Our Mission: To protect and improve the health and environment of all Kansans.
Rabies Prevention
A Community Partnership

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State Public Health Veterinarian
Kansas Department of Health and Environment
February 21, 2018
Overview

- What you really need to know
- The Virus
- Epidemiology of Rabies
- Exposure Assessment
- Animal Management
- Human Exposure Management
- Rabies Postexposure Prophylaxis
- Animals Exposed to Rabies

Photo: US National Library of Medicine
What You Really Need to Know

• Rabies risk is real in the U.S. and Kansas
• Review vaccination laws for cites/county
• Review animal bite reporting procedures
• Know protocols for animal observation & quarantine
• Protect yourself, staff, and volunteers
• Call County Health Department or KDHE with any questions

1-877-427-7317

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Ancient Disease

- Greeks called rabies Lyssa, or madness
- Latin word ‘rabies’ from Sanskrit ‘rabhas’, means ‘to do violence’
- 500 B.C., first recorded description of canine rabies
- 4th century B.C., Aristotle wrote ‘dogs suffer from the maddness’
- 1271 A.D. – first epizootic, rabid wolves
Modern Mythology
Help! Rabies! Rabies!
Global Rabies Impact

• One of the world’s deadliest diseases
• Impacts 5 billion people
• 59,000 people die from rabies every year worldwide
  – 40% of cases in children
  – 95% of deaths in Africa and Asia
• $124 billion annually
• 100% preventable

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Human Rabies in the United States, 2008-2017

Silver-haired Bat
Human Rabies in the United States, 2008-2017

• 23 human cases of rabies (1-3 per year)
Human Rabies in the United States, 2008-2017

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  - 8 cases, canine bite/contact outside U.S.
Human Rabies in the United States, 2008-2017

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  - 13 infected in U.S.
  - 10 had contact with a bat
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  - 8 cases, canine bite/contact outside U.S.
  - 13 infected in U.S.
    - 10 had contact with a bat
- Kansas
  - 1968, last human case

Silver-haired Bat

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Human Rabies in the United States, 2008-2017

- 23 human cases of rabies (1-3 per year)
  - 8 cases, canine bite/contact outside U.S.
  - 13 infected in U.S.
    - 10 had contact with a bat
- Kansas
  - 1968, last human case
- Missouri
  - 2008, 55 year old male, bitten by bat, died
  - 2014, 52 year old male, bat exposure, died

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Impact of Human Rabies Prevention

• Half of all Americans will have been bitten by an animal at some point during their lives
• 4.5 million people bitten by dogs each year in U.S.
  – 316,000 treated in emergency department
  – 9,500 hospitalized
  – 10 – 20 animal bite-related deaths/year (mostly dogs)
  – $50,000,000 in inpatient costs/year
• Most dog bite victims are children
• 30,000 – 60,000 courses of rabies post-exposure prophylaxis are administered annually in the U.S.
  – Cost of Rabies = $245-510 million/year
Impact of Animal Rabies Prevention in Kansas - 2015

- 1,182 animals tested for rabies
  - Domestic animals usually tested b/c of bite to human
- 100 rabies positive animals
  - Plus an additional 14 unsuitable specimens (treated like a positive)
- 46 rabid animals had at least 1 animal contact
  - A total of 91 animal contacts identified; 43 euthanized, 16 quarantined for 6 months
- 43 rabid animals had at least 1 human contact
  - 89 human contacts identified
    - 48 recommended PEP; 76 received PEP

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What is Rabies?
Rabies Virus

- Bullet-shaped virus
- Any mammal can be infected
  - Animals that have fur, bear live young, produce milk
- *Virus only found in saliva and neural tissue*
- Does not survive long in the environment
  - Inactivated by drying, sunlight, disinfectant
1) Virus in saliva. 2-4) Incubation period variable, depends on location of bite. Victim asymptomatic. PEP will prevent disease. 5) Encephalitis, symptomatic. 6) Victim infectious. Virus shed 10 days prior to symptom onset.
Rabies in Humans

• Nearly always fatal once symptoms begin
• Tingling or itching sensation at site of the bite
• Non-specific illness prior to neurologic symptoms
  – Flu-like illness (fever, headache)
• Rapid progression (days) to neurologic signs
  – Anxiety, confusion, agitation
  – Paralysis of muscles
• Death
Rabies in Animals

• Any mammal can become infected
  – 3 – 12 week incubation period (highly variable)
• Initial signs non-specific
  – Restlessness, G.I. signs, lameness
• Encephalitic (furious)
  – Aggressive
• Paralytic (dumb)
  – Wild animals appear tame
• Rapid progression of signs
  – Cannot swallow (foaming at mouth)
  – Cannot breathe
  – Death within 3-5 days of onset

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8 Month Old Cat with Rabies

Video from Bayside Animal Hospital

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Cow with Rabies

Video from Dr. Duane Droge
Droge Animal Health Center
Eureka, Kansas

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N = 5,508 total
92% Wildlife
N = 5,508 total
92% Wildlife

1,704 (30.9%), bats
Reported cases of rabies involving bats, by county, during 2015.

Histogram represents number of counties in each category for total number of bats submitted for rabies testing. Point locations for rabid bats were randomly selected within each reporting jurisdiction. Map courtesy CDC.
N = 5,508 total
92% Wildlife

1,704 (30.9%), bats
1,619 (29.4%), raccoons
Reported cases of rabies involving raccoons, by county, during 2015.

Histogram represents number of counties in each category for total number of raccoons submitted for rabies testing. Point locations for rabid raccoons were randomly selected within each reporting jurisdiction. Map courtesy CDC.

N = 5,508 total

92% Wildlife

1,704 (30.9%), bats
1,619 (29.4%), raccoons
1,365 (24.8%), skunks
Reported cases of rabies involving skunks, by county, during 2015.

Histogram represents number of counties in each category for total number of skunks submitted for rabies testing. Point locations for rabid skunks were randomly selected within each reporting jurisdiction. Map courtesy CDC.
N = 5,508 total
8% Domestic Animals
N = 5,508 total
8% Domestic Animals

244 (4.4%), cats
Reported cases of rabies involving cats, by county, during 2015.

Histogram represents number of counties in each category for total number of cats submitted for rabies testing. Point locations for rabid cats were randomly selected within each reporting jurisdiction. Map courtesy CDC.
N = 5,508 total
8% Domestic Animals

244 (4.4%), cats
85 (1.5%), cattle
N = 5,508 total
8% Domestic Animals

244 (4.4%), cats
85 (1.5%), cattle
67 (1.2%), dogs
Reported cases of rabies involving dogs, by county, during 2015.

Histogram represents number of counties in each category for total number of dogs submitted for rabies testing. Point locations for rabid dogs were randomly selected within each reporting jurisdiction. Map courtesy CDC.
Animal Rabies, Kansas – 2015
N = 100 total

76% Wildlife
Animal Rabies, Kansas – 2015
N = 100 total

76% Wildlife

67 (67%), skunks
Animal Rabies, Kansas – 2015
N = 100 total

76% Wildlife

67 (67%), skunks
6 (6%), bats
Animal Rabies, Kansas – 2015
N = 100 total

76% Wildlife

67 (67%), skunks
6 (6%), bats
3 (3%), foxes

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Animal Rabies, Kansas – 2015
N = 100 total
24% Domestic Animals
Animal Rabies, Kansas – 2015
N = 100 total

24% Domestic Animals

12 (12%), cows
Animal Rabies, Kansas – 2015
N = 100 total

24% Domestic Animals

12 (12%), cows
11 (11%), cats
Animal Rabies, Kansas – 2015
N = 100 total

24% Domestic Animals

12 (12%), cows
11 (11%), cats
1 (1%), horses

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### Animal rabies testing by species, Kansas, 2015

<table>
<thead>
<tr>
<th>Species</th>
<th># Positive</th>
<th># Negative</th>
<th># Unsuitable</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Domestic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cat</td>
<td>11</td>
<td>358</td>
<td>1</td>
<td>370</td>
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<tr>
<td>Chicken</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Cow</td>
<td>12</td>
<td>47</td>
<td>3</td>
<td>62</td>
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<tr>
<td>Dog</td>
<td>0</td>
<td>332</td>
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<td>333</td>
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<td>Donkey</td>
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<td>1</td>
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<td>Ferret</td>
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<td>0</td>
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<td>Goat</td>
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<td>6</td>
<td>153</td>
<td>5</td>
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<td>0</td>
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<td>Deer</td>
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<td>Mouse</td>
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<td>Opossum</td>
<td>0</td>
<td>13</td>
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<td>13</td>
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<td>Prairie dog</td>
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<td>0</td>
<td>1</td>
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<tr>
<td>Raccoon</td>
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<td>47</td>
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<td>Rat</td>
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<td>Shrew</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>Skunk</td>
<td>67</td>
<td>49</td>
<td>0</td>
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<tr>
<td>Squirrel</td>
<td>0</td>
<td>15</td>
<td>1</td>
<td>16</td>
</tr>
</tbody>
</table>
Rabies Positive Animals in KS, NE – 2015

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Rabies Positive Animals in KS – 2015

Legend (count)
- 1 - 2
- 3
- 4 - 6
- 7 - 9
- 9
- No Cases

Number of animal specimens submitted for rabies testing, by outcome >> Positive (2016)

Number of animal specimens submitted for rabies testing, by outcome >> Total (2016)

Data Footnotes
- Reported counts for the total number of animal specimens submitted include unsuitable specimens. As a result, the value reported may not equal the sum of positive and negative specimens.
- An animal specimen is considered unsuitable for rabies testing when there is insufficient tissue available to conduct the analysis.

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Rabies Positive Animals in MO – 2015

January 2, 2016

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Animal Vaccination

• Vaccination of domestic animals provide a buffer between wildlife and people

• Licensed rabies vaccine
  – Dogs, cats, ferrets, horses, cattle, sheep
  – Must be given by veterinarian or under direct supervision of vet (KS)
  – Should be given according to label

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Rabies Information by State

The Rabies Awareness Initiative is the first national resource available to veterinarians to address “must know” issues pertaining to companion animal rabies vaccines and vaccination in each of the 50 States and Puerto Rico. The Rabies Awareness Website provides rapid access to current, validated State-level laws and regulations on rabies vaccination that directly impact decisions made in private practice.

UPDATE: KANSAS and NEVADA

*Notes States that have no data yet.
1. WHICH SPECIES ARE REQUIRED TO BE VACCINATED AGAINST RABIES?
2. WHO IS LEGALLY AUTHORIZED TO ADMINISTER A RABIES VACCINE?
3. WHAT ARE THE MEDICAL RECORD REQUIREMENTS FOR RABIES VACCINATION?
4. WHAT ARE THE AGE REQUIREMENTS FOR RABIES VACCINATION?
5. FOLLOWING THE INITIAL RABIES DOSE, WHEN IS AN ANIMAL LEGALLY IMMUNIZED?
6. WHAT ARE THE STATE IMPORTATION REQUIREMENTS FOR RABIES VACCINATION?
7. CAN A 3-YEAR RABIES VACCINE BE SUBSTITUTED FOR A 1-YEAR VACCINE?
8. "OVERDUE" FOR RABIES VACCINE BOOSTER...
9. CAN A RABIES ANTIBODY TITER BE USED TO ESTABLISH "IMMUNITY"?
10. WHAT CONSTITUTES RABIES "EXPOSURE" IN A PET?
11. WHAT ARE THE CONSEQUENCES OF RABIES "EXPOSURE" IN A PET?
12. WHAT ARE THE CONSEQUENCES FOR A PET THAT BITES A HUMAN?
13. CAN A VETERINARIAN EXEMPT RABIES VACCINATION REQUIREMENTS?
14. AT WHAT AGE CAN RABIES VACCINATION BE DISCONTINUED?
15. IS RABIES VACCINATION OF HYBRID SPECIES RECOGNIZED OR ALLOWED?
Rabies Vaccination Laws, Kansas

- No statewide law
- Vaccination ordinance by municipality
  - 637 municipalities
- 10 counties with rabies vaccination law
- Johnson County
  - 20 municipalities

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Compendium of Animal Rabies Prevention and Control

• Published by National Assoc. of State Public Health Vets

• Recommendations serve as a basis for animal rabies prevention and control programs throughout the U.S.
  – Updated ~5 years (2016 most current)
  – Does not supersede state and local laws/requirements
  – Many State Health Departments base animal rabies prevention and control regulations on these recommendations

• Includes information on;
  – Principles of rabies prevention and control
  – Recommendations for parenteral vaccination procedures
  – All animal rabies vaccines licensed by USDA
Rabies Vaccination Highlights from Compendium

• All animal rabies vaccines should be restricted to use by or under the direct supervision of a veterinarian on premises.
• Document, document, document!
• Regardless of the age of the animal at initial vaccination a booster should be administered 1 year later.
  – Give subsequent booster vaccinations according to label.
• No lab or epi data to support the annual or biennial administration of 3-year vaccines after completion of the initial series.

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Animal Rabies Vaccination

• Vaccinate all dogs, cats, ferrets, and horses
• Vaccinate valuable livestock and animals that have frequent human contact (e.g. petting zoo)
  – If it has a name, vaccinate!
• In Kansas, it is illegal to own, and vaccinate, pet skunks, foxes, raccoons, coyotes

Photo Courtesy Dr. Ingrid Garrison
What About Rabies Titers in Animals?

• Rabies virus antibody titers are indicative of a response to vaccine or infection

• Titers do not directly correlate with protection because other immunologic factors also play a role in preventing rabies
  – Our abilities to measure and interpret those other factors are not well-developed (NASPHV Rabies Compendium, 2016)

• Therefore, evidence of circulating rabies virus antibodies in animals should not be used as a substitute for current vaccination in managing rabies exposures or determining the need for booster vaccination
So How Can I Avoid Liability in My Vaccine Protocol?

• AVMA Medical Law Association White Paper (2009)
  – Vaccine Liability Issues for Veterinarians

• Stay abreast of developments in the veterinary profession
  – Scientific, peer-reviewed articles supporting appropriate vaccination protocols
  – Follow decisions in your jurisdiction by the courts & state vet board

• Practice the duty to inform
  – Verbal discussion with client
  – Provide written material that outlines reasons for vaccination
    • Disclose risk, duration of immunity, practice position statement on vax policy

• Obtain owner’s consent prior to vaccination

• Properly document!!!
Rabies is Reportable!

- Phone call is required by law within 4 hours of a *suspect or confirmed case*
  - Health-care providers

- Kansas State University Rabies Laboratory sends results to KDHE
  - KDHE notifies local health department (LHD) of test results
  - If LHD unavailable, submitting vet contacted

- K.A.R. 28-1-13, Rabies Control
  - Authority given to the local health officer or their designee

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Rabies Exposure Risk Assessment

• Information needed when evaluating people who came into contact with a known rabid animal

Or

• Information needed when evaluating people with animal bites

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Public Health Investigation
Human Rabies Prevention – U.S.

- Advisory Committee on Immunization Practices (ACIP)
  - Provides updated information on human/animal rabies epidemiology
  - Summarizes effectiveness/efficacy and safety of rabies biologics
  - Recommendations for rabies postexposure and pre-exposure prophylaxis
  - Treatment considerations for human rabies patients
Local Health Department

• Conducts the investigation (known rabid animal)
  – Collects information about the incident
  – Conducts exposure assessment
  – Makes PEP recommendations

• Evaluate all people/animals that came into contact with the rabid animal 10 DAYS PRIOR TO ONSET OF CLINICAL SIGNS
  – This includes veterinarians, veterinary staff, animal control officers, etc.
Rabies Exposure Risk Assessment

- Species of animal causing exposure
- Type of exposure
  - Bite vs. non-bite
- Location of bite
- Vaccination status of animal
- Normal vs. abnormal behavior
  - Provoked vs. unprovoked

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Types of Exposure

• Bite
  – Any penetration of skin by teeth

• Non-bite
  – Open wound
  – Mucous membranes
  – Organ transplant
  – Scratch?
Bats and Rabies

- Any direct contact should be evaluated for exposure due to:
  - Limited visible injury
  - Inaccurate recall of encounter

- Test bat, or PEP recommended, if bat in same room with person;
  - Sleeping
  - Unattended child
  - Mentally disabled person
  - Intoxicated person


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Bats and Rabies

• Any direct contact should be evaluated for exposure due to:
  • Limited visible injury
  • Inaccurate recall of encounter

• Test bat, or PEP recommended, if bat in same room with person;
  • Sleeping
  • Unattended child
  • Mentally disabled person
  • Intoxicated person

*Photo Credit: The Lancet, 2001, Vol. 357, pp 1714*

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More to Add About Bats

• Reports of bats in or around homes increase in July and August
  – Baby bats learn to fly

• If a person reports a bat in their home the structure should be inspected to insure no additional bats

• Bats should be excluded, not exterminated
  – Bat ‘vent’ allows bats to escape but not return

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### Which Animals Pose a Risk to Humans?

<table>
<thead>
<tr>
<th>Higher / More Likely</th>
<th>Lower / Less Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bat</td>
<td>Rabbits/hares</td>
</tr>
<tr>
<td>Cat</td>
<td>Chipmunks</td>
</tr>
<tr>
<td>Coyote</td>
<td>Squirrels</td>
</tr>
<tr>
<td>Dog</td>
<td>Pet rats, hamsters, gerbils</td>
</tr>
<tr>
<td>Ferret</td>
<td>Other small rodents</td>
</tr>
<tr>
<td>Fox</td>
<td>Opossum</td>
</tr>
<tr>
<td>Horse</td>
<td></td>
</tr>
<tr>
<td>Large rodents (muskrat, beaver)</td>
<td></td>
</tr>
<tr>
<td>Livestock</td>
<td></td>
</tr>
<tr>
<td>Other carnivores</td>
<td></td>
</tr>
<tr>
<td>Raccoon</td>
<td></td>
</tr>
<tr>
<td>Skunk</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>No PEP recommended unless animal behaving abnormally / neurologic</strong></td>
</tr>
</tbody>
</table>
Location of Exposure

• Face
  – High risk (short distance for virus to travel to the brain)
  – Rabies PEP may be started immediately
Normal or Abnormal Behavior?

• Does the dog have a history of biting or other aggressive behavior?
  • If yes, less likely to be rabies

• Is the dog currently vaccinated?
  • If yes, less likely to be rabies

• Was the bite ‘provoked’?
  • If yes, less likely to be rabies
Vaccination Status of the Animal

- Currently vaccinated
  - Low risk of rabies
- Out-of-date but previously vaccinated
  - Low risk of rabies
- Unknown or never vaccinated
  - Higher risk of rabies
10 Day Observation Period
10 Day Observation Period

- Used when DOG/CAT bites HUMAN
  - *Can wait to administer PEP*
- Do not vaccinate the dog/cat during observation

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10 Day Observation Period

- Used when DOG/CAT bites HUMAN
  - *Can wait to administer PEP*
- Do not vaccinate the dog/cat during observation

- Location of observation determined by local health officer (K.A.R. 28-1-13)
  - *Home, vet, shelter*
- If animal develops signs of rabies, euthanize and test

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When Dog/Cat Bites a Human =
10 Day Observation Period

- Used when DOG/CAT bites HUMAN
  - Can wait to administer PEP
  - Do not vaccinate the dog/cat during observation

- Location of observation determined by local health officer (K.A.R. 28-1-13)
  - Home, vet, shelter
  - If animal develops signs of rabies, euthanize and test

- If alive at day 10 it does not have rabies
- If not current, vaccinate dog/cat at end of observation

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Cities or Counties May Have Bite/PEP Reporting Requirements!!!
Management of Humans Who Are Bitten or Exposed

• Bite wounds
  – *Immediately wash with soap and water*
  – Tetanus booster recommended
  – Appropriate antibiotic therapy

• Non-bite exposures
  – Immediately flush mucous membranes with clean water

• **Can wait to administer PEP**
  – If animal is available for observation
  – If animal is being tested for rabies
### TABLE 2. Cost-effectiveness ratios (cost/life saved) for rabies postexposure prophylaxis, by different scenarios of potential exposure* — United States

<table>
<thead>
<tr>
<th>Contact scenario</th>
<th>Probability of rabies†</th>
<th>Baseline cost scenario§</th>
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</thead>
<tbody>
<tr>
<td>Animal tests positive for rabies</td>
<td>(0.01–0.7)</td>
<td>Cost Saving</td>
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<tr>
<td>Skunk bite†</td>
<td>0.05</td>
<td>Cost Saving</td>
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<tr>
<td>(0.01–0.1)</td>
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<tr>
<td>Possible bat bite‡**</td>
<td>0.001</td>
<td>$2.9 million</td>
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<tr>
<td>(0.000001–0.01)</td>
<td></td>
<td>(Cost saving–$8.4 billion)</td>
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<tr>
<td>Dog bite‡</td>
<td>0.000001</td>
<td>$403 million</td>
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<td>(0.000001–0.001)</td>
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<td>($524,080–$840 million)</td>
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<td>Dog lick‡</td>
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<td>$4 billion</td>
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<td>(0.000001–0.000001)</td>
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<td>($162 million–$8.4 billion)</td>
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<td>Cat bite‡</td>
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<tr>
<td>(0.000001–0.01)</td>
<td></td>
<td>(Cost saving–$840 million)</td>
</tr>
<tr>
<td>Cat lick‡</td>
<td>0.0000001</td>
<td>$4 billion</td>
</tr>
<tr>
<td>(0.000001–0.000001)</td>
<td></td>
<td>($15 million–$8.4 billion)</td>
</tr>
<tr>
<td>Contact with rabid human in clinical setting**</td>
<td>0.0000001</td>
<td>$4 billion</td>
</tr>
<tr>
<td>(0.000001–0.000001)</td>
<td></td>
<td>($162 million–$8.4 billion)</td>
</tr>
</tbody>
</table>

* Contact with a potentially rabid animal does not necessarily constitute an exposure. A bite exposure is defined as “any penetration of the skin by teeth.” A nonbite exposure is defined as “contamination of open wounds, abrasions (including scratches) or mucous membranes with saliva or other potentially infectious material (e.g., neural tissue).”

† Probabilities of rabies transmission to a human were obtained from a panel of experts, except for “animal tests positive for rabies” when probabilities obtained from a previous study.

§ Estimates of the direct medical costs of rabies postexposure prophylaxis (PEP) were converted into 2004 dollars using the medical care price index. The cost-effectiveness of PEP under each contact scenario is calculated using the median probability of becoming clinically ill with rabies and the average cost of PEP. The most cost-effective ratio is calculated using the minimum cost of PEP and the maximum probability of becoming clinically ill with rabies. The least cost-effective ratio is calculated using the maximum cost of PEP and the minimum probability of becoming clinically ill with rabies.

‡‡ Animals not available for testing. The skunk bite data are considered applicable to bites from other rabies reservoir species (e.g., bats, raccoons, and foxes in the United States and dog bites occurring in countries with dog variant rabies).

** No recognized bite or saliva exposure.

Recommendations of the Advisory Committee on Immunization Practices. MMWR 2008;57(No.RR-3): pg 11.
Rabies Postexposure Prophylaxis (PEP)

• IT IS NEVER TOO LATE TO START PEP
  – Must give prior to onset of symptoms
• Medical urgency, not an emergency
• If previously unvaccinated and healthy
  – Human rabies immunoglobulin (HRIG), 20 IU/kg
  – FOUR, one-mL doses of vaccine IM (never in gluteal area)
    • Day 0, 3, 7, 14
Protect Yourself and Your Staff

- Pre-exposure vaccination recommended for people with high risk of exposure (e.g. Vets, Animal Control Officers)
  - Only allow vaccinated staff to handle rabies observation, quarantine, or suspect animals
- Three, 1.0 ml injections
  - Day 0, 7, and 21
- Titers checked every 2 years
  - Booster if titer falls below 1:5 dilution by RFFIT
- If exposed to a rabid animal
  - Two, IM doses of vaccine (day 0, day 3)
  - No HRIG
MANAGEMENT OF ANIMALS EXPOSED TO RABIES
Important Notes on Animal Quarantine

- Kansas Administrative Regulation 28-1-13 gives authority to Local Health Officer, or Secretary of KDHE, to determine the location of the animal quarantine

- Public Health Officials rely on veterinarians to provide information to help determine animal exposure
  - However final decision on exposure status of the animal is determined by the Local Health Officer
Compendium of Animal Rabies Prevention and Control

- Maintained by the National Association of State Public Health Veterinarians (NASPHV)
- First document published in 1971 by CDC, NASPHV took over in 1975
- Last updated in 2011
- Significant changes made to recommendations of animals exposed to rabies (March 2016) due to results of KSU study in addition to Texas study

Our Mission: To protect and improve the health and environment of all Kansans.
Current Scientific Evidence

KSU Rabies Laboratory

• Study compared antibody response of dogs and cats with a current vaccination to those that were out-of-date after being exposed to rabies

• Results indicated dogs and cats with an out-of-date rabies vaccination have similar antibody response to rabies booster when compared to dogs and cats with current vaccine

• http://avmajournals.avma.org/doi/pdf/10.2460/javma.246.2.205
No Animals with an Out-of-Date Vaccine Developed Rabies

• Evaluated outcome of animals exposed to reported rabies cases (Kansas, 2012 – 2015)
• 114 rabid animals with at least 1 animal contact
  – 219 animal contacts
    • 31% (68/219) currently vaccinated
    • 15% (32/219) out-of-date
    • 49% (108/219) unvaccinated
    • 5% (11/219) unknown
• 32 out-of-date contacts
  – 50% (16/32) were euthanized
  – 50% (16/32) were quarantined; 14 survived, 1 tested negative for rabies, 1 lost-to-follow-up
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MEMORANDUM

DATE: 01 March 2016

TO: Local health officers, public health administrators, medical consultants, law enforcement, and animal control officers

FROM: D. Charles Hunt, MPH
State Epidemiologist and Director
Bureau of Epidemiology and Public Health Informatics

SUBJECT: New guidelines for management of animals that have been exposed to rabies

In Kansas, local zoning regulations are a first step in controlling rabies, although the primary animal vector is the skunk. Rabies is a disease of wild animals, and there has been no documented human transmission to date in Kansas. The pre-incubation period is highly variable, but is usually 3 to 12 weeks. Animal control programs that emphasize vaccination of dogs and cats, removal of stray animals, animal population control, and enforcement of license programs are essential to reduce the risk of rabies exposure to humans1. These programs have reduced cases of rabies among dogs in the United States from 5,949 cases in 1947 to 89 cases in 20132. There have been deaths in people since 1980 due to rabies transmitted by domestic dogs and cats3.

The Animal Rabies Prevention and Control Board (K.A.R. 28-1-13) recommends the Kansas Department of Health and Environment to develop the Kansas Memorandum to the Administrator of the Animal Health Program in the Department of Health and Environment’s Infectious Disease Epidemiology and Response Section for the specific criteria and protocols.

Quarantine of Animals Exposed to Rabies

The current K.A.R. 28-1-13 requires dogs, cats, or ferrets that have been exposed to rabies and are not immunized against rabies, to be quarantined for 6 months. This includes animals that have been vaccinated for rabies.
When an Animal is Bitten by a Rabid Animal

- If a dog, cat, ferret, horse, cow, or sheep is currently vaccinated against rabies
  - Immediately booster and observe for 45 days
When a Dog or Cat is Overdue

- Dog or cat has been exposed to rabies, is overdue for vaccination, but has documentation of at least one rabies vaccine in its life
  - Immediately booster and OBSERVE for 45 days
  - If booster is delayed, observation period may be increased
When a Dog or Cat is Overdue with No Documentation

• Prospective serologic monitoring – must consult with KDHE
  – Collect 1-2 cc of serum and refrigerate
  – Administer booster vaccination (within 96 hours following exposure)
  – Collect 1-2 cc of serum 5 days (up to 7 days) after first serum collection and refrigerate
  – Ship paired serum together to KSU
  – Animal must be in quarantine until results are available
    • Adequate response – OBSERVE for 45 days
    • Inadequate response – QUARANTINE for 4 months
  OR
• Treat as unvaccinated

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Unvaccinated Dogs and Cats

- Euthanize

OR

- **4-month QUARANTINE**
  - Vaccinate at time of entry into quarantine
  - K-State Protocol recommended for naïve animals
  - Give 3 vaccines; one on day 0, 7, and 21-28
What You Really Need to Know

• Rabies risk is real in the U.S. and Kansas
• Review vaccination laws for cites/county
• Review animal bite reporting procedures
• Know protocols for animal observation & quarantine
• Protect yourself, staff, and volunteers
• **Call County Health Department or KDHE with any questions**

1-877-427-7317
Resources

• KDHE Epi Hotline – 1-877-427-7317

• Kansas Rabies Data (2012 – Present)
  – https://keap.kdhe.state.ks.us/Ephtm/PortalPages/ContentData

• K-State Rabies Laboratory
  – http://www.ksvdl.org/rabies-laboratory/

• Missouri Rabies Reports (2007 – Present)
Resources

• Centers for Disease Control and Prevention
  – http://www.cdc.gov/rabies/

• Animal Rabies Compendium
  – http://www.nasphv.org/documentsCompendia.html

• Human Rabies Vaccine Recommendations
  – https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/rabies.html
Questions?

RABIES

99% human cases result from dog bites

One death every 15 minutes worldwide

4 out of 10 deaths are in children

Zero deaths by 2030

VACCINATE TO STOP TRANSMISSION

VACCINATE TO SAVE LIVES

100% vaccine preventable

TODAY

#rabies
28 September
World Rabies Day
www.who.int/rabies/en

no bite no rabies
Our Mission: To protect and improve the health and environment of all Kansans.