



Radiation Safety Case Study

QUEENSLAND VETERINARY SPECIALISTS

Images courtesy of Queensland Veterinary Specialists

Radiation safety made simple: Essential tips for your Small Animal Practice

How do real-life practices keep their teams and patients safe during diagnostic imaging? VET.CT sat down with leading clinics to uncover practical, everyday tips that make radiation safety simple and effective.

Established in 1982, Queensland Veterinary Specialists (QVS) is a private, specialist veterinary hospital in Australia. QVS has two Brisbane hospitals located in Stafford and North Lakes, with building underway to open an additional hospital on the Sunshine Coast in early 2025.

The team utilises the latest technologies to ensure the highest standard of care for its patients. The wide range of imaging services includes digital radiography, ultrasonography, CT and MRI. VET.CT sat down with Paul Robins, Imaging and Safety Manager (also a radiographer), and Donna Hancock, General Manager, to discuss how they implement good radiation safety in the practice.

Legal obligation

“In Australia, each state has its own radiation safety legislation. In Queensland, the rules are robust and it's a requirement to have a Radiation Safety and Protection Plan (RSPP) for any practice with equipment that can produce ionizing radiation. We've recently updated our plan, with the help of a physicist, so we could capture and reference the change from Computed Radiography to Digital Radiography, as well as any legislative changes. We are required to review the policy when there's any operational change and submit it to the Radiation Health Department of the Queensland Government for approval.”



X-PERT Radiation Safety Centre

Access VET.CT's best practice guides and downloadable toolkit to keep your practice, people and patients safe.

QVS

QUEENSLAND VETERINARY SPECIALISTS

VET·CT

Clinical Support Services



Radiation Safety and Protection Plan (RSPP):

"Whilst updating the policy, we took the opportunity to review the entire document. This included:

- reviewing processes with a focus on the practicality of radiographic technique.
- taking the advice of a physicist familiar with the legislation and to review factors such as shielding thicknesses.
- making it as succinct and readable as possible.
- ensuring it is robust and actionable - compliance is all or nothing; you can't apply part of the policy and be compliant.

Radiation Safety Officer (RSO):

"We are required to have an RSO, which is compulsory for any company that has equipment that produces ionizing radiation." The RSO must be qualified in Radiation Safety and certified through the Queensland Government. Ideally, the RSO should be onsite; at QVS, the role is filled by Paul Robins.

Licencing:

"There are several different licences that apply to the use of ionizing radiation in the veterinary industry and it's important to ensure you have the correct licences in place. These include X-ray for small and large animals, fluoroscopy and CT scanning. Part of Paul's role is to ensure the correct people have the correct licence and they do not energise any equipment they are not licensed for."

Training the team:

"We're also involved in organising training for the Specialist team, and we now have several Specialists who are licensed to use CT and fluoroscopy. The government regulates training, so we use external educators to provide the theory and then Paul provides the practical training and oversees the licensing. Ensuring the correct training and licences are in place is something we take very seriously. We also work with primary vets, helping them to improve the quality of radiography."



Machine preparation:

“Machine preparation is much simpler with modern machines - for example, we just calibrate the CT machine daily and it's ready to go. We restart all our machines each day as this reduces faults and errors in the computers. We have pre-programmed exposure settings for multiple sizes of patients - from a dachshund to a bull mastiff. This ensures consistency in our exposures and radiographic quality.”

Patient preparation:

“Imaging is typically very unpredictable day to day. We encourage the specialist teams to liaise amongst themselves to determine order and priority and present us with the list. Typically, the nurses will be involved in monitoring the patient after sedation or anaesthesia. The vets determine which modality to use - we tend to use MRI for spinal patients or those with neurological symptoms, as we have a high-field MRI on site. We generally use CT for thorax/abdomens and extremities, including arthrograms.



Our clinicians will also be planning whether they're likely to take the case for a further procedure following imaging, for example rhinoscopy following a head CT, and thinking about how to make the whole patient journey as smooth as possible.



Workflows:

“The patient is assessed by the vets for their suitability for imaging, and whether to use sedation or anaesthesia. Even a small amount of sedation can make it much easier to image a patient - just relying on positioning aids alone, such as sandbags, is often not sufficient to get good quality images.

“We do everything we can to avoid physically restraining patients by a member of staff. As a referral centre, patients who come to us are often clinically compromised, and we're very familiar with managing those critical cases. Even then, it's rare to see the use of physical restraint.”



QVS

QUEENSLAND VETERINARY SPECIALISTS

VET·CT

Clinical
Support
Services

The Imaging Suite:

“Our imaging rooms generally include:



Standard positioning aids

Variety of sandbags, ties, foam wedges and troughs.

01



Personal protective equipment (PPE)

Lead aprons, gloves, thyroid shields and lead goggles.

02



Helpful guides & Protocols

Positioning book for guidance on technique. Lead window for patient observation outside the room – staff are required, where possible, to leave the room during a radiographic exposure and never to be in the room during CT.

03



Lead shielding

Involving a physicist with calculation of shielding requirements and conservative planning to ensure good compliance with regulations.

04

“We ran tests with the physicist checking scatter radiation at different distances from the primary beam, and then we checked it from behind a lead apron. We found it corresponded almost exactly with what the textbook predicted, which was reassuring.

“We’re currently building a new hospital, so our physicist has the machine specs and expected workflow to calculate the shielding. We’re very conservative when planning, rather than opting for the minimum and finding we need to add additional shielding later.”

Quality control:

"The machines automatically log and store all the images, and our system provides exposure feedback. With digital systems, operators may not know when they're taking incorrect exposures because the X-ray computer will adjust the image and make it look diagnostic. Paul teaches our team to keep watching the feedback score, and if it's outside the ideal parameters, we have a discussion as to why that is and how we can improve.

"All radiography team members are issued with radiation monitoring badges which are read quarterly. We have very strict government controlled guidelines for the maximum permissible dose per year. Radiation Health requires those records to be kept indefinitely.

"For occupational exposure, the total effective dose received should not exceed 100mSv over five years, but never more than 50mSv in one year. If people are higher than zero, this is investigated. I've never seen more than 1mSv in a quarter."



Setting the culture:

Paul came from human healthcare and has found that in the veterinary industry, people are generally more conscious about the risks of radiation and compliance tends to be good.

"We have all the PPE available and accessible so there is no excuse for noncompliance. In our team, we have also developed a culture to watch out for each other and to speak up if safety breaches are observed - this is reassuringly rare.

"For higher-risk team members, e.g. pregnant members of staff, ideally, we wouldn't have them taking x-rays. That said, we know the first trimester is the time of greatest risk and someone may not even be aware they're pregnant, so it's important to ensure exposure is always minimised for all team members and best safety practices are followed at all times. As soon as we're aware someone is pregnant, we advise them to stay out of the imaging room completely, if possible, to avoid any risk."

Take-home



"In summary, at QVS we take radiation safety very seriously. We ensure legal compliance, regularly review both radiation safety practices and image quality, and ensure ongoing training and licencing to keep our team members compliant and up to date.

"Having a culture where good radiation safety is the norm and being open and accountable to each other is key to ensuring we build and maintain good habits and best practices. Not only does this ensure we safeguard the health and safety of our team and patients, it also leads to better quality diagnostic images and more efficient workflows."