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Document Overview

• National Association of State Public Health Veterinarians, Compendium of Animal Rabies Prevention and Control Committee
• Best practice recommendations for animal rabies prevention and control programs throughout the U.S.
• Facilitate standardization of procedures among jurisdictions
• This document is reviewed and revised as necessary.
• These recommendations do not supersede state and local laws or requirements
• Traditionally published in JAVMA with subsequent MMWR publication
Compandering of Animal Rabies Prevention and Control, 2016

Public Veterinary Medicine: Public Health

Rabies is a fatal viral zoonosis and serious public health problem. All mammals are believed to be susceptible to the disease, and for the purposes of this document, use of the term animal refers to mammals. The disease is an acute, progressive encephalitis caused by viruses in the genus Lyssavirus. Rabies virus is the most important lyssavirus globally. In the United States, multiple rabies virus variants are maintained in wild mammalian reservoir populations such as raccoons, skunks, foxes, and bats. Although the United States has been declared free from transmission of canine rabies virus variants, there is always a risk of reintroduction of these variants.

The rabies virus is usually transmitted from animal to animal through bites. The incubation period is highly variable. In domestic animals, it is generally 5 to 12 weeks, but can range from several days to months, rarely exceeding 6 months. Rabies is communicable during the period of salivary shedding of rabies virus. Experimental and historic evidence documents that dogs, cats, and ferrets shed the virus for a few days prior to the onset of clinical signs and during illness. Clinical signs of rabies are variable and include inappetence, dysphagia, cranial nerve deficits, abnormal behavior, ataxia, paralyis, altered vocalization, and seizures. Progression to death is rapid. There are currently no known effective rabies antiviral drugs.

The recommendations in this compendium serve as a basis for animal rabies prevention and control programs throughout the United States and facilitate standardization of procedures among jurisdictions, thereby contributing to an effective national rabies control program. The compendium is reviewed and revised as necessary, with the most current version replacing all previous versions. These recommendations do not supersede state and local laws or requirements. Principles of rabies prevention and control are detailed in Part II. Recommendations for parenteral vaccination procedures are presented in Part III. All animal rabies vaccines licensed by the USDA and marketed in the United States are listed and described in Appendix 1, and contact information for manufacturers of these vaccines is provided in Appendix 2.

Modifications of note in this updated version of the compendium, compared with the previous version, include clarification of language, explicit en-
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Development and Implementation

• Consensus guidelines based on:
  – Peer reviewed literature
  – Expert opinion
  – Unpublished data

• Applied differently by jurisdiction
  – Flexible enough to account for variability
  – Specific enough to be used as regulation or law
U.S. Epidemiology of Animal Rabies

Terrestrial Rabies Virus Variants
- Arctic Fox
- CASkunk
- NCSkunk
- SCSkunk
- AZFox
- Mongoose
- Raccoon
- TXFox

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Animal Rabies by County, New Mexico, 2015

Total = 13
Acknowledge lack of standardized data collection by jurisdictions

• No national data exists on
  – Incubation periods
  – Number of animals developing rabies during quarantine
  – Vaccination histories of exposed animals
    • Those that completed strict quarantine versus those that didn’t
    • Vaccine failures
  – Epidemiologic characteristics of animals developing rabies
Pre-exposure Vaccination

- Routine pre-exposure vaccination remains the mainstay of rabies prevention and serves to protect both the animal and public health.
- Initial vaccination and booster vaccination one year later. Future booster vaccinations should be given consistent with the vaccine label.
- If a previously vaccinated animal is overdue for a booster, including the one-year booster, it should be revaccinated. Immediately after revaccination, the animal is considered currently vaccinated and should be placed on a booster schedule consistent with the label of the vaccine used.
Post-Exposure Management

- **Currently vaccinated dogs, cats and ferrets, no change**
  - Immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner’s control and observed for 45 days.

- **Never vaccinated dogs, cats and ferrets**
  - **Euthanasia**
  - Administer vaccine within 96 hours of exposure and place into strict quarantine, 4 months for dogs and cats, 6 months for ferrets
  - If vaccination is delayed, may consider extending the strict quarantine period to 6 months

- **Overdue dogs and cats WITH documentation of previous vaccination**
  - Immediately receive veterinary medical care for assessment, wound cleansing, and booster vaccination. The animal should be kept under the owner’s control and observed for 45 days.
Table 6—Rabies neutralizing antibody titers immediately before (baseline) and 5 to 15 days after booster vaccination for 24 cats with an out-of-date vaccination status classified on the basis of number of rabies vaccinations received previously.

<table>
<thead>
<tr>
<th>No. of vaccine doses received previously</th>
<th>Baseline titer (IU/mL)</th>
<th>Time between samples (d)</th>
<th>Titer after booster vaccination (IU/mL)</th>
<th>Time overdue for vaccination (mo)</th>
<th>Increase in titer (IU/mL)</th>
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Median increase in titer was 0.3 IU/mL for cats that had previously received ≥ 2 doses of vaccine and was 9.3 IU/mL for cats that had previously received only a single dose of vaccine.
Post-Exposure Management

• Overdue dogs and cats WITHOUT documentation of previous vaccination
  – Treat as unvaccinated
  – Work with local Rabies Control Authority to decide if the use of prospective serologic monitoring to assess for the presence of an anamnestic response indicative of previous vaccination is appropriate
    • Day 0 (immediately after exposure): draw serum sample, administer vaccination
    • Day 5 (to 7): draw second serum sample
    • Approved rabies laboratory runs as paired sample
    • Animal maintained in strict quarantine until results obtained
    • Evidence of anamnestic response: >2-fold rise in titer and second titer must be >0.5 IU/ml, interpretation MUST be done in conjunction with laboratory performing the test
    • Anamnestic response yes: treat as currently vaccinated with 45 day observation
    • Anamnestic response no: treat as unvaccinated with 4 month strict quarantine

• Overdue ferrets handled on case-by-case basis
Prospective Serologic Monitoring

• Based on data from anamnestic response paper
• Owners frequently unable to produce vaccine certificate
  – Provides an option, at their expense, to document response to vaccine
  – Process must be started within 96 hours
    • Reasonable time to see a vet on a 3 day weekend
    • First sample should be early enough to avoid capturing response to rabies exposure in a truly unvaccinated animal
Prospective Serologic Monitoring

- Guidance document and algorithm on NASPHV website posted with Compendium
- Decision to use MUST be made by local Rabies Control Authority
- Engage one of the approved rabies laboratories from the beginning
  - Sample collection and processing
  - Paperwork
  - Turnaround time
  - Results interpretation
Post-Exposure Management

• No change to post-exposure management recommendations of livestock

• Exposures in animals intended for commercial use
  – Notify state and local public health authorities, state meat inspectors and USDA Food Safety and Inspection Service (FSIS)
  – Animals should not be presented for slaughter in a FSIS-regulated establishment if such animals originate from a quarantine area and have not been approved for release by the proper authority.
Reduced Quarantine Period

• Dogs and cats only
  – Place where limited data has hampered us
  – Requested information from states with raccoon, skunk and fox strains of virus
  – Published reports of incubation periods following natural infection are rare
  – Vaccination at entry into quarantine may help protect minor exposures
  – Combination of unpublished data, expert opinion and experience of states
Adverse Events

• No epidemiologic evidence to link any single product to adverse events
• Serious adverse events are rare
  – vomiting, injection site swelling, lethargy, hypersensitivity, and the occurrence of rabies despite previous vaccination of an animal have been reported.
  – ALL adverse events should be reported to USDA APHIS’s Center for Veterinary Biologics
• Ill animals may not mount a full immune response but are not more likely to have an adverse event from vaccine
  – If vaccination is delayed due to illness, it should be rescheduled as soon as possible
Adverse Events

• Animals with well-documented severe adverse reactions to rabies vaccination
  – Hypersensitivity reactions can be medically managed
  – Decisions not to vaccinate must be made within the context of a valid veterinarian-client-patient relationship.
    • MUST consider the attendant risks and benefits of not vaccinating, including regulatory noncompliance.
    • Animals not currently vaccinated that experience a rabies exposure are at greater risk for infection and death and also put their owners and the community at risk.
Additional Highlights

• Explicitly encourage an inter-disciplinary approach with routine and consistent communication between all relevant parties
• Strive to reduce the risk from introduction of rabid animals through importation
• Facilitate implementation of routine or emergency low cost or free rabies vaccination clinics by working with veterinary medical licensing boards, veterinary associations and the local veterinary community, animal control officials, and animal welfare organizations
• Facilitate voluntary surrender of animals to prevent abandonment
• Maintenance of feral cat colonies is not recommended BUT communities that permit them should safeguard the health of the cats and the communities in which they reside by requiring that cats receive initial and ongoing rabies booster vaccinations.
• New Mexico Department of Health Rabies Webpage: https://nmhealth.org/about/erd/ideb/zdp/rab/
• Centers for Disease Control and Prevention, Rabies Section www.cdc.gov/rabies/
• Atlanta Health Associates, Inc. http://www.atlantahealth.net/
• Kansas State University Rabies Laboratory http://www.ksvdl.org/rabies-laboratory/
• NYSDOH Wadsworth Center http://www.wadsworth.org/programs/id/rabies