

The Trouble With Fellowships

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The fellowship year is now chosen by more than 90% of radiology residents. However, oversight of training programs is not uniform, with the number of occupied positions in non-ACGME programs now exceeding that of programs under periodic ACGME review. Lacking surveillance by a national regulatory body, non-ACGME programs are free to determine curricular content and the terms of employment, leaving trainees to function at program directors' behest, without guaranteed, codified appellate rights. Another area for concern is in ACGME-related fellowship programs, in which the record of citations, particularly in interventional radiology, is worse than for the core residencies. Moreover, the abandonment of the abortive fellowship match has recently led to the establishment of earlier deadlines for interviews and acceptance notification in many programs, in which such choices are now being made early in the third year of residency. These are troubling developments requiring increased attention by leaders in radiology education.

Key Words: Fellowship, radiology, ACGME, trainees

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INTRODUCTION: THE POPULARITY OF FELLOWSHIPS

The vitality of radiology as an exciting, clinically important discipline, composed of physicians possessing special knowledge and procedural skills, is due in great measure to the excellence of its various and variegated subspecialty training programs. As attested by the imposition of changes in the content, context, and timing of the ABR's qualifying and certifying examination [1], a postresidency fellowship position has become, if not obligatory, certainly highly sought by contemporary radiology residents. This reliance on the fellowship year as a crucial, career-promoting experience is now commonplace, as it has been for more than a decade. In a survey from 1999, 80% of fourth-year and 84.6% of third-year trainees had accepted fellowship offers or were expected to do so [2]. In 2005, 87% of 416 fourth-year resident respondents to a survey conducted by the ACR's Resident and Fellow Section (RFS) [3] planned to pursue fellowships immediately after residency. In our survey of attendees at our annual review courses in 2008 and 2009, nearly all of them senior residents, the fellowship option was acknowledged to be chosen by 93% and 95%, respectively. Hence, subspecialty training in radiology is now antici-

pated by nearly all beginning residents to be an essential component of their education in our specialty [2,4].

REGULATORY DIFFERENCES: ACGME VS NON-ACGME

And yet, many fellowships differ significantly in specification, regulation, and oversight from the characteristics of the training periods that precede them and the career that follows them. Allopathic American medical students, pursuing the path to fulfillment as practicing radiologists, must pass through the rigors of the medical school curriculum; the United States Medical Licensing Examination Parts 1, 2, and 3; and the match process for internship and residency. In residency itself, they and their programs must conform to the restrictions of ACGME criteria directed through the surveillance of its Diagnostic Radiology Residency Review Committee (RRC). Detailed requirements define eligibility for the ABR examinations, which confers to the diplomate a time-limited certification, renewable upon the successful completion of maintenance of certification exercises. And fully fledged radiologists must meet ongoing state and hospital credentialing obligations, including amassing the requisite number of continuing medical education credits at successive intervals throughout their careers as practicing physicians.

In comparison, many fellowships in radiology are situated outside the ACGME umbrella and are thus beholden to no supervising organization. They are free to choose their own curricula, affording them a wide range of programmatic flexibility. This enables the course of study and clinical obligations to be tailored to the

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strengths of the institution, the predilections of the fellowship faculty and its program director, and the preferences of the chair. Furthermore, program directors are also free to choose the conditions of employment offered to prospective fellows. For example, some programs provide salaries well above the average stipend received by a postgraduate year 6 resident and also allow the pursuit of substantial moonlighting opportunities, whereas other programs, banking on their prestige, may offer no salary or benefits or at most a pittance to their trainees. Furthermore, with the exception of a few programs in neuroradiology [5], which remain bound to the strictures of a fellowship match, program directors can set interview and acceptance dates at their convenience [6]. Hence, without regulatory oversight, fellows in non-ACGME programs may be considered “orphans” with respect to gaining redress or even hearings when they might endeavor to register complaints or grievances about any adverse situations related to curricula or working conditions.

NUMBER OF FELLOWS

To determine what percentage of radiology fellows are in programs under the ACGME’s purview and what percentage are outside the surveillance of this national organization, certain limitations must be acknowledged. Inasmuch as some fellowships are subject to regulation by outside agencies and others are not, it is important to know how many positions fit into either group. For non-ACGME fellowship programs, exact numbers cannot be determined. Not only is the total roster of programs and fellowship slots unknown, their numbers are apt to change from year to year depending on the availability of funding and the direction of departmental policy. Moreover, because they are only 1 year in length, they are subject to rapid decision making about continuance and complement number, often uninfluenced by formal external directives.

EXCLUSIVELY ACGME-RELATED FELLOWSHIPS

In essence, all radiology fellowships can be assigned to 1 of 3 categories:

1. *ACGME-associated fellowships*: All such programs are subject to the common requirements and subspecialty regulations of the ACGME and the specifications pertinent to each fellowship type. Included in this group are all pediatric, interventional, and neuroradiology fellowships. Each of these have detailed, enumerated characteristics as they provide criteria to be met by trainees as prerequisites for eligibility for their respective certificate of added qualification (CAQ) examinations administered by the ABR after the com-

pletion of the fellowship [7]. Possession of a CAQ is a well-recognized indicator of competence, which among its other benefits has served to continue to attach these programs to the ACGME anchor.

2. *Fellowships either ACGME or non-ACGME*: The second category consists of programs in which there are ACGME subspecialty criteria but for which there are no CAQ examinations. Program directors can opt either to submit to the curricular requirements set down by the ACGME or be free of them. By far, the predominant subspecialties in the group are abdominal imaging and musculoskeletal radiology. The overwhelming majority of programs and fellowships in these subspecialties have elected to function outside of ACGME surveillance. A reason for their independence is that the educational opportunities afforded by these programs may be inconsistent with the contingencies of the specified ACGME criteria. Also, both of these branches of radiology have grown to the extent that further subspecialization within them can be accommodated by the tailoring of curriculum to local interests and strengths, giving each program a distinctive emphasis. For example, an abdominal radiology program can focus on genitourinary or gastrointestinal imaging, each of which has in large measure a particular knowledge base and procedural repertoire [1]. Incidentally, thoracic imaging used to be an ACGME-possible discipline, but because so few programs have sought to continue to subscribe to its regulations, the link with the RRC was severed, and now all subspecialty training sites are independent.
3. *Non-ACGME fellowships*: The third group consists of subspecialties in which there is no ACGME option. The most frequently chosen are yearlong fellowships in MR and breast imaging and breast imaging combined with a different discipline, often abdominal radiology. Less common are cardiothoracic imaging, informatics, and emergency radiology.

FELLOWSHIP CATEGORY PERCENTAGES

Comparing the fellowship choices of residents in 2008 and 2009 recorded from a questionnaire compiled by attendees at our annual review course with data derived from a study obtained a decade ago, some trends emerge (Table 1). Body imaging and interventional radiology (IR) were the two most frequently pursued subspecialties in 1999 and 2000, but both have lessened in popularity [8]. Each has decreased from approximately 30% of post-residency choices to 15% in body imaging and 10% in IR. The decrease in body imaging fellowships may reflect the increasing popularity of MR fellowships, between which there is considerable case and curriculum overlap. The choice for exclusive MR training, which was rare 10

Table 1. Comparison of fellowship choices, 1999 and 2000 vs 2008 and 2009, by percentage of fifth-year activity

Choice	1999 (n = 402)	2000 (n = 395)	2008 (n = 142)	2009 (n = 214)	Percentage Change
Practice	10.2%	?	6.0%	6.3%	-4.0%
Military	5.2%	?	1.4%	0.9%	-3.0%
Cardiothoracic	0.0%	0.0%	3.6%	3.3%	+3.3%
Mammography	4.0%	4.2%	11.2%	13.6%	+7.0%
MR	0.6%	0.9%	11.2%	10.0%	+9.8%
Body	32.3%	28.7%	23.4%	15.0%	-11.2%
Musculoskeletal	3.4%	3.3%	12.7%	17.0%	+11.4%
Interventional	27.3%	28.4%	9.1%	10.5%	-19.2%
Pediatric	3.7%	3.3%	4.2%	3.6%	+0.4%
Neuroradiology	14.0%	16.1%	19.7%	15.9%	+2.7%
Nuclear	5.6%	4.8%	0.0%	1.0%	-1.2%
IT	0.0%	0.0%	0.0%	0.4%	+0.2%
Other	1.2%	2.0%	0.0%	0.0%	-1.5%
No response	9.5%	?	1.5%	0.0%	-8.0%
Fellowship	80.1%	84.8%	93.6%	93.4%	+11.0%

years ago, now accounts for approximately 10% of subspecialty positions. However, between the two surveys done in consecutive years, there was a wide variance in the choice for body imaging, with 23.4% pursuing it in 2008 and only 15% in 2009. Cardiothoracic radiology increased from 0% to 3.3%. Simultaneously, nuclear radiology, which was opted for by approximately 5% of senior residents in 1999 and 2000, now is taken by fewer than 1 in 100 graduating residents [9]. Neuroradiology and pediatric radiology have maintained relative stability in popularity, whereas musculoskeletal radiology is growing faster than all other fellowships, increasing from 7% in 1999 to 17% among 2009 respondents. And similar rapid growth has occurred in the past few years in breast (or women's imaging), which now constitutes nearly 14% of fellowship selections (Table 1).

An accounting of the respective percentages of ACGME-related and non-ACGME fellowships can be estimated with these data and with the recorded determination of the number of fellows in pediatric, interventional, and neuroradiology as listed in the 2006-2007 issue of the American Medical Association's annual *Graduate Medical Education Directory* (also known as the *Green Book*) [10].

The roster of category 1 fellowship positions offered in that year's edition of the *Green Book* encompassed 98 slots in pediatric radiology, 268 in IR, and 274 in neuroradiology. The number of positions actually occupied can also be identified from that source. There were 65 fellows in pediatric radiology, 149 in IR, and 210 in neuroradiology, for a composite total of 424 trainees.

For category 2 positions (abdominal radiology and musculoskeletal radiology), 55 ACGME-related positions were listed in abdominal radiology, and 41 were

occupied. Twenty-one of 34 available positions were filled in musculoskeletal radiology fellowships. Yet the vast number of fellows in these two disciplines were enrolled in independent, non-ACGME programs. The total number can be estimated by respondents to our survey, which encompassed approximately one-seventh of all fourth-year residents completing their core programs in 2009. Twenty-nine chose abdominal radiology and 18 musculoskeletal radiology. Prorated to the nation as a whole, 232 would be in abdominal radiology, of which 191 are in non-ACGME programs, and 144 in musculoskeletal radiology, of which 123 are in non-ACGME programs.

For category 3, a reasonable estimate of occupied positions in breast and women's imaging can be gained from the work of Baxi et al [11], in a survey they conducted of fellowship program directors. Thus, considering programs that have either one or multiple trainees, a reasonable figure for trainees in all such fellowships would be approximately 110 occupied positions last year. The number of chest and MR derived as well from our survey when prorated yielded 40 and 128 trainees, respectively. Thus, for category 3 positions, our estimate was 278 individuals engaged in fellowship training last year.

Taken together, our estimate of the 3 categories totaled 1,078 positions. The sum of all pediatric, IR, and neuroradiology occupied positions, plus those in musculoskeletal and abdominal radiology programs subject to RRC review, equaled 486. Hence, 45.1% of fellowship positions last year were within the purview of ACGME. Consequently, all the others, constituting more than

Table 2. Occupied positions in ACGME and non-ACGME radiology fellowships, actual and estimated, 2007-2008 academic year

ACGME Fellowships (Actual)		Non-ACGME Fellowships (Estimated)	
Neuroradiology	240	Abdominal	191
Interventional	189	Musculoskeletal	123
Pediatric	65	Breast	110
Musculoskeletal	21	Chest	40
Abdominal	41	MR	128
Total	486	Total	592

Note: Grand total, 1,078 fellowships; 45.1% ACGME, 54.9% non-ACGME.

half, were freestanding, at least with regard to surveillance by this national accrediting organization (Table 2).

ACGME FELLOWSHIP CITATION ANALYSIS

It might be presumed that oversight by the RRC on a regular basis will ensure fair play and the establishment and maintenance of curricular standards. Yet the certainty of that assumption is subject to question, as revealed by the relative frequency of citations in ACGME-fellowship programs compared with those in core residencies (Table 2). Here there is a compelling need for improvement. There are 186 core residencies, 93 vascular interventional programs, 85 neuroradiology programs, and 45 pediatric radiology programs, encompassing approximately 4,500 radiology residents and 424 fellows, respectively [10]. Hence it would be anticipated that the number of citations in fellowship programs should be fewer than those in core programs, given their smaller component of faculty members and the much fewer number of trainees in each subspecialty discipline.

The average core program contains 24 residents, whereas correspondingly in IR, there are 3.0 fellows, in pediatric radiology 3.2, and in neuroradiology 4.7 fellows per program. A comparison of citations per program in core and specialty areas from July 1, 2003, to December 31, 2007, reveals a disproportionate number of citations in fellowships. In scholarly activities, the core programs had 19 citations, and IR had 16. In duty hours and work environment, the core programs collectively sustained 5 citations, wherein IR had 4 and neuroradiology 3. In the important area of procedural experience, the core programs were given 13 citations, IR 16, and neuroradiology 13. Regarding the provisions of appropriate elements for didactic components, the core programs and neuroradiology each had 8 citations, but IR had 21. In the evaluation of residents, the core programs had 14 citations, IR had 11, and neuroradiology had 9. A glaring

difference was noted in the credentials of program directors, in which only 1 citation was registered for the core and neuroradiology programs, but 6 IR programs were deficient (Table 3). This information was obtained through personal communication with Linda Thorsen, a staff member of the RRC, who retrieved the data from the records of reviews of all programs, both core and subspecialty, as secured in the ACGME archive.

This recitation of citations reveals a special concern for compliance in IR fellowships. In a further review of 9 IR programs, 5 had credentialing issues recognized by the RRC, 7 had faculty members lacking ABR certification, and 13 faculty members lacked CAQs, which are required for program directors but not necessarily for faculty members. In fact, 3 program directors had no CAQs. Interventional radiology and to a lesser extent neuroradiology, even with surveillance by the RRC, have significant compliance problems. There is no reason to suspect that the data accumulated in the interval from 2003 to 2007 will be substantively different in 2008 and 2009.

SCHEDULING OF FELLOWSHIP INTERVIEWS

The timing of interviews and decision rendering has been the subject of controversy over the past decade [6]. Early on, there was enthusiasm for the establishment of a match for all fellowship programs, an initiative initially supported by many leaders of training programs and radiology chairs. However, the concept of a match was not embraced in fact or in spirit by all program directors. Soon after it was implemented, and then only with partial participation, barriers were placed in front of comprehensive compliance in most subspecialty programs. Without a strong consensus accompanied by a shared sense of trust, it is unlikely that an effective fellowship

Table 3. Citations in ACGME radiology residencies and fellowships

Citation	Core	IR	Neuroradiology
Scholarly activity	19	16	6
Duty hours	5	4	3
Procedural experience	13	16	13
Didactic components	8	21	8
Patient care	3	11	0
Evaluation of residents	14	11	9
Credentials of program director	1	6	1
Evaluation of program	11	10	9

match can be restored. Program directors in many fellowships have shown by their actions that their local concerns are more important than a collective consideration for the welfare of applicants who are impinged upon by the uncertainties and expense of a rolling admissions sequence.

What is more, in the past 2 to 3 years, in the absence of any agreement regarding the date for the scheduling of interviews, the timing of the decision process has been pushed back earlier and earlier within the term of the residency, obligating trainees to interview in many subspecialties at the beginning of their third year. This current impetus by fellowship directors to finalize their rosters of trainees more than 18 months before entry is at variance with a resolution passed by the Association of University Radiologists in the spring of 1998. This declaration, supported by the Society of Chairmen of Academic Radiology Departments and the Association of Program Directors in Radiology, asserted that the second half of the third year was the time to begin the application process for fellowship. The American Alliance of Academic Chief Residents in Radiology in 1998 advocated that the application process begin in the spring of the third year, with interviews to be held in the fall of the fourth year [12].

In 1999, a survey of members of the RFS of the ACR revealed that 61% of respondents approved a restricted application time, with 39% favoring the spring of the third year and 29% favoring the fall of the fourth year. In 2000, at the annual intersociety meeting held by the ACR, a resolution made then indicated strong support for the fall of fourth year as the appropriate interview season. Furthermore, in a survey from 2001 of members of the RFS, more than half favored the fall of the fourth year. In 2001, a Society of Chairmen of Academic Radiology Departments task force on this issue was divided between two alternatives, with 6 members choosing the spring of the third year and 5 advocating the fall of fourth year for the interview period. A survey of fellowship directors in 2005 affirmed that the spring of the third year should be retained as the optimal time for fellowship enrollment decisions [12].

Thus, a transference of the interview period to the first half of the third year, an initiative taken by many fellowship directors in women's imaging, abdominal radiology, musculoskeletal radiology, pediatric radiology, and IR, is a new development, one that has been undertaken primarily for the convenience of the fellowship directors. Clearly, an 18-month interval between acceptance and start date is for many residents too long. With nearly three-eighths of their residency yet to go, many trainees may become interested in other areas and regret that they precipitously chose a subspecialty in radiology for which they no longer maintain a predominant interest. More-

over, other important life events may occur during this period, rendering an earnest but hasty decision on fellowship choice problematic or unacceptable. Hence, some residents who have been chosen to enter programs are forced by circumstances or changing preferences to back out. For many trainees and for fellowship program directors, such a renegeing on an agreed-upon selection is regarded as a "moral failing," when in fact it is really a response to an unfair demand for engagement imposed by a fellowship director trying to fill up a class as promptly as possible.

The absurdity and unfairness of the relocation of the interview period to the middle of the radiology residency is demonstrated most egregiously by the emerging consensus of program directors in women's imaging. Many demand that the deadline for seeking interviews be completed at the end of August of the third year of residency training. The RRC-mandated requirement for breast imaging includes a 12-week experience during the 4 years of residency. However, residents must review at least 240 mammographic studies in any 6-month period in the final 2 years of residency [10]. Thus, many programs schedule all 12 weeks of breast imaging in the third and fourth years. To meet the terms imposed by many fellowship directors in breast imaging, residents must commit to it before they receive any training in mammography. This is an outrageous example of fellowship program directors' being heedless of the needs of residents. Hence, the matter of too many citations in subspecialty programs under the aegis of the ACGME combined with the establishment of too early interviews might make one conclude that while those in non-ACGME programs are "orphans," those in ACGME programs are akin to "stepchildren," whose legitimate interests and concerns are being neglected.

REMEDY PROPOSALS

Some remedies, radical in intent, have been proposed for this less than satisfactory state of affairs. One notion is to question whether the accretion of regulations imposed in ACGME programs, both core and subspecialty, are in fact counterproductive. According to Nazarian [13] in a recent critique, they are deemed to be costly in time and attention, being regarded with skepticism and even ridicule by attending physicians and trainees alike. With respect to the elaboration of residency rules, Gunderman [14] opined that regulation by its nature hinders creativity and eventual mastery. Both of these arguments are conceptually flawed. Nazarian's criticism has the earmarks of a cynic, one who, in the face of a change in requirements, proclaims that such efforts and impositions are wasteful and afford no added value. Gunderman maintains that an educational program can either be

one thing or another, highly regulated or open without restriction to thereby enhance the establishment of trust. But in social policy, there are no absolute dichotomies, mutually exclusive in detail and emphasis [15]. In fact, those who have embraced the competencies have realized that not only do they provide more well-defined structure, but they can also foster innovation. One should consult the RRC's newsletter for examples of new and exciting educational initiatives. There one can find best practices that a program may apply to further the training of fellows, each of which can be formulated to be in contextual compliance with the competencies. And a reliance on unfettered trust is chancy as evidenced by the scheduling constraints now being experienced by fellow candidates in radiology. Surely the indifferent attitude of many program directors to the problems imposed by ratcheting forward the interview season for fellowship interviews might stimulate concern and anxiety by residents, not confidence or trust.

Yet there are some realistic and realizable steps that can be taken. Both the timing of interviews and programmatic content should be regarded more closely by department chairmen and fellowship directors in particular and by the Society of Chairmen of Academic Radiology Departments and the Association of Program Directors in Radiology in general. There should be a comprehensive up-to-date national registry of all non-ACGME fellowships published with information derived from an annual survey. Other programs in non-ACGME subspecialties should take the lead of fellowship directors in women's imaging and provide broad outlines of a common curriculum, allowing for latitude with regard to imaging specifics at particular facilities. The interview season should occur during the first half of the fourth year. With the setting of the time of the qualifying examination in the spring of the third year, beginning in 2014, interviews will not take place close to it because it would be in the period of preparation for the examination. Hence only the fall of the third year or the fall of the fourth year will become possible times for interviews. Furthermore, because the curriculum must encompass an exposure to all subspecialty rotations within the first 3 years of residency, reliance on maintaining the fall of the third year as a suitable interview period would be even more unfair

than it is today. Consequently, in accordance with the sentiments currently professed by many residents and articulated in resolutions by program directors and chairmen from 1998 to 2006, an appropriate time for fellowship interviews should be established later than either the fall or the spring of the third year. This would make autumn of the final year of residency the most suitable interval for the fellowship interview process.

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