

# **MEDICAL RADIOLOGY**

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## **Radiation Oncology**

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# Technical Basis of Radiation Therapy

**Practical Clinical Applications**

**4th Revised Edition**

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With 507 Figures in 799 Separate Illustrations, 175 in Color and 146 Tables

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Continuation of Handbuch der medizinischen Radiologie  
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To my wife and children,  
whose support and  
encouragement make it all happen.

*Seymour H. Levitt*

# Foreword

This fourth revised edition of “Technical Basis of Radiation Therapy: Practical Clinical Applications”, edited by S.H. Levitt, J.A. Purdy, C.A. Perez, and S. Vijaykumar, continues this publication’s outstanding excellence in the definition of the technical advances for radiation therapy. The previous three editions were milestones in the definition of new technologies and how they would be applied in clinical practice. The present volume presents significant and important concepts of treatment planning, not only with regard to appropriate treatment plans but also how various auxiliary technologies can be used to achieve the best clinical outcome with the minimum complication.

The first portion of the book deals not only with the advances in imaging technology and their role in defining more precisely the extent of the tumor but also how these imaging techniques can be used in devising treatment plans. Clearly, three-dimensional treatment planning and conformal therapy along with intensity-modulated radiation therapy, stereotactic radiosurgery and radiotherapy, new technologies in brachytherapy as well as advances in cyberknife, tomotherapy and image-guided radiation therapy can lead to better outcomes. Consonant with these considerations is the impact on second malignancies following radiation therapy and the clinical applications for chemoradiation.

In the second part of the book, the practical clinical applications are defined precisely for essentially all major tumor sites. Each tumor site is dealt with in depth, and the authors show how the new techniques can improve the potential outcome in terms of management. In 2005, 60% of all malignant tumors were cancers of the lung, breast, prostate, and colorectum. Particular attention is directed toward these tumor sites and how the new methods can improve the overall outcome.

There is significant emphasis on the utilization of various brachytherapy techniques and how they may be integrated to produce better outcomes at each tumor site.

The excellence of the text is obvious, the data submitted important. This volume makes a major contribution to patient management.

LUTHER W. BRADY  
HANS-PETER HEILMANN  
MICHAEL MOLLS

# Preface

This is the 4<sup>th</sup> edition of a book which was originally initiated as a supplement to a post-graduate refresher course in radiation oncology held at the University of Minnesota. This program was instituted in 1970 and ended 25 years later. The idea of the course and the book that followed was to acquaint radiation oncologists with the concepts, policies and treatment methods in the cutting-edge radiation oncology departments.

The inspiration for this program came from Dr. Gilbert Fletcher and from Dr. Norah Tapley. Indeed, the first edition of this book was entitled “Levitt and Tapley’s”. Unfortunately these wonderful colleagues are no longer with us and their friendship and advice and contributions are much missed.

This edition has been completely rewritten. There are several new chapters, and all of the original chapters have been updated. We, the editors and authors, feel that this edition truly reflects the best approach to the technical basis of radiation oncology at this time.

Obviously our discipline is moving forward at break-neck speed, and it is essential for the practitioners of radiation oncology to have as many tools as possible to help them be at the cutting edge of our practice. We believe this edition achieves just that.

All of the chapter authors are experts in their areas, and have many high demands on their time. We are grateful for their efforts..

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