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Occupational Dose Limits for Radiation Workers and Requesting Changes to Dose-Related Information (NDR)

1.0 International Commission on Radiological Protection (ICRP):[1]

1.1 ICRP is a radiation protection standards organization considered to be the international authority on the safe use of sources of ionizing radiation.

1.2 After extensive study of the deterministic and stochastic effects of radiation on the human body, the ICRP formed recommendations on dose limits for occupational radiation workers and public dose limits.

2.0 Occupational Dose Limits for Radiation Workers:

2.1 Federal Dose Limits:[2]
Federal dose limits for radiation workers, the public, technologists-in-training, and students are based on recommendations from the ICRP (Publications 103 and 118) as listed in Table 1. Radiation workers are classified as individuals who are occupationally exposed to ionizing X-rays. Radiation dose limits for radiation workers apply only to irradiation resulting directly from their occupation and do not include radiation exposures from other sources.

2.2 Manitoba Provincial Dose Limits:
In Manitoba, federal occupational dose limits for radiation workers, the public, technologists-in-training, and students are followed as listed in Table 1. The Department of Radiation Protection, CCMB, also sets formal prospective whole-body dose constraint investigation levels as listed in Table 2.

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Table 1: **Federal** radiation dose limits for radiation workers, the public, technologists-in-training, and students.

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.

Table 2: Manitoba Provincial formal prospective whole body dose constraint investigation levels for radiation workers, the public, technologists-in-training, and students.

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	6	1
Whole Body	Effective Dose	Quarterly	1.5	1

Radiation Protection will provide an informal investigation with an NDS dose greater than 1.0 mSv but less than 1.5 mSv in a wearing period. Any dose less than 1.0 mSv in a wearing period will not result in an investigation (formal or informal).

3.0 Personal Dosimeters

3.1 Owner's Responsibility

Manitoba Regulation 341/88 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".[3]

All x-ray operators (and those who routinely participate in radiological procedures) 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[2] as specified in Table 1.

3.2 National Dosimetry Services[4]

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

- The inLight Nova dosimeter (whole body and head/neck dosimeter use Optically Stimulated Luminescence (OSL) technology to monitor exposure to x-ray, beta, and gamma radiation.
- Wearing periods available: Quarterly (4 shipments per year), monthly (12 shipments per year), and semi-monthly (24 shipments per year).
- Reporting threshold 0.10 mSv
- The InLight 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 release some of the stored energy as light. The amount of released light is measured and used to determine the radiation exposure received by the dosimeter's user during the wearing period.

3.3 National Dosimetry Registry[5]

- The National Dosimetry Registry (NDR) contains the dose records of individuals who are monitored for exposures to ionizing radiation in their work environment.
- NDR is Canada's national repository for radiation dose records of Canadian workers.
- 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.

4.0 Requesting Changes to Dose-Related Information (NDR)[6]

4.1 To request a dose change (due to an erroneous dose) to a dose record, users/workers must seek regulatory approval with Radiation Protection, CCMB. This is achieved by notifying Radiation Protection, CCMB, via email of intent to request a dose change CCMBMPX-rayCompliance@cancercare.mb.ca.

4.2 Radiation Protection, CCMB, will conduct an investigation of the event that has prompted a request for a dose information change. As part of the investigation, the user/worker shall prepare a letter stating:

a) Reasons for requesting the dose information change.
b) Description of the circumstances and time frame involved.
c) Calculations to support the request, when applicable.
d) Other relevant information, as determined by Radiation Protection, CCMB, such as the person's work and dose history.

4.3 Radiation Protection, CCMB, on behalf of the user/worker will send appropriate documents to the dosimetry service requesting dose change to be made. This action does not guarantee approval of the dose change.

4.4 If dose changes are approved or refused, copies of the letter are sent to the user/worker and the National Dose Registry by the dosimetry service (NDR adjusts the dose record if approved).

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

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[1]ICRP ICRP

[2]Safety Code 35 Safety Code 35

[3]Manitoba Regulation 341/88 R Manitoba Regulation 341/88 R

[4] National Dosimetry Services National Dosimetry Services

[5] National Dosimetry Registry National Dosimetry Registry

[6] Guidelines for Making Changes to Dose-Related Information in the National Dose Registry Dose-Related Changes in NDR