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Perspective on the New IR Residency Selection Process: 4-year Experience at a Large, Collaborative Training Program

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Interventional Radiology (IR) was officially approved by the American Board of Medical Specialties in 2012 and the Accreditation Council of Graduate Medical Education as a unique, integrated residency in 2014. Its establishment and distinction from diagnostic radiology was compelled by the increasing emphasis on clinical care delivery by IRs. The shift in the IR training paradigm, as exemplified in the Integrated IR residency programs, appeals to a distinct cohort of applicants, prompting the need to re-evaluate the recruitment and selection process. This article discusses selection criteria for identifying ideal candidates for the new IR training model (focusing on Integrated IR residency training), highlights the importance of collaboration between the IR and DR selection committees, and illustrates the changes made at a single institution over the course of 4 selection cycles prior to the COVID-19 pandemic as well as significant changes in the current climate of the global pandemic.

Key Words: IR Residency; Selection; Interviewing; ERAS; COVID-19.

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INTRODUCTION

Since the early years of Interventional Radiology (IR), pioneers emphasized the importance of a patient-centered approach to training. In their belief, a fixation on procedural execution alone would ultimately fail to provide good patient care without the comprehensive understanding of peri-procedural clinical care (1). Despite these intentions, IR training became increasingly focused on the procedural and imaging aspects of training, neglecting to address the importance of clinical management. In the traditional IR training model, clinical training is absent throughout the 4 years of diagnostic radiology rotations with a single, terminal fellowship year intended for learning procedural techniques. Awareness of this deficiency prompted several

programs to trial more clinically oriented training models such as the Diagnostic and IR Enhanced Clinical Training (DIRECT) and Clinical Pathways (2). Both the DIRECT and Clinical Pathways incorporated several clinically oriented, non-radiology rotations within the 6-year curriculum. These early adaptations of IR training, particularly the Clinical Pathway, would serve as precursors to the new Integrated IR residency. IR was recognized as a primary specialty by the American Board of Medical Specialties in 2012 and the Accreditation Council of Graduate Medical Education approved the Integrated IR and Independent IR residencies in 2014 (3-5).

Ultimately, the new IR residency aims to equip interventionalists with advanced procedural skills, imaging expertise, and experience in comprehensive peri-procedural patient care. To achieve this goal, the IR curriculum was changed. Like DR, the IR residency requires a preliminary clinical year; many IR programs prefer a surgical preliminary year (6). Many of the peri-procedural patient care and procedural skills utilized in IR can be gained from a year of dedicated surgical training, in the authors' opinions. Where the new Integrated IR curriculum diverges from traditional radiology training is in the integration of subspecialty clinical rotations. Integrated IR residents are assigned to clinical rotations in specialties where physicians frequently refer patients to the IR service, or serve as consultants to IRs, during post-graduate year (PGY)-2 to PGY-6. The specific

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clinical rotations are institution-dependent; example rotations include (but are not limited to) vascular surgery, surgical intensive care unit, hepatology, and the transplant service. At many institutions the final two years of the integrated IR residency (PGY-5 and PGY-6) are primarily IR rotations, including dedicated time seeing patients in IR clinic.

The curricular changes associated with the Integrated IR residency have begun to attract different types of medical student candidates that are inherently distinct from the traditional diagnostic radiology applicants (7). This has prompted the need to revamp the recruitment process to appeal to candidates better suited for IR residency. Our purpose is to review the selection criteria for identifying ideal candidates for the Integrated IR training model, highlight the importance of collaboration among the IR and DR selection committees, and illustrate the changes made at a single institution over the course of several selection cycles

WHY IS SELECTION OF IR RESIDENTS DIFFERENT FROM DR RESIDENTS?

Before the adoption of the IR residency, IR fellowship positions were traditionally matched from a pool of DR residents who had been previously selected from medical school to meet the criteria of the ideal DR resident. Today, Integrated IR residents are directly matriculating into graduate medical education training from medical school and face distinctive challenges brought on by the Integrated IR training model. More importantly, the practicing IR graduates require a skill-set different from their Diagnostic Radiology colleagues.

After concluding a year-long clinical internship, Integrated IR residents rotate through the diagnostic radiology curriculum interspersed with non-radiology clinical rotations. Adaptability of IR residents to immerse themselves into a variety of services and settings is crucial. Effectively, these trainees often serve as both an IR and DR consultant on each service, whether working in the radiology reading room or interacting with a patient or patient's family. Moreover, IR residents are subject to the same call requirements and duty hours as clinical residents on their respective services, while concurrently fulfilling DR and IR expectations.

Upon completion of the IR residency, trainees are qualified to receive certification in both IR and DR from the American Board of Radiology (2). The IR candidate must therefore be an adept learner and achieve a level of competency in DR similar to their DR colleagues, despite fewer rotations in Diagnostic Radiology.

IR candidates must be aware of the clinical service and time commitment required, and have the academic and emotional fortitude to successfully navigate the rigors of a combined program such as the Integrated IR residency. Self-discipline is required of the IR trainee to fully engage in diagnostic radiology, interventional radiology, and clinical rotations with equal vigor and enthusiasm. As such, selecting the right trainees to complete this rigorous training is of paramount importance to training programs and to the trainees.

THE PROCESS

Establishing Collaboration

Partnership between DR and IR interview committees and education leadership is critical to developing a consistent selection process and speaking to candidates in one coherent voice. Given that candidates may apply to either or both DR and IR programs, **establishing** similar baseline acceptance criteria is helpful. In addition, all medical students who match into the Diagnostic Radiology residency and the Integrated IR residency will rotate through both DR and IR services during residency. Being philosophically aligned, yet allowing each program to function independently in recruitment, is necessary as both programs work toward a common goal of successful recruiting for their closely related, but distinct, training experiences.

ELECTRONIC RESIDENCY APPLICATIONS SERVICES (ERAS) APPLICATION REVIEW

Over the last several years, partially due to steadfast advocacy by the Society of Interventional Radiology (SIR) and its Resident, Fellow and Student section, the IR residency has become well known among medical students across the country and has become one of the most desirable medical specialties. This has created a surge in the number of well-qualified applicants, many of whom have participated in a number of IR related activities by the time they apply for residency. IR programs across the country have immensely benefited from this emerging interest, which has also prompted them to scrutinize the applications carefully to identify the very best IR candidates.

The initial ERAS application review process for IR interview invitations, typically performed by the IR Program Director (PD) and Associate PD, is similar to the process for DR applicants with a few minor differences. There are many overlapping characteristics in successful IR and DR candidates, not surprising as approximately two thirds of the residency rotations are identical and both IR and DR residents will take the American Board of Radiology Core examination in their PGY-4 year.

Applicants meeting requirements common to both DR and IR are further assessed for evidence of an ongoing passion for, and commitment to, IR. Medical students frequently manifest their interest by participating in an IR interest group, serving in leadership roles, participating in SIR activities either through the medical student council (MSC) or Resident, Fellow and Student, performing IR-related research, applying for SIR scholarships to attend the annual meeting, and by performing well in IR and clinically relevant clerkships. A holistic approach to application review whereby focusing on the total experience and therefore potential of an applicant rather than specific scores or prestige of prior institutions is ideal.

The optimal number of candidates to invite for each available IR position is variable and can be estimated by reviewing prior match results, reviewing the number of programs and

positions available nationally, and assessing the number of candidates in the applicant pool. Approximately 10-12 applicants are interviewed for each IR position at many institutions, a ratio that reflects the competitiveness of the residency and the surplus of well-qualified applicants.

INTERVIEW COORDINATION

Many IR candidates apply for both IR and DR positions at the same institution. Some may have an interest in pursuing both fields without particular preference. Others have geographical requirements which outweigh specialty choice. Some may hope to be accepted into the DR residency and be considered for Early Specialization in IR to later train in an Independent IR residency. As there are fewer IR positions than DR positions, and IR is therefore more competitive, candidates are encouraged to apply to both DR and IR to maximize their chances of matching. However, both the IR and DR programs have the option to not rank candidates that they feel are not committed to either program, especially the IR integrated residency.

Since an applicant must meet all requirements for DR interview invitation prior to being considered for an IR position, a candidate qualified for an IR position is automatically qualified for a DR interview invitation at the authors' institution. If the applicant does not meet the criteria for IR, they may still be considered for a DR interview, but an IR candidate need not disclose if they have applied to the DR program. If a candidate applies only to the IR residency, they will receive only an IR interview. Those interviewing for both IR and DR positions interview for both residencies on the same day to minimize the travel cost incurred by the interviewee. Due to the complexity of the interview invitations, additional measures are taken to ensure that no repeat invitations are sent to those applying to both DR and IR programs. Multiple software programs exist to facilitate interview scheduling.

INTERVIEW LOGISTICS

The interview day is an assessment of the applicant by the program and an assessment of the program by the applicant; both parties are seeking a match. As such, the interview day should be well organized and allow exposure to both DR and IR, facilities, residents, and faculty. The program should emphasize the quality of both DR and IR training, cohesiveness of various divisions and services, research opportunities, and faculty and resident well-being.

Institutions vary, but the authors' experience has been to dedicate 1/3 to 1/2 of the interview dates to include IR candidates, and on those days, approximately 50% of the candidates will be IR residency applicants. IR-specific interview activities are performed early in the morning prior to the arrival of the DR applicants. The morning consists of a tour of the IR facilities by a senior IR resident and dedicated IR interviews with 2-3 IR faculty members and the IR chief

resident. Afterwards, the IR applicants join the DR applicants; both groups participate in breakfast with residents and faculty, orientation to the residencies, tour of the hospital and city, lunch with residents, and a didactic conference. Half of the group, consisting of a mix of DR and IR applicants, will participate in additional interviews in the morning and go on a tour of the hospital and the city in the afternoon. The other half of the interview group will participate in the same activities at the opposite times. This second set of interviews for the IR candidates is with the IR program director, two DR faculty members, the DR program director, and DR chief residents. The day comes to a close with a brief meeting with the program director of the preliminary surgery year where they briefly review the surgical internship curriculum.

COORDINATING WITH A PRELIMINARY YEAR PROGRAM

At the authors' institution, like many other categorical IR residencies, the surgical internship year is built into the curriculum. The Department of Surgery has agreed to accept the IR residents as preliminary surgical interns without directly participating in the interview selection process; this decision is in part secondary to the pre-existing strong relationship between the IR and surgical departments and the historically good experience the surgical department has had with the IR residents. Some surgical programs may opt to formally interview the candidates, which can be reserved for the end or the beginning of the radiology interview day or on a separate day, if needed. IR leadership encourages Surgery to interview these candidates, seeking their input and experience in vetting procedurally inclined candidates.

REVIEW OF THE APPLICANTS, FORMULATING THE RANK LIST, AND THE NATIONAL RESIDENCY MATCHING PROGRAM MATCH

After the dedicated IR interviews in the morning, a brief meeting takes place where the IR interviewees are reviewed, and a daily preliminary rank list is generated. Then, all DR and IR candidates are reviewed after each half day of DR interviews. Each DR and IR candidate is then discussed in detail by all interviewers and ranked accordingly into a separate DR rank list. These adjustments to the rank list after each interview session allow for almost real-time updates while the candidate is fresh in the interviewers' mind.

After completion of the interview season, the IR and DR selection committees revisit all of the applicants. After separate IR and DR rank lists are generated by the respective committees, any discordance in the ranking is reviewed and reconciled by the committee chairs. IR candidates invited for interviews are likely competitive for both programs; however, they may differ in their position on the rank lists. Most candidates ranked for either program are competitive for both programs.

	7:00-7:45	7:45-7:30	7:30-7:45	7:45-8:00	8:00-8:15	8:15-8:30	8:40-9:00	9:00-9:50	9:55-10:20	10:25-10:50	10:55-11:20	11:25-11:50	12:00-12:45	12:45-1:15	1:30-1:55	2:00-2:25	2:30-2:55	3:00-3:25	3:30-3:40	3:45-5:30
Candidate 1	Tour with IR Chief Resident			Faculty 1	Faculty 3	Faculty 2	Breakfast Reception	Program Overview with DR PD	IR PD	Lounge	Faculty	DR PD	Lunch	Noon Conference	Department Tour				Interview Day Wrap Up	Interview with Surgery Department
Candidate 2				Faculty 2	Faculty 1	Faculty 3			DR PD	IR PD	Lounge	Faculty								
Candidate 3				Faculty 3	Faculty 2	Faculty 1			Faculty	DR PD	IR PD	Lounge								
Candidate 4	Faculty 1	Faculty 3	Faculty 2	Tour with IR Chief Resident			Breakfast Reception	Program Overview with DR PD	Department Tour				Lunch	Noon Conference	IR PD	Lounge	Faculty	DR PD	Interview Day Wrap Up	Interview with Surgery Department
Candidate 5	Faculty 2	Faculty 1	Faculty 3												DR PD	IR PD	Lounge	Faculty		
Candidate 6	Faculty 3	Faculty 2	Faculty 1												Faculty	DR PD	IR PD	Lounge		

Figure 1. Sample Interview Schedule.

Finally, rank lists are uploaded to the National Residency Matching Program and separately certified by the program directors for IR and DR. Candidates and programs wait until Match Day to see where they will train/who will be in their program. Most candidates are happy with their Matched specialty and training program; others may be less thrilled but eventually figure out how to continue their life journeys, whether in DR or IR.

RESIDENT SELECTION DURING THE COVID-19 PANDEMIC

Given the ongoing COVID-19 pandemic, The Coalition for Physician Accountability (Coalition), a group of education leaders and organizations, have decided this application cycle will be different from years past (8). Unlike prior years, applicants may not have the opportunity to participate in visiting rotations. The Coalition “discourages” away rotations except in specific circumstances, where the learners do not have access to a specialty experience at their own institution or when an away rotation is required for graduation. This may make it more difficult for applicants from medical schools without IR training programs to be mentored or gain exposure to IR. At many institutions, visiting elective students are engaged and the 2 or 4-week rotation is considered an interview. It is also worth noting that COVID-19 has impacted IR training programs and clinical operations with reduction in elective cases leading the Accreditation Council of Graduate Medical Education to make some changes in training requirements, which may affect student experience negatively as well (9). While virtual electives are being discussed and developed, they are not presently operational at a majority of institutions. As programs develop virtual rotations, they may give students the opportunity to learn more about the program, but it will be difficult for both the program faculty and the students to truly get a sense of what each has to offer the other in this limited format, especially in IR where clinical and procedural experience are paramount.

Additionally, the Coalition recommends all programs conduct interviews virtually for all applicants. This poses challenges for applicants as they will not have the opportunity to get a sense of the culture of a program, will not have the ability to tour the facilities/city, and will not be able to interact with faculty, staff, and trainees, other than those directly conducting the virtual interviews.

Figure 1.

Finally, the Coalition recommends adjusting the ERAS application process including opening the application (June 8,

2020), initial applicant submission date (September 1, 2020), and initial residency program review and release of the MSPE (October 21, 2020) (10). This change may cause additional anxiety for trainees as the dates of application submission, interviewing, and the match may change based on the rapidly changing global pandemic and its limits on clinical experiences and completion of core curricula.

It remains to be seen how the above changes to the class of 2021 and potentially future classes will affect the number of applicants to IR and other specialty programs.

CONCLUSION

The interventional radiologists of the future will be different from those of years past due to the changing IR training paradigm. Program directors must address selection of ideal candidates for IR training differently as well. Collaboration throughout the process between DR, IR, and even preliminary year programs is key to recruit the best candidates to any institution. Although the COVID-19 pandemic is upon us, it is important for programs to continue collaboration in selection, while maintaining safety for all involved.

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