

Preface

It is with great enthusiasm and dedication to the art and science of brachytherapy instruction, and on behalf of our authors, that we present our image-guided brachytherapy handbook. Brachytherapy is the use of radioactive sources placed near or into a tumor to provide a high radiation dose to the area of interest and a reduced dose to surrounding normal tissues. It is this therapeutic advantage and steep dose gradient falloff that continues to make brachytherapy one of the most conformal and long-standing treatments in cancer therapeutics. Throughout the last decade, the utility of image guidance in brachytherapy has increased to enhance procedural development, treatment planning, and radiation delivery in an effort to optimize safety and clinical outcomes. Given the complexity of image guidance and required incorporation into brachytherapy skillsets, the contents of this user-friendly handbook are designed to be a practical reference for the busy and dedicated clinician. Our goal is to provide a concise compilation of brachytherapy experiences at the reader's fingertip.

After formal training in brachytherapy by pioneers in the field, continuing friendship, kinship, and association with mentors and peers of brachytherapy, my clinical practice continues to evolve. With this collaboration and direction of specific and detailed knowledge, I recognize that not all practitioners have these individual educational opportunities and that a compilation of skills and “tips” should be made available to all brachytherapists and, in turn, to their collective patients.

This image-guided brachytherapy handbook is divided into two main parts: a radiobiology and physics section led by Dr. Stanley Benedict and a clinical site-specific section directed by Dr. Mitchell Kamrava and myself. The reader will learn about the rationale and background of brachytherapy in the first section, and then review the practical application of this modality in the second section. The handbook is a combination of outline text, procedural illustrations, contour examples, treatment planning techniques, and dosimetry for the comprehensive treatment for each disease site. The handbook answers practical questions regarding the incorporation of imaging advances such as CT, MRI, and ultrasound into brachytherapy procedures. Furthermore, it presents a detailed guide on how to extrapolate these technological advances into patient contours and treatment planning. Some examples of questions we sought to answer are:

- “How shall I use MRI or CT to help in my cervical cancer brachytherapy procedures or treatment planning?”
- “How could I implant a prostate using transrectal ultrasound or MRI guidance?”
- “How do I decide which breast brachytherapy technique is better for my patient: a single multichannel catheter vs an interstitial implantation?”

I am extremely grateful to a diverse team of brachytherapy experts who tirelessly devoted their time and innovative minds to the contents of this handbook. During the handbook preparation period, I was perpetually awestruck by our authors’ ability to funnel their vast and substantial practical experiences into a concise and clinically relevant brachytherapy chapter. In addition, it continues to be an honor and pleasure to work in the field of brachytherapy and have developed this handbook with my coeditors, Drs. Stanley H. Benedict and Mitchell Kamrava, whose insight, knowledge, collaboration, and expertise are invaluable to our field.

<http://www.springer.com/978-3-319-44825-1>

Handbook of Image-Guided Brachytherapy

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2017, XVII, 622 p. 209 illus., 151 illus. in color.,

Softcover

ISBN: 978-3-319-44825-1