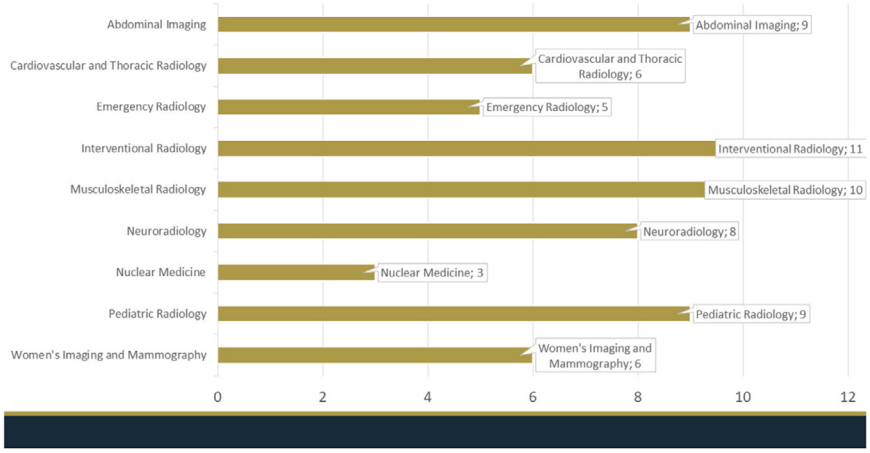

FIG 1. DR: I am interested in... (select all that apply), $n = 67$. (Color version of figure is available online.)

FIG 2. IM: I am interested in... (select all that apply), $n = 98$. (Color version of figure is available online.)

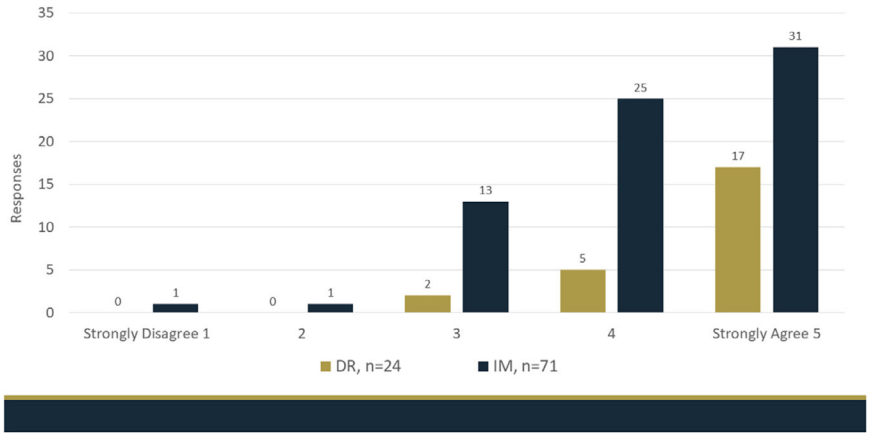

FIG 3. DR and IM: radiologists should have regular face-to-face meetings with referring clinicians to discuss cases. (Color version of figure is available online.)

should take place. Such direct contact is perceived to have an effect on imaging diagnosis and medical decision making above and beyond that conveyed by written communication alone. It is not surprising then that both groups in our study desired an increased amount of personal contact between these groups in their day-to-day practice. This represents a full-circle return by current residents who recognize and desire the benefits of "film rounds" although largely having never experienced them in person. Although this study did not examine the effect of increased contact between radiology and IM residents on specific patient outcomes, radiology rounds was perceived to improve the quality of patient care by making it easier to order the most appropriate imaging examination for addressing specific clinical questions.

Based on these results, we propose a set of 4 actionable steps, any of which can be taken to enhance direct contact between radiologists and referring clinicians at teaching institutions. The first would be establishing a resident-driven radiology rounds akin to that described in this study. Although this concept is not novel, our goal is to provide

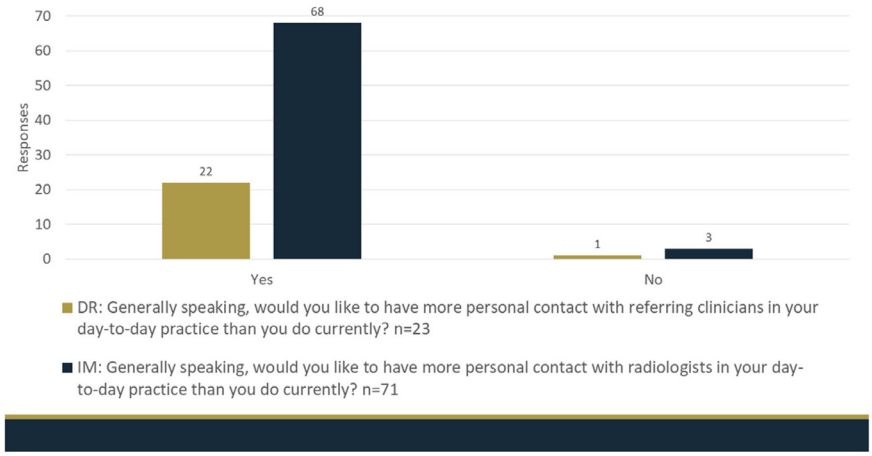

FIG 4. DR and IM. (Color version of figure is available online.)

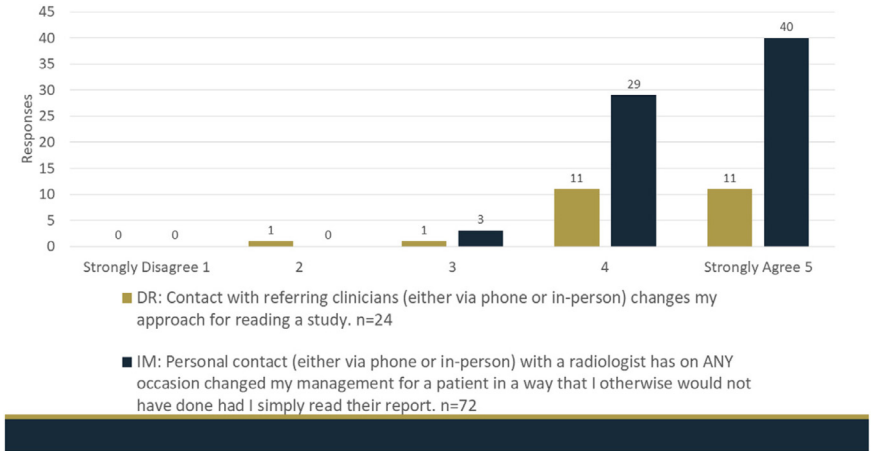

FIG 5. DR and IM. (Color version of figure is available online.)

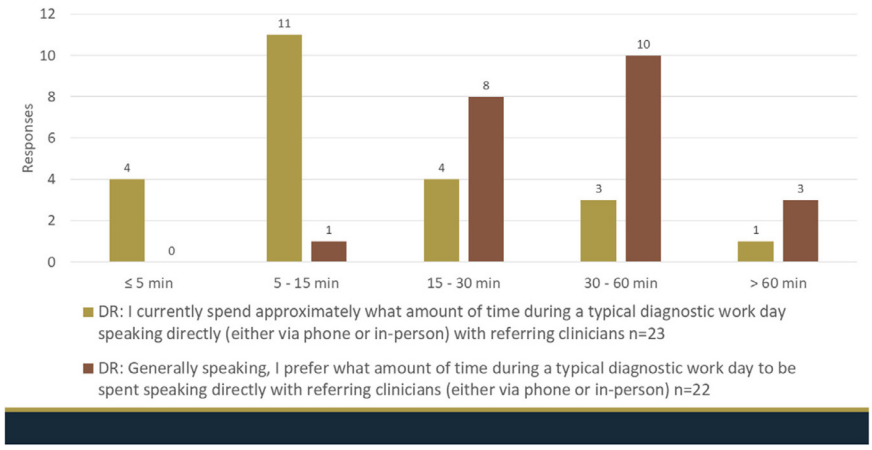

FIG 6. DR. (Color version of figure is available online.)

evidence for undertaking this type of educational enterprise at other institutions by demonstrating broad support and desire for such a program in a large academic medical center. In programs with fewer radiology residents, establishing a resident "consultant of the day" pager may be an alternative as described by Cizman et al.[7]

When surveyed, IM residents overwhelmingly agreed that having a telephone directory of subspecialty radiology reading rooms to call directly for questions (as opposed to calling via the hospital operator) would be beneficial to their clinical work-flow. In response to this, a directory was newly created and distributed electronically to all trainees at our institution with positive response from referring physicians. The directory contained not only subspecialty reading room phone numbers but also contact information and a directory of whom to consult for common image-guided procedures. Although this may not be practical for all radiology departments, anecdotal experience with our implementation has shown a decrease in the number of phone calls directed to the wrong reading room. Concerns over managing an increase in phone calls could be ameliorated via

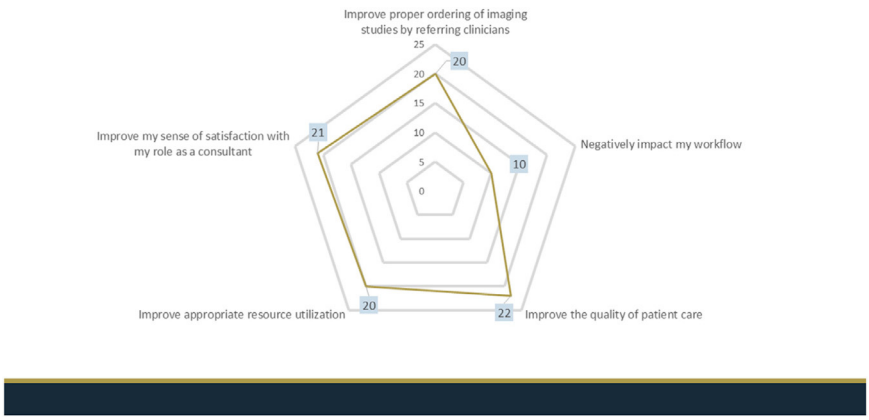

FIG 7. DR: spending more time than I currently do speaking with and answering questions from referring clinicians (either via phone or in person) will... (select all that apply), $n = 23$. (Color version of figure is available online.)

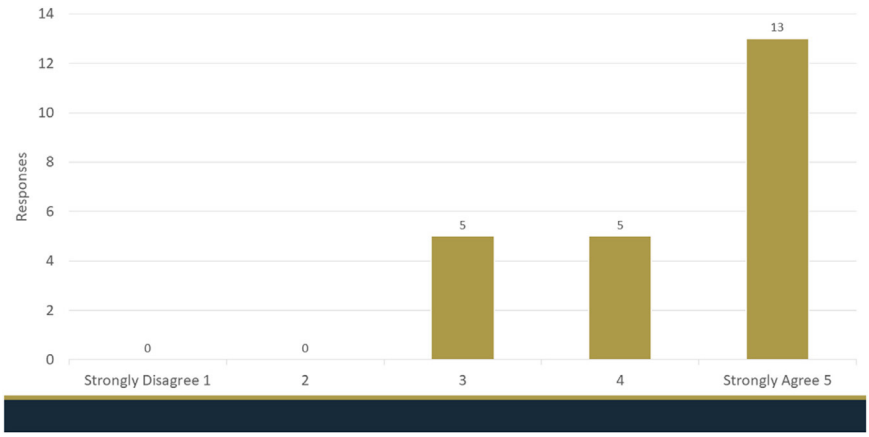

FIG 8. DR: participation in interdisciplinary conferences is an important part of my role as a radiologist $n = 23$. (Color version of figure is available online.)

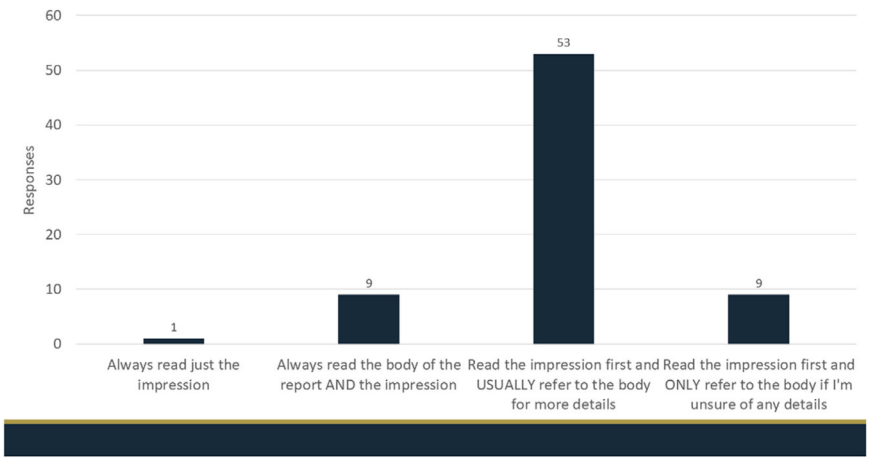

FIG 9. IM: when reading a radiology report I..., $n = 72$. (Color version of figure is available online.)

the use of reading room assistants. Further assessment of the effect of our directory and guide would be best addressed by a future targeted investigation. Overall, we stand by our conclusion from this study that in a situation in which more communication is desired, we should make ourselves as accessible as possible given that our referrers perceive personal contact with radiologists as directly impacting patient care above and beyond written reports.

Beyond this, we acknowledge that the prospect of taking a radiologist away from the work-list may be a challenge in today's RVU-driven practice climates. In-person radiology rounds programs as described here are facilitated by the relative freedom of radiology residents from being solely responsible for turn-around times on the day's imaging studies. In those situations where staffing and work volume prohibit regular in-person meetings, our survey highlights key features, desired by clinicians, that can alternatively be incorporated into traditional written radiology reports to also improve communication. These include the regular use of key image series, annotated images, and specific data-driven recommendations for next steps in imaging diagnosis or follow-up. The relative lack of interest by IM residents in having report findings structured by organ system is somewhat surprising

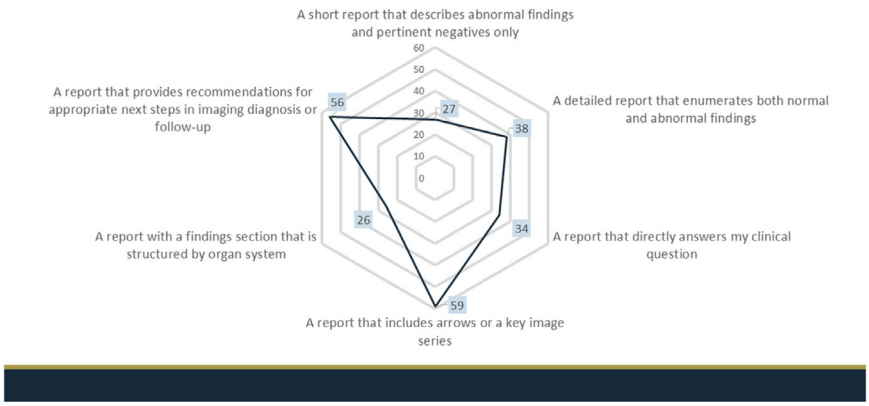

FIG 10. IM: select the style(s) of radiology reports that you would find most helpful in your clinical practice... (select all that apply), $n = 72$. (Color version of figure is available online.)

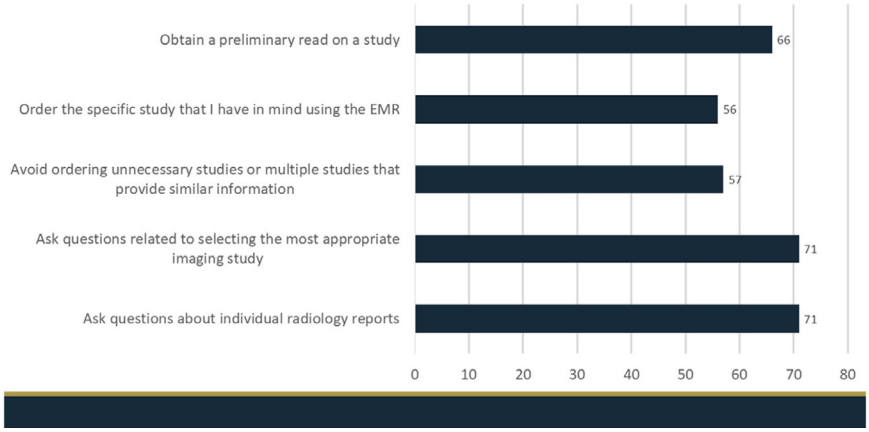

FIG 11. IM: having increased access to a radiologist (either via phone or in-person) would make it easier to... (select all that apply), $n = 72$. (Color version of figure is available online.)

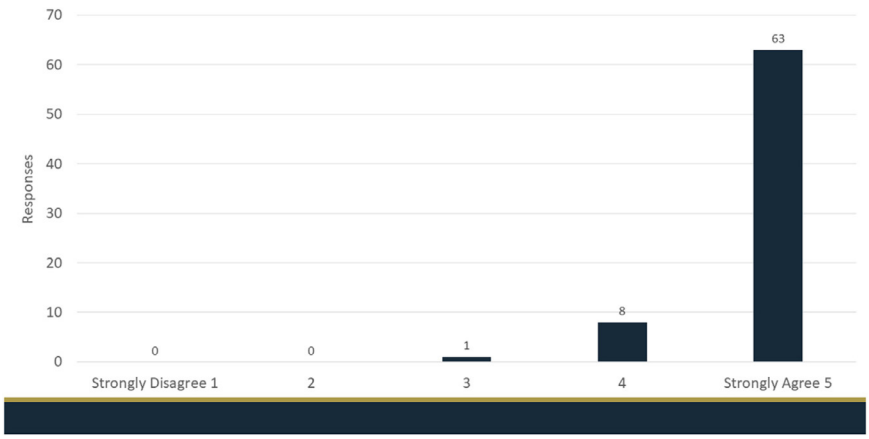

FIG 12. IM: having a telephone directory of the various radiology subspecialty reading room phone numbers would be helpful during my clinical work-flow $n = 72$. (Color version of figure is available online.)

given the emphasis on and widespread adoption of this practice by many radiologists. Although further investigation is warranted, this raises the question of who this practice is intended to benefit. Is it the radiologist or the referring clinician?

Although many practices already incorporate these features in their reports, understanding the strong desire among young physicians for such interventions can support a consistent and uniform use at the practice level. The success of various ACR supported "RADS" criteria such as BI-RADS and its cohort of related systems is echoed by the desire of the next generation of clinicians for a consistent, clear, and actionable reporting style. When implementing specific communication enhancements to written reports, we would like to emphasize that knowledge of your specific audience is always the most important factor. For example, general practitioners and subspecialists may have different preferences regarding next-step recommendations. We encourage readers to consider their own internal surveys among referrers before implementing practice-level changes.

The limitations of our study include a relatively small sample size and low survey response rates, 49% for DR and 36% for IM. This may have introduced bias in that those motivated to respond

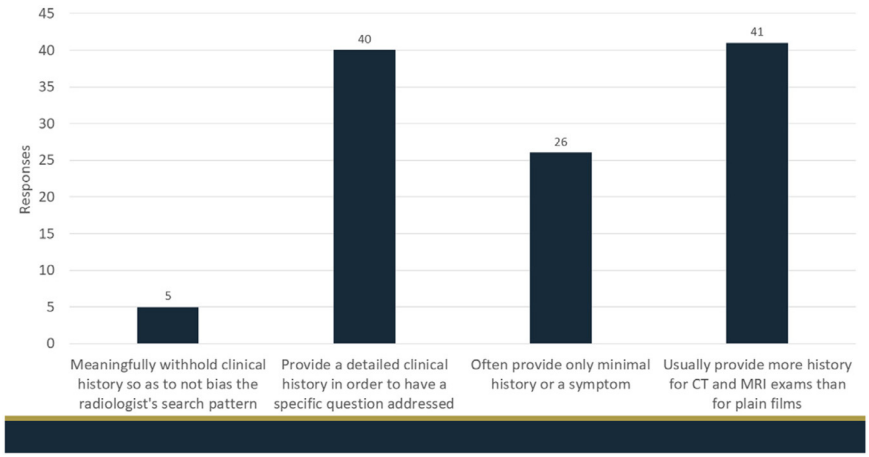

FIG 13. IM: in ordering an imaging study I. . .(select all that apply), $n = 72$. (Color version of figure is available online.)

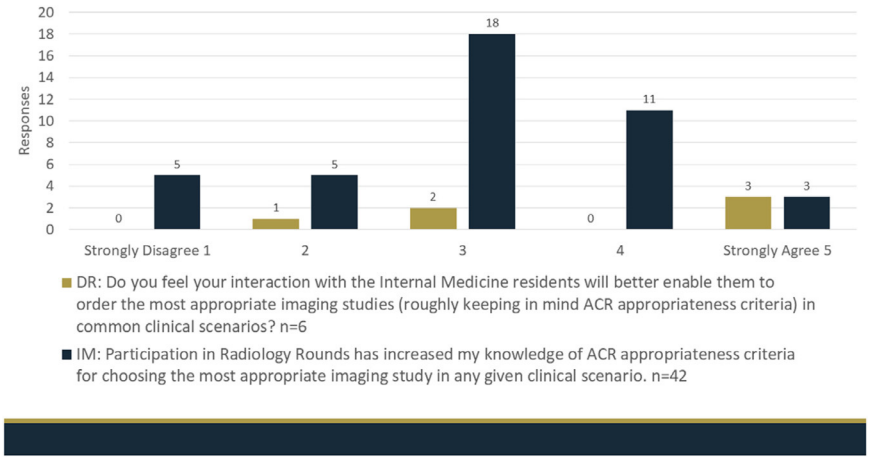

FIG 14. DR and IM: both groups including only those who participated in radiology rounds. (Color version of figure is available online.)

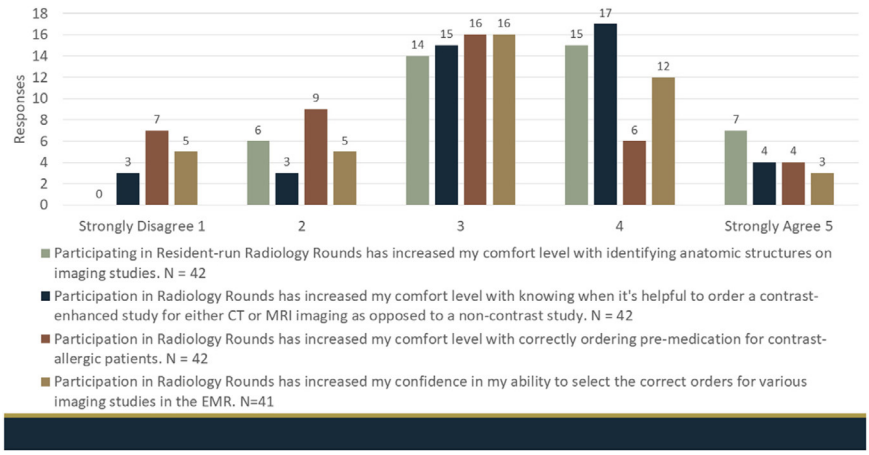

FIG 15. IM: for those respondents who participated in radiology rounds. (Color version of figure is available online.)

to the electronically distributed version may have been more likely to view radiology rounds and its effect in a positive light. Beyond this, although a majority of questions did not directly pertain to the effect of the radiology rounds program, administration of the survey only after implementation may have introduced bias by raising general awareness of in-person radiology consultation practices.

The low number of DR respondents who participated in the program also introduces bias in the participant-only questions given that a small cohort of interested individuals were capable of repeatedly volunteering due to the first-come-first-served recruitment process. One may also question if the small group of radiology resident volunteers elected to participate in the program due to an inherent interest in academic medicine and teaching. It follows then that such residents

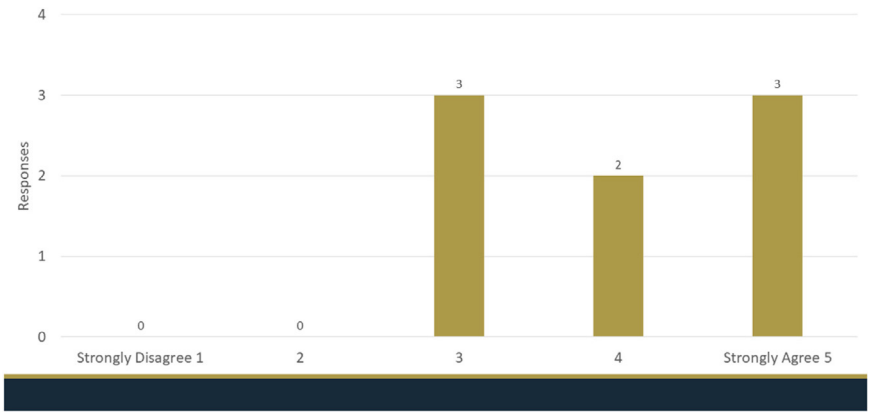

FIG 16. DR: participating in resident-run radiology rounds with internal medicine has improved my skill set as a consultant. $n = 8$, including only those having participated in radiology rounds. (Color version of figure is available online.)

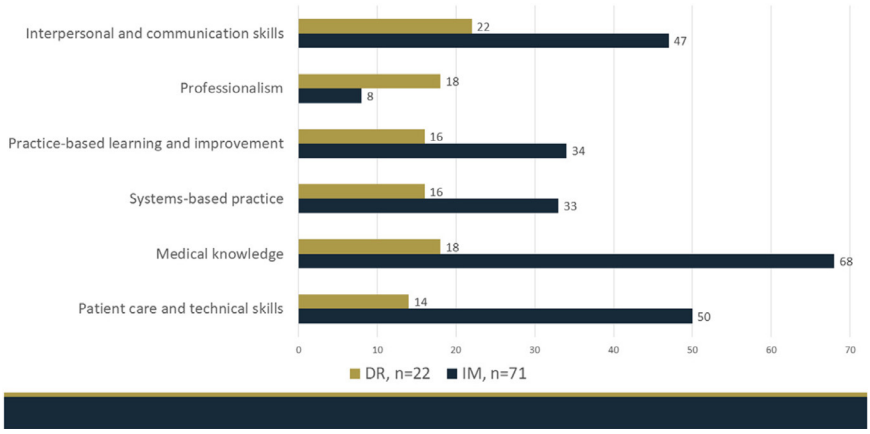

FIG 17. DR and IM: participation in resident-run radiology rounds would improve my competency in which of the following ACGME milestones? (select all that apply). (Color version of figure is available online.)

may already have experience with similar teaching sessions which could have provided a higher educational quality for participating IM residents. This may have played a role in the positive responses from IM residents. In practice, consideration should be given to teaching skills as part of quality assurance when implementing a radiology rounds program. Future directions for this could include a standard "train the teacher" session for radiology residents or creation of a standard educational curriculum for nonradiology residents.

Subgroup analysis of variations in responses among DR residents when stratified by subspecialty preference was limited by lack of power as well as respondent ability to select multiple areas of interest. The lone exception to this was a significant difference in those who indicated interest in IR being more likely to strongly agree with the value of interdisciplinary conferences. Although all radiologic subspecialties are key members of various interdisciplinary conferences such as tumor boards, we hypothesize that those interested in IR may share a greater clinical affiliation with referring clinicians due to the high volume of direct patient interaction inherent to this subspecialty.

Questions addressed to those IM residents who participated in radiology rounds showed that the program is having either a small or no effect on improving knowledge of ACR appropriateness criteria, cross-sectional anatomy, the utility of intravenous contrast media, standard contrast-allergy premedications, or how to specifically order imaging studies using our system's EMR. These gaps in content delivery can be addressed in the future by creating a structured curriculum and training for radiology volunteers.

Over the 9 months of radiology rounds implementation at our institution, no complaints regarding the temporary absence of DR resident volunteers from their clinical services were reported either directly to individual volunteers or to the residency program director. This ease of implementation was likely aided by the large number of residents per class in our program (13) as well as the large number of radiology fellows present in each division who share the daily work load. Although staffing limitations may present a challenge in smaller training programs, we feel that the benefit to patient care outweighs the primary drawback of workflow interruption. This assertion is strongly supported by our findings presented in Figure 5 in which 96% of IM residents agreed that personal contact with a radiologist has changed their management in a way that otherwise would not have been implemented had they only read a radiologist's report.

As we take a step back and re-examine the future course for radiology and Imaging 3.0 as charted by our leadership in the ACR, we can conclude from this study that the newest generation of radiology and IM trainees already recognize the value of a radiologist who plays an active, in-person role in the clinical decision-making process. Medicine is fundamentally about relationships: those between patient and physician as well as those among physicians. Bringing back the face-to-face interactions cherished by radiologists before the PACS era can improve our workplace satisfaction and thereby reduce the risk of burnout. Although it is interesting to note that DR residents improved their communications skills and IM residents enhanced their medical knowledge by participation in this program, both of these skill sets are enhanced by direct communication and are ultimately used for the benefit of patient care. Knowledge of this value will be key for radiology's continued relevance as the traditional

fee-for-service care model is slowly replaced. We hope this data can support leaders in protecting time for radiologists to regularly engage clinicians in discussion and play a broader in-person role in the clinical decision-making process.

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