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Employment outcomes for recent Canadian radiation oncology graduates

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ABSTRACT

Introduction Radiation oncology (RO) is one of several specialties identified by the Royal College of Physicians and Surgeons of Canada with employment difficulties for graduating trainees. The purpose of the present study was to determine the employment status and location of recent Canadian RO trainees within 2 years after graduation, to monitor workforce recruitment trends over time, and to capture the opinions of program directors about employment difficulty for graduates and resident morale. Visa trainee graduates were excluded.

Methods Results of the survey administered to RO program directors in 2016 and again in 2018, both with 100% response rates, are presented here.

Results In both surveys, approximately 57% of RO graduates had attained staff or locum employment in Canada or abroad within 2 years from graduation ($p = 0.92$). However, graduates with Canadian staff employment increased by 46% to 32 in 2018 from 22 in 2016, while the proportion of graduates with staff positions abroad decreased to 6% from 27% ($p = 0.04$). Most trainees without staff positions were employed as fellows. The proportion of program directors reporting employment difficulties for graduates in the Canadian labour market declined to 38% from 85% ($p = 0.04$), and the morale of residents in training programs remained high.

Conclusions Employment challenges for newly certified Canadian-trained radiation oncologists continue. However, compared with the situation 2 years ago, trends in the Canadian RO job market suggest a modest improvement, with more staff employment in Canada and lower emigration rates for jobs abroad.

Key Words Radiation oncology, workforce, graduates, emigration, employment, surveys

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INTRODUCTION

Our previous work and the work of others have established the existence of postgraduate employment difficulties for Canadian radiation oncology (RO) trainees in Canada[1,2] and higher than expected emigration rates for work abroad[3]. In 2011, in response to evidence of a competitive labour market, a Canadian RO workforce supply-and-demand model suggesting a transient physician surplus, and sufficient radiotherapy capacity (with acceptable wait times for Canadian cancer patients), the Human Resources Committee of the Canadian Association of Radiation Oncology proposed, and RO program directors endorsed, a coordinated national effort to reduce RO trainee intake by 16% to 21 residents per year from 25 residents per year and to minimize transfers into the specialty[4–6]. A minimum 5-year period (to 2016) was required before the effect of fewer graduates was seen in the labour market. Here, we present an evaluation, performed in 2016 and 2018, of employment trends for recent RO graduates within 2 years after residency training. This study is part of a concerted effort by the Human Resources Committee of the Canadian Association of Radiation Oncology to continually monitor the Canadian RO workforce situation with biennial assessments of employment outcomes for RO graduates.

Methods

A fill-in-the-blank spreadsheet was distributed to all 13 Canadian RO training programs requesting the employment status and location of their graduates over the preceding

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2 years and opinions about employment difficulty and resident morale. Visa trainee graduates, defined as international medical graduates who hold a visa permitting temporary employment as a postgraduate trainee and return to their home country after graduation, were excluded from the study. The survey was administered between 1 July 2016 and 30 August 2016 for 2014–2016 graduates and again from 1 July 2018 to 30 August 2018 for 2016–2018 graduates. In the first survey, the employment and location status of graduates were requested as of 1 July 2016, and in the second, as of 1 July 2018. Program directors were asked to classify graduates into 2 location categories (working in Canada or abroad) and then into 4 employment subcategories (staff, locum, fellowship, or other). The "other" classification required program directors to specify why that subcategory was selected. The survey also tallied, starting in 2011, the number of graduates employed abroad who returned to Canada for staff employment and the perceptions of program directors about graduate employment difficulty (yes or no) and resident morale (10-point scale).

To avoid disclosing geographic training information that might unintentionally lead to graduate identification, the regional analysis excluded 3 graduates with employment status categorized as "other." Chi-square tests or Fisher exact tests (for cell values <5), were used to compare the employment status of graduates by graduation year (in each survey) and by employment type and regional training location (between surveys). A p value less than or equal to 0.05 was considered statistically significant. The study received research ethics approval.

RESULTS

Employment Status

Figure 1 presents the employment status of RO graduates. The proportion of graduates with a staff position increased with length of time from graduation, and the proportion of graduates in fellowship training declined ($p < 0.01$). Comparing the 2016 results with the 2018 results, we observed no statistical difference between the employment outcomes of graduates. Graduates within 2 years from graduation who had staff positions remained similar: 30 of 65 (46%) in 2016 and 34 of 68 (50%) in 2018 ($p = 0.79$). Marginally fewer graduates were employed in locum positions (7 in 2016 vs. 5 in 2018). The 3 graduates categorized as "other" consisted of an immediate graduate from each survey who had completed residency training, but who had not been successful in the specialty certification exam and who continued electively in the program with trainee funding support, and a 2016 graduate in the 2018 survey who had completed a 2-year fellowship and who had no immediate employment plans. For all study-eligible graduates, employment status and location were categorized.

Table I shows the employment status of graduates by regional training location. For that analysis, the graduates were divided into 3 groups: Ontario (5 training programs), Quebec (3 programs), and elsewhere in Canada (British Columbia: 1 program; Alberta: 2 programs; Manitoba: 1 program; Nova Scotia: 1 program). Ontario graduates had the highest absolute number of staff and locum positions and the highest proportion of graduates in fellowships.

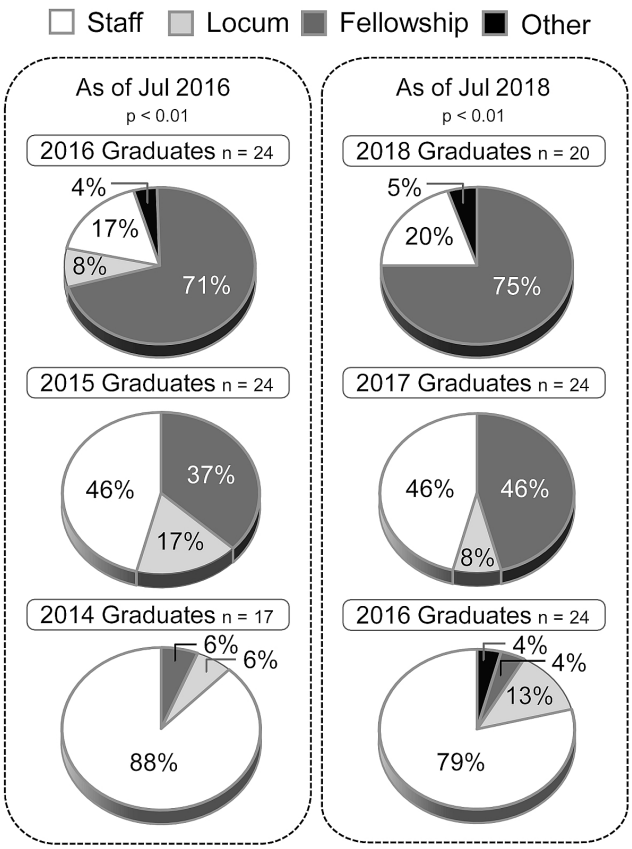

FIGURE 1 Employment status of recent radiation oncology graduates after training. Graduation date is 30 June each year. Survey results as of 1 July 2016 (left panel) and 1 July 2018 (right panel) are shown. "Other" category refers to graduates who were unemployed or without specialty certification and who elected to stay in the residency program with trainee funding.

With 43% fewer graduates in the 2018 survey than in the 2016 survey, Quebec graduates showed the largest between-survey change in employment classification, favouring staff employment ($p = 0.05$). Employment patterns in the two surveys for graduates from Ontario and elsewhere in Canada were not significantly different ($p = 0.94$ and 0.59 respectively). In 2018 compared with 2016, fewer Quebec and more Ontario graduates occupied fellowship positions ($p = 0.04$). No regional differences were identified in the ability of graduates to find work in a staff or locum RO position ($p = 0.90$ and 0.73 respectively).

Employment Location of Graduates

Figure 2 shows the employment status of graduates by location in Canada compared with abroad. The proportion of RO staff positions within Canada increased to 94% in 2018 from 73% in 2016, with a corresponding decline in staff employment abroad to 6% from 27% ($p = 0.04$). The proportion of graduates employed as fellows within Canada remained largely stable at 78% in 2016 and 82% in 2018, with the remainder being employed in fellowships abroad ($p = 0.74$). Both surveys found that all locum positions were in Canada. Program directors also reported that 15 graduates

TABLE I Employment status of graduates by residency training region[a]

Training region and employment type	Survey period [*n* (%)]		*p* Value	Employment type and training region	Survey period [*n* (%)]		*p* Value
	July 2016	July 2018			July 2016	July 2018	
Ontario				Staff			
Staff	13 (43)	14 (38)		Ontario	13 (43)	14 (41)	
Locum	3 (10)	4 (11)	0.94	Quebec	5 (17)	7 (21)	0.90
Fellowship	14 (47)	19 (51)		Elsewhere in Canada[b]	12 (40)	13 (38)	
Quebec				Locum			
Staff	5 (36)	7 (88)		Ontario	3 (43)	4 (80)	
Locum	1 (7)	0 (0)	0.05	Quebec	1 (14)	0 (0)	0.73
Fellowship	8 (57)	1 (13)		Elsewhere in Canada[b]	3 (43)	1 (20)	
Elsewhere in Canada[b]				Fellowship			
Staff	12 (60)	13 (62)		Ontario	14 (52)	19 (70)	
Locum	3 (15)	1 (5)	0.59	Quebec	8 (30)	1 (4)	0.04
Fellowship	5 (25)	7 (33)		Elsewhere in Canada[b]	5 (19)	7 (26)	

[a] Because of rounding, percentages might add to more than 100.
[b] Canadian provinces other than Ontario and Quebec.

working abroad since 2011 had returned to Canada for staff employment.

Perceptions of Program Directors

Fewer program directors reported employment difficulties for their graduates in 2018, down to 38% (5 of 13) from 85% (11 of 13) in 2016 ($p = 0.04$). When asked to quantify resident morale on a 10-point scale (0, poor, to 10, excellent), the average score was 7.1 in both surveys ($p = 0.98$).

DISCUSSION

Our data indicate that the employment situation for recent RO graduates remains challenging, with delayed staff employment after graduation. A sizeable physician surplus still persists, and as of July 2018, 32 graduates did not have a staff position. However, fewer graduates are leaving Canada to work abroad, and significantly more graduates in the 2018 survey than in the 2016 survey have attained staff positions within Canada. The study cohorts of 65 and 68 graduates within 2 years post-residency are smaller than the 77 and 84 graduate cohorts reported in the 2014 RO labour market assessment[3], suggesting that the actions taken to reduce trainee intake in RO residency programs were successful. The current snapshot suggests that the RO labour market within Canada has improved in the short term.

Canada continues to experience growth in the RO workforce, but at a slower rate than previously observed. Physician supply data from the Canadian Medical Association show that national staffing levels increased by 33 radiation oncologists from 2015 to 2018, demonstrating much less growth than the 75, 64, and 53 practitioners added to the workforce complement over the preceding three 3-year periods (2012–2015, 2009–2012, and 2006–2009 respectively)[7]. If the workforce expansion rate had remained higher, the current graduate surplus would be diminished and possibly eliminated.

The reasons for the workforce growth slowdown were not evaluated, but the 10-year, $41 billion federal health accord to improve radiotherapy capacity and shorten radiotherapy wait times for Canadians concluded in 2014[4]. Other factors, such as change in staff workload, use of alternative models of care delivery, and transitioning of follow-up patient care from cancer clinics to community general practitioners, might also be influencing staff recruitment. Funding for radiotherapy services and RO staffing is provided solely by provincial governments. With no privately funded facilities or opportunities for private practice in Canada, employment options for RO graduates are limited[8].

Another factor that affects workforce recruitment is the number of retirements, but departure rates over the study period are unknown. However, some indicators suggest that higher workforce turnover could be forthcoming—for example, the number of radiation oncologists 60 years of age and older more than doubled to 108 in 2017 from 47 in 2007[9]. Even so, the proportion of radiation oncologists 65 years of age and older in 2017 was 8.6% (47 of 545), up from 6.5% (24 of 367) in 2007, which might signal a rising trend of delayed retirements beyond age 65[9].

Underemployment in the context of global RO labour markets is not unusual. An Australian and New Zealand employment study of graduates within 2 years post-training revealed that 51% were employed as consultants, 20% as fellows, 15% as locums, and 5% in other areas; 9% were unemployed[10]. However, the labour market in the United States appears to be more robust, with more than 90% of 2014 U.S. RO graduates having staff employment approximately 7 months after graduation[11]. Although our study did not assess the job preferences of graduates, a number of

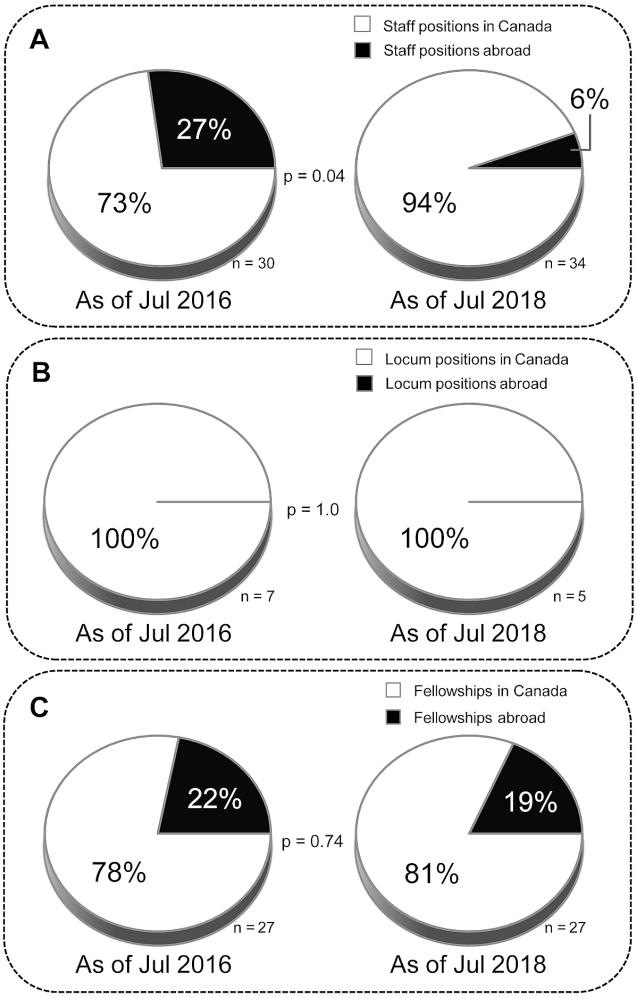

FIGURE 2 Employment status of radiation oncology graduates by location within Canada compared with abroad. Radiation oncology staff (panel A), locum (panel B), and fellowship (panel C) positions in Canada compared with abroad as of 1 July 2016 (left side) and 1 July 2018 (right side). Graduates whose employment was categorized as "other" were excluded from analysis to avoid disclosing geographic training information that might unintentionally lead to graduate identification.

reports suggest that employment close to home or in large urban environments is desirable[1,10,12,13]. Fellowship and staff recruitment of Canadian RO graduates to American academic centres is relatively common[14,15].

A weakness of our study is that hiring practices at Canadian cancer centres are unknown. Canada allows recruitment of qualified international medical graduates, and 26% of practicing radiation oncologists in Canada are internationally trained[9,16]. Some international medical graduates undertake their postgraduate training in Canada as permanent residents (or Canadian citizens) and are permitted to work in Canada after graduation. Data capture through surveys of program directors also has inherent limitations, with the potential for a gap between a change in a graduate's employment status and their program director's knowledge of it. The questions about the perceptions of program directors might elicit answers hoped to be viewed more favourably by others or more favourably than the situation appears, thereby potentially introducing social desirability bias. Furthermore, we acknowledge that a more accurate assessment of resident morale would be achieved by surveying graduates directly. However, the complete response rate in both existing surveys eliminates response bias in our findings. Surveying graduates directly was considered in the initial study design, but prior surveys of Canadian RO graduates and trainees had mediocre response rates (between 48% and 58%)[1,2,16,17] and might not represent employment outcomes as accurately as do the results presented here.

CONCLUSIONS

Despite the delayed workforce entry experienced by recent RO graduates, trends in the RO job market within Canada suggest a modest improvement compared with the situation 2 years ago, with more Canadian staff employment and lower emigration rates for jobs abroad. However, employment challenges still exist for newly certified Canadian-trained radiation oncologists. Continued monitoring of the labour market and workforce recruitment trends within the specialty is required.

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CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology*'s policy on disclosing conflicts of interest, and we declare that we have none.

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