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Canadian and American Emergency Radiology Fellowship Websites: An Evaluation of Content

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A B S T R A C T

Purpose: The internet is commonly employed by Radiology trainees to investigate and learn about potential fellowship programs. As a new and emerging subspecialty, Emergency Radiology requires strong internet presence and training program website content. This is vital to ensure good exposure of the fellowship programs to inform medical students, radiology trainees, and program directors, highlight unique aspects of a fellowship and raise awareness of the discipline at large.
Methods: To assess the standard and depth of information available online, Canadian and American Radiology fellowship websites were evaluated for content. Thirty-six criteria related to application process and recruitment, departmental structure, incentives, education, and research and clinical training were evaluated for presence or absence.
Results: Sixteen Emergency Radiology fellowship program websites were assessed from the United States and Canada for 36 criteria across 5 individual areas; application process and recruitment, departmental structure, incentives, education and research, and clinical training. Overall there was an absence of information found across all 5 areas. In particular areas for improvement were identified in education and research, and incentives both with median values of 12.5% of criteria present.
Conclusion: Most Emergency Radiology fellowship program websites demonstrate several information deficiencies. This relative lack of comprehensive information represents an actionable opportunity for individual programs and the field to better educate trainees, program directors and the public about the unique training of Emergency Radiologists.

Introduction

Imaging has long been an integral part of patient care in the acute setting. The radiologists who interpret studies performed in emergency departments and urgent care centers vary widely across the country. Recently, there has been rising demand for 24/7 attending radiologist coverage, with increasing emphasis placed on radiology turnaround time.[1] Concurrently, radiologists have become increasingly subspecialized, with nearly all (90%-95%) of radiology residents entering a fellowship after completing residency.[2-4] To effectively meet the needs of the emergency/urgent care patient population, radiologists with experience in all organ systems, modalities, disease processes, and age groups, are needed to rapidly interpret a large volume of cases with potentially life-threatening findings.

As such, many academic centers are moving towards 24/7 attending level coverage, establishing Emergency Radiology (ER) divisions to meet this developing need. Correspondingly, radiology training programs have a responsibility to prepare graduating trainees for a changing style of work and job market. Formal ER Fellowships have grown in number since their origin in the late 1980s[2]; there are now 14 of such Fellowship programs in the United States[5] and 4 in Canada.[6]

A recent survey study published in Emergency Radiology, demonstrated that over half of residents were unaware of the existence of Emergency Radiology, and approximately a quarter of radiology residents reported no exposure to an ER division or rotation during residency.[2] Prior studies assessing medical student and resident information-seeking behavior have demonstrated that trainees routinely visit training program websites to gain relevant information[7,8] and this is especially crucial where more traditional routes of recruitment such as word of mouth and peer recommendations are not as well established.

Given these challenges, as a developing subspecialty, it is of paramount importance that ER fellowship programs take every opportunity to engage prospective fellows in advertising it's benefits,

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rewards, and educational opportunities. In the modern technological age, embracing the internet as the primary mode of distributing information is crucial to providing a platform to enhance the reputation and promotion of ER. Fellowship websites can, and should, be well designed resources with easily accessible information regarding both programs and the subspecialty as a whole.

To address this topic, the purpose of our study was to characterize the comprehensiveness of ER Fellowship websites in Canada and the United States with 36 information points evaluated under the categories of application process and recruitment, departmental structure, incentives, education, and research and clinical training.

Methods and Materials

Online data collection

Data used in this study was gathered from available training program websites, and as such was deemed exempt from institutional review board approval requirements. Our methodology has been validated in a recent publication.[9]

A list of American ER Fellowships was obtained via the American Society of ER website.[5]

A list of Canadian ER Fellowships was obtained via the Canadian Association of Radiologist's website.[6] Data was collected between August and October 2018 and reassessed in November 2019.

Website evaluation

Each program website was visited by two of the authors. Thirty-six individual criteria were assessed for presence or absence according to previously established methodology.[9-16] The categories were organized according to these 5 subheadings: application process and recruitment, departmental structure, incentives, education and research and clinical training (Table 1). If the information was available within the program website or its subpages, it was categorized as present. If the information provided was only available through an external link to hospital system or university site it was categorized as absent, similar to prior work in this area.[9-16]

Statistical analysis

Statistical analysis was performed with Microsoft Excel and open-source software (R Project for Statistical Computing, version 3.6.0, 2019, R Foundation for Statistical Computing, Vienna, Austria). Individual criteria were divided into groups of Application Process, Departmental structure, Education and research, Clinical Training and Incentives. The number of schools to satisfy each group of criteria was compared with Kruskal-Wallis rank sum test, followed by Dunn Kruskal-Wallis multiple comparison *P* values adjusted with the Benjamini-Hochberg method. Results are reported as medians with 95% confidence intervals. *P* values of less than 0.05 were considered statistically significant.

Results

Online searches through the American Society of Radiology and Canadian Association of Radiologist's websites yielded 14 American and 4 Canadian ER fellowship programs. Two American programs did not have fellowship specific information available on their department websites and were excluded from analysis. Thus, 16 of 18 combined programs were available for content analysis. The results are summarized in Tables 2 and 3.

Application process and recruitment (10 criteria)

The median percentage of criteria present in this grouping was 62.5% (SD ±29.2%). The presence of the individual criteria was as follows: contact email and fellowship description both in 93.75% (15/16); Link to application in 81.25% (13/16); mailing address in 75% (12/16); selection criteria and Welcome message both in 62.5% (10/16); interview timeline in 53.25% (9/16); number of fellowship positions in 50% (8/16); electronic online application system in 18.75% (3/16); international visa info present in 6.25% (1/16).

TABLE 1
Criteria examined on the websites of emergency radiology fellowship programs

Application process and recruitment
Contact email
Mailing address
Electronic online application system
Fellowship description
Selection criteria
Link to application
Number of fellowship positions
International visa Info
Interview timeline
Welcome message
Departmental structure
Number of total staff/attending
Comprehensive faculty listing
List of current fellows
Equipment
Incentives
Salary
Benefits
Vacation
Moonlighting
Location highlights
Education and Research
Research Requirements and Opportunities
Highlight current research
Past research projects
Grants awarded
Teaching
Educational resources available to residents
Professional development fund
Clinical training
Academic days
Caseload
Call schedule
On call responsibility
Work hours
Imaging modalities
Rotation structure
Evaluation
Clinical sites
Career placement

Departmental structure (4 criteria)

The median percentage of criteria present in this grouping was 28.1% (SD ±10.8%). The presence of the individual criteria was as follows: comprehensive faculty listing and equipment both in 37.5% (6/16); number of total staff/attending and List of current fellows both in 18.75% (3/16)

Incentives (5 criteria)

The median percentage of criteria present in this grouping was 12.5% (SD ±10.3%). The presence of the individual criteria was as follows: Vacation in 31.25% (5/16); Location highlights in 25% (4/16); Salary and Moonlighting both in 12.5% (2/16); Benefits in 6.25% (1/16).

Education and research (7 criteria)

The median percentage of criteria in this grouping was 12.5% (SD ±24.2%). The presence of the individual criteria was as follows: research requirements/opportunity in 75% (12/16); teaching in 25% (4/16); professional development fund in 18.75% (3/16); current

TABLE 2
Presence of criteria by category sought on emergency radiology fellowship program websites

Information found on website	US and Canadian programs (n = 16)	% present
Application process/recruitment		
Contact email	15	93.75%
Mailing address	12	75%
Electronic online application system	3	18.75%
Fellowship description	15	93.75%
Selection criteria	10	62.5%
Link to application	13	81.25%
Number of fellowship positions	8	50%
International visa info	1	6.25%
Interview timeline	9	56.25%
Welcome message	10	62.5%
Departmental structure		
Number of total staff/attending	3	18.75%
Comprehensive faculty listing	6	37.5%
List of current fellows	3	18.75%
Equipment	6	37.5%
Incentives		
Salary	2	12.5%
Benefits	1	6.25%
Vacation	5	31.25%
Moonlighting	2	12.5%
Location highlights	4	25%
Education and research		
Research requirements/opportunities	12	75%
Highlight current research	2	12.5%
Past research projects	2	12.5%
Grants awarded	1	6.25%
Teaching	4	25%
Educational resources available to residents	1	6.25%
Professional development fund	3	18.75%
Clinical training		
Academic days	8	50%
Caseload	3	18.75%
Call schedule	4	25%
On call responsibility	3	18.75%
Work hours	3	18.75%
Imaging modalities	11	68.75%
Rotation structure	6	37.5%
Evaluation	4	25%
Clinical sites	9	56.25%
Career placement	1	6.25%

research and past research projects both in 12.5% (2/16); grants awarded and educational resources available to residents both in 6.25% (1/16).

Clinical training (10 criteria)

The median percentage of criteria present in this grouping was 25% (SD ±20%). The presence of the individual criteria was as follows: Imaging modalities in 68.75% (11/16); clinical sites in 56.25% (9/16); academic days in 50% (8/16); rotation structure in 37.5% (6/16); call schedule and evaluation both in 25% (4/16); caseload, on call responsibilities and work hours all in 18.75% (3/16) and career placement in 6.25% (1/16).

TABLE 3
Median values for presence of criteria per category on emergency radiology fellowship websites

Category	Median percentage of criteria present (n = 36)	Standard deviation percentage (+/-)
Application process/recruitment	62.5	29.2
Departmental structure	28.1	10.8
Incentives	12.5	10.3
Education and research	12.5	24.2
Clinical training	25	20

Discussion

In the modern technological age, the internet acts as a major primary source of information for radiology residents considering higher fellowship training. As an emerging and developing subspecialty, it is incumbent of ER fellowship programs to maximize the potential of this resource for self-promotion and recruitment. Particularly as word of mouth information and recommendations may not yet provide strong recruitment channels amongst Radiologists compared to more established subspecialties, the need to develop a strong online presence is evident.

Our study aimed to identify ER Fellowship websites in the United States and Canada and evaluate the comprehensiveness of the information available to potential fellows on them. Thirty-six criteria were assessed across 5 separate categories.

Overall, scarcity of information was found across all criteria. While information in some categories, particularly in those of application process and recruitment, was found to be frequently present, this was predominately in relatively superficial criteria such as contact emails and links to applications.

Information in areas of importance such as rotation structure and work hours was notably absent. As ER represents a unique working pattern for the specialty in terms of the predominance of shiftwork, this provides a specific opportunity to highlight an attractive flexible component of the subspecialty.

While the expected research component of fellowship programs was commonly present (75%), previously completed and ongoing projects were routinely absent (12.5%) again marking a missed opportunity for promotion. Few programs (18.75%) advertised online application systems.

Our study correlates and expands on recent findings of Hefferman et al.[17] Assessing the content of American ER fellowship websites only, they found similar deficiencies in content. In their ungrouped analysis of 23 individual criteria, the most present included “contact information” and “program description,” while the least present criteria included “salary,” “fellowship specific faculty education” and “rotation schedule.”

To ensure the ongoing growth and promotion of ER we believe it is vital that all fellowship programs engage in providing significant improvements to the quality and breadth of information available on their websites. The current situation projects an element of disinterest in self-promotion and may provide a poor impression to aspiring trainees.

Many programs lack an online application system and this represents an obvious target for improvement. Appropriate online systems make for an easier and more convenient process undoubtedly appealing to both program and applicant.

In terms of website content, we believe that we have highlighted a uniform lack of information however certain areas provide specific focus for improvement. We suggest programs should focus their website content on providing a strong account of the strengths of ER as a specialty and their individual programs. Strong welcome messages can highlight factors including flexible working hours, the concept of radiology as an emergent diagnostic providing prompt and meaningful impacts on patient outcomes and the constant variety of the daily workload.

Although we would stress that all of our defined criteria provide valuable information to prospective fellows, particular areas are key in promoting ER. Educational opportunities in research and teaching should be highlighted with emphasis on previous research projects, published articles and structured teaching.

As ER becomes more and more vital with an ever-increasing demand for rapid imaging in the urgent setting, such measures are vital for establishing and maintaining a reputation for a vibrant and attractive subspecialty

Conclusion

ER fellowship websites for Canadian and American programs are lacking in appropriate and complete information regarding multiple aspects of training. While information on the application processes is relatively abundant, there is a dearth of information regarding incentives, research, and clinical training. As a relatively new subspecialty, this represents a currently missed opportunity for valuable self-promotion and recruitment in emergency radiology. Particular areas of improvement lie in working hours where flexible shiftwork could be emphasized, highlighting of current research and development of online application systems.

Disclosures

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