ASK A SPECIALIST

Top Questions About Orthopedic Examinations From General Practitioners

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Accurate and efficient localization of lameness via orthopedic examination is a potential source of frustration for many veterinarians. With 20 years of experience performing orthopedic examinations and teaching others how to perform them, the author answers some common questions and provides practical tips for refining the examination, paying specific attention to the hip and shoulder.

How can I get better at gait evaluation?

Subjectively assessing the gait of a dog or cat for lameness can be deceptively difficult and may not always be reliable. Subjective lameness scoring has been compared with objective force plate analysis, and overall agreement is poor.[1,2] Individual assessments vary widely, particularly when the degree of lameness is mild.[1,2] The patient is likely to show the most representative lameness when it is most relaxed. A good opportunity to observe a relaxed patient in the clinical setting is when obtaining history from the client before actively examining the patient. The author often allows the patient to explore the examination room unleashed/unrestrained, avoiding direct eye contact or interactions during this time. By watching for weight shifting when the patient is standing and sitting, the clinician can frequently localize the lameness to a particular limb or limbs and differentiate ataxia from orthopedic lameness. The ideal situation for a more active examination is having a trained assistant walk and trot the patient in a location with good footing and minimal distractions. The trot is the steadiest rhythmic gait and often the easiest for identifying mild to moderate lameness. Pacing can make gait evaluation difficult to interpret and is best avoided by changing the gait speed.[3]

Abstract

One of the greatest challenges of the orthopedic examination of dogs and cats is confident localization of the lameness. Tips for success during orthopedic examinations include examining the patient while relaxed, sitting, and standing as well as while walking and trotting; knowing the compensatory movements that indicate and help localize lameness; and avoiding commonly made mistakes.

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Take-Home Points

- Observe when the patient is relaxed.
- Use an experienced assistant/handler.
- Observe the patient walking and trotting, not pacing.
- Watch videos of the patient in slow motion.
- Know the common adaptive gait patterns to look for.
- Have a consistent objective scoring system.
- Document findings at the time of examination.

Knowing the compensatory movements that animals use to unload a painful limb can guide the observer as to specific motions to look for. Characteristics of unilateral lameness are raising the head while concurrently planting a lame thoracic limb or hiking the hip of a lame pelvic limb. Often there is also an audible heavier footfall on the unaffected side, which can help with localization. The author prefers to look for this "down on sound" motion when the animal lowers the head or hip of the sound limb if lame on the contralateral limb.

Another useful practice is capturing a video of the animal in motion. Good-quality 15- to 20-second video clips of the patient walking toward, away from, and across the camera view allow better characterization of the gait, especially when replayed in slow motion. Although a previous study failed to demonstrate that slow-motion video improved the study participants' ability to identify lameness in dogs,[4] the author finds video helpful in practice and for teaching. For cats and patients that are anxious in the hospital environment, home videos can also be beneficial. Medical record systems that allow incorporation of video clips can also be extremely valuable for tracking improvement or deterioration of patient lameness over time.

TABLE 1 Unvalidated Lameness Grading System Used by the Author

GRADE	DESCRIPTION
1	No detectable lameness at any gait
2	Barely perceptible lameness
3	Mild or inconsistently apparent weight-bearing lameness
4	Severe, predominately weight-bearing lameness
5	Severe, predominately non–weight-bearing lameness

Observing the patient sitting and rising can also provide localization clues. Patients that sit "square" without hesitation or resistance are unlikely to have stifle or tarsal joint disease as pain in either joint will frequently result in weight-shifting away from that limb when sitting and avoidance of the full flexion needed to sit squarely, also known as a "sit test." An abnormal (positive) sit test behavior can frequently indicate cranial cruciate ligament disease in dogs. Dogs with hip dysplasia or lumbosacral disease will typically sit normally but may rise slowly or painfully and may try to avoid hip and lumbar extension during this process.

If lameness is detected, it should be assigned a grade. Unfortunately, a standardized validated grading system has yet to be established in canine orthopedics. However, having a scoring system that is used consistently by all staff in the same practice can be an effective way to subjectively quantitate and record the severity of an individual patient's lameness (**TABLE 1**).

How do I interpret pain on hip extension?

Differentials for resistance or a pain response during hip extension can include hip injury or disease such as hip dysplasia, lumbosacral disease, or iliopsoas tendinopathy. For patients with hip joint pathology, pain during hip abduction/extension and crepitus may be noted while manipulating the hip in a passive range of motion. Dogs that have lumbosacral disease will frequently also indicate pain during hip extension because the pelvis will tilt while the hips are extended, thus ventrally flexing the lumbar spine and lumbosacral junction. Checking for pain on isolated lumbar lordosis can be performed by keeping the hip joints flexed while applying upward weight-bearing force on the hind limbs. Direct dorsal pressure over the lumbosacral junction may also elicit a pain response. Evidence of

hind limb ataxia and neurologic deficits would further support a diagnosis of lumbosacral disease for patients with more severe cases. The iliopsoas muscle originates on the ventral lumbar spine and cranioventral ilium and inserts on the lesser trochanter. Iliopsoas injuries can be acute, chronic, or secondary to other orthopedic conditions and exhibited by varying degrees of pelvic limb lameness. Pain on direct palpation of the muscle may be detected, often most pronounced at the tendon of insertion near the lesser trochanter.[5] Mild extension of the hip with internal rotation of the femur can also stretch the iliopsoas muscle, thereby eliciting a pain response if affected.

Having a trained handler/assistant can really make or break a successful examination and not only improve the clinician's efficiency but also keep the patient and examiner comfortable and safe throughout the process.

What should I look for when examining the shoulder joint?

When manipulating the shoulder, it is important to stabilize the scapula as it is very mobile in dogs and cats. Any injury/pathology associated with the shoulder joint may result in muscle atrophy and increased prominence of the scapular spine. When screening for biceps brachii tendinopathy, the classic findings are pain during shoulder flexion and elbow extension with or without pain during direct palpation of the tendon. Osteochondritis of the shoulder can result in pain during flexion or extension to the end range of motion. Medial shoulder instability often results in pain during shoulder range of motion assessment and increased abduction angle. When interpreting shoulder abduction, care should be taken to first sedate the animal and then stabilize the scapula and ensure that the joint is in an extended position because flexion of the shoulder can allow higher-than-average abduction angles. Comparing the affected shoulder to the contralateral shoulder is recommended.

What are the most common mistakes while performing orthopedic examinations?

- **Not having a consistent/methodical approach.** It is easy to jump to the injured joint and forget to come back to the rest of your examination. Try to take the same approach with every patient and come back to the region of interest after your initial survey examination.
- **Not having a handler/assistant.** Having a trained handler/assistant can really make or break a successful examination and not only improve the clinician's efficiency but also keep the patient and examiner comfortable and safe throughout the process. Efficiency and accuracy can be improved even more by having an additional assistant, if possible, to take notes of examination findings.
- **Not comparing extension and flexion.** Full flexion of most healthy joints is not painful. Conversely, all joints will have an end range of extension at which point pain will be elicited during hyperextension even in the absence of any pathology. When testing range of motion, the author first evaluates comfort at full flexion and lends more significance to any discomfort noted during flexion versus extension.
- **Pulling versus pushing.** During joint manipulations, gently pushing rather than pulling joints into flexion and extension is optimal. Pushing is more comfortable and ergonomic for both the patient and the examiner.
- **Failure to identify landmarks.** When palpating for effusion or testing for specific instability such as cranial drawer, identifying and isolating anatomic landmarks can greatly facilitate localization of pathology.
- **Imaging before localization.** In small patients, it may be tempting to take radiographs of the entire limb to help localize lameness. This approach, however, often leads to misinterpretation of images due to mispositioning and poor beam centering. After orthopedic examination, if localizing the lameness to a specific joint is still challenging, obtaining separate radiographic series for each region of interest should lead to the most accurate interpretation.
- **Not allowing enough time.** If at the time of the initial survey examination the lameness is more challenging or multiple limbs/joints are suspected to be involved, ask the client to leave the patient at the hospital for a more thorough evaluation if the schedule

allows or reschedule a longer appointment at another time to allow adequate time for a complete evaluation, possibly with sedation and radiographs. An orthopedic examination on a straightforward well-natured dog with cruciate disease may take only 5 minutes, whereas a more complex forelimb or multiple-joint lameness workup may take 1 to 2 hours.

SUMMARY

To be productive, orthopedic examinations should be performed in a consistent manner, with appropriate assistance and adequate time. Being familiar with animals' compensatory movements during movement and being able to correctly manipulate limbs during examination will help with lameness localization and diagnosis. TVP

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