"ADVANCED RADIATION PROTECTION DOSIMETRY" BY SHAHEEN DEWJI AND NOLAN E. HERTEL

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Abstract— **This article is a brief review of the textbook "ADVANCED RADIATION PROTECTION DOSIMETRY" by Shaheen Dewji and Nolan E. Hertel, 2019, CRC Press, 480 p., ISBN 9781498785433**

1. Description

'Advanced radiation protection dosimetry' covers in 10 Chapters aspects of radiation protection dosimetry that physicists need in order to use ionizing radiation efficiently. The techniques presented in the book can be employed to determine radiation doses to patients and workers and, therefore, they are useful for medical physicists.

2. Purpose

This book is written primarily for experienced physicists wishing to acquire advanced and detailed knowledge in the field of radiation protection dosimetry.

3. Content and features

The book starts with a short introduction that includes basic information on radiation dosimetry and international committees and organizations that publish reports, guidelines, regulations and standards in the area of radiation protection and dosimetry. This introduction is very useful for individuals planning to follow a career in medical physics. The scientific content is structured in 9 Chapters. Chapter 2 provides an overview of units and quantities and describes briefly the atomic structure, the radioactive decay and the interactions of radiation with matter. Chapter 3 provides an interesting historical review starting from the discovery of X-rays and early reports of skin burns and other radiation-induced injuries. The status of protection standards during the early period (1905-1925 and 1925-1950) is very well covered and the transition to the risk-based model of radiation regulation (Linear No-Threshold model) is also discussed. Chapter 4 focuses on radiation detection. Dosimeters used in everyday clinical practice such as dosimeters based on ionization chambers and description of methods for calibration and testing are covered very well and, therefore, this chapter is very useful for clinical medical physicists. Chapters 5–8 are devoted on the scientific models in radiation dosimetry employing reference phantoms, biokinetic and dosimetric models as well as on dose coefficients. Medical physicists interested in Monte Carlo simulation will benefit considerably from the wealth of experience of authors who provide all necessary details on the above topics. Chapter 9 provides important information about cancer risk coefficients. Sections on limitations and uncertainties associated with these coefficients are very well written and include useful references for medical physicists. The appendix on BEIR VII risk models is also a useful addition to this subject. The last chapter examines the process of interpreting metabolic models for estimating the intake of radionuclides.

4. Assessment

This is a very well-written, comprehensive book on radiation protection dosimetry. An indispensable resource for medical physicists, this book provides theoretical and practical information from experts in this field.