

# Association Between Medical School Radiology Curricula and Application Rates to US Radiology Residency Programs

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**Purpose:** Data are limited on how radiology curricula vary across US medical schools and the association between characteristics of these curricula and application rates to radiology residency programs. The purpose of this study was to gather more information about medical school radiology curricula and to determine the association between radiology education and application rates to radiology residency programs.

**Methods:** An anonymous web-based survey was e-mailed to residency program directors affiliated with 129 accredited US medical schools. Residency program directors were instructed to forward the survey to a radiology clerkship director or complete the survey themselves. Electronic Residency Application Service data were also obtained for 122 participating medical schools.

**Results:** Fifty-five of 122 schools responded, a response rate of 45%. The majority of medical schools (76%) had a dedicated radiology curriculum, which was most often offered in the third and fourth years. The majority (87%) of schools integrated radiology education into other courses throughout all 4 years. The application data revealed that application rates were similar across schools, ranging from 6% to 8%. Applications rates did not significantly vary across several characteristics of educational curricula.

**Conclusions:** Although schools vary in the characteristics of radiology education, application rates to radiology residency programs are similar across schools and are not associated with specific characteristics of these educational programs. This lack of an association may be explained by universal exposure of medical students to radiology curricula and the fact that a career choice is a complex process that involves multiple factors.

**Key Words:** Medical student education, radiology education, radiology residency

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## INTRODUCTION

Evidence is conflicting regarding the effect of radiology education during medical school on the decision to pursue a career in radiology. Donnelly et al [1] have suggested that involving students with research projects in pediatric radiology makes them 6.35 times more likely to choose radiology as a career. Branstetter et al [2] found that greater exposure to radiology during the first year of medical school makes students more likely to consider a career in radiology. In contrast to these studies, however, a national survey of medical students who took a radiology elective found that 89% of students indicated that the elective had no effect on their career decision [3].

Additionally, a survey of practicing physicians who had taken a radiology elective during the sophomore year of medical school showed that only 16% said it affected their specialty choice [4].

Such discrepancies across studies could be explained by several factors. First, several of the studies suggesting a positive relationship between radiology education and medical student career choice were done at a single institution or involved students who may have taken radiology electives because they were already interested in a career in radiology [1,5,6]. Second, studies showing no relationship did not evaluate whether various types of curricula or exposure level have an impact on career choice [3].

The purpose of the current study was twofold. One goal was to obtain more information about the types of radiology curricula offered at various US medical schools. Second, the relationship between characteristics of medical school radiology education and application rates to radiology residency programs was analyzed. Previous studies

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have relied on medical student survey data to determine the effect of radiology education on career choice. However, to our knowledge, no study has used data from the Electronic Residency Application Service (ERAS) to determine the effect of radiology education on career choice.

## METHODS

A web-based survey containing 24 questions was created using SurveyMonkey Inc, Palo Alto, CA., which was sent via a link through the Association of Program Directors in Radiology (APDR) e-mail directory to 129 accredited allopathic US medical schools. The database consisted mostly of residency program directors. Thus, program directors were instructed to forward the survey to their affiliated medical school's radiology clerkship director, or if the school had no clerkship director, to complete the survey themselves. The survey was sent 3 times over a period of 1 month.

The survey instrument was divided into 3 main sections (see Appendix). The only unique identifier on the survey was the medical school name. The first section asked participants to describe the dedicated radiology course, if one existed, at their institution. A dedicated radiology course was defined as a course in which only radiology was taught. Requested information included number of students taking the course, length of course, medical school year the course was offered, and methods of evaluation (ie, pass/fail or graded). The second section contained questions about whether radiology education was integrated into the program, eg, having radiology taught alongside another course such as anatomy. A free-response section was included so that participants could describe any curriculum that they felt was not addressed by the survey. The third section asked participants to identify the number of students applying and matching in radiology as well as in all specialties. Given that survey participants might not know exact numbers, ranges were provided for answer choices.

Data from the third section of the survey were not used for analysis because more accurate data were obtained directly from ERAS. The number of 4th-year medical students who applied to any residency program or specifically to a radiology residency program was obtained for 122 participating medical schools from 2005 to 2010. Match data were not obtained through ERAS, owing to privacy issues. The 7 schools that were not ERAS users were excluded from the analysis.

A radiology application rate was computed for each school from ERAS data. For each school, the total number of radiology applicants from 2005 to 2010 was divided by the total number of ERAS applicants to all specialties for that time period. Rates were combined across all years to smooth data fluctuations arising from variations in class size across years. Of note, application rates that schools reported were compared to application rates according to ERAS, to serve as an internal test of validity; this comparison showed a close correspondence

(Appendix). Applications rates were compared across characteristics of radiology curricula, to assess the association between the rates and specific characteristics. The Student's *t* test was used, with *P* values reflecting two-tailed comparisons of means.

## RESULTS

A total of 55 of 122 schools responded to the survey, a 45% response rate. Table 1 provides a summary of the major findings. The majority of responding schools had dedicated radiology programs that were run by clerkship directors (76%). Most schools (77%) formally evaluated students in some way, with roughly half giving a letter grade and half a pass/fail grade. The majority of schools (87%) had some form of integrated radiology education, but only 39% had a mandatory dedicated radiology curriculum. Dedicated radiology generally occurred during the 3rd and 4th years of medical school, and 69% of schools had a 4-week curriculum.

Radiology was frequently integrated into other medical school coursework across all 4 years (Fig. 1). For example, in the first year of medical school, 32 schools had an integrated radiology curriculum, a number that fell only to 23 by the fourth year. In contrast, dedicated radiology curricula were offered infrequently in the first 2 years but frequently in the final 2 years. For example, only 4 schools surveyed had a dedicated radiology curriculum in the first

**Table 1.** Radiology education characteristics and application rates

	Number of Programs (% of total)	Radiology Application Rates (%)	<i>P</i> Value
Dedicated radiology curriculum			
Yes	42 (76)	6.88	.86
No	13 (24)	6.96	
Course mandatory			
Yes	14 (39)	7.29	.46
No	22 (61)	6.65	
Students tested			
Yes	27 (77)	6.82	.59
No	8 (23)	7.22	
Preclinical years*			
Yes	12 (18)	6.25	.37
No	55 (82)	7.11	
Letter grade	19 (54)	6.74	.62
Pass/fail or no grade	16 (46)	7.11	
Integrated radiology curriculum			
Yes	40 (87)	6.94	.93
No	6 (13)	6.87	

Note: If a question was left blank, the empty response was excluded from percentage calculations. All descriptors in the table excluding Integrated Radiology Curriculum, are in reference to features of dedication radiology curricula.

\*Preclinical is defined as the first 2 years of medical school. Some schools offered dedicated radiology education in multiple years. If this was the case, their response was counted more than once.

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