

BRIEF REPORT

Evaluation of Radiation Oncologist and Trainee Opinions on Residency Expansion, Possible Actions, and Training Program Accreditation Changes in the United States



Jason Liu, MD,* Yi-Jen Chen, MD, PhD,* Terence M. Williams, MD, PhD,* Emma Fields, MD,[†]
Brian Kavanagh, MD, MPH/MSPH,[‡] Chirag Shah, MD,[§] Trevor Royce, MD, MS, MPH,^{||} Colton Ladbury, MD,*
Arya Amini, MD,* and Scott Glaser, MD*

*Department of Radiation Oncology, City of Hope National Medical Center, Duarte, California; [†]Department of Radiation Oncology, Virginia Commonwealth University, Richmond, Virginia; [‡]Department of Radiation Oncology, University of Colorado Hospital, Aurora, Colorado; [§]Department of Radiation Oncology, Taussig Cancer Center, Cleveland, Ohio; ^{||}Department of Radiation Oncology, Wake Forest Baptist Health, Winston-Salem, North Carolina; and *Flatiron Health, New York City, New York

Received Jan 26, 2022; Accepted for publication May 2, 2022

Purpose: The objective of this study was to sample the opinions of radiation oncologists and trainees in the United States regarding residency expansion, what action(s) should be taken to limit residency supply, if any, and the proposed Accreditation Council for Graduate Medical Education (ACGME) changes.

Methods and Materials: An online survey was distributed to 1048 attending radiation oncologists by e-mail and approximately 800 residents through their program coordinators. The survey asked respondents to rank how strongly they agreed with certain statements regarding residency supply, possible solutions to address any perceived oversupply, and the proposed ACGME changes on a 1-to-10 disagreement-to-agreement scale. The 16% response rate yielded 294 responses for analysis.

Results: Of the respondents, 90 (30%) were residents, and 204 (70%) were attendings, of whom 117 (57%) were academic and 87 (43%) were nonacademic. Eighty-six percent agreed that there is a residency oversupply issue, and 91% agreed that actions should be taken to limit residency expansion. On χ^2 test, residents and attendings were similarly likely to agree that there is a residency oversupply issue (93% and 89%, $P = .27$), although residents were more likely to agree that this oversupply should be acted upon compared with attendings (100% and 88%, $P < .01$). Regarding possible solutions, respondents were most likely to agree that further expansion should be limited (90%), program requirements should be made more stringent (76%), and the use of the Supplemental Offer and Acceptance Program should be limited (69%). Proposed ACGME changes that respondents were most likely to agree with included requiring that programs have modern image guidance, stereotactic radiation therapy, and brachytherapy techniques (98%) and have 4+ faculty members and maintain a faculty-to-resident ratio of >1.5:1 (86%). Case log minimums most supported to be increased were 4 uterus (65%) and 11 postmastectomy breast (61%) simulations.

Conclusions: The majority of respondents agree that there is a residency oversupply issue and that actions should be taken to limit residency expansion and make program requirements more stringent. © 2022 Elsevier Inc. All rights reserved.

Corresponding author: Scott Glaser, MD; E-mail: sglaser@coh.org

Disclosures: none.

Data sharing statement: All data generated and analyzed during this study are included in this published article (and its supplementary information files).

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.jrobp.2022.05.005](https://doi.org/10.1016/j.jrobp.2022.05.005).

Introduction

The number of radiation oncology residency positions in the United States has nearly doubled over the past 15 years, from 128 to 188.¹ The effects of this expansion have been vigorously debated in the literature.²⁻⁵ The objective of this study was to sample the opinions of radiation oncologists and trainees in the United States regarding residency expansion and what action(s) should be taken to limit residency supply, if any, to form a foundation for other large-scale studies to address this going forward. A separate objective was to sample opinions regarding the proposed Accreditation Council for Graduate Medical Education (ACGME) changes⁶ to assess what changes they would like to see in the structure of their educational experience.

Methods and Materials

Survey

Institutional review board exemption was obtained before this study. The survey can be viewed in Appendix E1. The survey launched on November 11, 2021, and individual survey links were distributed via e-mail to 1048 attendings (compiled from multiple personal sources of colleagues and the Association of Residents in Radiation Oncology directory) and approximately 800 residents (survey link forwarded by program coordinators). Two reminders were sent out over the 4-week data collection period, which closed December 7, 2021. A public link through Google Forms was provided for respondents to participate. Sign in through Google was required before participating to ensure 1 response per person. E-mail addresses were not linked to responses, and the survey was anonymous. There were 294 responses available for analysis, comprising a 16% response rate out of the sampled population. In addition, 204 of 1048 attendings responded to the survey, comprising a response rate of 20%, and 90 of 800 residents responded to the survey, comprising a response rate of 11%. The lower response rate from residents may be attributed to a more indirect method of survey distribution used (ie, needing to rely on program coordinators to forward the survey). Despite this, a response rate of 15% to 30% is consistent with prior workforce surveys.⁷

Statistical analysis

Respondent demographics were summarized using counts and percentages. For analysis of questions asking respondents to rank how strongly they agreed with certain statements on a scale of 1 to 10, 1 to 4 was binned as “disagree” (1-2 was “strongly disagree, 3-4 was “disagree”), 5 to 6 was binned as “neutral,” and 7 to 10 was binned as “agree” (7-8 was “agree,” 9-10 was “strongly agree”). Relationships between respondent variables and responses to survey questions were analyzed using χ^2 tests. $P < .05$ was considered statistically significant.

Results

Respondent demographics

Table 1 summarizes respondent demographics. Of the 294 respondents, 90 (30%) were residents and 204 (70%) were attendings, of whom 117 (57%) were academic and 87 (43%) were nonacademic. The majority of respondents were ≤ 40 years of age (63%), male (76%), and White (68%). There was an even mixture of responses from all regions throughout the United States.

Perceptions of residency expansion and willingness for action

Table 2 summarizes survey responses related to residency expansion and willingness for action. The majority of

Table 1 Respondent demographics (N = 294)

Characteristic	Frequency, n (%)
Professional level	Resident
	90 (30)
	Attending
	204 (70)
	Academic
	117 (57)
	Nonacademic
	87 (43)
Age (y)	≤ 40
	171 (63)
	41-50
	74 (27)
	51-60
	21 (7)
	61+
	8 (3)
Sex	Male
	202 (76)
	Female
	62 (24)
Race/ethnicity	Non-Hispanic White
	168 (68)
	Black
	6 (2)
	Hispanic White
	8 (3)
	Asian or Indian
	62 (25)
	Other race
	5 (2)
Region of practice	Northeast
	51 (18)
	Mid-Atlantic
	19 (6)
	Southeast
	59 (20)
	Midwest
	71 (24)
	Southwest
	34 (12)
	West
	43 (15)
	Northwest
	12 (5)
Current or former residency size (residents per year)	1
	26 (9)
	2
	112 (39)
	3-4
	92 (32)
	5+
	59 (20)

Table 2 Perceptions of residency expansion and willingness for action

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
There is a residency oversupply issue	197 (67%)	56 (19%)	24 (8%)	7 (2%)	9 (3%)
Residency expansion is causing job market saturation	139 (47%)	87 (30%)	32 (11%)	21 (7%)	14 (5%)
Job market will improve without intervention	9 (3%)	17 (6%)	40 (13%)	64 (22%)	164 (56%)
Residency oversupply is causing decreased medical student interest in the field	205 (70%)	51 (17%)	16 (6%)	11 (4%)	10 (3%)
Residency oversupply is causing significant stress for current residents	170 (58%)	78 (27%)	31 (10%)	10 (3%)	5 (2%)
Actions should be taken to limit residency oversupply	211 (72%)	55 (19%)	16 (6%)	3 (1%)	9 (3%)
Leaders are aware and currently working on it	6 (2%)	32 (11%)	65 (22%)	85 (29%)	106 (36%)

respondents agreed that there is a residency oversupply issue, with 67% strongly agreeing and 19% agreeing. With regard to the job market, the majority agreed that residency expansion is causing job market saturation, with 47% strongly agreeing and 30% agreeing. Only 9% agreed that the job market will improve over time without intervention. With regard to its effect on trainees, 70% strongly agreed and 17% agreed that residency oversupply is causing decreased medical student interest in the field; 58% strongly agreed and 27% agreed that residency oversupply is causing significant stress for current residents. Finally, 72% strongly agreed and 19% agreed that action should be taken to limit residency oversupply.

On χ^2 test, residents and attendings were similarly likely to agree that there is a residency oversupply issue (93% and 89%, $P = .27$) and that residency oversupply is causing job market saturation (81% and 81%, $P = 1.00$). Residents were more likely to agree that action to be taken to limit residency oversupply compared with attendings (100% and 88%, $P < .01$). There was no difference in agreement rates between academic versus nonacademic attendings.

Perceptions on possible solutions

Table 3 summarizes survey responses regarding possible solutions. Regarding possible actions to address residency

oversupply, respondents were most likely to agree that residency expansion should be limited (78% strongly agree, 12% agree), program requirements should be made more stringent (57% strongly agree, 19% agree), and the use of the Supplemental Offer and Acceptance Program (SOAP) should be limited (56% strongly agree, 13% agree). Respondents were least likely to agree that the length of residency training should be increased from 4 to 5 years (72% strongly disagree, 12% disagree).

On χ^2 test, residents and attendings were similarly likely to agree that further residency expansion should be limited (93% and 89%, $P = .27$), program requirements should be made more stringent (77% and 77%, $P = 1.00$), and the use of SOAP should be limited (76% and 68%, $P = .20$). There was no difference in agreement rates between academic versus nonacademic attendings.

Perceptions on proposed ACGME changes

Table 4 summarizes survey responses regarding the proposed ACGME changes.⁶ Respondents were most likely to agree that all programs should be mandated to have capabilities for modern image guidance, stereotactic radiation therapy, and brachytherapy (88% strongly agree, 10% agree). Respondents were also in agreement that all programs

Table 3 Perceptions on possible solutions

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Program requirements should be more stringent	167 (57%)	56 (19%)	42 (14%)	16 (6%)	13 (4%)
Programs should not be allowed to SOAP	164 (56%)	39 (13%)	39 (13%)	25 (9%)	27 (9%)
Programs who go unmatched should lose that spot permanently	97 (33%)	39 (13%)	63 (21%)	53 (18%)	43 (15%)
Programs who go unmatched after several years should lose that spot permanently	144 (49%)	55 (19%)	37 (12%)	23 (8%)	35 (15%)
Programs should not be allowed to expand	229 (78%)	35 (12%)	16 (6%)	3 (1%)	11 (4%)
Programs who do not pass boards above a certain threshold should be forced to close	121 (41%)	60 (20%)	42 (14%)	38 (13%)	34 (11%)
Training should be increased from 4 to 5 years	14 (5%)	17 (2%)	25 (9%)	36 (12%)	212 (72%)
Abbreviation: SOAP = Supplemental Offer and Acceptance Program.					

Table 4 Perceptions on proposed ACGME changes

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
All institutions must have an ACGME-accredited medical oncology program	139 (47%)	54 (18%)	55 (19%)	18 (6%)	27 (9%)
All institutions must have 3+ ACGME-accredited programs in other oncology-related fields	129 (44%)	57 (19%)	58 (20%)	22 (8%)	27 (9%)
All educational experiences must take place at the primary site >75% of the time or at the primary site and one other site >90% of the time	143 (49%)	55 (19%)	53 (18%)	20 (7%)	22 (8%)
Programs must have 4+ faculty and maintain a faculty-to-resident ratio of >1.5:1	202 (69%)	50 (17%)	30 (10%)	5 (2%)	7 (2%)
Programs must have modern image guidance, SBRT/SRS, and brachytherapy capabilities	259 (88%)	29 (10%)	6 (2%)	0 (0%)	0 (0%)
<i>Abbreviations:</i> ACGME = Accreditation Council for Graduate Medical Education; SBRT = stereotactic body radiation therapy; SRS = stereotactic radiosurgery.					

should be mandated to have 4+ faculty members and maintain a faculty-to-resident ratio of >1.5:1 (69% strongly agree, 17% agree), all educational experiences must take place at the primary clinical site >75% of the time or at the primary clinical site and one other site >90% of the time (49% strongly agree, 19% agree), all sponsoring institutions must also sponsor an ACGME-accredited medical oncology program (47% strongly agree, 18% agree), and all sponsoring institutions must also sponsor 3+ ACGME-accredited programs in other oncology-related fields (44% strongly agree, 19% agree).

Table 5 summarizes survey responses regarding the proposed ACGME case log minimums. There was most support for increasing the minimums for 4 uterus (65%) and 11 postmastectomy breast (61%) simulations. There was least support for increasing the minimums for 24 intact head and neck (44%) and 7 non-Hodgkin lymphoma (27%) simulations.

Table 5 Perceptions on case log minimums

Case log minimums	More	Adequate	Fewer
5 bone/soft tissue sarcoma	51%	47%	2%
11 postmastectomy breast	61%	35%	3%
19 central nervous system	53%	44%	4%
24 intact head and neck	44%	49%	7%
5 esophagus	52%	46%	2%
7 rectum	51%	46%	3%
4 nonprostate genitourinary	50%	46%	4%
4 uterus	65%	34%	1%
7 non-Hodgkin lymphoma	27%	57%	16%
16 non-small cell lung cancer	52%	44%	4%

Discussion

To our knowledge, the present study is currently the only cross-sectional study to sample the opinions of radiation oncologists and trainees in the United States regarding residency expansion, whether action should be taken to limit residency supply, if any, and the proposed ACGME changes. The only study to be tangentially related to this current study was the American Society for Radiation Oncology 2017 Workforce Study that found that radiation oncologists in the United States were 5 times more likely to report concerns about a future oversupply than a future shortage (53% vs 12%).⁷ The present study adds to the existing body of literature by finding that the majority of respondents agree that there is a residency oversupply issue and that actions should be taken to limit residency oversupply, mostly by limiting residency expansion, making program requirements more stringent, and limiting the use of SOAP.

The ACGME proposed changes⁶ aiming to maintain the rigor of residency education in light of recent expansion were also evaluated by this study. Many of these proposed changes have been modified since the survey was initially distributed. The ACGME announced the final approved requirements set to take effect in July 2022 at the Association for Directors of Radiation Oncology Programs Annual Meeting on November 19, 2021.⁸ These changes are mostly consistent with what was supported by this study's findings. Respondents were most in favor of increasing the case log minimums for 4 uterus and 11 postmastectomy breast simulations. The requirement for 4 uterus simulations was increased to 10 gynecologic simulations, but the requirement for 11 postmastectomy breast simulations was kept the same. If case log minimums were to be adjusted in the future, published trends in case log volumes^{9,10} may be able to help optimize selection of case log minimums by the ACGME.

There are several limitations with this study. First, there is a possibility of anchoring bias in how the survey questions

were framed. The structure of the survey, including the title of the survey, may have influenced the level of respondents' agreement with the proposed statements. Future surveys could be oriented to avoid this potential bias to improve the quality of data collected, or alternative methods could be used to seek ground-up qualitative data on opinions regarding the issue of residency supply. Furthermore, the population sampled is a relatively small, nonrandom subset of all radiation oncologists in the United States comprising only 4% of the overall workforce (204 of 5300).¹¹ Unfortunately, distributing the survey to a larger, random subset of radiation oncologists could not be performed because there is no large registry of e-mail addresses that allows for the solicitation of surveys (prohibited by the American Society for Radiation Oncology directory). Respondents are also not entirely representative of the overall workforce, with an overrepresentation of residents, younger age distribution, and greater proportion working in academics. Other limitations of this study include self-selection bias, sampling bias, response bias, and nonresponse bias, all of which are common in survey-based research. Despite these limitations, this study adds to the currently limited evidence regarding radiation oncologist opinions regarding residency expansion and should help key stakeholders advance the field forward.

Ultimately, this survey attempts to capture a snapshot of radiation oncologist and trainee opinions regarding residency supply and finds that the majority of respondents agree that there is an oversupply issue and that actions should be taken to limit oversupply. Further work is needed to better assess the effects of residency expansion before changes are implemented.

References

1. Bates JE, Amdur RJ, Lee WR. Unfilled positions in the 2021 Radiation Oncology Match. *Pract Radiat Oncol* 2021;11:323–324.
2. Burt LM, Trifiletti DM, Nabavizadeh N, Katz LM, Morris ZS, Royce TJ. Supply and demand for radiation oncology in the United States: A Resident Perspective. *Int J Radiat Oncol Biol Phys* 2017;97:225–227.
3. McClelland S, Jagsi R. What has been will be again—Challenges in post-residency radiation oncology employment. *Int J Radiat Oncol Biol Phys* 2020;106:216–217.
4. Shah C. Expanding the number of trainees in radiation oncology: Has the pendulum swung too far? *Int J Radiat Oncol Biol Phys* 2013;85:1157–1158.
5. Shah C, Royce TJ. Chicken little or goose-is-cooked? The state of the US radiation oncology workforce: Workforce concerns in US radiation oncology. *Int J Radiat Oncol Biol Phys* 2021;110:268–271.
6. Accreditation Council for Graduate Medical Education. ACGME program requirements for graduate medical education in radiation oncology. Summary and impact of focused requirement revisions. Available at: https://www.acgme.org/globalassets/pfassets/reviewandcomment/430_radiationoncology_2021-09_impact.pdf. Accessed December 14, 2022.
7. Fung CY, Chen E, Vapiwala N, et al. The American Society for radiation oncology 2017 radiation oncologist workforce study. *Int J Radiat Oncol Biol Phys* 2019;103:547–556.
8. American Society for Radiation Oncology. ADROP Annual Meeting. Available at: <https://www.astro.org/Affiliate/ADROP/Annual-Meeting>. Accessed December 14, 2022.
9. Li R, Shinde A, Novak J, et al. Temporal trends of resident experience in external beam radiation therapy cases: Analysis of ACGME case logs from 2007 to 2018. *Int J Radiat Oncol Biol Phys* 2020;106:37–42.
10. Shinde A, Li R, Amini A, et al. Resident experience in brachytherapy: An analysis of Accreditation Council for Graduate Medical Education case logs for intracavitary and interstitial brachytherapy from 2007 to 2018. *Brachytherapy* 2020;19:718–724.
11. Bates JE, Parekh AD, Chowdhary M, Amdur RJ. Geographic distribution of radiation oncologists in the United States. *Pract Radiat Oncol* 2020;10:e436–e443.