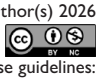
Check for updates

Original Research

Canadian Association of Radiologists Journal
1–7
© The Author(s) 2026

Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/08465371251407871
journals.sagepub.com/home/caj


Perceptions of Call by Canadian Radiology Residents: A National Survey

Claudia Deyirmendjian[1], Neel P. Mistry[2], Ha Le[3], Pamela Boustros[1], and Michael N. Patlas[4]

Abstract

Background: Call is among the most challenging aspects of radiology residency, fostering both knowledge development and decision-making under pressure. As imaging volumes have increased, call conditions have evolved. However, little is currently known about the variability in call structures among institutions. This study explores the perceptions of resident call across Canadian radiology programs.

Methods: A 28-question, bilingual, anonymous survey was distributed to all Canadian radiology residents via the Canadian Association of Radiologists (CAR) and institutional representatives of the CAR Resident and Fellow Section (RFS). Anonymous data was collected including demographic information, sleep habits, staff supervision, interactions with referring physicians, and wellness.

Results: Our survey was open from Sept 1, 2024, to Feb 28, 2025. Altogether, 112 residents responded from all training levels and programs, with 71.4% completing it in English and 28.6% in French. Most PGY-2 residents reported 8 to 11 call shifts in the preceding 8 weeks, compared to 4 to 7 shifts among PGY-3 to PGY-5. Close to half of residents reported that they did not sleep at all on call. Among those who did, 70.3% of them reported moderately insufficient sleep. Interactions with referring physicians were poor, with 49.2% of residents rating their experiences as unsatisfactory or very unsatisfactory. Lower call satisfaction was significantly associated with greater call volume and reduced sleep.

Conclusions: Canadian radiology residents reported high call volumes, limited rest, and challenging interactions with referring physicians, all of which were linked to lower satisfaction and well-being. These findings highlight opportunities to optimize call structures, strengthen supervision, and improve resident wellness.

Résumé

Contexte : Les gardes favorisent la consolidation des connaissances et la prise de décisions sous pression; elles comptent néanmoins parmi les aspects les plus exigeants de la résidence en radiologie. L'augmentation du volume d'examens d'imagerie a entraîné une évolution des conditions de garde. Cependant, la variabilité des structures de garde entre les établissements demeure peu documentée. La présente étude examine les perceptions des résidents concernant les gardes au sein des programmes de résidence en radiologie au Canada.

Méthodes : Un sondage bilingue anonyme de 28 questions a été distribué à l'ensemble des résidents en radiologie du Canada par l'entremise de l'Association canadienne des radiologistes (CAR) et des représentants de la section des résidents et fellows (RFS) de la CAR. Les données anonymes recueillies portaient sur les caractéristiques démographiques, les habitudes de sommeil, la supervision par le personnel, les interactions avec les médecins demandeurs ainsi que le bien-être.

Résultats : Le sondage s'est déroulé du 1er septembre 2024 au 28 février 2025. Au total, 112 résidents de tous les niveaux et programmes de formation y ont répondu, dont 71,4 % en anglais et 28,6 % en français. La majorité des résidents de 2e année ont déclaré avoir effectué entre 8 et 11 gardes au cours des huit semaines précédentes, comparativement à 4 à 7 gardes chez les résidents de 3e, 4e et 5e année. Près de la moitié des répondants ont indiqué n'avoir pas dormi durant leurs gardes. Parmi ceux qui avaient dormi, 70,3 % ont rapporté un sommeil modérément insuffisant. Les interactions avec les médecins demandeurs ont été jugées négativement par 49,2 % des résidents, qui les ont qualifiées d'insatisfaisantes ou de très insatisfaisantes. Une satisfaction moindre à l'égard des gardes était significativement associée à un volume de gardes plus élevé et à une réduction du sommeil.

Conclusions : Les résidents en radiologie au Canada ont rapporté un volume élevé de gardes, un repos limité et des interactions difficiles avec les médecins demandeurs, tous des facteurs associés à une faible satisfaction et un bien-être réduit. Ces résultats mettent en évidence des possibilités d'optimiser les structures de garde, de renforcer la supervision et d'améliorer le bien-être des résidents.

Keywords

residency, medical education, call, wellness, survey study

Introduction

Call represents one of the most challenging aspects of radiology residency in Canada. On call, residents' knowledge and efficiency are put to the test; they develop autonomy through management-defining decisions made under time pressure and limited, if any, supervision. As imaging volumes have surged, call conditions have also changed resulting in increased call cases, increased advanced modality studies (ie, CT, MRI), and longer call hours. Fatigue secondary to such conditions may impact resident performance and lead to reduced quality reports.[1]

Residency programs and their affiliated academic hospital centers are faced with the challenge of balancing resident call exposure, rotation attendance, adequate call-coverage, and resident wellness. For example, residents performing less call may improve their rotation attendance and wellness but may lack on-call learning opportunities. Those with frequent call may be deprived of day-time teaching and rotation-exposure, and may be more predisposed to burnout.[2] On a provincial level, certain residency associations have attempted to palliate the burden of call by adopting policies that limit call hours, protect time off from rotations, and enforce rest time between shifts.[3-10] On a local level, programs use a pyramidal call system to allow residents to gradually adapt to call conditions, but have variable avenues of support once independent call has begun and have widely different call structures.[11] Although call conditions have seemingly become more difficult, there is little data on the current climate of call as experienced by radiology residents.

The current study seeks to identify the perceptions of call by residents in Canadian radiology programs by surveying Canadian radiology residents. The specific objectives of the survey study include the following: (1) to explore the satisfaction and well-being experienced by radiology residents on-call, (2) to investigate factors that may influence their experiences, and (3) to explore how the on-call experience can be improved from a trainee perspective. We hypothesize that radiology residents' on-call satisfaction is influenced by workload, sleep quality, quality of supervision, and interaction with referring physicians. We hypothesize that on-call satisfaction is associated with improved resident well-being.

Methods

After a thorough literature review, we designed a 28-item questionnaire exploring call perception among radiology residents. The study was then piloted among the Canadian Association of Radiologists Resident and Fellow Section (CAR-RFS) institutional representatives for feedback. The most updated version was then revised by a collaborator from the *Centre de pédagogie appliquée aux sciences de la santé* at Université de Montréal. After obtaining institutional ethics approval, the online bilingual, anonymous survey was distributed to Canadian radiology residency programs via email by the CAR and individual CAR-RFS members. The survey remained open from Sept. 1, 2024, to February 28, 2025.

All individuals enrolled in a Canadian radiology residency program and part of the call pool (ie, doing independent call as of Sept. 1, 2024) were included in the study. Residents who had not yet started radiology call (ie, PGY-1 radiology residents on off-service rotations) were excluded. The 28-item anonymous, self-reported, electronic survey included questions regarding: demographics (ie, year of residency, name of institution), call workload, sleep quality and quantity, staff supervision, interactions with requesting physicians, and wellness. Wellness questions were based on The World Health Organization-Five Well-Being Index (WHO-5).[12] Residents could optionally fill out an open-ended question at the end of the survey asking for recommendations to improve call conditions. The complete survey can be found under Supplemental Materials.

Descriptive analyses were performed on demographic data, which were stratified by academic year and time interval. Categorical and continuous variables were assessed using Fisher's exact test and Mann-Whitney U test, respectively. Questions about call perception and satisfaction were evaluated using Likert scale and parametric analysis were performed by ANOVA. Statistical analyses were performed using SPSS, using a two-sided $P < .05$ as an indicator of statistical significance.

Results

A total of 112 Canadian radiology residents completed the survey, with 71.4% responding in English and 28.6% in French (Table 1). Respondents represented all training years, with the largest proportions from PGY-2 (33.3%) and PGY-3 (23.5%). Three respondents (2.9%) were PGY-1 residents and were excluded from the further analysis. Gender distribution was balanced across respondents, and all 16 Canadian residency programs were represented.

Call volume varied widely across training levels and programs, with most residents completing 10 or 11 call shifts in

[1]Department of Radiology, Radiation Oncology, and Nuclear Medicine, Université de Montréal, QC, Canada
[2]Department of Medical Imaging, University of Saskatchewan, Saskatoon, SK, Canada
[3]Department of Community Health and Epidemiology, University of Saskatchewan, Saskatoon, SK, Canada
[4]Department of Medical Imaging, University of Toronto, ON, Canada

Corresponding Author:
Claudia Deyirmendjian, Department of Radiology, Radiation Oncology, and Nuclear Medicine, Université de Montréal, 1000 Saint-Denis Street, Montréal, QC H3T 1J4, Canada.
Email: claudia.deyirmendjian@umontreal.ca

Table 1. Demographic Information of Surveyed Canadian Radiology Residents.

Factor	Number (%)
Language	
English	80 (71.4)
French	32 (28.6)
Residency year	
PGY1	3 (2.9)
PGY2	34 (33.3)
PGY3	24 (23.5)
PGY4	17 (16.7)
PGY5	21 (20.6)
PGY6+	3 (2.9)
Institution	
University of Alberta	11 (10.9)
University of Calgary	8 (7.9)
University of Saskatchewan	3 (3.0)
University of Manitoba	1 (1.0)
Western University	1 (1.0)
McMaster University	6 (5.9)
University of Toronto	10 (9.9)
Queen's University	3 (3.0)
University of Ottawa	6 (5.9)
McGill University	12 (11.9)
Université de Montréal	21 (20.8)
Université de Sherbrooke	3 (3.0)
Université Laval	10 (9.9)
Dalhousie University	3 (3.0)
Memorial University	3 (3.0)
Age	
21-25	10 (9.9)
26-30	59 (58.4)
31-35	26 (25.7)
36-40	4 (4.0)
41+	2 (2.0)
Gender	
Male	61 (60.4)
Female	35 (34.7)
Prefer not to answer	5 (5.0)

the last 8 weeks (Figure 1). Most PGY-2 residents reported completing between 8 and 11 call shifts in the 8 weeks preceding survey completion, while PGY-3 to PGY-5 residents reported fewer call shifts (generally between 4 and 7). More senior residents (PGY-5+) reported <4 shifts during the same time. Overnight call was the predominant structure, though access to a post-call day was inconsistent between programs.

The volume of cases seen per call also varied depending on weekday or weekend shifts (Figure 2), with most residents submitting over 90 preliminary reports on an average weekend shift. As expected, CT was the predominant modality read on call, while responsibilities pertaining to other modalities were inconsistent between programs. For example, not all programs read MRI on call. With respect to ultrasounds, most residents submitted <10 preliminary reports during a typical call shift. On the weekend, a few (22.2%) centers reported between 10 and 19 ultrasound studies. Some residents cited availability of ultrasound technologists on call, while for others, residents themselves were responsible for performing the ultrasounds.

Most residents described case volume on call as unmanageable or very unmanageable (62.4%; Figure 3). Difficulty managing case volume slightly decreased with more advanced residency level. In stratified analyses, 100.0%, 74.2%, and 70.8% of PGY-2, PGY-3, and PGY-4 residents, respectively, rated call volume as unmanageable or very unmanageable, whereas only 33.3% of PGY-5 residents found case volume unmanageable or very unmanageable.

Approximately half (47.9%) of residents reported that they did not sleep at all on call (Table 2), deviating from the norm. Among those who did, 70.3% of them reported moderately insufficient sleep. Quality of rest post-call varied significantly by program. 80.2% of residents indicated moderate-to-severe decreased functioning post-call. Residents also reported that fatigue negatively impacted both clinical decision-making and learning efficiency.

Most residents reported that direct staff supervision was available by phone (85.3%) but rarely in person (12.7%). Perceived adequacy of supervisions improved with training level; 40.9% of PGY-2s rated supervision as "insufficient" or "poor" compared to 28.5% PGY-3s, and <15% PGY4+. Most (72.2%) respondents felt staff backup was sufficient for safe patient care, though this varied depending on the attending on-call.

Residents' perceptions of their interactions ranged from "authoritative" to "collaborative." Overall satisfaction with referring physician interactions was low, with 49.2% of respondents rating their experiences as unsatisfactory or very unsatisfactory. Qualitative data revealed that interactions were more positive when radiology residents were treated as consultants rather than as "service providers."

Mean call satisfaction decreased with higher call volumes and poorer sleep quality ($P < .05$). For instance, residents reporting little to no sleep on call – a deviation from the norm – consistently reported lower satisfaction. Self-reported wellness varied, with over half of residents having reported being cheerful or in good spirits majority of the time (Table 3). On the other hand, 71.7% of residents reported waking up feeling fresh and rested less than half of the time with 22.4% of residents responding at no time. Wellness questions also indicated that many residents felt stressed and exhausted during call-heavy periods.

Discussion

This national survey highlights important systemic challenges faced by Canadian radiology residents during call. Residents reported variable experiences across institutions and training levels, with high call volume, limited sleep, and variable

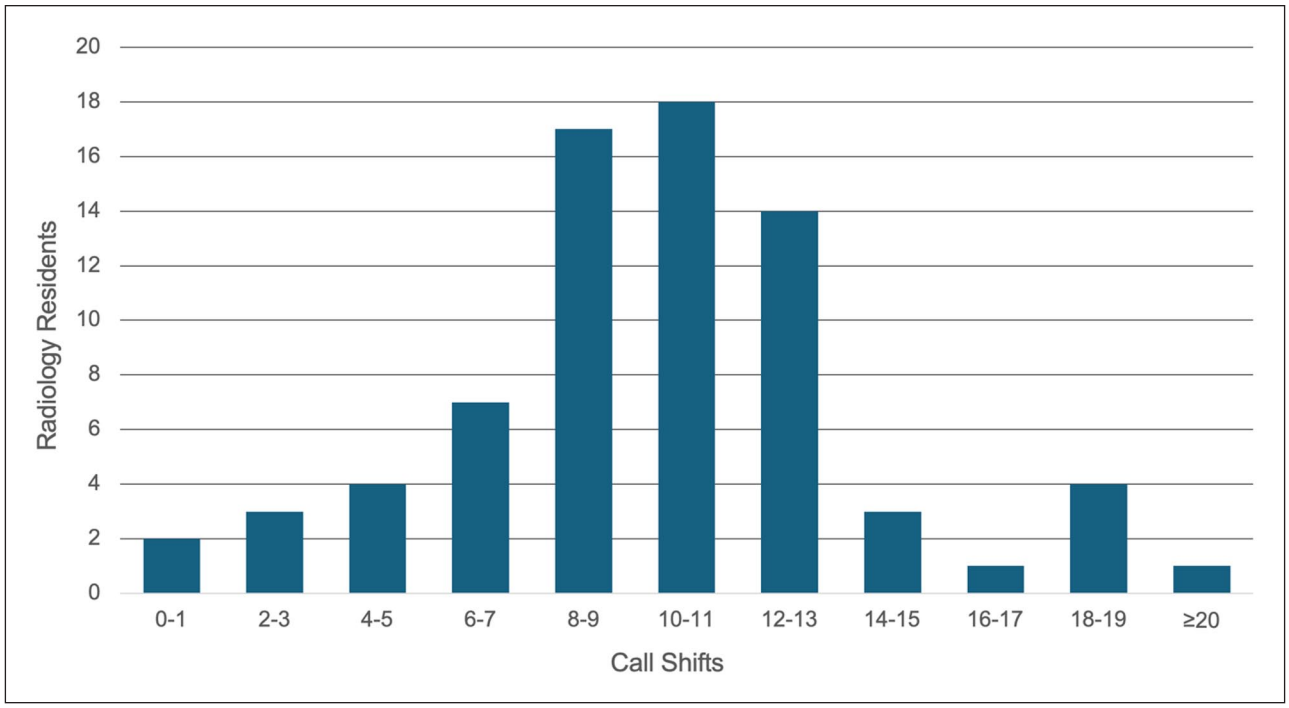


Figure 1. Distribution of number of call shifts among surveyed Canadian radiology residents in the past 8 weeks.

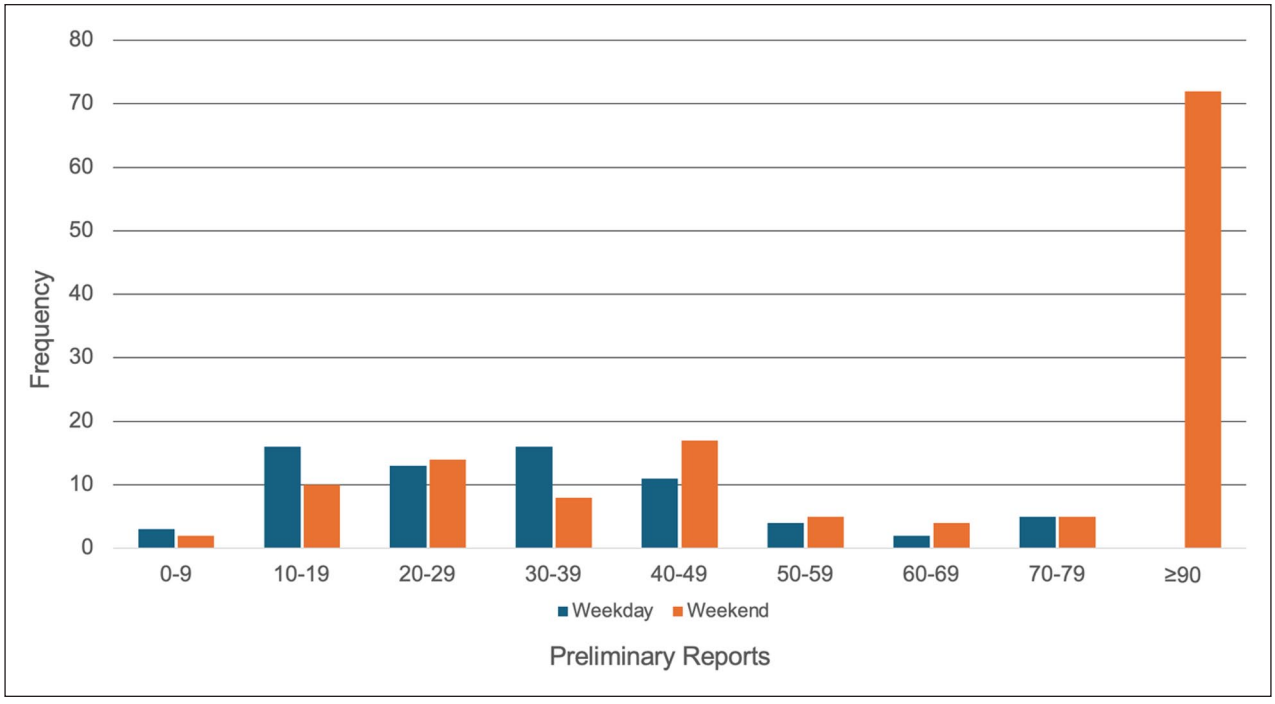


Figure 2. Number of preliminary reports submitted during weekday and weekend shifts, on average, in the past 8 weeks.

supervision emerging as significant contributors to reduced well-being and call satisfaction. These findings align with prior reports linking fatigue and increased workload to decreased diagnostic accuracy and burnout among radiology trainees.[1,13]

Call volume was a central source of dissatisfaction, with most respondents describing case volume as unmanageable or very unmanageable. Overall, as post-graduate year increased, residents found call volume to be slightly more manageable. However, a significant number of residents still

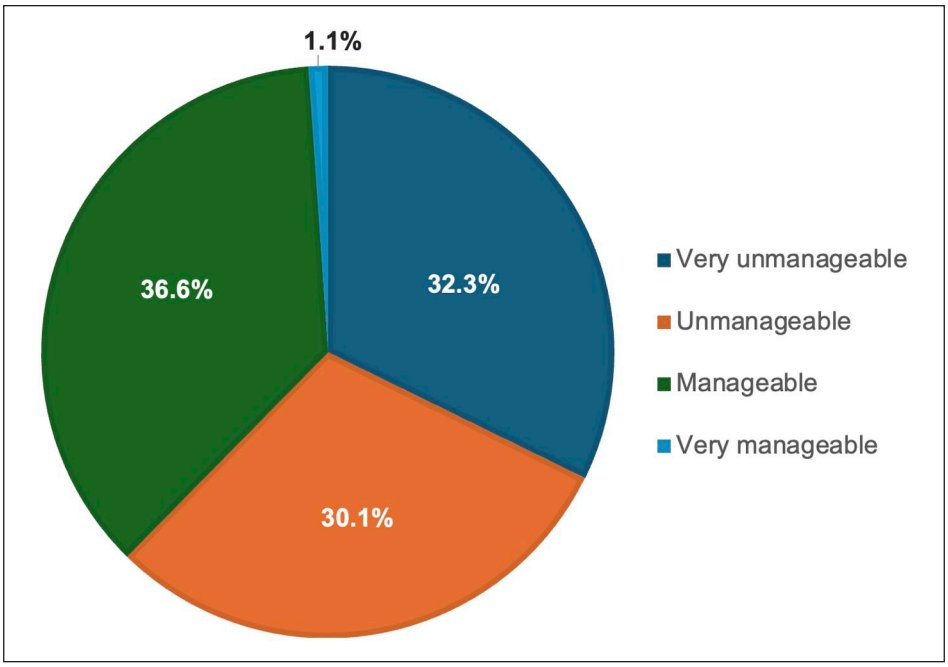


Figure 3. Resident perception of call volume during each call shift over the past 8 weeks.

Table 2. Sleep Quality and Quantity During Call Shifts (n = 71).

Call-Related Sleep Items	Completely insufficient N (%)	Moderately insufficient N (%)	Slightly insufficient N (%)	Sufficient N (%)
Duration of sleep on call	34 (47.9)	26 (36.6)	8 (11.3)	3 (4.2)
Quality of sleep (no matter how long you slept)	35 (49.3)	25 (35.2)	9 (12.7)	2 (2.8)
Physical and mental functioning post-call	28 (39.4)	29 (40.8)	11 (15.5)	3 (4.2)
Sleepiness during the post-call day	25 (35.2)	30 (42.3)	14 (19.7)	2 (2.8)

Table 3. On-Call Resident Wellness Based on the World Health Organization-Five Well-Being Index (WHO-5; n = 67).

Wellness Items	At no time N (%)	Some of the time N (%)	Less than half the time N (%)	More than half the time N (%)	Most of the time N (%)	All the time N (%)
Over the past 2 weeks, I have felt cheerful and in good spirits	2 (3.0)	12 (17.9)	14 (20.9)	20 (29.9)	16 (23.9)	3 (4.5)
Over the past 2 weeks, I have felt calm and relaxed	5 (7.5)	16 (23.9)	18 (26.9)	11 (16.4)	15 (22.4)	2 (3.0)
Over the past 2 weeks, I have felt active and vigorous	7 (10.4)	14 (20.9)	19 (28.4)	20 (29.9)	5 (7.5)	2 (3.0)
Over the past 2 weeks, I woke up feeling fresh and rested	15 (22.4)	14 (20.9)	19 (28.4)	12 (17.9)	5 (7.5)	2 (3.0)
Over the past 2 weeks, my daily life has been filled with things that interest me	3 (4.5)	16 (23.9)	9 (13.4)	22 (32.8)	14 (20.9)	3 (4.5)

found call volume difficult to manage despite being quite advanced in their training, with 70.8% of PGY-4 residents and 33.3% of PGY-5 residents describing case volume as unmanageable or very unmanageable.

Interactions with referring physicians also represented a major source of dissatisfaction. Over one-third of residents described these interactions as poor or unsatisfactory, echoing prior studies that suggest radiologists are often viewed as

peripheral rather than central to patient care. A recurring suggestion in our survey was increased awareness among referring clinicians on call conditions, the role of imaging, and application of imaging appropriateness criteria. This raises broader questions about the culture of interdisciplinary communication in academic hospitals and its impact on resident learning and professional identity.[14]

Supervision was another key area of concern. While staff radiologists were generally available by phone in case the resident had a question, in-person support was limited. This may reflect increasing workload pressures on staff, but it also highlights discordance between the goals of resident autonomy and patient safety.[15] A minority of Canadian centers have staff correcting resident reports over 24 hours. Among residents who did not have 24-hour corrections, multiple comments expressed interest in increased evening support and the implementation of 24-hour coverage. Routine phone corrections were a point of concern. Residents cited that phone corrections often would begin after the end of their call shift. On the other hand, other comments mentioned that the interruption of reading from phone corrections during the call shift was incompatible with the continuous high volume of cases. Programs must carefully balance these priorities, particularly for junior residents who are newly transitioning to independent call.

Resident wellness and sleep are imperative for efficient and safe performance on call. Call satisfaction appeared to relate to workload and rest, with higher call volumes and poorer sleep associated with lower mean satisfaction scores. Wellness responses indicated that many residents experienced fatigue and reduced energy during call-heavy periods.

These findings add to the limited literature on the Canadian radiology resident call experience and provide a descriptive overview of current conditions across programs.[16,17] They also highlight the need for systemic strategies to reduce resident fatigue – whether through optimized call schedules, protected time off for rest and recovery, or increased staff support overnight.

Conclusion

To the best of our knowledge, this national survey is the first of its kind to provide a comprehensive overview of Canadian radiology residents' experiences with call. Residents reported high call volumes, insufficient supervision, and frequent fatigue, all of which were associated with lower satisfaction and well-being. Interactions with referring physicians also represented a key challenge. These findings highlight opportunities for programs and national organizations to optimize call structures, support resident well-being, and strengthen supervision models.

Acknowledgments

We would like to thank Mr. Robert Gagnon of the *Centre de pédagogie appliquée aux sciences de la santé* at Université de Montreal, for revising the call questionnaire.

ORCID iDs

Neel P. Mistry https://orcid.org/0009-0002-1190-6951
Pamela Boustros https://orcid.org/0009-0008-2726-9778
Michael N. Patlas https://orcid.org/0000-0001-9304-6355

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Funding was provided by the Canadian Association of Radiologists Resident and Fellow Section (RFS).

Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr. Michael N. Patlas is the Editor-in-Chief of the CARJ and the senior author of this study.

Supplemental Material

Supplemental material for this article is available online.

References

1. Vosshenrich J, Brantner P, Cyriac J, Boll DT, Merkle EM, Heye T. Quantifying radiology resident fatigue: analysis of preliminary reports. *Radiology*. 2021;298(3):632-639. doi:10.1148/RADIOL.2021203486
2. Ferguson C, Low G, Shiau G. Burnout in Canadian radiology residency: a national assessment of prevalence and underlying contributory factors. *Can Assoc Radiol J*. 2020;71(1):40-47. doi:10.1177/0846537119885672
3. Health Employers Association of British Columbia, Resident Doctors of British Columbia. Collective Agreement between HEABC Health Employers Association of British Columbia and RDBC Resident Doctors of British Columbia April 1, 2022 – March, 31 2025. 2022. Accessed November 25, 2025. https://cms.residentdoctorsbc.ca/media/2022-2025-RDBC-Collective-Agreement-FINAL.pdf
4. University of Saskatchewan, Resident Doctors of Saskatchewan. 2018. Collective Agreement for the period January 1, 2018 - December 31, 2022 between University of Saskatchewan and Resident Doctors of Saskatchewan. 2018. Accessed November 25, 2025. http://www.residentdoctorssk.ca/contract/current-collective-agreement/article-9
5. Alberta Health Services, The Governors of the University of Alberta, The Governors of the University of Calgary, The Professional Association of Resident Physicians of Alberta. Agreement between Alberta Health Services (AHS), The Governors of the University of Alberta (UAlberta) and The Governors of the University of Calgary (UCalgary) (as one Party to the Agreement) and The Professional Association of Resident Physicians of Alberta (PARA) (as the other Party to the Agreement) July 1, 2024 – June 30, 2028. 2025. https://www.para-ab.ca/uploads/source/ROM/2024-2028_PARA_Agreement_-_Final_Signed_(1).pdf
6. Professional Association of Residents of Ontario (PARO). Your contract. 2016. Accessed November 25, 2025. https://myparo.ca/your-contract/

7. Fédération des médecins résidents du Québec, Minister of Health. Agreement between: the Fédération des médecins résidents du Québec (FMRQ), acting on behalf of: Association des médecins résidents de Montréal (AMRM); Association des médecins résidents de Québec (AMReQ); Association des médecins résidents de Sherbrooke (AMReS); Association of Residents of McGill (ARM); and the Minister of Health AND: the Minister of Health. 2025. Accessed November 25, 2025. https://fmrq.qc.ca/wp-content/uploads/2025/09/Agreement-FMRQ-MSSS-2021-2028-with-highlighted-change-marks.pdf
8. Maritime Resident Doctors, Nova Scotia Health Authority, Izaak Walton Killiam Health Centre For Children Women and Families, New Brunswick Regional Health Authorities, Any Other Hospital/Medical Centre/Community Centre Involved in the Dalhousie University Postgraduate Medical Education Program. Maritime Resident Doctors a body corporate under the Societies Act of Nova Scotia of the one part and Nova Scotia Health Authority; Izaak Walton Killiam Health Centre For Children Women and Families; New Brunswick Regional Health Authorities; and Any Other Hospital/Medical Centre/Community Centre Involved in the Dalhousie University Postgraduate Medical Education Program of the second part Collective Agreement July 1, 2024 to June 30, 2027. 2025. Accessed November 24, 2025. https://immediac.blob.core.windows.net/maritimeresidentdoctors/data/documents/pdf/MarDocs%20SIGNED%20FINAL%202024-2027%20-%20Maritime%20Resident%20Doctors.pdf.pdf
9. Her Majesty the Queen in Right of Newfoundland, Professional Association of Residents of Newfoundland and Labrador. Collective Agreement Between Her Majesty the Queen in Right of Newfoundland represented herein by the Treasury Board; and the Professional Association of Residents of Newfoundland and Labrador (PARNL) representing the Residents employed in the hospitals in the Province. August 10, 2022 - June 30, 2024. 2023. Accessed November 25, 2025. https://www.gov.nl.ca/exec/tbs/files/PARNL-expires-2024-1.pdf
10. Professional Association of Residents, Shared Health. Professional Association of Residents and Interns of Manitoba and Shared Health Collective Agreement July 1, 2021 to June 30, 2024. 2022. Accessed November 25, 2025. https://www.parim.org/wp-content/uploads/2022/12/PARIM-Collective-Agreement-2021-to-2024.pdf
11. Yu H, Shahi N, Robert SC, et al. Characterizing the variety of call structures across Canadian diagnostic radiology postgraduate medical education programs. *Can Assoc Radiol J*. 2024;75(1):187-190. doi:10.1177/08465371231182415
12. World Health Organization (WHO). The World Health Organization-Five Well-Being Index (WHO-5). October 2, 2024. Accessed October 25, 2025. https://www.who.int/publications/m/item/WHO-UCN-MSD-MHE-2024.01
13. Ardila JAL, Sánchez SAC, Cadavid LFP, Rozo GAM, Romero JA. Radiology under pressure: the challenge of burnout in residents and a call for action. *Acad Radiol*. 2024;31(7):3068. doi:10.1016/j.acra.2024.05.014
14. Rentmeester CA. "Why aren't you doing what we want?" Cultivating collegiality and communication between specialist and generalist physicians and residents. *J Med Ethics*. 2007;33(5):308-310. doi:10.1136/jme.2006.016162
15. Szymanski KA, Hoang AT, Van Tassel D, Kang P, Pfeifer CM. On-call radiology resident preliminary report major discrepancies: a meta-analysis. *Acad Radiol*. 2025;32(4):2342-2356. doi:10.1016/j.acra.2025.01.015
16. Huynh J, Horne D, Bryce R, Leswick DA. Is call karma real? Resident after-hours on-call imaging at the University of Saskatchewan: an assessment of call volumes including inter-resident variability. *Can Assoc Radiol J*. 2022;73(1):38-48. doi:10.1177/08465371211026310
17. Scali EP, Strovski E, Forster BB, Mar C, Chang SD. Sink or night float: University of British Columbia radiology residents' experience with overnight call. *Can Assoc Radiol J*. 2015;66(2):185-189. doi:10.1016/J.CARJ.2014.07.003