Marvelous Marsupials: Medical Management of Virginia Opossums

Prepared by Olivia Schiermeyer, DVM, CWR | Research Fellow | Wildlife Center of Virginia

---

1. Natural History and Unique Traits

- **Description**: Virginia opossums are easily recognizable by their hairless ears, feet, and tail. They generally weigh between 2-6 kg, with females often slightly lighter than males. Opossums generally live between 1-3 years.
- **Behavior and Habitat**:
  - Primarily nocturnal but may be seen in daylight; highly adaptable to different environments.
  - Known as solitary nomads, opossums often forage alone and maintain a broad diet as opportunistic omnivores.
  - Range from the west coast west of the Rocky Mountains in the US and the eastern half of the US, extending south into central America and north into Minnesota, Wisconsin, and Canada
- **Reproduction and Lifecycle**:
  - As marsupials, they give birth to underdeveloped young that continue growing in the mother's pouch for approximately 8 weeks.
  - Opossums can have 2-3 litters each year, with peak birthing seasons between January and September. After leaving the pouch, young opossums will ride on the mother's back for another 6-8 weeks.
  - Opossum's have 13 nipples in a U-shape with 1 in the middle, so up to 13 joeys can survive. The average litter size is 8.
  - They reach sexual maturity at around six months of age.
- **Unique Anatomical and Physiological Traits**:
  - Lower body temperature relative to other mammals, potentially contributing to lower susceptibility to some diseases (e.g., rabies).
  - Unique dentition (50 teeth – more than any other North American land mammal).
  - Opposable toes and prehensile tail.
  - Resistance to venom of elapid snakes.
  - Females have 2 uteri and a bifurcated vagina while makes have a bifurcated penis.
  - Lack an ossified patella and have long epipubic bones, which are readily identifiable on radiographs.

2. Physical Examination and Handling Techniques

- **Initial Assessment**:
  - Begin with a distance exam to observe overall mentation, mobility, signs of severe wounds or fractures, and respiratory effort.
  - **Vitals**:
    - Heart Rate: 180-240 bpm
    - Respiratory Rate: 25-40 breaths per minute
    - Temperature: 90-95°F (32.2-35°C)

- **Physical Exam**:
  - Observe for signs of injury, infectious disease, and malnutrition. Wear appropriate PPE and be thorough.
  - **Pouch Check**: Examine the pouch for live vs deceased young, signs of mastitis, or other pouch/mammary abnormalities.
- **Restraint**:
  - Use appropriately sized leather gloves depending on age. Never handle with bare hands.
  - Avoid over-handling; utilize minimal restraint when possible, using sedation for more thorough exams as needed.
- **Anesthesia:**
  - Sedative Options: Buprenorphine (painful procedures) or butorphanol (non-painful procedures) with dexmedetomidine and midazolam (doses per NWRA formulary).
  - Always intubate when possible.
  - Monitoring should include ECG, heart rate, CO2, O2, and temperature.
- **Diagnostic Methods**:
  - **Bloodwork**: Conduct CBC and Chemistry within a week of admission. Normal blood values can be found in the Medical Management of Wildlife Species textbook.
    - At WCV, we run an emergency panel (normal PCV: 31-57% and normal TP 4.3-8g/dL) and a lead test on admission.
    - Use the lateral or ventral tail veins for blood draws.
    - The lateral tail veins are a great choice for IV catheter placement.
  - **Radiographs**: Standard dorsoventral (DV) and lateral (LAT) views for fractures, internal injuries, and other abnormalities. Include skull radiographs for opossums with facial wounds or head trauma.
  - **Fecal Exam**: Recommended for diagnosing parasitic infections, as nematodes and many other parasites are common in opossums.

3. Euthanasia Indications

- **Severe skull/jaw fractures**
- **Loss of any limb**
- **Loss of greater than ½ of the tail**
- **Loss of numerous toes, especially thumbs**
- **Geriatric, emaciated opossums**
- **Severe infectious disease**
- **Blindness**
- This list is not all-inclusive but can provide some general guidance.

4. Common Presenting Conditions

- **Infectious Diseases**:
  - Wide range of endoparasites, including nematodes, cestodes, and trematodes, which opossums often tolerate well.
  - **Zoonotic Risks**: Opossums can transmit diseases such as rabies, though cases are rare due to their low body temperature. PPE and biosecurity protocols are essential when handling to mitigate zoonotic risk.

- **Exposure to Environmental Toxins**:
  - **Lead**: Frequently encountered due to ingestion of ammunition and fishing tackle residues; clinical signs include dull mentation, ataxia, and weight loss.
  - **Rodenticides**: Typically anticoagulant types (e.g., brodifacoum, warfarin), causing internal bleeding and anemia. Clinical signs include pale mucous membranes and petechia.
- **Trauma**:
  - Common causes include vehicle strikes (HBC) and predator attacks.
  - Trauma can range from superficial wounds to fractures, and opossums often demonstrate impressive healing capacity when treated appropriately.

5. Infectious Disease Management

- **Parasites**:
  - **Types of Endoparasites**: Nematodes are the most commonly encountered, but cestodes and trematodes are also present.
  - **Diagnosis**: Fecal exams to detect and quantify parasite load.
  - **Treatment**: Varied due to limited research on deworming efficacy in opossums. Treatment options are selected based on observed tolerance and clinical significance of parasite load.
- **Protozoan Infections**:
  - Protozoans like *Besnoitia darlingi* can cause cystic lesions in various organs, impacting the opossum's health.
  - **Diagnosis**: Anatomic lesions, histopathology, and advanced diagnostics like immunofluorescence or electron microscopy.
  - **Prognosis**: Grave. Humane euthanasia recommended as no treatment is available.
- **Zoonotic Diseases**:
  - While opossums have a lower risk of rabies, they remain susceptible, so biosecurity practices are vital. PPE should be worn during examination and treatment.

6. Toxic Exposures and Management

- **Lead Toxicosis**:
  - **Sources**: Ingested lead from ammunition, contaminated environments, or fishing tackle.
  - **Clinical Signs**: Ataxia, tremors, anorexia, and GI signs including anorexia and GI stasis.
  - **Diagnosis and Treatment**:
    - Whole blood lead levels confirm exposure.
    - Chelation therapy (DMSA or Ca EDTA) alongside supportive care, fluids, and nutritional support.
- **Rodenticide Toxicity**:
  - Common anticoagulants include brodifacoum and warfarin, leading to hemorrhaging.
  - **Clinical Signs**: Pale mucous membranes, petechiae, and external bleeding from mucosal surfaces.
  - **Treatment**: Vitamin K therapy and fluids.

7. Metabolic Bone Disease (MBD)

- **Etiology**:
  - Chronic dietary calcium deficiency, low Ca:P ratio, and lack of UV exposure lead to MBD, common in juvenile opossums.
- **Symptoms**:
  - Skeletal deformities, reluctance to move, lameness, and ataxia.
  - Bones may show decreased opacity on radiographs.
- **Management**:
  - Correction of diet to increase calcium and vitamin D levels, use of UV light, and pain management as needed.
  - Severe cases usually warrant euthanasia due to poor quality of life.

8. Geriatric Opossums

- **Common Geriatric Issues**:
  - Dental Disease: Tooth decay and gum disease can impact nutrition and health.
  - Loss of Body Condition: Aging opossums may lose muscle mass and fat stores.
  - **Supportive Care**: Focus on a nutrient-rich diet, pain relief (NSAIDs), and environmental comfort.
  - **Often is a condition to euthanize due to numerous co-morbidities.**

9. Mastitis

- Always check the pouch!
- Often seen in lactating female opossums who are debilitated
- Usually pouch young are no longer present or die while in care
- **Treatment:** Antibiotics, Pain management (NSAIDs), Warm compressing

10. Dermatological Conditions

- **Dermatitis**: Often linked to external parasites or allergens; treated with topical antiparasitics, antihistamines, and baths.
- **Dermal Septic Necrosis**: "Crispy ear" syndrome due to septicemia, leading to necrosis of ear and tail tips.
  - **Treatment**: Aggressive antibiotic therapy, wound care, and monitoring for secondary infections.
  - **Prognosis**: guarded to poor, dependent on when treatment was started in disease process.

11. Trauma Management

- **Wound Care**:
  - Clean and debride wounds; hair should be removed around wound areas for effective treatment.
    - Generally daily cleaning with SSD or hydrogel bandages aide in wound healing

    - Surgery is often required to repair larger wounds or wounds involving tails and toes.
    - Puncture wounds should be left open to heal by second intention to reduce abscess formation.
    - **Pain Management**: Meloxicam, gabapentin, and other appropriate pain relief options.
    - **Antibiotics**: Clavamox and culture-based selection as needed.
- **Fracture Care**:
    - **Types of Fractures**: Includes skull, jaw, shoulder girdle, long bones, and pelvis.
    - **Spinal Fractures = euthanasia**
    - **Skull fractures**:
        - Cranium fractures often require euthanasia.
    - **Treatment Approaches**:
        - **Surgical Fixation**: Often necessary for jaw and long bone fractures.
        - **Cage Rest**: Used for minor fractures (scapula, clavicle) and as a post-surgery recovery measure.
    - **Pain Management**: NSAIDs and analgesics for maintaining comfort during recovery.
- **Head Trauma**:
    - **Signs**: Facial fractures, ocular trauma, and neurological deficits.
    - **Treatment**: Supportive care, oxygen therapy, fluids, and management of secondary symptoms.

Key Takeaways for Clinical Practice

- **Exam Protocols**: A thorough physical exam is crucial for every opossum intake.
- **Infectious Disease and Zoonotic Risk**: Always follow biosecurity protocols to protect both staff and patients.
- **Tailored Care for Trauma and Toxicity**: Trauma management and toxin exposure care should be personalized to the severity and specific needs of each opossum. Surgery is often required for wounds and fractures.
- **General case management:** Remember these conditions do not exist in isolation and you are usually treating multiple problems at once. Always consult with a licensed veterinarian to form treatment and care plans.

For further information, please refer to the references or consult the Medical Management of Wildlife Species guide.

Dosing information for medications mentioned can be found in the NWRA formulary.