AAVMC/APTR One Health Interprofessional Education

Animal Bites

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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%


Over 3000 postal workers suffer dog bites each year.

Dog Breeds

- 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

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

Despite being a law in most areas.

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


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
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
• Disinfest contaminated surfaces
Human Victim:
To close or not to close, that is the question...

- 96 patients with 169 dog bite wounds
  - 7 (7.6%) closed became infected
  - 6 (7.8%) open became infected
- 145 bites by dogs, 31% by cats
  - 8 patients (5.5%) became infected
- 168 patients with dog bite wounds
  - 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.

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 mandated to be reported by law almost everywhere in the U.S. This applies to physicians as well as veterinarians.

Give a tetanus booster if the patient has not had one in the previous 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%)
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)

Cover the most common organisms:
• Staph
• Strep
• Pasteurella
Antibiotic prophylaxis

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.

A 3-7 day course is adequate
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 situation, lifestyle, and any medical conditions, socialize puppies to people of all ages when young. There is a small window for this. A trained pet is more confident and less fearful with new people and situations and is less likely to bite.

Healthy pets are less painful. Just like people, when animals are sick or painful, they are more likely to snap at people.

Neutered pets are less aggressive.

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


A community approach to dog bite prevention, AVMA task force on canine aggression and human-canine interactions, JAVMA vol. 218 no. 11, June 1, 2001.
Rabies

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

Classic symptom of hypersalivation.
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

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

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

Courtesy CDC, no copyright
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!
Wild Animals

Number of bats tested and number confirmed positive for rabies in 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

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

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

Compendium of animal rabies prevention and Control, MMWR, 2011
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