



# Contents

<b>Preface</b> .....	iii
<b>1. Introduction</b> .....	1
1.1 Relationship to Previous Reports .....	1
1.2 Modern Trends in Radiotherapy .....	1
1.3 The Systems Approach to Radiotherapy .....	2
1.4 Concomitant Clinical and Radiobiological Problems .....	2
<b>2. Basic Data Derived from Water Phantom Measurements—Single Beams</b> .....	4
2.1 Absorbed Dose at a Point .....	4
2.2 Absorbed Dose Along the Central Ray .....	4
2.3 Single-Beam Absorbed-Dose Distributions in Two Dimensions .....	8
2.4 Modification of Single-Beam Absorbed-Dose Distributions .....	12
<b>3. Patient Data</b> .....	16
3.1 Differences Between the Patient and an Homogeneous Phantom .....	16
3.2 Acquisition of Patient Data .....	17
<b>4. Combination of Basic Data and Patient Data</b> .....	19
4.1 Contour Shape .....	19
4.2 Effect of Patient Size .....	21
4.3 Effect of Body Inhomogeneities .....	21
4.4 Input of Data for Manual and Computer Calculations .....	24
4.5 Use of Anatomical Phantoms for Checking Procedures .....	24
<b>5. Combinations of Single Beams</b> .....	26
5.1 Multiple Fixed Beams .....	26
5.2 Moving Beams .....	33
5.3 Analysis .....	36
5.4 Methods of Visualizing Distributions in Three Dimensions .....	37
<b>6. Planning and Delivery of Radiation Therapy</b> .....	38
6.1 Use of Simulators .....	38
6.2 Beam Compensating Devices .....	39
6.3 Methods of Optimization .....	41
6.4 Setting-Up of the Patient and the Radiation Beams .....	41
6.5 Use of <i>In Vivo</i> Dosimetry .....	42
<b>7. Errors in Clinical Dosimetry</b> .....	45
7.1 Accuracy Required in Clinical Dosimetry .....	45
7.2 Random and Systematic Uncertainties in Clinical Dosimetry ..	46
7.3 Mistakes in Clinical Dosimetry .....	49
<b>Appendix-Glossary of Terms</b> .....	51
<b>References</b> .....	56
<b>ICRU Reports</b> .....	62
<b>Index</b> .....	64