Radiation Oncology: A Snapshot in Time, 2014

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This special series issue of *Journal of Clinical Oncology* is devoted to the field of radiation oncology. The intention is to apprise our multidisciplinary readership of the latest developments and potential future directions in this field. The contents of this issue represent a snapshot in time, highlighting carefully selected topics in radiation oncology circa 2014. The editors enjoyed the process of considering what to record, given that we had such a broad and exciting assortment of choices available.

We regret that we could not cover every aspect of the field. For example, we did not include a piece on lymphomas, although there have been significant changes in recent years with respect to the role of radiotherapy in managing that group of malignancies. Likewise, we did not specifically spotlight brachytherapy, or the contributions of the engineers and medical physicists whose work is the technologic basis of modern radiation oncology. The latter point is worth extra emphasis: the marriage of computed tomography, magnetic resonance, and positron emission tomography imaging to treatment planning, the consequential advent of three-dimensional (3D) conformal radiation therapy, the development of inverse planning software and intensity-modulated radiation therapy delivery hardware, the invention of near real-time image guidance of treatment delivery using cone-beam computed tomography and other techniques, and the adaptation of motion management strategies and 4D treatment planning (3D with a breathing motion component) are just some of the marvelous inventions that are the sine qua non on which the field is now based. Radiation oncology is not alone as a medical specialty that has benefited greatly from computerization and other applied modern technology, but we radiation oncologists owe a particularly large debt to our medical physics colleagues, who work alongside us in the clinic every day.

Some of the articles that are included in this special series issue do, in fact, address clinical gains that are enabled by technologic progress (articles on stereotactic radiosurgery, stereotactic body radiation therapy, particle therapy, and novel paradigms for early-stage breast cancer, for example). These high-tech treatments are sometimes highly resource intensive, and we must be mindful of whether we are providing good value to patients and society with these sophisticated innovations—hence the

thoughtful contribution by Teckie et al¹ concerning how we begin to frame that question.

The laws of physics are not changing, nor is human anatomy likely to evolve noticeably in this millennium. Consequently, as pointed out by Giaccia,² it could be that we are reaching the limits of how far we can go on the basis of advances in treatment delivery technology alone. For further progress we will likely need to emphasize tumor biology from perspectives that vary from the genome to growth factor signaling to the tumor-immune system interface. Morris and Harari³ discuss pioneering efforts to translate such knowledge to the clinic.

The ultimate measure of any success in oncology is how patients regard their own outcomes, and a fine discussion of the methodology of analyzing patient-reported outcomes is provided by Siddiqui et al,⁴ who also discuss important issues to consider in the long-term post-treatment survivorship phase of life—a state that is gratifyingly becoming more and more common. Whereas Salama and Milano⁵ describe the virtue of maintaining an aggressive approach for many patients with limited metastatic disease, Lutz et al⁶ offer insights into how radiotherapy is best integrated into the end-of-life phase of care for patients with cancer.

In a few contributions in this issue, there are passages that provide background information of a historical nature on the development of treatment strategies and methods that are now in routine clinical use. The value of these sections is twofold: first, they recognize important individuals and schools of thought from the past that have helped to shape our modern approaches; and second, they remind us that future readers of material published today might look back on treatments given in 2014 and consider many to be outdated. Indeed, we hope that this will be the case. Although we are proud of how the field of radiation oncology has progressed, there remain many challenges to overcome before the problem of cancer is a thing of the past.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Disclosures provided by the authors are available with this article at www.jco.org.

AUTHOR CONTRIBUTIONS

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