

## **RABIES, HUMAN: Notes about the Disease**

North Carolina has realized a marked increase in terrestrial wildlife rabies since 1991; the year that Eastern Raccoon Variant rabies was first identified. In February 2013, the first-ever North Carolina acquired case of human rabies genotyped to the Eastern Raccoon Variant (ERV) that circulates in east-central NC was reported. The NC case was identified retrospectively and linked through investigation of the death of a Maryland patient, who died of infection caused by the same rabies virus variant (ERV) in 2013, 17 months after organ transplant from the NC case. An investigation of the donor revealed that he had been an avid hunter and trapper of small game in eastern NC and had been bitten by raccoons on at least two occasions, 18 and seven months prior to his death in September 2011, although he never sought treatment.<sup>1</sup> This highlights the care and caution that must be shown for wildlife. Persons should be advised to leave sick or orphaned wildlife alone, avoid approaching, handling, and feeding wildlife. Seek prompt medical attention for any animal bites and exposures to wild carnivores, bats, stray or feral dogs and cats. Hunters should be educated and advised of the potential risk for rabies and other zoonotic disease (that can affect animals and humans) transmission from wildlife. See detailed and comprehensive preventive and control measures described in the 2013 NC Rabies Public Health Program Manual.<sup>2</sup>

From 1918 to 2013, twenty-six human cases of rabies were reported in North Carolina. Prior to 2011, the last human case occurred in 1955, when a woman from Cherokee county died of canine variant rabies after being bitten by her pet dog. NC state law requires owners to have their dogs, cats and ferrets immunized against rabies by four months of age. According to the World Health Organization, there are approximately 60,000 human deaths due to rabies each year worldwide, primarily due to endemic canine variant rabies in over 80 countries and territories, mainly in the developing world.<sup>3</sup> Persons traveling to “at risk” countries should be advised to complete a rabies pre-exposure prophylaxis regimen prior to the trip.<sup>4</sup>

Bat variant rabies is the leading cause of indigenous human rabies cases and deaths in the US over the last 3 decades. Any direct contact with a bat may pose a risk for rabies. Over the past five years about 2-3% of bats tested at the NC State Laboratory of Public Health were positive for rabies. After a potential bite exposure to rabies, prompt and thorough wound cleansing should occur initially followed by submission of the animal for testing or confinement by animal control, depending on the species. The patient should see a physician for wound care, rabies risk assessment and the need for a tetanus booster and antibiotic treatment. As visible trace of a bat bite can rapidly disappear, circumstances suggesting a possible bat bite should also be carefully assessed. Consultation with the Communicable Disease Branch Public Health Veterinarians is available 24/7 at 919-733-3419 and encouraged for medical and veterinary professionals. Pre-exposure rabies prophylaxis is recommended for persons with animal or laboratory risk for exposure to rabies.

The importance of educating the public on the dangers of potential bat exposures cannot be overemphasized. On December 19, 2011 a South Carolina woman died from bat variant rabies. The patient had sought information on bat removal from a local county service, but was not advised of the risk of rabies associated with bat exposures and was not referred for public health consultation.<sup>5</sup> This case highlights the importance of strong partnerships among public health officials, communicable disease nurses, animal control, state wildlife biologists and wildlife damage control agents to ensure appropriate referral of persons exposed to bats in their homes for prompt and appropriate risk assessment, postexposure prophylaxis (PEP) recommendations, and information on safe, effective, and humane bat exclusion methods. The NC Rabies Public Health Program Manual, Human Rabies chapter has several documents to guide local health department communicable disease nurses through bat exposure assessments and investigations of bat infestations (see “Bats in Buildings” section).<sup>2</sup>

1. Vora, N.M., et al., *Raccoon rabies virus variant transmission through solid organ transplantation*. JAMA, 2013. 310(4): p. 398-407.
2. *North Carolina Rabies Public Health Program Manual*, February 2013.  
<http://epi.publichealth.nc.gov/cd/lhds/manuals/rabies/human.html>

3. *Who Expert Consultation on Rabies. Second Report; 2013.*  
[http://apps.who.int/iris/bitstream/10665/85346/1/9789241209823\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/85346/1/9789241209823_eng.pdf)
4. *Human Rabies Prevention --- United States, 2008 Recommendations of the Advisory Committee on Immunization Practices.* MMWR May 23, 2008 / 57(RR03);1-26,28  
[www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm)
5. *Human rabies - South Carolina, 2011.* MMWR Morb Mortal Wkly Rep, 2013. **62**(32): p. 642-4  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6232a2.htm>