

# Rabies Epidemiology

## Central Intern Training

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# Introduction



- Rabies exists in the wildlife of NC and can cross species lines
- Rabies is a fatal disease that can affect people
- Prevention is important, treatment is paramount
- Last recognized NC case
  - 1953, Cherokee Co. woman



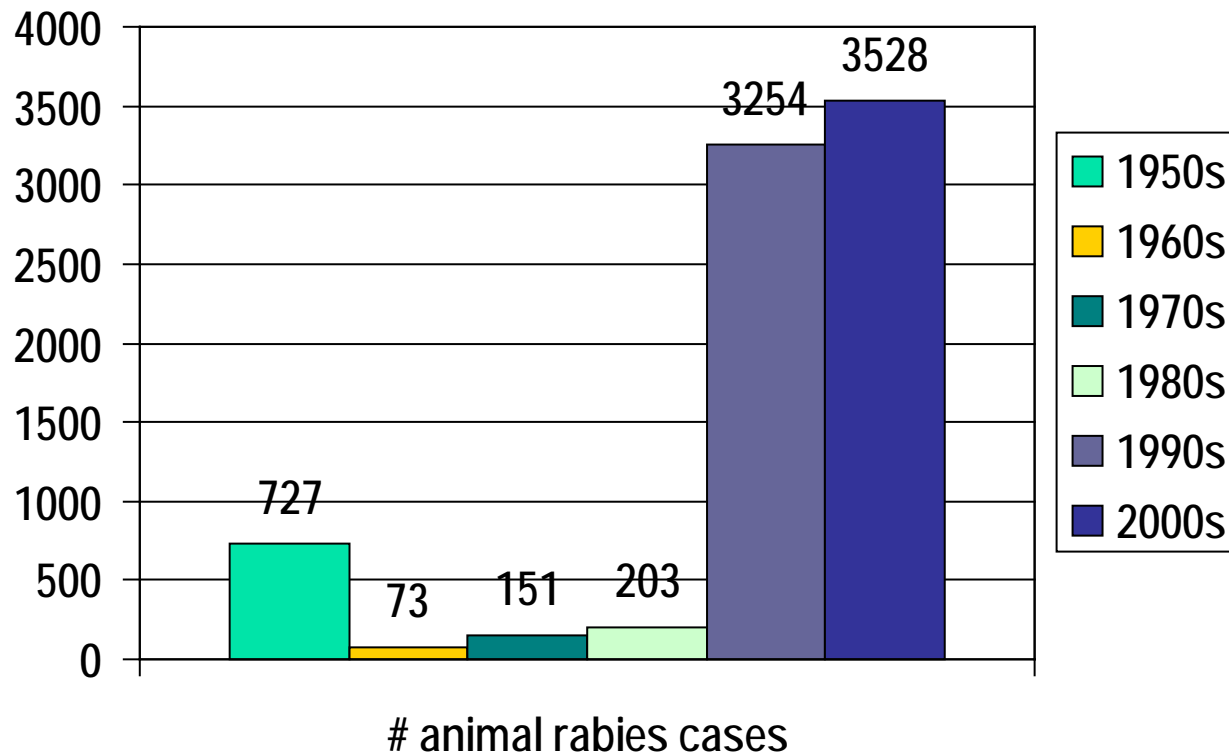
# Human Cases of Rabies, US

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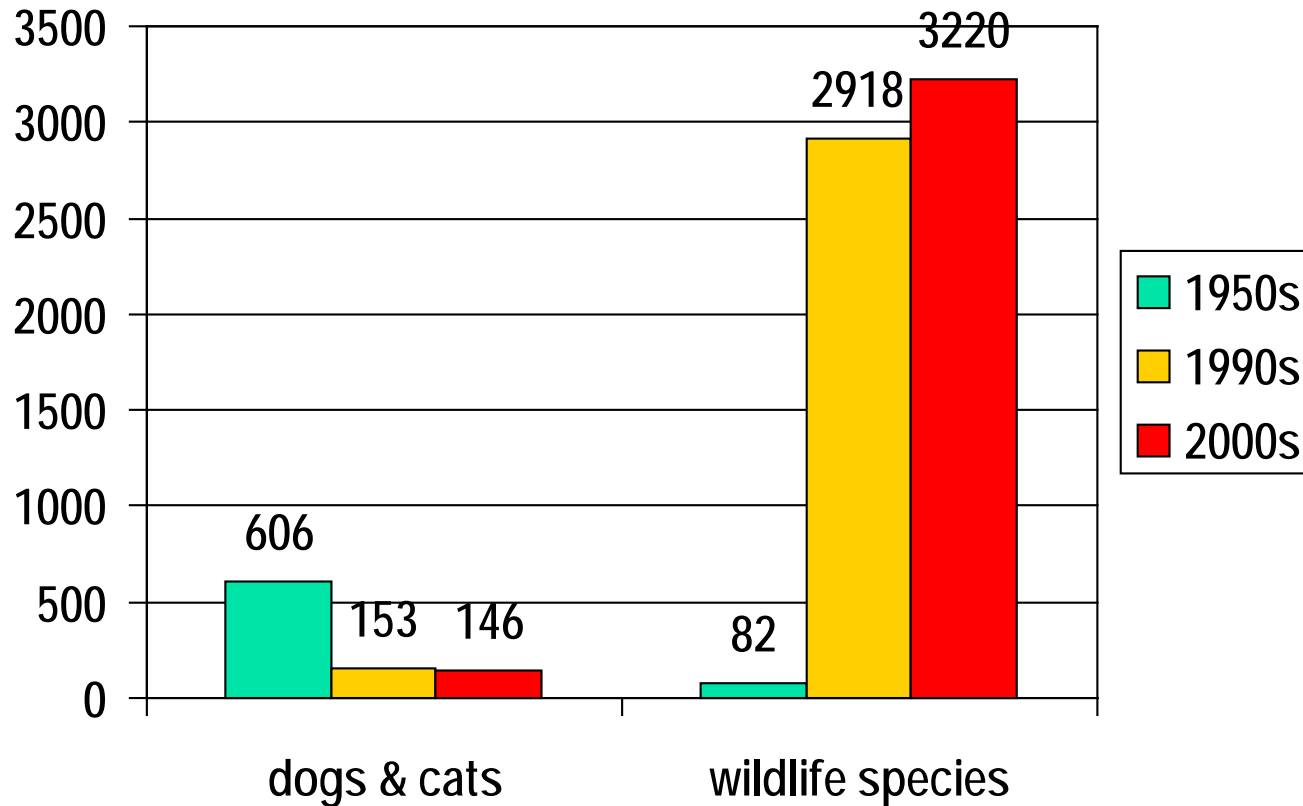
- 2005 – 1 case
  - MS, bat, first case since 1956
- 2004 – 8 cases
  - AR (1), OK (1), TX (3), bat, transplant associated
  - CA (1), FL (1), canine, acquired out of country
  - WI (1), bat, patient survived
- 2003 – 3 cases
  - CA, bat
  - PR, mongoose
  - VA, raccoon
- 2002 – 3 cases
  - TN, CA, IA, bat
- 2001 – 1 case
  - CA, canine, acquired out of country
- 2000 – 5 cases
  - NY, canine, acquired out of country
  - CA, GA, MN, WI, bat

*Last Recognized Case in NC:  
1953, Cherokee County*

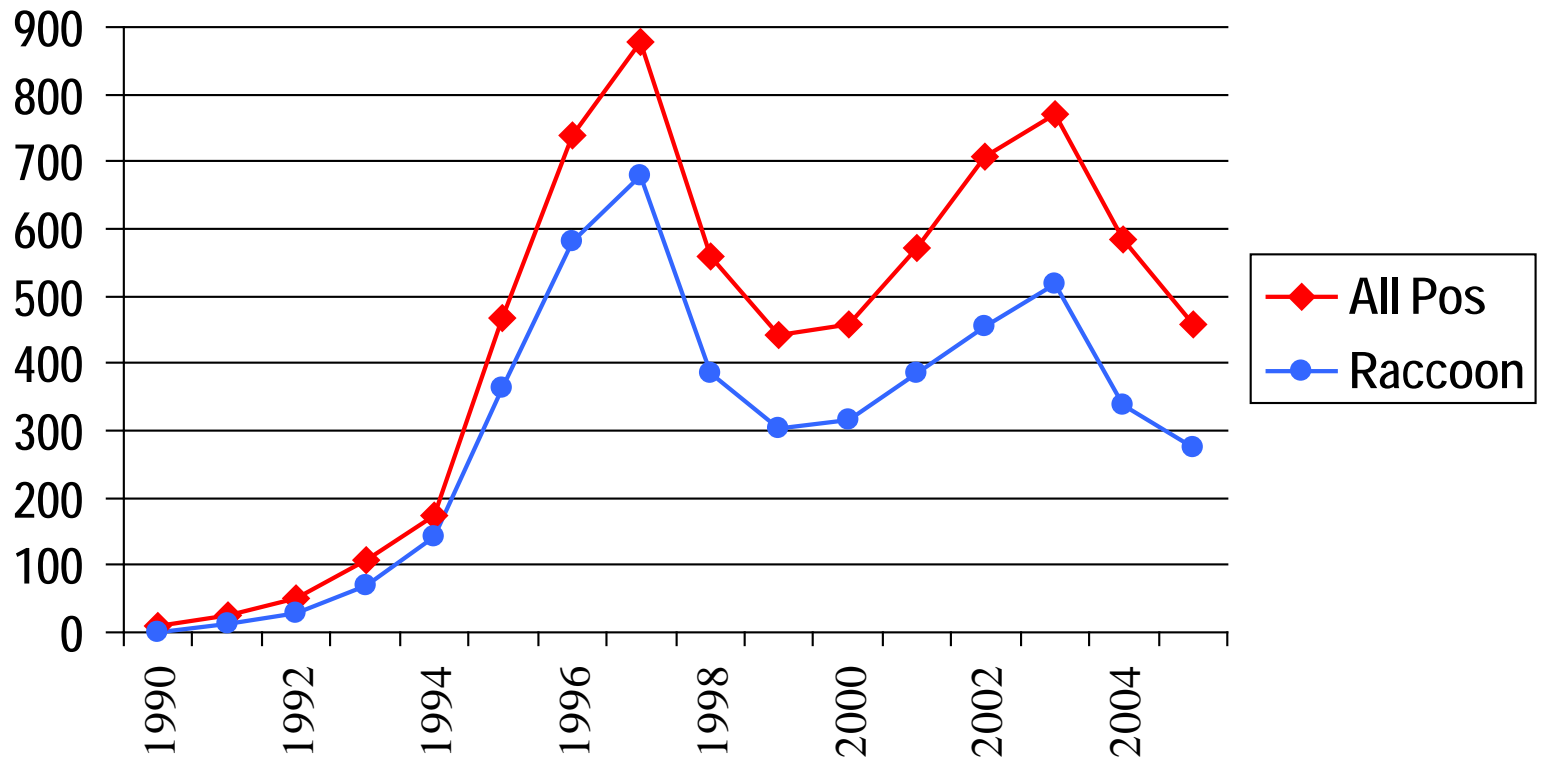
# Epidemics over the years, NC



# Epidemics by species, NC



# Positives by Year and Species, NC



# Rabies in North American Wildlife

- Within each geographic area, spillover of rabies into other (non-reservoir) species occurs

Striped Skunk

*Mephitis mephitis*



Coyote

*Canis latrans*

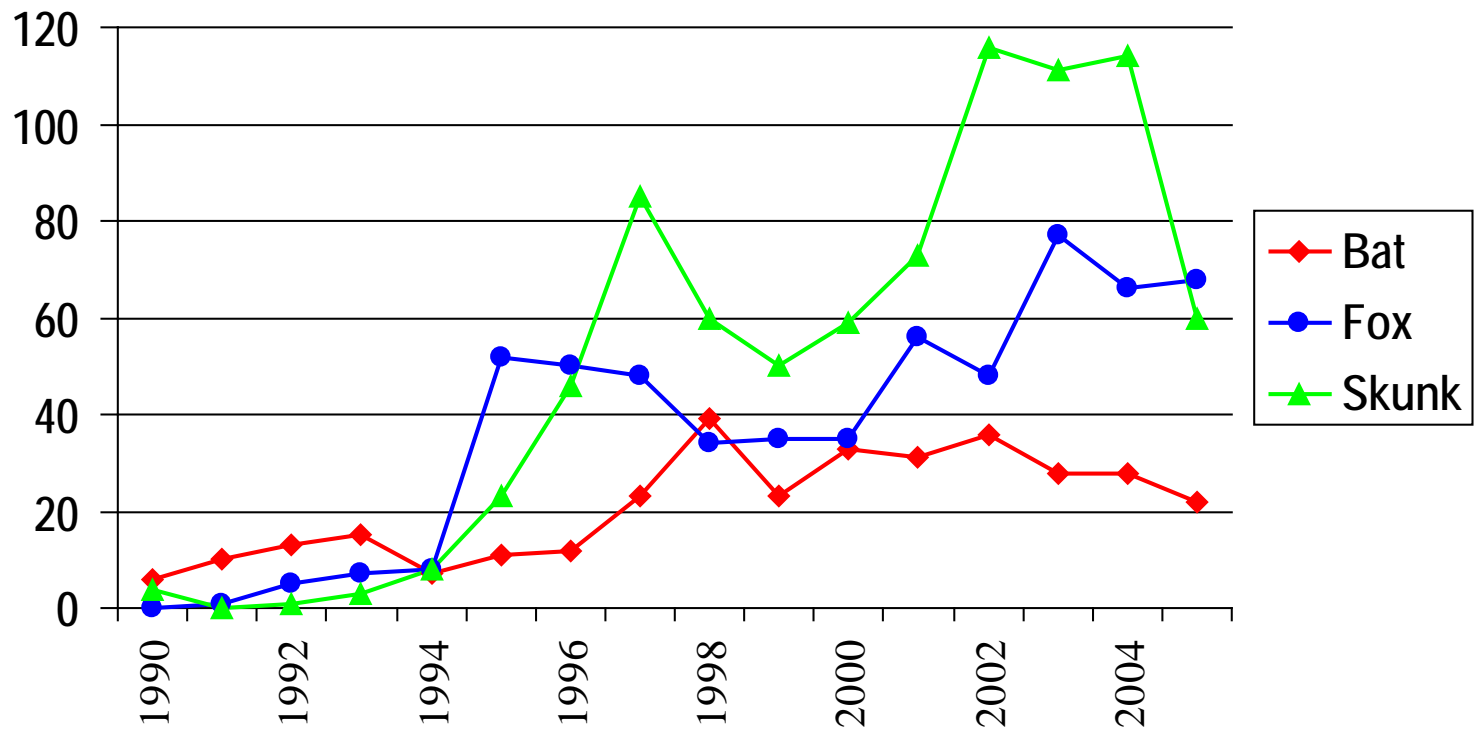


Red Fox

*Vulpes vulpes*

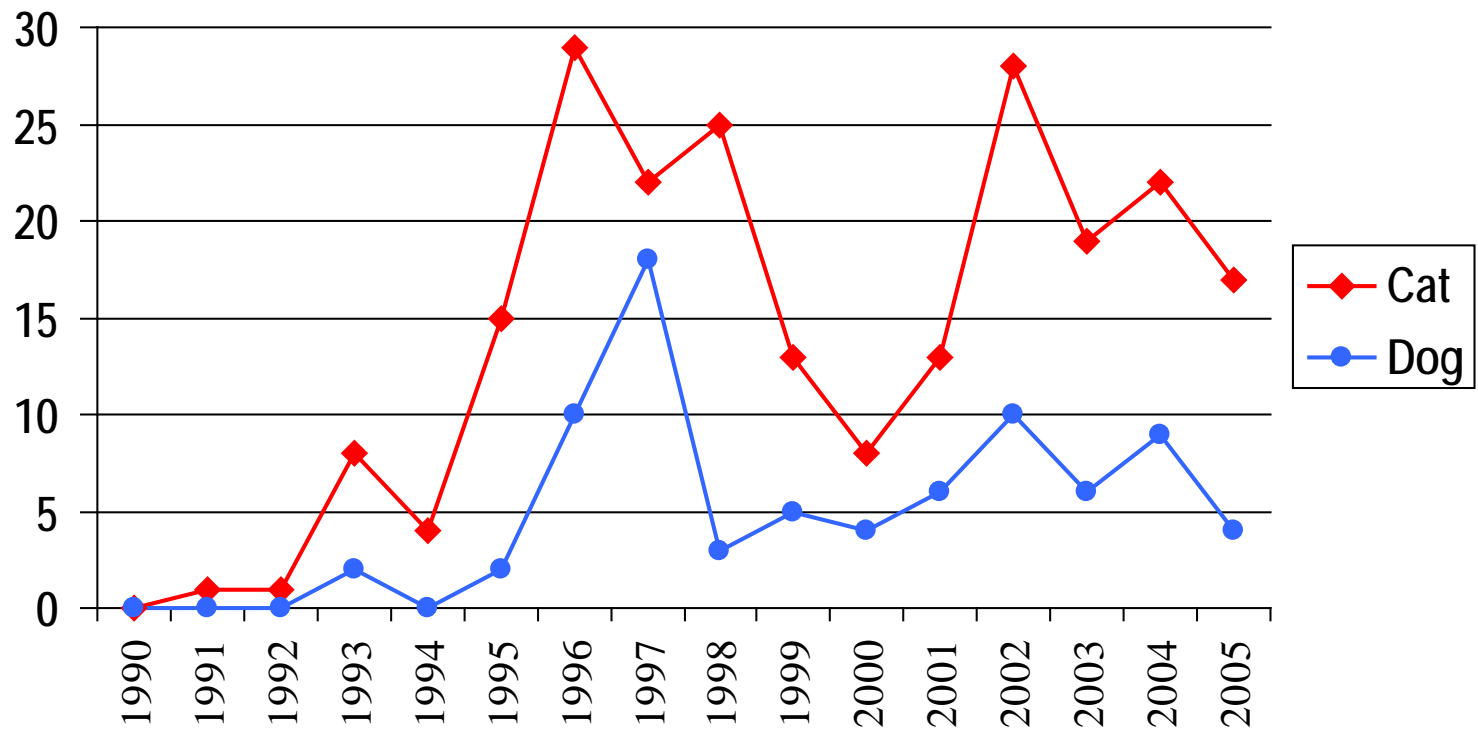


# Positives by Year and Species, NC



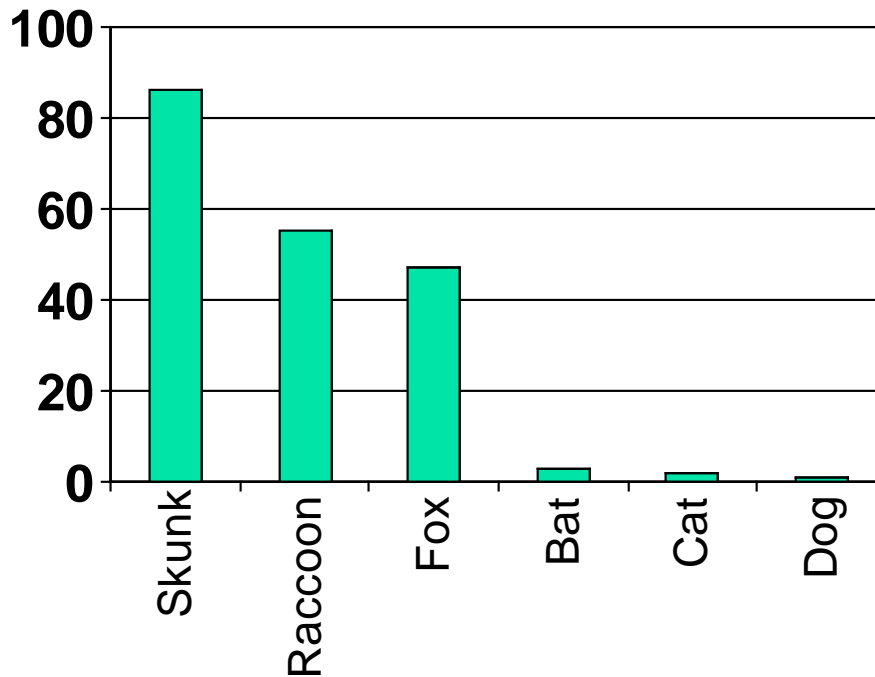


# Positives by Year and Species, NC



# Percent Positive, NC, 2003-2004

■ % Positive



Based on NC SLPH data

# Specimens Tested are:

Skunk: 263

Raccoon: 1563

Fox: 304

Bat: 1645

Cat: 2103

Dog: 1390



## § 130A-185. Vaccination of all dogs and cats

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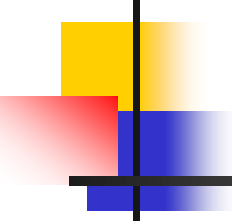
- (a) The owner of every dog and cat over four months of age shall have the animal vaccinated against rabies. The time or times of vaccination shall be established by the Commission. Rabies vaccine shall be administered only by a licensed veterinarian or by a certified rabies vaccinator.
- (b) Only animal rabies vaccine licensed by the United States Department of Agriculture and approved by the Commission shall be used on animals in this State. (1935, c. 122, s. 1; 1941, c. 259, s. 2; 1953, c. 876, s. 2; 1973, c. 476, s. 128; 1983, c. 891, s. 2.)



## § 130A-193. Vaccination and confinement of dogs and cats brought into this State

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- (a) A dog or cat brought into this State shall immediately be securely confined and shall be vaccinated against rabies within one week after entry. The animal shall remain confined for two weeks after vaccination.
- (b) The provisions of subsection (a) shall not apply to:
  - (1) A dog or cat brought into this State for exhibition purposes if the animal is confined and not permitted to run at large; or
  - (2) A dog or cat brought into this State accompanied by a certificate issued by a licensed veterinarian showing that the dog or cat is apparently free from and has not been exposed to rabies and that the dog or cat has received rabies vaccine within the past year. (1935, c. 122, s. 11; 1983, c. 891, s. 2.)



**§ 130A-196. Confinement of all biting dogs and cats; notice to local health director; reports by physicians; certain dogs exempt.**

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- When a person has been bitten by a dog or cat, the person or parent, guardian or person standing in loco parentis of the person, and the person owning the animal or in control or possession of the animal shall notify the local health director immediately and give the name and address of the person bitten and the owner of the animal.
- All dogs and cats that bite a person shall be immediately confined for 10 days in a place designated by the local health director.
- However, the local health director may authorize a dog trained and used by a law enforcement agency to be released from confinement to perform official duties upon submission of proof that the dog has been vaccinated for rabies in compliance with this Part. After reviewing the circumstances of the particular case, the local health director may allow the owner to confine the animal on the owner's property.



## § 130A-196. Confinement of all biting dogs and cats; notice to local health director; reports by physicians; certain dogs exempt

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- An owner who fails to confine his animal in accordance with the instructions of the local health director shall be guilty of a Class 2 misdemeanor. If the owner or the person who controls or possesses a dog or cat that has bitten a person refuses to confine the animal as required by this section, the local health director may order seizure of the animal and its confinement for 10 days at the expense of the owner.
- A physician who attends a person bitten by an animal known to be a potential carrier of rabies shall report within 24 hours to the local health director the name, age and sex of that person. (1935, c. 122, s. 17; 1941, c. 259, s. 11; 1953, c. 876, s. 13; 1957, c. 1357, s. 9; 1977, c. 628; 1983, c. 891, s. 2; 1985, c. 674; 1989, c. 298; 1993, c. 539, s. 950; 1994, Ex. Sess., c. 24, s. 14(c).)



## § 130A-197. Infected dogs and cats to be destroyed; protection of vaccinated dogs and cats

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- When the local health director reasonably suspects that a dog or cat has been exposed to the saliva or nervous tissue of a proven rabid animal or animal reasonably suspected of having rabies that is not available for laboratory diagnosis, the dog or cat shall be considered to have been exposed to rabies.
- A dog or cat exposed to rabies shall be destroyed immediately by its owner, the county Animal Control Officer or a peace officer unless the dog or cat has been vaccinated against rabies in accordance with this Part and the rules of the Commission more than three weeks prior to being exposed, and is given a booster dose of rabies vaccine within three days of the exposure.
- As an alternative to destruction, the dog or cat may be quarantined at a facility approved by the local health director for a period up to six months, and under reasonable conditions imposed by the local health director. (1935, c. 122, s. 14; 1953, c. 876, s. 10; 1983, c. 891, s. 2; 2000-163, s. 4.)

# Prevention

- knowledge
- caution
- common sense
- vaccination
  - human
  - pet animal





## Pre-exposure prophylaxis

- 1.0 mL HDCV/PCEC/RVA  
IM deltoid, days 0, 7 & 21 *or* 28



Bobcat

*Lynx rufus*



## Pre-exposure prophylaxis

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- Booster vs titer
- how often





## Treatment for people that are exposed

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- wash wound thoroughly with soap and water for 10 minutes
- seek medical assistance
- contact county health department



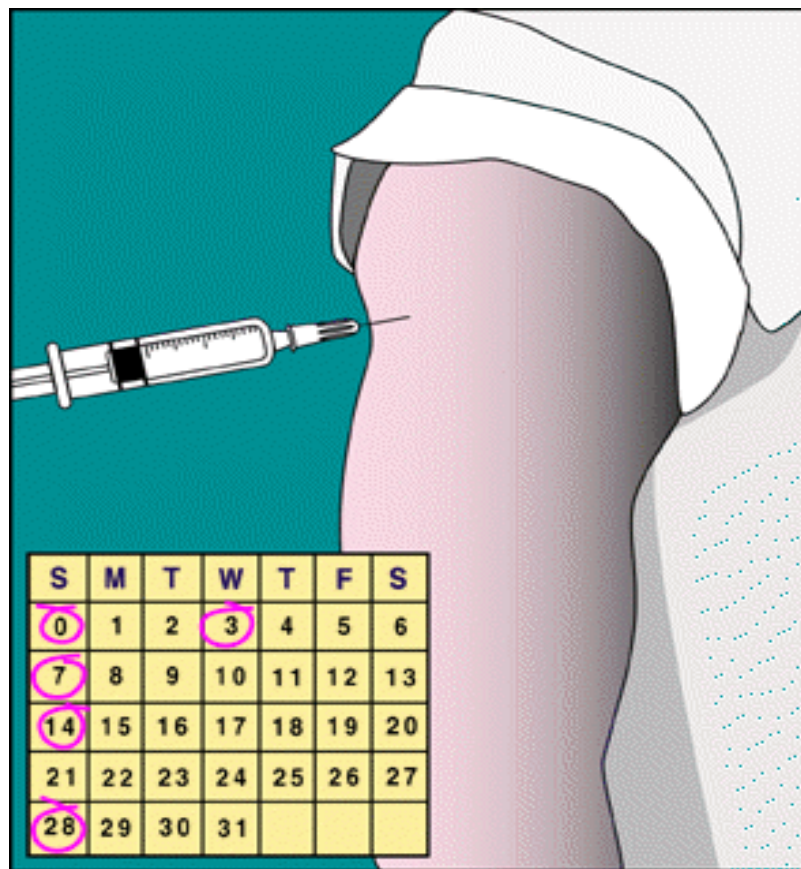
## Post-exposure rabies vaccination

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- previously vaccinated against rabies
  - **1.0 mL IM only**, HDCV or PCEC
  - days 0, 3

# Post-exposure rabies vaccination

- not previously vaccinated against rabies
  - **1.0 mL IM only, HDCV or PCEC**
  - days 0, 3, 7, 14, 28
- *and*
  - 20 IU/kg body weight RIG
  - day 0





# Rabies PEP Guide

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Animal Type	Evaluation and Disposition of Animal	PEP recommendations
Dog and Cat	Healthy & available for 10 day observation	Begin PEP only if symptoms develop
	Rabid or suspected rabid	Administer PEP, submit for testing
	Escaped	Consult PH
Skunk, Raccoon, Bat, Fox	Regard as rabid unless proven negative by lab test	Administer PEP
Livestock, Rodents, Lagomorphs	Consider Individually	Consult PH



## Decline in Human Rabies Cases, US

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- Incidence of human rabies has declined sharply
- Average of 11 persons/year in the 1950's
- Less than 3 persons/year in the 1990's
- Attributed largely to successful control of rabies in domestic dogs



# Bats and Rabies, US

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- Non bite associated cases of rabies (cryptic) now constitute the largest category of human rabies cases in the US.
  - 78% of all cases in the 90's vs. 23% during the 50's
- Hx of animal bite reported in only 7 of last 35 cases of human rabies
- WHY?
  - Cannot get adequate history from neurologically impaired patient
  - Bites from small mammals, such as bats, might go unnoticed





# Bats and Rabies, US

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- There have been 35 recorded human rabies deaths from 1990 through 2002 in the US
- 26 of 35 (74%) were associated with the bat variant of rabies virus
- In only 2 of 26 was a bite history documented



Silver-haired bat

*Lasiurus noctivagans*

Eastern pipistrelle bat

*Pipistrellus subflavus*





## What would you do?

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- 5 year old female spayed terrier gets in a fight with a fox in New Hanover Co.
- Owner wants to know what to do.
- What if the...
  - Dog is currently vaccinated against rabies
  - Dog is not currently vaccinated against rabies



## What would you do?

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- In Cary an 8 year old male cat catches a bat and brings it, alive, to owners
  - Cat is not currently vaccinated against rabies
- Owner calls you and wants to know what to do



## What would you do?

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- 4 month old golden retriever puppy vaccinated against rabies for the first time two weeks ago.
- Puppy gets in fight with raccoon in Mitchell Co.
- Owner wants to know what to do.



## What would you do?

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- Owner brings his dog to an emergency veterinary clinic in Charlotte on a Saturday night.
- He wants his two year old cocker spaniel euthanized because it just bit his three year old daughter on the hand.
- Vet clinic calls you for advice.



## What would you do?

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- In Madison Co. a 7 year old collie eats an oral rabies vaccination (ORV) bait.
- The owner calls for advice.



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News

Tuesday, July 18, 2006

## Coyote attack victim sought

**By Joseph R. Schwartz**

Staff Writer

Guilford County Department of Public Health leaders are still looking for a woman and dog that an onlooker said were attacked by a rabid coyote Friday.

Officials are desperate to make contact with the woman and confirm whether she or the dog sustained bites at Guilford Courthouse National Military Park.

"We could have a major spread of the rabies virus if both of them were attacked," said Sandy Ellington, community health educator with the health department.

If the woman is infected, she could die within seven to 21 days if she does not receive treatment, Ellington said.

Animal control workers have set a large-dog trap in the park and hope to catch wild animals. The captured animals will be observed for warning signs of rabies, including foaming at the mouth, biting at the cage or pacing in circles.

If an animal shows symptoms, officials will kill it and examine its brain tissue to confirm rabies.