

## ASTRO and ESTRO call for action: Maintaining the cycle of innovation in radiation oncology

A better understanding of cancer biology is a major driver of innovation in oncology, fostering drug development and promising improved survival. Meanwhile, the field of radiation oncology has progressed through the additional path of technological innovation. Multiple advanced radiotherapy technologies have demonstrated significant and clinically relevant improvements in outcomes for people with cancer treated in both curative and palliative settings. Notable examples include intensity-modulated radiotherapy (IMRT)<sup>1</sup>, stereotactic body radiotherapy (SBRT, SABR)<sup>2,3</sup> and magnetic resonance image-guided radiotherapy (MRIgRT)<sup>4</sup>.

There are fundamental differences in the innovation cycles between drug and technology development. The pharmaceutical industry invests and bears the risks of drug development. Scientifically involved health care providers are reimbursed for their efforts in clinical trials, generally without the need for up-front capital investments. Conversely, the clinical evaluation of novel technology development requires significant upfront investment from healthcare providers. Early technology adopters often bear innovation risks themselves without established reimbursement pathways. Clinical trials may be funded by government grants or philanthropy, but rarely by the industry<sup>5</sup>. As a result, evidence to support new technology typically lags behind institutional capital investments.


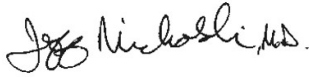

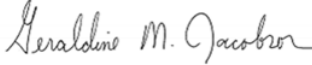


Radiation oncology technological innovations have a very low failure rate compared to drug development, primarily due to their incremental nature and the ability to predict benefits based on available radiation dose-response relationships. In addition, the market of radiotherapy equipment companies is very small. As recently witnessed, bankruptcy of a healthcare company, even when their products are scientifically and clinically successful, can occur. Such catastrophic failures pose serious threats to all stakeholders.

- To the radiation oncology community: lack of access to service and maintenance services resulting in immediate cessation of clinical and scientific programs.
- To our patients: lack of adequately prepared and equivalent treatment alternatives.
- To our hospitals and health care providers: lack of financial mechanisms to compensate for immediate and complete depreciation.

Even more concerning, catastrophic failures can initiate a vicious cycle for technology-based innovations in radiation oncology, leading to serious long-term risks. Radiation oncology departments, hospitals and funding bodies may reduce their engagement with small but highly innovative industry partners, who are key drivers for breakthrough innovations. Reduced capital funding for emerging companies due to higher entry barriers could ultimately stifle innovation in radiation oncology.

**ASTRO and ESTRO** jointly call for action to protect our patients, radiation oncology communities and health care systems from catastrophic failures and to prevent such situations in the future. In the event of acute and unexpected business failures, governments, funding agencies and the radiation oncology industry as a whole must accept their responsibilities and safeguard clinical

programs by ensuring uninterrupted and secured access to service, maintenance and spare parts. Intellectual property disputes should not disrupt optimal patient care. For long-term prevention of catastrophic failures, discussions are needed to better distribute risks in the radiation oncology innovation cycle, involving all stakeholders: governments, health care providers, academic funding bodies, radiation oncology industry, radiation oncology community and patient representatives.

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