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RADIATION PROTECTION, CCMB

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An Overview: Personal Dosimeters

1.0 Purpose

To provide an overview of personal radiation dosimeters and the owner's responsibility.

2.0 Owner's Responsibility

2.1 Safety regulations state that it is the owner's responsibility to ensure all x-ray workers and other personnel who routinely participate in radiological procedures must wear personal dosimeters while on duty to monitor the occupational dose.

2.2 Manitoba Regulation 341/R, an X-ray Safety Regulation under the Public Health Act, states, (11), The owner of the x-ray equipment shall ensure that personal dosimeters are worn by all x-ray workers while on duty. Manitoba Regulation 341/88 R

2.3 Health Canada, Safety Code 35, Radiation Protection in Radiology-Large Facilities, states, 1.3.(6), All operators must monitor their radiation exposures with the use of a personal dosimeter, if they are likely to receive a dose in excess of 1/20th of the dose limit to radiation workers specified in Appendix I. Safety Code 35

Applicable Organ or Tissue	Limit Type	Dosimetry Period	Radiation Workers Limit Value (mSv)	Members of the Public, Technologists-in-Training, and Students Limit Value (mSv)
Whole Body	Effective Dose	One (1) year	20*	1
Lens of the Eye	Equivalent Dose	One (1) year	20*	15
Skin	Equivalent Dose	One (1) year	500	50
Hands and Feet	Equivalent Dose	One (1) year	500	50

Five (5) year effective dose for whole body limit value is 100 mSv.

* For whole body effective dose and lens of the eye equivalent dose: 20 mSv per year averaged over a defined 5-year period and no single year exceeding 50 mSv.

3.0 Dosimetry Service: National Dosimetry Services (NDS)

3.1 National Dosimetry Services National Dosimetry Services, Health Canada, is Canada's leading dosimetry service provider and is licensed and regulated by the Canadian Nuclear Safety Commission CNSC

National Dosimetry Services, Health Canada
775 Brookfield Road, Address Locator 6301D
Ottawa, ON K1A 1C1
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W: National Dosimetry Services

3.2 NDS provides dosimetry products and services to a variety of job sectors to monitor occupational exposure to X-ray, gamma, beta, and neutron radiation, including: industry, research, medicine, and agriculture.

4.0 Personal Dosimeters (OSL)

4.1 The dosimeter NDS uses to monitor exposure to X-ray, beta, and gamma radiation is the *InLight Nova* dosimeter (whole body and head/neck dosimeter) which uses Optically Stimulated Luminescence (OSL) technology.

4.2 Wearing period available

- Quarterly (4 shipments per year)
- Monthly (12 shipments per year)
- Semi-monthly (24 shipments per year)

4.3 Wearing location

- Whole body
- Head/neck

4.4 Reporting threshold

- 0.10 mSv

4.5 The *Inlight Nova* OSL dosimeter contains sensitive elements that absorb radiation and store some of the energy in the form of excited electrons. The dosimeter is read by stimulating the elements using Light Emitting Diodes (LED) which releases some of the stored energy as light. The amount of released light is measured and used to determine the radiation exposure (radiation dose is proportional to the amount of light measured) received by the dosimeter's user during the wearing period.

5.0 Provision of Personal Dosimeters (OSL)

5.1 The provision of personal dosimeters is mandatory as outlined in 2.0.

5.2. The cost of supplying personal dosimeters for any health-funded facility in Manitoba is covered by Manitoba Health through the budget of CancerCare Manitoba.

5.3 When applicable, dental, chiropractic, industrial, veterinary facilities, etc. must bear the cost of personal dosimeters (OSL) through the National Dosimetry Services, Health Canada. To apply for dosimetry services: NDS Apply for Dosimetry Services

6.0 General Guidelines for Wearing and Storing Personal Dosimeters

6.1 Personal dosimeters are to be worn during working hours only.

6.2 Personal dosimeters are to be worn securely on the torso or collar region underneath protective lead clothing.

6.3 When not in use, dosimeters are to be stored in a controlled location, well away from any ionizing radiation source.

6.4 Personnel are to only wear the dosimeter that has been assigned to them. Personal dosimeters are not to be borrowed or loaned.

6.5 NDS operates on a continual wear and exchange cycle. Personal dosimeters are worn for a specified amount of time (usually on a quarterly basis) and then returned to Health Canada, National Dosimetry Services, to be processed and analyzed. A replacement dosimeter is provided during this exchange and return period; therefore, staff are to ensure that their personal dosimeter is accessible during this process.

6.6 Any lost, misplaced, or missing dosimeters are to be reported to the manager or the facility's dosimetry coordinator.

6.7 Do not intentionally expose dosimeters to radiation. Intentional tampering with a personal dosimeter is a serious matter.

7.0 NDS Exposure Reports

7.1 User groups will receive National Dosimetry Services exposure reports.

7.2 Dosimeter readings on the exposure report represent cumulative effective dose for the wearing period (usually quarterly).

7.3 Managers (or appointed persons) are to review National Dosimetry Services exposure reports when received to ensure that occupational radiation exposure levels are below recommended annual dose limits and/or to investigate any unusual readings. Radiation Protection, CCMB, is accessible for questions or assistance with this process.

7.4 Accidental occupational exposures or any unusually high doses are to be reported to Radiation Protection, CCMB, upon discovery. Information regarding the details of this occurrence is to be provided for review, if necessary, an investigation will be conducted.

7.5 Exposure reports contain personal employee information and therefore should be kept confidential.

7.6 Radiation Protection, CCMB, is to be provided with National Dosimetry Services exposure reports upon request.

7.7 National Dosimetry Services exposure reports are to be kept for the lifetime of the facility.

8.0 National Dosimetry Registry (NDR) National Dose Registry

8.1 The National Dosimetry Registry (NDR) contains the dose records of individuals who are monitored for exposures to ionizing radiation in their work environment.

8.2 NDR is Canada's national repository for radiation dose records of Canadian workers.

8.3 NDR is administered by Health Canada's Radiation Protection Bureau and supports Health Canada and the Canadian regulatory authorities in their mandates to protect the health and safety of Canadians exposed to ionizing radiation in the workplace.

9.0 Electronic Personal Dosimeter (EPD)

9.1 An electronic personal dosimeter (EPD) is a personal radiation monitor that detects and measures ionizing (or Gamma or beta) radiation to give a real-time readout to the user.

9.2 An EPD is not licensed to be used as a "Dose of Record" and dose data is not sent to the National Dose Registry (NDR).

9.3 An EPD is meant to be used as a dose management tool and is to be used in conjunction with a personal OSL dosimeter.

9.4 Display threshold is 1 uSv.

9.5 Radiation Protection, CCMB, offers a lend-out service of electronic personal dosimeters to support supplementary occupational dose monitoring in professional activities including but not limited to fluoroscopy-guided interventional procedures, nuclear medicine, and radiotherapy. Electronic personal dosimeters are issued on a case-by-case basis. Please email Radiation Protection, CCMB, to request an EPD.
Email: CCMBMPX-rayCompliance@cancercare.mb.ca

Please do not hesitate to contact us with any questions or concerns.

CONTACT US

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