


<b>Release of Radioactive Animal Patients</b>			
SOP NUMBER <b>EHS-SOP-RAD-700.01</b>	SUPERSEDES SOP (IF APPLICABLE)		
Latest Version Prepared By <b>Cade Register, RSO</b>	APPROVAL <b>Cade Register, RSO</b>	EFFECTIVE DATE <b>11/1/2023</b>	PAGE NUMBERING <b>Page 1 of 3</b>

**1. Purpose:** The purpose of this SOP is to provide guidance for the release of animal patients receiving brachytherapy or radiopharmaceuticals (diagnostic and/or therapeutic doses).

**2. Scope:** Veterinary Medicine staff should apply this SOP to all clinical animal patients receiving brachytherapy or radiopharmaceuticals at the MU Veterinary Health Center.

**3. Definitions:**

- 3.1** Brachytherapy – a medical procedure during which a sealed radioactive source (or sources) is implanted directly into a patient being treated for cancer.
- 3.2** Member of the Public – any individual, except when that individual is receiving an occupational dose. Members of the public, therefore, include bystanders, pet owners, family members, or other caretakers of the animal after it has been released from care.
- 3.3** Radiopharmaceutical – a pharmaceutical drug that emits radiation and is used in diagnostic or therapeutic medical procedures.

**4. Procedure Details:**


**4.1** An animal patient that has received a radiopharmaceutical or brachytherapy implant must stay in isolation for a predetermined amount of time. These stay times should be determined by the Permitted Individual and submitted for approval during the permit application process.

4.1.1 In general, isolation stay times may be determined as follows:

	Small animal			Large animal**
<b>Half-life</b>	> 24 hrs	> 24 hrs	< 24 hrs	< 24 hrs
<b>Activity</b>	> 1 mCi	≤ 1 mCi	any	any
<b>Stay Time</b>	48 hrs	24 hrs*	24 hrs*	48 hrs
*If the animal is to remain in the hospital for additional treatment, it will be released from isolation at 48 hours instead of 24.				
**Large animal administrations with half-lives greater than 24 hours are determined on a case-by-case basis.				

4.1.2 The Permitted Individual may determine that shorter or longer stay times are required on a case-by-case basis. This should be reflected in the permit application.

**4.2** When the isolation stay time is over, the animal patient cannot be released until a radiation worker ensures that the dose to members of the public from the animal for this procedure is within the limits of 10 CFR 20.1301 (see Appendix A for suggested release rates):

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4.2.1 The total effective dose equivalent to an individual member of the public from the licensed operation cannot exceed 100 mrem (1 mSv) in a year.

4.2.2 The dose in any unrestricted area from external sources cannot exceed 2 mrem (0.02 mSv) in any 1 hour.

**4.3** A release form must be completed for each patient and kept as a record. This form should include, at a minimum, the patient name, the date of administration of the radiopharmaceutical, the date of release, and the dose rate at 1 meter at release.

**4.4** Upon release of the animal patient, the owner/caretaker must be given written instructions that address, at a minimum, waste handling, contamination, human interaction, and isolation of the animal. The owner/caretaker should follow these instructions at home for a period of time that is based on the half-life of the radionuclide administered.

<b>Half-life of Radionuclide</b>	<b>Duration of Instructions</b>
0 - 10 hours	3 days
>10 hours - 20 hours	5 days
>20 hours - 30 hours	7 days
>30 hours - 50 hours	14 days
>50 hours	21 days

4.4.1 If an animal patient is re-admitted before the expiration of the written instructions, the veterinarian that administered the radiopharmaceutical must be alerted.

## 5. References:


5.1 NUREG 1556 Volume 7, Revision 1, Appendix D

5.2 Regulatory Guide 8.39 Revision 1

5.3 10 CFR 20.1301

## 6. Revisions

6.1 Rev 01 – 2023-11-1 – New SOP.

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## Appendix A – Suggested Dose Rates at 1 meter for the Release of Animals (assume that 1 R = 1 rem)

The animal patient can be released when the dose rate at 1 meter from the animal is 2 mrem/hour or less for all radionuclides administered except for the following:

Radionuclide	Half-life (days)	Release Dose Rate @ 1 meter (mrem/hr)
Cr-51	27.704	0.4
I-125	60.14	0.2
I-125 implant	60.14	0.2
I-131	8.04	1.4
Ir-192 implant	74.02	0.2
Lu-177	6.71	1.7
P-32	14.29	0.8
Pd-103 implant	16.96	0.7
Sn117m	14	0.8

These radionuclides have longer half-lives than average radiopharmaceutical radionuclides. As a result, releasing an animal that has received one of these radionuclides at a dose rate of 2 mrem/hr could result in annual exposure greater than 100 mrem.

For more information on how these values were calculated, contact the Radiation Safety Staff at [rad@missouri.edu](mailto:rad@missouri.edu).