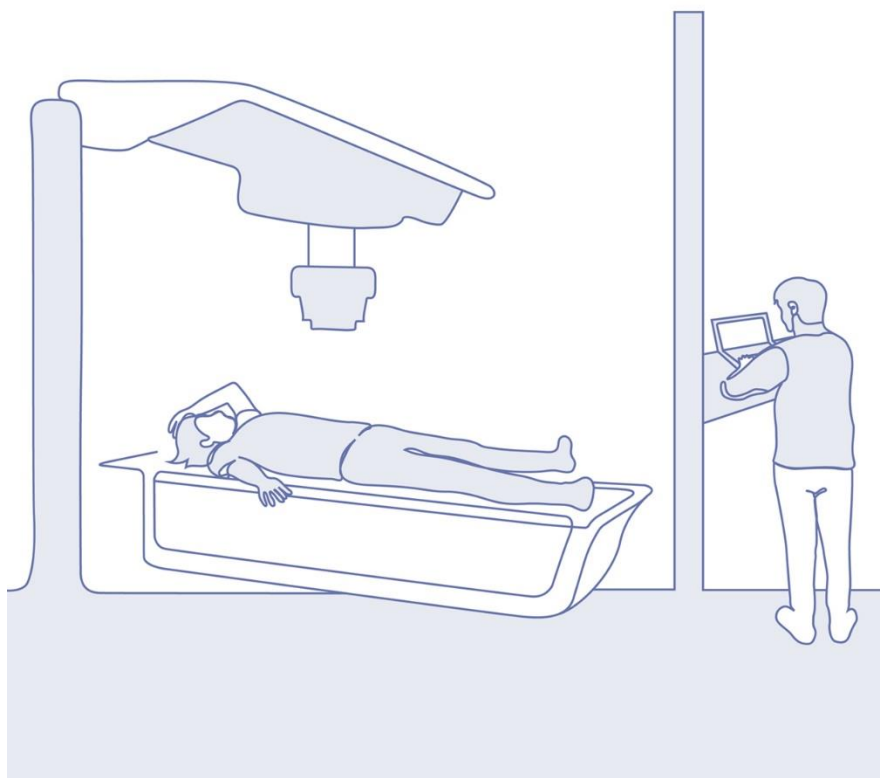


Exposure Control Plan for Ionizing Radiation



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Purpose

To protect health care workers in this clinic from ionizing radiation hazards, including X-rays and/or computed tomography (CT) scans, by ensuring compliance with WorkSafeBC regulations and keeping exposure levels as low as reasonably achievable (ALARA).

Responsibilities

Physician employer:

- Ensure proper installation, operation, and maintenance of the equipment producing ionizing radiation.
- Ensure proper implementation of this exposure control plan (ECP) in the clinic.
- Provide necessary training, equipment, and resources.
- Review this ECP annually and update it accordingly.

Supervisor/Manager:

- Monitor compliance with safety procedures.
- Ensure workers are trained and equipped to follow safe work practices.

Workers/Staff:

- Adhere to the procedures outlined in this plan.
- Use personal protective equipment (PPE) as required.

Risk Identification and Assessment

Risk Identification:

- Sources of Exposure: Diagnostic X-ray machines, portable X-ray units, and CT scanners.
- Affected Individuals: Radiation-emitting equipment operator (e.g., radiologist or radiology technician).
- Potential Risk: Acute and chronic radiation exposure can lead to health effects.
 - Acute exposure occurs when a large dose of radiation is received in a short period, usually due to equipment malfunction. It can cause radiation burns, hair loss, radiation sickness, and, in extreme cases, acute radiation syndrome (ARS).
 - Chronic exposure occurs when workers are routinely exposed to smaller doses of ionizing radiation, typically from diagnostic sources like X-ray machines and CT scanners, increasing the risk of cancer (e.g., leukemia, thyroid cancer), cataracts, thyroid dysfunction, and reproductive health problems.
- Exposure Limits:
 - Staff exposure to ionizing radiation must not exceed an effective dose of 20 millisieverts (mSv) over 12 consecutive months, and a limit of 4 mSv for the remainder of the pregnancy for pregnant staff.

Risk Assessment:

- A radiation safety program is in place, and radiation protection surveys are conducted by a qualified expert (medical physicist or radiation safety officer) at least every four years.
 - These surveys should also be conducted when acquiring new X-ray equipment, relocating or modifying existing equipment, suspecting high worker radiation exposure, or addressing renovations or damage to radiation safety barriers.
- Equipment operators must monitor their individual radiation exposure regularly to ensure it stays within legal limits.

Risk Control

The hierarchy of controls implemented is as follows in priority of most effective to least effective. PPE should be used in conjunction with engineering and administrative controls.

Engineering

- The room containing radiation-emitting equipment is equipped with shielding materials, such as lead, concrete, or gypsum wallboard, to reduce radiation levels in both controlled and uncontrolled areas to the recommended dose limits.
- Protective shielded screens (either movable or fixed) are used to shield workers from radiation exposure during imaging procedures.
- Collimation is used to narrow the X-ray beam, reducing radiation exposure.
- Radiation-emitting equipment is regularly calibrated and maintained by authorized personnel.

Administrative

- A warning sign featuring the X-ray symbol and the words "Unauthorized Entry Prohibited" is posted on the door of the room containing radiation-emitting equipment.
- Warning lights have been installed outside X-ray rooms to alert clinic staff and prevent entry during imaging procedures.
- Personal dosimeters must be worn by all equipment operators in the clinic.
- Personnel must keep as far away from the X-ray beam as practicable.

Personal Protective Equipment

- A lead apron is provided to the equipment operator and must be worn during imaging procedures. Protective lead aprons must provide at least 0.25 mm lead attenuation for peak X-ray tube voltages up to 100 kV, and at least 0.35 mm for voltages over 100 kV but less than 150 kV.
- A lead thyroid collar is available to be used if required.

For your information: The thickness of the room shielding material and regular equipment maintenance are determined according to the applicable code recommendations ([Health Canada Safety Code 35](#)).

Safe Work Practices

- All persons must leave the room during operation, except for the patient and the operator.
- PPE should be visually inspected before each use. If cracked or damaged, remove the PPE immediately, tag it out of service, and report to your manager for proper disposal.
- All personnel must use available protective devices (i.e., lead aprons).
- Entrance doors to an X-ray room must be closed when machine is in operation.
- Energized radiation-emitting equipment must not be left unattended.
- The irradiation should be controlled by the equipment operator from the control panel located in a shielded area. Operators should remain in the shielded area during imaging.
- Holding devices should be used to support weak patients or comfort children. If parents or others assist, they must be provided with protective aprons and gloves and positioned to avoid the X-ray beam.

Health Monitoring

Operators of ionizing radiation-emitting equipment in the clinic must have their radiation exposure monitored with personal dosimeters and submit their dosimeters for analysis. The [National Dosimetry Services \(NDS\)](#) monitors ionizing radiation levels for Canadian workers, including our clinic's equipment operators. These services are regulated by the [Canadian Nuclear Safety Commission \(CNSC\)](#) and provincial authorities to ensure safety limits are not exceeded.

Training

All staff must complete radiation safety training before operating or working near radiation-emitting equipment. There is a free certified course on LearningHub for radiation safety training (Course #9947: [Radiation Safety Basics](#)). Staff must recertify every three years.

Documentation

- Radiation surveys are conducted according to the applicable Health Canada Safety code, and the records are kept for at least 10 years.
- Records of equipment maintenance are kept in maintenance logs for at least 10 years.
- All personal dosimetry records are maintained for the lifetime of the facility.

References

- [WorkSafeBC Occupational Health and Safety Regulation 7.17-7.25](#)
- [Health Canada Safety Code 35: Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities \(2024\)](#)
- [NHMSFAP X-ray and Radiation Safety Standard – College of Physicians and Surgeons of British Columbia](#)

Approval

Employer/Manager:	Date:
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