

## **NCRP Releases Report No. 151, *Structural Shielding Design and Evaluation for Megavoltage X- and Gamma-Ray Radiotherapy Facilities***

The purpose of radiation shielding is to limit radiation exposures to members of the public and employees to an acceptable level. This Report presents recommendations and technical information related to the design and installation of structural shielding for x- and gamma-ray radiation therapy facilities.

This information supersedes the recommendations in NCRP Report No. 49, *Structural Shielding Design and Evaluation for Medical Use of X Rays and Gamma Rays of Energies Up to 10 MeV*, pertaining to such medical radiotherapy facilities. Since the publication of NCRP Report No. 49, many facilities have been designed for accelerating voltages greater than the 10 MV maximum that was covered in that Report. Hence recent shielding designs have had to refer to NCRP Report No. 51, *Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities*; NCRP Report No. 79, *Neutron Contamination from Medical Electron Accelerators*; and NCRP Report No. 144, *Radiation Protection for Particle Accelerator Facilities*, in order to account for the higher energies and the associated production of neutrons. In addition, the use of barriers constructed with composite materials has become commonplace. This Report includes the necessary information for these higher accelerating voltages as well as a discussion of the various factors to be considered in the selection of appropriate shielding materials and in the calculation of barrier thicknesses.

In addition to conventional radiotherapy, the Report covers the newer modalities such as total-body irradiation, intensity modulated radiation therapy, stereotactic radiosurgery, stereotactic radiotherapy, and intraoperative radiotherapy. A number of example calculations also are included in a separate section of the Report, and an appendix on neutron monitoring is included.

The Report is mainly intended for those individuals who specialize in radiation protection and particularly the qualified experts that prepare shielding designs for such facilities. However, it will also be of interest to architects, hospital administrators, and related professionals concerned with the planning of new radiation therapy facilities of this type.

NCRP Report No. 151 can be purchased in hard- and softcopy formats online at <http://NCRPpublications.org>. A 20 % discount is available to American Association of Physicists in Medicine members for all online purchases by entering the code [aapm49151](#) at checkout. For additional information contact David A. Schauer, ScD, CHP at [schauer@NCRPonline.org](mailto:schauer@NCRPonline.org), 301.657.2652 (x20) or 301.907.8768 (fax).

The National Council on Radiation  
Protection and Measurements

7910 Woodmont Avenue, Suite 400  
Bethesda, Maryland 20814-3095  
Telephone: (301) 657-2652  
Fax: (301) 907-8768  
<http://NCRPonline.org>  
<http://NCRPpublications.org>

For additional information:  
David A. Schauer  
*Executive Director*