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# Operation Control (Radiation management Plan)

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# 1. Purpose

This document is produced to identify the process of managing radiation at a workplace.

## 1.1. Scope

This document is applicable to all departments of Vets for Pets.

## 1.2. General Requirements

1. All concerned personnel are responsible to ensure that work is carried out in compliance with this procedure.
2. Practice manager shall ensure that development, review, and improvement of this procedure is conducted at least once every year.
3. Development, review, and improvement of this procedure must be done in consultation with management team and vets.
4. This procedure to be documented and recorded as per the hospital document control procedure.
5. The use of radiation in the clinic is justifiable, no radiation exposure practices are undertaken unless they provide sufficient benefit to the exposed individuals to offset the radiation detriment the procedure poses.
6. The use of radiation exposure is minimised yet optimised to ensure the best outcome for minimal exposure levels possible.



## 2. Plan

### 2.1 Radiation Hazards present on the premises

1. X-ray machine (details) radiation leakage.
2. Exposure of personnel or the public to radiation x-ray beam.

### 2.2 Xray machine Care and Maintenance

It is the responsibility of the practice manager under the guidance of the practice owner to ensure that all radiation producing equipment in the clinic is serviced and regularly calibrated according to manufacturer's recommendations and legislative requirements.

When not in immediate use, the x-ray machine must be kept turned off at both the machine switch and unplugged at the power point.

This will ensure inadvertent discharge of the x-ray tube cannot occur. Personal protective equipment must be hung on hangars and stored without folding at all times.

### 2.3 patients control

This is a direct responsibility of the veterinarian in charge of the procedure on the day.

- The animal should be identified by the cage card located on its cage and verified by the veterinarian in charge prior to the procedure being undertaken.



- The veterinarian in charge is responsible for formulating the radiography views to be taken and must check that the correct area is being targeted by the x-ray beam.
- The animal shall not be held for radiography except in exceptional circumstance when other means of immobilisation are not practicable e.g. due to the severity of the clinical condition of the animal.
- Immobilisation should be achieved by mechanical means, or by tranquillisation or anaesthesia to eliminate or reduce the radiation hazard from manual restraint and assist in the reduction of image blurring due to movement of animal. Refer to (1.8 use of ancillary equipment and animal restraints).
- If mechanical means, tranquillisation or anaesthesia is not possible, the animal shall be restrained by the minimum number of persons necessary, personnel must be positioned such that they are outside the exposure area as far as practicable but such that they can visually monitor the animal for movement during the procedure. This is vital to ensure no movement during the exposure and to ensure appropriate radiographs are taken (inspiratory/expiratory etc). No part of any person shall be in the primary X-ray beam.
- Persons holding the animal shall wear protective lead aprons and lead gloves. Refer to (1.7 Personal Protective Equipment).
- Between exposures, a staff member (registered veterinarian, veterinary nurse or trainee under supervision) must be available to return to the animal's side to monitor its vital signs (especially important if under sedation or anaesthesia) and to provide comfort if conscious.

## 2.4 Calculation of Radiographic Doses

- Prior to taking radiographs, the positioning for the x-ray and the exact location on the animal should be entered into the x-ray computer and these doses used to set the x-ray machine dosage parameters.
- The dosages must be checked by the veterinarian and adjusted by the veterinarian if required.



## 2.5 Shield

- Shielding includes (but is not limited to):
  - Personal protective equipment (see below)
  - Use of walls as barriers between exposed areas and personnel. Currently the walls at Glenfield Veterinary Hospital do not provide a lead barrier but are situated more than 1m from the primary beam in all directions with regard to clinic personnel. (CHECK)
- All non-essential personnel to be outside the x-ray room during exposure as far from the direction of the primary beam, the x-ray housing and the animal as possible.
- The x-ray beam must be collimated to ensure that the minimum area of the animal required for diagnostic radiographs is exposed and no extraneous areas are exposed.
- Radiology procedures: The vet must ensure-
  - No exposure is made until the animal is fully restrained and positioned
  - Avoidance of repetition of radiographs is paramount as much as is practicable
  - X-ray tube assembly is rigidly supported and no person is required to hold the x-ray tube assembly or the cassette (unless required position cannot be otherwise achieved).
- A warning sign must be placed on the control panel warning of hazardous radiation emitted when in operation and prohibiting unauthorised use. (B4.2)

## 2.6 Training, Supervision and Qualification

- All staff members (both paid and voluntary) must undergo safety and radiography machine usage training according to the clinic's



radiography training protocol before being allowed to participate in radiography.

- A registered veterinarian must be in charge of and present at each radiography session.
- Assistance can be provided by veterinary staff who are gainfully employed by the clinic or training as such in the clinic who have undergone the clinic's radiography training program under the guidance of the practice manager and/or practice owner.
- No trainee staff member will be allowed to participate in radiographic imaging unless under the direct supervision of a registered veterinarian or cert IV qualified veterinary nurse.

## 2.6 Personal Monitoring Device (PMD)

- According to the (Radiation Control Regulation 2013) small animals veterinary hospitals are exempted from the usage of PMD. Refer to: <https://www.legislation.nsw.gov.au/#/view/regulation/2013/52>

## 2.7 Personal Protective Equipment

Any person involved in the taking of radiographs must ensure that they are minimising their own personal risk of exposure, and that of other personnel and the public in the clinic.

- Operator- the operator positioning the animal and restraining the animal (if necessary) must wear the following PPE during the procedure:
  - Lead apron covering thoracic cavity, abdomen and upper legs. The apron must completely cover the front areas noted and must be adjusted using the waist strap to fit snugly on the wearer.



- Thyroid protector- must be worn and firmly closed around the neck as per manufacturer's instructions.
- Lead gloves must be worn whilst in the radiography room during the taking of x-rays.
- PPE must be stored without folding or creases, eg on a hanger to prevent damage or weakening of its protective abilities.
- Assistants and all personnel not required in the radiography room must stand as far as possible from the direction of the primary beam, the x-ray housing and the animal.
- Persons should not restrain animals for radiography except in exceptional circumstances (as medically required).
- Immobilisation of animals for radiographs must be via mechanical or medical means (sedation/anaesthesia) wherever practicable.
- Persons under the age of 18 must not hold animals during radiography procedures (a notice stating this must be maintained in the x-ray room).
- During radiography, pregnant women must remain at least 2m from the edge of the beam and must not hold animals during the procedure (a notice stating this must be maintained in the x-ray room).
- When multiple radiographs are to be taken over a period of time, care should be taken to ensure that the same personnel are not continually involved in the procedures.
- Care must be taken when deciding on clinically relevant radiographs to take and when positioning the animal and setting exposures to ensure that the repetition of radiographs is minimised to limit exposure of personnel and the animal.
- The practice manager is responsible for ensuring the PPE is tested regularly for effectiveness (at least every 12 months) (B4).

## 2.8 Radiation Incident

The most likely radiation incidents in the current environment of Glenfield Veterinary Hospital include (but may not be limited to):



- Accidental exposure of personnel due to failure to wear personal protective equipment. All staff should be actively seeking to monitor the personnel during x-rays to ensure this does not occur. If this event occurs, the staff member involved must immediately report the incident in person (or via phone) and in writing to the practice manager.
- Accidental exposure of personnel during handling of an animal during radiography. As above.
- Accidental exposure to the public. All staff members must ensure that non-staff members are not allowed access to the radiography area during radiography procedures. Signage in the clinic must be maintained noting “staff only” areas.
- When pressing the exposure button on the x-ray machine, personnel are to call “x-ray” immediately prior to exposure as a warning to all persons in the clinic at that time.
- The practice manager is responsible for all reporting of radiation incidents to the practice owner and relevant authorities (as required by law).

## 2.9 Emergency Response to Radiation Incident

In the unlikely case of a radiation accident/incident where radiation leakage occurs from the x-ray machine, staff are to close the door to the radiation room and turn off the air conditioner in the room, isolate any affected person and immediately phone emergency services (on 000) for advice and describe the incident in detail, noting any human exposure.

The practice manager must be contacted immediately in person or via phone and at a later time in writing.

It is the responsibility of the practice manager under the guidance of the practice owner to organise all paperwork as required and to meet all regulatory requirements with regard to this event.



All staff members (both paid and voluntary) are required to fully cooperate in any investigation or provide any information required in an investigation of the situation (as limited by law).

## 2.10 Reporting of Faults in radiation Equipment

All suspected faults must be immediately referred to the practice manager in person or via phone and in writing.

It is the responsibility of the practice manager to organise for inspection and repair of the equipment as required and to meet all regulatory requirements with regard to this event.

## 2.11 Storage and disposal of radioactive materials

At the time of writing (February 2018), Glenfield Veterinary Hospital does not use chemotherapeutic agents or radiation treatment therapies and as such should have no known need to store or dispose of radioactive materials. This statement is to be reviewed as circumstances dictate.

## 2.11 Review of the Radiation Management Plan

The radiation management plan will be reviewed on Feb 2019 by the practice manager and a registered veterinarian on staff as per the current relevant legislation and safety recommendations.

## 2.11 Review of the Radiation Management Plan

This plan is written in accordance with recommendations in the Safety Guide for Radiation Protection in Veterinary Medicine (2009) which is a supplement to the Code of Practice for Radiation Protection in Veterinary Medicine (2009). Suggestions for areas to address are taken from Schedule A1 of said guide.



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