

Medical specialists and the use of x-ray image intensifiers

The Radiation Protection Act 1965 requires all use of radiation to be either under the control of a licensee or “under the supervision or instructions” of such a licensee. The Radiation Protection Advisory Council has already advised that the “instructed or supervised” role does not apply to peers, but truly represents a hierarchy in radiation control. For this reason radiologists and cardiologists require individual licences.

For effective control over the use of x-ray image intensifiers in theatre or other rooms by medical specialists, the following two options are available:

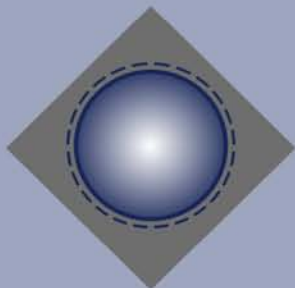
Option 1 – Individual licences

Individual medical specialists in a given department or facility have their own licences under the *Radiation Protection Act*. There will also be a principal licensee responsible for the management of radiation safety and a requirement for the presence of a medical radiation technologist. This is the option that must be chosen if the medical specialist is working independently of Radiology.

Option 2 - The use “under instructions” of x-rays by medical specialists in accordance with a Radiation Safety Plan

Responsibility for the management of radiation safety rests with a person licensed to use x-rays and designated principal licensee for the x-ray equipment in the theatre. This will usually be the principal licensee of Radiology. Any unlicensed user of the equipment must act only with the authorisation and under the instructions of this principal licensee. This responsibility means establishing a *Radiation Safety Plan* that specifies how radiation safety control is to be maintained effectively in the theatres and other areas where specialists use x-ray image intensifiers. In particular this *Radiation Safety Plan* must contain the following:

- i) **Authorisations:** The names of all medical specialists authorised to use x-rays and the scope of these authorisations. Any authorisation must be on the basis of documented evidence of attendance at a radiation safety course that follows the NRL-prescribed syllabus, presented by a qualified health physicist. The scope of a particular authorisation would limit the x-ray procedures able to be performed by that individual. This latter ties in with the requirement for formal instructions on how the procedures are to be performed (see below). The authorised person must personally indicate acceptance of the terms of use.



ii) **Written local rules:** These are in effect the instructions from the principal licensee under which the medical specialist is using radiation. The content of these written local rules will vary from facility to facility, but the following must be included:

- The presence of a registered medical radiation technologist: For all procedures involving medical specialists using image intensifiers there must be a medical radiation technologist present at all times and the advice from the medical radiation technologist, with respect to radiation safety, must be followed.
- Personal monitoring: All medical specialists using radiation must wear a personal dose monitor. In addition, other theatre staff (eg, scrub nurse) that work close to the patient during the procedure must also be monitored. The wearing position for the personal dose monitor must be specified.
- Protective clothing: All personnel required to be in the treatment room who are not adequately shielded by mobile or fixed protective screens must wear a protective lead body apron. For procedures involving a beam energy less than 100 kV the body apron should have a lead equivalence of not less than 0.25 mm. In all other cases the lead equivalence should be not less than 0.35 mm.
- Basic radiation protection practice: The local rules need to specify how the following principles of safe practice are applied to the particular authorised procedures.
 - Keep screening times to a minimum
 - Use strict x-ray beam collimation
 - Keep the image intensifier as close to the patient as possible
 - Keep the x-ray tube as far away from the patient as possible
 - Use magnification (zoom) mode of the image intensifier as little as possible
 - Remove the grid for procedures on small patients or when the image intensifier cannot be placed close to the patient
- The requirement for a logbook for each image intensifier, giving the procedure undertaken, the name of the medical specialist, and either the total dose-area product or the total screening time.

Each option has different implications for responsibilities. With Option 1, the principal licensee for the facility has managerial responsibility for radiation safety, including the quality assurance programme in radiation protection and establishing safety procedures and local rules to be followed by everyone working in the facility. Within this framework, each individually licensed medical specialist is responsible for the safety of his or her own work.

With Option 2, the responsibilities of the principal licensee extend beyond those of Option 1. There is the additional responsibility for the unlicensed radiation users working under “instructions”. In compliance with regulation 11 of the *Radiation Protection Regulations 1982* the licensee must take responsibility for ensuring only suitably trained and authorised people use the x-ray equipment and that they comply with all the requirements of the *Radiation Safety Plan* and the *Code of safe practice for the use of x-rays in medical diagnosis, NRL C5*.

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