BRIEF REPORT

A Window to Internet-based Information Seeking of US Fourth-Year Medical Students: Are Radiation Oncology Residency Program Websites Comprehensive?

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Introduction

Residency recruitment in radiation oncology is an important process during which fourth-year medical students compete for limited residency positions, and individual programs compete for the strongest candidates using the Electronic Residency Application Service (ERAS) (1) and the National Resident Matching Program (2). During this process, applicants access residency program websites to obtain important information on the programs (3-6).

Studies in different specialties have shown deficiencies in the content available and the variable usage of residency program websites for education and recruitment (5, 7-17). The purpose of the present study was to evaluate the comprehensiveness of radiation oncology residency program websites. We hypothesized that program size and program director gender would affect the information depth on the websites and that no regional differences in website completeness would be apparent.

Methods and Materials

The present study was exempt from institutional review board approval because all information was public. In December 2017, a list of 87 radiation oncology programs participating in the 2018 National Resident Matching Program was obtained from the ERAS. Each residency program's website was accessed through links at the ERAS website or using Google; 1 program did not have a residency website. The websites were evaluated for the presence of 21 unique criteria, which were selected based on previous studies (Table 1) (3, 5, 8, 12, 18). Information was considered present if found directly on the radiation oncology residency or department website. Information on salary, meals, parking, benefits, and faculty listing was considered present if

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Table 1   Presence of 21 unique criteria in 86 radiation oncology residency program websites (most to least prevalent)

Feature	Websites (n)
Comprehensive faculty listing	81 (94.2)
Contact email	76 (88.4)
Facility description	74 (86.0)
Didactics and physics curriculum	73 (84.9)
Current residents listing	72 (83.7)
Research description	70 (81.4)
Published research projects by faculty	67 (77.9)
Resident benefits*	55 (64.0)
Link to ERAS or ERAS identification number	55 (64.0)
Rotation schedule	52 (60.5)
Message from chairperson	42 (48.8)
Information on surrounding geographic area	37 (43.0)
Employment/fellowship placement of previous residents[†]	35 (41.2)
Resident salary	31 (36.0)
Message from program director	26 (30.2)
Published research projects by residents	26 (30.2)
Parking	25 (29.1)
Meal allowance	20 (23.3)
Call schedule	20 (23.3)
Selection criteria	16 (18.6)
Conference presentations given by residents	13 (15.1)

Abbreviation: ERAS, Electronic Residency Application Service.
Data in parentheses are percentages.
* Including any benefits other than salary, meal allowance, and parking.
[†] One program was excluded because it did not have a graduating resident yet.

accessible through a direct link on the residency website. Two of us (A.V.P. and P.K.) independently evaluated each website and resolved discrepancies through discussion.

The programs were organized geographically using the US census bureau-designated regions. The programs were categorized by size with the median number of residents (n = 8) as the reference point. The programs were also classified by the gender of the program director.

Student's t test was used to compare the presence of website criteria stratified by program size and gender of the program director. Analysis of variance was used for comparisons among regions. All statistical tests were 2-tailed, with statistical significance at $P < .05$.

Results

In the ERAS, only 5 program websites (5.8%) addressed $\geq 80\%$ of the criteria, and no website had all 21 factors available for electronic display. Larger programs had a significantly greater number of included criteria (12.6 ± 2.7 vs 10.9 ± 3.2; $P = .02$). Programs with female program directors listed more criteria, but the difference was not statistically significant (12.4 ± 3.0 vs 11.0 ± 3.2; $P = .09$).

Of the 86 programs, 25 (29.1%) had broken or missing links in their program pages in the ERAS; 1 program had an inaccessible program page in the ERAS because it was no longer accepting applications. The individual program websites had a mean ± standard deviation of 11.2 ± 3.2 of the 21 factors (53.3%) sought. The programs ranged from having as few as 5 of the 21 criteria (23.8%) on their websites to as many as 17 (81.0%). Exactly 33 of the 86 programs (38.4%) included <50% of the criteria.

More than three-fourths of websites included a comprehensive faculty listing (94.2%) and published research projects by faculty (77.9%; Table 1). Fewer than 25% of all websites included a call schedule (23.3%), meal allowance (23.3%), selection criteria (18.6%), or conference presentations given by residents (15.1%). We found no difference among the number of criteria included on a website according to the location of the program ($P = .78$; Table 2).

Discussion

Our results have shown that radiation oncology residency websites are incomplete and not being used to their full marketing potential. We observed a significant interaction between program size and website completeness. Most programs included comprehensive faculty listings and published research. Resident publications and conference presentations, however, were frequently omitted.

Many factors likely contribute to programs omitting important criteria on their websites. Websites are only 1 component in residency decision-making, which involves geography, prestige, and "fit."

To the best of our knowledge, the present study is the first to evaluate radiation oncology residency websites, but

Table 2   Average number of features included on programs' websites stratified by program size, geographic location, and gender of program director

Characteristic	Programs	Features addressed (of 21)	P value
Region			.78
Midwest	21 (24.4)	12.3 ± 3.4	
Northeast	21 (24.4)	10.5 ± 2.6	
South	27 (31.4)	10.9 ± 2.8	
West	17 (19.8)	11.4 ± 3.8	
Program size*			.02[†]
Small (≤8 residents)	43 (58.10)	10.9 ± 3.2	
Large (≥9 residents)	31 (41.90)	12.6 ± 2.7	
Program director gender			
Male	70 (81.40)	11.0 ± 3.2	.09
Female	16 (18.60)	12.4 ± 3.0	

Data presented as n (%) or mean ± standard deviation.
* Program size information was not available for 12 programs.
[†] Statistically significant.

our study had limitations. We performed a cross-sectional study using only the information available at data collection. We selected criteria shown to be important to residency applicants across a variety of domains, although determining which criteria to use was inherently subjective (5, 8, 12, 18). Finally, we marked the criteria as either present or absent and did not examine the quality or accuracy of the content.

Conclusions

Our study provides a comprehensive list of criteria that programs should consider including on their websites. The relatively low cost of developing and updating websites should encourage all programs to prioritize this component of the program toolbox.

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