

**United States Nuclear Regulatory Commission**  
**Comments on NCRP Report 46-16, "Radiation Protection in Veterinary Medicine"**

1. Although there is a disclaimer in the beginning of the document (e.g., page 5 line11) that the radiation control program needs to be in compliance with all federal, state, and local regulations, guidance on the pages 18 lines 15-16, 57 lines 5-10, and 66 lines 2-3 may put licensees in non-compliance with NRC requirements because the dose limit for the maximally exposed person from a veterinary patient release is the public dose limit of 0.1 rem (1 mSv) per year. The human patient release requirements in 10 CFR Part 35 do not apply to veterinary medical licensees.
2. Page 10, Line 22 indicates radioactive decay, bio-distribution, and biological elimination will quickly change the radiation and contamination levels. This statement gives a false sense of radiological safety. The bio-distribution and biological elimination factors depend on the type of animal and its health. For example some cats given I-131 for hyperthyroidism retain 65% of the I-131 administered 72 hours later and others 20%. Recommend the sentence be changed to "After administration, radiation and contamination levels will be affected by radioactive decay, ..."
3. Page 10, Lines 26-28 reads, "Often contamination surveying can be done by taking a representative wipe of an area with a paper towel and checking the paper towel with a survey meter to determine if it picked up transferable contamination." The use of a paper towel to perform this survey would promote an inconsistent media. We would suggest some sort of more specific media, such as filter paper.
4. The discussion on pages 18 and 19 on occupationally-exposed employees does not recognize that some veterinary facility employees are members of the general public because their employment and duties do not meet the definition of an occupationally exposed worker.
5. In a number of places the document text appears to be lifted from medical use documents without editing for application to veterinary medicine. For example on page 19 the definition of visitors includes "patients." Veterinary "patients" are not members of the general public but their owners, care givers, animal control officers, or other individuals that bring them to the veterinarian may be. On page 20 the discussion about the x-ray suite in a hospital or clinical office building also seems to be more appropriate for medical use licensees. In other places common concerns associated with veterinary practices are not addressed such as contaminated bedding, litter, and runs and could be added to discussion of contamination control (3.2.1), radioactive waste (3.2.3) and other locations.
6. Although defined in 10 CFR Part 20, the section on sewers should clarify that sanitary sewers do not include sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee.
7. The document should discuss the availability of radioactive drugs and permanent radioactive source implantation procedures for "food animals." At the current time there are no approved radioactive drugs approved for "food animals" but discussion of where updates can be obtained would be helpful to clarify the situation and provide information if any are approved.

8. NRC has approved the Lixiscope for diagnostic medical use. If these devices are still being manufactured with I-125 sources, they could be used in veterinary practices to image small animals or leg bones of larger animals. Consideration should be given for discussing the Lixiscope or its handheld portable x-ray equivalents in section 5.2.
9. Current teletherapy units, both old and refurbished units, have mechanical and electro-mechanical clocks that are used to initiate treatment and terminate the treatment. These devices have a history of failing and inaccuracy. 6.1.2 indicates therapy equipment shall be examined for electric and mechanical functioning and 6.4.1 (page 49 line 9) indicates the timer at the control panel terminates the exposure. Due to the problems with the timers and the consequences of their failure, i.e., beams turning on unexpectedly and failure of the beam to turn off, there should be additional discussion on this item as well as the importance of properly functioning interlocks.
10. Section 6.5, "Brachytherapy," does not appear to discuss: 1) the use of brachytherapy sources in permanent implants, 2) monitoring bedding and litter for lost seeds, and 3) how new liquid and microsphere brachytherapy sources that are being introduced into human brachytherapy treatments could also be part of new techniques used in veterinary brachytherapy. Sophisticated veterinary cardiology practices may also introduce intravascular brachytherapy, so unique radiation safety considerations associated with this should also be included.
11. Page 51 line 1, indicates all sources should be tested for leakage prior to use, NRC does not require leakage test if the manufacturer has a certificate of leakage within the last 6 months and there is no obvious damage to the source or device.
12. The instructions (page 51, line 30) to use a scrub brush on contaminated skin be replaced with text similar to that on pages 60 lines 18-21 or 61 lines 22-29. It is preferable to take the soft approach and avoid internal contamination due to rough decontamination the term "scrub brush" may result in too vigorous an effort in spite of the caution not to abrade the skin.
13. Page 53 should include a discussion of need to monitor bedding and litter to insure sources are not lost.
14. Page 58, is the NRC recommending I-131 treated cats be washed or wiped down before release to remove contamination?
15. Page 26, discussion of waste disposal should specifically address bedding and litter since these may account for the largest volume of contaminated material.
16. Page 65, should be more explicit in saying radioactive waste may be transferred to waste brokers licensed to receive radioactive waste.

## Appendix C.2.

1. The appendix is too general. It should provide more quantitative information to explain ambiguous terms like “minimize,” “close contact,” “prolonged contact.” At radiation release levels accepted by some agencies “prolonged contact” could mean “minutes.” The information provided should enable the owner/care giver to appreciate the potential radiation levels surrounding the animal and the public dose limits the licensee must meet to release the animal. The general instructions should also address cleaning the animals bedding, chew toys, and other potentially contaminated items.
2. The statement that the pet will continue to “excrete small amounts” of radioactivity may be misleading - cats released with radiation readings of 0.5 mR/hr at 1 meter still contain approximately 2.5 millicuries to decay or be excreted.