Technicians form the backbone of canine veterinary rehabilitation

By Michelle Tilghman, DVM, CVA, CCRP and Elizabeth Barrett, RVT, CCRP

A larger variety of conditions benefit from physical therapy (PT) than many veterinarians realize. As a technician, by instituting some aspects of PT into the veterinary practice, you can help greatly increase practice income and client satisfaction.

Veterinary physical therapy for rehabilitation uses non-invasive techniques to benefit canine patients in a number of ways.

- Aids in improving physical capabilities and lessening pain in dogs after injury, illness or surgery.
- Maximizes a dog's functioning, and minimizes pain in chronic conditions like arthritis.
- Improves the results of weight management (under or overweight) and general conditioning, especially for the canine athlete.
- Educates owners in proper management techniques for a long and flexible life for their dogs.

Conditions and concerns must be diagnosed by the veterinarian, then as a technician, you can implement a treatment protocol based on the diagnosis, the patient's condition, his abilities/limitations, and the available equipment and tools. You can also educate the client on home care, and help design information handouts outlining the benefits of the rehabilitation regimen, as well as home care procedures.

On a more regular basis, you can do most of the work when PT is used for conditioning show and performance dogs, as well as with weight loss programs and geriatric support. Of course, medical problems such as fractures, any injuries/illnesses requiring prolonged immobilization/crating, post-surgical cases, hip/elbow dysplasia, back injuries/herniated discs/IVDD, neurological cases (degenerative myelopathy, spondylosis), arthritis/degenerative joint diseases and gait abnormalities/uneven movement patterns will need much more veterinary oversight.

Overview of the canine body

The body is made up of bone, muscle, water and connective tissue called fascia. It is an entire moving organism that is 96% oxygen, hydrogen, nitrogen and carbon, mostly made up of water. The remaining 4% of the body is made up of other elements like calcium and phosphorus. Since these parts and components all work together as a unit, PT that addresses one aspect can help the entire body.

Bones

The entire canine body is connected, just as in the children's song: "The head bone is connected to the neck bone." The skull is a collective of many bones in the head, and the mandible and the maxilla make up the jaw. The thoracic limb skeleton is comprised of the thoracic girdle, whose bones include the scapula and clavicle (may be absent). The brachium bone is the humerus and then we move down to the antebrachium, radius and ulna. The forepaw is composed of carpal and metacarpal bones, and phalanges.

The pelvic limb has a pelvic girdle, and the bones are the ilium, ischium and pubis. The thigh consists of the femur, and the leg includes the tibia and fibula. The hind paw is composed of the tarsal and metatarsal bones, and phalanges. The vertebral column is composed of seven cervical, 13 thoracic, seven lumbar, three sacral and 20+ coccygeal bones.

Fascia

Also known as myofascia (see the late Dr. Kerry Ridgeway's fascia article in the Winter 2015/16 issue of *IVC Journal*), fascia

is the most fluid form of connective tissue, in its normal state. It has the highest proportion of elastic fibers of all the connective tissues of the body. It also has the highest percentage of ground fluid, which is primarily composed of water, glycosaminoglycans (most notably hyaluronan), proteoglycans and glycoproteins. Because of its water content, fascia requires the highest level of hydration to remain healthy.

Tendons and ligaments

Tendons are extensions of the fascia that run through the muscle, attaching the muscle to the bone. As the muscle nears the bone, the fascia becomes less elastic and more strap-like. The fascia of tendons is composed of collagen, elastic fibers, and ground fluid. The percentage of elastic fibers and ground fluid is much lower than in myofascia, giving tendons their strap-like consistency and function. Tendons are actually an extension of the fascia that permeates muscle. The fascia in these areas simply loses the elastic fibers and ground fluid as it nears its attachment to bone. Tendons do not stretch much, if at all.

Ligaments are very similar to tendons. They are also made up of mostly collagen with very little in the way of elastic fibers and ground fluid. Ligaments attach bone to bone as is seen in the knees and other joints. Ligaments also do not stretch.

Manual techniques

Manual techniques in PT entail the physical manipulation of tissues and joints. They involve using the therapist's touch to stretch and massage compromised areas.

Stretching and range of motion – Maximizes flexibility of joints and extensibility of periarticular tissues, muscles and tendons. Diminishes effects of disuse and immobilization.[1]

Massage/soft tissue work – Reduces muscle spasms and trigger points due to compensation or favoring of limbs. Increases joint range of motion. Releases toxins, increases blood flow and the production of endorphins.

Therapeutic exercises

Therapeutic exercises are designed to improve strength and flexibility for the animal and are directed at the individual's physical condition.

Balls and wobble boards – Excellent for stretching the back, shoulders, hips and psoas, and improving flexion in the elbows, hips and stifles. Also useful for encouraging the use of favored limbs, and building core strength to increase stabilization.

Resistance bands – Increases muscle mass and strength. By increasing resistance or "drag" on a limb, you can prolong stance phase during walking on a favored limb.

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A few things to keep in mind when performing these joint exercises:

1. Always keep your dog's limb in a natural plane of normal function.
2. Keep one hand above the joint, and one hand below the joint, in order to isolate your efforts to that one joint. Do not try to stretch multiple joints at the same time.
3. Work within your dog's comfort zone.

DO NOT FORCE THE STRETCH AND DO NOT FIGHT WITH YOUR DOG!

1 Hip flexion

While pushing into your dog's rump with the hand above the hip joint, draw the thigh up with the opposite hand to "sandwich" (close) the hip between your hands. When you get to the point where the hip naturally stops closing, add GENTLE pressure to encourage the joint to close a TINY fraction more. This should not hurt if your dog reacts then you are pushing too hard! Hold the stretch for 10-15 seconds, release for a few seconds and repeat 3-5 times. Have someone use treats to distract and reward your dog if needed during this exercise.

HIP FLEXION

2 Shoulder extension

While pushing toward your dog's feet with the hand above the shoulder, draw the upper arm forward with the opposite hand to straighten (open) the shoulder. When you get to the point where the shoulder naturally stops opening, add GENTLE pressure to encourage the shoulder to open a TINY fraction more. This should not hurt if your dog reacts then you are pushing too hard! Hold the stretch for 10-15 seconds, release for a few seconds and repeat 3-5 times. Have someone use treats to distract and reward your dog if needed during this exercise.

SHOULDER EXTENSION

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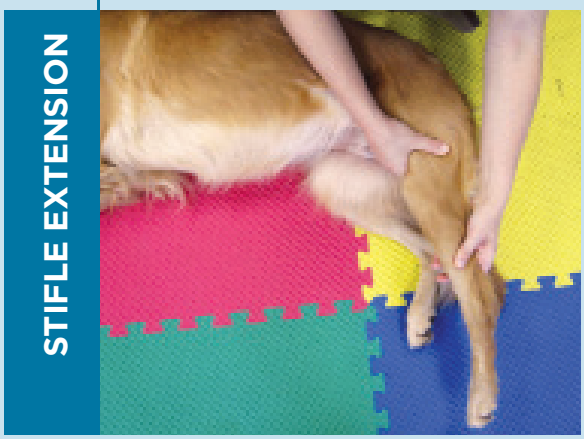
3 Stifle extension

While pushing into the front of your dog's thigh with the hand above the stifle, push the lower leg (calf) forward with the opposite hand to straighten (open) the stifle joint. When you get to the point where the stifle naturally stops straightening, add GENTLE pressure to encourage the stifle to open a TINY fraction more. This should not hurt if your dog reacts then you are pushing too hard! Hold the stretch for 10-15 seconds, release for a few seconds and repeat 3-5 times. Have someone use treats to distract and reward your dog if needed during this exercise.



4 Hip extension

While pushing into your dog's rump with the hand above the hip joint, push the thigh back with the opposite hand to straighten (open) the hip joint. When you get to the point where the hip naturally stops straightening, add GENTLE pressure to encourage the joint to open a TINY fraction more. This should not hurt if your dog reacts then you are pushing too hard! Hold the stretch for 10-15 seconds, release for a few seconds and repeat 3-5 times. Have someone use treats to distract and reward your dog if needed during this exercise.

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Cavalettis – Multiple functional benefits include the promotion of flexion and extension in the shoulders, elbows, hips and stifles. For patterning proper stride length, weight shifting and conscious proprioception.[2]

Weave cones – Improve flexion of the spine and supporting musculature for increased trunk stability and balance. Weight shifting promotes improved muscle mass and conscious proprioception.[3]

Hill work – By having the dog walk up/down, zigzag or walk across the face of a hill, you can target his front or rear assembly and his bilateral or unilateral limbs to improve strength. For example, walking up an incline strengthens quadriceps, semitendinosus, semimembranosus and gluteal muscles while promoting extension of the hip and stifle. Walking down an incline promotes flexion of the hock, stifle and hip.[2]

Sit to stands – Equivalent to a human squat, this exercise strengthens the quads and hamstrings.

Uneven surface walking – Challenges core balance, promotes use of favored limbs and conscious proprioception.

Underwater treadmill – Multiple functional benefits include exaggeration of joint motion, extension of stride length due to treadmill action, reduced load-bearing due to buoyancy effect, and muscle output increases due to resistance created by the water's viscosity, friction and turbulence. Many practices are now recommending or offering water options that technicians can use, especially for geriatric population.

Additional PT modalities

There are many different PT modalities that are beneficial for reducing injury and pain.

Heat/cold – Cold is used for acute trauma/injury to reduce inflammation and pain through vasoconstriction, reduced cellular metabolism and decreased sensory and motor nerve conduction velocity. Heat is used for chronic conditions and to warm muscles and superficial joint capsule structures to facilitate stretching.[2]

Therapeutic ultrasound – Warms muscles at a deeper level than topical heat application can reach. It is useful prior to deep stretching.

Electrical stimulation – Interferes with the sensation of pain. It also stimulates muscles with nerve damage to decrease the rate of muscle atrophy.

Cold laser – Therapeutic lasers send photons, or packets of light energy, deep into tissue without damaging it (read Dr. Robin Downing's article in the Winter 2015/16 issue of *IVC Journal*). These photons are absorbed within the mitochondria of the cells and induce a chemical change called "photo-bio-modulation". This light energy then inspires production of ATP in the cell. Increased ATP production leads to healthier cells, healthier tissue, and healthier animals.[4]

Shockwave therapy – The shock waves (high energy waves) work at a cellular level, releasing proteins that accelerate healing. Neovascularization takes place, leading to increased blood supply to the treated tissue, resulting in tissue regeneration in tendons, joints and bone.[5]

Role of technicians in client education

Home care and owner assistance is crucially important in rehabilitation, especially with long-term chronic care. Under supervision of the veterinarian, you can decide on the needed daily exercises and demonstrate them to the client until he/she feels comfortable doing them with the dog on a daily basis between clinic treatments.

Clients are greatly helped when taught about environmental changes and adaptive equipment that can assist dogs with their mobility needs. Since patience is often needed with rehabilitation programs, teaching clients about pertinent anatomy/pathology will assist with their understanding of the disease process and/or injury recovery.

Technicians can also design handouts tailored to the practice, including pictures demonstrating how to properly and improperly do the main exercises. You can also, with the veterinarian's guidance, create a unique handout for uncommonly-recommended exercises.

As a technician, being trained in physical therapy can greatly improve the health of patients in your practice and be an income source for the clinic and even an extra income stream for you, depending on state laws. IVC

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[1] Brody LT. "Mobility impairment" in Hall CM, Brody LT, editors, *Therapeutic Exercise: Moving Toward Function*, Williams & Wilkins, 1999, Philadelphia.

[2] Millis DL, Levine D, Taylor R. "Therapeutic Exercises." *Canine Rehabilitation & Physical Therapy*. St. Louis, Mo.: Saunders, 2004. pp. 244-286.

[3] Gross DM. "Therapeutic Exercise." *Canine Physical Therapy – Orthopedic Physical Therapy*. East Lyme: Wizard of Paws, 2002; 124.

[4] "Common Questions", Companion Therapy Laser, Litecure LLC. n.d. Web. 16 June 2015. *litecure.com/companion/for-pet-owners/common-questions*.

[5] "VersaTron 4Paws – Shock Wave Therapy of dogs." PulseVet, Pulse Veterinary Technologies. n.d. Web. 16 June 2015. *pulsevet.com/versatroncanine/about-versatron-equine*.

Advertorial

VetzLife
All-Natural News

By Christopher Kelly Groth
Business Development, Vetzlife/Petzlife all-natural

Enhancing the effects of professional dental care

An integrative approach to dental care has been shown to improve oral health by combining professional care and cleaning with natural oral health products. "An evaluation was done of cats and dogs with and without professional cleaning below the gum tissue," says Kimberly Wasko, CVT, VTS, ALAT, SRS Drexel University College of Medicine. "Significant improvements were seen, including reduced gingivitis, less bleeding on periodontal probing, gingival enzyme activity, and tartar reduction in treated areas.

"Further clinical results demonstrated that topical application of VetzLife oral health products was effective in reducing the depth of periodontal pockets – similar to the effects of flossing in people. As well, healing was so accelerated that after five to eight days of treatment the diseased gingival sites were difficult to locate. We also utilized the spray formula as a 'flush' solution in the pockets of extracted teeth and the deep periodontal pocketed areas of surgical cases. Instead of 'finishing off' the oral cavity with a fluoride foam or gel after dental cleaning, we used the company's oral care gels.

"This suggests the topical application of VetzLife oral care products improves periodontal and dental disease not only as a sole treatment, but also in combination with surgical and non-surgical therapies."

VetzLife oral health products prevent plaque from forming, and also dissolve existing tartar. They're also the perfect solution for elderly patients that are not candidates for scaling under anesthesia.

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