Electromyography

Electromyography (EMG) is a diagnostic test performed under general anesthesia used to determine whether there is disease affecting the muscles. This test helps determine if the muscles have inappropriate electrical activity due to diseases that either primarily affect the muscles or if there is disease affecting the nerve that supplies stimulation to the muscles tested.

In general, the EMG cannot determine the difference between a primary muscle disease vs. abnormal nerve supply to the muscle.
The interpretation of findings, together with history and clinical examination findings, can help formulate a plan for further testing, diagnosis, and treatment.

Best Uses for EMG Include:

- Suspect a primary muscle disease
  - Myositis - inflammation/infection of the muscles
  - Myopathy - diseases of the muscle that include inherited and degenerative muscle diseases
- Suspect a disease of the nerve
  - Polyneuropathy - disease affecting multiple nerves at many locations
  - Focal neuropathy - disease affecting an isolated nerve(s)
  - Nerve/nerve root tumors
- Distinguish between disuse muscle atrophy (bearing less weight on the limb) and neurogenic muscle atrophy (loss of muscle due to nerve disease)
- A lameness associated with significant isolated muscle atrophy that cannot be localized to a specific joint or bone along the affected limb
  - Disuse atrophy will have normal EMG findings
  - Neurogenic neuropathy will have abnormal electrical activity

Nerve Conduction Study

Nerve Conduction Study (NCS) is a diagnostic test that evaluates the nerve's response to external electrical stimulation. It is also performed under general anesthesia. This study evaluates the velocity of conduction through the nerve as well as the appropriate appearance of the wave recording of the nerve response. This test is frequently used in conjunction with EMG. The interpretation of findings, together with history and clinical examination findings, can help formulate a plan for further testing, diagnosis, and treatment.

Best Uses for NCS Include:

- Suspect polyneuropathy (disease affecting multiple nerves)
  - Polyradiculoneuritis – inflammation of the nerves/nerve roots
  - Chronic degenerative neuropathy – degeneration of nerves
  - Localized nerve injury – i.e. a nerve injured during lateral fabellar/tibial surgery for cruciate ligament stabilization

These tests are the primary way in which muscle or nerve diseases are confirmed. Further testing following EMG/NCS may include muscle/nerve biopsy (for primary nerve or muscle diseases) or advanced imaging (MRI/CT if a nerve tumor is suspected).

For more information

Please feel free to reach out to our Neurology & Neurosurgery Department if you have any questions.

843.614.8387

Lisa Klopp, DVM, MS
Diplomate ACVIM
(Neurology)