

PREFACE

The principal goal of radiation therapy is to develop methods and techniques for improved accuracy in the delivery of the radiation dose to the target volume, at the same time as the dose to normal tissues should be kept as low as possible. Towards the end of the seventies 'quality assurance in radiation therapy' became a commonly used concept for integrating all aspects on how to delineate the target volume and the organs at risk, and measure, improve and finally maintain the required precision in dose delivery, not least in multicentric clinical trials. Quality assurance programs were also developed for other areas of the radiology field like x-ray diagnostics and nuclear medicine.

The first motivation for the present effort, initiated by the ICRU in 1980*, was to suggest requirements and measuring procedures for the commissioning and continued quality control of equipment used in radiotherapy procedures. Very soon it became clear to the working group that a large number of measuring techniques and recommendations on technical requirements was already published in the open literature. However, what was really needed was a systematic overview of the interaction and accumulation of different types of uncertainties and not least a biologically based analysis of the precision required in radiation therapy.

These questions have therefore been given special attention in this report as seen from Sections 1, 2, 6, and 7, that have been mainly authored by Torsten Landberg and Anders Brahme. The same line of thought has been followed by Hans Svensson in Section 3 on the various uncertainties in the determination of the absorbed dose in a uniform phantom. The 4th section devoted to quality assurance of radiotherapy procedures has mainly been edited by Göran Svensson. Quality control of different equipments used in radiotherapy procedures (Section 5) include Edwin McCullough (computed tomography and simulators), Fridtjof Nüsslin (computed dose planning), Alan Rawlinson and Anders Brahme (therapy accelerators) and Jean Chavaudra (conventional and low energy x-rays) as principal authors. The main part of the report was written before 1985 and only a small number of references to more recent publications have been included during the recent final revision.

The chairmen of ICRU during the work on this document have been Harlod Wyckoff and André Allisy and the working group sponsors have been Harold Rossi and André Wambersie who also contributed greatly at the meetings of the working group. Constructive criticism by Olof Mattsson and Karl-Axel Johansson, financial support of the ICRU for the meetings and the Swedish Cancer Society for the travel of consultants and the editorial work are gratefully acknowledged.

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* Quality assurance in radiation therapy has been of continuing interest to the International Commission on Radiation Units and Measurements (ICRU). With the support of the ICRU, a study group has reviewed the present situation for the ICRU. The Commission considers publication of their report useful, as it should facilitate early dissemination of the information and elicit comments.