Horse 'n Hound
Physical Therapy
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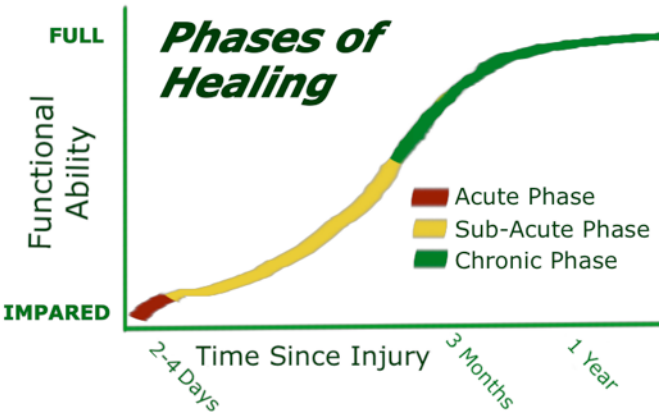
531 Amherst St, Nashua, NH 03063

What Physical Therapy provides for Animals

Animal physical therapy is growing throughout the United States. Physical Therapy is a 100 year old human based profession focused on clinical rehabilitation supported by scientific research, that addresses neuro-musculo-skeletal movement deficits with a goal of returning function after a surgery, disease or injury. Now, what has been known to work in human medicine, physical therapy is being utilized in the rehabilitation of animals.

How does Physical Therapy play within The Phases of Healing

The acute phase of healing starts immediately after a surgery or injury and is an ideal time to start physical therapy to address pain relief, decrease inflammation and maintain range of motion in animals. Continuing physical therapy during the sub-acute 'second' phase of healing, which starts about 48 hours after a surgery or injury and ends approximately three months post injury, is pivotal for the best outcomes of returning to full function. A positive prognosis is much more likely when treatment is initiated early versus waiting until the later third 'chronicity' stage. Physical Therapy can offer a long-term resolution for movement based dysfunction that pet owners can implement via a prescribed home exercise program.



Physical Therapists (PT) take a systematic approach to assessing the functional movement deficiencies of the patient. By assessing the entire animal from tip to toe, your physical therapist can identify both limitations caused by the immediate injury (or surgery) as well as areas of motion restrictions that can be improved, as the injured limb or area proceeds through the healing process. Physical Therapist are concerned with mechanics of functional movement.

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Common pet conditions that can benefit from physical therapy include:

- Spinal injury, post spinal surgery, back pain and core strengthening
- Osteoarthritis (O.A.)
- Surgical repair of canine stifle ligament tears (CCL) or medial luxation of patellae (MPL) and femoral head osteotomies (FHO).
- Hind end weakness, common in geriatric patients.
- Weight reduction and management to prevent O.A.
- Joint and Soft Tissue Injuries: Sprains, fractures, dislocations including pre- and post-surgical conditions
- Neurological Conditions: Disk disease, lumbo-sacral disease, peripheral nerve injuries.
- Degenerative Myopathy (DM) - research has shown PT to prolong functional longevity and improve quality of life for up to 5 months longer than without PT.
- Integumentry (skin) Conditions: Burns, ulcers, lick granulomas and wound healing
- Cardiopulmonary, circulatory conditions and lymphedema
- Tendinitis and over-use injuries
- Conditioning programs for agility and working dogs and horses
- Equine Stifle Dysfunction also know as Upward Fixation of the Patellae
- Equine back pain
- Equine core strength and hind end impulsion deficits
- Many more problems with cats, alpacas, and other mammals.

To better understand physical therapy, the following definitions are explanations pet owners may find helpful.

- ***Bones*** are the structural elements of all mammalian skeletons, typically quite strong, with minimal flexibility to allow your animal to stand-up and move against gravity. Damaged bones are typically supported while healing using external splinting, casting or surgical intervention (depending on the severity). Because bone damage often involves immobilization, physical therapy is employed to maintain joint mobility during healing and aid in the return of muscle strength often lost while waiting for the damaged bone to restore itself.

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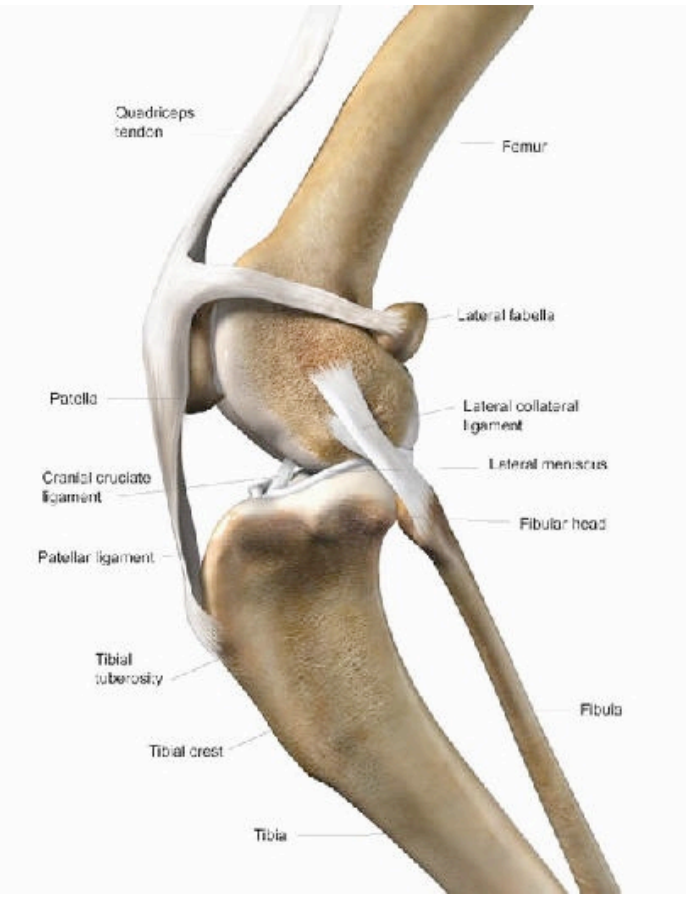
- Blood Supply: Moderate
- Healing Time: 6-10 weeks



- ***Ligaments*** are soft tissues, yet are very strong tensile bands that maintain the bone to bone connection. While able to flex in a side to side motion, ligaments are not elastic, meaning then do not easily extend in length. Often injuries to ligaments include sprains (partial tears) or can be complete, tearing a small bit of adjacent bone with it, are called avulsions. A partial ligament tear can aided by physical therapy, to reduce healing time and restore joint movement. A full tear requires surgery to re-attach the ligament to the bone where it was detached. While this re-attachment site is healing (weeks to months) physical therapy can help maintain joint mobility. After the tear site has healed, physical therapy is beneficial for recovering strength and functional movement. A sprained ligament is stretched, therefore joint integrity is compromised, contributing to osteoarthritis and often future repeated sprains. Physical therapy can help restore strength and mobility after a ligament injury (tear or stretch) by promoting a strong muscle system surrounding the joint, as well as safe movement training, to protect the ligament from further injury or re-injury. A safe movement example would be to dis-allow a dog with collateral carpal injury to jump down out of the car or off the bed or couch.
  - Blood Supply: Low
  - Healing Time: 3-12 months

- ***Tendons*** Much like ligaments, tendons are strong soft tissue that connects muscles to bone. Because the tendons move over bony prominences or through other soft tissue structures, they can easily become irritated with over use. This injury is called "tendinopathy" and is a common injury physical therapist can help your animal recover from. In severe cases, tendons can be torn from either the muscle or bony end of their connection. A full tear requires surgical repair before the recovery process can begin. Therapeutic ultrasound is a common beneficial modality that can reduce the inflammation from tendonitis and promote faster healing.
  - Blood Supply: Moderate
  - Healing Time: 6-8 weeks
- ***Muscles*** are the active part of the mammalian movement system. Muscles function is to contract and relax for active movement of limbs. Neurological balance of muscles on opposing sides of a joint is required to allow for full movement of joints and limbs. The normal range of motion (ROM) of a joint is limited by the joint's ligaments, the joint capsule and surrounding muscle length. Muscles can be damaged by diseases, impact or overuse. Muscle contraction is controlled by nerves from the animal's central nervous system consisting of brain and spinal cord. If a joint or structure attached to a muscle is injured, the pain from the injury will inhibit adjacent muscle contraction and motion to reduce further damage to the injury site. This inhibition is neurologically automated and explains why a damaged structure often has muscle spasms, reduced strength, poor coordination and muscle atrophy soon to follow.
  - Blood Supply: High
  - Healing time: Days to a few weeks
- ***Joints*** are the mobile connections systems between two or more bones which encompass all the structures that have been described in this paper. Each joint has a range of motion which is determined by soft tissue limitations. The movement and power around each joint is determined by the adjacent muscle system. Some joints, like wrists, elbows and shoulders have many "degrees of freedom"; meaning they can move in lots of different directions by design. Others, like the knee joint move mostly in one specific two-dimensional path or arc of motion. When damaged, or

immobilized for joint healing, the muscles powering a joint can "atrophy", loosing muscle mass and strength. As part of the healing and maintenance processes, an animal's body is constantly producing protein collagen fibers. If these fine strands are not broken by normal movement, they can result in undesired "adhesions". In the healthy joint any adhesions that grow in the wrong directions are very small and simply broken and re-absorbed during normal movement, without any conscious awareness of pain for the human or animal. However, if a joint is immobilized for a long time period due to injury or surgery, adhesions grow in all directions resulting in excessive restriction disallowing proper movement of a joint. This adhesion generation process, known as "contracture" once out of control, can lead to a "Frozen Shoulder", for example, in humans and permanent mobility restrictions in animals.

- ***Nerves*** are the command and control pathways from the brain to its many body systems with eventual feedback returning to the brain. Sensory nerves provide touch sensation and pain feedback. Motor nerves cause the muscles to impose motion on limbs. Specialized sensory nerves like optical, olfactory or auditory provide vision, smell and hearing, respectively. If a peripheral nerve becomes crushed or cut it has minimal ability to regenerate. There are times when the animal's neural system will be able to find an alternative pathway around a damaged nerve to eventually restore some or all noticeable functionally. It is critical that animals who experience nerve injury are treated with veterinary intervention followed by physical therapy as soon as possible, as there is a limited window of recovery time for neurological function. Often physical stimulation will improve recovery of movement. Some nerve disease processes are degenerative, meaning prognosis of disease and dysfunction are inevitable and therefore not a way to re-gain lost or damaged movement. In the case of permanent functional loss the human owner might wish to consider a physical therapist's aid in teaching the animal compensation methods of movement and function, and possibly fitting a wheelchair or other adaptive splinting process to provide the animal with as much movement as possible. The adaptive equipment supports the animal to maintain its

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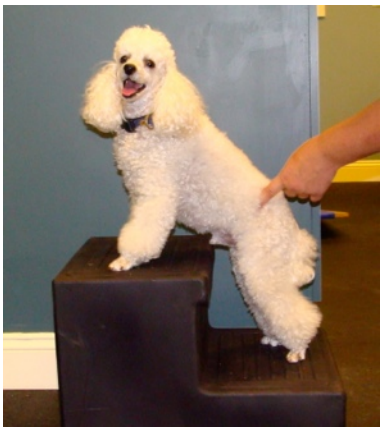
mental well-being, functional mobility and cardiac health to the extent possible.

- Blood Supply: Medium
- Healing Time: Months to Years

- ***Cartilage and Meniscus*** are the friction reduction and shock absorption materials of mammalian joints. Attached to the ends of bones and between two or more bones these materials promote pain-free, smooth movement within a joint. If cartilage or meniscus is damaged this can lead to "Arthritis" which means the ends of the bones have worn down the cartilage leading to an inflamed, swollen and painful joint with restricted movement. Major damage to these surfaces and tissues can eventually result in chronic pain, reduced range of motion and function requiring medication, physical therapy or surgical intervention involving a partial or full joint replacement.
  - Blood Supply: Low
  - Healing time: Months to Years



An animal physical therapist assesses all these defined tissues and structures in, and around, the injured area. This functional assessment, including damaged tissue identification, is conducted during the initial evaluation. The therapist will assess the effect of an injury on the functional mobility of the entire animal. Once the PT has determined which structures or tissues have been injured or damaged and how this is affecting the animal's ability to move they will have completed their initial evaluation and develop a treatment plan.

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The physical therapist's findings in conjunction with the veterinarian's diagnosis of the animal's injury or disease allows the creation of a specific rehabilitation plan for each animal patient based on their specific issues, strength, age and the goals of their owner. For the house pet, the goals of physical therapy might be to simply be able to go for a walk or get around the house. For a working or athletic animal a return to high strength, skilled performance might be the ultimate goal.

Providing your animal with physical therapy is your animal's best chance for a speedy recovery to full mobility after disease, injury or surgery. The sooner and animal is evaluated and prescribed an treatment plan of stretching and strengthening exercises, the better and faster the recovery to optimal results. The animal's owner is a major part of the recovery effort. The physical therapist will prescribe the human owner a home exercise program for them to implement on a daily basis with their pet.

The three main parameters the physical therapist is going to to treat include:

- ***Range of Motion*** Can the joint(s) in question be moved through all its possible directions, to the normal limits, without pain or internal restriction? "Actively" meaning the therapist observes the available joint motion the pet exhibits independently at movement activities such as walking. Then range of motion is assessed "passively" meaning the PT will move the joint without the animals' muscles contributing to the motion. Any difference in these two measurement

versus what should be available for a healthy animal is an area of treatment focus.

- ***Strength*** Question, do the muscles surrounding a joint have the power to move within the full range of motion, with enough energy to reach the established treatment goals? If not the animal will often be put on an exercise program to build up its muscle mass, strength and endurance. This will typically happen gradually over weeks or months to regain its ability to function. This is where the "art" of physical therapy meets the science, as too much strength training too soon may cause pain and an unwanted set back.
- ***Restoring full weight bearing of a limb, balance and functional mobility*** are critical parameters for your animal's optimal recovery. If the injury compromises the animal's ability to remain upright and in motion, without falling, the animal is likely to re-injure itself and not progress. Muscle balancing means that the opposing and surrounding muscle groups on either side of a specific joint maintain length, tension and appropriate strength. If one muscle group is too strong or tight, over time this imbalance pulls a joint out of alignment to cause joint damage. Stretching the side that is too strong, and strengthening the side that is too weak or tight will be a major part of the treatment plan for the subject animal.

When you visit a physical therapist you may hear the term "modalities". This simply refers to the additional use of physical technologies of laser, ultrasound, electrical stimulation, etc. that improve the healing process to restore pain-free functional movement. Early in the healing phases of acute and sub-acute, modalities are focused on reducing pain and the

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inflammatory response. Reducing inflammation and pain early in the recovery is critical to rehabilitation. Pain reduction can be achieved from something as simple as a cold pack, to therapeutic laser use or medications prescribed by the veterinarian. Reducing the pain level is an important first step in the process of recovery. Modalities such as Therapeutic Ultrasound, provide multiple benefits including tissue extensibility while reducing pain and promoting healing.

With pain and swelling reduction while the healing process continues, the physical therapist helps the animal regain flexibility, balance and strength to restore and coordinated functional movement. Modalities for this phase of the recovery include items like wobble boards for balance, therapy balls and Theraband™ for core strength. The use of an underwater treadmill is ideal for building strength, flexibility and endurance in a low weight bearing environment that restores functional, pain free movement.

Pet owners have a variety of choices for treatment of their animal's injuries. Alternative interventions such as massage, chiropractic and acupuncture are highly beneficial, especially when combined with PT. Massage can reduce muscle spasms, chiropractic can restore joint alignment and movement and acupuncture can reduce pain. If the rehabilitation plan does not address all the involved systems; bone, ligament, tendon, muscle, cartilage and meniscal tissues, the animal will not achieve long-term recovery of functional motion. Physical therapy addresses all of these systems for the best long-term recovery of movement dysfunction secondary to injury and disease.

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Taking a long-term approach to injury recovery is the best option for your animal's restored functional movement. Combined efforts of your veterinarian, physical therapist and other medical service providers can establish a set of recovery goals and a treatment plan that enables your animal to get back on its feet, faster, and stay there over time.

Helpful Links to learn more about animal physical therapy include:
http://en.wikipedia.org/wiki/Canine_physical_therapy
http://www.orthopt.org/content/special_interest_groups/animal_rehabilitation
http://www.horse-n-hound-pt.com/what.htm
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