NC Rabies Prevention and Control, 2018

Overview

- Public Health authority in NC
- Your state resources
- General Rabies Surveillance
- Human risk assessment overview
- Animal Risk assessment
- NCGS 130A-197
NCGS 130A-41  Powers and duties of local health director

- A local health director shall have the following powers and duties:
  - To investigate the causes of infectious, communicable and other diseases;
  - To exercise quarantine authority and isolation authority pursuant to G.S. 130A-145;
  - To examine, investigate and control rabies pursuant to Part 6 of Article 6 of this Chapter;

Coordination is Essential

- NCGS places authority for CD control with the Local Health Director
- The LHD may delegate (some) responsibility to Animal Control (AC) agencies
  - There must be written agreements (MOA) between agencies specifically delineating responsibility
  - AC officers must defer human rabies risk assessments to local CD nurses
Local Board of Health, or County Commissioners, or Consolidated Human Services Agency [S.L. 2012-126 (H 438)]

Typical Organizational Structure for Rabies Control

Local Health Director

Communicable Disease Staff

Animal Services Officers

County Sheriff

County Manager

Advise Clinicians, Veterinarians, Exposed Persons, Pet owners

Advise Veterinarians, Pet owners, Instruct Exposed Persons to call CD staff or Health Care Provider

10 NCAC 13C .4106 POLICIES AND PROCEDURES

- Each emergency department shall establish written policies and procedures which specify the scope and conduct of patient care to be provided in the emergency areas. They shall include the following:
  - tetanus and rabies prevention or prophylaxis;
NC Communicable Disease Resources

North Carolina Division of Public Health
Communicable Disease Manual
Public Health Management of Reportable Diseases and Conditions

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Two people are on call each day during business hours
- One for rabies
- One for general communicable disease (everything else)
- All staff are cross trained on rabies and GCDC, SMEs available

Who Answers Your Calls?

Medical Consultation Unit
CDC Assigned EIS Officer
CDC Assigned PHAP

Medical Consultation Unit
- Healthcare Associated Infections
- Influenza & Respiratory Diseases
- Vaccine Preventable Diseases
- Enterics
- Zoonotics
- Vectorborne Diseases
- Technical Assistance & Training
- TB Control
Reported Rabies Positive Wildlife by Species and Year, NC
Reported Rabies Positive Domestic Animals by Species and Year, NC

Rabies Positive Animals by Species, NC, 2017, n=254
What’s in a Name?

• Rabies is an acute encephalitis or meningoencephalitis due to a lyssavirus infection.
• The etiological agents of rabies encephalitis belong to the Mononegavirales order, the Rhabdoviridae family and the Lyssavirus genus
• There are 17 identified Lyssaviruses (genotypes) capable of causing the disease “Rabies”
• Only genotype 1, classic rabies virus, is present in North America

Rabies Exposure & Pathogenesis

• Bite
  • Any penetration of the skin by teeth constitutes exposure
  • It is assumed that all bite exposures result in contamination of the wound with saliva

Jackson. Rabies.
Neurol Clinic 26 (2008) 717-726
Management of People Exposed to Rabies

- These protocols remain unchanged

Dogs and Cats

- It is estimated that each year in the US
  - 4.5 million people are bitten by dogs
  - Resulting in 316,000 ED visits and 9,500 hospital stays in 2008
- In the state of Victoria, Australia, 1998-2004
  - 12,982 bites occurred
    - 79.6% due to dogs
    - 8.7% due to humans!!
    - 7.2% due to cats


NC Data, 2008-2010

• ~14 million ED visits
  • 38,971 Animal bite or scratch related
    • 29,586 dog bites, 5,314 cat bite scratch
  • Rabies PEP initiated for
    • 839 / 29,586 dog bites (2.8%)
    • 379 / 5,314 cat bites / scratches (7.1%)

Rhea, et. al. Use of statewide emergency department surveillance data to assess incidence of animal bite injuries among humans in North Carolina. JAVMA, Vol 244, No. 5, March 1, 2014

Incidence rates for animal bite–related emergency department visits among humans in North Carolina by patient age group and biting animal species
Millions of Bites, Thousands of ED Visits
What do these patients really need?

- Wound care
- Antibiotic therapy
- Tetanus Booster or TIG administration
  - Many immigrants not adequately vaccinated against tetanus, thorough history needed
- Rabies specific risk assessment
  - Most dog/cat bites do not require rabies PEP

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Basis for 10 day Confinement

- 86 cats experimentally infected with rabies virus
- 26 died from rabies
- 23 had detectable rabies virus in saliva
- Range of viral shedding extended from 1 day prior to symptom onset to 7 days after symptom onset
- Most cats died 5 – 6 days after symptom onset


Basis for 10 day Confinement

- 117 dogs experimentally infected with rabies virus
- 54 died from rabies
- 25 had detectable rabies virus in saliva
- Range of viral shedding extended from 3 days prior to symptom onset to 7 days after symptom onset
- Most dogs died 3 – 4 days after symptom onset

Exposure:
bite, scratch, saliva touches eyes, nose, mouth

Incubation

Shedding

Exposure: bite, scratch, saliva touches eyes, nose, mouth

Animal NOT infectious, appears healthy, up to 120 day duration

Animal IS infectious, may appear healthy or ill 1-10 day duration

DEATH

1. virus enters body
2. virus dormant for variable time period
3. virus enters PNS travels toward brain
4. virus enters brain
5. virus spreads to salivary glands
6. Animal shows signs of rabies

Essen Schedule; 5 doses, 5 visits*
PEP for those persons not previously vaccinated

D 0 x 1
D 3 x 1
D 7 x 1
D 14 x 1
D 28 x 1
D 0 HRIG 20 IU/kg
D 0 Wound Cleansing

1 ml (IM) into deltoid (adults) or into anterolateral area of thigh (children)

*RabAvert® Novartis Vaccines Rev. 10/06
*IMOVAX® Sanofi Pasteur SA (December 2005)
ACIP Modified Essen Schedule; 4 doses, 4 visits*

1 ml (IM) into deltoid (adults) or into anterolateral area of thigh (children)

D 0 x 1
D 3 x 1
D 7 x 1
D 14 x 1
D 0 HRIG 20 IU/kg
D 0 Wound Cleansing

*Use of a Reduced (4-Dose) Vaccine Schedule for Postexposure Prophylaxis to Prevent Human Rabies. March 19, 2010 / 59(RR02);1-9

Human Rabies PEP IF previously vaccinated; 2 doses, 2 visits*

1 ml (IM) into deltoid (adults) or into anterolateral area of thigh (children)

D 0 x 1
D 3 x 1
D 0 Wound Cleansing

*RabAvert® Novartis Vaccines Rev. 10/06
*IMOVAX® Sanofi Pasteur SA (December 2005)
The New Control Measures

Not new, but important; NCGS 130A-185

Vaccination required - The owner of an animal listed in this subsection over four months of age shall have the animal vaccinated against rabies.

(1) Cat
(2) Dog
(3) Ferret

Adherence to a regular rabies vaccination schedule is critical to protect animals against recognized and unrecognized exposures.
NCGA Amended NCGS 130A-197
2017 Session

- SB 74 ratified by NC General Assembly, signed by Governor July 12, 2017

- Amended 130A-197 by implementing the recommendations and guidelines of the Compendium of Animal Rabies Prevention and Control, specifically for management of dogs, cats, and ferrets exposed to rabies
Amended NCGS 130A-197

- Effective October 1, 2017
- Mostly less restrictive
- Potentially fewer dogs and cats euthanized.
- More *never vaccinated* dogs and cats placed under quarantine (instead of euthanized) for a shorter period of time (4 months).
Currently Vaccinated

- Veterinary medical care for assessment, wound cleansing, and booster vaccination.
  - Immediate or within 96 hours
  - The animal should be kept under the owner’s control and observed for 45 days

The Rabies Certificate is not expired. If the animal’s initial Rabies vaccination, it occurred at least 28 days prior to the exposure and at ≥ 3 months of age Or per Vaccine Manufacturer’s label

Owner Observation 45 Days

- Under the owner’s strict control and observation for 45 days until the LHD officially releases the 45 day observation period
- No contact with animals or people other than the designated owner/caretaker(s)
  - Leash walk, direct supervision secure fenced yard
  - Unless prior approval from LHD,
    - No travel in or out of state
    - No boarding
    - No outings to doggie park or other parks
    - No public venues, etc.
- Notify LHD immediately or illness or behavior change or bites to people; need for veterinary care
Overdue with Documentation

- Veterinary medical care for assessment, wound cleansing, and booster vaccination.
  - Immediate or within 96 hours
  - The animal should be kept under the owner’s control and observed for 45 days

Rabies Certificate is expired, but animal has received at least one rabies vaccine in its lifetime. If a single vaccine, the animal was vaccinated at $\geq 3$ months of age.

Overdue with Documentation

- What constitutes documentation
- Rabies Certificate
  - Model NASPHV form #51, OR
  - Official Veterinary Record (with same information as NASPHV form #51)
Overdue without Documentation

- Euthanize Immediately or, If owner unwilling to euthanize…
- Strict Quarantine –
  - Immediate Veterinary Care
  - Consult with LHD
  - Rabies Booster: on day of exposure but not more that four days (96 Hours) after exposure
  - Dogs and Cats – Four Months
  - Ferrets – Six Months
- Prospective Serologic Monitoring

Indications for Prospective Serologic Monitoring

- Evidence the animal has…
  - Microchip
  - Tattoo
  - Rabies Tag
  - Shelter papers
  - Evidence of Spay or Neuter
  - Ear-tipped Cat

- Owner provides strong anecdotal evidence of animal’s prior rabies vaccination.
Overdue without Documentation – Prospective Serologic Monitoring

0.5 IU RVNA / ml = evidence of adequate immunity as measured by RFFIT

Days

Immunologically Naïve – 28 days required to develop evidence of adequate immunity

Serum Draw: 0 & 5
Administer Vaccine: 0

RVNA – rabies virus neutralizing antibody
RFFIT – rapid fluorescent focus inhibition test

This immune response indicates no prior exposure to rabies antigen → 4 month quarantine or euthanasia
**Overdue without Documentation – Prospective Serologic Monitoring**

- Days

0.5 IU RVNA / ml = evidence of adequate immunity as measured by RFFIT

Immunologically Primed – 5 days required to develop evidence of adequate immunity

May have baseline titer at Day 0; should be evidence of twofold (or greater) rise by Day 5

- Serum Draw: 0 & 5
- Administer Vaccine: 0

RVNA – rabies virus neutralizing antibody

RFFIT – rapid fluorescent focus inhibition test

This immune response indicates prior exposure to rabies antigen → release for 45 day home observation
Never Vaccinated

- Euthanize Immediately or, If owner unwilling to euthanize…
- Strict Quarantine –
  - Immediate Veterinary Care
  - Consult with LHD
  - Rabies Booster: on day of exposure but not more that four days (96 Hours) after exposure
  - Dogs and Cats – Four Months
  - Ferrets – Six Months

2016 NASPHV Rabies Compendium Postexposure Management Control Measures For Dogs and Cats by Rabies Vaccination Status

1. Currently Vaccinated with Appropriate Documentation?
   - Yes
     - Immediate Veterinary Care, Exposure assessment, Consult with Local Health Department, Wound Care, Booster within 96 hours of exposure
     - Under Owner’s Control and Observation 45 Days
     - Manage as Unvaccinated (See Category 2)

2. Unvaccinated – (Never Been Vaccinated)?
   - Yes
     - Euthanize Immediately
   - OR
     - Immediate Veterinary Care, Consult with Local Health Department, Exposure assessment, Wound Care, Rabies Vaccination within 96 hours of exposure
     - Manage as Unvaccinated (See Category 2)
     - Strict Quarantine Dogs & Cats - 4 months

3. Appropriate Documentation?
   - Yes
     - 45 days
   - No
     - Prospective Serological Monitoring (PSM)

4. Consult with Local Health Department (LHD)
   - Yes
     - Manage as Unvaccinated (See Category 2)
   - No
     - Immediate Veterinary Care, Exposure assessment, Consult with Local Health Department, Wound Care, Rabies Vaccination within 96 hours of exposure

1. Appropriate documentation: A rabies certificate or official veterinary record validating that the animal has received a USDA-licensed rabies vaccine at least once previously, and if a single vaccination, the animal was vaccinated at least 28 days prior to the exposure date (NCGS 130A-185 and 130A-197).
2. If rabies booster or vaccination is delayed, LHD may consider increasing observation period (case-by-case) or quarantine period (from 4 to 6 month), considering severity of exposure, length of delay in vaccination, current health status, & number of prior rabies vaccines and lapses.
3. Owner Observation: Under the owner’s strict supervision and control (leash walk, fenced yard, no travel or boarding unless approved by the LHD, no outings at doggie park or other parks, etc.). There should be no contact with animals or people other than the caretaker(s) until the local health director has released the animal from the 45 day observation period. October 11, 2016
Postexposure Management: Illness or Death in exposed animal

- Any illness or death in an exposed animal shall be reported immediately to the local health department and animal control.

- If the exposed animal dies for any reason or develops signs suggestive of rabies (the animal shall be euthanized), the head or entire brain (including brainstem) shall be submitted to NCSLPH for testing.

- § 130A-198 and § 130A-199 - Immediately notifiable
Control Measure Summary

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Questions?