



Dr Suh is the editor-in-chief of *Applied Radiation Oncology*, and professor and chairman, Department of Radiation Oncology, at the Taussig Cancer Institute, Rose Ella Burkhardt Brain Tumor and Neuro-Oncology Center, Cleveland Clinic, Cleveland, OH.

Artificial Intelligence: Aiding Precision and Practice in Radiation Oncology

John H. Suh, MD, FASTRO, FACR

Artificial intelligence (AI) has quickly moved from promise to practice in radiation oncology. Once viewed as futuristic, AI now shapes daily workflows in imaging, treatment planning, adaptive therapy, and even education. The fall issue of *Applied Radiation Oncology* captures this pivotal moment, highlighting both clinical applications and questions about how best to integrate and leverage AI into practice and training.

The article, *Recent Trends of Artificial Intelligence in Radiation Oncology: A Narrative Review of Prospective Studies*, focuses on prostate and head and neck cancers, where AI is already being incorporated into guidelines and practice. In prostate cancer, AI-driven digital pathology and multimodal models are improving prognostication and guiding treatment selection—advances now reflected in the NCCN guidelines. In head and neck cancer, deep learning enhances the detection of extranodal extension and supports treatment de-escalation strategies, while machine learning assists in identifying high-risk patients. The review also explores the use of AI to personalize treatment, improve outcomes, and advance precision medicine in daily practice.

In *Artificial Intelligence-Assisted Peer Review in Radiation Oncology*, the authors discuss how AI can be used during the peer review process to assist in identifying patients at high risk for interruptions or changes to their treatment plans. Their retrospective study demonstrates that AI and machine learning can help expedite peer review and mitigate the need for modifications after the start of therapy.

While AI can assist in overcoming human challenges to collective decision-making, such as interobserver variability, it is not the only solution. Another research article, *A Head and Neck Contour Grading System Provides an Objective Assessment of Radiation Oncology Resident Contouring Skills*, highlights how a structured grading system used with a peer review process is enabling attendings to objectively track residents' skill development in contour grading of head and neck malignancies, which provides a unique opportunity to optimize training.

As AI-assisted processes continue to replace manual tasks such as contouring, residents and more experienced radiation oncologists grapple with the prospect of trading skill development for efficiency. In the latest *Residence Voice*, *Auto Contouring in Residency: Cutting Corners or Creating Confidence?* Dr Elizabeth Thompson raises an important question: Should residents lean on AI to accelerate contouring, or does manual practice remain essential for mastery? Her perspective reflects the tension that many programs now face, the exchange of experience for efficiency, which has implications for the training of future radiation oncologists.

With the continued adoption of AI throughout the medical system, our challenge will be how to best balance automation with expert oversight. The future of radiation oncology will depend on how well we integrate human expertise with algorithmic precision.

As always, I truly appreciate your support of *Applied Radiation Oncology*. I look forward to seeing you at the upcoming ASTRO meeting in San Francisco!