RADIATION SAFETY

Although Cal/OSHA is not the primary regulatory oversight agency for radiation safety, radiation poses a health risk to employees and therefore Cal/OSHA does have some jurisdictional authority. The primary agency for radiation safety is the California Department of Public Health, Radiologic Health Branch.

Law Regarding Radiation Safety in Veterinary Practices

The California Code of Regulations, Title 17, Section 30314: Veterinary Medicine Radiographic Installations states:

(a) Equipment.

(1) The tube housing shall be of diagnostic type.

(2) Diaphragms or cones shall be provided for collimating the useful beam to the area of clinical interest and shall provide the same degree of protection as is required of the housing.

(3) The total filtration permanently in the useful beam shall not be less than 1.5 millimeters aluminum-equivalent for equipment operating up to 70 kvp and 2.0 millimeters aluminum-equivalent for machines operated in excess of 70 kvp.

(4) A device shall be provided to terminate the exposure after a pre-set time or exposure.

(5) A dead-man type of exposure switch shall be provided, together with an electrical cord of sufficient length so that the operator can stand out of the useful beam and at least 6 feet from the animal during all X-ray exposures.

(b) Operating Procedures.

(1) The operator shall stand well away from the tube housing and the animal during radiographic exposures. The operator shall not stand in the useful beam. If film must be held, it shall be held by individuals not occupationally exposed to radiation. Hand-held fluoroscopic screens shall not be used. The tube housing shall not be held by the operator. No individuals other than the operator shall be in the X-ray room while exposures are being made unless such person's assistance is required.

(2) In any application in which the operator is not located behind a protective barrier, clothing consisting of a protective apron having a lead-equivalent of not less than 0.25 millimeter shall be worn by the operator and any other individuals in the room during exposures.

(3) No individual shall be regularly employed to hold or support animals during radiation exposures. Operating personnel shall not perform this service except very infrequently and then only in cases in which no other method is available. Any individual holding or supporting an animal during radiation exposure shall wear protective gloves and apron having a lead-equivalent of not less than 0.25 millimeter.

Radiation Safety Tips

- Only individuals with radiation safety training are allowed to operate or assist with the operation of radiographic equipment. Radiographic equipment must be operated under the proper level of supervision:
  - RVTs – direct or indirect supervision by a licensed veterinarian
  - Veterinary Assistants – direct supervision of licensed veterinarian or RVT

- All efforts to avoid physical restraint of animals during the taking of radiographs are made to minimize human radiation exposure. Examples of alternative methods of animal restraint include chemical restraint or use of inanimate objects such as leashes, troughs, straps or sandbags. Physical restraint of animals is avoided except during emergency situations.

- All employees understand the health risks associated with radiation and pregnancy both verbally and in writing.

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- Individuals under the age of 18 years are not allowed in the x-ray room or in the vicinity of the x-ray machine at any time while it is in use. The practice should have a written policy to this effect that is given to all employees at the time of hire.

- No pregnant individuals should be allowed in the x-ray room or in the vicinity of the x-ray machine at any time while it is in use. The practice should have a written policy to this effect that is given to all employees at the time of hire.

- The operator must stand well away from the tube housing and the animal during radiographic exposure whenever possible. A “dead man” type of exposure switch must be provided along with a cord long enough to allow the operator to stand at least six feet from the animal during X-ray exposure. A “dead man” switch is defined as on which is “so constructed that a circuit-closing contact can only be maintained by continuous pressure by the operator.”

- All persons not behind a protective barrier must wear protective aprons with a lead-equivalent of at least 0.25 millimeters. (0.5 mm lead equivalent is preferable.) The value of each protective garment should be stated on a hem or cuff label. If not behind a protective barrier or wearing protective equipment, persons must stand at least six feet away from the primary beam during the exposure. Protective garments can include: lead gowns, lead gloves, lead thyroid shields, and radiation protective goggles.

- All personal protective equipment should be inspected on a routine periodic basis for damage or weaknesses which could result in radiation exposure to employees. Records of inspections should include the date, items inspected, deficiencies noted, and corrective actions taken, as well as the name of the inspector.

- The operator must keep all parts of his or her body out of the primary or useful beam during exposure, even if wearing protective equipment. (Lead garments only protect from scatter radiation and are insufficient to provide protection in the primary beam. 0.25 mm lead-equivalent material would only reduce the exposure to 100 kVp by 51%.)

- The primary X-ray beam must be collimated to the area of interest.

- Hand-held fluoroscopic screens and film cassettes must not be used.

- The tube housing cannot be held by the operator (including portable units.)

- No individuals other than the operator can be in the X-ray room while exposures are being made unless that person's assistance is required.

- No individuals shall be regularly or solely employed to hold or support animals during radiation exposure.

- All employees shall know where Title 17 of the California Code of Regulations can be accessed.

- All employees shall know where the circuit breaker box that powers the X-ray machine is located and how to shut down the machine in an emergency.

- All non-RVT and non-DVM employees who assist in the taking of radiographs shall be given a VMB Radiation Safety Guide and pass the quiz included in the guide. The guide can be accessed in the Licensee section of the VMB website: vmb.ca.gov

- All staff taking or assisting in the taking of radiographs shall wear a radiation dosimetry badge at the thyroid level.

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RADIATION SAFETY QUESTIONS

What equipment is available for restraining animals to minimize human radiation exposure during the taking of radiographs?

How does the radiation machine work and how can the settings be adjusted to minimize radiation exposure to employees?

What personal protective gear is available for employees who take or assist in the taking of radiographs, how is it worn and where is it stored?

What is the minimum distance that radiographers should stand away from the patient when radiographs are being taken?

What are the emergency shut down procedures for the X-ray machine?

Who can employees report radiation exposure questions or concerns to in the practice?

ADDITIONAL TRAINING RESOURCES

CVMA Radiation Compliance Kit: This kit contains sample policies, required posting, and training documents that comply with state regulatory requirements. It can be accessed at www.cvma.net in the “Products” section.

VMB Radiation Safety Training Guide: This guide and quiz may be given to and completed by all unlicensed staff who take or assist in the taking of radiographs. It can be accessed in the “Licensee” section of www.vmb.ca.gov

CDPH Radiologic Health Branch Radiation Safety and Protection Program Requirement Guidance can be accessed at: https://www.cdph.ca.gov/pubsforms/forms/Documents/RHB-Guide-RadProtectionProgram.pdf

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