

Required Competencies for Plain Film Diagnostic Radiography of the Chest and Extremities

Scope

Under the *Radiation Safety Act 1999*, all persons who operate radiation apparatus to perform diagnostic or therapeutic procedures on humans must hold an appropriate licence issued by the Chief Executive, Queensland Health. These use licences may only be issued to persons who have appropriate skills and knowledge of the principles and practices of radiation protection, as well as expertise in the use of the radiation apparatus.

This document specifies the knowledge and practical competencies required before a person is considered eligible to obtain a licence to use radiation apparatus for plain film radiography of the chest and extremities.

The competencies required will usually be obtained in two stages:

- (i) Stage 1 which relates to knowledge of diagnostic radiography of the chest and extremities
- (ii) Stage 2 which relates to the practical skills and competency to perform diagnostic radiography of the chest and extremities.

Persons 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.

Please note that radiography of the shoulder joints and hip joints, per se, does not lie within the scope of this licence.

Documents

Certain documents should be available for reference at every location in which X-ray operators perform plain film diagnostic radiography of the chest and extremities. 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 an officer at Radiation Health on (07) 3328 9987 or, alternatively, via email at radiation_health@health.qld.gov.au.

Note: Under the Radiation Safety Regulation 1999, 'plain film diagnostic radiography' includes a digital equivalent of plain film diagnostic radiography.

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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 and extremities.
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 <i>Radiation Safety Act 1999</i> to perform diagnostic radiography, duty of care, clinical consequences of poor radiography for the patient and the legal consequences for the operator.
5	X-ray film, intensifying screens, darkroom procedures and film processing	Basic understanding of the structure and function of X-ray film and intensifying screens, darkroom design and safety and automatic film processing.
6	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.
7	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.
8	Positioning techniques	Appreciation of the positioning techniques required to produce diagnostic radiographs of the chest and extremities. Please note that radiography of the shoulder joints and hip joints, per se, does not lie within the scope of this licence.
9	Image artefacts	Appreciation of film 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 and extremities competently.

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		
10	Problems and faults in the darkroom	Demonstrated ability to identify problems and faults in the darkroom and be able to carry out light and safelight tests.
11	Processor operation	Demonstrated knowledge of processor operation and the ability to maintain processor cleanliness and chemical preparation.
12	Care and handling of films and ancillary equipment	Demonstrated ability in the care and handling of films, screens, cassettes and other ancillary equipment.
13	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.
14	Image artefacts	Demonstrated ability to identify various film faults and how to prevent their recurrence.
15	Production of radiographs	Demonstrated ability to produce diagnostic radiographs of the chest and extremities which have a high standard of image quality.
16	Use of computerized radiography equipment	Demonstrated ability to use CR equipment to produce a plain image, perform any post processing necessary, store the image on CD and hard drive and transfer it electronically to another site for assessment by a medical practitioner.

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, 5th edn (1999)*. Mosby.

Ballinger P W and Frank E D. *Merrill's Atlas of Radiographic Positions and Radiologic Procedures, Volume 1, 10th edn (2003)*. Mosby.

Royal Australian and New Zealand College of Radiologists. *Imaging Guidelines, 4th edn (2001)*.

Royal College of Radiologists. *Making the best use of clinical radiology services - Referral guidelines (MBUR6), 6th edition (2007)*.