



**R A D I O C A T**  
Centers For The Treatment Of Feline Hyperthyroidism

July 18, 2025

Janice Nguyen  
Senior Health Physicist  
Division of Radiological Safety and Security (DRSS)  
Medical and Licensing Assistance Branch (MLAB)  
U.S. Nuclear Regulatory Commission, Region I  
475 Allendale Road, Suite 102  
King of Prussia, PA 19406-1415

RE: RADIOCAT, LLC, LICENSE NUMBER 45-25330-01  
REQUEST FOR ADDITIONAL INFORMATION, MAIL CONTROL NO. 625737

Dear Ms. Nguyen:

This is in response to your June 27, 2025, email request for additional information. For clarity, RADIOCAT's responses follow the items in the June 27, 2025, request.

- (a.) My biggest concern is that your response still doesn't fully address the 2 mR in any given hour. Your response did include an estimated dose rate at contact. Does your estimate consider decay and is your estimated dose rate calculated at 48 hours (i.e., at the proposed time of release)?

The contact dose rate estimate is for the time of release and decreases with a  $T_{\text{eff}} = 3.4$  d. Modeling of incidental exposures is based upon the dose rates on the day of release.

- (b.) Your revised procedures below are more conservative, but it assumes that the owner will be at least 1 foot away from the cat for the first four weeks following treatment. Since there will inevitably be incidental close contact (e.g., when the owner is transporting the cat home in its carrier, if the cat needs medication and



needs to be picked up to be pilled, the cat rubs up against the owner's legs during mealtime, etc.) where the owners could be in direct contact (less than 1 foot) from the cat for brief periods of time, please either demonstrate that these scenarios would not exceed the 2 mrem in any one hour dose limit, or include a time limit in your instructions for this incidental close contact.

The EDEs calculated for doses from incidental activities follow.

Incidental Activity			
Activity	EDE Rate (mrem/hr)	Duration	EDE (mrem)
Cat in carrier	1.194	6 minutes	0.119
Cat in car, front passenger seat	0.479	1 hour	0.479
Cat in car, rear passenger seat	0.233	1 hour	0.233
Pilling a cat	17.307	1 minute	0.288
Cat rubbing against legs	0.374	5 minutes	0.031
Holding a cat	8.255	3 minutes	0.413

(c.) The included release instructions weren't updated to reflect the 5 minutes per day at 30 cm (1 foot).

The owner's instructions in the attached procedure have been upgraded to reflect the 5 minutes per day at 30 cm (1 ft.).

(d.) Overall, the response is much better, but it assumes no close contact and limits all contact to 5 minutes at 1 foot, and 2 hours per day at 1 meter. That would not address incidental close contact activities (i.e., activities that would occur at less than 1 foot), such as pilling the cat, transporting the carrier, the cat

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potentially rubbing up against the owner during mealtime,  
etc.

See response to (b.).

Please call me at 847-965-1999 if you have any questions.

Sincerely,

Eli A. Port, CHP, P.E. (Safety Engineering)  
Health Physicist

attachment

cc: David S. Herring, DVM, DACVR  
Kathleen Olsen, DVM

**Projected Dose from Release of Patients After Two Days and When  
The Exposure Rate At One Meter is  $\leq 0.5$  mR/hr**

Releasing a patient to its owners as early as possible has clear clinical advantages. Prolonged hospitalization unnecessarily stresses both the patient and the owner. Radiocat will not release an animal injected with I-131 until 48 hours after treatment and the exposure rate at 1 m is 0.5 mR/hr or less. Prior to accepting a cat for treatment, Radiocat will use the **I-131 TREATMENT PRE-SCREENING QUESTIONNAIRE** to interview the cat's owner to determine owner-cat behavior patterns and to determine behavior modifications necessary to achieve public dose goals. Radiocat will evaluate the owner's ability and willingness to make necessary behavior changes.

Release after two days and at an exposure rate of 0.5 mR/hr or less at one meter achieves an ALARA balance of maintaining owner dose below the Radiation Dose Limits for Individual Members of the Public in 10 CFR 20 Subpart D and minimizing patient and owner stress. Measurements of exposure rate will be performed by an Authorized User, by the Radiation Safety Officer, or by a trained technician under the supervision of an Authorized User or the Radiation Safety Officer.

The Total Effective Dose Equivalent (TEDE) is less than 40 mrem in the year following treatment, 28.5 mrem from internal dose and 7.3 mrem from external dose. Little dose savings would be achieved from longer hospitalization that would increase stress to both owners and patients.

Radiocat provides the attached comprehensive instructions to owners. These instructions emphasize the need to restrict contact with a treated patient and are realistic for patients and owners. Pre-treatment evaluation of owners is used to determine the owners' understanding of the instructions and their willingness to comply with these instructions. The instructions have also prevented any reported incidents of waste from Radiocat patients reaching landfills.

The instructions contain the statement, "I have been given a copy of these instructions and understand that I must comply with the instructions under the conditions the US Nuclear Regulatory Commission (NRC) has set to approve the release. I also understand that Radiocat will determine when my cat reaches the radiation level required for safe release of my cat set by the NRC."

The owner must sign the instructions agreeing to the conditions in the instructions prior to treatment. Radiocat will not treat a patient if the owner will not sign the statement and agree to the conditions in the instructions. The owners must sign a similar statement before patient release to emphasize the importance of limiting close contact during the first two weeks following release.

#### Uptake and excretion of I-131

It is assumed that the initial renal clearance rates for iodine in mammals, including cats, are similar to the human clearance rate. ICRP 53 specifies the renal clearance half-time for iodine as 8 hours. This value corresponds to 0.875 clearance in 24 hours. This value is used to determine free I-131 in cats at the time of release. Cats receive therapeutic doses of 3.5 mCi to 5 mCi. A conservative 5 mCi is used for modeling dose to an owner.

A cat receiving a dose of 5 mCi will typically have an uptake of approximately 20%, or 1 mCi. The remainder of the activity is excreted at the 0.875 day<sup>-1</sup> clearance rate. The animal will have retained 63 µCi of free iodine after 48 hours. This free iodine is assumed to subsequently be excreted without decay.

A recent paper, "Dose Assessment for Humans Exposed to Domestic Animals Administered Radioactive Material", DM Hamby, RS Flora, RR Benke, VA Shaffer, and K Tapp, reports biological half lives that would result in  $T_{eff}$  for I-131 in cats of 1.6 days - 1.8 days. The NRC's Donna Beth Howe has stated that  $T_{eff}$  is between 2.7 days and 3.4 days. Other studies have observed similar  $T_{eff}$ s. In modeling of dose after release, a conservative  $T_{eff} = 3.4$  days is used. For  $T_{eff} = 3.4$  days,  $\lambda_{eff} = 0.204$  days<sup>-1</sup>. These values are used in calculating external dose.

#### Internal Dose

It is conservatively assumed that a member of the public inhales or ingests up to 0.1%, or 0.063 µCi of the free iodine that was excreted by the cat. The ICRP 30 committed dose to the thyroid is 1.78 rem/µCi I-131. The ingestion of 0.063 µCi would produce a 112 mrem Committed Dose Equivalent to the thyroid. The Committed Effective Dose Equivalent's contribution to the Total Effective Dose Equivalent would be 28.5 mrem.

## External Dose

Radiocat will not release a patient injected with a therapeutic dose of I-131 until the exposure rate at 1 m is 0.5 mR/hour or less. Owners are instructed in writing to limit contact to no more than two hours per day at three feet, and no more than 5 minutes at 30 cm, during weeks one through four following treatment. During weeks five through eight following treatment, the owner is instructed to limit exposure to the patient to no more than four hours at three feet (90 cm), and no more than one hour at 6 inches (15 cm) from any part of the owner's body. The attached instructions for owners emphasize the need for the owner to restrict contact with a treated cat. Dose equivalent is treated as numerically equal to exposure rate. The dose from intermittent exposure from a decaying external source is:

$$H = \int_0^T \dot{H} dt$$

Where:  $\dot{H}_0$  is the dose received on the day of release and

$\dot{H}$  is the dose received on subsequent days, equal to  $\dot{H}_0 e^{-\lambda_{\text{eff}} t}$ .

$$\lambda_{\text{eff}} = 0.204/\text{day}$$

Owners are instructed to limit exposure to the patient during the first four weeks after release to no more than two hours at 90 cm. The exposure to an owner will be entirely from the 1 mCi uptake to the cat's thyroid. This yields an exposure rate of 0.22 mR/hr at 1 meter. The exposure rate is 0.27 mR/hr at 90 cm, 2.44 mR/hr at 30 cm.  $\dot{H}_0$  was calculated using tissue weighting

factors ( $W_{\text{ts}}$ ) from 10 CFR 20.1003, with the cat positioned at a height of 90 cm, and a lateral distance of 90 cm from the reference person. Tissue positioning was approximated using anthropometric data. Exposure and dose are used interchangeably (1 mR = 1 mrem). Exposure rates are calculated using Microshield V.8.03 using  $W_{\text{ts}}$  from 10 CFR 20.1003 to calculate Effective Dose Equivalent (EDE) for 2 hours/day at 90cm.

**EDE at 90 cm**

<b>Tissue</b>	<b>W<sub>T</sub></b>	<b>Distance (cm)</b>	<b>EDE Rate (mrem/hr)</b>
Gonads	0.25	90.0	0.069
Breast	0.15	98.5	0.034
Red Bone Marrow*	0.12	92.2	0.031
Lung	0.12	100.6	0.026
Thyroid	0.03	108.2	0.006
Bone Surfaces**	0.03	92.2	0.008
Remainder**	0.30	92.2	0.079
Total	1.00	-	0.253
<b>Total, 2 hours per day</b>	1.00	-	<b>0.506 (mrem/day)</b>

\*In adults, red Bone Marrow is distributed primarily in central axial bones. [3]. The distance used to calculate dose equivalent is conservatively assumed to be the distance from the source to the body's center of mass, or around mid abdomen.

\*\* Placement of the bone surfaces and the remainder organs is also considered to be at the body's center of mass.

$\dot{H}_0$  is equal to 0.506 mrem for exposure from a cat 90 cm away for 2 hours on the first day of release. Using this initial dose rate value, the dose for the first 28 days can be calculated.

$$H = \int_0^T \dot{H} dt = \dot{H}_0 \int_0^T e^{-\lambda_{eff} t \text{ days}} dt = 0.506 \text{ mrem} \int_0^{28} e^{-0.204 t \text{ days}} dt$$

$$H = 2.472 \text{ mrem when } T = 28 \text{ days.}$$

For a distance of 30 cm for 5 minutes per day, the same methodology is used.

**EDE AT 30 cm**

<b>Tissue</b>	<b>W<sub>T</sub></b>	<b>Distance (cm)</b>	<b>EDE Rate (mrem/hr)</b>
Gonads	0.25	30.0	0.617
Breast	0.15	50.0	0.133
Red Bone Marrow	0.12	36.1	0.205
Lung	0.12	54.1	0.091
Thyroid	0.03	67.1	0.015
Bone Surfaces	0.03	36.1	0.051
Remainder	0.30	36.1	0.513
Total	1.00	-	1.632
<b>Total, 5 minutes per day</b>	1.00	-	<b>0.136 (mrem/day)</b>

$\dot{H}_0$  is equal to 0.136 mrem for exposure from a cat 30 cm away for 5 minutes on the first day of release.

$$H = \int_0^T \dot{H} dt = \dot{H}_0 \int_0^T e^{-\lambda_{eff} t \text{ days}} dt = 0.136 \text{ mrem} \int_0^{28} e^{-0.204 / \text{day} \cdot t \text{ days}} dt$$

$$H = 0.662 \text{ mrem when } T = 28 \text{ days.}$$

### Months Following Release

During weeks five through eight, the owner is instructed to limit exposure to no more than four hours at 90 cm, and no more than one hour at 15 cm from the owner's body. This is calculated using the same methods as previous calculations, where the cat is positioned 90 cm vertically, level with the gonads.

#### EDE AT 15 cm

Tissue	$W_T$	Distance (cm)	EDE Rate (mrem/hr)
Gonads	0.25	15.0	2.458
Breast	0.15	42.7	0.183
Red Bone Marrow	0.12	25.0	0.426
Lung	0.12	47.4	0.119
Thyroid	0.03	61.8	0.017
Bone Surfaces	0.03	25.0	0.107
Remainder	0.30	25.0	1.07
<b>Total</b>	<b>1.00</b>	<b>-</b>	<b>4.376</b>

To account for a month passing,  $\dot{H}_0$  is calculated using the dose on the release date and factoring in the decay from the subsequent month.

$$\dot{H}_0 = 4.376 \text{ mrem} \cdot e^{-0.204 d^{-1} \cdot 28d} = 0.0145 \text{ mrem/day at 15cm for 1 hour}$$

$$\dot{H}_0 = 1.012 \text{ mrem} \cdot e^{-0.204 d^{-1} \cdot 28d} = 0.0033 \text{ mrem/day at 90cm for 4 hours}$$

On day 28, the EDE from the residual I-131 will be 0.0033 mrem per day at 90 cm and 0.0145 mrem per day at 15 cm.

$$\dot{H}_{\text{external},28} = 0.0033 \text{ mrem} + 0.0145 \text{ mrem} = 0.0178 \text{ mrem}$$

$\dot{H}_{\text{external}}$  is the EDE received on subsequent days, equal to  $\dot{H}_{\text{external},28} e^{-\lambda_{eff} t}$

$$H_{\text{external},28} = \dot{H}_{\text{external},28} \int_0^T e^{-\lambda_{eff} t} dt = 0.0178 \text{ mrem} \int_0^{337} e^{-0.204 / \text{day} \cdot t \text{ days}} dt = 0.087 \text{ mrem.}$$

A typical litter box is 45 cm x 60 cm. An individual may work for up to 5 minutes per day cleaning a litter box with the individual's body 50 cm from the litter. All unbound I-131 following release is deposited in the litter box. The initial dose rate 50 cm from 63  $\mu$ Ci in a 45 cm x 60 cm plane is 0.05 mrem/hr. Servicing the litter box for five minutes does not contribute significant dose.

Several incidental situations are evaluated to determine maximum dose in one hour. Following treatment, owners must transport, administer medication, and may interact in close contact with the cat. EDE remains below 2 mrem in any hour in these situations.

### Cat In Carrier

To transport the cat from the clinic, a carrier would be used. This situation is depicted in Fig. 2. Considering the crate is held just above the knee at lower thigh level, the EDE rate in this configuration is 1.194 mrem/hr, below 2 mrem per hour. If it takes an owner a total of 1 minute to load the cat into the car, and another 5 minutes to bring the cat inside their residence, the total EDE is 0.119 mrem.

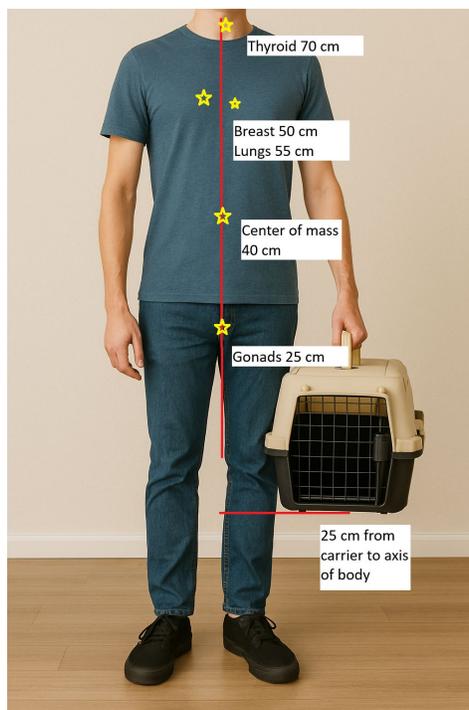


Figure 2: A person carrying a cat carrier with dose points.

**EDE FROM A CAT IN A CARRIER**

<b>Tissue</b>	<b><math>W_T</math></b>	<b>Distance (cm)</b>	<b>EDE Rate (mrem/hr)</b>
Gonads	0.25	35.4	0.444
Breast	0.15	55.9	0.106
Lung	0.12	60.4	0.074
Red Bone Marrow	0.12	47.2	0.120
Thyroid	0.03	74.3	0.120
Bone Surfaces	0.03	47.2	0.030
Remainder	0.30	47.2	0.300
<b>Total</b>	<b>1.00</b>	<b>-</b>	<b>1.194</b>

Transport From Clinic

Owners are expected to transport the cat from the door of the veterinary clinic to their residence. It is assumed that the distance from the center of the driver seat to the center of the passenger seat is 65 cm, and the distance between the front row and back row is 70 cm. If the cat is placed in the backseat on the passenger side, the EDE rate is 0.233 mrem/hr, well below 2 mrem per hour. These calculations do not include the shielding that would be provided by seats or other objects in the car such as the cat's crate.

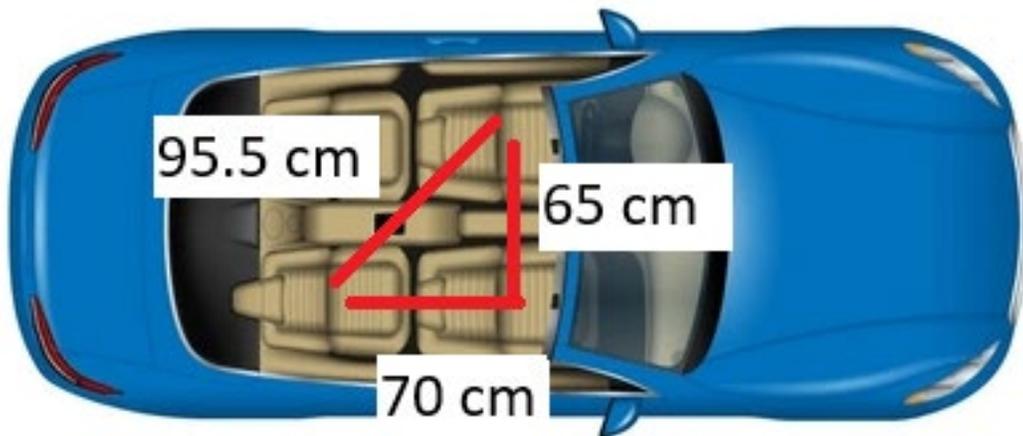


Figure 3: The reference car, as seen from above.



Figure 4: A reference person driving. Dose points are taken along the central axis.

**EDE FOR TRANSPORT BY CAR (REAR RIGHT SEAT)**

<b>Tissue</b>	<b>W<sub>T</sub></b>	<b>Distance (cm)</b>	<b>EDE Rate (mrem/hr)</b>
Gonads	0.25	95.5	0.061
Breast	0.15	100.1	0.033
Lung	0.12	98.7	0.027
Red Bone Marrow	0.12	97.6	0.028
Thyroid	0.03	105.6	0.006
Bone Surfaces	0.03	97.6	0.007
Remainder	0.30	97.6	0.070
<b>Total</b>	<b>1.00</b>	<b>-</b>	<b>0.233</b>

Pilling

Cats may need to be pilled during their treatment. Pilling a cat may involve physically restraining the cat to force a pill into its mouth and throat. This activity may involve direct contact close to the chest. The distance between the thyroid and the cat's skin is estimated to be 1.8 cm. The EDE rate would be 17.307 mrem/hr as a result from pilling a cat (See figure 1). If pilling a cat reaches 1 minute, the EDE amounts to 0.288 mrem.

Cats being treated for hyperthyroidism have usually required pilling prior to treatment. Owners of the cats are likely to be competent and comfortable with pilling the cat. Different pilling techniques may involve the cat being physically restrained via a towel and placed on the floor or a table and being pilled at a distance from the owner. Calculations for

pilling likely to produce the highest dose are with the owner holding the cat close to the chest. If pilling the cat takes one minute, the EDE will be 0.288 mrem.

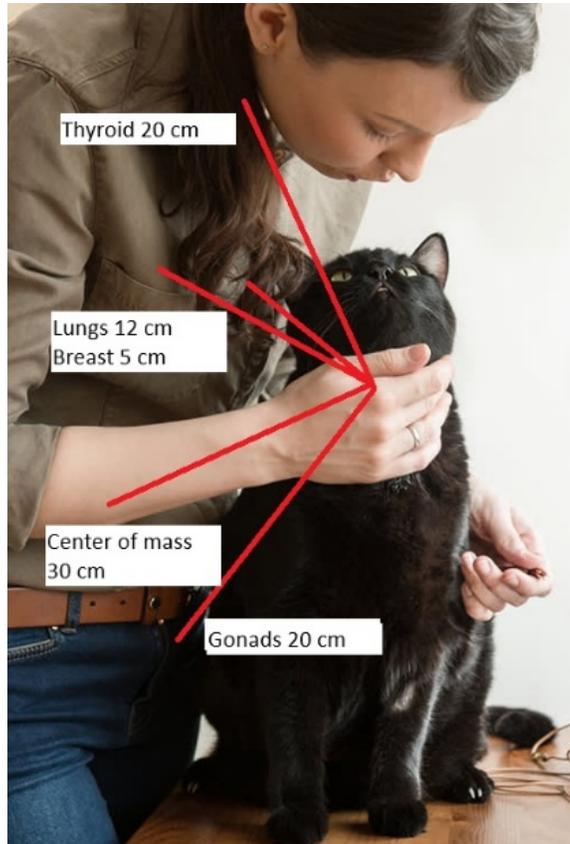


Figure 5: A cat being pilled at chest level with dose points.

**EDE FROM PILLING**

Tissue	$W_T$	Distance (cm)	EDE Rate (mrem/hr)
Gonads	0.25	20	1.386
Breast	0.15	5	12.706
Lung	0.12	12	1.939
Red Bone Marrow	0.12	30	0.296
Thyroid	0.03	20	0.166
Bone Surfaces	0.03	30	0.074
Remainder	0.30	30	0.740
<b>Total</b>	<b>1.00</b>	<b>-</b>	<b>17.307</b>

Rubbing Against Leg

A cat may rub itself against an owner's leg as seen in Fig 6. This action results in an EDE rate of 0.374 mrem/hr, below 2 mrem per hour. If this action is for a total of 5 minutes in a day, the EDE will be 0.031 mrem.

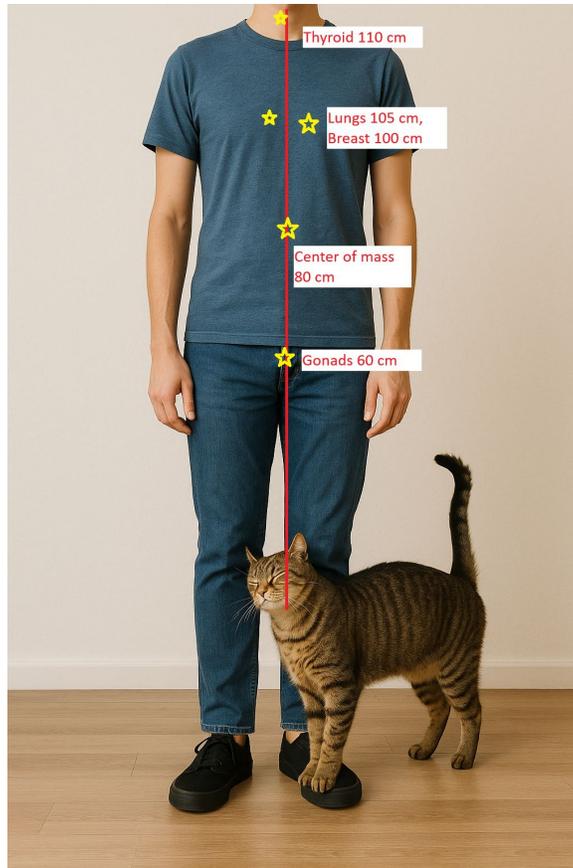


Figure 6: A cat rubbing against its owner's leg with distances to dose points.

**EDE FROM CAT RUBBING AGAINST OWNER'S LEG**

<b>Tissue</b>	<b><math>W_T</math></b>	<b>Distance (cm)</b>	<b>Dose Equivalent (mrem/hr)</b>
Gonads	0.25	60	0.154
Breast	0.15	100	0.034
Lung	0.12	105	0.024
Red Bone Marrow	0.12	80	0.042
Thyroid	0.03	110	0.006
Bone Surfaces	0.03	80	0.010
Remainder	0.30	80	0.104
<b>Total</b>	<b>1.00</b>	<b>-</b>	<b>0.374</b>

Holding in Arms

There may be situations where an owner must hold the cat, such as in the event of it jumping onto a counter. Fig. 7 depicts this interaction. The EDE rate for this activity is 8.348 mrem/hr. If this activity is for 3 minutes, the EDE is 0.413 mrem.



Figure 7: A person holding a cat with distances to dose points.

#### EDE FOR HOLDING THE CAT

Tissue	$W_T$	Distance (cm)	Dose Equivalent (mrem/hr)
Gonads	0.25	30	0.617
Breast	0.15	8	5.111
Lung	0.12	15	1.180
Red Bone Marrow	0.12	25	0.426
Thyroid	0.03	30	0.166
Bone Surfaces	0.03	25	0.107
Remainder	0.30	25	1.066
<b>Total</b>	1.00	-	<b>8.348</b>

#### Total Effective Dose Equivalent

The Total Effective Dose Equivalent in the year following treatment from internal and external sources is  $28.50 \text{ mrem} + 2.472 \text{ mrem} + 0.662 \text{ mrem} + 0.087 \text{ mrem} = 31.723 \text{ mrem}$  plus the dose from short term low dose situations.

If the owner makes a one-time 1-hour commute from the clinic with the cat in the rear passenger seat, and walks for a total of 5 minutes with the cat in the carrier, they receive an additional 0.223 mrem + 0.09 mrem.

If the cat rubs against the owner for 5 minutes a day, requires to be pilled twice per day, and requires to be held for 3 minutes a day, the initial EDE rate is 0.031 mrem + 0.413 mrem + 2 x 0.288 mrem = 1.02 mrem/day. Accounting for decay over the entirety of the year, this amounts to 5.00 mrem.

$$H_{Incidental,365} = \dot{H}_{Incidental,365} \int_0^T e^{-\lambda_{eff} \cdot t} dt = 1.02 \text{ mrem} \int_0^{365} e^{-0.204/\text{day} \cdot t \text{ days}} dt = 5.00 \text{ mrem.}$$

**The TEDE for the year is 37.0 mrem.**

**TEDE FOR THE YEAR**

<b>Activity</b>	<b>TEDE (mrem)</b>
Driving	0.223
Carrier	0.090
Pilling + Rubbing + Holding	5.000
Internal	28.5
90 cm for 2 hours, first 4 weeks	2.472
30 cm for 5 mins, first 4 weeks	0.662
Months Following Treatment	0.087
<b>TOTAL FOR YEAR</b>	<b>37.0</b>

Radiocat's goal is to maintain doses to owners as low as is reasonably achievable (ALARA), as defined in 10 CFR 20.1003, making every reasonable effort to maintain exposures to radiation as far below the dose limits in the regulations as is practical, consistent with the purpose for which the use of I-131 for the treatment of pets is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization I-131 in the public interest.

## Citations

[1] Volckaert, Veerle & Vandermeulen, Eva & Daminet, Sylvie & Saunders, J.H. & Peremans, Kathelijne. (2016). Hyperthyroidism in cats - Part I: Anatomy, physiology, pathophysiology, diagnosis and imaging. *Vlaams Diergeneeskundig Tijdschrift*. 85. 255-264. 10.21825/vdt.v85i5.16317.

[2] Wikipedia contributors. "Cat." *Wikipedia, The Free Encyclopedia*. *Wikipedia, The Free Encyclopedia*, 2 Jun. 2025. Web. 16 Jun. 2025.

[3] Bone Marrow | Radiology Reference Article | radiopaedia.org. (n.d.). <https://radiopaedia.org/articles/bone-marrow?lang=us>

## **PROCEDURE FOR PATIENT SELECTION, INTAKE, AND RELEASE**

This procedure is designed to be used with Radiocat's treatment of feline hyperthyroidism with I-131. The primary objective of the procedure is to ensure that owners understand and can comply with post-treatment restrictions. In this procedure, owners interact with Radiocat staff three times.

If, during any of these interactions compliance with instructions and restrictions cannot be confirmed, the treatment will not be administered, or if the cat has been treated, the cat will not be released. The process is summarized in a flow chart in Figure 1.

### **A: Identification of Cats suitable for Treatment with I-131.**

Prior to screening the owner, Radiocat will review referring veterinarian's tests and determine if I-131 is clinically appropriate. If so, Radiocat will discuss the I-131 treatment with the owner.

Radiocat will interview the owner and complete the Pre-Screening Questionnaire to determine the behavior patterns of the cat and owner. The owner must have full knowledge of household members' interaction with the cat. Radiocat must determine if these behavior patterns could result in exposure to household members resulting in public dose limits being exceeded. During Pre-screening, Radiocat will evaluate the owner's attitude and ability to comply with release instructions, and determine if the owners can modify behavior necessary not to exceed public dose limits.

Follow each prompt in the Questionnaire guided by this procedure.

- a. Collect information regarding the cat and household members (anyone that shares the residence where the cat lives). Ask the owner to describe the behavior of their cat. Use open ended questions that result in more than yes or no answers. Suggested questions include:

- What does your cat typically do during the day?
- Where does it sleep?
- Who primarily interacts with the cat?
  
- How does the cat interact with family members?
- For each activity, determine:
  - What is the interaction?
  - Which person?
  - For how long?
  - At what distance? [Guide the owner to think of the distance from the cat's body to the closest portion of the owner's body.]
    - Attempt to discern the distance from the cat's thyroid to the center of the owner's body and categorize as six inches, three feet, or more than 3 feet.
  - Ask if other behaviors or interactions have not been discussed.

c. Compile the answers to determine the amount of time each person spends at distances of six inches, three feet, or more than 3 feet on a daily basis. The time at more than 3 feet does not need to be modified.

d. The Additional Items on the Questionnaire is the opportunity for Radiocat to provide a focused discussion on items related to the patient's household. Discussions should include the general ALARA principle, strategies to minimize public dose with particular attention to children and potentially pregnant members of the household, clarifying dialogue about the distances, to carry a treated cat only in a carrier to minimize dose, the duration the Release Instructions will apply to the owner's behavior, what to do if their cat is injured or dies, the restrictions on boarding treated cat, and what to do if the owner thinks the limits have been exceeded.

Mark answers that contraindicate treatment with an asterisk and discuss these answers with the owner to determine if the identified behavior can be changed and, if so, how. Note specific behavior

modifications on the Questionnaire. If the owners are not able to modify their behaviors to comply with the Release Instructions, Radiocat may make an informed decision to contraindicate the therapy. There may be other clinical factors which may influence the decision of Radiocat such as unique time and distance behaviors exhibited by the cat and owner, split time caring for the cat by multiple owners, or other conditions that are not expressly covered in the Questionnaire. Radiocat has the ultimate responsibility to ensure regulatory limits are met.

If Radiocat is confident the owner understands the need to comply with public dose limits and the household can comply with the Release Instructions, schedule treatment and order I-131. If Radiocat is not confident the owner and other household members can comply with the Release Instructions notify the owner their cat cannot be treated I-131.

If Radiocat determines the owner is not willing or able to comply with behavioral limitations necessary not to exceed the public dose limits, treatment will not be offered.

In either case, Radiocat will retain a copy of the Questionnaire, and give the owner a copy.

## **B: Review Release Instructions at Intake**

The purpose of this review is to ensure that owners appreciate and understand the Release Instructions they will receive after treatment. Radiocat will explain that cats cannot be released without a signed copy of the Release Instructions specific to each cat, so care is taken to ensure owners understand those Release Instructions and confirm their ability to comply before treatment is planned. The owner must confirm that they understand and will comply each item in the instructions, and sign the release instructions before treatment.

## **C: Post Treatment and Review of Release Instructions**

Before release, Radiocat and owners will again review the Release Instructions the owners signed at intake. The owner must confirm that they will comply with and sign the Release Instructions before the cat can be released. Upon release, the owner is given a copy of the signed Release Instructions. Radiocat will retain a signed copy of the Release Instructions.

## **D. Radiocat will:**

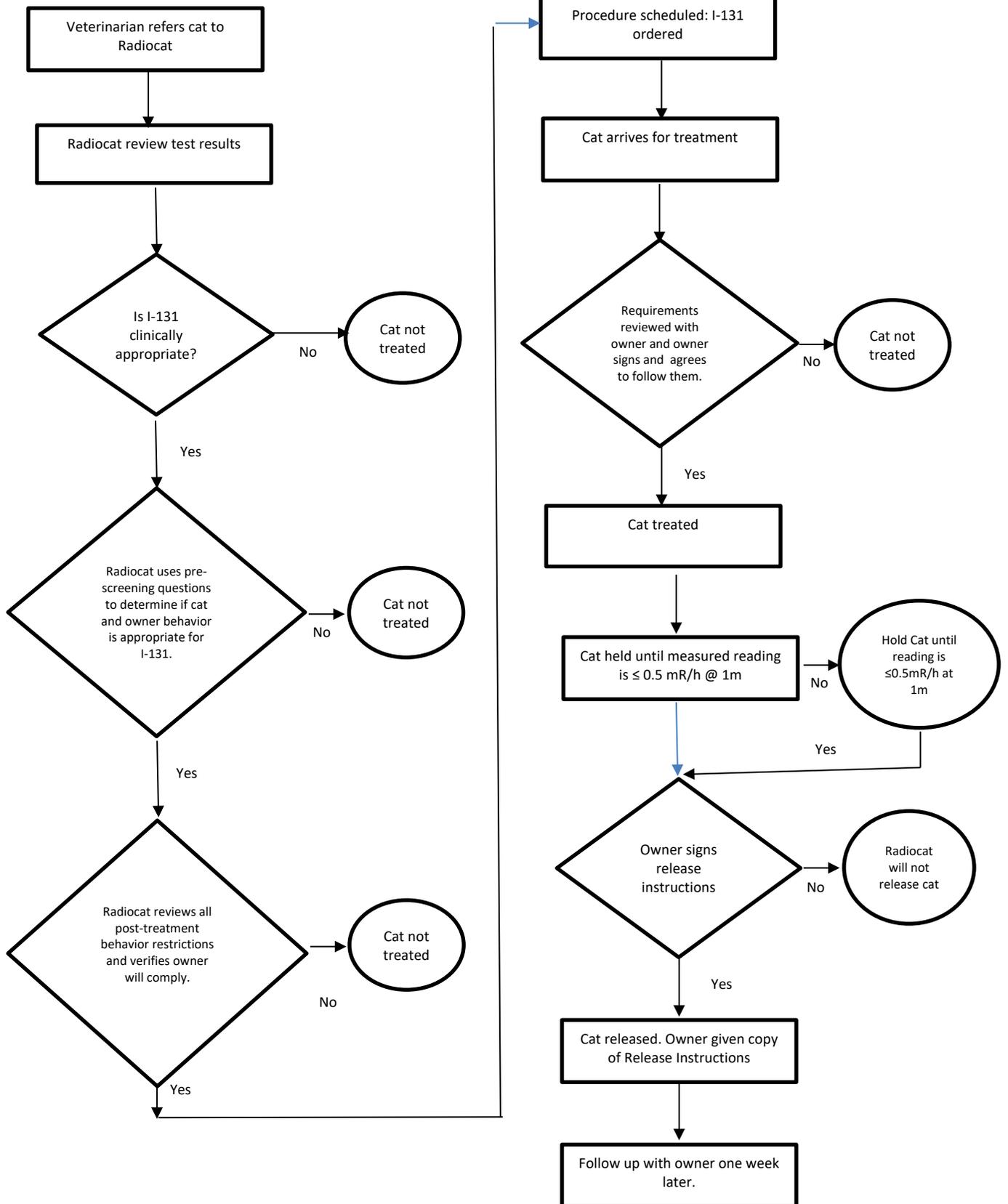
- a. Measure the exposure rate daily until the release exposure rate criteria is met,
- b. Fill in the duration of time on the Release Instructions and present to the owner for signature,
- c. After the owner signs the Release Instructions, release the cat and provide the owner with a copy of the signed Release Instructions. Radiocat will retain a copy of the signed Release Instructions,
- d. Reinforce to the owner that they may return to their normal interactions with the cat eight weeks after treatment. They should continue to practice ALARA (time and distance moderation) for the next eight weeks, and
- e. Instruct owner to contact Radiocat if they have questions or the cat needs to be seen by another veterinarian or dies. Burial or cremation may be delayed for 80 days following treatment.

## **D. Post-Release follow up**

Follow up with the cat's owner approximately one week after the procedure. Remind the owner on how to keep doses

ALARA and reinforce the need to comply with the Release Instructions. Document in the patient's file if follow up contact was successful or not and the date of follow up. If the owner indicates that the household has not complied with the written instructions, perform a dose assessment to determine the dose to date of the individual household members and formulate corrective actions for the household members to follow as necessary.

Figure 1





Person #    Name	
Activity and type of contact involved: Direct, 6", 3', or >3'	Duration of contact

Can interactions with children and pregnant women be modified to eliminate close contact with the cat?

Yes:  No: \* N/A:

If the answer to the above question is yes, describe proposed modifications: \_\_\_\_\_

\_\_\_\_\_

Does your cat ever sleep in the bed with any household members?

Yes:  No:

If the answer is yes, can arrangements be made to avoid the cats sleeping with household members for eight weeks after treatment?

Yes:  No: \*

If the answer to the above question is yes, describe proposed modifications: \_\_\_\_\_

\_\_\_\_\_

Does your cat jump up to sit next to or on laps of household members?

Yes:  No:

If yes, can arrangements be made to avoid sitting next to or on the laps of household members or visitors?

Yes:  No: \*

Describe how the cat will be prevented from sitting next to or on the laps of household members or visitors. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Does your cat sit or lie closer than 3 feet from you?

Yes: \* No:

If yes, can behavior during the first through fourth week after treatment be changed to limit time to no closer than 3 feet for 2 hours or less per day?

Yes:  No: \*

If the answer to the above question is yes, describe proposed changes in behavior.

\_\_\_\_\_

\_\_\_\_\_

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During the fifth through eighth weeks following treatment, can behavior be changed to limit time no closer than 3 feet to 4 hours or less per day and no closer than 6 inches for no more than one hour per day?

Yes:  No:

If the answer to the above question is yes, describe proposed changes in behavior.

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How will the cat be transported after treatment? Will the owner be the only person in the vehicle?

Yes:  No:

Can the cat be transported in a second or third row seat of the vehicle?

Yes:  No:

Does the cat take medication regularly?

Yes:  No:

If yes, can the cat be given pills using pill pockets?

Yes:  No:

If no, describe how the cat is usually administered medication, and how long typical administration takes:

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IV. Has the owner been provided with Release Instructions sheet?

Yes:  No:

V. Do you believe the owner fully understand and will follow the procedures they must arrange for their cat?

Yes:  No:

VI. Any \*response may be a contraindication for treatment with I-131. These responses must be resolved before treatment.

VII. Additional Items Discussed with the cat Owner

- ALARA concept:
- Release Instructions
- Importance of modifying time and distance from the cat.
- Sleeping arrangements for the cat.
- Added precautions for children and pregnant women.
- What to do if the cat dies or needs medical attention.
- Transport and carrying techniques to minimize contact.
- Only one treated cat per household per year.
- No boarding, traveling, or commercial grooming.

VIII. By signing below, I acknowledge I fully understand the radiation safety aspects associated with I-131 treatment and will follow the instructions required by the US NRC.

Name of Owner or Interviewee: \_\_\_\_\_

Signature: \_\_\_\_\_ Date \_\_\_\_\_

Name of individual who conducted interview: \_\_\_\_\_

It is my belief that the owner whom I have interviewed understands, and will follow the instructions that Radiocat will provide upon release of their cat.

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

## INSTRUCTION FOR OWNERS OF CATS THAT HAVE BEEN TREATED BY RADIOCAT

After being released from therapy, your cat will possess a small amount of I-131 that will be excreted primarily in urine, feces, and saliva. The I-131 in the cat is radioactive and is a source of radiation to members of your household and other members of the public. You don't need to totally isolate your cat, but you must follow these safety precautions which are required by the US Nuclear Regulatory Commission (NRC) to keep doses below the NRC limits. The dose you and your family will receive is kept low by limiting contact to no more than 2 hours per day at 3 feet, and 5 minutes per day at 12 inches during weeks one through four following treatment. During weeks five through eight following treatment, limit exposure to the cat to no more than four hours at three feet, and no more than one hour at 6 inches from any part of a person's body. This amount of attention will satisfy your cat's emotional needs, and will keep your exposure to radiation to below one-half of the limit in NRC regulations. After eight weeks, distance restrictions are not required. The cat may only be carried in its carrier, must be kept indoors, and must use a litter box.

1. Following treatment, have no other people in your vehicle when taking the cat home. Drive straight home.
2. **Do not** use a plastic litter box liner in the cat's litter box. Keep the box out of occupied bedrooms and the kitchen and away from unsupervised pets and children. Wear rubber gloves when removing soiled litter from the box. When necessary and eight weeks after treatment, using the gloves, clean the box using normal cleaning procedures. Use the gloves only for this and the other tasks described in these instructions.
2. **You must use flushable litter.** Scoop soiled litter into toilet and flush. Follow the manufacturer's instructions on the package. The litter must be disposed of in the toilet. **Do not discard the litter in trash. The radioactive material your cat excretes will set off an alarm at a waste site and may result in an investigation by the NRC or another enforcement agency.**
3. If your cat vomits or urinates outside the litter box, wear the rubber gloves and use normal cleaning procedures. When possible, use flushable tissue for the cleanup. Thoroughly wash all non-flushable items before disposal.
4. Pregnant women and children should never be closer than three feet from the cat, and should not change the cat's litter boxes.
5. Close contact with your cat may transfer radioactive material to you, your family, or members of the general public. Do not permit the cat to lick you during the first four weeks after treatment. Avoid any snuggling, and face or hand contact with your cat's saliva & footpads. Plan to avoid having to pick up the cat, and avoid picking up the cat unless necessary.
6. Radiation dose limits may be exceeded if you do not follow these instructions. Do not permit your cat to sleep with you. Keep your cat in its crate or in an unoccupied room at night. Do not hold the cat in your lap because this increases the dose to your gonads. Wear rubber gloves to pill the cat, if needed. Ask Radiocat staff about the best methods to pill your cat quickly and minimize radiation exposure.
7. Keep your cat away from food preparation and eating areas.
8. Instruct children to avoid the cat, and wash their hands if they touch it. Small children may not remember or understand these rules. Take extra precautions by having them wash their hands often, especially before eating.
9. Keep the cat confined to your home. The radioactivity in the cat's urine or feces must be kept away from wildlife, neighbors and their children, and other pets. Flush any remaining soiled litter in small quantities at a time, following the manufacturer's instructions. Put on your gloves and thoroughly wash them before disposal. Your cat will have lost essentially its entire radioactivity after eight weeks and it may return to its normal routines.
10. In the event your cat needs to be taken to another veterinarian or dies, you must contact Radiocat at 800-323-9729 for instructions. If the cat requires emergency treatment and contacting Radiocat prior to going to another veterinarian may endanger the cat, inform the veterinarian about the treatment with I-131 and give the veterinarian a copy of these instructions.
11. If you have any questions about radiation safety, call Dr. Kathleen Olsen, Radiocat's Radiation Safety Officer at 800-323-9729.

OWNER STATEMENT AT ADMISSION

I have been given a copy of these instructions and understand that I must comply with the instructions under the conditions the US Nuclear Regulatory Commission (NRC) has set to approve the release. I understand that I am responsible for compliance with these instructions. I also understand that Radiocat will determine when my cat reaches the radiation level required for safe release of my cat set by the NRC.

\_\_\_\_\_  
Owner's Signature at Admission

\_\_\_\_\_  
Date

RADIOCAT STATEMENT

The owner has been interviewed and given these instructions on how to take care of their pet when at home.

\_\_\_\_\_  
Signature Prior to Treatment

\_\_\_\_\_  
Date

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Administration of dose: Date: \_\_\_/\_\_\_/\_\_\_ Time: \_\_\_:\_\_\_.

RELEASE MUST BE AT LEAST 48 HOURS AFTER TREATMENT

Exposure Rate At 1 m At Release: \_\_\_ mR/hr Date \_\_\_/\_\_\_/\_\_\_ Time: \_\_\_:\_\_\_.

Measured by: \_\_\_\_\_

OWNER STATEMENT AT DISCHARGE

I have been given a copy of these instructions and understand that I must comply with the instructions under the conditions the US Nuclear Regulatory Commission has set to approve the release. I understand that I am responsible for compliance with these instructions.

\_\_\_\_\_  
Owner's Signature at Discharge

\_\_\_\_\_  
Date