

# AAVMC/APTR One Health Interprofessional Education

## Animal Bites



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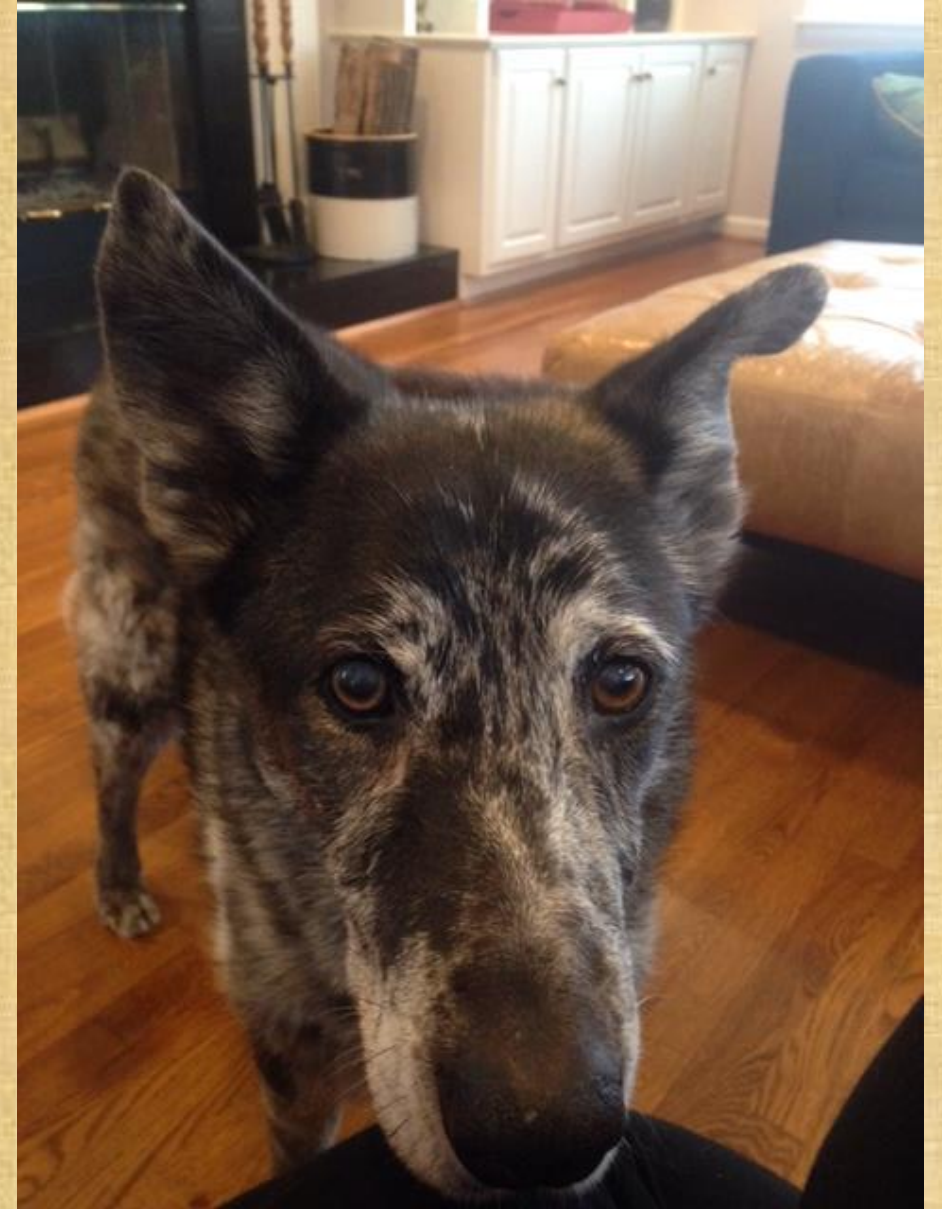
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# Objectives

- Understand the health care burden of animal bites
- Provide immediate first aid, triage, and definitive treatment for individuals with a bite wound
- Discuss laws and regulations involving animal bites
- Provide education and preventive recommendations to patients/owners



# Animal Bites

- Annual incidence of ~4.7 million
- 1% of all visits to E.D. (~316,000/yr)
- ~9,500 hospitalizations costing ~ \$53.9 million/yr
- 103-118 per 100,000
- 10 to 20 deaths annually (mostly Peds)
- Species
  - Dogs: 85 - 90%
  - Cats: 5 – 10%
  - Rodents: 2 – 3%



Holmquist L, Elixhauser A. Emergency department visits and inpatient stays involving dog bites, 2008. November 2010. Rockville, Md.: Agency for Healthcare Research and Quality; 2010. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb101.pdf>. Accessed June 24, 2014.

MMWR: Nonfatal Dog Bite-Related Injuries Treated in Hospital Emergency Departments - United States, 2003, July 4, 2003 / 52(26);605-610

Nonfatal dog bite-related injuries treated in hospital emergency departments--United States, 2001, MMWR Morb Mortal Wkly Rep 2003 Jul 4;52(26):605-10.

# Dog Breeds

Over 3000 postal workers suffer dog bites each year.



**DON'T BE FOOLED**

Man's best friend...



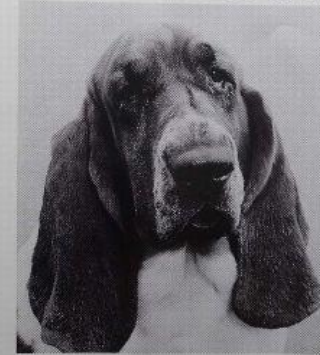
Can  
have  
bad  
days  
too!



UNITED STATES  
POSTAL SERVICE

- Any dog can bite
- No one breed is overrepresented
- Larger breeds can cause more damage and thus accounts for more hospital admissions and ED visits

**IS THIS  
YOUR DOG?**



Even the sweetest dogs can pose a threat if their owners don't take the proper precautions.

**NATIONAL DOG BITE  
PREVENTION WEEK**  
MAY 19-26, 2007

Help stop dog bites by being a responsible owner.  
Protect your community by protecting your dog.

UNITED STATES  
POSTAL SERVICE

# Dog Bites



- Known animals account for >70% of bites
- 60% of bites in children
- Head and neck was involved in greater than 67%
- >50% of these attacks were not provoked
- 65% were not vaccinated for rabies

This is per victim self report. This number likely much lower in reality.

Despite being a law in most areas.

# Look for body language!

Never let babies  
or toddlers crawl  
on a pet!



This is an unhappy dog!

It is giving lots of  
warning signs and is a  
bite waiting to happen.

Ears back  
Brow furrowed  
Shark eyes  
Lip beginning to curl

Other signs can include: bearing teeth,  
licking lips, vocalizing/growling, tail  
tucked between legs

# LOOK CLOSELY.



Keep your face and children's face away from a dog's face.

Supervise all interactions between animals and young children.



# Cat Bites

- 89% are provoked
- 92% not vaccinated for rabies
- Signs of *Pasteurella multocida* infection can develop rapidly
- *P. multocida* is found in 50% of infections
- Occur more often in adults and females

Don't mess with a cat and they won't bite you!



Neutering may help.



# Human Victim: Wound Care

- Surface should be cleaned with iodine solution
- Irrigated with saline or flush with copious amounts of tap water. (20ml or larger syringe to get the proper pressure for adequate cleaning)
- If possible rabid animal, flush with an iodine solution.
- Wound should be carefully explored
- Radiograph if bite near bone or foreign body suspected



# Liability warning for the veterinary field

- Refer **all** human bites to a physician immediately for treatment. Veterinarians have been sued for not doing this.
- Do not allow owners to hold their animal during an exam, injection, or other procedure. You will be liable if the owner gets bit. This is well documented in case law.
- Doing basic first aid on a human victim is allowed and falls under the Good Samaritan Act.

# Practice Universal Precautions

- Assume all blood is infectious
- Wash hands after exposure to or clean up of hazardous materials (blood, etc)
- Always use personal protective equipment (gloves) if there is potential contact with blood
- Dispose of gloves and contaminated material in an appropriate hazardous waste disposal unit
- Disinfect contaminated surfaces
- For more information, see the CDC Guide to Infection Prevention for outpatient settings. [http://www.cdc.gov/hai/pdfs/guidelines/Ambulatory-Care+Checklist\\_508\\_11\\_2015.pdf](http://www.cdc.gov/hai/pdfs/guidelines/Ambulatory-Care+Checklist_508_11_2015.pdf)

# Human Victim: To close or not to close, that is the question...



- 96 patients with 169 dog bite wounds
  - 7 (7.3%) wounds were closed
  - 6 (7.1%) wounds were not closed
- 145 bites by cats
  - 8 patients had wounds closed
- 168 patients with wounds closed
  - 82 primarily closed, 86 left to heal by second intention
  - Infection rate the same in both groups (8.3%)
  - Closed wound had significantly improved cosmetic appearance

• It is acceptable to close a wound if it is cosmetically favorable.

• Most experts recommend simple interrupted stitch

• Use a monofilament suture

• Skin adhesives (i.e. Dermabond) has not been studied and is not FDA approved for animal bites.

• Do not close wounds at high risk for infection.

by dogs, 31%

# Wounds at high risk for infection (Should not be closed)



- Crush injuries
- Puncture wounds
- Bites involving the hands
- Delayed presentation
  - >6-12 hrs for arm or leg
  - >12-24 hrs for face
- Cat or human bites
- Wounds in immunosuppressed hosts and possibly diabetics

# Treatment

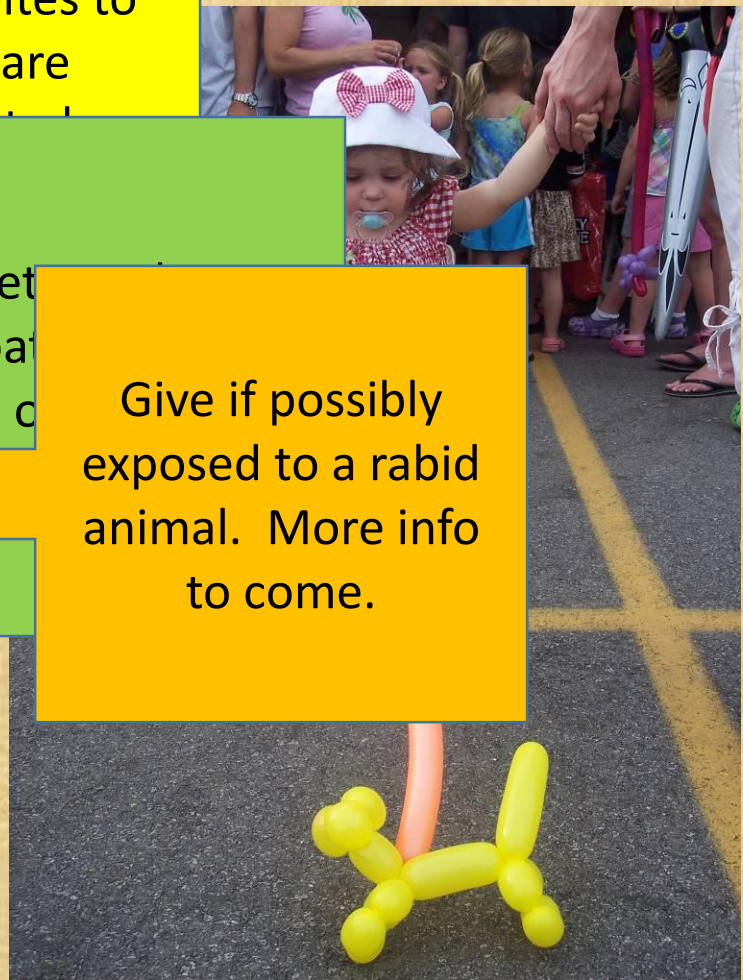
- Culture generally not recommended
- Contact local/state health department
- Tetanus immunization
- Rabies prophylaxis
- Watch for PTSD
- Antibiotic prophylaxis?

All animal bites to humans are

almost the

Give a tetanus shot if the patient had a tetanus shot in the last 5 years

Give if possibly exposed to a rabid animal. More info to come.



# Human Victim: Antibiotic prophylaxis

- Meta-analysis: 8 randomized trials
  - 16% infection rate if untreated
  - RR: 0.56 (95% CI, 0.38 - 0.82)
  - NNT: 14
- Cochrane Review: 9 trials
  - No statistical difference in dog bites (Except for hand wounds: 28% vs 2%)
  - Limitation: Type of antibiotic

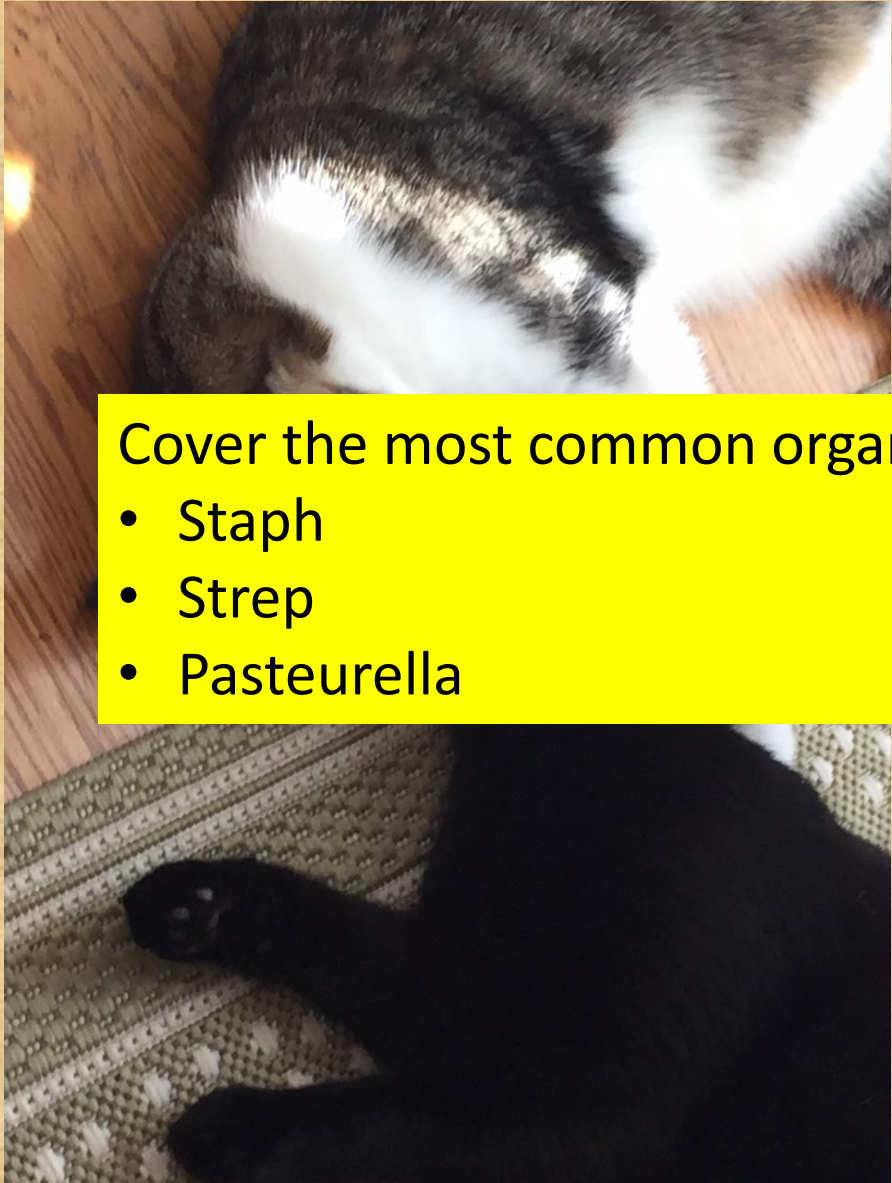


# Antibiotic prophylaxis

- Treat those at high risk
  - Hand bite wounds
  - Deep puncture wounds
  - Wounds requiring surgical debridement
  - Older frail patients
  - Immunocompromised patients
  - Bite wound near or in a prosthetic joint
  - Bite wound in an extremity with underlying venous and/or lymphatic compromise
  - All cat wounds (infection rate >50%)







Cover the most common organisms:

- Staph
- Strep
- Pasteurella

## Antibiotic Prophylaxis

- Potential Organisms
  - *Staphylococcus aureus*
  - Alpha-, beta-, and gamma-hemolytic streptococci
  - Gram negative organisms
  - Anaerobic microorganisms
  - *Pasteurella multocida*  
(20-50% in dogs, 75% or more in cats)
  - *Capnocytophaga canimorus*  
(Emerging human pathogen)  
(Can cause septicemia, meningitis, endocarditis)

# Antibiotic prophylaxis

A 3-7 day course is adequate

## Adults

- First Line:
  - Amoxicillin-clavulanate 875/125 mg twice daily
- Alternatives:
  - Clindamycin 300 mg every 8h plus ciprofloxacin 500 mg twice daily
  - Doxycycline 100mg twice daily

## Children

- First Line:
  - Amoxicillin-clavulanate 25-44 mg/kg divided twice daily
- Alternatives:
  - Clindamycin 10-25 mg/kg divided every 6-8 hours plus trimethoprim/sulfamethoxazole 8-10 mg/kg divided twice daily

Pregnant woman with penicillin allergy:  
Azithromycin 250-500 mg daily  
Monitor closely due to high treatment failure rate.

# Bite Prevention-adults

- Carefully consider your pet selection
- Make sure your pet is socialized
- Train your dog
- Keep your dog healthy
- Neuter your pet
- Be alert
- **NEVER** leave a baby or small child alone with a dog
- Teach children proper behavior around animals.

Based on home

Socialize puppies to

A trained pet is

Healthy pets are less painful. Just like people when

Neutered pets are less aggressive.

Don't let young children climb on or hit pets. Keep hands and face away from their mouth.

## Dog Bite Prevention



Brochure available

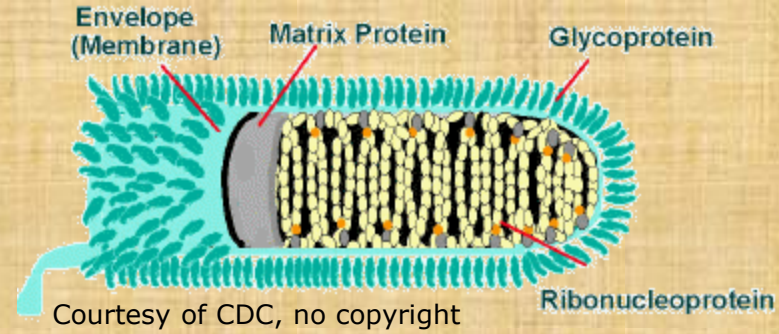
by your veterinarian and the AVMA

**Dogs don't like hugs and kisses** from kids. They may tolerate this, they may not.

This is a major cause of facial bites to children by the family dog.



# Rabies



Classic symptom of hypersalivation.

- *Rhabdoviridae* family, nonsegmented, negative-stranded RNA
- 1-8 human cases/year (34 from 2003-2013)
- 99.9% mortality



# Rabies - Health Care Cost

- Exceeding \$300 million annually
- Post-exposure proph. > \$1000
- cost per human life saved \$10,000 - \$100 million
- Post-exposure prophylaxis 100% successful

This depends on who you ask and how you calculate it.



If done correctly:  
Started within 10 days of exposure, immunoglobulin given, and correct number of vaccine doses given.



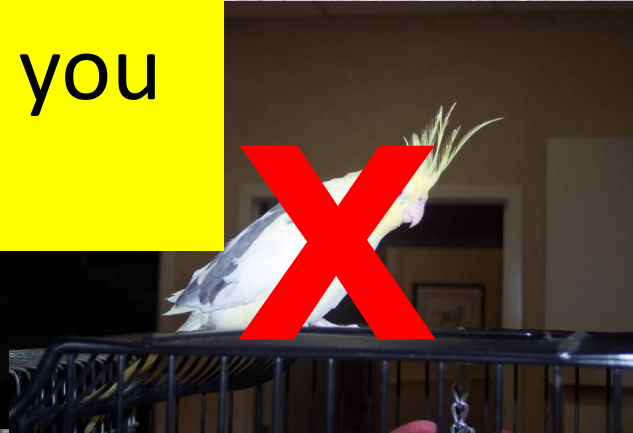
# Which animals can have rabies?



# Which animals can have rabies?



If you're a mammal, you can get rabies!



# Clinical Signs of Infected Animals

- CNS signs
- Furious Form
  - Classic (think Cujo)
- Paralytic form (“Dumb rabies”)
  - Much more common
  - Various neurologic signs
- May only exhibit minimal clinical signs and die quickly
- Prevention: vaccinate!

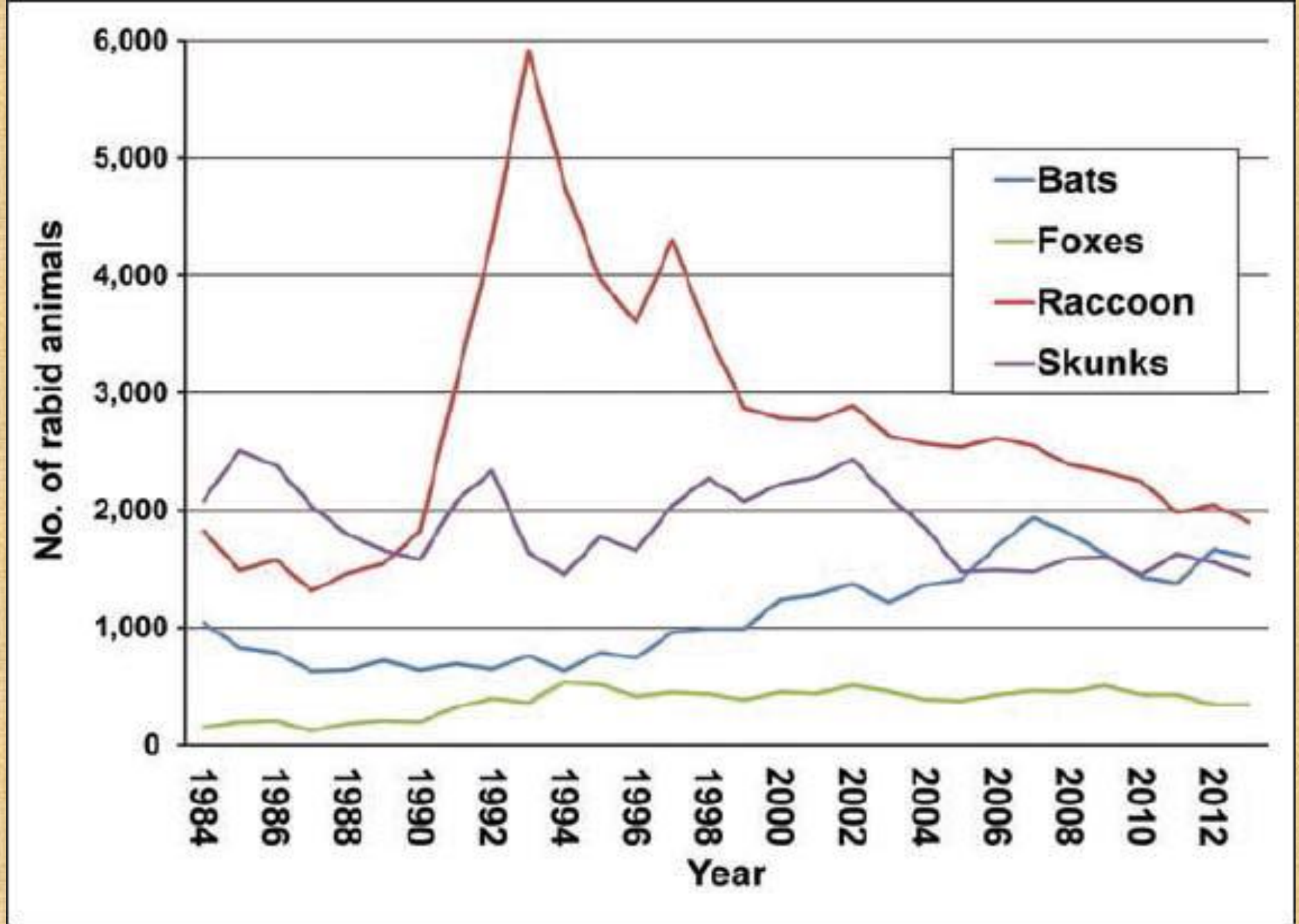
Both of these dogs are exhibiting neurologic signs. Head pressing is a common neurologic sign in animals.

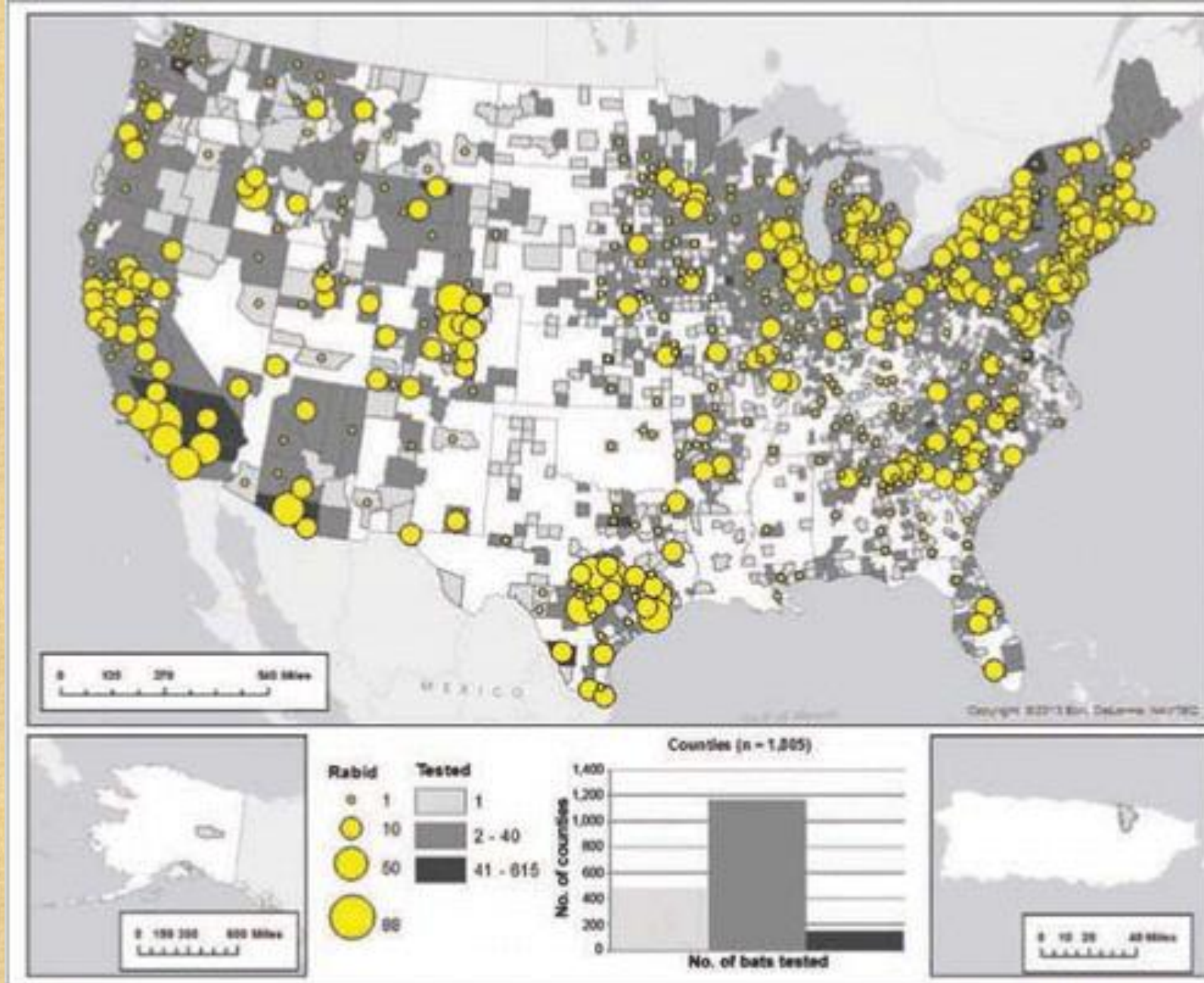


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# Wild Animals



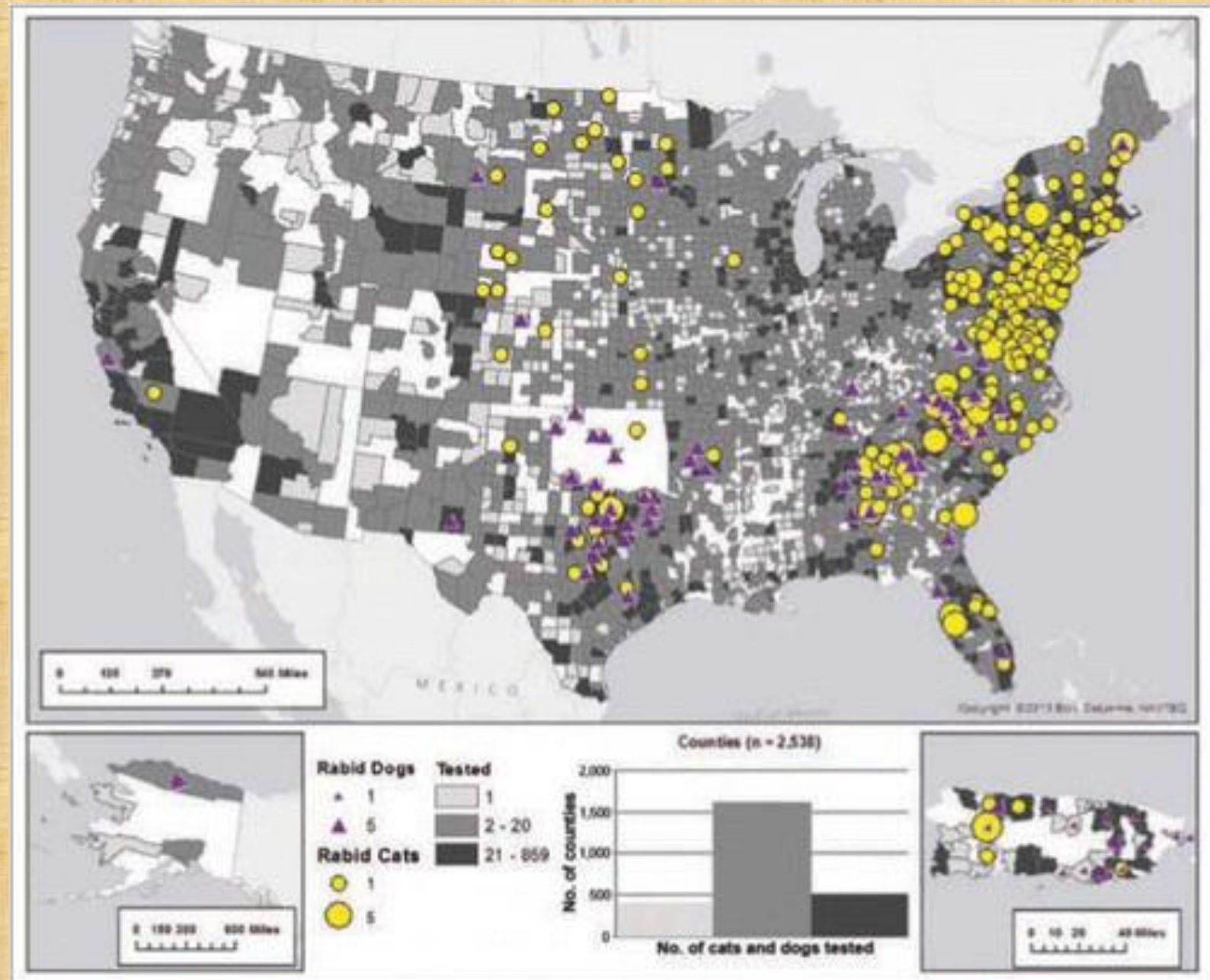


Number of bats tested and number confirmed positive for rabies in 2012.

# Domestic Animals 2012

Cases of rabies in  
Domestic animals  
in 2013:

- Cats: 247
- Dog: 89
- Cattle: 86
- Horse/mule: 31
- Goat/sheep: 9



# Post-exposure Prophylaxis

- Indicated for persons possibly exposed to a rabid animal.
- one dose of immune globulin and four doses of rabies vaccine (days 0,3,7,14)
- **For state and local rabies consultation contacts:**  
<http://www.cdc.gov/rabies/resources/contacts.html>

Courtesy CDC, no copyright

Rabies is transmitted through saliva, CSF, and neurotissue. Exposure to blood of a possibly infected animal by itself is not considered an exposure.



## Recommendations for Post-Exposure Rabies Prophylaxis for Human Victims

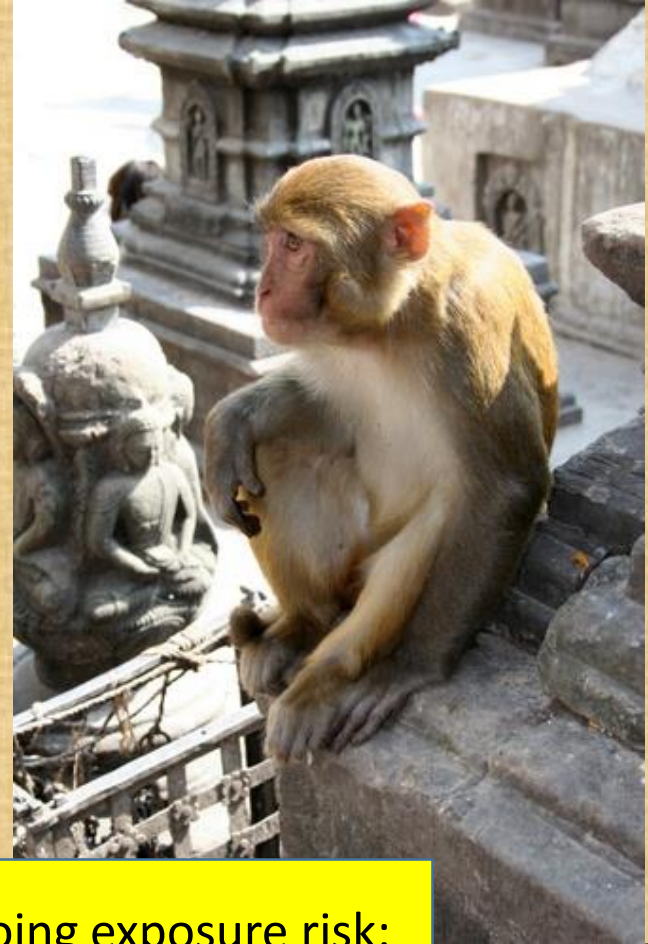
Type of animal bite	Evaluation and disposition of animal	Recommendations
Dog, cat, ferret	Healthy; observe animal for 10 days	Vaccination should not be initiated unless the animal develops clinical signs of rabies
	Rabid (or suspected)	Vaccination should begin immediately
	Unknown (e.g., escaped)	Public health officials should be consulted; immediate vaccination should be considered
Raccoon, skunk, fox, other carnivore, bats	Regarded as rabid unless the animal tests negative	Consider immediate vaccination; if the animal is being tested, delay vaccination until results are available
Livestock, horses	Consider individually	Public health officials should be consulted; most livestock in the United States are vaccinated for rabies
Rodent, rabbit, hare, other mammal	Consider individually	Public health officials should be consulted; bites of rabbits, hares, and small rodents (e.g., squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice) almost never require post-exposure rabies prophylaxis

# Pre-Exposure Prophylaxis

- High-risk groups
  - Veterinarians
  - animal handlers
  - certain laboratory workers
  - +/- international travelers
- Rabies vaccine
  - Given days 0, 7, and 21 - 28
- Titer every? ←
- Post-exposure:
  - No HRIG
  - 2 vaccines (days 0 and 3)

Depends on ongoing exposure risk:

- Certain lab workers: 6 months
- Veterinarian/Tech: 2 years
- Others: potentially never



# Animal Prevention

- Vaccinate all dogs, cats, ferrets, and horses
- Vaccinate livestock with frequent human contact (petting zoos)
- Consider vaccinating very valuable livestock



# Animal quarantine

## Animal bites person

### Dog/cat/ferret

- Confined and observed for 10 days
- Location of the confinement depends on the case (could be in the owners possession)
- Stray or unwanted animal may be euthanized immediately and submitted for rabies testing

### Other animals:

- Depends on species, exposure, and local epidemiology
- Contact the local health department for assistance





# Animal quarantine

- **Dog/cat/ferret possibly exposed**
  - No previous vaccine
    - Immediately euthanize and submit for testing
    - Owner refusal
      - strict isolation for 6 months (no human contact)
  - Vaccine overdue
    - Evaluate on case basis
    - Euthanize vs revaccination and isolation
  - Currently vaccinated
    - Revaccinate
    - 45 day quarantine under owner care



# Animal quarantine

- **Livestock possibly exposed**
  - Unvaccinated
    - Euthanize and submit for testing
    - If not euthanized then, strict isolation (no human contact) for 6 months
  - Current vaccination
    - Revaccinate
    - Observation for 45 days
- Any animal possibly exposed in previous 8 months should be rejected for slaughter.



# Case example

- Two people in York County were exposed to rabies from a horse that was thought to be lame but turned out to be rabid, health officials said.
- The people were providing care to the horse when it started to exhibit aggressive behavior. The horse was euthanized, tested and found to have had rabies. Both people were told to seek medical treatment for possible rabies exposure, state health officials said in a release Wednesday.
- Horses are not required to have rabies shots. However, state officials encourage rabies vaccinations for any animals that have frequent contact with people. State officials urge people to notice sudden changes in domestic animal behavior and avoid contact with wild animals.

# Discussion Questions

- What went well in this case?
- What could have been done better?
- How can veterinarians, physicians, and public health officials work together to prevent future exposures?

# Summary

- Immediately clean bite wounds thoroughly
- Close bite wounds if cosmetically favorable
- Consider antibiotic prophylaxis
- Give rabies post-exposure prophylaxis to those possibly exposed to rabies

