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A Practical Guide to Inversely Optimized Treatment Planning by E. Ishmael Parsai and Ana I. Begarano B.

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DESCRIPTION

A Practical Guide to Inversely Optimized Treatment Planning was written to provide a comprehensive overview of the IMRT for those that are starting an IMRT program for the first time, with a special emphasis on treatment planning. The book consists of initial chapters that summarize the various steps of IMRT treatment planning, QA and treatment delivery. Most of the book is dedicated to reviewing sample plans and planning procedures for different treatment sites commonly treated with IMRT using three commonly used Treatment Planning Systems available commercially.

PURPOSE

IMRT has been widely adopted in North America and several other parts of the world for over several decades. As a result of that, there have not been any recent books that have been written with the primary focus on providing a comprehensive overview of information relevant to programs that are interested in starting up a new IMRT program. This book has been written as a "practical guide" (as the name suggests) for those wishing to implement a new IMRT program. It is not a detailed technical textbook, but rather provides a comprehensive list of references and resources that the reader may need to review for different aspects of program implementation, and moreover provides the most updated information accrued over the years of IMRT use. The unique feature of this book is its workbook-style list of cases for the three primary disease sites – Thorax and abdomen, Head and Neck, and Pelvis to help new adopters of IMRT to learn from.

AUDIENCE

As indicated by the authors in the preface, the primary audience of this book is radiation oncology professionals who wish to start a new IMRT program and could also include new trainees to the field who could use this book as a reference to help guide their learning. Since this is not necessarily written for a particular subspecialty within radiation oncology, the book is written to appeal to a broad audience in the core information presented, with pointers to reference materials that could serve as more detailed reports or other references for different subspecialties within the field of Radiation Oncology. Given the style of how the material is presented, I do not envision this to be a textbook used for any specific didactic audience, but rather a reference guide in conjunction with specific course content in a classroom setting, or a workbook to be used by a clinical team.

CONTENTS/FEATURES

The content of this book is organized in a systematic fashion with a lot of illustrations and figures that provide a graphical represnetation of the concepts discussed. One aspect I particularly appreciated is the Definition and Abbreviations chapter as the opening chapter of the book. Our field uses so many acronyms in discussions, manuscripts and other documents developed, that it is very difficult for a new user/team to learn all these easily, and I feel the intended audience for this book will really appreciate having this. The book dedicates a chapter describing resource requirements for implementing an IMRT program, and then dedicates chapters to various process steps for a patient treatment including chapters on Simulation, Planning, and Quality Assurance for IMRT. The authors have also included a chapter on a topic of reemerging interest – the use of VMAT for implementing spatially fractionated radiation therapy. The IMRT Planning chapter provides a very practical overview of some of the intricacies of contouring requirements including the development of optimization structures that are typically used in IMRT planning, some of the tips and tricks involved in placing plan isocenter, beam arrangement, and then gets into quite a detailed discussion around optimization, since learning optimization is a crucial aspect of IMRT implementation. This is the chapter where the differences between how different treatment planning systems implement IMRT optimization are highlighted with detailed descriptions of how optimization is set up and handled for each of the planning systems covered in this book – Pinnacle, Eclipse, and Raystation. The empirical approach to starting and subsequently adding more complexity and additional constraints to successfully optimize an IMRT plan are reviewed. Finally, using a lung tumor case as an example the concepts described in the treatment planning chapter are demonstrated. The rest of the book (about 80% of the 298 pages) is dedicated to presenting a series of treatment planning cases planned with Pinnacle, Eclipse and Raystation treatment planning systems. For each case a brief clinical history of the case is presented, along with the treatment prescription, and information on simulation for that case, and then gets into a review of contours, how the optimization was set up, and the reviews of the dose distributions and Dose Volume Histograms obtained for the plan. With the gamut of cases covered and the workbook style presentation of the plans, this is probably the most valuable aspect to a team or person learning how to develop IMRT plans.

ASSESSMENT/COMPARISON

As stated earlier, this book is quite unique in its handbook style writing, and workbook style case reviews, and fills a niche for its intended audience. The senior author Dr. Parsai, has been a lifelong educator and his insights on the needs of the intended audience for this book come from years of teaching . I do have some humble suggestions for the authors to consider for future editions of the book. Firstly, it would be very useful if they were able to create an electronic repository as a companion to this book with all the cases available for download for a new user to practice planning and see if they are able to follow the optimization methodologies taught and arrive at successful plans for the cases. Secondly, it would also be very helpful to use the same case planned on different planning systems, to illustrate differences. This would be very educational to the audience to learn how different planning systems and their optimization algorithms require different tips and tricks on how to draw optimization contours, push the optimization engine, etc., to arrive at comparable plans. Finally, a bibliography chapter where the authors could compile all the educational resources for additional in-depth learning for different sub-specialties within radiation oncology would be very useful.

BOOK REVIEWER BIOGRAPHY:

Dr. Nilendu Gupta is a Professor of Radiation Oncology, Health and Rehabilitation Sciences and Material Sciences and Engineering, and the Vice Chair of Medical Physics in the Department of Radiation Oncology at The Ohio State University, James Cancer Hospital. He is the Program Director for the Medical Physics Residency Training Program in Radiation Oncology. In his clinical role, he leads Clinical Medical Physics Services, and the development of Quality Management Programs for accreditation and regulatory compliance in Radiation Oncology for one of the largest academic Radiation Oncology programs in the country and has been long standing member of the University and Hospital Quality and Safety Committees. Dr. Gupta has been a practicing medical physicist for over thirty years and has been teaching undergraduate, graduate and professional students throughout his career. Dr. Gupta is a Fellow of the AAPM and currently serves as a board member for CAMPEP.