

SESLHD PROCEDURE COVER SHEET



Health
South Eastern Sydney
Local Health District

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FUNCTIONAL GROUP(S)	Radiation Safety
KEY TERMS	Radiation safety, ionising radiation, x-rays, radioactive substances, radiation monitors
SUMMARY	Procedure to ensure that all appropriate staff are issued with, and wear, personal radiation monitors, and that survey meters are maintained and calibrated.

COMPLIANCE WITH THIS DOCUMENT IS MANDATORY

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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 in relation to the provision and use of personal radiation monitors.

2. BACKGROUND

The *Code for Radiation Protection in Planned Exposure Situations* (ARPANSA RPS C-1) requires a personal radiation monitor to be provided to each occupationally exposed person who is likely to be exposed to ionising radiation in excess of 1 mSv in any one year. In addition, the *Protection from Harmful Radiation Regulation 2013* (NSW) lists those occupationally exposed persons to whom an employer must provide a personal radiation monitor. This includes those using radiation for radiotherapy, radiology or nuclear medicine. The Regulation also requires the employer to provide a copy of the employee's radiation exposure record to the employee when the employee leaves the employer's employment.

3. RESPONSIBILITIES

3.1 Department Manager

The Department Manager will:

- ensure that a personal radiation monitor is obtained and issued to each of their occupationally exposed staff;
- ensure that these monitors are promptly sent for processing at the end of each wearing period; and
- provide both regular and on-demand reports of the radiation monitoring results to their staff.

3.2 Radiation Safety Officer (RSO)

The Radiation Safety Officer will:

- advise Department Managers on monitoring requirements for staff members;
- maintain the personal dose records of the staff; and
- provide an exit letter and dose history for staff at the end of their employment.

3.3 Human Resources Manager

The Human Resources Manager will:

- advise the Radiation Safety Officer when employees join or leave the organisation; and
- maintain current contact information for occupationally exposed employees and provide it on request to the RSO.

3.4 Monitored Staff

Staff members issued with a personal radiation monitor will:

- wear the monitor at all times when potentially exposed to ionising radiation;
- leave their monitor in a designated location at their place of work after-hours; and
- submit their monitor to their manager for processing at the end of the wearing period.

4. PROCEDURE

4.1 Personal Radiation Monitors

All personal dosimeters shall be issued, processed and calibrated by a dosimetry provider approved to do so by the NSW Environment Protection Authority (EPA).

Managers can request dosimeters for their staff by completing an *Application for a Personal Radiation Monitor* ([SESLHD form F339](#)), available on the intranet, and forwarding it to the site RSO, along with the staff member's current radiation licence (if any) and any radiation exposure records they may have received from a previous employer.

Where Departments have local contracts with a dosimetry provider, the Application for a Personal Radiation Monitor must still be completed and provided to the RSO, along with any Radiation Licence and Dose History. Dose records must be forwarded to the RSO as they are received so they can be integrated into the District's records.

Dosimeter applications should be made for staff prior to their commencing work where they may be occupationally exposed as they must be monitored during all such work.

When not being worn, dosimeters should be stored in an area of low background radiation, such as an assigned locker, dosimetry board or office desk drawer. Persons responsible for a dosimetry centre must similarly keep the control monitor provided by the dosimetry service in an area of low background radiation, normally an office area.

Dosimeters should not be taken home; if a dosimeter is taken home in error, it, must not be left in direct sunlight or in a motor vehicle especially in summer. Internal vehicle temperatures can reach temperatures exceeding 60°C, which could cause erroneous readings for some types of dosimeter. This is especially detrimental to dosimeters using photographic film.

Lost dosimeters should be reported to the Department Manager and Radiation Safety Officer as soon as possible. A replacement will be ordered and the RSO will note that the monitor was lost so that it can be excluded from the wearers record if it is found and reported on a future date.

4.1.1 Body monitors

The standard personal dosimeter is a small badge, intended to be worn at the front of the body, preferably in the area of the body likely to receive the highest amount of radiation exposure. This is likely to be the centre of the torso.

This monitor should be worn underneath any X-ray protective apparel as it is intended to measure the amount of radiation reaching the radiosensitive tissues of the chest and abdomen.

A second body dosimeter may be issued and worn at the collar, outside of X-ray PPE. The purpose of this second monitor is to estimate the radiation reaching the unprotected face and eyes. Note that staff who are issued with a second dosimeter for this purpose must take care not to confuse it with the main body dosimeter as the two will report very different results. For this reason, a dedicated eye dose monitor is preferred.

4.1.2 Extremity monitors

Plastic rings incorporating a radiation monitor are available for staff to wear if their hands are likely to receive significant radiation exposure. These monitors are usually issued to radiation laboratory staff, nuclear medicine technologists and brachytherapy and implant therapy practitioners. The ring is normally worn on the index or middle finger with the active surface facing the same way as the person’s palm. Worn this way, it provides an acceptable estimate of the average dose received by the wearer’s hands and fingers.

4.1.3 Eye dose monitors

Ophthalmological studies have shown an increased incidence of radiation-related eye lens opacities in interventional radiologists. Consequently, the dose limit for the lens of the eye has been lowered from 150 to just 20 mSv per year.

Practitioners performing interventional radiology procedures should protect their eyes with suitable lead-impregnated eyewear. They can also be issued with eye dose monitors on request. These are small packets of radiosensitive material which clip onto the frames of lead eyewear. They are designed to be mounted inside the protective eyewear, just outside of the main field of view.

4.1.4 Foetal Dose Monitors

A secondary body monitor can be ordered for pregnant staff working with radiation who choose to continue to do so through part of their pregnancy. This will be termed a *foetal dose monitor* and it is reported separately from the main body monitor. These monitors will be cycled monthly, although the results will still lag the monitor return by about a month.

When staff are issued with a foetal dose monitor they must take care not to confuse it with their main body monitor. Landauer foetal dose monitors can be distinguished by a graphic of a baby superimposed over the womb region of a female silhouette, replacing the usual white spot over the chest of a gender-neutral silhouette. This graphic indicates where on the body the monitor is intended to be worn.

As with the main body monitor, the foetal dose monitor should be worn underneath any X-ray protective apparel as it is intended to measure the amount of radiation exposing the developing foetus.

4.1.5 *Electronic Personal Dosimeters*

Electronic Personal Dosimeters (EPDs) allow instantaneous measurement of radiation dose and dose rate. These are used in certain situations where it is necessary to continuously and immediately be able to determine the current accumulated dose. EPDs do not replace the normal personal monitors but can be used in addition to them.

EPDs may also have an alarm operating on a dose rate threshold or an accumulated dose threshold. The RSO or a medical physicist will issue an EPD to a staff member if electronic monitoring is required. The Department Manager should contact the RSO if it is believed that electronic monitoring is needed.

4.2 Dose Records

The Radiation Safety Officer must ensure that records of doses assessed to have been received by monitored employees, including details of monitoring results and dose calculation methods, are kept:

- during the working life of the employee;
- afterwards for not less than 30 years after the last dose assessment; and
- at least until the employee reaches, or would have reached, the age of 75 years.

These records must be available for inspection by the person to whom they relate at reasonable times during normal working hours and must include:

- the full name, sex and date of birth of the employee;
- the employee's current address, or last known home address if no longer employed;
- the date of commencement of employment (and, if applicable, the date of separation);
- the kind of work performed by the employee;
- details of the types of ionising radiation to which the employee may have been exposed, including information about exposure to radioactive substances in unsealed form;
- details of any radiation accidents in which the employee has been involved or by which the employee may have been affected;
- details of the personal monitoring device worn by the employee; and
- the results of monitoring the levels of radiation exposure of the employee.

4.2.1 *External and legacy dose records*

Employees may work for more than one employer at a time. If they are occupationally exposed during the course of multiple employments then their dose records must be merged to ensure that dose limits are not exceeded.

Employees are therefore required to provide copies of the dose reports that they receive from any other employer, at least annually. These will be merged into their SESLHD dose record with the service provider set to "import" to distinguish them from local dose reports.

Older dose reports from within SESLHD may be imported similarly to external dose reports if there is no other way to merge them into current records. If so, the service provider will be set to "legacy" to distinguish them from records imported from other organisations.

4.3 Dose Reports

Periodically, the RSO will make available to Department Managers a record of the doses received by their staff over the most recent monitoring period. These records should be posted in an area where they are available for staff to review.

On request, the RSO will provide details of all doses estimated to have been received by an employee to that employee, or to the relevant regulatory authority or its approved central record keeping agency.

These reports will not include dose records imported from other organisations, except as directed by the regulatory authority.

4.3.1 Exit letters

When notified of an employee’s termination, the RSO will generate a copy of their radiation exposure records and draft an exit letter. This will be sent to the current contact address for the ex-employee. Electronic mail to a private account will be preferred, with hard copy sent if a private e-mail address is not available.

If the employee takes up employment as an occupationally exposed person with another employer and if the employee requests, the RSO will send a copy of dose history and exit letter to the other employer.

The exit letter will summarise the employee’s exposure history whilst working in SESLHD facilities and must include the following text:

THESE RECORDS SHOULD BE KEPT SAFELY AND PERMANENTLY AND BE GIVEN TO ANY FUTURE EMPLOYER EMPLOYING YOU AS A RADIATION WORKER.

4.4 Actions to be taken if staff radiation doses exceed the dose constraints

The Radiation Safety Committee has established the following actions that are to be taken when the dose reported for a personal radiation monitor exceeds certain dose constraints:

Monitoring Period			Action to be taken
4 weeks	8 weeks	12 weeks	
> 0.5 mSv (body/lens)	> 1.0 mSv (body/lens)	> 1.5 mSv (body/lens)	Immediately investigate the circumstances concerning the receipt or possible receipt of the dose. A report must be submitted to the Radiation Safety Committee.
> 12.0 mSv (ring)	> 24.0 mSv (ring)	> 36.0 mSv (ring)	
> 1.6 mSv (body/lens)	> 3.2 mSv (body/lens)	> 4.8 mSv (body/lens)	As above, but a report must also be submitted to the Radiation Control Section of the EPA.
> 40 mSv (ring)	> 80 mSv (ring)	>120 mSv (ring)	

SESLHD PROCEDURE

Radiation Safety – Personal Monitoring

SESLHDPR/543

5. DOCUMENTATION

- SESLHD form [F399](#) Application for a Personal Radiation Monitor
- Exit letter template

6. AUDIT

The following documents should be available for audit:

- Personal radiation dose records
- Records of investigation of supra-threshold exposures
- Records of exit letters provided to separated workers

7. REFERENCES

- [1] ARPANSA RPS C-1 Code for Radiation Protection in Planned Exposure Situations (2020)
- [2] *Protection from Harmful Radiation Regulation 2013* (NSW)

8. VERSION AND APPROVAL HISTORY

Date	Version	Author and approval notes
August 2010	Draft	Brent Rogers, RSO NHN
November 2010	Revised draft	Richard Smart, RSO
February 2011	0	Approved by Combined Clinical Council
December 2015	1	Periodic Review
October 2016	1	Updates endorsed by Executive Sponsor
December 2019	2	Updates endorsed by Executive Sponsor
26 April 2024	3	Major review: Added reference to ARPANSA C-1; added lens dose levels to table on section 4.4. Approved at SESLHD Clinical and Quality Council.