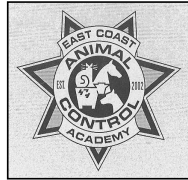
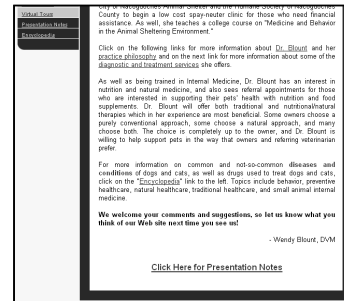


# Rabies and the ACO

Wendy Blount, DVM



[www.wendyblount.com](http://www.wendyblount.com)



## Rabies

- **Infectious agent:** virus that attacks nervous system
  - **Causes brains cells to malfunction**
  - Worldwide - tens of thousands of human deaths yearly
  - 0-5 deaths per year in the US
  - Death by lightning strike is more likely
  - **Fear of disease such as rabies was a major contributing factor to the development of animal control which began in the late 1800's in the US**

## Rabies Transmission

- **Hosts:**
  - All warm-blooded animals are susceptible
    - **Reptiles and birds don't get rabies**
  - Young animals are more susceptible than adults
  - Least susceptible to disease (rare):
    - Marsupials – **opossums (curriculum says no)**
  - Domestic animals most likely to be diagnosed with rabies in the US:
    - Cat > Dog > Cow > Horse/mule > sheep/goat

## Rabies Transmission

- **Hosts:**
  - Cats are more likely to have rabies than dogs in the US
    - Most of these spill over from raccoon rabies on the East Coast
    - Fewer cats than dogs are vaccinated for rabies
    - There are fewer leash laws for cats than for dogs

## Rabies Transmission

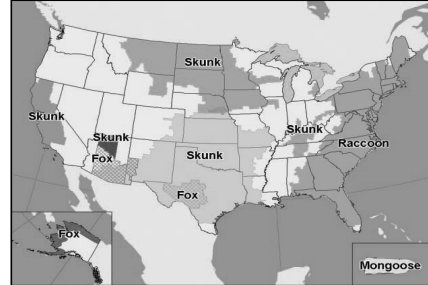
- **Hosts:**
  - Those to which the virus has an adapted subtype transmit the virus best
  - **These are called "high risk" animals and are "reservoir species"**
    - Dog (wild or domestic – fox, coyote, wolf, etc.)
    - Raccoon, Skunk, Mongoose
    - Cow (South America only)
    - Bat (vampire, insectivorous, not vegetarian)
  - Cats, bobcats and cougars can also be **vectors**
    - **Vector – animal that actively or passively transmits a disease**

## Rabies Transmission

- **Hosts:**
  - **Reservoir Species**
    - the virus is passed amongst these animals, keeping it alive in the population for long periods of time
  - **Population Density**
    - Number of animals per square foot of ground
    - Higher population density increases rate of transmission
  - **Herd Immunity**
    - Immune animals protect susceptible individuals within their herd

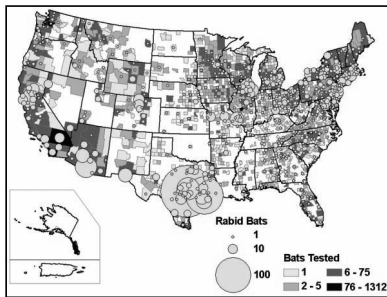
## Rabies Surveillance

- **Hosts: Terrestrial Rabies**



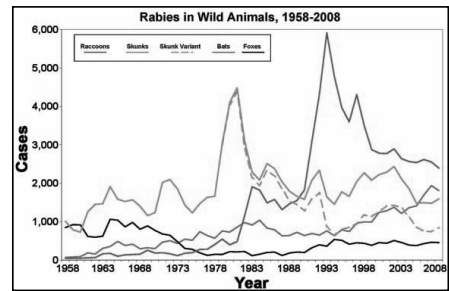
## Rabies Surveillance

- **Hosts: Sylvatic (Bat) Rabies**



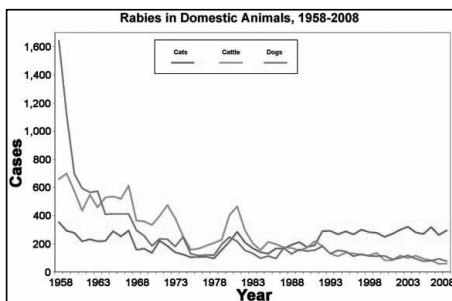
## Rabies Surveillance

- **Hosts: Rabies in Wild Animals**



## Rabies Surveillance

- **Hosts: Rabies in Domestic Animals**



## Rabies

- **Incubation:**
  - 2 weeks to years
  - **1-5 weeks is most common\*\*\***
  - Why is rabies quarantine only 10 days?
  - The closer the bite to the brain, the shorter the incubation
  - Rabies virus travels 1 cm per day
- **Diagnosis:**
  - brain biopsy (usually after death)
  - Negri Bodies (virus particles) are found
  - There also is a saliva test which is inaccurate

## Rabies

- **Symptoms:** neurologic
  - Early signs are non-specific
    - Fever, headache, weakness, achy muscles
  - Incoordination, confusion, **strange behavior**
    - **Attacking and biting moving and stationary objects**
  - Salivation (can't swallow, like choking)
  - Fear of water (hydrophobia)
  - Paralysis
  - Seizures
  - **Death within 2 weeks of showing signs**

## Rabies

- **Transmission:**
  - **Spread by bites or contact of infected saliva with mucous membranes** (eyes, mouth, etc)
  - Saliva becomes non-infectious when it dries
  - Also transmitted by contact with nervous tissue
  - People have been infected by aerosol in bat caves

## Rabies

- **Transmission:**
  - Disinfectants that kill rabies virus:
    - Formalin
    - Phenols (Lysol)
    - Halogens (bleach)
    - Quats
    - UV light (sunlight) and heat

## Rabies

- **Transmission:**
  - Asymptomatic carriers are possible in species adapted to rabies
    - Can carry and transmit disease but never show signs
    - There are documented cases of human carriers
  - Rabies remains infectious in a carcass for less than 24 hours at 20C (frozen)
    - Survives days when the carcass is refrigerated

## Rabies

- **Transmission:**
  - Rabies is not transmitted by causal contact between people
  - Transmission by organ transplant
    - 4/40 people who have died of rabies in the US since 1990 contracted rabies through organ transplant
      - the single donor died of undiagnosed rabies from a bat bite – transplants killed 4 others
    - 8 people have died of rabies after corneal transplant
      - Some donors were asymptomatic at the time of death

## Rabies

- **Treatment & Prognosis**
  - Dogs and Cats
    - Recovery is possible, but may have prolonged shedding for many months
    - There is a protocol for treatment (PEP – post-exposure prophylaxis) in dogs
      - **Not recommended for unvaccinated dogs when there is known exposure to a rabid animal**
      - **Risk for vaccinated dogs may be worth taking, if caretakers do so with informed consent**
    - No proven protocol for PEP in any other animal except people

## Rabies

### • Treatment & Prognosis

- People
  - Nearly 100% treatable if exposure is known and post-exposure treatment begins before signs of disease
  - Nearly 100% fatal once symptoms occur
  - Only 6 people have ever survived (with brain damage) when treated after clinical signs began
    - [http://en.wikipedia.org/wiki/Jeanna\\_Giese](http://en.wikipedia.org/wiki/Jeanna_Giese)
- **Once symptoms begin, death within 2 weeks**
  - Often within days
  - Usually within 1 week

## Rabies

- **Excluded from adoption due to rabies risk, unless quarantined for 14 days:**
  - Animals with bite wounds of unknown origin
  - Feral animals
  - Animals who have bitten or scratched within the past 10-14 days
  - Wolf hybrids (no approved vaccine)

### Management of Exposed Animals National Assoc. State Public Health Vets

Animal Status	Disposition
<i>Unvaccinated dogs, cats and ferrets with a known exposure to a rabid animal</i>	Immediately euthanize <u>or</u> strict isolation for 6 months and vaccination 1 month before release
<i>Vaccinated dogs, cats and ferrets with a known rabies exposure</i>	Re-vaccinate and keep under owner's control for 45 days
<i>Healthy dog, cat or ferret who bites a person</i>	Confine and observe for 10-14 days

### Management of Exposed Animals National Assoc. State Public Health Vets

#### SUSPECTED rabies exposure

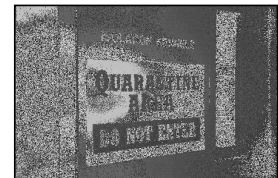
- If a dog is bitten by a rabies vector species and the biting animal is available for testing, then it is killed in a way to preserve the brain and tested ASAP.
- If the biting animal is not available, then the animal is quarantined for up to six months. Some states allow home quarantine.
- If a dog is not vaccinated, some jurisdictions recommend vaccinating for rabies immediately and repeatedly, while others do not allow vaccination during the quarantine period.
- Vaccination is usually allowed once the quarantine period is over.
- In the case where humans are potentially exposed, there may be different rules.

### Management of Exposed Animals National Assoc. State Public Health Vets

- If animal bitten is not eligible for rabies vaccination
  - Not a dog, cat, ferret, horse or cow in most states
  - Some states prohibit vaccination of wolf hybrids
  - Animal is managed according to state law or at the discretion of the LRCA

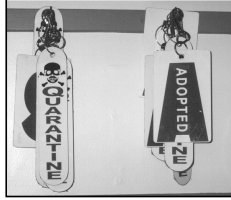
## Rabies Quarantine Procedures

- Dogs, cats and ferrets
- Never rotate animals from cage to cage
- Maintain cages & kennels in good repair
- Keep all cage doors locked with appropriate signs
- Designate one person to work in that area



## Rabies Quarantine Procedures

- No doors leading directly to outside
- Solid walls separating animals
- Never keep in public area
- Watch for signs of illness & behavior changes
- Disinfect all surfaces that come into contact with suspect (including hands)
- WEAR GLOVES AND MASK!!



## Rabies Quarantine Procedures

- The quarantine period is 10 days from the bite
- **Rabies quarantine evaluates for likelihood of rabies transmission by the bite**
  - insurance against the remote possibility that an animal might appear healthy but actually be sick of rabies
  - Or determination whether a sick animal who bit is possibly sick from atypical rabies
  - No person has ever contracted rabies from an animal that survived a 10 day quarantine
- **Rabies quarantine does not guarantee that the animal is free of rabies**
  - Incubation commonly 1-5 weeks and can be years

## Rabies Testing Procedures

- Euthanize humanely, in a way that does not damage the head or brain
- Carcass should be refrigerated, not frozen
  - If frozen by mistake, submit anyway
- Remove head from the body with hand saw
  - Power saws can cause aerosolization
  - Wear PPE (personal protection equipment)

## Rabies Testing Procedures

- Ship in state approved container with proper labeling
  - We ship by bus – arrives the same day
  - Contact the lab to let them know your sample is on the way
  - Follow up to make sure it arrived
- Complete history should accompany the specimen
  - Include contact information of those exposed

## Need for Post-Exposure Prophylaxis

- Indications for PEP
  - **Animal bite by an animal at high risk for rabies, when the animal can not be tested**
    - Skunk
    - Fox/Coyote
    - Raccoon
    - Bat
  - Any contact with a bat that is not available for testing
  - Bite by an animal that has tested positive for rabies
  - Contact with saliva or nervous tissue of a person or animal infected with rabies

## Need for Post-Exposure Prophylaxis

- Indications for PEP
  - **Bite by an animal with neurologic disease that is not being immediately tested**
    - Animal may be in quarantine
    - Requires close observation by a veterinarian for 1-2 weeks after the bite
    - 2-4 day window for treatment is closing
    - Always involve the health department on these cases

## Need for Post-Exposure Prophylaxis

### Dogs, Cats and Ferrets

- No PEP is indicated for a person who is bitten by an apparently healthy dog, cat or ferret, when that animal is quarantined for 10 days
  - Regardless of vaccination status of animal
- The person bitten should contact the health department to discuss PEP if:
  - The dog, cat or ferret is sick at the time of the bite or becomes ill during quarantine. That animal should be examined for signs of rabies by a veterinarian.
  - The dog, cat or ferret is not available for quarantine.

## Need for Post-Exposure Prophylaxis

### Animals at Low Risk for Disease or Transmission

- For exposure to horses, cattle and other livestock, contact health department to discuss need for PEP
  - **Risk in these animals and even high risk animals varies by location**
  - **Regardless of vaccination status of animal**
- PEP is almost never needed for animals susceptible to rabies but at very low risk for transmitting rabies
  - **Rodents** – squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, **ground hogs**, etc.
  - **Lagomorphs** – rabbits, hares
  - **Marsupials** – opossums

## Post-Exposure Prophylaxis (People)

- Rabies Exposure is an urgent medical matter, but not an emergency
  - Treatment must begin within a few days
  - Even casual contact with a bat means possible rabies exposure
  - Scratches are not likely to cause rabies infection unless contaminated with wet saliva

## Post-Exposure Prophylaxis (People)

- **The First Step is First Aid**
  - **Allow the bite wound to bleed**, stopping only severe blood loss
  - **Immediate, thorough washing of the wound with water**
  - Apply disinfectant
    - **96 proof (43%) or higher ethanol**
    - **soap**
    - **1-4% Quaternary ammonium (QUATS)**
  - Irrigate with pressure (18g IV catheter attached to 60cc syringe)
  - **See a doctor for wound care and antibiotics**

## Post-Exposure Prophylaxis (People)

- **Within 24 hours or as soon as exposure is considered likely**
  - If immunized, there is no need to take immediate action if rabies test results will be back within a few days
    - **Often can have rabies test results within 24 hours**
  - If vaccinated and no titer within the past 2 years
    - **Draw blood and overnight for STAT titer**
    - **You may be treated as unvaccinated until the titer is back or until you run out of time to take action**
  - **If unvaccinated or titer <1:5, administer H-RIG (human rabies immunoglobulin) and 1 dose human vaccine IM**

## Post-Exposure Prophylaxis (People)

- **Continue with further vaccination** if rabies test is positive or if results are not available within 2-4 days of the bite
  - If immunized, give 1<sup>st</sup> dose human vaccine (no immunoglobulin)
  - 2<sup>nd</sup> Vaccine booster 2-4 days after 1<sup>st</sup> for all
- **Final Boosters**
  - if vaccinated, 1 more booster in 7-14 days after the 2<sup>nd</sup> (3 vaccines within 2 weeks)
  - If unvaccinated, 2 more boosters on days 7 and 14 (4 vaccines within 2 weeks)
  - **5 total vaccines used to be recommended, but that has recently changed to 4**

## Vaccination of Animals

- There are no federal laws governing the use of any vaccines, as there are for drugs
  - There are no federal penalties for using vaccines in an "off label" manner as for drugs
  - There are no federal laws determining who can administer vaccines
- State laws governing rabies vaccination vary from state to state
  - Some states prohibit use of rabies vaccine other than as indicated on the label
  - Some states require that rabies vaccines be administered under the direct supervision of a veterinarian

## Vaccination of Animals

- There are no federal laws governing animal control with respect to rabies
  - Only guidelines
  - **NASPHV** – National Association of Public Health Veterinarians
  - Compendium of Animal Rabies Prevention and Control, 2008
- State laws govern rabies prevention and control
  - In most states, the LRCA (Local Rabies Control Authority) is the ultimate authority on rabies prevention and control
  - More stringent local laws override state laws

## Vaccination of Animals

- Very effective vaccine in people, **dogs, cats, ferrets**, cattle and horses.
  - Puppies kittens vaccinated at 3-4 mos.
    - 50% of puppies titered at their 1 year visit have no titer to rabies
  - then annually or every 3-4 years, depending on state law
  - Oral rabies vaccine is offered to wildlife

## Vaccination of People

- People vaccinated if at risk (**priority order**)
  - 1. Those who work with rabies virus in labs**
  - 2. Vector Species Handlers**
    - Animal Control Officers
    - Spelunkers
    - Veterinarians and Staff
    - Wildlife Managers and Zoo Workers
  - 3. Those who have regular casual contact with Vector Species**
    - Animal caretakers.
    - International Travelers.

## Vaccination of People

- Documented rabies immunization (pre-exposure prophylaxis) in people is:
  - Vaccinated with a series of 3 killed rabies vaccines
    - 2<sup>nd</sup> vaccine 7 days after the first
    - 3<sup>rd</sup> vaccine 21 or 28 days after the 1st
  - Titer >5:1 within the past 2 years

## Vaccination of People

- People re-vaccinated if titers fall below 1:5
  - **Make sure you get viral neutralization titer, not ELISA!!**
  - ELISA is also used in the in clinic/shelter saliva test
  - ELISA has been proven inaccurate and the New York Department of Health has been trying to get it taken off the market in recent months
  - Titering not usually needed for travelers

## Vaccination of People

Should you get vaccinated?

- Pros
  - Rabies is uniformly fatal once signs begin
  - Most people who die from rabies don't seek treatment after exposure
  - The source of exposure is never identified for a significant proportion of those who die of rabies
  - Vaccination will protect you when you are unknowingly exposed

## Vaccination of People

Should you get vaccinated?

- Cons
  - Killed vaccines carry increased risk of vaccine reaction
  - **Mild rabies vaccine reaction:**
    - soreness, redness, swelling, or itching where the shot was given (30% - 74%)
    - headache, nausea, abdominal pain, muscle aches,
    - dizziness (5% - 40%)

## Vaccination of People

Should you get vaccinated?

- Cons
  - **Moderate rabies vaccine reaction:**
    - hives, pain in the joints, fever (about 6% of booster doses)
    - illness resembling Guillain-Barré Syndrome (GBS), with complete recovery (very rare)
    - GBS can cause paralysis and blindness
  - **Severe rabies vaccine reaction:**
    - Severe allergic reaction
    - death

## Human Rabies

- Bats are the most common source of human rabies in the US (80%)
  - Although bats represent only 11-15% of the animals diagnosed with rabies each year
- Dogs are a common source of rabies outside the US

## Human Rabies

- only 8 people have survived rabies (with brain damage) when treated after clinical signs began.
- Only 2 of those had not received a pre-exposure rabies vaccine and did not receive PEP after the bite
  - they were treated with the Miluawkee protocol which was invented to treat Jeanna Giese.
  - In Jeanna's case, by the time rabies was suspected, 37 days after the bat bite, it was too late for PEP.
  - Jeanna graduated from high school after her recovery from rabies, is now attending college, and doing well.
  - <http://www.youtube.com/watch?v=zAShY1yWI8Q&feature=fvw>

## Human Rabies

- The Miluawkee protocol
  - was tried unsuccessfully on 16 year old Zachary Jones in 2006.
  - tried unsuccessfully for a second time on 10 year old Shannon Carroll in 2006.
  - Dr. Willoughby who wrote the protocol says it was not followed exactly in the unsuccessful cases.



## Human Rabies

- The Milwaukee protocol
  - There have been a two other successes of the Milwaukee Protocol:
    - In 2008, the protocol was used successfully on a Brazilian Boy, with Dr. Willoughby's guidance.
    - 2009 - a boy with canine rabies in Equatorial Guinea survived rabies after treatment with the Milwaukee Protocol, but subsequently died of complications due to malnutrition.
  - There are many documented failures of the Milwaukee Protocol as directed by Dr. Willoughby in the last few years, and many doctors wonder whether it works consistently.

## Human Rabies

- Jerome Andrulonis
  - a microbiologist, contracted rabies in 1977
  - He was conducting a federally supervised experiment in a state laboratory on inoculating wild animals against rabies.
  - He suffered severe and permanent brain damage and 12 years after the rabies infection was emotionally and behaviorally unstable, requiring supervision at all times and drugs to control his behavior.
  - It's rare for people to survive rabies.
  - If they do survive, they are never the same

## MD State Laws

### Human Rabies Immunization

Acts 1982, c. 21, § 2; Acts 1984, c. 626;  
Acts 1986, c. 746. § 18-314. Immunization  
The Department shall provide pre-exposure immunization, without charge, to any individual who provides rabies control services at the request of the Department.

## MD State Laws

### Rabies Vaccination Clinics

#### Acts 1983, c. 197 § 18-315. Clinics

- (a) With the county health department for each county, the Department shall provide for an anti-rabies clinic in the county.
- (b) Each clinic shall be staffed by a graduate veterinarian.
- (c) The clinic for a county shall be offered on or before June 30 of each year, on the date and at the location that the Department and the health department for the county determine.
- (d) Each county health department may charge fees that are set so as to produce funds to cover the cost of material and services that the clinic provides.
- (e) The public health veterinarian shall set the vaccination procedures to be used at the clinics.

## MD State Laws

### Mandatory Reporting

Acts 1982, c. 21, § 2. § 18-316. Reports required  
(a)(1) Except as provided in paragraph (2) of this subsection, an individual immediately shall report to the local police or sheriff if the individual:

- (i) Knows that a dog, cat, or other warm blooded animal has bitten, scratched, or otherwise exposed an individual to a possible rabies infection; or
- (ii) Suspects that an animal has rabies.

(2) In Frederick County, the individual shall report to the animal control center of Frederick County.

## MD State Laws

### Mandatory Reporting

Acts 1982, c. 21, § 2. § 18-316. Reports required  
(b) **On receipt of a report under this section, the police, sheriff, or animal control center staff shall:**

- (1) **Notify the health officer for the county where the report is made; and**
- (2) **Enforce all orders of the health officer and the public health veterinarian.**

## MD State Laws

### Mandatory Reporting

- Acts 1982, c. 21, § 2. § 18-316. Reports required
- (c) If the public health veterinarian or the local health officer issues an order to surrender an animal that is suspected of having rabies, a person may not hide or secret the animal:
- (1) In the custody of the person; or
  - (2) In the custody or with the cooperation of any other person.
- (d) A person who fails or refuses to comply with any provision of this section or any order issued under this section is guilty of a misdemeanor and on conviction is subject to a fine not exceeding \$500.

## MD State Laws

### Payment for Anti-Rabies Treatment

- Acts 1982, c. 21, § 2; Acts 1984, c. 626. § 18-317. Treatment cost
- The Department shall pay the cost of any antirabies treatment that an individual requires, if the individual is unable to pay for the treatment.

## MD State Laws

### Required Vaccination of dogs, cats and ferrets

- Acts 1982, c. 21, § 2.18-318. Vaccination required
- (a) Each person who owns or keeps a dog, cat, or ferret that is 4 months old or older shall have the dog, cat, or ferret vaccinated adequately against rabies.
- (b)(1) A county may not register or license a dog, cat, or ferret unless the person who owns or keeps the dog, cat, or ferret submits, with the application for registration or license, proof that the dog, cat, or ferret has been vaccinated adequately against rabies.
- (2) The public health veterinarian shall determine the proof of vaccination that is acceptable.

## MD State Laws

### Veterinary Responsibility in Rabies Vaccination

- Acts 1982, c. 21, § 2; Acts 1985, c. 311; Acts 1996, c. 684, § 1, eff. Oct. 1, 1996. § 18-319. Responsibilities of veterinarian
- (a) A licensed veterinarian who vaccinates a dog, cat, or ferret against rabies:
- (1) May select the vaccine to be used;
  - (2) Shall administer the vaccine in a manner that is consistent with the recommendations of the National Association of State Public Health Veterinarians;
  - (3) Shall issue to the owner of the dog, cat, or ferret a vaccination certificate, on the form that the Department approves; and
  - (4) Shall keep a record of the vaccination for a period of 5 years.

## MD State Laws

### Veterinary Responsibility in Rabies Vaccination

- Acts 1982, c. 21, § 2; Acts 1985, c. 311; Acts 1996, c. 684, § 1, eff. Oct. 1, 1996. § 18-319. Responsibilities of veterinarian
- (b) The information in the rabies vaccination record that a licensed veterinarian keeps may not be used:
- (1) To license the dog, cat, or ferret; or
  - (2) To tax the owner of the dog, cat, or ferret.

## MD State Laws

### Rabies Quarantine

- Acts 1982, c. 21, § 2; Acts 1985, c. 311; Acts 1996, c. 684, § 1, eff. Oct. 1, 1996. § 18-320. Quarantine
- (a) Except as provided in subsection (e) of this section, an apparently healthy dog, cat, or ferret that has been adequately vaccinated against rabies in accordance with § 18-318 of this subtitle or any other animal that bites a human or otherwise exposes a human to rabies shall be quarantined as provided in subsection (b) of this section.
- (b) An animal under quarantine shall be quarantined in a place, which may include the residence of the owner, in the manner designated by the local health officer or the public health veterinarian for a suitable period as determined by the health officer or the public health veterinarian.

## MD State Laws

### Rabies Quarantine

Acts 1982, c. 21, § 2; Acts 1985, c. 311; Acts 1996, c. 684, § 1, eff. Oct. 1, 1996. § 18-320. Quarantine

- (c)(1) At any time during the quarantine period, the public health veterinarian or local health officer may order the owner of a biting animal to have the animal monitored for rabies by a licensed veterinarian.
- (2) The owner of the animal shall pay for the cost of any examination or other associated cost.
- (d) An animal under quarantine may not be moved from the place of quarantine without the written permission of the local health officer or public health veterinarian.

## MD State Laws

### Rabies Quarantine

Acts 1982, c. 21, § 2; Acts 1985, c. 311; Acts 1996, c. 684, § 1, eff. Oct. 1, 1996. § 18-320. Quarantine

- (e) The public health veterinarian or local health officer or the designee of the public health veterinarian or local health officer may order the immediate and humane destruction of a biting animal for rabies testing if:
- (1) It is necessary to preserve human health;
  - (2) A licensed veterinarian determines that a quarantined animal is inhumanely suffering; or
  - (3) The animal is considered wild and is not claimed by an owner within 24 hours.

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

#### Definitions

- (a)(1) In this section the following words have the meanings indicated.
- (2) "Dangerous dog" means a dog that:
- (i) without provocation has killed or inflicted severe injury on a person; or

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

#### Definitions

- (a)(2)(ii) is determined by the appropriate unit of a county or municipal corporation under subsection (c) of this section to be a potentially dangerous dog and, after the determination is made:
1. bites a person;
  2. when not on its owner's real property, kills or inflicts severe injury on a domestic animal; or
  3. attacks without provocation.

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

#### Definitions

- (a)(3)(i) "Owner's real property" means real property owned or leased by the owner of a dog.
- (ii) "Owner's real property" does not include a public right-of-way or a common area of a condominium, apartment complex, or townhouse development.

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

#### Definitions

- (a)(4) "Severe injury" means a physical injury that results in broken bones or disfiguring lacerations requiring multiple sutures or cosmetic surgery.

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

### Exception

**(b) This section does not apply to a dog owned by and working for a governmental or law enforcement unit.**

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities.  
Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

### Determination of potentially dangerous dog

**(c) An appropriate unit of a county or municipal corporation may determine that a dog is potentially dangerous if the unit:**

- (1) finds that the dog:**
  - (i) has inflicted a bite on a person while on public or private real property;**
  - (ii) when not on its owner's real property, has killed or inflicted severe injury on a domestic animal; or**
  - (iii) has attacked without provocation; and**
- (2) notifies the dog owner in writing of the reasons for this determination.**

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities. Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

### Required notice

- (e) An owner of a dangerous dog or potentially dangerous dog who sells or gives the dog to another shall notify in writing:**
- (1) the authority that made the determination under subsection (c) of this section, of the name and address of the new owner of the dog; and**
  - (2) the person taking possession of the dog, of the dangerous behavior or potentially dangerous behavior of the dog.**

## MD State Laws

### Dangerous Dogs

Title 10. Crimes Against Public Health, Conduct, and Sensibilities. Subtitle 6. Crimes Relating to Animals. § 10-619. Dangerous dog.

### Penalty

- (f) A person who violates this section is guilty of a misdemeanor and on conviction is subject to a fine not exceeding \$2,500.**

## MD State Laws

### Handling of Vector Species

MD. CODE ANN., NAT. RES. §70D

- (a) Prohibited conduct. -**
- (1) A person may not import into Maryland, offer for sale, trade, barter or exchange as a household pet any live:**
    - (i) Fox, skunk, raccoon, or bear;**
    - (ii) Alligator or crocodile;**
    - (iii) Member of the cat family other than the domestic cat; or**
    - (iv) Any poisonous snakes specifically in the family groups of Hydrophidae (sea snakes), Elapidae (cobras), Viperidae (vipers), or Crotolidae (new world pit vipers).**

## MD State Laws

### Handling of Vector Species

MD. CODE ANN., NAT. RES. §70D

- (a) Prohibited conduct. -**
- (2) Notwithstanding the provisions of paragraph (1) of this subsection, a person may offer these species for sale, trade, barter, import, or exchange to a public zoo, park, museum, educational institution, or to a person holding a valid State or federal permits for educational, medical, scientific, or exhibition purposes.**

## MD State Laws

### Handling of Vector Species

MD. CODE ANN., NAT. RES. §70D

(b) Penalty. - Any person violating the provisions of this section shall be guilty of a misdemeanor and upon conviction, in the case of an individual, shall be fined not more than \$1,000; or in the case of any person other than an individual, by a fine of not more than \$10,000.

## MD State Laws

### Handling of Vector Species

MD. CODE ANN., NAT. RES. §70D

(c) Exceptions. - Exempted from the provisions of this section are those species of wildlife not being kept as household pets and which are individually exempted by a permit issued by the Department of Natural Resources.

## Rabies Case #1

### 1. You receive a phone call from Mr. Troup at 8:30 am on Sunday morning.

- The previous evening, he and his family had returned from a 3-day trip
- At feeding time, they noticed that their 7-month old pup was "acting weird."
  - **Not walking a natural gait.**
  - **Head cocked to one side.**
  - **Refused to eat and acted like something was caught in his throat.**
  - **With the help of family and friends, Mr. Troup proceeded to try to force the dog's mouth open to remove the foreign object.**
- **The search ended when the dog bit the man.**

## Rabies Case #1

### 1. What is your advice?

1. Ask if the dog has been vaccinated
  - No
2. Ask about the dog's living environment
  - He lives outside and roams free in a rural area, with no fence
  - The dog happens to live within a few miles of an area in which we have recorded numerous raccoon rabies cases in the past 2 years
3. Take the dog to a veterinarian for examination today.
4. Do not let the dog out of your control, so it can not get lost, stolen, run away or become dinner for a coyote.

## Rabies Case #1

### 1. What is your advice?

6. Whatever you do, do NOT shoot the pup in the head.
7. Go to the emergency room to have your bite wound treated, give them my phone number and ask them to call me prior to treating you.
8. Call me after your bite wound is treated, and/or after the dog is seen by a vet.

## Rabies Case #1

2. **All goes well at the emergency room, you talk to the staff there, and Mr. Troup calls you after he is treated. The wound was cleaned and antibiotics dispensed. But you never hear back about how the vet visit went.**

**What do you do?**

### Rabies Case #1

3. You call Mr. Troup early Monday morning. Because there is an extra fee to see the vet on call on a Sunday, he decided to wait until Monday morning to take the pup to the vet. The pup is no better, and he is on the way to the vet now.

What do you do?

### Rabies Case #1

4. Call the vet he is going to see (you already asked him who it was) to let them know that there is a rabies suspect pup on the way to their clinic.

The vet calls you back in one hour to let you know that the pup was indeed showing signs of rabies, was euthanized and is being prepared for shipment to the state lab by bus. Results should be available by early Tuesday afternoon.

What do you do?

### Rabies Case #1

5. You call the State Lab to let them know the specimen is on the way, to make sure someone is at the bus station to pick it up, so it can be processed by tomorrow afternoon.
6. You also call the health department to notify them of the situation, and together you begin to interview family and friends to determine exposure.
  - When you discover that more than 10 people were potentially exposed, the health department begins calculating dosages and counting stock of HIG-R and vaccines on hand.
  - They conclude that more may be needed if the test is positive, so place an order for more.

### Rabies Case #1

7. You also find out that most of those potentially exposed do not have a regular doctor.
  - As a courtesy, the Health Department keeps rabies treatment biologicals on hand, delivers them to the doctor for administration, then is reimbursed by either insurance or the patient if they are able to pay.
  - Because those exposed have no doctor to work with, the Health Department contacts the Public Health District. They are happy to help, and are waiting to be notified of test results.

What do you Do?

### Rabies Case #1

8. On Tuesday afternoon, the State Lab calls the vet and Health Department to notify that the pup is indeed positive for rabies.
  - Health Department and ACO split up the list of those exposed (family, friends and vet clinic), and begin calling patients to meet at the Public Health District to begin treatment.
  - Treatment begins at 2 pm and continues until 7:30pm when 11 people have been treated.
  - During the treatments, patients were interviewed further and it was determined that several more people and one additional were exposed.
  - All were contacted an arrangements were made to begin treatment on Wednesday.
  - The exposed dog was euthanized and tested negative.

### Rabies Case #1

9. After more people are added to the treatment list, supplies to finish all treatments are recounted, and a second order is placed.
10. All patients must be treated on days 0, 3, 7 and 14.
  - For those who started on Wednesday, day 3 falls on a Saturday.
  - Arrangements are made with the Health District to have a nurse come in on Saturday to administer the Saturday treatments.
  - 7-10 pages of forms in addition to usual medical records per patient were copied and submitted to the Health Department and Vaccine Company by the Health District Nurse.

## Rabies Case #1

**HAPPY ENDING....**

**11. This happened in March 2010, and all treated are doing fine.**

**A Rabies shot for an animal costs \$10-20.**

**Costs for biologics to treat exposed in this case cost \$20,106.**

## Web Resources – [www.wendyblount.com](http://www.wendyblount.com)

### **Compendia**

- Rabies surveillance in the United States during 2008

### **Staff Handouts**

- CBC – Rabies Vaccination – What You Need to Know

### **Human Rabies**

- CDC Weekly Report - Jeanna Geise Case Report
- NEJM – Jeanna Geise Case Report
- CMAJ – Milwaukee Protocol Failure 73 year old man
- Fox News – Brazilian Boy Rabies Survival
- NY Times – Jerome Androlonis Judgement
- Abstracts – 4 Milwaukee Protocol Failures
- CDC reduces PEP from 5 to 4 doses vaccine