Guideline for Determining the X-ray Shielding Requirements for a *Small Animal Veterinary Facility*



This guideline may be used to determine the shielding required for a new installation or when modifying an existing one, provided the following criteria apply to the installation. Before using the guideline, first read the Explanatory Notes provided. If the following Criteria do not apply, contact Radiation Protection, Environmental Health Services office for assistance. Note: the shielding specified in this guideline is to protect workers outside the x-ray room to the WorkSafeBC Action Level (1 mSv/year) rather than to the Exposure Limit (20 mSv/year). *Owners wishing to shield to an exposure level greater than 1 mSv/year outside the room should not use this guideline and should be aware of the regulatory implication if the Action Level is or may be exceeded.*

<u>Criteria</u>

- The x-ray unit is operated at up to 100 kVp and is equipped with a beam-limiting device.
- The room containing the unit has dimensions of at least 2.5m x 3m
- The x-ray workload (number of exposures) per work week does not exceed 40 and the useful x-ray beam is directed vertically down towards the floor. This workload allows for up to two horizontal (cross-table) exposures per week, provided the x-ray beam is directed either to a wall located at least 2.5m from the x-ray tube or to a wall beyond which there is partial occupancy (see definition below) or where there is no occupancy.
- The maximum film size (cassette size) is 35cm x 43cm (14" x 17"); smaller cassettes are normally used.
- Shielding is required to provide protection outside the room, (a) for workers, to meet the Action Level of 1 mSv/year, as specified in the WorkSafeBC's <u>Occupational Health and Safety Regulation</u>, and (b) for the general public to not exceed the recommended public dose limit of 1 mSv/year.
- Occupancy beyond barriers: the shielding required (see over) takes into account the amount of time (occupancy) spent by persons outside the barriers (i.e. walls/doors):
 - <u>Full occupancy</u> applies to areas occupied by workers or other persons for a total of more than 30 minutes per day, and applies to adjacent rooms and tenanted facilities.
 - <u>Partial occupancy</u> applies to areas occupied by workers and other persons for a total of no more than 30 minutes per day, and applies to areas such as adjacent stairwells, parkades and parking lots, lanes, gardens and infrequently used rooms (storage). Areas that can be converted from <u>Partial Occupancy</u> to <u>Full</u> Occupancy (e.g. from storage to office) should be considered as <u>Full Occupancy</u> for shielding requirements.
- Workers directly involved in taking x-rays and holding small animals must wear appropriate protection (e.g. lead aprons/gloves) to ensure that their doses do not exceed the maximum permissible doses for the whole body, hands and other organs/tissues and that doses are kept as low as is reasonably achievable.
- Unexposed x-ray film is stored in a film bin lined with 0.8mm (2 lb/ft²) thickness of lead or kept outside the x-ray room prior to use.
- If the facility has accessible areas (e.g. rooms) above and/or below the x-ray room, protection for these areas must be provided in the intervening floors (see over). For confirmation of construction material requirements for the intervening floor, above and/or below the x-ray room, please refer to the current BC Building Code.

If your facility design and use meets the above criteria, you can use the shielding information (over) to determine the thickness of materials required for the barriers. Complete the assessment and provide a copy to the responsible person carrying out the installation.

N.B. Building plans are <u>NOT required</u> to be submitted to Radiation Protection, Environmental Health Services.

...over



For further information, please contact:

Radiation Protection | Environmental Health Services LL0073, 655 12th Ave W | Vancouver BC V5Z 4R4 T: 604.707.2442 | F: 604.707.2441 | E: rpsinfo@bccdc.ca

Guideline for Determining the X-ray Shielding Requirements for a Small Animal Veterinary Facility

(Area see Room Layout Diagram below)	Shielding Requirements up to 40 Exposures/Week	Check 🗹 one per Area
	Regular Drywall Construct	on: ½" = 1.6 lbs/ft ² 7.8 kg/m ² 5/s" = 2.2 lbs/ft ² 10.7 kg/m	2
Wall Labeled 'A' on diagram			
or	Full Occupancy (1 mSv/year)	2.5 cm (1") regular drywall construction	
	Partial Occupancy (1 mSv/year)	No shielding required	
Wall labeled 'B' on diagram			
or	Full Occupancy (1 mSv/year)	2.5 cm (1") regular drywall construction	
	Partial Occupancy (1 mSv/year)	No shielding required	
Wall labeled 'C' on diagram			
or	Full Occupancy (1 mSv/year)	2.5 cm (1") regular drywall construction	
	Partial Occupancy (1 mSv/year)	No shielding required	
Wall Labeled 'D' on diagram			
or	Full Occupancy (1 mSv/year)	2.5 cm (1") regular drywall construction	
	Partial Occupancy (1 mSv/year)	No shielding required	
Door			
or	Full Occupancy (1 mSv/year)	2.5 cm (1") solid wood or 1 mm (1/25") steel	
	Partial Occupancy (1 mSv/year)	No shielding required	
Flooi	r (room below)	No occupancy space below x-ray room – no shielding required	
or	Full Occupancy (1 mSv/year)	0.8 mm (2 lb/ft ²) lead sheet with minimum dimensions of 80 cm X 80 cm on x-ray table	
	Partial Occupancy (1 mSv/year)	2 mm (1/16") thick steel over table top	

*Note: For shielding installation requirements, see *Guideline & Checklist for Installation of Lead Shielding in a Diagnostic X-ray Facility*.



Small Animal Veterinary Practice Name & Address:

