

## BACKGROUND

- The veterinary and public health fields have seen a rise in the usage of radionuclides. High usage carries additional risk during an emergency.
- If you were in an emergency and had to evacuate, you would save yourself, but what about your animal companions? Canines? Felines? etc.
- There is a lack of clarity regarding the appropriate response that veterinary professionals and pet owners should give during an emergency evacuation.
- To protect the safety of both humans and pets, veterinary doctors and pet owners must adhere to precise measures when a companion animal is receiving radiation therapy.



## MANAGEMENT OF RADIOACTIVE FELINES DURING AN EMERGENCY EVACUATION

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### USE OF IODINE-131 ON CATS

- I-131 therapy is an effective treatment for hyperthyroidism in cats. In approximately 95% of cases, the condition is cured after a single injection, which is given under the skin.
- I-131 works by causing a reduction of the thyroid hormone.
- Under normal circumstances, the cat is monitored for a minimum of 4 days after I-131 treatment and is released into the owner's care only if the observed dose rate is below 0.25 mR/hour at 1 foot.

### EMERGENCY PLAN

- Owners should wear proper PPE before handling the animal, keep their pet inside at all times, and thoroughly wash their hands with soap and water after direct contact with the animal.
- All clothing should be thoroughly washed with soap and water immediately after handling the animal.
- Pregnant women and children should limit direct contact with the animal whenever possible.
- Feline waste should be packed and stored outside away from humans and food sources until the emergency has passed. It should then be properly disposed of at a landfill.

## DOSE RATE CALCULATION

Iodine-131 is given to a cat. The scenarios are as follows:

- The average cat weighs 8-12 pounds.
- The cat owner is 30 years old and has no pre-existing cancer risk factors.
- A wildfire engulfs the area, prompting an evacuation as the owner rushes to bring their cat home from treatment.
- What would the dosage be if the 12 lbs size feline sat on the owner's lap for two hours?

$$D_{\text{rate}} = \frac{\Gamma \cdot A}{d^2}$$

Where:

- $D_{\text{rate}}$  = dose rates in Roentgen
- $\Gamma$  = gamma constant = 0.22 R.m<sup>2</sup>/hr.Ci
- A = Activity = 0.0029Ci
- d = distance from point source, 0.2m
- $D_{\text{rate}} = 0.01595 \text{ R or } 15.95 \text{ mrem}$

In conclusion, there is a risk of I-131 exposure for a person evacuating with their radioactive animal, especially vulnerable populations. The occupational dose limit for pregnant women is 500mrem per year, so they should limit their contact with the felines as they will reach the 500mrem limit in approximately 62 hours, which is equivalent to less than 3 days of direct exposure.

