The Oral Rabies Vaccination Program in Tennessee – Past, Present, and Future

160 Plant Biotechnology Building
12:20 p.m.
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2010 U.S. Animal Rabies Cases
(6,154 reported cases – 92% in wildlife)

CDC, 2010

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Distribution of Major Terrestrial Reservoirs of Rabies in the United States

CDC, 2010
Rabies in Tennessee - Past

Domestic animal vaccination, licensing, and stray animal control

CDC

Distribution of Raccoon Variant of Rabies in the late 1970’s


National Rabies Management Program: Preventing the Spread of Raccoon Rabies

Historic Spread of Raccoon Rabies
Great Impacts of Raccoon Variant Rabies

- More rabid animals
- Greater interspecies spillover
- Agricultural impacts
- Human/pet exposure risks
- More indirect ‘exposures’—saliva on surfaces, pet’s fur, etc. resulting in PEP

Rabid Raccoons reported in US during 2010

CDC, 2010
Rabid foxes reported in the US during 2010

CDC, 2010

Rabid skunks reported in the US during 2010

CDC, 2010

FY2013 Oral Rabies Vaccine Distribution Areas in the U.S.

Legend
- UPRV: Urban/Rural Interface
- PPRV: PPRV High Density
- PNP: PNP High Density
- PNP: PNP Non-Rural/County
- OHR: OHR High Density
- OHR: OHR Standard Density

National Rabies Management Program
NRMP in Eastern US

- ORV
  - Bait Distribution
  - Monitoring & Evaluation
  - Enhanced Surveillance

Raboral V-RG® Rabies Vaccine Merial Limited, Inc.

- Fishmeal Polymer Bait (25 g)
- Coated Sachet (6g)

Conditional License: 1995
Full License: 1997

Bait Distribution
- Flight lines 1,500’ apart at 500’ AGL
- 75 baits/Km² (1/3.3 acres)
2002 ORV Bait Zone and Raccoon Status

1st Tennessee case in Johnson County in April 2003. 5 total cases in Johnson and Carter Counties in 2003.

2003 ORV Bait Zones and Raccoon Rabies Status

1st case in Chattanooga in January 2004. During 2004 there were 14 cases in TN, all in Hamilton County.
2005 ORV Bait Zones and Raccoon Rabies Status

Unicoi County became positive in May 2005 when a woman was attacked by a rabid gray fox near Erwin. In June 2005, a rabies positive raccoon attacked a dog in Washington County.

A sick-acting red fox picked up by Knox County Animal Control in October and tested by USDA’s Enhanced Surveillance system had raccoon variant rabies, representing a several county “jump” in the disease.

2006 ORV Bait Zones and Raccoon Rabies Status

Bradley County became the 7th Tennessee county positive for raccoon variant rabies in January 2006.

2007 ORV Bait Zones and Raccoon Rabies Status

Sullivan County became positive in May 2007 and in June 2007, a rabies positive skunk from Greene County was typed as raccoon variant. A record 17 cases occurred in Washington County, including 4 skunks, with raccoon variant.
Polk County became the 10th Tennessee county positive for raccoon variant rabies in March 2008.

No additional counties became positive for raccoon variant rabies to date (Feb 2014).
Monitoring and Evaluation

Post-Bait Trapping

- Blood Samples
  - Rabies Antibody Titer
  - Distemper/other testing
- Tooth Samples
  - Actual Age
  - Tetracycline Biomarker
- Population Demographics
- Habitat Preferences
Serum Biomarker

Vaccination Success Bait Acceptance

GAT

Sample Type

Positive Serology %

ORV Positives in TN 2005-2012

ORV Positives
Rabies Surveillance

- Public Health Surveillance
  - Human or domestic animal exposure
  - Guides decisions for PEP

- Enhanced Surveillance
  - Road kills
  - Sick-acting or found dead
  - Nuisance or hunter-collected
  - Determines geographic distribution of rabies

TN/KY Enhanced Surveillance Collection Protocol

- Targeting Raccoons, Skunks, Foxes, Coyotes
- Only want animals with No Human or Pet Exposure
- Freezers Placed in Strategic locations
- We provide biohazard bags, ziplock bags, and datasheets to cooperators (Animal Control, local Health Department, etc.)
- Datasheet: Date, County, Location (GPS coordinates if available, street address is OK, an X-mark on a map as a last resort), Any Info on Animal (Acting sick, roadkill?), Contact Info
Freezer locations
- Data sheets
- Red bags
- Ziploc bag

*Please place datasheet inside ziploc and put that ziploc inside the red bag with the animal.

The Significance of DRIT
- Direct, rapid immunohistochemistry test
- Certification required by CDC
- Accuracy comparable to DFA test
- Reduces test result turnaround time
DRIT Positive Slide

• Touch impression of rabies-positive Tanzanian domestic dog variant
  – Rabies virus antigen appears as magenta inclusions against purple-blue neuronal hematoxylin counterstain x630

Photo courtesy of Lembo et al. 2006

DRIT testing in Tennessee

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<th>Year</th>
<th>Number of Animals Tested</th>
<th>Positives</th>
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<td>Total</td>
<td>10,223</td>
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National Rabies Management Program: Preventing the Spread of Raccoon Rabies

• Service to the public: Who do I call?
• Standard protocol – make sure a potential human rabies exposure isn’t missed
• Increase submission of animals for testing
Rabies Management in TN – Future?

Would helicopter baiting be a better option for delivering ORV baits in urban and suburban areas?

Deployed 18 GPS collars in July 2013
Retrieved 15 of the collars in Dec 2014
Rabies Management in TN – Future?

- Compare serology from hand baited ORV distribution to helicopter distribution
- Compare raccoon locations and movement
- Keep track of bait contact calls for aerial, hand, and helicopter distribution
- Work to reduce/eliminate skunk variant cases in TN

Questions?

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