

## Brief Opinion

# Achieving gender equity in the radiation oncology physician workforce

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**Abstract** There is currently much interest in identifying and mitigating gender inequity within medicine, the greater workforce and society as a whole. We provide an evidence-based review of current and historical trends in gender diversity in the RO physician workforce and identify potential barriers to diversity and inclusion in training, professional development, and career advancement. Next, we move to actionable items, addressing methods to mitigate bias, harassment, and other impediments to professional productivity and characterizing leadership lessons and imperatives for departmental, institutional, and organizational leaders.

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## Introduction

During the past year, there has been a surge in the discussion of gender equity in society. Conventional and social media have publicized the gender wage gap,<sup>1</sup> the lack of standardized parental leave policies,<sup>2</sup> and the #MeToo movement,<sup>3</sup> highlighting important issues for women in the workplace. The radiation oncology (RO) physician workforce is not immune from these issues, and introspection and honest conversation are needed within our field. In this article, we provide an evidence-based review of current and historical trends in gender diversity in the RO physician workforce and identify potential barriers to diversity and inclusion in training, professional development, and career advancement. Next, we move to actionable items, addressing methods to mitigate bias, harassment, and other impediments to professional productivity and characterizing leadership lessons and imperatives for departmental, institutional, and organizational leaders.

## Trends in gender representation

The representation of women in the U.S. RO physician workforce is not proportional to the pool of practicing physicians, academic faculty, graduate medical education trainees, and medical school graduates (Fig 1).<sup>4</sup> This suggests that RO is not accessing the available pool of female candidates and may be losing this talent to other specialties.<sup>5,6</sup> Although 7 of the 20 largest training specialties now have a female majority among trainees, RO continues to rank near the bottom in female representation

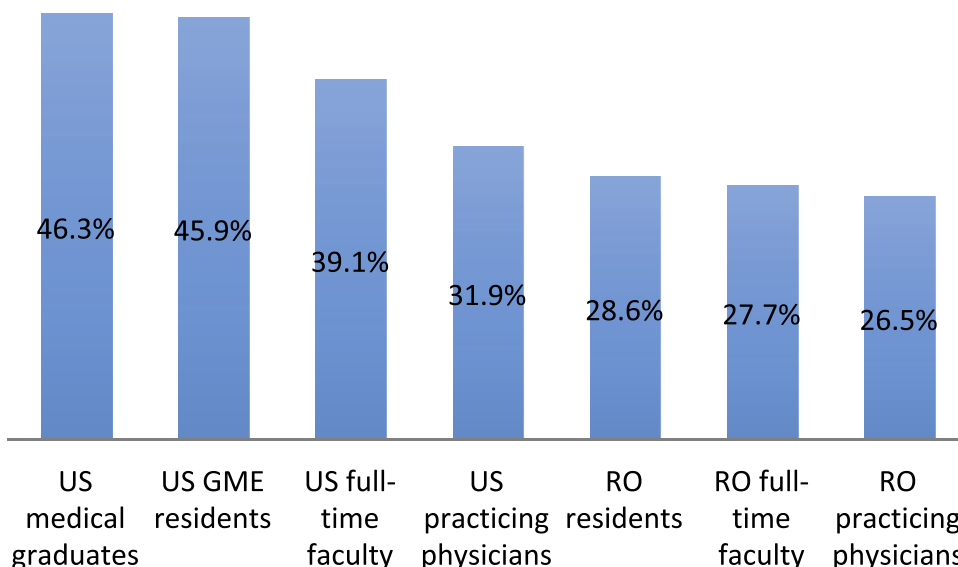
relative to other specialties.<sup>7</sup> In 2017, among the 20 largest training specialties, RO ranked 17th in terms of percentage of female applicants (Table 1).<sup>8</sup>

Over the past 30 years, the percentage of women in the academic RO physician workforce has increased by approximately 0.3% per year for both residents and faculty, compared with 1% per year for medical oncology fellows and faculty.<sup>9</sup> At this rate, it would take over 50 years for women and men to hold equal numbers of resident and faculty positions within RO.<sup>10</sup> Furthermore, although the proportion of women among medical oncology trainees peaked near gender parity (48%) in 2013, the proportion of women among RO trainees peaked in 2007 at only 35% and has since generally declined, suggesting a ceiling in female representation.<sup>9</sup> With respect to leadership, only 9% of academic RO department chairs were women in 2017. Only 4 women have served as president of the American Society for Radiation Oncology in the past 60 years, and only 2 of 15 members of the board of directors were women in 2017.<sup>11</sup>

## Gender-related barriers to training and other pipeline issues

The exact causes for this ongoing gender disparity are unclear, but barriers that may contribute include unconscious bias, sexual harassment and overt discrimination, collisions between biological and professional clocks, and lack of RO exposure and mentorship for female medical students.

Unconscious bias refers to ways that humans unknowingly draw upon assumptions about individuals and groups to make decisions about them.<sup>12</sup> Bias exists at



**Figure 1** Representation of women in the United States physician workforce for 2015 in descending order of representation. *Abbreviations:* GME: graduate medical education; RO: radiation oncology.

**Table 1** Representation of women among residency applicants in 2017 for the 20 largest training specialties: Top and bottom 5

Rank	Specialty	Total number of applications	Total number of female applicants	Percentage of female applicants
Top 5 residency programs by percentage of female applicants				
1	Obstetrics and gynecology	2641	2009	76.1%
2	Pediatrics	7174	4649	64.8%
3	Dermatology	1084	576	53.1%
4	Family medicine	14,479	7205	49.8%
5	Psychiatry	5241	2563	48.9%
Bottom 5 residency programs by percentage of female applicants				
16	Radiology	2442	693	28.6%
17	Radiation oncology	539	152	28.2%
18	Urology	500	135	27.0%
19	Neurosurgery	415	88	21.2%
20	Orthopedics	1474	247	16.8%

various stages of the pipeline in science, technology, engineering, and mathematics (STEM) fields<sup>13</sup> and may affect RO gender representation via multiple mechanisms. Unconscious biases may result in qualified women (1) being perceived as less competitive for and (2) less likely to apply to RO residency programs. For example, RO residencies are well known to consider research productivity and completion of a doctorate degree in the match process.<sup>14</sup> Women experience unconscious bias when seeking out STEM research opportunities<sup>15</sup> and mentorship,<sup>16</sup> which may affect their publication records and competitiveness for doctorate programs that RO residencies value. Furthermore, the broad societal influences that deter women from pursuing STEM fields<sup>16</sup> may affect gender representation in RO, given its technical nature and historical gender composition.

Overt discrimination and sexual harassment may also deter women from pursuing careers in RO. Sexual harassment experienced during medical school has been shown to influence specialty choice.<sup>17</sup> However, little, if any, research has focused on the presence of sexual harassment and other forms of overt discrimination in RO. Therefore, further research is needed to understand how overt and covert biases may affect gender representation in our field.

Collisions between biological and professional clocks may also affect gender representation in RO. Across all specialties, women are more likely to become depressed during training, which may be partially driven by work–family conflict.<sup>18</sup> Among RO residents, women are less likely than men to have a partner who stays at home or performs a larger share of the childrearing.<sup>19</sup> Although this may not be unique to RO, the 5-year length of training delays the posttraining period, which can be associated with a more flexible (although not necessarily less demanding) schedule, as well as increased financial means with which to hire help with domestic labor. Indeed, training length does influence the career choices of some medical students.<sup>20</sup> Although the length of RO

residency training is currently fixed, potential solutions exist to mitigate the impact of the collision of biological and professional clocks on gender representation and gender advancement in our field.

Finally, lack of RO exposure, mentorship, and female role models and the male predominance of the field may deter women from entering RO. Limited exposure to RO is driven by the field's small size, its exclusion from the core curriculum, and its unique nonmedical, nonsurgical nature. Misconceptions regarding limited patient contact, radiation exposure, or physics requirements may also disproportionately influence women's interest.

### Mitigating bias, harassment, and other impediments to professional productivity

A number of innovative interventions and promising strategies have been developed to mitigate the impact of unconscious bias, harassment, and other impediments to the productivity of female physicians. One major class of interventions focuses on unconscious bias training. Such programs are most effective when they move beyond simple recognition of bias and include tools and skills that participants can use to combat bias when it arises. For example, in a cluster-randomized controlled trial, participation in a 2.5 hour workshop intervention designed to break the habit of gender bias was associated with significantly increased self-reported personal bias awareness and internal motivation among participants. When at least 25% of a department's faculty attended the workshop, there was a significant increase in self-reported action on a regular basis to promote gender equity in the department at 3 months.<sup>21</sup>

Another set of interventions seeks to transform the culture within which more overt forms of discrimination and harassment transpire.<sup>22</sup> Occupational psychologists have established that harassment is less likely to occur when there are proactive, well-disseminated, and

well-enforced policies for reporting and sanctioning of inappropriate behaviors.<sup>23</sup> Informing, empowering, and equipping bystanders to intervene when harassment occurs is also valuable.<sup>24</sup> Bystanders can distract or redirect the perpetrator, remove the victim, or engage in reporting or confrontation.

Training programs would be most effective if they were institutionally or departmentally directed, and they could be instituted as part of mandatory annual training modules that currently cover topics such as patient safety and research integrity. Training programs that extend throughout the workplace are important to harness the opportunity provided by the viral popularity of the #MeToo movement to help change the environment that allows unacceptable behavior toward women to continue.

Changes to policies that force collisions between biological and professional clocks, as well as those that magnify the traditionally gendered division of domestic labor in our society, are also critical. Simple, seemingly neutral policies such as tenure clocks and limits on grant eligibility that relate to the number of years since completion of training can inadvertently disadvantage women. More generous and transparent policies for maternity leave<sup>25</sup> and for support of lactation and integration of work and family responsibilities are also important for the promotion of gender equity.

Innovative programs that recognize and reward service tasks that bolster education and collegiality in the workplace but typically do not advance careers are also gaining sway. Stanford piloted a time-banking system that assigned credits for things such as filling in for a colleague on short notice, mentoring students or trainees, curriculum planning, or organizing meetings. Credits could then be redeemed for help at home (eg, housecleaning, laundry, and meal delivery) or work (eg, manuscript editing, website design, and graphics preparation).<sup>25</sup>

Finally, mentoring programs are particularly efficient ways to address multiple impediments faced by women in particular.<sup>26,27</sup> Such programs may provide women access to opportunities that otherwise might be allocated by an informal old-boys' network to which they are not privy.<sup>28,29</sup> There is growing recognition of the importance of sponsorship in addition to mentorship in promoting women's access to opportunities to demonstrate their abilities and achieve success. Mentors may instill important lessons, including inculcation of resilience and persistence in the face of the failures that are common experiences for many professionals as they reach independence.<sup>30</sup>

Sponsors, on the other hand, have a more vested interest in a protégé's career growth. They may advocate for their protégé and advise them of loopholes such as the time off the tenure clock, of which they may not be aware or which they may be simply embarrassed to use. Both mentors and sponsors are valuable teachers of negotiation

skills who can help women understand the concept of principled negotiation that helps them marshal the resources needed to support their success.<sup>31</sup> Such programs are optimally structured to encourage the development of mentor networks rather than hierarchical dyadic relationships, given the diversity and multiplicity of needs of women in medicine.<sup>32</sup> Although mentoring programs need not necessarily be gender specific, there is evidence from select gender-specific programs that have had a substantial impact, particularly when focused on promoting the development of enduring support networks.<sup>33</sup>

### Leadership lessons and imperatives in diversity and inclusion

Leaders in RO have a responsibility to their employees, trainees, and patients to promote a culture of diversity and inclusion. Clear and explicit commitment to such a culture by leaders is imperative to ensuring the success and dissemination of these values in the workplace and society. Whereas most efforts to improve diversity take a bottom-up approach, relying on the underrepresented populations for implementation, a top-down approach in which leaders are engaged and accountable is needed for widely accepted and durable culture change.<sup>34</sup> There are several strategic, targeted approaches that leadership can take to address the systematic obstacles that women and underrepresented minorities face in RO (Table 2).

Leaders' commitment to hiring, retaining, and promoting underrepresented individuals is critical to a culture of inclusion. Implementation of clear policies to hire a more diverse population, such as increased representation of minorities on recruitment committees, active recruitment of women and underrepresented minorities, blinded resume review, standardized interviews, and adjusting for likeability scores, can all serve to minimize bias in hiring and promotion.<sup>35–39</sup>

In addition to these strategies, other actions can help retain talented women.<sup>40</sup> Leaders should encourage and facilitate women to participate in institutional and national career development programs, which have been shown to improve retention and career advancement.<sup>41</sup> Finally, incorporating metrics that reward investment in diversity and collaboration into promotion criteria can motivate everyone in the workplace to strive toward this shared goal.

Leaders must to accurately assess the status of diversity at their own institutions. Task forces and working groups geared toward identifying whether and why disparities exist, instituting rational interventions, and assessing progress over time may significantly improve disparities.<sup>34,42</sup> These task forces should work closely with and report directly to leadership because they

**Table 2** Examples of barriers and strategies to address gender equity in the radiation oncology physician workforce

Barrier	Strategy	Leadership imperative
Bias	<ul style="list-style-type: none"> <li>- Unconscious bias training</li> <li>- Blinded resume review</li> <li>- Standardized interviews, adjusting likeability scores</li> </ul>	Hiring and recruitment: <ul style="list-style-type: none"> <li>- Increase representation of underrepresented groups on recruitment committees</li> <li>- Active recruitment of women and underrepresented minorities</li> </ul>
Sexual harassment	<ul style="list-style-type: none"> <li>- Proactive and enforced policies</li> <li>- Bystander training</li> </ul>	Transform culture: <ul style="list-style-type: none"> <li>- Create culture that treats women with respect</li> </ul>
Salary inequity	<ul style="list-style-type: none"> <li>- Transparent salary scales</li> <li>- Standardized salary scales</li> <li>- Negotiation training</li> </ul>	<ul style="list-style-type: none"> <li>- Honest assessment of salary inequities at institution</li> </ul>
Collisions between biological and professional clocks	<ul style="list-style-type: none"> <li>- Generous and transparent maternity leave policies</li> <li>- Support of lactation and integration of work and family responsibilities</li> <li>- On-site childcare options</li> <li>- More flexible tenure timelines</li> <li>- Meetings scheduled during workday to avoid conflict with family responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>- Model practices of inclusion</li> <li>- Implement and support clear policies</li> </ul>
Mentorship	<ul style="list-style-type: none"> <li>- Increase opportunities for networking and connecting residents and junior faculty with senior faculty</li> </ul>	<ul style="list-style-type: none"> <li>- Create and promote institutional and national career development programs</li> </ul>
Exposure	<ul style="list-style-type: none"> <li>- Debunk misconceptions (eg, lack of patient contact, radiation exposure) through early education of medical students</li> <li>- Include radiation oncology introductory teaching in preclinical curricula</li> </ul>	<ul style="list-style-type: none"> <li>- Connect faculty with medical school opportunities for education, such as guest lectures</li> <li>- Reward faculty for roles in medical school involvement and other diversity initiatives</li> </ul>

are reliant on leadership to enact and reinforce their recommended changes. This introspection and action is needed everywhere—in our training programs, workplaces (academic and private), and professional societies. To advance, women must establish reputations in organized medicine and in the clinic.

While addressing hiring biases, it is especially important to measure and report salary inequity, and a careful examination of this should be undertaken at the administrative level to address this probable cause of physician drop-out.<sup>43</sup> Additionally, given their significant role in hiring, promoting careers, and establishing workplace culture, leaders should reflect on their own conscious and unconscious biases.<sup>44</sup>

Ultimately, creating a culture in which diversity and inclusion are valued and central requires firm and explicit backing of leadership, with a pledge to enact and enforce policy changes that allow people of diverse background and interests to flourish. Communicating and reiterating the importance of professionalism and respect and engaging all employees in understanding the importance of inclusion are key to this goal. Leaders can and should use their platform to educate and institute policies that serve these aims and model practices of respect and inclusion. Promoting a diverse workplace is integral to developing an institution of excellence, where academic richness, dynamic discourse, and high-quality patient care will thrive.

## Conclusions

Although gender disparities and inequities exist in the RO physician workforce and affect representation, professional development, and career advancement, there are numerous strategies that are prime for implementation to address these issues. By recognizing and mitigating barriers in hiring, promotion, mentorship, and retention, leaders can best maximize scientific progress and advancement in RO. RO is a unique and rewarding field that will thrive further with the best and brightest physicians at its helm—reflective of the diverse patients and society it serves.

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