**Radiation Safety Act 1999**

# Information Sheet

## Required Competencies for Plain Film Diagnostic Radiography - Chest and Extremities (Rural and Remote – Medical Practitioner)

The Radiation Safety Act 1999 requires all persons who operate radiation apparatus to perform diagnostic or therapeutic procedures on humans to hold a use licence. Use licences are granted by the Director-General of the Department of Health (*chief executive*). Only an individual may apply for a use licence.

Use licences may be issued only to persons who have appropriate skills and knowledge of radiation safety and protection, as well as expertise in the use of the radiation source. This document specifies the knowledge and practical competencies required before a medical practitioner is considered eligible to obtain a licence to use radiation apparatus for plain film radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones.

The competencies required will usually be obtained in two stages:

(i) Stage 1 which relates to knowledge of diagnostic radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones

(ii) Stage 2 which relates to the practical skills and competency to perform diagnostic radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones.

Medical practitioners who have demonstrated to a licensed diagnostic radiographer that they have attained the competencies mentioned in Stage 1 only will be eligible for a trainee X-ray operator licence. Only assessments made by licensed diagnostic radiographers approved by the Director, Radiation Health Unit will be accepted.

Medical practitioners who:

(a) hold an X-ray operator chest and extremities or an X-ray operator chest and extremities (rural and remote – extended) licence; and

(b) have also gained the competencies mentioned in Item 7 in Stage 1 as attested to by a licensed diagnostic radiographer approved to make such assessments by the Director, Radiation Health Unit,

will be eligible to receive an X-ray operator chest and extremities (rural and remote – medical practitioner) trainee licence; i.e. they do not need to work through Stage 1 again, they may progress directly to Stage 2.

### Documents

Certain documents should be available for reference at every location in which X-ray operators perform plain film diagnostic radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones. These documents are listed in Appendix A. They should be available to persons studying to obtain a 'trainee' licence as well as persons who hold an X-ray operator licence.

### Enquiries

For further information, please contact the Radiation Health Unit. The contact details are:

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## Stage 1 - Knowledge

During this part of the training, prospective licence applicants are not permitted to use X-ray machines. The intention of this stage of the training is that the prospective licence applicants gain sufficient knowledge to permit them to commence their practical period of radiographic training safely.

It is expected that during this period of training the books mentioned in Appendix A will be available to the prospective licence applicant for reference purposes.

Once a person has successfully completed this part of the training as assessed by a licensed diagnostic radiographer they will be eligible to obtain a trainee X-ray operator licence. Only assessments made by licensed diagnostic radiographers approved by the Director, Radiation Health Unit will be accepted.

| No. | Subject | Competencies to be gained |
|---|---|---|
| **Stage 1 – Knowledge** | | |
| 1 | Anatomy | Ability to identify the major bones and bony landmarks involved in radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones. |
| 2 | Properties of X-rays and X-ray equipment | Basic knowledge of the properties of X-rays, the control factors affecting the X-ray beam, and the operation of the types of equipment encountered in rural and remote areas. |
| 3 | Radiation protection | Basic knowledge of the effects of ionising radiation, the principles of radiation protection and personal radiation monitoring. |
| 4 | Legislative requirements and medico-legal issues | Basic knowledge of requirements relevant to licensing of persons under the *Radiation Safety Act 1999* to perform diagnostic radiography, duty of care, clinical consequences of poor radiography for the patient and the legal consequences for the operator. |
| 5 | Radiographic technique | Understanding of the terminology used in radiography, radiographic equipment and accessories, the factors affecting image quality, the conduct of a radiographic examination and record keeping. |
| 6 | Exposure standardisation | Understanding how the radiographic factors (kVp, mA, time, focus-film distance) affect the quality of a radiograph and how to alter these factors to accommodate differences in patient size, the use of grids and the application of plaster. |
| 7 | Positioning techniques | Appreciation of the positioning techniques required to produce diagnostic radiographs of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones. |
| 8 | Image artefacts | Appreciation of imaging faults and the errors that produce them in relation to X-ray technique and processing. |

## Stage 2 - Practical proficiency

To complete this part of the training, trainee X-ray operators must hold a suitable trainee X-ray operator licence. The intention of this stage of the training is that trainee X-ray operators gain sufficient knowledge to permit them to perform diagnostic radiography of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones competently following consultation with a suitably experienced, licensed diagnostic radiographer.

It is expected that during this period of training the books mentioned in Appendix A will be available to the trainee X-ray operator for reference purposes.

Once the trainee X-ray operator has successfully completed this part of the training, as assessed by a licensed diagnostic radiographer the 'trainee' status will be removed from the person's licence. Only assessments made by licensed diagnostic radiographers approved by the Director, Radiation Health Unit will be accepted.

| No. | Subject | Competencies to be gained |
|---|---|---|
| **Stage 2 – Practical proficiency** | | |
| 9 | Exposure parameters | Demonstrated ability to alter exposure parameters to compensate for incorrect exposure, different body thicknesses, different film/screen combinations and the use of grids, plaster etc. |
| 10 | Image artefacts | Demonstrated ability to identify various imaging faults and how to prevent their recurrence. |
| 11 | Radiographic technique and positioning | Demonstrated ability to use radiographic techniques and appropriately position patients to produce diagnostic radiographs of the chest (lung ribs and sternum), spine, extremities, shoulder joints, hip joints, pelvis and abdomen, skull and facial bones. |
| 12 | Use of radiography equipment | Demonstrated ability to use radiography equipment to produce a plain radiograph, perform necessary post processing and store and transfer images. |

## Appendix A

# Documents

Australian Radiation Protection and Nuclear Safety Agency 2008, Code of Practice for Radiation Protection in the Medical Applications of Ionizing Radiation (2008), Radiation Protection Series No. 14, ARPANSA, Yallambie.

Australian Radiation Protection and Nuclear Safety Agency 2008, Safety Guide for Radiation Protection Diagnostic and Interventional Radiology (2008), Radiation Protection Series No. 14.1, ARPANSA, Yallambie.

Ballinger P W and Frank E D. Pocket Guide to Radiography, 12th Edn (2011). Mosby.

Ballinger P W and Frank E D. Merrill's Atlas of Radiographic Positions and Radiologic Procedures, Volume 1, 12th Edn (2012). Mosby.

Royal College of Radiologists. Making the best use of clinical radiology services - Referral guidelines BFCR(12)2 (2012).