THE FELINE NEUROLOGIC EXAMINATION

Letting the Cat Out of the Bag

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The Basis of the Feline Neurological Examination

- Quiet room
- Time
- Carpet or non slippery floor
- Area to observe gait
- Non obstructive areas (no where to hide)
- +/- table
Instrumentation
Instrumentation

- Dark room
- Strong light source
- Indirect bio lens
Following a good general physical exam....
Components of the Neurologic Examination

- Mentation/general observation
- Body/head Posture
- Cranial Nerves
- Spinal Reflexes
- Gait/motor
- Proprioception
- Sensory
Mentation

- Level of Consciousness
- Content of consciousness
Mentation

- Level of Consciousness
  - Alert
  - Dull
  - Stuperous - Responds to noxious stimuli
  - Comatose - No response to noxious stimuli
Mentation

- Content of Consciousness
  - Appropriate for the surroundings
  - Agitated or reticent
  - Aggressive vs. timid
  - Change in habits
  - Pacing
  - Inappropriate urination / defecation
  - Change in sleep/wake patterns
Body/Head Posture

- Abnormal posture
  - Head tilt
  - Head turn
  - Twisting or rolling of body
- Limbs
  - Wide or narrow based stance
  - Muscle tone
- Decerebrate or Decerebellate rigidity
- Opisthotonos
Cranial Nerves

- CNN 1 – Olfactory
- CNN 2 – Optic
- CNN 3 – Oculomotor
- CNN 4 – Trochlear
- CNN 5 – Trigeminal
- CNN 6 – Abducent
- CNN 7 – Facial
- CNN 8 – Vestibulocochlear
- CNN 9 – Glossopharyngeal
- CNN 10 – Vagus
- CNN 11 – Accessory
- CNN 12 – Hypoglossal
Cranial Nerves

- Menace Response
  - Learned response
  - Afferent: CNN II (Optic Nerve)
  - Efferent: CNN VII (Facial Nerve)
  - Most common in forebrain lesions
  - Cerebellar disease
Cranial Nerves

- Pupillary Light Reflex (PLR)
  - Afferent: CNN II (Optic Nerve)
  - Efferent: CNN III (Oculomotor Nerve)
  - Beware of ophthalmologic disease
    - Iris atrophy as a cause of asymmetry
    - Retinal disease
  - Direct vs. Indirect response
    - “Swinging flashlight”
  - Also assessing for symmetry, size, etc.
Cranial Nerves

- **Palpebral Reflex**
  - **Afferent**: CNN V (Trigeminal Nerve)
  - **Efferent**: CNN VII (Facial Nerve)
  - Touch medial canthus of eye >> Ophthalmic branch of CNN V (sensory branch) >> synapse with CNN VII nuclei in brainstem >> orbicularis oculi muscle contraction >> blink
  - Lateral canthus – maxillary branch
Cranial Nerves

- Retractor Bulbi Reflex
  - Afferent: CNN V (Trigeminal Nerve)
  - Efferent: CNN VI (Abducent Nerve)
  - Tests ophthalmic branch of CNN V
  - Touch finger to the cornea and assess globe retraction by contraction of retractor bulbi muscle (CNN VI)
  - Can also use moistened cotton tip applicator
Cranial Nerves

- Vestibuloocular Movements (Oculocephalic reflex)
  - Step 1 – Body senses movement
  - Step 2 – Eyes follow movements accordingly
  - Afferent: CNN VIII (Vestibulocochlear Nerve)
  - Efferent: CNN III, IV, VI (Oculomotor, Trochlear and Abducent Nerves)
    - Oculomotor – dorsal, medial and ventral recti and ventral ob.
    - Trochlear – dorsal oblique muscle
    - Abducent – lateral rectus and retractor bulbi
  - Assess for strabismus - abnormal ocular position
    - Ventrolateral - Oculomotor nerve dysfunction
    - Medial - Abducent
Cranial Nerves

- Vestibuloocular Movements
  - Nystagmus - Pathologic
    - 3 Types
      - Horizontal, rotary and vertical
      - Peripheral vs. central vestibular disease
        - Horizontal or rotary nystagmus that is non-changing implies peripheral vestibular localization
        - Any nystagmus that changes with position or has a vertical character implies a more central lesion
    - Turn animal on its back to assess for changing nystagmus!
    - Named for the fast component
Cranial Nerves

- **Doll’s Eye Reflex** - Physiologic nystagmus
- Slow phase - mediated through the brainstem
- Oculocephalic – fast phase – mediated through the forebrain
- Assess for conjugate eye movements
- Useful in cases of head trauma
Vestibular and Cerebellar rebound

- **Vestibular rebound**
  - Turn head to either side 45 degrees and let the head fall after being – the rebound occurs secondary to over compensation by the normal side

- **Cerebellar rebound**
  - Hold head straight up and let fall
  - Lack of cerebellar control results in dramatic acceleration of the head downward
Vestibular and Cerebellar Rebound
Cranial Nerves

- Nasal/Facial Sensation
  - Assesses all 3 branches of CNN V
    - Ophthalmic (red)
    - Maxillary (blue)
    - Mandibular (yellow)
  - Should test all 3 areas
Cranial Nerves

- **CNN V**
  - Mandibular branch – motor branch
  - Innervates muscles of mastication
    - Masseter, temporal, rostral digastricus, pterygoid, mylohyoid muscles
  - Palpate head muscles for symmetry
Cranial Nerves

- Assess for facial symmetry
- Innervation through CNN VII (Facial)
- Drooping of the lips/drooling/dropping food
- Contracture comes with chronic CNN VII paralysis
Gait

- Assess for Lameness vs. Ataxia

- 3 Forms of Ataxia (Sensory Dysfunction)
  - Vestibular - Listing/leaning/rolling/veering
  - Cerebellar - Dysmetria/hypermetria of one or all limbs
  - Proprioceptive - Crossing over of front/hind limbs/evidence of nail wear/dragging of front or hind limbs
Postural Reactions

- Function of the proprioceptive tracts
- Sensory and motor function
- 2 main types of postural reactions
  - Hopping, wheel barrow, and extensor postural thrust
  - Proprioceptive positioning and placing
Postural Reactions

- Hopping, Wheel barrowing, extensor postural thrust
  - Require movement of the limb to correct for displacement of the body
  - Weakness will accentuate
  - Hopping is the most sensitive for minor deficits
    - Poor initiation
      - Sensory (proprioceptive)
    - Poor follow through
      - Motor (paresis)
Postural Reactions

- Proprioceptive positioning and placing
  - Performed with some support of the animal’s weight so weakness has less influence

- Positioning
  - Gently turn animal’s paw over and they should immediately replace
    - Watch out for withdrawal!

- Placing
  - Tactile – bring animal up to edge of platform or table without being able to visualize and watch for proper placement
  - Visual placing – Repeat, allowing animal to visualize normally
Motor System

- Observe for movement both at rest and at gait
- Paresis vs. Paralysis
- Mono vs. Hemi vs. para vs. tetra
Spinal Reflexes

- Most important and easily elicited
  - Withdrawal in all 4 limbs
  - Hind limbs
    - Patellar
    - Cranial tibial
  - Thoracic
    - Extensor carpi radialis
Spinal Reflexes

- Flexor reflex
  - Withdrawal
    - Noxious stimulus applied to toe and entire limb should flex
    - Should test both medial and lateral toes
    - Does not require input from the brain
    - Thoracic limbs – Axillary, musculocutaneous, median, ulnar and radial nerves (C6-T2)
    - Pelvic limbs – Sciatic nerve (L6-S1)
Spinal Reflexes

- **Perineal Reflex**
  - Similar to a flexor reflex
  - Light stimulation of the perineum with forceps
  - Pudendal nerve (S1-3)
  - Follow with a rectal examination
Sensory

- Assess for spinal pain/hyperpathia
- Cervical vertebrae
  - Ventral palpation
  - Thoracic inlet
  - Gentle flexion and extension
- Thoracolumbar vertebrae
  - Over dorsal spinous processes or just lateral to them
  - Support gently under abdomen
Sensory

- Cutaneous Trunci (Panniculus) Reflex
  - Lateral thoracic nerve (C8-T1) >> cutaneous trunci muscle
  - Best done with a small hemostat
  - Most sensitive when voluntary motor is lost
Sensory

- **Superficial vs. Deep pain vs. NO Pain**
- The difference between a withdrawal and conscious pain perception
- Prognosis!
Questions ?