

Expanding the Horizon of Medical Education in Radiation Oncology

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The care for patients using radiation therapy is, at its core, an educational enterprise. Every radiotherapy treatment course is the product of sustained learning from the health-care team, the patients and caregivers. The educational mandate of radiation medicine is beyond medical residency training, continuing professional development or patient navigation. It sits at the intersection of complex, multi-disciplinary decision making, precise technical delivery and long-term supportive care. Education remains the primary mechanism by which quality care is determined, delivered and improved. This edition of *Seminars in Radiation Oncology* features a series of articles which are motivated by a common premise: education in radiation oncology deserves the same scientific rigor as our clinical trials and technology assessments. Taken all together, these articles illustrate the breadth and depth of medical education in radiation oncology. They serve as strong examples of scholarship and should stimulate the reader to observe medical education in their own setting, identify potential gaps, and thoughtfully approach ways to improve radiation oncology medical education. Consider this a call to action to our specialty, to expand our horizons and the rigor of radiation oncology medical education research, noting its fundamental place in oncology care.

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This edition of *Seminars in Radiation Oncology* features a series of articles which are motivated by a common premise: education in radiation oncology deserves the same scientific rigor as our clinical trials and technology assessments. This series spans the spectrum of medical education with common grounding in strong foundations of scholarship. When considering the types of scholarship one can consider Boyer's classification of scholarship as discovery (original research), integration ("work that connects across disciplines, seeks to interpret, draw together, and bring new insight to bear on original research"), application (the application of knowledge in new ways) and teaching, all of which are reflected in this collection of literature.¹ When reviewing scholarship in medical education, frameworks such as Glassick's can help to frame the critical components of quality scholarship.² These include clear goals (articulation of a key issue or problem in medical education), adequate preparation (including an understanding of the literature), appropriate methods, significant results, effective presentation and reflective critique. Education scholarship is strongest when grounded in and expands on conceptual frameworks. According to Bordage, "Conceptual frameworks represent ways of thinking about a problem or a study, or ways of representing how complex

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things work the way they do. Different frameworks will emphasize different variables and outcomes, and their inter-relatedness.”³ Through engagement with this collection, we challenge the reader to reflect how each of these principles is applied in these manuscripts. Moreso, we challenge the reader to take the learnings and apply in their own settings, developing their own scholarly projects in one of the scholarly domains, with strong rigor per Glassick’s and utilizing conceptual frameworks.^{2,3}

Radiation medicine has experienced profound transformations the past 3 decades, —intensity-modulated radiotherapy, image-guided workflows, adaptive approaches, stereotactic techniques, and the integration of systemic therapy and immuno-oncology—each requiring skill development and reflective practice to allow them to be translated into a reliable, teachable clinical care. This series begins with Braunstein et al. and their article, “Radiation Oncology Education Across the Learning Continuum: Current Challenges and Future Directions” which provides a rich overview of the impact of change in the practice of radiation oncology on all aspects of education. Education is the mechanism by which innovation becomes reproducible and disseminated into clinical care. Gillan et al., in their article “Education as a tool to navigate changing technology in Radiation Oncology” provide an in-depth analysis of these issues. Braunstein et al provide further analysis on these issues through a review of modern education across the continuum from undergraduate medical education, postgraduate medical education and continue professional development. The practice of radiation medicine is dependent on a highly-functioning, interprofessional team. Interprofessional care and education are complex and Gillan & Harnett, discuss this in relation to organizational behavior theories. Their article, “A new lens on interprofessional education: organizational behavior theories explain one institution’s experience with authentic collaboration” explores those theories and how they relate to successful interprofessional collaboration models.

For medical training, ensuring medical students have an opportunity to experience and become interested in Radiation Oncology is critical to the future of the speciality. Fedrigo et al. in their article, “Recruiting the Next Generation: A Review of Medical Student Interest and Career Decision-Making in Radiation Oncology” discuss the complex landscape of medical student interest in Radiation Oncology and various efforts to improve engagement and exposure to the specialty. Strong conceptual frameworks are presented with respect to medical student career selection. The authors demonstrate how a conceptual framework can be applied across studies and expanded. Di Lalla and Alfieri, in “Rethinking Competency-Based Medical Education in Radiation Oncology: Early Lessons and Future Directions” explore the next stage of education, residency. They thoughtfully reflect on the development of competency-based education, the application of competency-based education in radiation oncology, early lessons implementation and future directions for research. This manuscript can serve as guide for other

programs early in the development of competency-based frameworks or as a roadmap for critical inquiry and research for those who have implemented.

Education is a critical tool to advance equity, diversity and inclusion in radiation medicine. Khan and Croke, in their article “Advancing Equity, Diversity, and Inclusion in Medical Education: Implications for Radiation Oncology” provide a critical overview of these issues in healthcare training and patient care. They consider EDI across the learning journey, providing practical suggestions for ensuring we educate our future radiation oncology care providers to prepare us to deliver care with a diverse and inclusive team.

Approaching an educational problem with a strong established framework can provide rigor and strengthen the scholarly approach. Duo et al. in “Application of a Systematic Approach to Curriculum Development within Oncology Education: the Oncology National Course for Advocacy, Research, and Education” demonstrate how Kern’s curricular model.⁴ can be thoughtfully applied to address learning gaps. The manuscript can serve as a stepwise guide to others developing educational interventions. Likewise, Morris and Turner in “Global Expert Perspectives on Radiation Oncology Education for Managing Older Adults with Cancer: Current Practice and Future Directions” expand on a key step in curriculum development, the needs assessment. Qualitative methods are commonly used in medical education research, to provide rich information and deep exploration of complex phenomena. In their article, Morris and Turner, apply a qualitative approach to data collection and analysis to gain insights into learning gaps in geriatric oncology to inform the development of objectives and educational strategies. This rigorous study serves as an exemplary model of application of qualitative methods in medical education.

Education in radiation oncology is not only focused on professional formation; it is also patient and caregiver education and public-facing communication. Radiation therapy is often either unfamiliar to patients or carries stigma and misunderstanding. High-quality, adherence to health literacy best practices, patient and caregiver education can improve preparedness, reduce distress, strengthen shared decision-making, and support adherence to care.⁵ Patient and caregiver education is not simply informational; it is an essential, equity-promoting, component of care delivery. Hart et al. in “An Evaluation of Radiation Oncology Patient Education Materials: Readability, Gaps, and Health Literacy Implications” explores a standardized approach to reviewing commonly available educational materials for oncology patients. The results not only help to define gaps and strengths in current resources but also provide a roadmap for medical education researchers to do their own similar studies.

Taken all together, these articles illustrate the breadth and depth of medical education in radiation oncology. They serve as strong examples of scholarship and should stimulate the reader to observe medical education in their own setting, identify potential gaps, and thoughtfully approach ways to improve radiation oncology medical education. Consider this a call to action to our specialty, to expand our horizons

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Data Availability

Data will be made available on request.

Declaration of Competing Interest

MG and PI have no relevant conflicts of interest to declare.

CRedit authorship contribution statement

Meredith Giuliani: Conceptualization, Visualization, Writing – original draft, Writing – review & editing. **Paris-Ann**

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