

# A Narrative Review on Radiation Oncology Physician Well-Being in the United States

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## Abstract

**Objective:** To summarize articles reporting on burnout and well-being among attending and resident radiation oncologists in the United States in a narrative review.

**Methods:** PubMed was searched for peer-reviewed articles from 2010 through 2023 reporting on burnout and well-being among radiation oncologists in the United States. Each study was critically reviewed and included if it reported primary data utilizing a validated tool to measure burnout among radiation oncologists. A subset of high-quality studies was included.

**Results:** There are limited studies regarding burnout among radiation oncologists in the United States, especially when compared with data from other countries. Despite these limitations, there is a prevalence of burnout among radiation oncologists of all career stages, with rates of burnout ranging from 30% to 63%. A few smaller studies have explored interventions to decrease burnout and enhance professional fulfillment among radiation oncologists. Best practices to enhance professional fulfillment for radiation oncologists include optimizing support structures to alleviate physicians of administrative duties; including physicians in departmental decisions that affect their work; providing dedicated time for research; promoting work-life balance and job satisfaction; providing support for trainees, including psychological tool-focused approaches and humanities exercises; and encouraging mindfulness.

**Conclusions:** A large cross-sectional study is warranted to further explore modern burnout rates and causes among radiation oncologists in the United States. This may inform areas of advocacy to improve professional fulfillment among radiation oncologists.

**Keywords:** radiation oncology; well-being; wellbeing; wellness; burnout, physicians

## Introduction

Radiation oncology (RO) is a rewarding yet challenging career, where physicians blend advanced technology and compassionate care to treat patients with cancer. Daily, radiation oncologists

make complex decisions, balance treatment effectiveness and side effects, confront mortality, keep pace with rapid technological and medical advancements, and engage in emotionally charged conversations.<sup>1</sup> These oncology-specific elements, combined with recognized

stressors of being a physician, including time demands, lack of autonomy, burden of electronic medical records, productivity and reimbursement models, and misalignment of values between providers and practice leadership, can lead to burnout.<sup>2</sup>

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Burnout is characterized by emotional exhaustion (EE), depersonalization (DP) (ie, feeling detached from or callous toward patients), and a sense of reduced personal accomplishment (PA); physicians and physicians-in-training experience burnout at greater rates than the general population.<sup>3,4</sup> Consequences may include inadequate patient care, professional ineffectiveness, and excessive job turnover contributing to financial strain on health care systems. Unfortunately, burnout also contributes to physician harm, including substance abuse, clinical depression, and suicidality.<sup>5</sup> Although physician burnout is widely documented, little is published on its prevalence among radiation oncologists.

Burnout is particularly relevant to the field of RO as additional stressors have recently arisen, including uncertainty regarding future earnings, with government exploration of alternative payment models,<sup>6</sup> declining reimbursements for specialists, and job market concerns.<sup>7,8</sup> Despite efforts to assure alignment between future growth and training,<sup>9</sup> these concerns have presumably contributed to reduced ability to recruit trainees to the field as evidenced by the increased number of unfilled residency positions. In this narrative review, we provide an overview of well-being among RO attendings and trainees in the United States as well as explore potential interventions to improve the state of mental health in the specialty.

### Search Strategy and Selection Criteria

We searched PubMed for peer-reviewed, English-language articles published between 2010 and July 2023 using the search terms *oncologist* OR *oncology* AND *radiation*

AND *burnout* OR *depression* OR *depressive disorder* OR *mental health* OR *depersonalization* OR *distress* OR *anxiety* OR *emotional exhaustion* OR *well-being* OR *wellbeing* OR *wellness*. We identified additional studies from the reference lists of these articles. Each study was critically reviewed. Studies examining patient mental health were excluded. Of 52 reviewed articles, a total of 20 cross-sectional and 2 prospective interventional studies were included. Of the cross-sectional studies, 7 were thought to be particularly impactful as they included large cohorts that reported primary data utilizing a tool to measure burnout among radiation oncologists in the United States (**Table 1**). The remaining 13 cross-sectional studies included 8 describing burnout among international radiation oncologists, 3 exploring the relationship between burnout in RO with other factors in small cohorts, and 2 describing burnout among medical students and residents of all specialties. We included 2 high-quality prospective studies that were thought to be most pertinent and insightful to describe potential interventions for RO trainees. This article is informed by our narrative review and experience.

### Burnout Among Career Stage

Medical school applicants and matriculants are stronger each year with higher Medical College Admission Test scores and Grade Point Averages.<sup>10</sup> Accepted students tend to be highly intelligent, altruistic, and have a strong commitment to the field of medicine. At matriculation, mental health profiles of medical students are similar to, if not more favorable than, those of other college graduates.<sup>11,12</sup> Shortly after orientation, the risk of developing burnout and depression during

medical school increases, with rates approaching 50% and 25%, respectively. Contributing factors include personality traits, maladaptive perfectionism, type A personalities, anger suppression, stress, and curricular factors.<sup>11</sup> A large multi-institutional study reported 11.2% of medical students experience suicidal ideation, which is higher than individuals of similar age in the general US population (6.9% among 25-34-year-olds).<sup>13</sup> Unfortunately, the prevalence of distress does not decrease as medical students adapt to the challenges of medical school.<sup>11,13</sup>

In the transition from medical school to residency training, responsibilities increase, leading to increased rates of reported stress and burnout. More than 60% of medical trainees experience burnout in the United States, significantly higher than age-matched individuals in the general population.<sup>12</sup> In residency, trainees often experience inadequate sleep, difficulty with work-life integration, lack of autonomy, time demands, difficulty finding meaning in work, lack of social support (especially for those training at locations away from family and friends), crippling student debt, difficulty caring for sick patients, and future career uncertainty.<sup>1,12</sup> These factors make residents especially vulnerable to burnout.

Although each training program faces unique challenges, burnout has been shown to affect trainees of all specialties.<sup>5</sup> Radiation oncology residents were included in the 2012 Radiation Oncology Workforce Survey conducted by the American Society for Radiation Oncology (ASTRO). Trainee-specific sources of stress included difficulty finding research opportunities and job placement.<sup>14</sup> A survey assessing burnout among RO residents in the United States was performed in 2016 using the Maslach Burnout Inventory

**Table 1. Select Cross-Sectional National Studies Including Radiation Oncologists**

CITATION	YEAR OF STUDY	INCLUDED SUBJECTS	BURNOUT INSTRUMENT UTILIZED	NO. OF SUBJECTS	NO. OF RESPONDERS (RESPONSE RATE %)					OVERALL BURNOUT*, N (%)
					MEAN EE SCORE	HIGH EE (%)	MEAN DP SCORE	HIGH DP (%)		
Shanafelt <sup>3</sup>	2011	US physicians	MBI	All specialties: 27,276	7288 (26.7)	22.7	37.9	7.1	29.4	3310 (45.5)
				RO: x	RO: 55 (x)	20.5	x	5.2	x	21 (38.2)
Kusano <sup>41</sup>	2012	Academic RO chairs	MBI	87	66 (75.9)	21	25	5.3	10	x (30)
Pohar <sup>14</sup>	2012	RO residents and attendings	Likert scale <sup>#</sup>	All: 4186	1212 (29)	x	x	x	x	x (47)
				Attending: 3618	1047 (29)					
				Residents: 568	165 (29)					
Aggarwal <sup>35</sup>	2014	RO program directors	MBI	88	47 (53.4)	21.5	48	7	29	30 (63)
Shanafelt <sup>21</sup>	2014	US physicians	MBI	All specialties: 35,922	6880 (19.2)	25.5	46.9	8.1	34.6	3680 (54.4)
				RO: x	RO: 64 (x)	23.9	x	5.8	x	29 (46)
Ramey <sup>17</sup>	2016	RO residents	MBI	733	232 (31.7)	20.5	28.3	7.1	17.1	x (33.1)
Shanafelt <sup>22</sup>	2017	US physicians	MBI	All specialties: 30,456	5197 (17.1)	23.2	38.7	6.8	27.3	2147 (43.9)
				RO: x	RO: 42 (x)	23.5	x	5.3	x	16 (41)

*x Information not available in the manuscript or supplemental materials.*

*\*Defined as high score on the DP or EE subscales of MBI.*

*<sup>#</sup>Not a validated burnout inventory; however, in this review frequency of feeling burned out always, often, or occasionally met the criteria for burnout.*

*Abbreviations: DP, depersonalization; EE, emotional exhaustion; MBI, Maslach Burnout Inventory; RO, radiation oncology.*

—Human Services Survey (MBI-HSS). MBI-HSS is a validated, 22-question survey to measure burnout among those who work in human services; it includes 3 subscales, EE, DP, and PA. The presence of high levels of EE and/or DP has been considered the foundation of burnout in physicians.<sup>3,15,16</sup> In total, 232 of the 733 residents surveyed responded (31.7% response rate). High levels of EE and DP were identified in 28.3% and 17.1%, respectively. Of the responding residents, 33.1% met the criteria for burnout (high EE and/or DP), and 12% had a low sense of PA. Twelve residents (5.9%) responded they felt “at the end of my rope” on a weekly basis or more. There was a statistically significant inverse association between perceived adequacy of

work-life balance (odds ratio 0.38; 95% CI 0.17-0.83) and burnout on multivariable analysis.<sup>17</sup> This study was conducted over a decade ago, and current residents likely have additional stressors including variable pass rates on the American Board of Radiology qualifying (written) examinations, perception of job market saturation, future uncertainty, and the coronavirus 2019 (COVID-19) pandemic.<sup>7,8</sup>

Burnout is not specific to students or trainees; attending physicians are at risk of burnout as well. Attending physicians also experience heavy workloads of caring for critically ill oncology patients. Other unique challenges include difficulty finding coverage, productivity targets set by administrators, inefficiency of health care systems, time-consuming

documentation requirements, less patient-facing time, lack of autonomy with many treatment decisions dictated by insurance companies, lack of meaning at work, and the fear of malpractice lawsuits.<sup>17-19</sup>

A national study of burnout among US physicians from all specialties was performed in 2011 using the MBI assessment, reporting that 46% of physicians experienced burnout based on either high EE and/or DP levels. Of the physicians surveyed, 55 radiation oncologists responded. Although the percentage of radiation oncologists experiencing burnout was lower than the mean among all participating physicians, the rate was 38% (21 of 55 responders), which is unacceptably high.<sup>3</sup> Burnout rate among radiation oncologists was

higher than the rate of medical and surgical oncologists, 35% and 28% to 36%, respectively.<sup>3,20</sup> The percentage of radiation oncologists reporting burnout increased in follow-up studies by the same group in 2014 and 2017 to 46% (29 of 64 responders) and 41% (16 of 42 responders), respectively, although this increase was not statistically significant.<sup>21,22</sup> The percentage of radiation oncologists satisfied with work-life integration was not statistically different over the years, decreasing from 54.5% (30 of 55 responders) to 44.7% (17 of 42 responders) between 2011 and 2017. Factors contributing to burnout among radiation oncologists could not be identified due to small sample size.

To determine the needs and concerns of the field as well as the prevalence of burnout, radiation oncologists in the United States were surveyed in the 2012 Radiation Oncology Workforce Survey.<sup>14</sup> A 10-point Likert scale was used to assess the frequency that RO attendings and trainees experienced burnout, with a 29% (1047 out of 3618) response rate. Roughly half of radiation oncologists felt burned out always, often, or occasionally. An increasing number of patient consults per year was directly associated with increased frequency of burnout. The top concerns of radiation oncologists in 2011 included documentation, reimbursement, and patients' health insurance coverage.<sup>14</sup> These factors provide areas for which national organizations can advocate on behalf of the workforce; however, concerns have likely changed since this analysis, and the follow-up 2017 Workforce Study and the 2023 ASTRO Workforce Taskforce Review did not address burnout.<sup>9,23</sup>

It is possible that work-life integration is worsening in 2023 compared with when the 2012 Radiation Oncology Workforce

Survey was published due to increased at-home demands from the widespread adoption of remote work (eg, tasks involving electronic medical records and contouring), as demonstrated in other fields.<sup>24-26</sup> RO reimbursement is declining while our patients' diseases and treatments are becoming more complex.<sup>27</sup> Recently, there has been increased discussion regarding productivity and reimbursement models, including the new Radiation Oncology Case Rate payment program.<sup>28</sup> Reimbursement changes may put undue pressure on physicians to increase their productivity in other ways.<sup>29-32</sup> Although RO-specific data relating compensation models to burnout have not been reported, compensation plans based on relative value unit (RVU) generation have been significantly associated with high burnout among hematologists and medical oncologists.<sup>33</sup> Physicians may increase their workload when feeling pressure to meet RVU targets, and having more new patients per year has been associated with burnout in RO<sup>14</sup>; in addition, increased patient volume can lead to medical errors.<sup>34</sup> Patient-centered care, including hypofractionation or radiation omission when appropriate, may conflict with financial incentives and departmental expectations for RVU targets. This may lead to slower adoption of evidence-based hypofractionation regimens or overestimating the benefit of radiation or treatments like androgen deprivation therapy, when omission may be appropriate.<sup>30,32</sup> This struggle between financial pressures and patient-centered, up-to-date care can lead to moral injury and decreased professional satisfaction.

Every physician role within an RO department is at risk for burnout, including residency program directors (PDs) and chairs.

Radiation oncology residency PDs were surveyed in 2014 using MBI-HSS to assess their rates of stress and burnout,<sup>35</sup> with a response rate of 53.4% (47 out of 88 PDs). Of responders, 11%, 83%, and 6% met the criteria for low, moderate, and high burnout, respectively. Using the burnout definition of high EE and/or DP scores, the rate of PD burnout was 63% (30 of 47 responders), higher than the rate of RO attendings with burnout on the Shanafelt and ASTRO Workforce surveys.<sup>3,14,21,22</sup> Although this is a small study, not having prior experience as a PD correlated with high DP and overall burnout on univariable analysis. Having more years on faculty prior to becoming a PD was correlated with less EE and DP. Dedicated time for PD duties correlated with less EE. There were no significant correlates to burnout on multivariate analysis, likely due to the small sample size. Although 78% reported satisfaction or high satisfaction with being a PD, 85% planned to remain a PD for fewer than 5 years. Major stressors of PDs included Accreditation Council for Graduate Medical Education requirements (47%), administrative duties (30%), and resident morale (28%). As the majority of responders reported planning to remain a PD for fewer than 5 years, this could mean excessive turnover and potential decreased experience or quality of PDs. This study suggests that PDs require additional support, including mentorship and protected time with a goal of increasing professional satisfaction and decreasing burnout. This may lead to enhanced PD retention. This survey was conducted several years ago, and thus did not capture the impact of the sharp decline in medical student applications to RO with many unfilled positions.<sup>36-40</sup> This shift adds additional pressure

for recruitment to their program as a crucial part of the PDs role is to successfully recruit and train future radiation oncologists.

Similar to PDs, members of the Society of Chairs of Academic Radiation Oncology Programs (SCAROP) were surveyed in 2011-2012 using MBI-HSS to determine the prevalence as well as factors contributing to burnout in this cohort.<sup>41</sup> A total of 66 of 87 chairs (76%) responded to this survey, of which 75% and 25% demonstrated moderate and low burnout, respectively. When analyzing the proportion of chairs that had high EE and/or DP scores, 30% met this definition of burnout, which is similar to the rate of RO residents (33%),<sup>17</sup> but lower than the rate of RO attendings (38%-46%)<sup>3,21,22</sup> and RO PDs (60%).<sup>35</sup> On average, responders were working 62.3 hours per week and 79% were satisfied with their current role, which is similar to the PD satisfaction rate.<sup>35</sup> A total of 43% felt their professional roles largely or totally interfered with developing other life goals, and one-quarter felt they were at least moderately likely to step down in the coming 1-2 years; higher EE scores were found among those reporting a moderate likelihood of stepping down. One-quarter of chairs considering stepping down is much lower than the 85% of PDs that planned to stay in their role for at least 5 years; this discrepancy may be attributed to the lower burnout rate among chairs and/or protective factors, such as high rates of emotional intelligence among chairs.<sup>42</sup> Major stressors encountered by academic chairs included budget deficits, faculty recruitment and retention, human resources issues, and balancing the many roles of chair. Chairs have been faced with new financial challenges in recent years as well due to staff shortages during the COVID-19 pandemic, necessitating hiring temporary

workers, which is more expensive for departments and not a long-term solution.<sup>43,44</sup> This, coupled with decreased reimbursement rates, leads to chairs making unpopular decisions for departments, such as potential pay cuts or methods to be more financially productive. These financial stressors likely further decrease satisfaction and staff retention.

A follow-up study investigating the relationship between emotional intelligence and burnout among members of SCAROP was performed in 2015.<sup>42</sup> This study utilized the Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF), a 30-item questionnaire designed to measure global trait intelligence,<sup>45</sup> as well as the abbreviated Maslach Burnout Inventory (a-MBI). Of the 95 academic chairs surveyed, 60 responded (63.2%). The median TEIQue score was found to be 172 out of a possible 210, which is higher than published TEIQue-SF scores of physicians in other specialties, suggesting that RO academic chairs have high emotional intelligence. In this study, higher TEIQue-SF global scores were significantly correlated with lower burnout subscores on a-MBI, including lower EE and DP scores as well as higher PA. This study suggests that emotional intelligence may be protective against burnout.

### The Impact of COVID-19

COVID-19 placed unprecedented stress on health care workers across all specialties and practice environments due to work overload, job insecurity, safety concerns, patient deaths, and overall uncertainty.<sup>46</sup> Health care workers of all specialties and roles from 124 institutions across 30 states were surveyed regarding fear of viral exposure

or transmission, COVID-19-related anxiety or depression, work overload, burnout, and intentions to reduce hours or leave their jobs between July 1, 2020, and December 31, 2020. Of responding physicians, 1 in 3 intended to reduce work hours and 1 in 5 planned to leave their practice. The University of Texas MD Anderson Cancer Center (MDACC) surveyed their radiation oncologists in May 2020 and found overall decreased burnout using the Qualtrics-based MiniZ burnout survey compared with the year prior.<sup>47</sup> Burnout on the 2020 survey was associated with job-related stress, the COVID-19 pandemic, poor or marginal control over workload, and fears of job security. The majority of employees working from home at least part of the time reported a positive experience, which was associated with reduced burnout.<sup>48</sup> Although MDACC had overall decreased burnout in the early pandemic, institutions' responses to COVID-19 were heterogeneous. The impact of these responses on well-being is underreported.

### Strategies to Reduce Burnout and Future Directions

As we have shown, though data are limited, burnout may affect a large portion of radiation oncologists throughout their training and career. Strategic approaches to optimize well-being are needed, and it is important to follow best practices (**Table 2**).<sup>49</sup> The American College of Radiology recently published specific strategies to overcome burnout and enhance professional fulfillment based on existing burnout literature, assigning each category an impact factor reflecting its importance ranked by diverse members of the RO community.<sup>48</sup> The most impactful strategy identified was optimizing support

PRACTICE	SOURCE
<i>Efficiency of Practice*</i>	
Optimize support structures by maintaining adequate multidisciplinary staffing and providing administrative support to alleviate physicians of administrative duties	Beltrán Ponce <sup>49</sup>
<i>Culture of Wellness*</i>	
Include physicians in departmental decisions that affect their schedules and productivity requirements	Beltrán Ponce <sup>49</sup>
Provide dedicated time for research	Beltrán Ponce <sup>49</sup>
Promote work-life balance and job satisfaction	Beltrán Ponce <sup>49</sup>
Provide support for trainees, including psychological tool-focused approaches and humanities exercises	Gergelis, <sup>48</sup> Khorana <sup>50</sup>
<i>Personal Resilience*</i>	
Encourage mindfulness	Goodman, <sup>51</sup> Eckstein <sup>52</sup>
*Dimensions of the Stanford Model of Professional Fulfillment. <sup>63</sup>	

structures by maintaining adequate multidisciplinary staffing, providing administrative support to alleviate physicians of administrative duties, including physicians in departmental decisions that affect their schedules and productivity requirements, and providing dedicated time for research to promote recruitment and retention. Other categories with high-impact factors included promoting work-life balance and job satisfaction.

Departmental-level interventions to enhance well-being among radiation oncologists are also warranted. A well-being curriculum combining psychological tool-focused approaches and humanities exercises among residents led to decreased burnout and increased professional fulfillment among residents at 1 institution.<sup>50</sup> Another institution found that narrative-based humanities exercises were well-received by medical and RO trainees, although the effect on burnout was not specifically evaluated.<sup>51</sup> Mindfulness has also been shown to decrease burnout and improve well-being among health care providers<sup>52</sup>; an RO department conducted a survey-based study, which

demonstrated that mindfulness was protective against burnout.<sup>53</sup> Providing information on financial well-being was provided as a burnout reduction and wellness strategy for early career and trainee radiation oncologists; however, the impact of this has not been assessed.<sup>54</sup>

Data regarding RO burnout in the United States are lacking compared with other countries<sup>18,55-60</sup> and other oncology disciplines, such as medical and surgical oncology burnout in the United States.<sup>61,62</sup> Due to differences in health care systems and reimbursement models across various countries, international data cannot be a surrogate for the state of well-being for radiation oncologists in the United States. Given the unique pressures facing each specialty, data from medical and surgical oncology in the United States can also not serve as a substitute. In addition, the field of RO has changed greatly over the recent years, suggesting ongoing study is needed. Greater access to work from home offers flexibility, but also results in blurring of professional and personal life, with more work-at-home, after-clinic hours. Declining reimbursement rates, struggles to maintain our

workforce, and decreased interest in the field from prospective trainees are all potential contributors to dissatisfaction and burnout. Information regarding radiation oncologist well-being in the United States is outdated and warrants updates to reflect these changes. Current data may serve to squelch inaccurate concerns about the field, which can be amplified on social media and may deter prospective residents.<sup>8</sup>

## Future Directions

Surveying the current workforce can inform us of common sticking points across practices to identify the areas we as a field can advocate to change. Having input from current radiation oncologists would guide our professional organizations on which aspects of the specialty to focus their advocacy efforts.

In ASTRO's recently published Workforce Taskforce Review,<sup>9</sup> they note that ASTRO has "a mission to represent and support the success and well-being of RO and its members"; however, as of August 2023, ASTRO does not have a dedicated well-being taskforce. Although creating a taskforce within ASTRO to address the well-being of our physicians would require resources, it is necessary to use the power of our professional organization. The American Society of Clinical Oncology (ASCO) established the Oncology Clinician Well-Being Task Force after the ASCO Ethics Committee held a Burnout and Moral Distress in Oncology Roundtable.<sup>63</sup> This Task Force created a roadmap with 5-year goals to engage in clinician well-being across ASCO activities, broaden clinician resources to support well-being, and promote research to identify clinical and practice needs. We urge our professional organizations to do the

same to advocate for our workforce to improve both professional satisfaction and patient care.

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