

Radiation Safety

Ontario Regulation 861, *Occupational Health and Safety Act*

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Purpose

The purpose of this Legislative Overview is to provide veterinarians who own and operate x-ray equipment with information about the expectations and requirements contained in Regulation 861 under the *Occupational Health and Safety Act*.

Overview of Ontario Regulation 861 - X-Ray Safety

The *Occupational Health and Safety Act (OHSA)* provides the framework to ensure that workplaces in Ontario are safe and healthy. It sets out the rights and duties of both employers and employees and through regulations establishes specific requirements for managing workplace hazards.

The *OHSA* and its accompanying regulations are administered by the Ministry of Labour (MOL). There are 25 regulations under *OHSA* that address risks related to specific professions, work settings and workplace hazards including Regulation 861 X-ray Safety.

With limited exceptions for facilities under the *Healing Arts and Radiation Protection Act* (Ontario) and the *Atomic Energy Control Act* (Canada), Regulation 861 applies to every owner, employer, supervisor and worker at a workplace where an x-ray machine is present or used in Ontario. The objective of Regulation 861 is to minimize the risk of exposure for anyone involved in taking and processing radiographs and for anyone who may be exposed to radiation (i.e., veterinarians, staff, clients, the public and animals).



Relevance for Veterinary Practice

In addition to setting general standards for the installation and operation of x-ray machines, Regulation 861 describes specific requirements for veterinary practice. These regulations complement requirements set out by the College in the *Accreditation Standards for Veterinary Facilities in Ontario*.

Under the *OHSA*, inspectors from the MOL have broad powers to inspect, investigate, order compliance and initiate prosecutions. From time to time, based on risk assessments, the Ministry conducts blitz inspections and in the past, veterinary dental x-ray facilities have been the subject of these inspections.

Under Regulation 861, the following expectations are described for employers:

- Register with the MOL all x-ray equipment used in the workplace using the approved form.
- For equipment that will be installed in a permanent location including x-ray equipment designed for portable or mobile use that will be used regularly in one location:
 - Apply for and receive approval from a MOL inspector before installing or operating x-ray equipment using the approved form with the required plan location drawings.
 - Install the x-ray equipment in accordance with the accepted application.
 - Notify and receive approval from a Ministry of Labour inspector for any changes to the equipment made after the installation that may result in increased exposure of a worker to x-rays (e.g., a change in the installation or use of the x-ray equipment; use of rooms or areas adjacent to the x-ray equipment or shielding of the x-ray equipment).
- For x-ray equipment designed for portable or mobile use and that is so used:
 - Provide written notice to the MOL including the required information about the facility and equipment.
- Designate a person who has the knowledge, training or experience, to train and direct staff on the safe use of x-ray equipment and provide the name of that person to the MOL.



- Inform employees, at the time of hiring, who may be exposed to x-rays that they may be exposed to radiation, the limits imposed in regulation on dose equivalents that may be received and for female workers, the dose equivalent limits for pregnant workers.
- Retain a record of all employees who may be exposed to x-rays.
- Ensure that exposure to radiation is as low as reasonably achievable and does not exceed the annual dose equivalent limits as prescribed in the regulation.
- Ensure that all reasonable precautions are taken for pregnant workers so that the mean dose equivalent received by the abdomen does not exceed limits set in regulation.
- Post or install x-ray warning signs and devices throughout the facility and on equipment as required by the regulation.
- Provide appropriate controls (e.g., barriers, locks, interlocks) to limit access to x-ray areas.
- Ensure that dose equivalent limits are not exceeded by installing structural or other shielding and providing diaphragms, cones, adjustable collimators or other devices.
- Provide each worker who may be exposed to radiation with a personal dosimeter, ensure it is read accurately to measure the dose equivalent received by the worker and provide the worker with the reading.
- Record all dosimeter readings.
- Retain the dosimeter records for at least 3 years.
- Notify an inspector at the MOL, in writing and within a reasonable time frame, when the reading of a personal dosimeter indicates that the dose equivalent does not appear reasonable and appropriate.

Under Regulation 861 the following expectations are described for employees:

- Use personal dosimeters as instructed.



Under Regulation 861, the following expectations are described for every x-ray machine used to examine animals:

- Perform, where practicable, x-ray examinations in a designated room.
- Ensure air kerma due to leakage radiation does not exceed limits as defined in the regulation.
- Limit exposure duration by using a pre-set timing mechanism initiated by a switch.
- Restrict dimensions of the useful beam to not more than those of the film.
- Do not hold film cassettes by hand during an exposure.
- Restrain or support, by mechanical means, any animal that is being x-rayed.
- Ensure that all staff wears appropriate protective aprons and gloves when restraining or supporting animals during exposure.
- Maintain a record of all radiographic exposures including the date, kilovoltage, tube current and duration of exposure.
- Retain records of exposures for at least one year.



Frequently Asked Questions

The following questions and answers are intended to provide veterinarians with additional information regarding use of X-ray equipment by veterinarians:

Where can I access the MOL forms for registering to operate x-ray equipment and application for review of permanent x-ray location?

Forms are available from the Ministry of Labour, Training and Skills Development – Occupational Health and Safety Branch.

I am planning to replace my current x-ray equipment. Do I need approval from the MOL to install and operate the new equipment?

Any change to permanently installed X-ray equipment must be reviewed and approved by a MOL inspector.

Are hand-held dental x-ray units permitted in veterinary facilities?

No. Hand-held x-ray equipment does not meet the requirements of the Radiation Emitting Devices Regulation and is not permitted in Canada.

Are portable or stand-mounted dental x-ray units permitted in veterinary facilities?

Portable or mobile x-ray equipment is permitted in mobile facilities. In veterinary hospitals and clinics that are located in permanent facilities, the MOL generally expects that portable or mobile x-ray equipment is permanently installed in the treatment room used to provide dental care. A veterinarian who does not wish to permanently install such equipment may submit plans for approval along with sufficient documentation of safety mechanisms, equipment and procedures. An inspector will determine if safety standards will be maintained before approving installation of the x-ray equipment.

I operate a mobile facility and provide x-ray services using a portable machine. Do I have to register with the MOL and receive approval to operate the equipment?

A veterinarian operating a mobile x-ray service must be registered with the MOL (Form 1 Application for Registration) but is not required to submit Form 2 (Application for Review of Permanent x-ray Location). The veterinarian must provide the following information in writing to the Ministry: name and



address, registration number, location where the equipment is normally stored, purpose for using the equipment, make/ mode/serial number of the equipment and maximum operating voltage and current.

Are the requirements for installation of dental X-ray machines the same as for other x-ray machines?

Yes, dental x-ray machines must meet the same installation requirements as other x-ray machines. The MOL website provides helpful information about the installation of dental x-ray machines that you may want to review.

Where can I find information on the annual dose equivalents?

Annual permissible radiation exposure limits for x-radiation are set in accordance with the International Commission on Radiological Protection recommendations. Maximum permissible levels are established for both radiation workers (individuals who are exposed to radiation during the course of their work) and others (staff, clients, public). The current exposure limits are set out in the Schedule to Regulation 861.

I hired a new veterinary technician who will assist with x-rays. How can we monitor any previous exposure to radiation to ensure annual dose equivalents are not exceeded?

All employers who use x-ray equipment are required to record employees' dose exposures accurately. When a dosimeter is submitted for reading to the dosimeter provider, the readings are submitted to both the employer and the National Dose Registry. The cumulative information is retained by the Registry and is accessible by the employee based on their personal information provided by the employer, usually a social insurance number.

How do I dispose of lead aprons and gloves?

Lead aprons and gloves are considered hazardous materials. A veterinarian should use approved waste carrier companies to transport and dispose of hazardous materials.

Can a veterinarian take an x-ray of a human being (e.g., a horse steps on an auxiliary's foot)?

No. The Healing Arts Radiation Protection Act governs the operation of x-ray equipment on humans. Veterinarians are not included in the list of persons who are authorized under the Act to prescribe x-



rays of humans. x-ray equipment used on humans must meet the standards defined in the regulations including approval by the Ministry of Health and Long-Term Care.

Legislative Authority

Occupational Health and Safety Act, R.S.O. 1990, c O.1

R.R.O. 1990, Reg. 861, X-Ray Safety (*Occupational Health and Safety Act*)

Radiation Emitting Devices Regulations, C.R.C., c 1370, Part II, Design Standards, s. 2(1)(c)
(*Radiation Emitting Devices Act*)

Resources

The following can be found at the College's website at cvo.org:

Accreditation Standards for Veterinary Facilities in Ontario

The following additional resource may be helpful:

Veterinary Dental X-Ray Machine Installation, Health and Safety Guidelines, Ministry of Labour

College publications contain practice parameters and standards which should be considered by all Ontario veterinarians in the care of their patients and in the practice of the profession. College publications are developed in consultation with the profession and describe current professional expectations. It is important to note that these College publications may be used by the College or other bodies in determining whether appropriate standards of practice and professional responsibilities have been maintained. The College encourages you to refer to the website (www.cvo.org) to ensure you are referring to the most recent version of any document.