

BOOK REVIEWS

HIGH DOSE-RATE AFTER-LOADING IN THE TREATMENT OF CANCER OF THE UTERUS. Edited by Thelma D. Bates and Roger J. Berry. 200 pages. British Journal of Radiology. Special Report No. 17, 1980. Price: £15:—.

The original indication to develop the after-loading technique for radium treatment of carcinoma of the cervix was to decrease the radiation hazard to the personnel.

However, with a well developed radiation protection system in the form of lead shields used by the therapist and the assisting personnel the radiation exposure can be kept very low. The main indication to use after-loading technique is therefore that the institution has many patients to handle.

Another advantage of the after-loading technique is to increase the significance of the calculated dose distribution in the pelvis. This is done by application of dummies. The position is controlled by roentgen films and can be altered to achieve the best dose distribution. Physical calculation can then be made using the films. The dummies can also be loaded with low intensity radiation sources to measure the dose in the bladder and the rectum.

When using the same geometric dose distribution and dose rate as with pre-loaded radium applicators, no new complicated biologic fractionation problems are introduced with the after-loading technique. However, using the high dose rate after-loading technique new intriguing biologic problems are introduced in the treatment.

A considerable interest has been focused on the after-loading technique in treatment of carcinoma of the uterus in the last decades especially in developing countries.

This book is a report of an international workshop held at the Middlesex Hospital Medical School in London April 1978. Eighty-six participants from 35 hospital centres in 16 different countries had gathered together to discuss and pool their clinical experience in the use of high dose-rate after-loading devices.

The reports in this book represent the up-to-date experience in after-loading technique reviewing biologic aspects, treatment techniques, results and complications.

It has often been stated that the after-loading technique gives as good results as the conventional radium treatment. It must be remembered, however, that this statement has not yet been confirmed by a randomized prospective trial.

The main advantages of high dose-rate after-loading are that treatment is delivered in minutes rather than hours or days with much greater accuracy. These short treatments are carried out in a radiation-shielded room avoiding all the problems of protecting staff, visitors and other patients. In addition many centres treat patients without general anaesthetic and as out-patients thus saving beds and operating theatre time.

These advantages of the technique include the initial financial outlay and the need to budget for source replacements. Accurate dosimetry is essential and this necessitates special instruments and an experienced staff. The technique is therefore most suitable for those centres

where large number of patients are treated. The complication rate seems to be rather high especially as far as the small intestine injuries are concerned. This might be explained by the fact that the small intestine does not have the possibility to move around in the pelvis and the abdomen during the very short treatment time thus delivering the total intestinal dose to the same segment of the intestine.

This book is recommended to everyone concerned with the radiation treatment of carcinoma of the uterus.

Olle Kjellgren

CATALOGUE OF SPECTRAL DATA FOR DIAGNOSTIC X-RAYS. By R. Birch, A. Marshall and G. M. Ardran. 142 pages. The Hospital Physicists Association, Scientific Report Series No. 30. Price: £9.50.

The catalogue of spectral data is a compilation of tables and roentgen spectra for a variety of applications to diagnostic radiography. The data presented in this book originate from computations, making use of a model having been found to give results in good agreement with data experimentally obtained (Birch & Marshall 1979). Whilst these observations have been clearly exemplified in an introducing section, any general estimates of the overall uncertainty of the presented data are lacking.

The catalogue contains a total of 102 spectra for various target angles, tube voltages, filtration and voltage ripple. Each diagram presents both the photon and the kerma spectra in clear figures and the data for the photon spectra in tables (in steps of 0.5 or 1.0 keV). Values are given for the mean photon energy, photon flux, kerma in air, half value layers and penetrometer estimates.

The catalogue covers a wide range of diagnostic applications:

General radiography (31 spectra) with constant tube voltages between 50 and 140 kV and filtration from 1.5 mm Al to 0.25 mm Cu.

Mammary radiography (12 spectra) in the voltage range 30 to 50 kV, filtration from 0.5 mm Al to 0.06 mm Mo and with W or alternatively Mo targets.

CT-scanners, with 8 spectra from three commercial units and finally the effect of voltage ripple (in 10 spectra), target angle (7 spectra), and a large section of 34 exit spectra for various thicknesses of bone and tissue.

Intensifying screens and their absorption characteristics are treated in a separate section with tables for their composition and mass attenuation coefficients.

The catalogue is easy to use—all measures are, for instance, expressed in SI-units—and contains a valuable material which makes it highly recommended for all who deal with optimization of roentgen images or estimations of radiation doses in diagnostic radiography.

Stig A. Larsson

MEDICAL RADIATION PHYSICS. Roentgenology, nuclear medicine and ultrasound. Second edition. By William R. Hendee. 517 pages. Year Book Medical Publishers, Chicago 1979. Price: \$50.50.

The first edition of Medical Radiation Physics by Dr Hendee was published about one decade ago. This original material has now been revised and upgraded with recent developments in the fields of roentgenology, nuclear medicine and ultrasound and published in a second edition. Several chapters have been rewritten and five new chapters have been added in the new edition; four chapters on the basic principles of ultrasound and one chapter on computed tomography.

The first half of the book deals with basic radiation physics; radioactive decay, interaction of ionizing radiation with matter, production of roentgen rays, counting statistics and radiation detectors.

This part of the book gives an easy understandable review of various physical phenomena appearing in the clinical use of ionizing radiation. The presentation is clear with illustrative figures and without involvement of advanced mathematics. Definitions for various radiation quantities and units are generally given both in SI-units and in old units, however old units are consequently used elsewhere in the book.

The second part deals with methods and instrumentation for clinical applications. To me, as a physicist serving in nuclear medicine, the section on nuclear medicine feels somewhat out of date; scintigraphs are for instance described carefully while the configuration of nowadays common gamma camera-computer systems are missing.

The new chapters on ultrasound, on the other hand, give a proper review of the basic principles and the instrumentation and fulfil a need which is generally not covered in books of this kind.

The last part of the book deals with radiation protection (two chapters) and contains some appendices. Some of these, for instance the tables of e^{-x} and e^{+x} , seem to be unnecessary in these days with commonly available calculators.

To those who desire a comprehensive introduction or a review of medical radiation physics, including ultrasound, this book may be a good alternative. Formulas are pedagogically illustrated by examples and problems which make the book suitable for teaching radiologic technologists or students in lower graduate studies.

Stig A. Larsson