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Surface Guided Radiation Therapy, 1st Edition, edited by Jeremy David Page Hoisak, Adam Brent Paxton, Benjamin James Waghorn, Todd Pawlicki. Boca Raton, FL: CRC Press, 2020. ISBN 9781032173757.

Reviewed by Dustin Jacqmin, PhD

DESCRIPTION

This book titled “Surface Guided Radiation Therapy” provides a comprehensive overview of both clinical and technical aspects of surface imaging in modern radiation therapy. The book covers basic principles of modern digital surface imaging, implementations, and features of existing commercial surface imaging systems, quality assurance, and clinical use of surface imaging for a wide variety of treatment sites and applications.

PURPOSE

In discussing the purpose of the book, the authors recognized that surface guided radiation therapy (SGRT) has been in use in radiation oncology for more than 15 years and the body of literature on surface imaging has grown quite large. Their goal was to recruit internationally recognized experts on different aspects of surface imaging and have each author prepare a structured review on a particular topic in SGRT. I believe that the editors and authors of this book were successful at creating a valuable resource for those interested in surface imaging. The timing of the work is appropriate as well. Surface imaging has become common in clinical practice, and the technical and clinical practice of surface guided radiotherapy has matured to a point that the content in this book will remain relevant for many years.

AUDIENCE

While most of the authors of this book are clinical medical physicists, the authors also include physicists from industry, physicians, and radiation therapists. The authors of the book's 26 chapters are well-known in the surface imaging community for their high-quality publications, presentations, and clinical experience. The writing is not highly technical and doesn't assume the reader has a significant background in surface imaging for radiotherapy. As a result, the book will appeal to a wide variety of readers, both within and outside the medical physics community, including trainees.

CONTENT / FEATURES

The book's first two chapters serve as an introduction to surface imaging, describing the history of localization technologies and the role surface imaging plays in promoting quality and safety in radiotherapy. The next several chapters describe the implementations of commercially available systems and quality management programs for these systems. The remainder of the book primarily covers the clinical use of surface imaging. Several chapters are dedicated to breast radiotherapy (including deep inspiration breath-hold) and stereotactic radiosurgery, the most common uses of surface imaging in clinical practice today. Additional chapters cover less common clinical uses of surface imaging like head-and-neck cancer, SBRT, and pediatric radiotherapy.

The highlight of the book for me was the chapters on the clinical use of SGRT. At their strongest, they neatly balance providing a review of the technical literature with practical recommendations based on user experience. This approach will give readers the confidence to implement surface imaging in new clinical spaces with a well-curated bibliography to dig deeper if interested. I particularly enjoyed the way breast radiotherapy, SRS and tattoo-less radiotherapy were covered in the book. Each topic is covered over the course of multiple chapters from many different perspectives (physicist, physician, and therapist) to give a comprehensive view of these topics.

The chapters largely stand on their own, making it easy to jump into a specific topic of interest. A drawback to this is that there is a little bit of repetition in content. There is a series of three chapters on commissioning and quality assurance for three commercial

surface imaging systems, and the chapters cover the application of TG-147¹ in very similar ways. I would have preferred a single, vendor-neutral chapter on implementing TG-147 in the clinic and additional chapters on quality assurance for special uses of SGRT like respiratory gating and radiosurgery.

ASSESSMENT / COMPARISON

To the best of my knowledge, this is the only book that comprehensively covers the topic of surface guided radiotherapy. Its value is best understood by contrasting it with resources from professional societies, like AAPM TG-147,¹ AAPM TG-302,² and the ESTRO-ACROP guideline on surface guided radiation therapy.³ These guidelines are exceptional resources, but they tend to be more narrowly focused. TG-147 only covers quality assurance. The ESTRO-ACROP guideline covers quality assurance and the clinical use of surface imaging but focuses on a generic workflow. TG-302 covers the clinical use of surface imaging the most comprehensively. Deep-inspiration breath-hold for breast cancer and radiosurgery are covered at a deeper level, but most other topics in the report are addressed in one to two paragraphs.

In contrast, this book provides a more comprehensive background on surface imaging in radiotherapy, shares a wider range of perspectives and is willing to venture into clinical topics that are not covered at all in professional society guidelines. I highly recommend this book for any clinical department that uses surface imaging. It is a great resource for practitioners interested in improving their SGRT practice, and its structure and writing style make it an accessible resource for radiation therapists and physicians as well.

BOOK REVIEWER BIOGRAPHY

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