

## ORIGINAL RESEARCH

# Characterizing the Clinical Role of Radiation Oncology Advanced Practice Providers Using Entrustable Professional Activities

BRETT S. WAGNER,<sup>1</sup> BA, LEVI MARTINKA,<sup>1</sup> MD, DREW GORDON,<sup>1</sup> BA, SARAH ANDERSON,<sup>1</sup> DNP, AGACNP-BC, OCN, WCC, KATHERINE BUKOLT,<sup>2</sup> MSN, FNP, NP-C, AOCNP, KATE MARTIN,<sup>3</sup> PA-C, and DANIEL W. GOLDEN,<sup>1</sup> MD, MHPE

From <sup>1</sup>Department of Radiation Oncology, Rush University Medical Center, Chicago, Illinois;

<sup>2</sup>Department of Radiation Oncology, Sammons Cancer Center - Texas Oncology, Dallas, Texas;

<sup>3</sup>Department of Radiation Oncology, Dana Farber Brigham Cancer Center, Boston, Massachusetts

Authors' disclosures of conflicts of interest are found at the end of this article.

Correspondence to: Daniel W. Golden, MD, MHPE, Department of Radiation Oncology, RUSH University Medical Center, 1520 W Harrison Street, Chicago, IL 60607

E-mail: dan\_golden@rush.edu

<https://doi.org/10.6004/jadpro.2026.17.7.8>

© 2026 BroadcastMed LLC

## Abstract

**Purpose/Objective:** Advanced practice providers (APPs), including physician associates (PAs) and nurse practitioners (NPs), are increasingly utilized in radiation oncology. However, radiation oncology-specific training for APPs is not standardized. This study elucidates the current role of US radiation oncology APPs by assessing clinical responsibilities.

**Methods:** Radiation oncology APPs in the US were sent a survey examining demographics, training, practice structure, and clinical tasks using the framework of the 52 entrustable professional activities (EPAs) developed by the Radiation Oncology Education Collaborative Study Group (ROECSG). **Results:** 37 PAs and 84 NPs participated. 53.7% practiced a different specialty previously. 63.6% had three or more APPs in the department, and 71.9% covered multiple physicians. 65.3% worked in a practice alongside radiation oncology residents, and 79.7% of these APPs worked directly with residents. 25.6% performed procedures. 95% completed follow-up/survivorship visits, 71% completed acute symptom visits, 65% completed ambulatory consults, 45% completed inpatient consults, and 38% completed on-treatment visits. 21.5% specialized in one disease site, 39.7% covered multiple disease sites, and 38.8% covered all disease sites. 22 of 52 ROECSG EPAs were performed by > 90% in some capacity. > 90% did not complete EPAs 15, 32, 33, 35, 36, 37, 38, 40, and 46. Only 2.5% of APPs received formal radiation oncology training during APP education. **Conclusions:** APPs perform many ROECSG EPAs, primarily during follow-up/survivorship visits. However, job responsibilities vary widely across radiation oncology clinics. Further definition of the APP role is essential to meet the growing demands of cancer care, support the evolution of radiation oncology, and enhance patient care.

Advancements in early cancer detection and treatment have reduced mortality in recent decades; however, the incidence of 6 of the 10 most common cancer subtypes continues to rise (Siegel et al., 2026). In response, oncology providers are looking for ways to efficiently and effectively treat this expanding patient population (Bluethmann et al., 2016; National Cancer Institute, 2025). Advanced practice providers (APPs), including physician associates (PAs) and nurse practitioners (NPs), have become an integral component of nearly every medical specialty in recent decades. Radiation oncology is a small subspecialty with a limited number of APPs practicing in it, including only 0.2% of PAs (National Commission on Certification of Physician Assistants, 2021). Additionally, many radiation oncology clinics do not utilize APPs in their clinical milieu.

## BACKGROUND

Advanced practice providers positively affect the field of radiation oncology by expanding available services, optimizing workflow, increasing department efficiency, and increasing clinic revenue (Hollis & McMenamin, 2014; Martin et al., 2020). As oncologic providers, APPs perform similarly to residents and attendings on over 95% of quality assurance metrics in both high-performing and low-performing measures (Zhu et al., 2015). This supports the idea that APPs establish competence in completing independent patient encounters to augment clinical capacity.

Oncology APPs have been shown to provide direct care through patient counseling and treatment management at follow-up visits, while spending nearly half (46%) of their time on indirect patient care activities (Bruinooge et al., 2018). However, there is variability within the role of a radiation oncology APP between clinics and a lack of knowledge about the precise activities that define this role. Further research is needed to clarify the details of these responsibilities and to examine the degree of independence with which APPs complete these tasks.

To categorize responsibilities and operationalize competence, entrustable professional activities (EPAs) have been proposed as discrete tasks that are independently executable and important

to the profession (ten Cate & Scheele, 2007). In 2023, the Radiation Oncology Education Collaborative Study Group (ROECSSG) Core Curriculum Project developed an EPA framework to define activities that radiation oncology residents should be able to complete independently during different stages of training (Jeans et al., 2023). The EPAs were developed using a modified Delphi process incorporating feedback from subject-matter experts; however, APPs were not involved in their construction. We hypothesize that radiation oncology APPs participate in a subset of these EPAs with varying levels of physician supervision, although which clinical tasks they complete has not been clearly defined. No formal framework describing radiation oncology APP responsibilities has been described previously. As such, the ROECSSG EPAs, although originally developed for radiation oncology medical residents, provide a foundational framework that may guide the exploration and definition of role-specific responsibilities pertaining to APPs. Activities completed by APPs that are not captured by the ROECSSG EPAs are also explored.

This study serves as a needs assessment that aims to elucidate the current role of radiation oncology APPs in the US and clarify tasks that may benefit from the development of a radiation oncology-specific curriculum. We hypothesize that radiation oncology APPs will identify a specific subset of the ROECSSG EPAs that they routinely perform. These data can be used to establish a standardized radiation oncology APP curriculum to ensure radiation oncology APPs have sufficient training for their clinical responsibilities. Additionally, these data can be used to define the clinical role of a radiation oncology APP in modern health care, which will be useful to radiation oncology clinics considering adding APPs to their clinical milieu. Ultimately, this study aims to define the APP role in the context of the ROECSSG EPAs, thus improving clinic efficiency, elevating the quality of patient care, and providing data to address the evolving demands of cancer care.

## METHODS AND MATERIALS

Advanced practice providers, including PAs and NPs, were recruited to participate from a newly established US radiation oncology-specific APP

network composed of APPs across the US from various APP-focused groups and conferences. This APP network was built as a grassroots radiation oncology APP group with the aim of sharing best practices and advocate for radiation oncology APP interests. Participants were screened to include APPs who practiced in the US, spoke English, and were over 18 years old. Participants received an initial invitation email, followed by weekly reminder emails throughout the 3-week data collection period.

A Research Electronic Data Capture (REDCap) survey was sent to all study participants in May 2024. Study data were collected and managed using REDCap electronic data capture tools hosted at Rush University Medical Center (Harris et al., 2009, 2019). REDCap is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry; (2) audit trails for tracking data manipulation and export procedures; (3) automated export procedures for seamless data downloads to common statistical packages; and (4) procedures for importing data from external sources.

The survey collected demographic information including training, degree type, experience, practice structure, and practice model. Information on occupational responsibilities and specialties including procedures was also gathered. Free-text responses were available to describe work arrangements with physicians, radiation oncology-specific training, other types of patient encounters, and other procedures performed in an effort to capture APP-specific role responsibilities that are not covered by the ROECSSG EPAs.

The survey then presented the 52 ROECSSG EPAs for participant assessment. Each EPA could be rated based on the degree of independence in which the APP completed the given activity. Answer choices included “(1) I do not participate in this clinical activity,” “(2) Yes, I do this as a shared visit with the physician,” “(3) Yes, I do this with a physician discussion,” or “(4) Yes, I do this without a physician discussion (independently).” An EPA was considered routinely performed by APPs if  $\geq 90\%$  reported performing it in some capacity ([2] direct supervision, [3] indirect supervision, or [4] independently). The survey then allowed free-

text input on other APP-specific clinical tasks that were not covered by the ROECSSG EPAs. Each participant who completed the survey received a \$5 gourmet coffee gift card as a survey incentive for participation. Personal identifiers such as name, age, and workplace were not collected to maintain participant anonymity.

Data were collected using REDCap survey software. The data were then exported and analyzed using Stata version 18 (StataCorp LLC, College Station, TX). The two Doctor of Nursing Practice participants were recoded to NPs for this analysis. Specialties practiced before working in radiation oncology were categorized into medical oncology, surgical oncology, primary care, internal medicine subspecialties, or multiple specialties. Descriptive statistics were reported. Subset analyses compared EPA scores, practice setting, number of radiation oncologists, presence of radiation oncology residents, and PA vs. NP EPA ratings using chi-square comparisons. A Bonferroni correction ( $p = .05/52 = .00096$ ) was applied to determine the level of significance when analyzing the 52 EPAs across groups. Free-text responses for tasks not covered by the ROECSSG EPAs were reviewed and discussed by the authors to determine if the listed responsibilities were independent from the ROECSSG EPAs. Responses were then categorized by education, indirect patient care, direct patient care, research, administrative work, and leadership.

This study was deemed exempt from IRB review by the Rush University Medical Center Institutional Review Board, and a waiver of HIPAA authorization was granted in accordance with applicable federal regulations.

## RESULTS

The survey response rate was 121 of 204 (59%), including 37 PAs and 84 NPs. 71.9% of APPs began working in radiation oncology in 2017 or after. One participant practiced in Canada; all other participants practiced within the US. 2.5% of APPs received formal training in radiation oncology during their APP graduate education. 53.7% practiced a different specialty before working in radiation oncology, most commonly medical oncology (30.8%) or an internal medicine subspecialty (32.3%). 66% of participants practiced at an academic medical

center. 61.2% practiced in an urban setting, while only 11.6% practiced in a rural setting. 63.6% had three or more APPs in the department. 80.2% had three or more radiation oncologists in the department. 65.3% worked in a practice setting with radiation oncology residents, and 79.7% of these APPs reported working directly with the radiation oncology residents. 71.9% covered multiple physicians in their department. 25.6% performed procedures as part of their role. 21.5% specialized in only one disease site, 39.7% specialized in more than one disease site, and 38.8% covered all disease sites. 95% completed follow-up and survivorship visits.

With regard to individual EPAs, Table 1 lists the EPAs in order from most frequently completed to least frequently completed. The percentage of APPs performing each EPA by independence level is also reported in Table 1. EPAs 2, 5, 7, 10, 17, 19, and 20 were completed by > 99% of APPs. > 90% of APPs completed EPAs 2–13, 17–20, 25, 30, 39, 43, 48, and 49. > 90% of APPs performed EPAs 2, 4, 7, 18, and 19 independently. < 10% of APPs completed EPAs 15, 32, 33, 35, 36, 37, 38, 40, and 46. Most APPs regularly participated in follow-up appointments (95%) and unscheduled acute symptom visits (71%). Advanced practice providers also regularly completed ambulatory consults (65%), inpatient consults (45%), and weekly on-treatment visits (38%).

Entrustable professional activities scores were compared across practice location, size, teaching status, and APP type (Table 2). The only significant difference found was comparing EPA 14 (Determining appropriate simulation techniques and ensuring appropriate execution of simulation for simple cases) between APPs who worked at centers with and without residents. At centers with residents, 46.8% of APPs participated in staffing simulations, compared with only 19.0% of APPs at centers without residents ( $p < .0001$ ).

## DISCUSSION

This needs assessment elucidated the specific responsibilities and education of radiation oncology APPs in the US. 22 of the 52 ROECSG EPAs were found to be commonly performed by APPs (> 90% of survey respondents) in some capacity. However, only 2.5% of APPs received

formal radiation oncology-specific training for their role. Given the small percentage of APPs receiving formal radiation oncology training, it would be beneficial to further explore formal training programs to ensure APPs are able to confidently fulfill their clinical role. By evaluating the tasks that most APPs are completing, the standard responsibilities of a radiation oncology APP can now be defined, and educational curricula can be developed to efficiently and effectively onboard future APPs into radiation oncology practices.

Follow-up and acute symptom visits are routinely completed independently. Such visits augment clinical capacity to fit the increased need for survivorship following the 25% decrease in the cancer mortality rate between 1991 and 2014 (National Cancer Institute, 2025). Although 65% of APPs completed outpatient consults and 45% completed inpatient consults, the survey did not specify with what level of independence APPs completed these visits. The main tasks that APPs do not routinely perform include determining simulation techniques and staffing simulations, contouring target volumes, prescribing target volume doses, interpreting radiation therapy treatment plans, performing advanced radiation oncology examination techniques, performing brachytherapy procedures, supervising stereotactic radiation therapy treatments, and providing feedback on radiation treatment plans. The EPAs that APPs were found to frequently perform fit into the categories described in the American Society for Radiation Oncology's (ASTRO) *Safety is No Accident* reference guide, namely clinical evaluation, psychosocial evaluation, patient and family education, coordination of care, weekly evaluation, follow-up, and survivorship (American Society for Radiation Oncology, 2019). Most of these EPAs come from the Core of Discipline and Transition to Practice subsets as outlined by ROECSG, which describe tasks that residents are completing during the middle and end of their training.

The job responsibilities for APPs also vary depending on the practice model and structure. Some APPs complete shared visits with physicians while others run practices in parallel to their physician counterparts. The advent of an

**Table 1. EPA Performance Based on Level of Independence**

	<b>I do not participate in this clinical activity, %</b>	<b>Yes, I do this as a shared visit with the physician, %</b>	<b>Yes, I do this with a physician discussion, %</b>	<b>Yes, I do this without a physician discussion (independently), %</b>
EPA 2	Establishing a professional relationship with patients, families, and caregivers from diverse backgrounds. (Transition to Discipline)			
	0.0	5.8	2.5	91.7
EPA 5	Accurately, clearly, and concisely documenting radiation oncology clinical care. (EPA49) (Transition to Discipline)			
	0.0	6.6	5.8	87.6
EPA 10	Recommending and interpreting basic diagnostic studies. (EPA25) (Foundation of Discipline)			
	0.0	9.1	31.4	59.5
EPA 19	Delivering oncologic care with cultural awareness and cultural humility. (EPA43) (Foundation of Discipline)			
	0.0	3.3	1.7	95.0
EPA 7	Identifying and addressing knowledge deficits during routine patient care. (EPA52) (Transition to Discipline)			
	0.8	5.0	4.1	90.1
EPA 20	Delivering bad news and facilitating difficult conversations. (Core of Discipline)			
	0.8	11.6	28.9	58.7
EPA 17	Providing education, counseling, and management for patients regarding common acute and late treatment toxicities. (EPA39) (Foundation of Discipline)			
	0.8	5.0	7.4	86.8
EPA 3	Obtaining a disease-site focused patient history. (Transition to Discipline)			
	1.7	9.9	1.7	86.8
EPA 4	Performing basic radiation oncology physical exam techniques. (EPA24) (Transition to Discipline)			
	1.7	5.0	2.5	90.9
EPA 18	Facilitating communication across professions within a radiation oncology department. (EPA48) (Foundation of Discipline)			
	1.7	2.5	4.1	91.7
EPA 8	Discussing and establishing patients' goals of care to ensure shared decision making. (Foundation of Discipline)			
	2.5	6.6	19.8	71.1
EPA 39	Providing education, counseling, and management for patients regarding uncommon acute and late treatment toxicities. (EPA17) (Core of Discipline)			
	2.5	5.8	20.7	71.1
EPA 43	Advocating for patients to receive appropriate oncologic care taking into account health disparities and inequities. (EPA 19) (Core of Discipline)			
	2.5	5.8	10.7	81.0
EPA 13	Presenting an oncologically-focused clinical history. (Foundation of Discipline)			
	3.3	6.6	7.4	81.8
EPA 30	Collaborating with other medical disciplines and other health professionals, synthesizing recommendations, and integrating these into the oncology care plan. (Core of Discipline)			
	4.1	14.0	29.8	52.1
EPA 12	Educating patients, families, and caregivers about the radiotherapy experience and the radiobiologic rationale. (Foundation of Discipline)			
	4.1	9.1	11.6	75.2
EPA 25	Recommending and interpreting advanced diagnostic studies. (EPA10) (Core of Discipline)			
	5.0	12.4	54.5	28.1
EPA 49	Appropriately documenting to convey management plan to patient and care team and to support billing charges. (EPA5) (Transition to Practice)			
	5.0	2.5	10.7	81.8

Note. EPA = entrustable professional activity. EPAs in parentheses are related to the EPA.

**Table 1. EPA Performance Based on Level of Independence (cont.)**

	<b>I do not participate in this clinical activity, %</b>	<b>Yes, I do this as a shared visit with the physician, %</b>	<b>Yes, I do this with a physician discussion, %</b>	<b>Yes, I do this without a physician discussion (independently), %</b>	
EPA 9	Counseling patients about lifestyle management to reduce long term cancer risk and improve overall health. (Foundation of Discipline)	5.0	5.8	2.5	86.8
EPA 48	Managing patient care across professions within a radiation oncology department. (EPA18) (Transition to Practice)	5.0	4.1	15.7	75.2
EPA 11	Providing evidence-based treatment recommendations for patients with simple radiation oncology clinical presentations. (EPA26) (Foundation of Discipline)	8.3	19.8	36.4	35.5
EPA 6	Assessing patient capacity for medical decision making. (Transition to Discipline)	9.9	8.3	13.2	68.6
EPA 26	Providing evidence-based treatment recommendations for patients with complex or atypical radiation oncology clinical presentations or complex medical issues. (EPA11) (Core of Discipline)	14.9	39.7	36.4	9.1
EPA 28	Discussing outcomes of different cancers and treatment paradigms with patients, families, and caregivers. (Core of Discipline)	15.7	23.1	22.3	38.8
EPA 41	Formulating a long-term oncologic/survivorship care plan for patients. (Core of Discipline)	15.7	5.0	13.2	66.1
EPA 1	Triaging medically unstable patients. (Transition to Discipline)	16.5	11.6	34.7	37.2
EPA 47	Identifying bias and harassment in the professional environment and utilizing appropriate mitigation strategies. (Transition to Practice)	19.0	5.0	8.3	67.8
EPA 44	Facilitating transfers of care through the health care system. (Transition to Practice)	19.0	7.4	25.6	47.9
EPA 21	Managing appropriate disclosure and care for patients who have experienced a patient safety incident or severe adverse event. (Core of Discipline)	19.8	24.0	31.4	24.8
EPA 23	Providing appropriate radiotherapy and palliative care for patients at the end of life. (Core of Discipline)	20.7	40.5	31.4	7.4
EPA 22	Identifying and managing patients that require emergent radiotherapy. (Core of Discipline)	23.1	34.7	33.9	8.3
EPA 52	Identifying continuing education needs in clinical practice and addressing them with a learning plan. (EPA7) (Transition to Practice)	23.1	5.8	14.9	56.2
EPA 27	Assessing for the use of appropriate local and/or systemic management prior to, concurrent with, or adjuvant to radiotherapy. (Core of Discipline)	24.0	30.6	34.7	10.7
EPA 29	Critically appraising evidence including study design, statistical methods, and generalizability as it applies to patient care. (Core of Discipline)	33.9	22.3	19.0	24.8
EPA 45	Advocating for appropriate use of radiotherapy as a treatment modality at multidisciplinary tumor board and educating other physicians and allied health professionals about the role of radiotherapy. (Transition to Practice)	41.3	18.2	26.4	14.0

Note. EPA = entrustable professional activity. EPAs in parentheses are related to the EPA.

**Table 1. EPA Performance Based on Level of Independence (cont.)**

	<b>I do not participate in this clinical activity, %</b>	<b>Yes, I do this as a shared visit with the physician, %</b>	<b>Yes, I do this with a physician discussion, %</b>	<b>Yes, I do this without a physician discussion (independently), %</b>
EPA 24	Performing advanced radiation oncology exam techniques. (EPA4) (Core of Discipline)			
	44.6	14.9	5.8	34.7
EPA 16	Interpreting a radiotherapy treatment plan. (EPA42, EPA50) (Foundation of Discipline)			
	48.8	22.3	18.2	10.7
EPA 51	Identifying and analyzing system-level safety, quality, or resource stewardship concerns in radiotherapy delivery. (EPA34) (Transition to Practice)			
	57.0	6.6	12.4	24.0
EPA 34	Participating in a radiotherapy quality and safety program. (EPA51) (Core of Discipline)			
	58.7	9.9	7.4	24.0
EPA 14	Determining appropriate simulation techniques and ensuring appropriate execution of simulation for simple cases. (EPA31) (Foundation of Discipline)			
	58.7	15.7	18.2	7.4
EPA 31	Determining appropriate simulation techniques and ensuring appropriate execution of simulation for complex or atypical cases. (EPA14) (Core of Discipline)			
	67.8	13.2	16.5	2.5
EPA 42	Evaluating a radiotherapy treatment plan. (EPA16, EPA50) (Core of Discipline)			
	74.4	10.7	10.7	4.1
EPA 50	Providing feedback on a radiotherapy treatment plan to planning staff or peers. (EPA16, EPA42) (Transition to Practice)			
	76.9	5.8	5.8	11.6
EPA 35	Reviewing pre-, intra-, and post-fraction imaging and recommending appropriate patient shifts. (Core of Discipline)			
	92.6	5.0	1.7	0.8
EPA 37	Performing simple brachytherapy procedures. (Core of Discipline)			
	94.2	4.1	1.7	0.0
EPA 46	Performing complex brachytherapy procedures. (Transition to Practice)			
	95.0	4.1	0.8	0.0
EPA 36	Determining appropriate clinical indications for and treating with unsealed sources. (Core of Discipline)			
	95.0	3.3	1.7	0.0
EPA 15	Contouring simple target volumes and organs at risk using appropriate imaging modalities. (EPA32) (Foundation of Discipline)			
	95.9	2.5	0.8	0.8
EPA 32	Contouring complex target volumes and organs at risk using appropriate imaging modalities. (EPA15) (Core of Discipline)			
	96.7	2.5	0.8	0.0
EPA 40	Formulating a plan, performing emergency monitor unit calculations, and supervising radiotherapy in an emergency clinical setup. (Core of Discipline)			
	97.5	0.8	1.7	0.0
EPA 38	Supervising stereotactic radiotherapy treatments. (Core of Discipline)			
	97.5	2.5	0.0	0.0
EPA 33	Prescribing target volume doses, selecting dose constraints for organs at risk, and calculating biological dose conversions. (Core of Discipline)			
	98.3	0.8	0.8	0.0

Note. EPA = entrustable professional activity. EPAs in parentheses are related to the EPA.

EPA-styled competency list for APPs in radiation oncology may help clarify a transition to an “independent-to” practice model, which could improve clinical workflow. An “independent-to” practice model differs from parallel practice models in that APPs discuss cases with physicians when treatment planning or complex care decisions are required yet largely practice independently (Martin et al., 2020). This study did not survey practice models; however, 80.2% of APPs reported covering three or more physicians, which suggests that shared visits may not be commonly performed.

Clearly defined job descriptions, expectations, and the utilization of an “independent-to” practice model have also been shown to increase APP job satisfaction (Moote et al., 2012). Improved job satisfaction as a result of confident and competent radiation oncology APPs may improve employee retention rates and reduce the cost of employee turnover. This independent practice model affords physicians increased time to see new patient consults, perform contouring, and conduct research, thus minimizing turnaround time for radiation treatment and reducing risk of physician burnout.

We found that 65.3% of APPs responding to this survey worked in a practice that utilized radiation oncology residents and that 79.7% of these APPs reported working directly with residents. This high percentage relative to the national average may be due to selection bias. Having residents in clinic was not found to change the responsibilities of APPs; however, some EPAs that pertain more closely to required experiences, such as delivering bad news (EPA 20), may be preferentially allocated to residents for experiential training (Moote et al., 2012). It is important to note that state-mandated restrictions may also limit an APP’s ability to complete various EPAs. Entrustable professional activities help create an educational framework during training and postgraduate professional development, yet only 35% of APPs report using EPAs after graduation for newly acquired specialty-specific skills (de Raad et al., 2023). Further work is needed to develop an APP-specific list of EPAs for radiation oncology that more closely aligns with their licensing and scope of practice.

The establishment of APP-specific EPAs for radiation oncology can be used to guide curricular goals for APP onboarding and continuing education. Advanced practice provider-specific radiation oncology EPAs can serve as the backbone for assessment tools to certify APPs during their onboarding. These APP-specific EPAs should be revisited periodically to reassess alignment with the APP role in radiation oncology. Barriers to EPA implementation include variation in scope of practice determined by state licensure, differences in role responsibilities influenced by institutional size and resources, and inconsistency in reimbursement tied to billable services.

This study does not intend to suggest that APPs can replace radiation oncology residents. Radiation oncology residents undergo extensive training to become skilled radiation oncologists who lead multidisciplinary teams within the department of radiation oncology while overseeing the planning, treatment delivery, and overall care of their patients. Their role differs from that of APPs, who concentrate on providing comprehensive supportive care in collaboration with the radiation oncologist often focusing on acute symptom management, follow-up care, and survivorship.

### Limitations

There are multiple limitations to this study. One limitation is the use of a previously developed list of EPAs that was composed for radiation oncology medical residents instead of being tailored to the APP role. This list may omit some tasks that APPs are regularly completing. However, as there is no published list of radiation oncology APP clinical responsibilities, use of the ROECSSG EPAs provided a foundational starting point. Another limitation is the use of an established APP contact list that may cause sampling bias as some centers are overrepresented and this distribution may influence the clinic demographic and practice structure data. Additionally, this list is unlikely to include all APPs in the US. Lastly, more than twice as many NPs completed the survey as PAs, which may alter survey data based on the weight of each licensed cohort. However, the chi-square analysis did not identify differences in job responsibilities between certifications.

**Table 2. Subanalyses of EPA Performance Between Groups**

Practice location: urban vs. rural		Practice size: solo vs. group practice		Teaching status: with vs. without residents		APP type: PA vs. NP	
EPA	p value	EPA	p value	EPA	p value	EPA	p value
5	.031	21	.036	14	.001	7	.036
17	.031	23	.033	16	.041	25	.028
39	.046			20	.038		
				28	.039		
				30	.014		
				31	.014		

Note. EPA = entrustable professional activity; APP = advanced practice provider. PA = physician associate; NP = nurse practitioner. Only *p* values < .05 are shown. Bonferroni correction for 52 tests of significant sets level of significance at  $0.05/52 = 0.00096$ .

## CONCLUSION

Going forward, this study acts as a benchmark for how radiation oncology APPs are currently utilized in US radiation oncology clinics. Given the reported lack of formal radiation oncology training, these findings can inform the development or refinement of a targeted radiation oncology APP curriculum for training APPs onboarding into the field. This study can also guide radiation oncology clinical directors when considering their utilization models of radiation oncology APPs. In addition, ongoing investigation on the utilization of APPs in radiation oncology clinics and the development of metrics to measure performance will be critical in shaping the future of the APP role in radiation oncology. ●

## Acknowledgment

The authors would like to thank the advanced practice providers who participated in this study for their invaluable transparency and insight.

## Disclosure

This study was funded in part by NIH CTSA UL1TR002389 and by the Rush University Medical Center Department of Radiation Oncology. Dr. Golden reports grant funding from the Radiological Society of North America, American Association of Cancer Education, and serves as chair of the Radiation Oncology Education Collaborative Study Group. The authors have no conflicts of interest to disclose.

## References

- American Society for Radiation Oncology. (2019). Safety is no accident: A framework for quality radiation oncology care. <https://www.astro.org/practice-support/quality-and-safety/safety-is-no-accident>
- Bluethmann, S. M., Mariotto, A. B., & Rowland, J. H. (2016). Anticipating the “silver tsunami”: Prevalence trajectories and comorbidity burden among older cancer survivors in the United States. *Cancer Epidemiology, Biomarkers & Prevention*, 25(7), 1029–1036. <https://doi.org/10.1158/1055-9965.EPI-16-0133>
- Bruinooge, S., Pickard, T. A., Vogel, W., Hanley, A., Schenkel, C., Garrett-Mayer, E., Tetzlaff, E., Rosenzweig, M., Hylton, H., Westin, S. N., Smith, N., Lynch, C., Kosty, M. P., & Williams, S. F. (2018). Understanding the Role of Advanced Practice Providers in Oncology in the United States. *Oncology Nursing Forum*, 45(6), 786–800. <https://doi.org/10.1188/18.ONF.786-800>
- de Raad, T., Wiersma, F., Kuilman, L., & Ten Cate, O. (2023). The fate of entrustable professional activities after graduation: A survey study among graduated physician assistants. *The Journal of Continuing Education in the Health Professions*, 43(1), 28–33. <https://doi.org/10.1097/CEH.0000000000000467>
- Harris, P. A., Taylor, R., Minor, B. L., Elliott, V., Fernandez, M., O’Neal, L., McLeod, L., Delacqua, G., Delacqua, F., Kirby, J., & Duda, S. N. (2019). The REDCap consortium: Building an international community of software platform partners. *Journal of Biomedical Informatics*, 95, 103208. <https://doi.org/10.1016/j.jbi.2019.103208>
- Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, 42(2), 377–381. <https://doi.org/10.1016/j.jbi.2008.08.010>
- Hollis, G., & McMenamin, E. (2014). Integrating nurse practitioners into radiation oncology: One institution’s experience. *Journal of the Advanced Practitioner in Oncology*, 5(1), 42–46. <https://jadpro.com/issues/volume-5-num->

- ber-1-janfeb-2014/integrating-nurse-practitioners-into-radiation-oncology-one-institution-s-experience/
- Jeans, E. B., Brower, J. V., Burmeister, J. W., Deville, C., Fields, E., Kavanagh, B. D., Suh, J. H., Tekian, A., Vapiwala, N., Zeman, E. M., & Golden, D. W. (2023). Development of a United States Radiation Oncology Curricular Framework: A Stakeholder Delphi Consensus. *International Journal of Radiation Oncology, Biology, Physics*, 115(5), 1030–1040. <https://doi.org/10.1016/j.ijrobp.2022.12.009>
- Martin, K. L., Krechmer, B., Boyajian, R. N., Reynolds, M. C., Cagney, D. N., & Martin, N. (2020). Advanced Practice Providers in Radiation Oncology. *Practical Radiation Oncology*, 10(4), e192–e198. <https://doi.org/10.1016/j.prro.2019.10.001>
- Moote, M., Wetherhold, R., Olson, K., Froelich, R., Vedhapudi, N., Lash, K., Moore, S., & Hayman, J. A. (2012). Physician assistant and nurse practitioner utilization in radiation oncology within an academic medical center. *Practical Radiation Oncology*, 2(4), e31–e37. <https://doi.org/10.1016/j.prro.2012.03.009>
- National Cancer Institute. (2025). Cancer Statistics. <https://www.cancer.gov/about-cancer/understanding/statistics>
- National Commission on Certification of Physician Assistants. (2021). Statistical Profile of Certified PAs: Annual Report. <https://www.nccpa.net/wp-content/uploads/2022/08/2021StatProfileofCertifiedPAs-A-3.2.pdf>
- Siegel, R. L., Kratzer, T. B., Wagle, N. S., Sung, H., & Jemal, A. (2026). Cancer statistics, 2026. *CA: A Cancer Journal for Clinicians*, 76(1), e70043. <https://doi.org/10.3322/caac.70043>
- ten Cate, O., & Scheele, F. (2007). Competency-based postgraduate training: Can we bridge the gap between theory and clinical practice? *Academic Medicine: Journal of the Association of American Medical Colleges*, 82(6), 542–547. <https://doi.org/10.1097/ACM.0b013e31805559c7>
- Zhu, J., Zhang, T., Shah, R., Kamal, A. H., & Kelley, M. J. (2015). Comparison of Quality Oncology Practice Initiative (QOPI) measure adherence between oncology fellows, advanced practice providers, and attending physicians. *Journal of Cancer Education*, 30(4), 774–778. <https://doi.org/10.1007/s13187-015-0798-z>