

REVIEW OF LEARNING MATERIAL

MARTIR Project (Multimedia and Audio-visual Radiation Protection Training in Interventional Radiology – Radiation Protection 119)

This training CD was produced as part of a European Communities project as a tool to allow individuals to acquire the theoretical knowledge on radiation protection that they require before practising as an interventional radiologist. The package includes an assessment component to allow accreditation boards to follow the progress made by users of the material and assess their progress.

Although the package is entitled training in interventional radiology, it incorporates all aspects of radiology physics, biological effects of radiation, protection and techniques relating to radiography and fluoroscopy. As such the training is appropriate for a radiologist practising the standard techniques, but not computed tomography.

The lecture programme has 80 components which are divided into 5 main sections. The user can either work through the programme or access individual components in which they are interested. Each component is categorised in a colour coded system for basic, intermediate or advanced level. Thus those wishing a basic knowledge of interventional radiology, who may be peripherally involved could complete the basic section while others requiring knowledge in more depth could take the whole course.

The first general section is an introduction giving an overview of the social and economic issues for interventional radiology, basic information on the procedures and the relevant regulations. The second section which has 15 components covers the interactions of radiation with matter, the biological effects of ionising radiation and radiation dosimetry. It also contains more detailed aspects of radiation detection and shielding, some of which are aimed primarily at the physicist.

The third section on technology deals in detail with X-ray equipment. This includes the X-ray tube, filters, automatic exposure control, anti-scatter grids and techniques relating to fluoroscopy, digital imaging and subtraction. It also includes information on procedural equipment such as catheters, balloons, stents and contrast injection systems. It also includes information on systems from the main manufacturers, although since the CD was produced in 2001, this is not up-to-date.

The fourth section entitled “radiation protection in interventional radiology” has 25 components which go through in detail first the protection systems in place for staff and then the protection of the patient. The section on protection of the patient includes the basic dosimetric quantities that are measured to evaluate patient dose as well as the quantities effective dose and organ dose. It includes diagnostic reference levels and finishes off with a discussion of the influence of various components on patient dose such as the complexity of the procedure, the position of the X-ray tube, the projection, the size of the patient and the anti-scatter grid.

The final section deals with quality assurance and interventional radiology and considers the quantities that are used in evaluating image quality, including the modulation transfer function, noise and contrast. Various approaches adopted in different parts of the world are described and reviewed. The section finishes off with components on staff and patient dosimetry in interventional radiology.

The course is set out as text that a trainee can work through, with links to images, videos and relevant references. These provide helpful illustrations of the points covered enabling the trainee to appreciate both the fundamentals of the science and clinical techniques. There is also a glossary of over 120 terms with definitions and links to relevant parts of the text, web-sites and other references. The whole training package is relatively easy to navigate and can be used either as a reference tool to dip into or as a complete training package. As such it can potentially provide an invaluable adjunct to teaching of radiologists and others involved in X-ray technique. Since the software has been produced by the European Community for general use. Copies (283 MB) can be downloaded free of charge from:

http://europa.eu.int/comm/energy/nuclear/radioprotection/index_en.htm