BOOKS REVIEW

A Practical Guide to Intensity-Modulated Radiation Therapy
Authors: Memorial Sloan-Kettering Cancer Center (eds: Z Fuks, S A Leibel, C C Ling), pps 423, Medical Physics Publishing, Madison, WI, 2003, ISBN: 1-930524-13-7, Price US$125

Intensity-Modulated Radiation Therapy: The State of the Art
2003 AAPM summer school text; AAPM Medical Physics Monograph No. 29 Eds: J R Palta, T R Mackie, pps 888 (includes CD-ROM with electronic version and additional figures, etc.) Medical Physics Publishing, Madison, WI, 2003, ISBN: 1-930524-16-1, Price US$100 (AAPM members: US$80)

Intensity-modulated radiation therapy: it seems this topic is currently almost permanently under discussion by professionals working in radiation oncology. There are a multiplying number of courses and workshops on it; every author tries to work it into their paper somewhere; it seems every clinic is either doing it (this means two or more patients!), has just begun to do it (this means one patient!), has begun to commission or implement it (no patients, ...yet?), is considering doing it (might have some patients in a year or so's time!). There are lots of papers in the literature on various aspects of IMRT, although still not so many clinical results. There are national and international working parties drawing up recommendations, guidelines, points to consider (including ESTRO's own QASIMODO group). There have already been textbooks about IMRT (e.g. the first with that term in the title: The Theory and Practice of Intensity Modulated Radiation Therapy, Sternick (ed) 1996; and the more recent Intensity-Modulated Radiation Therapy, Webb 2001). And all this on a topic whose name appeared less than ten years ago, although the concept of fluence modulation had, of course, been around for decades and the idea of inverse planning was discussed first probably in a paper by Brahme and others in 1982.

Of course, one of the main factors generating this intensity of activity in the subject - and certainly modulating our behaviour - is that the major manufacturers are now offering systems to provide IMRT planning and delivery and so it is increasingly rapidly becoming available to all centres and not any longer just to research centres who have developed, tested and implemented their own systems. Indeed a number of those systems are exactly the ones picked up and taken to the market by the manufacturers. This rapid expansion of the potential availability of IMRT means there is an enormous requirement for knowledge, for learning from the experience of others and for careful evaluation and testing of the systems installed before applying to patients. IMRT is a potentially powerful tool in the evolving armoury we have available for radiation therapy, but also it is complex and has a parallel potential for problems and risks if not carefully and cautiously installed, implemented and assured. It is important to understand the physics and the technology, but also the changes required in clinical thinking about volumes, margins, uncertainties, treatment planning constraints and criteria, plan evaluation and comparison, delivery uncertainties, verification, etc.

And this brings me finally to these two recent excellent books from Medical Physics Publishing. The first is the collected experience of 29 members of the Departments of Medical Physics, Radiation Oncology and Radiology from the Memorial Sloan-Kettering Cancer Center (indeed the publisher's listing gives the author as MSKCC!). In 19 chapters they cover the necessary imaging; an overview of the IMRT process; plan optimisation; delivery, mainly by the sliding window technique; computational methods for independent verification of IMRT and their validation; how to treatment plan; acceptance testing, commissioning and QA; and then the MSKCC approaches to the use of IMRT for prostate, head-and-neck, paediatric cancers, breast, NSCLC, and sites requiring large radiation fields. As part of this hands-on guided tour of the MSKCC's programme of IMRT and its development and implementation, they also deal with NTCP and TCP considerations for planning, geometric uncertainties, verification, advanced treatment techniques and radiation protection. There is a wealth of practical detail here for the new user of IMRT, and also for those who may already have started or those who are just planning their approach, be they physicist, radiation oncologist or radiation technologist. The book is intended to be an attempt to provide an account of MSKCC's perspective, methodology and experience in the physical and medical aspects of IMRT and it admirably succeeds in this aim.

One of the strengths of the above book is that it is a comprehensive and cohesive 'handbook' of one centre's experience, neatly packaged and made available for others. Therefore on the whole it deals with one common approach to the problems and one set of systems and solutions. However given the diversity of approaches and the multiplicity of systems, still evolving and developing, this could also be seen as a possible limitation. The second book meets this challenge head-on. It is the text from the recent (June 2003) AAPM summer school of the same title and it also overwhelms with its coverage of the subject, but now from the perspective of 66 experienced and expert physicists and clinicians, many of whom were/are the pioneers of IMRT (mainly US, as one would expect for an AAPM school, but including two based in

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Europe (Webb, Lomax), a number from other countries, e.g. Israel, Canada, and some we have simply allowed North America to have for a while on hopefully short-term loan (!) such as Thomas Bortfeld). There is linkage to the previous book as some of the authors are common to both. However in contrast this book distils experience from over 25 different institutions and covers a range of systems in depth, including serial tomotherapy, static MLC, dynamic MLC, and helical tomotherapy. It deals in 35 chapters with an even wider range of topics, including an historical overview; mathematical, physical and biological optimisation; imaging and structure definition; methods of delivery; dosimetry, commissioning and system and patient QA; inverse planning, prescription, plan validation and MU calculation; Monte Carlo and IMRT; modulated electron and proton therapy; clinical techniques and experience for a range of sites, including prostate, head-and-neck, lung; image-guided techniques, respiratory motion management; and radiation protection. In addition it is punctuated by refreshing chapters on the philosophy, limitations, possible misconceptions, socio-economic aspects and novel uses of IMRT; and some reflective horizon scanning on IMRT's future. As an AAPM monograph, this book is aimed at physicists. Its level is intended to be for practicing medical physicists who are not specialists in IMRT, although it contains much that will interest others involved in IMRT also. The editors state it is a handbook to aid both experienced radiation oncology physicists and newcomers to the field in understanding the nuances of IMRT and in its safe implementation in the clinics. The editors and authors have done an excellent job in achieving this.

Approaches and methods in IMRT – along with the associated planning and delivery systems – are rapidly evolving and no such book will stay totally up to date for long. However these two books summarise the current status of IMRT from two supportive viewpoints – one centre's in-depth experience of all aspects relevant to their practice versus a wide range of centres' experiences of the various parts of the process. Together they form a breathtaking roller-coaster ride through the subject, so bursting with information you will be exhausted by the polymathy, but exhilerated by the possibilities. They provide invaluable practical guides to the topic, as well as discussion of the theoretical, clinical and philosophical framework, and come highly recommended if you really want to get into the detail of IMRT and make it work in your clinic.

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