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Target Volume Delineation For Conformal And Intensity Modulated Radiation Therapy

- Summarizes the state of the art in the most relevant areas of medical physics and engineering applied to radiation oncology - Covers all relevant areas of the subject in detail, including 3D imaging and image processing, 3D treatment planning, modern treatment techniques, patient positioning, and aspects of verification and quality assurance - Conveys information in a readily understandable way that will appeal to professionals and students with a medical background as well as to newcomers to radiation oncology from the field of physics

Provides an account of the perspective, methodology, and experience in the physical and medical aspects of IMRT at Memorial Sloan-Kettering Cancer Center (MSKCC).

A look at the recent oncology literature or a search of the common databases reveals a steadily increasing number of nomograms and other prognostic models. These models may predict the risk of relapse, lymphatic spread of a given malignancy, toxicity, survival, etc. Pathology information, gene signatures,

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and clinical data may all be used to compute the models. This trend reflects increasingly individualized treatment concepts, the need for approaches that achieve a favorable balance between effectiveness and side-effects, and the goal of optimal resource utilization reflecting prognostic knowledge. In order to avoid misuse, it is important to understand the limits and caveats of prognostic and predictive models. This book provides a comprehensive overview of such decision tools for radiation oncology, stratified by disease site, which will enable readers to make informed choices in daily clinical practice and to critically follow the future development of new tools in the field.>

Over the past decade, PET-CT has achieved great success owing to its ability to simultaneously image structure and function, and show how the two are related. More recently, PET-MRI has also been developed, and it represents an exciting novel option that promises to have applications in oncology as well as neurology. The first part of this book discusses the basics of these dual-modality techniques, including the scanners themselves, radiotracers, scan performance, quantitation, and scan

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interpretation. As a result, the reader will learn how to perform the techniques to maximum benefit. The second part of the book then presents in detail the PET-CT and PET-MRI findings in cancers of the different body systems. The final two chapters address the use of PET/CT in radiotherapy planning and examine areas of controversy. The authors are world-renowned experts from North America, Europe, and Australia, and the lucid text is complemented by numerous high-quality illustrations.

Indications and Techniques

Decision Tools for Radiation Oncology

Clinical Target Volumes in Conformal and Intensity Modulated Radiation Therapy

Target Volume Delineation for Conformal and Intensity-Modulated Radiation Therapy

Target Volume Delineation and Field Setup

Surface Guided Radiation Therapy

Clinical conformal radiotherapy is the holy grail of radiation treatment and is now becoming a reality through the combined efforts of physical scientists and engineers, who have improved the physical basis of radiotherapy, and the interest and concern of imaginative

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radiotherapists and radiographers. Intensity-Modulated Radiation Therapy describes in detail the physics germane to the development of a particular form of clinical conformal radiotherapy called intensity modulated radiation therapy (IMRT). IMRT has become a topic of tremendous importance in recent years and is now being seriously investigated for its potential to improve the outcome of radiation therapy. The book collates the state-of-the-art literature together with the author's personal research experience and that of colleagues in the field to produce a text suitable for new research workers, Ph.D. students, and practicing radiation physicists that require a thorough introduction to IMRT. Fully illustrated, indexed, and referenced, the book has been prepared in a form suitable for supporting a teaching course.

Defining organs at risk is a crucial task for radiation oncologists when aiming to optimize the benefit of radiation therapy, with delivery of the maximum dose to the tumor volume while sparing healthy tissues. This book will prove an invaluable guide to the delineation of organs at risk of toxicity in patients undergoing radiotherapy. The first and second sections address the anatomy of organs at risk, discuss the

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pathophysiology of radiation-induced damage, and present dose constraints and methods for target volume delineation. The third section is devoted to the radiological anatomy of organs at risk as seen on typical radiotherapy planning CT scans, with a view to assisting the radiation oncologist to recognize and delineate these organs for each anatomical region – head and neck, mediastinum, abdomen, and pelvis. The book is intended both for young radiation oncologists still in training and for their senior colleagues wishing to reduce intra-institutional variations in practice and thereby to standardize the definition of clinical target volumes.

This handbook will enable radiation oncologists to appropriately and confidently select and delineate tumor volumes/fields for conformal radiation therapy, including intensity-modulated radiation therapy (IMRT), in patients with commonly encountered cancers. The orientation of this handbook is entirely practical, in that the focus is on the illustration of clinical target volume (CTV) delineation for each major malignancy. Each chapter provides guidelines and concise knowledge on treatment planning and CTV selection, explains how the anatomy of lymphatic drainage shapes target volume selection, and

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presents detailed illustrations of delineations, slice by slice, on planning CT images. While the emphasis is on target volume delineation for three-dimensional conformal therapy and IMRT, information is also provided on conventional radiation therapy field setup and planning for certain malignancies for which IMRT is not currently suitable.

This handbook is designed to provide the radiation oncologist with clear practical guidance in the delineation of tumor volumes and/or radiation fields for a wide variety of pediatric cancers, including the most frequently encountered malignancies of childhood. This is a guide to designing treatment fields and volumes that may be utilized in the delivery of conformal therapies such as intensity-modulated radiation therapy and proton therapy, the latter being particularly relevant in children. Each chapter focuses on a specific tumor type, providing general guidelines that will assist the reader in delineating the clinical target volume for particular presentations, including patterns of spread. As the target volumes can be complex, detailed illustrations are presented of the volumes in representative cases, contoured slice by slice on the planning CT images. In addition to

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target volume delineation for conformal treatment, field design setup for conventional approaches is also discussed.

Basic Radiotherapy Physics and Biology

Essentials of Clinical Radiation Oncology, Second Edition

A Compendium for Medical Physicists and Radiation Oncologists

New Technologies in Radiation Oncology

A Handbook for Teachers and Students

Target Volume Delineation and Treatment Planning for Particle Therapy

Essentials of Clinical Radiation Oncology is a comprehensive, user-friendly clinical review that summarizes up-to-date cancer care in an easy-to-read format. Each chapter is structured for straightforward navigability and information retention beginning with a "quick-hit" summary that contains an overview of each disease, its natural history, and general treatment options. Following each "quick-hit" are high-yield summaries covering epidemiology, risk factors, anatomy, pathology, genetics, screening, clinical presentation, workup, prognostic factors, staging, treatment paradigms, and medical management for each malignancy. Each treatment paradigm section describes the current standard of care for radiation therapy including indications, dose constraints, and side effects. Chapters conclude with an evidence-based question and answer

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section which summarizes practice-changing data to answer key information associated with radiation treatment outcomes. Flow diagrams and tables consolidate information throughout the book that all radiation oncologists and related practitioners will find extremely useful when approaching treatment planning and clinical care. Essentials of Clinical Radiation Oncology has been designed to replicate a "house manual" created and used by residents in training and is a "one-stop" resource for practicing radiation oncologists, related practitioners, and radiation oncology residents entering the field.

Key Features: Offers digestible information as a learning guide for general practice
Examines essential clinical questions which are answered with evidence-based data from important clinical studies
Places clinical trials and data into historical context and points out relevance in current practice
Provides quick reference tables on treatment options and patient selection, workup, and prognostic factors by disease site

Strategies for Radiation Therapy Treatment Planning provides radiation oncologists, physicists, and dosimetrists with a step-by-step guide to implementing external beam treatment plans that meet clinical requirements for each major disease site. As a companion book to the Handbook of Treatment Planning in Radiation Oncology Second Edition, this book focuses on the technical aspects of treatment planning and the major challenges in creating highly conformal dose distributions, referenced to as treatment plans, for external beam radiotherapy. To overcome challenges associated with each step, leading experts at the Cleveland Clinic have consolidated their knowledge and

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experience of treatment planning techniques, potential pitfalls, and other difficulties to develop quality plans across the gamut of clinical scenarios in radiation therapy. The book begins with an overview of external beam treatment planning principles, inverse planning and advanced planning tools, and descriptions of all components in simulation and verification. Following these introductory chapters are disease-site examples, including central nervous system, head and neck, breast, thoracic, gastrointestinal, genitourinary, gynecologic, lymphoma, and soft tissue sarcoma. The book concludes with expert guidance on planning for pediatric cancers and how to tailor palliative plans. Essential for all radiation therapy team members, including trainees, this book is for those who wish to learn or improve their treatment planning skills and understand the different treatment planning processes, plan evaluation, and patient setup. **KEY FEATURES:** Provides basic principles of treatment planning Contains step-by-step, illustrated descriptions of the treatment planning process Discusses the pros and cons of advanced treatment planning tools, such as auto-planning, knowledge-based planning, and multi-criteria based planning Describes each primary treatment site from simulation, patient immobilization, and creation of various treatment plans to plan evaluations Includes instructive sample plans to highlight best practices Intensity-modulated radiation therapy (IMRT), one of the most important developments in radiation oncology in the past 25 years, involves technology to deliver radiation to tumors in the right location, quantity and time. Unavoidable irradiation of surrounding

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normal tissues is distributed so as to preserve their function. The achievements and future directions in the field are grouped in the three sections of the book, each suitable for supporting a teaching course. Part 1 contains topical reviews of the basic principles of IMRT, part 2 describes advanced techniques such as image-guided and biologically based approaches, and part 3 focuses on investigation of IMRT to improve outcome at various cancer sites.

Details technology associated with radiation oncology, emphasizing design of all equipment allied with radiation treatment. Describes procedures required to implement equipment in clinical service, covering needs assessment, purchase, acceptance, and commissioning, and explains quality assurance issues. Also addresses less common and evolving technologies. For medical physicists and radiation oncologists, as well as radiation therapists, dosimetrists, and engineering technologists. Includes bandw medical images and photos of equipment. Paper edition (unseen), \$145.95. Annotation copyrighted by Book News, Inc., Portland, OR

Gynecologic Radiation Oncology: A Practical Guide

Accelerated Partial Breast Irradiation

PET-CT and PET-MRI in Oncology

A Clinical Guide to Cancer Treatment

Radiation Therapy Treatment Effects

Absolute Clinical Radiation Oncology Review

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This textbook is designed to help the busy radiation oncologist to accurately and confidently delineate tumor volumes for conformal radiation therapy (including IMRT). The book provides an atlas of clinical target volumes (CTVs) for commonly encountered cancers, with each chapter illustrating CTV delineation on a slice-by-slice basis, on planning CT images. Common anatomic variants for each tumor are represented in individual illustrations, with annotations highlighting differences in coverage. The anatomy of each site and patterns of lymphatic drainage are discussed, and their influence on the design of CTVs is explained in detail. Utilization of other imaging modalities, including MRI, to delineate volumes is highlighted. Key details of simulation and planning are briefly reviewed. Although the emphasis is on target volume delineation for conformal techniques, information is also provided on conventional radiation field setup and design when IMRT is not suitable.

This book is a concise and well-illustrated review of the physics and biology of radiation therapy intended for radiation oncology residents, radiation therapists, dosimetrists, and physicists. It presents topics that are included on the Radiation Therapy Physics and Biology examinations and is designed with the intent of presenting information in an easily digestible format with maximum retention in mind. The inclusion of mnemonics, rules of thumb, and reader-friendly illustrations throughout the book help to make difficult concepts easier to grasp. Basic Radiotherapy Physics and Biology is a valuable reference for students and prospective students in every discipline of radiation oncology.

This book is a practical, up-to-date guide to the treatment of patients with brain and

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spinal tumors. Leading experts in the field explain treatment techniques in detail, highlighting key considerations in the use of external beam radiation therapy, intensity-modulated radiation therapy, particle therapy, radiosurgery, and stereotactic body radiation therapy. Specific recommendations are described for different tumor types, and helpful information provided on other important issues, such as the interaction of radiotherapy and systemic therapy and the avoidance of treatment complications. With the development of modern technology, highly conformal radiotherapy techniques have become more complicated, yet also more widely employed. This book will equip readers with the knowledge required to set up practices to deliver quality brain and spinal radiation therapy appropriate to each patient. It will be of benefit to radiation oncologists, clinical oncologists, medical physicists, medical dosimetrists, radiation therapists, and senior nurses as well as medical oncologists and surgical oncologists with an interest in radiotherapy. This book, now in its second edition, provides a comprehensive overview of current re-irradiation strategies, with detailed discussion of re-irradiation methods, technical aspects, the role of combined therapy with anticancer drugs and hyperthermia, and normal tissue tolerance. In addition, disease specific chapters document recent clinical results and future research directions. All chapters from the first edition have been revised and updated to take account of the latest developments and research findings, including those from prospective studies. Due attention is paid to the exciting developments in the fields of proton irradiation and frameless image-guided ablative radiotherapy. The book documents fully how refined combined modality

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approaches and significant technical advances in radiation treatment planning and delivery have facilitated the re-irradiation of previously exposed volumes, allowing both palliative and curative approaches to be pursued at various disease sites. Professionals involved in radiation treatment planning and multimodal oncology treatment will find it to be an invaluable aid in understanding the benefits and limitations of re-irradiation and in designing prospective trials.

A Practical Guide on Treatment Techniques

Re-Irradiation: New Frontiers

Target Volume Definition in Radiation Oncology

Intensity-Modulated Radiation Therapy

Stereotactic Body Radiation Therapy

Image-Guided IMRT

Radiation Therapy Treatment Effects is a practical guide to common and uncommon toxicities which occur related to radiation therapy. Organized by anatomic region, from CNS to skin and extremities, it concisely and comprehensively reviews the symptoms, timing, preventative measures, and treatment of acute, delayed, and chronic radiation toxicities and provides evidence-based recommendations for management of both early and late effects. Other important chapters consist of topics such as radiation toxicity management in children, systemic effects of

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radiation therapy, radioprotection for radiation therapy, risk and prevention of radiation-induced cancers, challenges and approaches to cancer survivorship and how to maximize cancer patient wellness after radiation therapy. This evidence-based handbook of radiation therapy side effects, is an invaluable reference for the daily management of cancer patients and survivors. The topic coverage will assist physicians, APPs, and nurses practicing or training in radiation oncology, other oncology specialties, and primary care providers caring for cancer survivors. Key Features: Provides management recommendations and clinical pearls from topic experts Organized for quick reference by body area and toxicity Numerous tables consolidate important radiation effects for ease of reference Summarizes each known toxicity, its presentation, prevention, and management

Surface Guided Radiation Therapy provides a comprehensive overview of optical surface image guidance systems for radiation therapy. It serves as an introductory teaching resource for students and trainees, and a valuable reference for medical physicists, physicians, radiation therapists, and administrators

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who wish to incorporate surface guided radiation therapy (SGRT) into their clinical practice. This is the first book dedicated to the principles and practice of SGRT, featuring: Chapters authored by an internationally represented list of physicists, radiation oncologists and therapists, edited by pioneers and experts in SGRT Covering the evolution of localization systems and their role in quality and safety, current SGRT systems, practical guides to commissioning and quality assurance, clinical applications by anatomic site, and emerging topics including skin mark-less setups. Several dedicated chapters on SGRT for intracranial radiosurgery and breast, covering technical aspects, risk assessment and outcomes. Jeremy Hoisak, PhD, DABR is an Assistant Professor in the Department of Radiation Medicine and Applied Sciences at the University of California, San Diego. Dr. Hoisak's clinical expertise includes radiosurgery and respiratory motion management. Adam Paxton, PhD, DABR is an Assistant Professor in the Department of Radiation Oncology at the University of Utah. Dr. Paxton's clinical expertise includes patient safety, motion management, radiosurgery, and proton therapy. Benjamin Waghorn, PhD, DABR is

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the Director of Clinical Physics at Vision RT. Dr. Waghorn's research interests include intensity modulated radiation therapy, motion management, and surface image guidance systems. Todd Pawlicki, PhD, DABR, FAAPM, FASTRO, is Professor and Vice-Chair for Medical Physics in the Department of Radiation Medicine and Applied Sciences at the University of California, San Diego. Dr. Pawlicki has published extensively on quality and safety in radiation therapy. He has served on the Board of Directors for the American Society for Radiology Oncology (ASTRO) and the American Association of Physicists in Medicine (AAPM).

" This is a highly practical resource about the specific technical aspects of delivering radiation treatment. Pocket-sized and well organized for ease of use, the book is designed to lead radiation oncology trainees and residents step by step through the basics of radiotherapy planning and delivery for all major malignancies. This new, evidence-based edition retains the valued, practical features of the first edition while incorporating recent advances in the field. Chapters are the result of a joint collaboration between residents and staff

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radiation oncologists in the Department of Radiation Oncology at the Cleveland Clinic. Sections are organized by body site or system whichever is best suited to consistency in presenting planning principles. Also included are such specialized topics as palliative therapy and pediatrics. More than 200 images help to clarify the steps of radiotherapy planning and delivery. Written by and for residents on the "front lines" of their training, it is also a valuable resource for training other professionals in the field such as technologists, nurses, dosimetrists, and others as well as a quick reference for practicing physicians. Key Features of Handbook of Treatment Planning in Radiation Oncology, Second Edition: Provides a consistent, step-by-step approach to effective radiotherapy planning and delivery Presents content in consistent, concise, bulleted format for easy review Includes over 200 color images Explains specific technical aspects of delivering radiation treatment Addresses such specialized topics as palliative therapy and pediatrics New to the Second Edition: Stereotactic body radiation therapy (SBRT) for prostate and GI tumors Intraoperative therapy for GI tumors Volumetric modulated arc

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therapy (VMAT) for brain tumors New coverage of MRI based planning in simulation "

This book, now in its fourth edition, is unique in detailing in depth the technological basis of radiation therapy. Compared with the previous edition, all chapters have been rewritten and updated. In addition, new chapters have been included on various topics, including the use of imaging in treatment planning, second malignant neoplasms due to irradiation, and quality assurance in radiation oncology. The book is divided into two sections. The first covers basic concepts in treatment planning, including essential physics, and explains the various approaches to radiation therapy, such as intensity-modulated radiation therapy, tomotherapy, and high and low dose rate brachytherapy. The second part documents the practical clinical applications of these concepts in the treatment of different cancers. All of the chapters have been written by leaders in the field. This book will serve to instruct and acquaint teachers, students and practitioners in the various fields of oncology with the basic technological factors and approaches in radiation therapy. Stereotactic Radiosurgery and Stereotactic Body Radiation

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Therapy (SBRT)

An Evidence-based Guide to Managing Toxicity

Prognosis, Treatment Response and Toxicity

Radiotherapy for Head and Neck Cancers

Radiotherapy and Brachytherapy

A Practical Guide

Successful clinical use of intensity-modulated radiation therapy (IMRT) represents a significant advance in radiation oncology. Because IMRT can deliver high-dose radiation to a target with a reduced dose to the surrounding organs, it can improve the local control rate and reduce toxicities associated with radiation therapy. Since IMRT began being used in the mid-1990s, a large volume of clinical evidence of the advantages of IMRT has been collected. However, treatment planning and quality assurance (QA) of IMRT are complicated and difficult for the clinician and the medical physicist. This book, by authors renowned for their expertise in their fields, provides cumulative clinical evidence and appropriate techniques for IMRT for the clinician and the physicist. Part I deals with the foundations and techniques, history, principles, QA, treatment planning, radiobiology and related aspects of IMRT. Part II covers clinical

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applications with several case studies, describing contouring and dose distribution with clinical results along with descriptions of indications and a review of clinical evidence for each tumor site. The information presented in this book serves as a valuable resource for the practicing clinician and physicist.

Updated and expanded, this Second Edition of Essentials of Clinical Radiation Oncology continues to provide a succinct and effective review of the most important studies in the field. Organized by disease topic and grouped by body part, each chapter employs structured sections for targeted information retrieval and retention. Chapters begin with a "Quick Hit" overview of each disease summarizing the most significant paradigms before moving into dedicated summaries on epidemiology, risk factors, anatomy, pathology, genetics, screening, clinical presentation, workup, prognostic factors, staging, treatment paradigm, and medical management. An evidence-based question-and-answer section concludes each chapter, which pairs commonly encountered clinical questions with answers connecting historical context and pertinent clinical studies to better inform decision-making and treatment planning. Providing the latest treatment paradigms and guidelines, this comprehensive second edition now outlines

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the evidence and must-know considerations for using radiation therapy with immunotherapy, the strategies for metastasis-directed therapy for oligometastatic disease, and much more. Written for the practicing radiation oncologist, related practitioner, and radiation oncology resident entering the field, this "one-stop" resource is the go-to reference for everyday practice. Key Features: Structured sections offer high-yield information for targeted review Cites need-to-know clinical studies and treatment guidelines in evidence-based question-and-answer format Each chapter has been reviewed and updated to include the most recent and relevant studies New chapters on spine tumors, thyroid cancer, sinonasal tumors, cholangiocarcinoma, renal cell carcinoma, multiple myeloma and plasmacytoma, miscellaneous pediatric tumors, and treatment of oligometastatic disease from underlying cancers Designed for quick reference with comprehensive tables on treatment options and patient selection, workup, and prognostic factors by disease site Purchase includes digital access for use on most mobile devices or computers The third edition of Intensity Modulated Radiation Therapy was written to enhance the reader's understanding of the cutting-edge technology of Intensity Modulated Radiation Therapy. It is designed to both update old

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readers and inform new readers about the complexities and details of clinical management. This completely updated edition provides a step-by-step, practical approach to the use of IMRT in the evaluation and treatment of cancer patients. Because of IMRT's ability to employ individually controlled beamlets, it is an extremely promising technique, especially when paired with CT, PET, and/or MRI. With these improved procedures, doctors and clinicians will be able to take high resolution images of tumors while minimizing dosages to surrounding tissue. In order to focus on the most up to date IMRT techniques, the introductory chapters have been condensed to provide a brief overview of IMRT physics, mechanics and quality assurance, and also CT and MR imaging. To help assist in clinical decision-making it provides the reader with more than 700 full-color illustrations, IMRT tables and clear, straightforward descriptions that address a range of tumor types and sites including head and neck, urinary, and gynecologic cancers.

Issues in Cancer Treatment / 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Cancer Treatment. The editors have built Issues in Cancer Treatment: 2011 Edition on the vast information databases of ScholarlyNews.™ You can

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expect the information about Cancer Treatment in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Cancer Treatment: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

A Practical Guide for Conformal and Intensity-Modulated Radiation Therapy
Issues in Cancer Treatment: 2011 Edition

Practical Essentials of Intensity Modulated Radiation Therapy

Delineating Organs at Risk in Radiation Therapy

Essentials of Clinical Radiation Oncology

A Guide for Delineation of Lymph Nodal Clinical Target Volume in Radiation Therapy

The main objective of this book is to provide radiation oncologists with a clear, up-to-date guide to tumor delineation and contouring of organs at risk. With this in mind, a detailed

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overview of recent advances in imaging for radiation treatment planning is presented. Novel concepts for target volume delineation are explained, taking into account the innovations in imaging technology. Special attention is paid to the role of the newer imaging modalities, such as positron emission tomography and diffusion and perfusion magnetic resonance imaging. All of the most important tumor entities treated with radiation therapy are covered in the book. Each chapter is devoted to a particular tumor type and has been written by a recognized expert in that topic.

This publication is aimed at students and teachers involved in teaching programmes in field of medical radiation physics, and it covers the basic medical physics knowledge required in the form of a syllabus for modern radiation oncology. The information will be useful to those preparing for professional certification exams in radiation oncology, medical physics, dosimetry or radiotherapy technology.

Preceded by Radiotherapy for head and neck cancers / K. Kian Ang, Adam S. Garden. 4th ed. c2012.

This text is a concise handbook designed to assist the clinician in the implementation of Accelerated Partial Breast Irradiation (APBI). It includes a review of the principles that underlie APBI, a practical and detailed description of each technique for APBI, a review of current clinical results of APBI, and a review of the incidence and management of treatment related complications. The book encompasses a number of different techniques and approaches that include brachytherapy, intraoperative, and external beam techniques. There is currently no single source that describes these techniques and their clinical implementation.

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Clinical Evidence and Techniques

Strategies for Radiation Therapy Treatment Planning

Target Volume Delineation for Pediatric Cancers

Defining the Planning Target Volume

A Practical Guide to Intensity-modulated Radiation Therapy

Handbook of Treatment Planning, 2nd Ed

Conformal radiation therapy represents a new challenge. It offers the prospect of either increasing the radiation dose to target tissues while delivering a similar dose to organs at risk, or reducing the dose to organs at risk while maintaining the dose to target tissues. First, lymph node areas at risk are established using the available data from pathological examination. Then, based on a three-dimensional description of the anatomical regions, guidelines for the delineation of the clinical target volumes are proposed. The data presented should enable the reader to make appropriate decisions regarding the selection and delineation of the target volumes when confronted with the most frequent tumor types and sites.

This handbook is designed to enable radiation oncologists to treat patients appropriately and confidently by means of particle therapy. The orientation and purpose are entirely practical, in that the focus is on the physics essentials of delivery and treatment planning , illustration of the clinical target volume (CTV)

and associated treatment planning for each major malignancy when using particle therapy, proton therapy in particular. Disease-specific chapters provide guidelines and concise knowledge on CTV selection and delineation and identify aspects that require the exercise of caution during treatment planning. The treatment planning techniques unique to proton therapy for each disease site are clearly described, covering beam orientation, matching/patching field techniques, robustness planning, robustness plan evaluation, etc. The published data on the use of particle therapy for a given disease site are also concisely reported. In addition to fully meeting the needs of radiation oncologists, this "know why" and "know how" guide to particle therapy will be valuable for medical physicists, dosimetrists, and radiation therapists.

This book will facilitate the understanding of cross-sectional anatomy details and assist radiation oncologists in the difficult task of a detailed delineation of lymph node targets in multiple anatomical locations.

Offering practical approaches to common clinical problems, Gynecologic Radiation Oncology: A Practical Guide compiles the extensive clinical experience of Drs. Patricia J. Eifel and Ann H. Klopp from MD Anderson Cancer Center into one user-friendly volume. This reference addresses practical aspects of the field: how to evaluate the role of radiation therapy in various clinical settings, how to explain the

rationale for treatment recommendations to referring physicians and patients, when and how to apply various external beam and brachytherapy techniques to address specific clinical problems, and how to monitor and manage patients during and after treatment. The book focuses on the following items, which can have immediate application to the treatment of patients with gynecologic cancers.

Intracranial and Spinal Radiotherapy

Practical Clinical Applications

Handbook of Evidence-Based Radiation Oncology

Index Medicus

Technical Basis of Radiation Therapy

Stereotactic Radiosurgery and Stereotactic Body Radiation Therapy (SBRT) is a comprehensive guide for the practicing physician and medical physicist in the management of complex intracranial and extracranial disease. It is a state-of-the-science book presenting the scientific principles, clinical background and procedures, treatment planning, and treatment delivery of SRS and SBRT for the treatment of tumors throughout the body. This unique textbook is enhanced with supplemental video tutorials inclusive to the resource. Beginning with an overview of SRS and SBRT, Part I contains insightful coverage on topics such as

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the evolving radiobiological principles that govern treatment, imaging, the treatment planning process, technologies and equipment used, as well as focused chapters on quality assurance, quality management, and patient safety. Part II contains the clinical application of SRS and SBRT for tumors throughout the body including those in the brain, head and neck, lung, pancreas, adrenal glands, liver, prostate, cervix, spine, and in oligometastatic disease. Each clinical chapter includes an introduction to the disease site, followed by a thorough review of all indications and exclusion criteria, in addition to the important considerations for patient selection, treatment planning and delivery, and outcome evaluation. These chapters conclude with a detailed and site-specific dose constraints table for critical structures and their suggested dose limits. International experts on the science and clinical applications of these treatments have joined together to assemble this must-have book for clinicians, physicists, and other radiation therapy practitioners. It provides a team-based approach to SRS and SBRT coupled with case-based video tutorials in disease management, making this a unique companion for the busy radiosurgical team. Key Features: Highlights the principles of radiobiology and radiation physics underlying SRS and SBRT Presents and discusses the expected patient outcomes for each indicated disease site and condition including a detailed analysis of Quality of Life

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(QOL) and Survival Includes information about technologies used for the treatment of SRS and SBRT Richly illustrated with over 110 color images of the equipment, process flow diagrams and procedures, treatment planning techniques and dose distributions 7 high-quality videos reviewing anatomy, staging, treatment simulation and planning, contouring, and management pearls Dose constraint tables at the end of each clinical chapter listing critical structures and their appropriate dose limits Includes access to the fully-searchable downloadable eBook

Building on the success of this book's first edition, Dr. Eric Hansen and Dr. Mack Roach have updated, revised, and expanded the Handbook of Evidence-based Radiation Oncology, a portable reference that utilizes evidence-based medicine as the basis for practical treatment recommendations and guidelines. Organized by body site, concise clinical chapters provide easy access to critical information. Important "pearls" of epidemiology, anatomy, pathology, and clinical presentation are highlighted. Key facets of the work-up are listed, followed by staging and/or risk classification systems. Treatment recommendations are discussed based on stage, histology, and/or risk classification. Brief summaries of key trials and studies provide rationale for the recommendations. Practical guidelines for radiation techniques are described. Finally, complications and follow-up

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guidelines are outlined. Updates from the first edition include brand new color figures and color contouring mini-atlases for head and neck, gastrointestinal, prostate, and gynecological tumors; redesigned tables for increased readability; new chapters on management of the neck and unknown primary, clinical radiobiology, and pediatric malignancies and benign conditions; and new appendices including the American College of Radiology guidelines for administration of IV contrast.

This book provides a quick reference guide for clinicians in radiation oncology. It is designed to be an intuitive and easily reviewed study guide for board or maintenance of certification examinations, as well as a quick reference for residents and established radiation oncologists who need a refresher. The text begins with a general pearls chapter that radiation oncologists should consider in all aspects of their practice, including cancer visibility, dosing, counseling recommendations, and toxicity management. The subsequent chapters then delve into different cancer disease sites, including pediatrics, central nervous system, head and neck, thoracic, breast, gastrointestinal, gynecologic, genitourinary, hematologic, soft tissue, palliative, and radiophysics/radiobiology. Within each chapter, each disease and its recommended approach is then summarized in only a few pages, allowing a focus on the most essential

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information. Bullet points, figures, tables, and images make for an intuitive reader experience. Recommendations are taken from the American Society for Radiation Oncology (ASTRO), the European Society for Radiation Oncology (ESTRO), and the National Comprehensive Cancer Network (NCCN). Planning guides for imaging, diagnosis, and staging offer readers a starting point in approaching each patient based on disease origin, and dosing guidelines then detail consideration for treatment methods. Each chapter additionally includes disease-specific pearls and key points to test the knowledge reviewed in the chapters. Experts in the disease sites from the United States serve as senior authors on each chapter. The authors include all diseases associated with radiation oncology training to ensure a comprehensive resource for exam studying and clinical care. Residents, trainees, and established radiation oncologists find this an ideal study resource for both board and certification exams, as well as an easily accessible aid during practice.

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Techniques and Clinical Implementation

The Modern Technology of Radiation Oncology

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Geometric Uncertainties in Radiotherapy Evolution of Ionizing Radiation Research

This book reports the majority of lectures given during the NATO Advanced Study Institute ASI-982996, which was held at the European Scientific Institute of Archamps (ESI, Archamps – France) from November 15 to November 27, 2007. The ASI course was structured in two parts: the first was dedicated to what is often called “teletherapy”, i. e. radiotherapy with external beams, while the second focused on internal radiotherapy, also called “brachytherapy” or “curietherapy” in honour of Madame Curie who initiated the technique about a century ago. This ASI took place after the European School of Medical Physics, which devoted a 3 week period to medical imaging, a subject complementary to the topics of this book. Courses devoted to nuclear medicine and digital imaging techniques are collected in two volumes of the NATO Science Series entitled “Physics for Medical Imaging Applications” (ISBN 978-1-4020-5650-5) and “Molecular imaging: computer reconstruction and practice” (ISBN 978-1-4020-8751-6). Every year in autumn ESI organises the European School of Medical Physics, which covers a large spectrum of topics ranging from Medical Imaging to Radiotherapy, over a period of 5 weeks. Thanks to the Cooperative Science and Technology sub-programme of the NATO Science Division, weeks four and five were replaced this year by the ASI course dedicated to “Physics of Modern Radiotherapy & Brachytherapy”. This allowed the participation of experts and students from 20 different countries, with diverse cultural background and professional experience.

Stereotactic body radiation therapy (SBRT) has emerged as an important innovative treatment for various primary and metastatic cancers. This book provides a comprehensive and up-to-date account of the physical/technological, biological, and clinical aspects of SBRT. It will serve as a detailed resource

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for this rapidly developing treatment modality. The organ sites covered include lung, liver, spine, pancreas, prostate, adrenal, head and neck, and female reproductive tract. Retrospective studies and prospective clinical trials on SBRT for various organ sites from around the world are examined, and toxicities and normal tissue constraints are discussed. This book features unique insights from world-renowned experts in SBRT from North America, Asia, and Europe. It will be necessary reading for radiation oncologists, radiation oncology residents and fellows, medical physicists, medical physics residents, medical oncologists, surgical oncologists, and cancer scientists.

The industrial and medical applications of radiation have been augmented and scientific insight into mechanisms for radiation action notably progressed. In addition, the public concern about radiation risk has also grown extensively. Today the importance of risk communication among stakeholders involved in radiation-related issues is emphasized much more than any time in the past. Thus, the circumstances of radiation research have drastically changed, and the demand for a novel approach to radiation-related issues is increasing. It is thought that the publication of the book *Evolution of Ionizing Radiation Research* at this time would have enormous impacts on the society. The editor believes that technical experts would find a variety of new ideas and hints in this book that would be helpful to them to tackle ionizing radiation.