

A snapshot of the Canadian radiation oncology workforce
Report on results from the pan-Canadian Radiation Oncology Health
Human Resources Survey

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December 2025



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A huge thanks goes out to the radiation oncology community, and the expertise and leadership provided by the Survey Steering Committee members listed below.

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Overview and Key Findings

With Canada's aging population and steadily increasing cancer incidence, the demand for radiation oncology (RO) services continues to grow. Projections suggest a 79% increase in cancer diagnoses between 2003 and 2028 (Canadian Cancer Society, 2023), with approximately 48% of cancer patients expected to require radiation therapy at some point during their care. These trends underscore the importance of robust, evidence-informed health human resource (HHR) planning across the multidisciplinary radiation oncology workforce, including radiation oncologists, medical physicists, radiation therapists, and oncology nurses.

This report presents results from a comprehensive, pan-Canadian survey of the radiation oncology workforce conducted between May 2023 and January 2024. The survey findings are presented here as a report for Canada's national radiation oncology professional associations - CARO, COMP, CAMRT, and CANO/ACIO, to support knowledge sharing with members and broader workforce planning discussions.

The survey achieved an overall response rate of 60%, with representation from 51 radiation oncology centres across Canada. Responses were received from both large centres (serving catchment areas of more than 1,000,000 people) and small centres (serving catchment areas of fewer than 1,000,000 people), allowing for comparisons by centre size. Data were collected across workforce supply, resourcing relative to infrastructure, recruitment and retention trends, scopes of practice, and education and training capacity.

Key findings highlight considerable variability in workforce resourcing across regions and centre size, particularly when measured against linear accelerator capacity. Radiation therapists represent the largest workforce group, followed by radiation oncologists, medical physicists, and nurses working in ambulatory radiation oncology settings. While overall workforce growth has occurred across professions, gains have not been uniform, and in some cases have not kept pace with departures or projected increases in workload. Recruitment challenges were most pronounced for medical physicists, while retention challenges were commonly linked to uncompetitive remuneration and limited opportunities for career or academic advancement.

The survey also illustrates substantial variation in the use of non-oncologist and advanced practice roles, including general practitioners in oncology, hospitalists, clinical or physician assistants, advanced practice radiation therapists, nurse practitioners, and clinical nurse specialists. While these roles contribute meaningfully to patient care and workload distribution in some centres, they remain absent in others, particularly smaller centres.

Finally, results related to education, training, and academic infrastructure point to uneven access to residency programs, academic appointments, and research opportunities, with potential implications for future workforce supply and sustainability.

Taken together, the findings provide a national snapshot of the current radiation oncology workforce and identify areas of strength, variability, and potential vulnerability. This report is intended to inform ongoing dialogue among professional associations, employers, educators, and policymakers as they work collaboratively to support a sustainable, resilient radiation oncology workforce capable of meeting current and future patient needs. Further information can also be found in the article *Radiation Oncology Nursing: Highlights of the first multi-disciplinary Pan-Canadian workforce survey*, published in the *Canadian Oncology Nursing Journal*, 2025 (Newton, et al., 2025).

Introduction

With Canada's aging population and increasing cancer incidence, the demand for radiation oncology (RO) services continues to grow, placing sustained pressure on the multidisciplinary workforce required to deliver timely, high-quality care. Recent projections suggest a 79% increase in cancer diagnoses between 2003 and 2028 (Canadian Cancer Society, 2023) with approximately 48% of Canadian cancer patients requiring radiation therapy during their treatment journey (Delaney, Jacob, Featherstone, & Barton, 2005). These trends underscore the importance of robust, evidence-informed health human resource (HHR) planning across the multidisciplinary radiation oncology workforce, encompassing recruitment, retention, workload management, and scope of practice across professions.

Previous Canadian studies have provided important insights into aspects of the radiation oncology workforce but have largely been single discipline focused. For example, a 2019 national study reporting on work led by CARO identified rising patient volumes, increasing workload pressures, and growing linear accelerator requirements across Canada (Loewen, 2019). While workforce levels showed incremental growth, patient demand was found to be outpacing these gains, highlighting the need for enhanced recruitment and retention strategies.

Comparable national data describing other key radiation oncology professions, radiation therapists, medical physicists, and oncology nurses, have been more limited. Together, these professionals play an essential role in patient care delivery, quality and safety, and operational efficiency within radiation oncology programs. Without a comprehensive understanding of their workforce capacity, scopes of practice, and distribution across regions, it is challenging to develop coordinated, system-level responses to workforce pressures.

Internationally, there is growing recognition of the need for multidisciplinary workforce planning in oncology, including the use of innovative models of care that integrate advanced practice and non-physician roles. Evidence suggests that such models can improve patient outcomes, enhance access to care, and strengthen health team resiliency. In Canada, however, data describing the extent to which these roles are deployed in radiation oncology settings remain limited.

This study was undertaken to address these gaps by providing a comprehensive, pan-Canadian overview of the radiation oncology workforce across multiple professions. By examining workforce supply, recruitment and retention trends, scopes of practice, and education and training capacity, the survey aims to inform evidence-based workforce planning and support collaboration across professional groups. The findings presented in this report offer insights into how workforce availability and role distribution may influence service delivery and patient access across the country. Survey highlights, focusing on nursing results were published in 2025 (Newton, et al., 2025).

Methodology

Survey Design and Scope

The Pan-Canadian Radiation Oncology Health Human Resources Survey was developed collaboratively with four national professional organizations: the Canadian Association of Radiation Oncology (CARO), the Canadian Organization of Medical Physicists (COMP), the Canadian Association of Medical Radiation Technologists (CAMRT), and the Canadian Association of Nurses in Oncology (CANO/ACIO). Building on established survey approaches used in prior workforce studies undertaken by these organizations, the instrument was designed to capture comprehensive workforce data across the multidisciplinary radiation oncology team.

The survey consisted of 186 questions and used branching logic to tailor content by profession. This design enabled collection of profession-specific information related to workforce demographics, workload distribution, recruitment and retention trends, educational requirements, and scopes of practice. In addition, the survey gathered data on services offered, equipment and technologies available at each centre, and geographic catchment characteristics to support analysis of workload and access to radiotherapy services. Where possible, questions mirrored those used in previous national workforce surveys to allow for comparisons over time. The inclusion of oncology nursing expanded the scope of prior efforts and contributed to a more complete picture of the radiation oncology workforce.

Participants and Data Collection

The survey was distributed to radiation oncology and medical physics department heads, radiation therapy leads, and nursing managers in 51 radiation oncology centres across Canada. Centres were categorized as large or small based on whether their catchment population exceeded 1,000,000 people. Data collection occurred between May 23, 2023, and January 4, 2024, with follow-up emails, phone calls, and newsletter reminders used to encourage participation and maximize response rates.

Limitations

Given the breadth of the survey and the complexity of collecting multiple responses per centre, partially completed surveys were included in the analysis to maximize data utility. As a result, denominators vary across sections of the report. The survey focused on roles directly involved in radiation oncology programs; nursing data reflect ambulatory radiation oncology staffing models, and registered practical nurses or licensed practical nurses were excluded from analysis due to small reporting numbers. Similarly, data were collected on all medical physics staff, but analysis was limited to radiation oncology physicists.

The survey was developed for quality improvement purposes and was not subjected to external validation, which may limit generalizability. In addition, while responses were received from across Canada, participation was not complete in all provinces and

territories, and some regions may be underrepresented. These limitations should be considered when interpreting the findings.

Results

Response Rates

The survey achieved an overall response rate of 60% (123 of 204 potential responses). Profession-specific response rates were 59% for radiation oncology (30 of 51 centres), 76% for medical physics (39 of 51), 65% for radiation therapy (33 of 51), and 41% for nursing (21 of 51).

Profession-specific response rates

Profession	Responses / Centres	Response Rate
Radiation Oncology	30 / 51	59%
Medical Physics	39 / 51	76%
Radiation Therapy	33 / 51	65%
Nursing	21 / 51	41%

Responses from large centres accounted for 34% (42 of 123) of results, while small centres represented 66% (81 of 123).

Responses by centre size

Centre Size	Responses	Percentage
Large centres (>1,000,000)	42	34%
Small centres (<1,000,000)	81	66%

Workforce and Resourcing

The survey captured detailed workforce and resourcing data across professions, revealing substantial variation by region and centre size.

Radiation Oncologists

A total of 389 radiation oncologists were reported, representing 346 full-time equivalents (FTEs). RO FTEs per centre ranged from 2.0 to 35, with an average of 11.9. Large centres reported an average of 20.6 RO FTEs, compared to 8.1 in small centres. Nationally, there was an average of 1.9 RO FTEs per linear accelerator, ranging from 1.0 to 3.0. Large centres averaged 2.1 RO FTEs per linear accelerator, while small centres averaged 1.8. Across Canada, 63% of radiation oncologists were male, and 17% were aged over 60.

Radiation Oncology Physicists

Radiation oncology physicists accounted for 347 individuals, representing 306 FTEs. ROP FTEs per centre ranged from 1.0 to 23, with an average of 10. Large centres averaged 14

ROP FTEs, while small centres averaged 8.0. Nationally, the average was 1.7 ROP FTEs per linear accelerator, with little difference between large and small centres. Overall, 66% of ROPs were male, and 8% were aged over 60, findings that align closely with recent COMP professional survey data.

Radiation Therapists

Radiation therapists formed the largest workforce group, with 1,849 individuals representing 1,631.4 FTEs. RT FTEs per centre ranged from 5.5 to 176, with an average of 54.4. Large centres reported an average of 89.9 RT FTEs, compared to 36.7 in small centres. Nationally, there was an average of 9.0 RT FTEs per linear accelerator, ranging from 5.5 to 13. Over half of RT FTEs were assigned to external beam radiation services.

Nurses

Within ambulatory radiation oncology departments, 218 nurses were reported, representing 169.4 FTEs. Nursing FTEs per centre ranged from 2.0 to 24.5, with an average of 8.5. Large centres averaged 10.4 nursing FTEs, while small centres averaged 7.2. Nursing FTEs per linear accelerator varied widely, ranging from 0.5 to 6.4. Registered nurses comprised 87% of nursing FTEs, and advanced practice nursing roles were limited, with nurse practitioners present at eight centres and clinical nurse specialists at three centres, all in Quebec.

Recruitment and Retention

The survey captured recruitment and retention trends across professions, highlighting both workforce growth and areas of concern.

Radiation Oncologists

Between 2019 and 2022, radiation oncologist retirements averaged 5.3 FTEs per year, with an additional 3.2 FTEs per year departing for reasons other than retirement. Hiring averaged 12.15 FTEs per year, resulting in a net gain of 14.4 RO FTEs over the four-year period, largely driven by growth in large centres.

Radiation Oncology Physicists

Over the same period, ROPs experienced a total of 46.4 FTE departures, representing approximately 15% of the surveyed workforce. While hiring exceeded departures overall, 2022 saw a national net loss of 0.7 ROP FTEs, with losses concentrated in small centres and the West Coast and Prairies.

Radiation Therapists and Nurses

Most centres planned to replace retiring RTs and nurses, but replacement of staff leaving for other reasons was less certain. Many centres projected increases in staffing, although a substantial proportion of new positions were vacant at the time of reporting. Anticipated workload increases were common across professions.

When considering multidisciplinary results collectively, centres reported moderate difficulty recruiting staff overall, with recruitment rated easiest for radiation oncologists and most difficult for medical physicists. Key challenges included uncompetitive remuneration, high cost of living, limited career and academic advancement opportunities, and geographic location. Retention was reported to be somewhat easier than recruitment, though similar challenges were noted.

Roles and Scopes of Practice

The survey revealed wide variation in the use of non-oncologist and advanced practice roles. General practitioners in oncology and hospitalists were commonly employed, particularly in small centres, while advanced practice radiation therapist and nursing roles were less consistently integrated. Tasks performed by these roles varied across centres, reflecting differences in workforce models and local practice patterns.

Selected tasks performed by non-oncologist and advanced practice roles

Role	Commonly Reported Tasks
GPOs	Unscheduled assessments, investigations, inpatient care, prescribing
Clinical/Physician Assistants	Investigations, follow-up care, prescribing
CSRTs	Consultations, follow-up care, assessments
NPs	Follow-up care, investigations, prescribing, on-treatment assessments

Workforce Education, Experience, and Opportunities

Residency training programs for radiation oncologists and medical physicists were more prevalent in large centres, while many small centres reported no access to such programs. Academic appointments and clinical trial participation were also more common in large centres, although most small centres participated in research activities to some extent.

Conclusion

This report provides a comprehensive snapshot of the Canadian radiation oncology workforce across professions and regions. While workforce growth has occurred, variability in resourcing, recruitment challenges, uneven integration of advanced practice roles, and differences in education and training infrastructure point to ongoing vulnerabilities. The findings underscore the importance of coordinated multidisciplinary workforce planning and continued collaboration among professional associations, educators, employers, and policymakers to ensure the sustainability and resilience of radiation oncology services in Canada.

Works Cited

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