IMRT, IGRT, SBRT –
Advances in the Treatment Planning and Delivery of Radiotherapy
Frontiers of Radiation Therapy and Oncology

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<td>3DCRT</td>
<td>Three-dimensional conformal radiation therapy</td>
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<tr>
<td>CTV</td>
<td>Clinical target volume</td>
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<td>DVH</td>
<td>Dose-volume histogram</td>
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<tr>
<td>EPI</td>
<td>Electronic portal imaging device</td>
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<tr>
<td>GTV</td>
<td>Gross tumor volume</td>
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<td>IGRT</td>
<td>Image-guided radiation therapy</td>
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<td>IMRT</td>
<td>Intensity-modulated radiation therapy</td>
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<td>kV</td>
<td>Kilovoltage</td>
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<td>MV</td>
<td>Megavoltage</td>
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<td>PTV</td>
<td>Planning target volume</td>
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<td>RTOG</td>
<td>Radiation Therapy Oncology Group</td>
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This text offers a guide to the new technologies of radiotherapy and their major applications in the modern radiotherapy clinic. It is intended to be a readable and practical resource, encompassing the several areas of concurrent development that have advanced this field. The volume is divided into three sections. The first offers explanations and discussions of the technologies themselves and technical methods for their implementation. The second section brings these technologies into the radiation clinic with presentations by noted physicians at major centers who have broad experience with these new treatment approaches. In each chapter, the authors offer specific guidelines for current clinical practice. The third section explores the use of these high-precision technologies in the developing field of stereotactic body radiotherapy.

I have planned and developed this volume based on presentations recently given at the San Francisco Radiation Oncology Conference, which is jointly sponsored by the Departments of Radiation Oncology of Stanford University; University of California at San Francisco; Saint Francis Memorial Hospital, San Francisco, and University of California at Davis. Drs. R. Hoppe, W. Wara and S. Vijayakumar joined me in organizing the conference, which carried the same name as this volume. In our planning, we were assisted by the physics directors at these centers, including Drs. A. Boyer, L. Verhey and J. Purdy. I wish to thank all of them. Papers were selected for publication from the conference presentations, and were supplemented by selected additional papers given at a recent meeting on Image-Guided Radiation Therapy held in Las Vegas, USA, and sponsored by the American Society of Radiation Therapists and Oncologists. All presentations have been expanded, updated and integrated for this volume.

Advances in radiologic imaging are the foundation of much of the current work explored in this text. Throughout the volume, examples of this are often presented
in more than one format. In addition to the printed illustrations, a website (www.
karger.com/FRATO40_suppl) allows the reader to view a number of the import-
tant figures in time-elapse video. This is especially useful in understanding the
work presented by George Chen and colleagues in their chapter ‘Four-Dimension-
al Imaging and Treatment Planning of Moving Targets’ (p 59–71). Other illustra-
tions are also posted on this website for greater clarity and dynamic visualization,
and the website is an essential part of these presentations overall.

I wish to thank all of the authors, especially Drs. J. Purdy, B. Kavanagh and R.
Timmerman for their excellent contributions and guidance on the volume. I wish
to thank Dr. C. Burns for her assistance in the preparation of the manuscripts for
publication. Finally I wish to thank Dr. Thomas Karger and Steven Karger, and
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