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Full Body Assessment

This issue will cover why the whole body is assessed when a dog comes to The Canine Fitness Centre for an initial assessment. When owners bring their dog in for an assessment for a specific problem area, they often wonder why the whole dog is closely assessed and not just the problem area. This issue will cover why successful rehabilitation depends upon an accurate physical/clinical diagnosis and the importance in evaluating the entire body of the dog. The unique skill set that therapists bring to the field include manual assessment techniques, enhanced deductive reasoning skills and evaluation of function. Veterinary medicine & human medicine tends to rely on what can be called a 'patho-anatomical' diagnosis, whereas physiotherapy looks at what can be termed a 'patho-functional' assessment. This issue outlines the difference between a patho-functional diagnosis and a patho-anatomical diagnosis, and the importance each plays in rehab. It also discusses why motor control and timing is assessed during the initial assessment as well. Keep on reading to find out more!

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Why Assess the Full Body?

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For dog owners who aren't as familiar with the assessment and rehabilitation process, it may not be clear why a full body assessment is done. The anatomy of the dog is so complicated and intricate that it is literally impossible to move one area without having some impact on the rest of the body. In a dog with no injury or dysfunction, gait is a coordinated movement of the limbs and entire body. As soon as there is an area of dysfunction, this coordinated dynamic changes; there may be a change in weight distribution on each limb, or some muscles may overwork/underwork, for example. An area of pain and dysfunction cannot be assessed and treated in isolation from the rest of the body because that problem impacts other areas of the body (and vice versa).

Normally, more of a dog's body mass is supported by the front limbs (60%) vs the hind limbs (40%). This means that each front limb carries 30% of the body weight and the hind limbs each carry 20%. It is not uncommon after a knee surgery for example, for the operated leg to have as little as 0%-5% of the dog's weight on it! Conversely, the other 3 limbs would increase their load in this scenario!



All of a sudden, the shoulders, elbows and wrists take more weight and the muscles that surround those joints have to work harder... the 'sound' opposite hind limb also takes more weight and is therefore at increased risk of injury. Normally the spine and pelvis have 'symmetrical' stresses from both sides of the body, but if there is an unequal weight distribution between the right and left, the joints between the vertebrae, or in the pelvis, can become inflamed and sore. As the surgical knee is treated, it is important to check and address any of these other areas that crop up because they can continue to be a source of pain/problem/dysfunction long after the knee has healed.

Another important example of why it is necessary to check the whole dog is that sometimes asymptomatic dysfunctions can actually cause an injury. A dog that has a shoulder dysfunction that may not be obvious to the owner can cause a subtle shift in their weight onto the opposite hind limb. Over time, this extra load can cause little bits of damage to that hind limb and make it more likely that the dog will sustain a hip or knee injury! If the whole dog is assessed, the shoulder dysfunction can be treated before it leads to more problems.

The goal of canine rehabilitation is to achieve maximum function for the dog following an injury, a surgery, or changes that occur as a result of advancing age. In order for a dog to achieve maximum function, it is important to look at all of the interconnections between different limbs/muscles/areas of the body and treat any secondary problems that have arisen separately, as a result of the primary problem, or that could lead to more problems!

Patho-Anatomical Diagnosis

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Laurie Edge-Hughes BScPT, MAnimSt(Animal Physio), CAFCI, CCRT

A patho-anatomical diagnosis is a perspective that seeks the anatomical origination of the 'problem', relying some on clinical tests, and heavily on diagnostic tests. The primary goal is to 'name the lesion', with the subsequent thought process being how to reduce the lesion. Several non-traditional sites and lesions can result in lameness, poor movement, reduced athletic performance, and postural alterations. Muscles can be the culprit of these ailments. Not only may muscle be directly implicated, as with a muscle strain or tendinopathy, but they may be creating functional impairments and pain when they are weak, tight/shortened, or riddled with myofascial trigger points. Important areas for assessment and how they affect the rest of the body are listed below.

Myofascial Trigger Points

- A hyper-irritable spot associated with a hypersensitive palpable module in a taut band
- Characteristic to referred pain and motor dysfunction
- Can be caused by low-level muscle contractions, uneven intramuscular pressure and direct trauma among others

Weak Muscles

- Do not cushion arthritic joints well
- Can alter proper biomechanical forces around a joint
- Can contribute to abnormal joint development
- Need specific, targeted and guided exercises to improve pain and function

Tight, shortened muscles

- Tend to be weak muscles
- Impacts stride length, leading to gait compensatory issues

Axial Skeleton

- Consists of joints in relation to the skull, spine, ribs and pelvis
- Dysfunctions of these areas can cause localized pain, and in some locations refer pain down a limb.
- Soft tissues around these areas should also be assessed



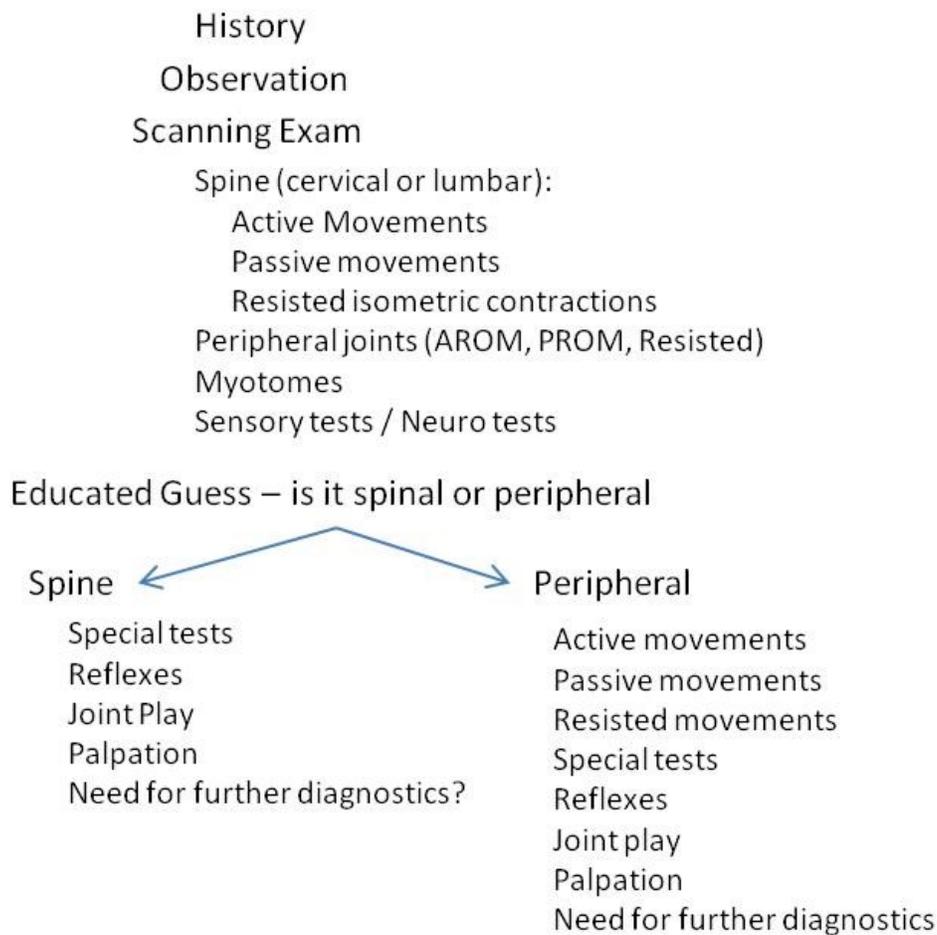
A Physical Therapy Assessment Algorithm

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Figure 1 depicts a typical rehab evaluation and the physical evaluation tools that help to guide clinical reasoning for identification of the lesion and functional problems. Where an x-ray may find degenerative changes in the hip of a lame dog, a thorough physical evaluation will help to determine if that radiographic finding is the root of the lameness, impacted by the lameness, having a biomechanical impact on the true site of the lesion, or entirely coincidental to the lameness. What this algorithm describes includes physical therapy principles, such as conducting a scanning exam. The scanning exam gives a cursory examination of all joints in all limb, as well as the spine, and includes a neurological screen. It then goes into further detail to examine either the spine or extremities.

Scanning Exam Assessment



Orthopaedic Physical (Rehab) Assessment Algorithm

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Tick Sheet

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The tick sheet below is a tool used by therapist when evaluating every dog. Depending on what is found, and what area seems to be most problematic, the region in question can be evaluated in more depth.

SCAN

POSTURE

Topline	
Limb offloading	
Balance on displacement	
Placing reflex	
Muscle tone throughout	

GAIT

Walk	
Trot	
Turns	
3-leg Stands	

PELVIS

Level cranial-caudal	
Level dorso-ventral	
Tender piriformis	
Tender dorsal SIJ	

TARSUS

Posterior joint line swelling	
Calcaneal tendon thickening	
Hyperextension test	
Full flexion	
Full extension	

LUMBAR

Tender D-V pressures	
Tender S-S pressures	
Muscle tone	

REAR DIGITS

Feel for joint thickenings	
Full flexion	
Full extension	
Look for cuts / abrasions / etc	

THORACIC

Tender D-V pressures	
Tender S-S pressures	
Muscle tone	

SHOULDER

Full flexion	
Full extension - with scapula	
Full extension - pure GH	
Abduction	
Palpate Biceps	
Palpate Supraspinatus	
Palpate Teres Major	
Palpate medial joint line	

RIBS

Tender at the 'angles'	
Ribs 1	

ELBOW

Full flexion	
Full extension	
Palpate deep in elbow crease	
Palpate medial joint line	
Palpate lateral joint line	

CERVICAL

Palpation C1 - 7	
Side glides C2 - 7	
C1 position	
Muscle tone brachiocephalicus	
Muscle tone suboccipitals	

CARPUS

Full flexion	
Full extension	
Palpate tendons / ligaments	

TMJ

Muscle tone masseters	
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HIPS

Strong palpation pectineus	
Deep palpation deep gluteal	
Full flexion	
Full extension	

FORE DIGITS

Feel for joint thickenings	
Full flexion	
Full extension	
Look for cuts / abrasions / etc	

STIFLE

Parapatellar tendon swelling	
Postero-medial jt line sulcus	
Medial Buttress	
Patellar laxity	
Full flexion	
Full extension	

Patho-Functional Diagnosis

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This diagnostic perspective not only seeks the anatomical origination of the ‘problem’ utilizing an assessment algorithm and the cumulative results from clinical tests, but also identifies the functional impairment, inter-relationships with other structures, repercussions, and potential biomechanical origins of the lesion. Thus the subsequent goal or thought process is not only how to best reduce the lesion (perhaps by rehabilitative treatments or by referral for surgery, etc), but also how to improve function. The table below briefly overviews what therapists will evaluate during an initial an initial rehabilitation assessment. The cumulative results of all of the physical tests plus subjective history create the patho-functional diagnosis.

Myotomes Dermatomes	<ul style="list-style-type: none"> • A myotome is a muscle supplied primarily by one nerve root • A dermatome refers to an area of skin whereby sensation is supplied by one nerve root and is good to know when attempting to correlate when a patient has a lick granuloma
A Capsular Pattern	<ul style="list-style-type: none"> • A capsular pattern of restriction occurs when a lesion is of the joint capsule or when a total joint reaction is present that affects the joint capsule • A non-capsular pattern may indicate other restrictive lesions
Passive Movement	<ul style="list-style-type: none"> • Quality of the movement provides clues to the health and function of the joint • Does not only pertain to joint ROM, but to extensibility of the soft tissues as well
Joint Play	<ul style="list-style-type: none"> • Evaluates the joint and all of its movements <ul style="list-style-type: none"> • Physiologic movements • Accessory movements • At End Ranges and in Neutral • End feel
Palpation	<ul style="list-style-type: none"> • Evaluates swelling and tenderness • Detecting abnormal muscle tone
Reflexes	<ul style="list-style-type: none"> • Testing of particular muscle groups supplied by specific nerves
Special Tests	<ul style="list-style-type: none"> • Example: Cranial drawer test to evaluate for cruciate ligament deficiency



A Patho-Functional Example

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Take, for example, the case of a chronic partial CCL tear. The joint is likely to be somewhat arthritic and fibrosed, but what about all of the compensations throughout the body that can impact function? For ease of discussion, one can look at this scenario from distal to proximal. With a chronic intra-articular issue of the stifle, the animal is not likely to put that joint into the end range of motion in either flexion or extension. The animal is likely to 'side-sit' to avoid full flexion. Over time, without regular positioning into a proper sit, the calcaneal tendon can become shortened to a point as to disallow full tarsus flexion. The side-sitting posture does not allow for symmetric use of the rear limbs when getting up from a sitting position or down to a sitting position. This may create an over dependence on the 'good' rear leg and both front legs in order to maneuver in and out of sitting. In this scenario, the animal could develop myofascial trigger points in his latissimus dorsi muscles and dysfunctions in his mid thoracic spine because of these compensations. As well, the unaffected limb may be at risk of injury due to perpetual overloading. Lack of full stifle extension can shorten the end stance phase of gait. In order to compensate, animal may try to gain some additional extension by hyperextending at the tarsal joint or through the lumbo-pelvic-hip region (e.g. as seen with dogs that externally rotate the limb and circumduct the leg as they walk). Hence secondary issues in the tarsus, sacroiliac joint, or lumbar spine may occur.

While walking could be affected, often stance is as well, and even slight off-loading of the rear limb can result in a hypomobility in the caudal lumbar spine, or a kyphosis of the thoraco-lumbar region if the animal compensates by weight shifting forwards onto the front limbs. Furthermore, the off-loading requires overuse of the iliopsoas and Sartorius muscle groups on the affected limb in order to maintain the posture, which often results in the formation of myofascial trigger points and shortened muscles in these locations.

Lastly, so as not to avoid the obvious, but in the case of the chronic partial cranial cruciate lesion, the musculature of the entire affected limb is likely to be atrophied and weaker, which can perpetuate the functional impairments brought about with this scenario, and potentially exacerbate comorbid areas of dysfunction with which the animal is also afflicted (eg. arthritic elbow joints). It can best be summed up with 'if an animal is lame somewhere, he is lame everywhere.' And as such, it is 'everywhere' that needs to be addressed!

Physical therapy in human medicine is a 'professional skill' for a reason. It is not just a summation of techniques and tools, but rather a professional discipline that utilizes problem solving skills, advanced manual skills, and a comprehensive functional physical examination in order to create a patho-functional diagnosis. Perhaps next time you have the difficult patient in front of you; think of referring to a physical therapist with animal rehab training to get a second diagnostic opinion, as well as to provide a therapeutic treatment option to complement your traditional veterinary plan.



Motor Control

Margaret Kraeling DPT, CCRT

Whenever we perform a full examination on our canine clients not only does that include the complete nose to tail assessment i.e. all spinal and extremity joints, ligaments, muscles and tendons, basic neuro tests, special tests such as cruciate ligament and hip stability testing, but we also assess the functional ability of the dog. This is important for all dogs but especially vital for all the performance dogs. Frequently we have full pain free ROM in all joints, good muscle tone and bulk and overall an apparently fit dog however the owner reports some small performance issues. These might be the conformation dog that does not place one foot perfectly or does not want to maintain a stack. It may be the obedience dog that can't maintain a square sit. In these cases and many more similar situations we must be able to assess the more subtle functional control of the dog – their motor control and timing of movements.

Motor control described simply is the ability to perform an action with precision and accuracy as well as a sense of ease. Motor control of the body comes from a feedback loop that includes perception, neural signals, and body movements. They must all work together to achieve precise, controlled movements. Precision means moving the body in the intended pattern and not allowing any excess movements that can increase the chances for injury. Motor control must include coordination, balance, strength, and flexibility as well to control all of those in the required pattern needed for the function at hand. When a fault is present somewhere in the coordination, timing and symmetry a dysfunction is noticed.

We tend to easily notice and assess weakness but we don't always notice tightness as much. Tight tissue can restrict fluid movement and cause various adaptations. This tissue tightness can include deep fascia or even scar tissue from a previous injury. Usually strength and flexibility is measured locally.

When implementing this in our canine clients, first the basics such as spinal joint dysfunctions will be assessed and addressed. Then assessment of the mobility of the soft tissues including connective tissue such as deep and superficial fascia. Functional tests such as planking, step ups and cross leg stand among others can also be useful in the assessment process.

Once all of this information is collected, a program can be designed that is appropriate for each individual dog to restore optimal motor control. It takes a coordinated effort with owners to carry out these programs but they are extremely motivated to return their performance partner to top competition level.



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