Repositioning Radiation Oncology at the centre of integrated oncology care: a manifesto of the European Society for Radiotherapy and Oncology (ESTRO)

Meattini, I.; Aznar, M.C.; Boldrini, L.; Borgmann, K.; Clark, C.H.; Faivre-Finn, C.; ... ; Guckenberger, M.

Radiotherapy and Oncology 210 (2025) 111035

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Perspective

Repositioning Radiation Oncology at the centre of integrated oncology care: A manifesto of the European Society for Radiotherapy and Oncology (ESTRO)

ARTICLE INFO

Keywords:
Radiotherapy
Oncology
Oncopolicy
Multimodal treatment
Health policy
Health equity

ABSTRACT

Modern oncology increasingly relies on integrated, multimodality care, yet radiation oncology remains undervalued in strategic frameworks despite its central therapeutic role. This ESTRO manifesto calls for a repositioning of radiation oncology as a core discipline in cancer care, scientifically, clinically, and politically. The field now extends beyond beam delivery to encompass systemic therapy integration, personalised strategies based on biology and imaging, and active participation in clinical decision-making and guideline development. Radiation oncology contributes to treatment sequencing, synergistic combinations, and innovation in areas such as radioligand therapy and artificial intelligence. ESTRO's initiatives, including education, research networks, and oncopolicy engagement, underscore the discipline's broad scope and societal value. Strategic partnerships with Pharma and MedTech, alongside a renewed emphasis on equitable access, are essential to sustaining progress. ESTRO invites all stakeholders to recognise radiation oncology as fundamental to the design, delivery, and evolution of modern cancer therapy.

Introduction a critical juncture in cancer care

The past decade has seen a profound transformation in cancer treatment. Multimodality care has replaced traditional siloed approaches, with the integration of diverse treatment strategies now established as the gold standard. Radiation therapy has been a cornerstone of cancer care for over a century, and the field of radiation oncology is increasingly recognised for its critical role in driving innovation and shaping integrated, holistic cancer treatment strategies, though its contributions have not always been fully acknowledged [1,2]. In many healthcare systems, the scope of radiation oncology practice now extends beyond traditional boundaries to include systemic therapies, such as radionuclide prescribing, as well as inpatient care, day-clinic activities, and interdivisional care pathways, reflecting its growing clinical relevance and versatility [3].

As the European Society for Radiotherapy and Oncology (ESTRO), we believe the time has come to reassert the central role of radiation oncology as a clinical discipline in modern cancer management. This editorial presents a manifesto: to reposition radiation oncology not simply as a treatment modality, but as a strategic, innovation-driven discipline that is integral to the cancer care pathways, clinical guideline development, and the design and delivery of clinical trials.

From beam delivery to strategic anti-cancer care

Radiation oncology today sits at the crossroads of biology, physics, radiology, technology, and clinical decision-making. The discipline has evolved well beyond its traditional focus on technical radiotherapy developments [4–6]. It now plays a central role in:

- Providing continuous care for and support for cancer patients and their families, spanning early curative treatments, follow-up, advanced care planning and palliative care, including end-of life support.
- Developing and optimising combination therapy protocols.
- Individualising treatment based on imaging, tumour biology and genomics.
- Integrating systemic agents, such as radiosensitisers, immunotherapy and target therapies [6].
- Implementing organ preservation strategies.
- Integrating neoadjuvant and adjuvant strategies and advancing the use of surrogate endpoints, such as pathological complete response.
- Establishing curative-intent ablative approaches for patients with limited metastatic disease (oligometastatic disease) [4,7].
- Pioneering the use of artificial intelligence in radiotherapy decision making, patient stratification, planning, workflow automation, and treatment delivery.

A clinically grounded perspective

The integration of radiation therapy with systemic agents and other core disciplines is supported by a robust and expanding evidence base [5]. Radiation oncologists play a critical role in the strategic deployment of pharmaceutical agents, including radionuclides, through their expertise in:

https://doi.org/10.1016/j.radonc.2025.111035
Received 17 June 2025; Accepted 21 June 2025
Available online 12 July 2025

- Mechanistic synergy: understanding how radiotherapy interacts with and enhances the efficacy of immune checkpoint inhibitors and other targeted therapies.
- Treatment sequencing: determining optimal timing and combinations of systemic agents with local radiotherapy.
- Disease definition and response assessment: guiding therapeutic strategies in settings such as oligometastatic disease and neoadjuvant treatments.
- Emerging modalities: advancing the clinical integration of emerging modalities, including radioligand therapy and theragnostic platforms, to enable more targeted, personalized cancer treatment.

These contributions are firmly grounded in radiobiology, pharmacology, clinical and translational research, reinforcing radiation oncology's integral role in shaping the future of multimodal cancer care (see Table 1 and Table 2).

Although not all radiation oncology clinicians are licensed to prescribe anti-cancer agents, in several countries many radiation oncology specialists (often referred to as "clinical oncologists"), are trained and authorised to prescribe a broad range of systemic therapies, extending beyond radiation-based regimens [3]. This highlights the discipline's capacity to inform and influence therapeutic decision-making cross the broader oncology landscape, serving as a bridge between advanced technologies and pharmacological treatments. Radiation oncology itself functions as a potent therapeutic modality – often as impactful as systemic drugs and, in many cases, more cost-effective [8].

Such synergy between radiation therapy and pharmacological innovation depends on close collaboration among professionals – medical physicists, biologists, radiation therapists, dosimetrists, nurses, and clinicians – as well as engagement with industry partners to optimise treatment strategies. In this context, radiation therapy may be best conceptualised as a 'high-impact therapy' – one that demands sophisticated expertise and dedicated infrastructure for safe and effective delivery [9]. Looking ahead, there is considerable untapped potential for deeper engagement between the pharmaceutical industry and the radiation oncology community, offering exciting opportunities for earlier integration and co-development of the next generation of treatments and multimodality clinical trials [10].

Table 1
Key pillars of the manifesto.

Pillar	Description
Discipline centrality	Position radiation oncology as a strategic, innovation-driven field integral to modern cancer care.
Multidisciplinary focus	Emphasise the interdisciplinary team-based nature of the discipline (e.g., radiation oncologists, physicists, therapists, dosimetrists, biologists), while enhancing collaboration with medical oncology, surgery, and other disciplines.
Combined modality expertise	Showcase how radiotherapy integrates with systemic agents (e.g., immune checkpoint inhibitors, DNA repair inhibitors, targeted therapies) to improve outcomes and cost-effectiveness.
Educational & research leadership	Provide world-class resources (e.g., ESTRO School, FALCON, e-learning, mentorship) to support lifelong learning, research networks, clinical excellence, and international guideline development.
Broad prescribing authority	Highlight the role of clinical oncologists in many regions as prescribers of systemic therapies, contributing to integrated and holistic cancer care.
Partnership with Pharma & MedTech	Strengthen collaboration with pharmaceutical and MedTech sectors to co-develop innovative multimodality strategies and advance cutting-edge technologies in imaging, planning, and real-time adaptive therapy. This includes pioneering novel approaches such as FLASH and lattice radiotherapy, as well as next-generation treatment platforms like upright units.
Oncopolicy and Research Advocacy	Leverage collaboration with industry platforms (e.g., COCIR, pharma associations) to influence oncology policy, shape research and development funding agendas, and co-advocate for radiotherapy's role in cancer control strategies. Provides a foundation for future collaboration with the Advocacy Task Force.

ESTRO – European Society for Radiotherapy and Oncology.
FALCON – Fellowship in Anatomic deLineation and CONtouring.
COCIR – European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry.

Table 2
ESTRO proposed actions and anticipated impact.

Action	Key Components	Anticipated Impact
Toolkit for industry partners	– Concise, narrative-driven briefing documents illustrating radiation oncology's relevance in oncology innovation and research	– Strengthened early-stage collaboration – More innovative and efficient combination trials – Increased recognition of radiation oncology role among industry stakeholders
Educational enhancement	– Expansion of ESTRO courses and webinars offerings (online & in-person) – New modules on systemic therapy integration modules, biomarkers and translational science	– Improved multidisciplinary understanding – Up-skilled workforce – Accelerated uptake of best practices and innovations
Clinical trials and guideline leadership	– Establishment of dedicated ESTRO-led taskforces to co-design multimodality clinical trials – Proactive participation in international guideline development panels	– Promote the comprehensive integration of RT in clinical trial portfolios, ensuring active involvement of radiation oncology professionals in the design, leadership, and management of trials. – Evidence-based inclusion in treatment guidelines – Higher-quality evidence supporting RT with drug combinations
Stakeholder mapping and registry	– Development of a centralised directory of radiation oncology experts – Categorisation by disease site, research expertise	– More efficient academic–industry partnership – Easier access to key opinion leaders in radiation oncology for pharma and MedTech engagement
Strategic bilateral conference presence	– Enhanced engagement with partner scientific societies – Joint sessions at general oncology congresses – Targeted presentations on combined modality innovation – Greater presence at industry forums	– Greater visibility of radiation oncology – Stronger cross-disciplinary partnerships – Improved engagement with pharma and MedTech sectors

ESTRO – European Society for Radiotherapy and Oncology.
RT – Radiation Therapy.

ESTRO's call to action: reframing the dialogue, and embracing the multidisciplinary nature of radiation oncology

To bridge the current gap, ESTRO is launching a strategic initiative to redefine the discipline's role within the broader oncology ecosystem [11]. Our goal is to ensure that radiation oncology is recognised not only as indispensable in clinical care but also as a driving force in therapeutic

innovation, research and education [12].

ESTRO's influence extends well beyond its flagship annual congress. The Society offers a rich portfolio of educational and collaborative platforms that foster excellence and innovation year-round. These include the ESTRO School, with its extensive catalogue of in-person and online multidisciplinary courses, the FALCON programme (Fellowship in Anatomic deLineation and CONtouring), providing hands-on contouring workshops and a suite of e-learning modules, mentorship programme, and structured continuing professional development pathways [13]. Together, these initiatives cultivate deep, cross-border, cross-disciplinary engagement.

ESTRO also drives consensus and knowledge-sharing through its thematic networks, technology and disease-oriented focus groups, workshops, and guideline-development committees; mechanisms that promote networking collaboration and build a strong, unified voice across oncology disciplines. By fostering this integrated and inclusive approach, ESTRO is uniquely positioned to lead the repositioning of radiation oncology in the modern oncology landscape.

Each professional role within the discipline – clinicians, medical physicists, biologists, radiation therapists, dosimetrists – brings essential expertise that ensures safe implementation of technological innovations translate into meaningful patient outcomes. This collective focus on quality and patient-centred care underpins progress in the discipline.

Moreover, advanced medical technologies are the backbone of modern radiation oncology, enabling precision and accuracy throughout the treatment pathway, from imaging acquisition and planning to real-time dose delivery and adaptive therapy. Partnership with MedTech innovators is essential to maintaining this momentum, enhancing treatment accuracy, and enabling seamless integration with novel systemic agents.

Framing the collaboration between ESTRO and both the pharma and MedTech industries explicitly as an access strategy highlights that all workstreams — evidence, technology, education, financing, and policy — ultimately aim to ensure optimal patient access to care. Such collaborative efforts can support and advocate for policy and health technology assessment pathways that acknowledge the long-term value of radiation therapy as a high-impact treatment.

A manifesto for the discipline's future

The complexity of modern care calls for deeply integrated, multidisciplinary collaboration. Radiation oncology occupies a unique position at the crossroads of therapeutic precision, scientific innovation, and strategic decision-making.

To fully realize the potential of emerging cancer therapies, it is essential that stakeholders across academia, industry, patient communities, the public, and policymakers recognize and actively engage with radiation oncology as a central partner in driving innovations. This manifesto sets out ESTRO's commitment to advancing this vision. The future of cancer care is undeniably multimodal, and radiation oncology is not only central to its delivery but fundamental to its design, evolution, and long-term success.

Author contributions

Icro Meattini, Matthias Guckenberger, Alessandro J. Cortese, and Uulke A. van der Heide drafted the initial version of the manuscript. All authors contributed equally to the writing, critical revision, supervision, and final approval of the manuscript.

Funding statement

This initiative received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Icro Meattini: Conceptualization, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Marianne C. Aznar:** Conceptualization, Validation, Visualization, Writing – review & editing. **Luca Boldrini:** Conceptualization, Validation, Visualization, Writing – review & editing. **Kerstin Borgmann:** Conceptualization, Validation, Visualization, Writing – review & editing. **Catharine H. Clark:** Conceptualization, Validation, Visualization, Writing – review & editing. **Corinne Faivre-Finn:** Conceptualization, Supervision, Validation, Visualization, Writing – review & editing. **Elizabeth Forde:** Conceptualization, Validation, Visualization, Writing – review & editing. **Uulke A. van der Heide:** Conceptualization, Supervision, Validation, Visualization, Writing – review & editing, Writing – original draft. **Barbara Alicja Jereczek-Fossa:** Conceptualization, Validation, Visualization, Writing – review & editing. **Núria Jornet:** Conceptualization, Validation, Visualization, Writing – review & editing. **Anna M. Kirby:** Conceptualization, Validation, Visualization, Writing – review & editing. **Piet Ost:** Conceptualization, Validation, Visualization, Writing – review & editing. **Ivica Ratosa:** Conceptualization, Validation, Visualization, Writing – review & editing. **Kari Tanderup:** Conceptualization, Validation, Visualization, Writing – review & editing. **Esther G.C. Troost:** Conceptualization, Validation, Visualization, Writing – review & editing. **Alessandro J. Cortese:** Conceptualization, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Matthias Guckenberger:** Conceptualization, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Icro Meattini declares honoraria from Eli Lilly, Novartis, Pfizer, Gilead, AstraZeneca, Daiichi Sankyo, Menarini StemLine, MSD, Exact Sciences, TEMA Sinergie; Marianne C. Aznar declares grants from the Engineering and Physical Sciences Research Council (EP/T028017/1) and NIHR Manchester Biomedical Research Centre (NIHR203308); Uulke A. van der Heide declares research support from Elekta AB and Philips Healthcare; Barbara Alicja Jereczek-Fossa declares research support from IBA and Accuray. Member of IBA scientific advisory board; speaker honoraria from Roche, Bayer, Janssen, Carl Zeiss, Ipsen, Accuray, Astellas, Elekta, IBA, and AstraZeneca (all outside the current project); Piet Ost declares research grants from Bayer; consultancy for AstraZeneca, Bayer, Janssen, Novartis. Kari Tanderup declares research grants from Elekta and Danish Cancer Society; Esther G. C. Troost declares scientific advisory board member for IBA; speaker fees from Elekta; Matthias Guckenberger declares research grants from AstraZeneca and Varian. Consultancy for AstraZeneca and Varian. All remaining authors have declared no conflicts of interest.

The authors Marianne Aznar, Uulke van der Heide, Esther Troost and Kari Tanderup are Editors of Radiotherapy and Oncology and were not involved in the editorial review or the decision to publish this article.

Acknowledgements

We gratefully acknowledge the contributions of all participants in the 2025 ESTRO Strategy Retreat, the ESTRO Office team, members of the ESTRO Strategic Task Forces, and the ESTRO Board. We would also like to thank Professor Lorenzo Livi (University of Florence, Italy) for his valuable input.

References

[1] Valentini V, Boldrini L, Mariani S, Massaccesi M. Role of radiation oncology in modern multidisciplinary cancer treatment. Mol Oncol 2020;14:1431–41.

[2] Yancey JL, Jones GL, Kopecky AL, McGunigal ML, Sioshansi SL, Rava PL, et al. Radiation oncology-future vision for the modern radiation oncologist. Med Res Arch 2023;11.
[3] Benstead K, Lara PC, Eller Y, Engell-Noerregaard L, Eriksen JG, Gaye PM, et al. Clinical oncology module for the ESTRO core curriculum. Radiother Oncol 2021; 156:19–22.
[4] Guckenberger M, Lievens Y, Bouma AB, Collette L, Dekker A, deSouza NM, et al. Characterisation and classification of oligometastatic disease: a European Society for Radiotherapy and Oncology and European Organisation for Research and Treatment of Cancer consensus recommendation. Lancet Oncol 2020;21:e18–28.
[5] Demaria S, Ng B, Devitt ML, Babb JS, Kawashima N, Liebes L, et al. Ionizing radiation inhibition of distant untreated tumors (abscopal effect) is immune mediated. Int J Radiat Oncol Biol Phys 2004;58:862–70.
[6] Meattini I, Becherini C, Caini S, Coles CE, Cortes J, Curigliano G, et al. International multidisciplinary consensus on the integration of radiotherapy with new systemic treatments for breast cancer: European Society for Radiotherapy and Oncology (ESTRO)-endorsed recommendations. Lancet Oncol 2024;25:e73–83.
[7] Pasquier D, Bidaut L, Oprea-Lager DE, deSouza NM, Krug D, Collette L, et al. Designing clinical trials based on modern imaging and metastasis-directed treatments in patients with oligometastatic breast cancer: a consensus recommendation from the EORTC imaging and breast cancer groups. Lancet Oncol 2023;24: e331–43.
[8] Naci H, Murphy P, Woods B, Lomas J, Wei J, Papanicolas I. Population-health impact of new drugs recommended by the National Institute for Health and Care Excellence in England during 2000-20: a retrospective analysis. Lancet 2025;405: 50–60.
[9] Lievens Y, Defourny N, Corral J, Gasparotto C, Grau C, Borras JM, et al. How public health services pay for radiotherapy in Europe: an ESTRO-HERO analysis of reimbursement. Lancet Oncol 2020;21:e42–54.
[10] McIntosh K, Messin L, Jin P, Mullan Z. Countering helicopter research with equitable partnerships. Lancet Glob Health 2023;11:e1007–8.
[11] Kirby AM, Guckenberger M, Slotman BJ, Clark CH, Eriksen JG, van der Heide U, et al. European Society of Radiotherapy and Oncology (ESTRO) strategy 2024–2026: growth and diversification in a rapidly changing world. Radiother Oncol 2024;196:110283.
[12] Zhu H, Chua MLK, Chitapanarux I, Kaidar-Person O, Mwaba C, Alghamdi M, et al. Global radiotherapy demands and corresponding radiotherapy-professional workforce requirements in 2022 and predicted to 2050: a population-based study. Lancet Glob Health 2024;12:e1945–53.
[13] Boldrini L, La Porta L, Gasparotto C, Eriksen JG. The future of education in radiation oncology. Semin Radiat Oncol 2024;34:468–73.

Icro Meattini[a,b,*], Marianne C. Aznar[c], Luca Boldrini[d], Kerstin Borgmann[e], Catharine H. Clark[f,g], Corinne Faivre-Finn[h], Elizabeth Forde[i,j], Uulke A. van der Heide[k,l], Barbara Alicja Jereczek-Fossa[m,n], Núria Jornet[o], Anna M. Kirby[p], Piet Ost[q,r], Ivica Ratosa[s,t], Kari Tanderup[u,v], Esther G.C. Troost[w,x,y,z,aa], Alessandro J. Cortese[ab,ac], Matthias Guckenberger[ad,ae]

[a] *Department of Experimental and Clinical Biomedical Sciences "M. Serio", University of Florence, Florence, Italy*
[b] *Radiation Oncology Unit & Breast Unit, Azienda Ospedaliero-Universitaria Careggi, Florence, Italy*
[c] *Division of Cancer Science, University of Manchester, Manchester, UK*
[d] *Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Rome, Italy*
[e] *Department of Radiotherapy & Radiation Oncology, Hubertus Wald Tumor Center, University Cancer Center Hamburg, University Medical Center Hamburg-Eppendorf, Hamburg, Germany*
[f] *Department of Radiotherapy Physics, University College London Hospital, London, UK*
[g] *Department of Medical Physics, University College London, Radiotherapy and Radiation Dosimetry Group, National Physical Laboratory, Teddington, UK*
[h] *The Christie NHS Foundation Trust & University of Manchester, Manchester, UK*
[i] *Applied Radiation Therapy Trinity, Discipline of Radiation Therapy, Trinity College Dublin, Dublin, Ireland*
[j] *Trinity St. James's Cancer Institute, Dublin, Ireland*
[k] *Department of Radiation Oncology, the Netherlands Cancer Institute, Amsterdam, the Netherlands*
[l] *Department of Radiation Oncology, Leiden University Medical Center, Leiden, the Netherlands*
[m] *Department of Oncology and Hemato-oncology, University of Milan, Milan, Italy*
[n] *Department of Radiation Oncology, IEO European Institute of Oncology IRCCS, Milan, Italy*
[o] *Hospital de la Santa Creu i Sant Pau, Barcelona, Spain*
[p] *Royal Marsden NHS Foundation Trust & Institute of Cancer Research, Sutton, UK*
[q] *Department of Radiation Therapy, Iridium Network, Antwerp, Belgium*
[r] *Department of Human Structure and Repair, University Ghent, Ghent, Belgium*
[s] *Division of Radiotherapy, Institute of Oncology Ljubljana, Ljubljana, Slovenia*
[t] *Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia*
[u] *Danish Centre for Particle Therapy, Aarhus University Hospital, Aarhus, Denmark*
[v] *Department of Clinical Medicine, Aarhus University, Aarhus, Denmark*
[w] *German Cancer Consortium (DKTK), Partner Site Dresden, Dresden, Germany*
[x] *German Cancer Research Center (DKFZ), Dresden, Germany*
[y] *OncoRay - National Center for Radiation Research in Oncology, Dresden, Germany*
[z] *Technische Universität Dresden, Dresden, Germany*
[aa] *Helmholtz-Zentrum Dresden-Rossendorf, Germany, Dresden, Germany*
[ab] *European Society for Radiotherapy and Oncology (ESTRO), Brussels, Belgium*
[ac] *Antwerp Management School, University of Antwerp, Antwerp, Belgium*
[ad] *Department of Radiation Oncology, University Hospital Zurich, Zurich, Switzerland*
[ae] *University of Zurich, Zurich, Switzerland*

[*] Corresponding author at: Department of Experimental and Clinical Biomedical Sciences "M. Serio", University of Florence, Radiation Oncology Unit & Breast Unit, Azienda Ospedaliero-Universitaria Careggi, Viale Morgagni 50, 50134 Florence, Italy.
E-mail address: icro.meattini@unifi.it (I. Meattini).