# SESLHD PROCEDURE COVER SHEET

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| **NAME OF DOCUMENT** | Protection of Staff and the General Public in Departments Performing Diagnostic or Interventional Radiology |
| **TYPE OF DOCUMENT** | Procedure |
| **DOCUMENT NUMBER** | SESLHDPR/538 |
| **DATE OF PUBLICATION** | May 2024 |
| **RISK RATING** | Medium |
| **LEVEL OF EVIDENCE** | Legislative Requirements<br>National Safety and Quality Health Service Standards: Standard 1 – Clinical Governance |
| **REVIEW DATE** | May 2027 |
| **FORMER REFERENCE(S)** | SESLHNPD/57 Radiation Safety – Protection of Staff and the General Public in Departments Performing Diagnostic or Interventional Radiology |
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| **FUNCTIONAL GROUP(S)** | Radiation Safety |
| **KEY TERMS** | Radiation safety; ionising radiation; x-rays; radiology; medical imaging; PPE; lead aprons; protective clothing |
| **SUMMARY** | Procedure to limit the risk to health of staff and members of the public arising from exposure to radiation from diagnostic or interventional radiology at SESLHD facilities. |

**COMPLIANCE WITH THIS DOCUMENT IS MANDATORY**



Feedback about this document can be sent to SESLHD-Policy@health.nsw.gov.au

# Protection of Staff and the General Public in Departments Performing Diagnostic or Interventional Radiology

SESLHDPR/538

## 1. POLICY STATEMENT

South Eastern Sydney Local Health District (SESLHD) is committed, through a risk management approach, to protecting employees, contractors, students, volunteers, patients, members of the public and the environment from unnecessary exposure to radiation arising from systems and processes which use radiation apparatus and radioactive substances, whilst maintaining optimum diagnostic and therapeutic quality, therapeutic efficacy and patient care.

This document provides procedures necessary to ensure compliance with Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Codes of Practise C-1 and C-5 in relation to the protection of staff and the general public in departments performing diagnostic or interventional radiology[7]. It applies to all departments using diagnostic x-rays, such as the Cardiac Catheter Laboratory and Endoscopy, as well as the Department of Medical Imaging.

## 2. BACKGROUND

Staff involved in diagnostic or interventional radiology procedures could receive radiation exposure principally from scattered radiation from the patient being examined. In normal circumstances no one, other than the patient, should be exposed to the primary x-ray beam, but such exposure could occur unintentionally.

Radiation dose limits for the levels of radiation exposure to occupationally exposed persons and to members of the public are given in Schedule A and Schedule B of Radiation Protection Series (RPS) C-1[3]. Compliance with this procedure should ensure the radiation exposures as a result of activities utilising radiation in SESLHD remain within these prescribed limits.

Members of the public (for example, carers or comforters of a paediatric patient) may need to be in the imaging room while a diagnostic or interventional radiology procedure is taking place and could also receive a radiation exposure.

Staff or members of the public in adjoining areas will be adequately protected as long as the required radiation shielding has been installed as required in SESLHNPR/536, and they comply with the requirements around personal protective garments for radiation protection as described in SESLHD/732[7].

## 3. RESPONSIBILITIES

### 3.1 The Radiation Medical Practitioner (Radiologist or Medical Specialist)

- is responsible for the clinical management of the patient undergoing a diagnostic or interventional radiology procedure. This includes the decision to proceed with a radiology procedure based on the specialist's knowledge of the potential risks and benefits of the procedure, taking into account the clinical information, and the sensitivity and specificity of the procedure.

- where the Radiation Medical Practitioner is the Operator then it is their responsibility to minimise radiation exposure to persons other than the patient (Carer and Comforters + Staff)

### 3.2 The Radiographer

- is responsible for performing diagnostic radiology procedures as prescribed by the radiation medical practitioner in accordance with the centre's written standard protocols. This will include:
  - correctly identifying the patient, the procedure and the site to be examined
  - following established imaging protocols to ensure optimal data acquisition and analysis
  - performing quality assurance procedures for instrumentation and image quality.
  - And as the operator it is their responsibility to minimise radiation exposure to persons other than the patient (Carer and Comforters + Staff), in compliance with the requirements of this procedure.

### 3.3 The Radiology Medical Physicist

- is required to be available for consultation on optimisation of medical exposures, including clinical dosimetry and quality assurance, and to give advice on matters relating to radiation protection.
- works closely with the radiologists and radiographers in the optimisation of clinical studies – through image acquisition, analysis and display optimisation and ongoing oversight of the quality control of equipment.
- is required to provide Human Research Ethics Committees with a radiation dose estimation and risk assessment for any research studies that involve the research participants receiving an exposure from ionizing radiation, in accordance with the requirements of RPS8 (ARPANSA 2005).
- Is responsible to provide dose estimates in the event of inadvertent exposure of staff/general public.

### 3.4 The Radiation Safety Officer

- will oversee and provide advice on radiation safety within departments performing diagnostic or interventional radiology.

## 4. PROCEDURE

### 4.1 Procedures to minimise radiation exposure

The radiation dose to the operator or a member of the public can be minimised by prudent positioning relative to the X-ray tube, patient and/or structural shielding. Where there is no structural shield and the operator has to remain in the room during general radiography, such as with mobile radiography, the operator should stand:

- at least two metres away from the X-ray tube; and
- outside the primary beam.

In these circumstances the operator should, wear protective garments and glasses in compliance with SESLHDPR/732.

Where a person is required to be present in a controlled area during an X-ray exposure, such as in a fluoroscopy suite, that person should not remain any closer to the patient or the X-ray tube than is necessary. The operator should ensure that any person who is required to remain in the room during the radiation exposure wears protective clothing or stands behind protective shields.

The design of all radiology suites should include a protected area in which the operator's console is located. The operator's console should be the only area within the radiology suite that radiography and remote-controlled fluoroscopy systems (usually over-table X-ray tube systems) are operable.

### 4.2 Personal protective equipment

Refer to SESLHDPR/732 – X-Ray Protective Clothing for details on personal protective equipment.

### 4.3 Patient Immobilisation

In some cases, it may be necessary for a person to restrain an uncooperative patient (e.g. a child or incapacitated patient) during an exposure. Where such a situation arises, the operator should use restraining devices as a first preference. If this is not possible, someone not occupationally exposed to radiation, such as a carer or comforter, should restrain the patient.

### 4.4 Protection of Carers or Comforters

Any relatives of the patient should be discouraged from entering the room during an examination unless they are required to assist with the examination. If they insist, they must be asked to stand at least 2 m away from the patient and must wear a protective apron.

Any person aiding an examination (e.g. restraining the patient) shall use a protective apron and avoid facing the direct primary beam. If their hands are near the primary beam, they should be provided with protective gloves.

When children are to be examined, parent participation should be encouraged and adequate protection provided to the parents along with clear instructions as to the parent's role.

Dose limits do not apply for Carers and Comforters, as no monitoring is done. In cases of uncertainty get advice from a Medical Physicist as to the estimated exposures to such Carers and Comforters.

### 4.5 Protection of Pregnant Staff

Pregnant staff have the same occupational dose limits prescribed as before they were pregnant, but their pregnancy is treated as a member of the public hence has an applicable limit of 1 mSv per annum.

Abdominal monitoring can be done monthly following declaration of the pregnancy by the pregnant staff member, but this is not required.

Appropriate changes in duties and working areas may be required to ensure that the prescribed limits are achieved. Pregnant staff should not be working in interventional theatres, interventional CT, or fluoroscopic theatres.

### 4.6 Protection of Staff under 16 years of age

The Responsible Person must ensure that no person under the age of 16 years is or could be subject to occupational exposure.

### 4.7 Protection of Staff over 16 years of age but under 18 years of age

The Responsible Person must ensure that persons under the age of 18 but more than 16 years are not subject to occupational exposure unless they are under supervision and only for the purpose of training for employment or for the purpose of studies in which sources are used.

## 5. DOCUMENTATION

Protocols for performing diagnostic radiology procedures.

## 6. AUDIT

The following documents should be available for audit:

- Annual lead apron testing records showing the identification number, usual location, date of purchase, lead equivalence, style, testing dates and test results.
- Records of staff radiation exposure.

## 7. REFERENCES

[1] SESLHDPR/536 - Shielding and Facility Design

[2] NSW Health Policy Directive PD2017_032 - Clinical Procedure Safety

[3] ARPANSA RPS C-1 "Code for Radiation Protection in Planned Exposure Situations", ARPANSA, Yallambie (2020)

[4] ARPANSA RPS C-5 "Code for Radiation Protection in Planned Exposure Situations", ARPANSA, Yallambie (2020)

[5] NSW Environment Protection Authority (2023) Radiation Standard 4 - Compliance requirements for x-ray protective clothing

[6] ARPANSA RPS-8 Code of Practice for the Exposure of Humans to Ionizing Radiation for Research Purposes (2005).

[7] SESLHDPR/732 Radiation Safety – X-Ray Protective Clothing

## 8. VERSION AND APPROVAL HISTORY

| Date | Version | Version and approval notes |
|---|---|---|
| May 2010 | Draft | Richard Smart, Area Radiation Safety Officer in conjunction with the Area Radiation Safety Committee |
| February 2011 | 0 | Approved by Combined Clinical Council |
| October 2012 | 1 | Broken link to SESLHNPD/53 fixed |
| January 2016 | 2 | Periodic review |
| October 2016 | 2 | Updates endorsed by Executive Services |
| November 2019 | 3 | Updates endorsed by Executive Services |
| 20 May 2024 | 4.0 | Major review: Updated to include requirements from ARPANSA documents C1 & C5; section 4.2 updated to link to SESLHDPR/732. Approved by SESLHD Clinical and Quality Council. |