

Mobility Evaluations: A Rehabilitation Perspective

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As veterinarians, we always want an anatomical diagnosis. However, we can have two patients with the same diagnosis that have drastically different levels of pain or disability. From a rehabilitation perspective, it is the level of pain and disability that dictates our treatment plans. We are often focusing on the physical impairments, the alterations in gait, and the secondary or compensatory changes due to altered biomechanics. Like any other appointment, the first step for a mobility evaluation includes taking a thorough history. Information regarding a specific lameness, previous injury, current activity level, progression of the problem, previous response to medications, aggravating factors, weight fluctuations, and changes to daily habits can all provide clues as to how a pet is functioning. Knowing information with respect to daily activities, levels of exercise, and the household environment is also helpful. Client based questionnaires can assist with obtaining feedback regarding subtle behaviour changes that may be occurring at home.

Gait analysis is an important component of a mobility evaluation. Goals include evaluating how efficiently an animal moves and looking for the quality of movement. It is ideal to evaluate in an area with good space and appropriate traction. Videotaping allows for analyzing movement in slow motion and can serve as a base line to compare with at a later date. It is best to evaluate during symmetrical gaits such as a walk or trot. Animals can be viewed moving from both sides, towards, and away from the evaluator. A challenging lameness can often be exaggerated with circling, stairs, or jumping onto a higher surface. Changes to gait can occur during stance phase when the leg is weight bearing and during swing phase when the limb is advancing forward. Changes in gait may be secondary to joint discomfort, inadequate range of motion, weakness, or soft tissue dysfunction resulting in pain or a lack of flexibility. Clues to look for regarding a thoracic limb lameness include the classic "head bob" and clues for pelvic limb lameness include a "swagger" or exaggerated lateral pelvic movement during ambulation. It is helpful to adopt a lameness scoring system within the clinic to assist with tracking improvement or deterioration in medical records.

Observing patients while they are standing allows for assessment of general symmetry, body condition with respect to weight and muscle, conformation, posture, weakness, cranial weight shifting, limb placement, digit positioning, and general nail care. Assessing the position of limbs during resting postures can provide information regarding restrictions or discomfort. Observing patients while they are transitioning into different positions such as a sit posture can also provide information regarding joint comfort, strength, and coordination.

A thorough mobility evaluation includes a myofascial examination which evaluates the muscles for symmetry, atrophy, and pain. An overlooked source of discomfort in our veterinary patients is muscle pain or myalgia. Any injury, arthritis, and even surgery can result in changes to posture, weight bearing, and gait which can lead to activation of pain sensing pathways contributing to myofascial dysfunction and secondary muscle pain. Palpating a patient while they are standing allows for examination of overall symmetry, body condition score, muscle tone, swelling, and soreness prior to the movement of limbs and joints. General palpation of the cervical muscles and vertebrae for tenderness can precede assessment of active cervical range of motion. Palpate over each scapula to appreciate muscle atrophy as prominence of the scapular spine becomes evident with thoracic limb dysfunction.

Palpation and reactivity over latissimus dorsi muscle is often due to chronic cranial weight shifting or inappropriate transitioning from a sit to a stand. Palpation along the epaxials for sensitivity prior to dorsal/ventral palpation along each vertebra can occur while the patient is standing. Evaluation of the lumbosacral area should be included with any mobility assessment as lumbosacral disease is a common

condition in the senior and large breed population. For a true assessment of this region, it is recommended to evaluate the lumbo-sacral joint prior to hip extension. Direct palpation with dorsal/ventral pressure, gentle tail elevation, or pelvic extension are all methods for assessing the lumbo-sacral region. Discomfort in this region may be due to lumbosacral disease (an all-encompassing term for a variety of different diseases), myofascial discomfort secondary to abnormal posture or movement, or secondary to wind-up or central sensitization from a pelvic or pelvic limb condition. Other mobility changes that can be seen secondary to pain and dysfunction with lumbosacral disease may include a tucked pelvic posture, low tail carriage, weakness, a shuffling gait secondary to avoidance of full hip extension, a lack of active stifle/tarsal flexion due to sciatic involvement and possibly abnormal nail wear.

The following muscles can be assessed while the patient is standing: iliocostalis lumborum, iliopsoas, sartorius, tensor fascia latae, rectus femoris, gracilis, pectineus, semimembranosus, and semitendinosus. Any changes to weight bearing or abnormal movement can lead to inappropriate use of muscles, affect joint movement, promote further weakness, and contribute to pain and dysfunction. While standing, the patient can now be assessed for: hip range of motion, patellar laxity, presence of a medial buttress, digit positioning while weight bearing, and abnormal weight bearing. For patients presenting with neurological abnormalities, conscious proprioception and appropriate limb placement with hopping are important neurological reflexes that can be tested while standing. Measuring forelimbs or thigh circumference can provide a baseline measurement for assessing muscle atrophy and trending changes to muscle girth.

Examining a patient in lateral recumbancy allows for more specific palpation and evaluation of muscles, joints, tendons, ligaments, range of motion, and instability or laxity. Good landmarks for the shoulder include the scapular spine, acromion, and greater tubercle. The myofascial examination assesses for general tone and should include examination of the biceps, supraspinatus, and triceps as these are common muscles involved with injury and overuse conditions. These soft tissue structures can be evaluated with direct palpation as well as a targeted stretch. Examine all thoracic limb joints for range of motion and appreciate any restrictions, crepitus, effusion, or pain. Measuring the available range of motion of each joint is called goniometry and helps to provide baseline measurements. The shoulder can also be evaluated for excess abduction which may be indicated of medial shoulder syndrome/medial shoulder instability. Long bones should always be palpated and assessed for pain with respect to osteosarcoma. Neurological patients can be assessed for medial and lateral digit withdrawal reflexes and thorough palpation of the axilla if there are concerns regarding a nerve sheath tumour.

With respect to the pelvic limb, myofascial examination assesses for general tone and should include examination of the iliocostalis lumborum, hip flexors (iliopsoas, sartorius, rectus femoris, and tensor fascia latae), gluteal muscles, pectineus, gracilis, semimembranosus, and semitendinosus. Fibrotic myopathy can affect working dogs and commonly involves the gracilis and semitendinosus muscle groups. Iliopsoas injuries can result in acute pain and dysfunction; however, the iliopsoas can also be chronically overused. Any biomechanical change resulting in altered pelvic posture or gait could lead to an over-reactive iliopsoas. The iliopsoas can be painful with palpation ventral to ilium, along the insertion point on the femur, along the lumbar epaxials, and with rectal palpation. Again, many soft tissue structures can be evaluated with direct palpation and a targeted stretch.

Examine all the pelvic limb joints for range of motion and appreciate any restrictions, crepitus, effusion, or pain. Measuring the available range of motion of each joint is called goniometry and helps to provide baseline measurements. Further assess for patella and stifle stability. The cruciate ligament has three functions: prevents internal rotation, prevents hyperextension, and prevents drawer. Pain can be assessed with any of these movements and instability is typically evaluated with drawer or tibial thrust testing. Always palpate and assess for long bone pain with respect to osteosarcoma. Neurological patients can be further examined for withdrawal, sciatic, and patella reflexes. A common location for central nervous system disease is a T3-L3 myelopathy, understanding the difference between a withdrawal reflex and deep pain response is imperative for determining the potential severity of a neurological lesion. During mobility evaluations, don't forget to assess the Achilles' tendon, digits, nails, interdigital spaces, and Ortolani sign for hip laxity in juveniles.