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Introduction to Veterinary Physical Rehabilitation

David Levine, PT, PhD, CCRP[a,b,c,*],
Darryl L. Millis, MS, DVM, CCRP[a,b],
Denis J. Marcellin-Little, DEDV, CCRP[c]

[a]Department of Physical Therapy, Dept. 3253, University of Tennessee at Chattanooga, 615 McCallie Avenue, Chattanooga, TN 37403–2598, USA
[b]Department of Small Animal Clinical Sciences, University of Tennessee College of Veterinary Medicine, 2407 River Drive, Knoxville, TN 37996, USA
[c]Department of Clinical Sciences, North Carolina State University College of Veterinary Medicine, 4700 Hillsborough Street, Raleigh, NC 27606, USA

Physical therapy is a profession with an established scientific basis in human beings and companion animals. It has a large number of clinical applications in the restoration, maintenance, and promotion of optimal physical function [1]. It is beneficial in helping people to recover from anterior cruciate ligament reconstruction, fracture stabilization, joint arthroplasty, spinal surgery, and many other injuries or diseases [2–5]. It also improves function in a variety of patients with osteoarthritis, total joint arthroplasty, and chronic lower back pain throughout their lives [6–8]. It also helps athletes to individualize their training and optimize their fitness [9,10]. Similar applications exist in animals.

In providing physical therapy, the goal is to restore, maintain, and promote optimal function, optimal fitness, wellness, and quality of life as they relate to movement disorders and health. In dogs, this may include treating patients during their recovery from orthopedic surgical procedures (eg, femoral head ostectomy), monitoring weight loss programs, strengthening specific muscle groups, and helping to manage chronic conditions (eg, osteoarthritis) or progressive conditions (eg, degenerative myelopathy). A major emphasis is to prevent or minimize the onset, clinical signs, and progression of impairments, functional limitations, and disabilities that may result from diseases, disorders, conditions, and injuries. Examples in people include designing and delivering treatment programs for patients with problems like pneumonia, multiple

*Corresponding author. Department of Physical Therapy, Dept. 3253, University of Tennessee at Chattanooga, 615 McCallie Avenue, Chattanooga, TN 37403–2598, USA.
E-mail address: david-levine@utc.edu (D. Levine).

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sclerosis, diabetes, cerebral palsy, lower back pain, or frozen shoulders [1,11–14].

TREATMENT PHILOSOPHY

Physical therapists use a variety of treatment interventions, such as manual therapy, including stretching, targeted massage, passive range of motion, and joint mobilization. They also use electrical and thermal modalities and therapeutic exercises to help patients reach their goals. These treatments work synergistically to achieve the therapeutic goals. When designing a treatment plan, the therapist should be aware of the scientific evidence supporting the use of each modality and exercise for the problems being treated. For example, when treating postoperative edema, ice has been proven to be beneficial and low-level laser treatment is relatively unproven. The therapist should integrate the individual treatment plan with established perioperative and postoperative pain management protocols. Although the clinical signs present in many dogs with orthopedic or neurologic problems may improve over time, such as after fracture repair, a well-designed physical rehabilitation program may accelerate the recovery, prevent permanent disability, and help to prevent future reinjury.

Patients with movement disorders, weakness, pain, and limited endurance are candidates for physical rehabilitation. Examples of conditions include dogs recovering from orthopedic or other surgery and dogs with osteoarthritis, tendonitis, or other soft tissue injuries. After a medical diagnosis is available, the therapist evaluates several aspects of the patient's health, particularly the health of the cardiopulmonary, neurologic, orthopedic, and integumentary systems. The more specific the medical diagnosis, the more directed the care can be. For example, the medical diagnosis for a patient may be osteoarthritis of the elbow, and the physical rehabilitation diagnosis for that patient may be limited flexion and extension with cranial and caudal joint capsule tightness. These factors may be limiting function in terms of gait; improving elbow range of motion through specific treatment interventions may improve the functional status of the patient. In the practice of physical therapy for human beings, the areas evaluated include aerobic capacity, balance, arousal, cognition, environmental barriers, ergonomics, posture, gait, pain, range of motion, prosthetic requirements, and assistive and supportive devices. Most of these parameters may be evaluated in dogs.

Physical rehabilitation in veterinary medicine follows the same principles. The therapist collects functional information by evaluating the dog's physical fitness as well as its orthopedic and neurologic health. This may be done in conjunction with or after the veterinarian's orthopedic and neurologic evaluations. There is overlap in these evaluations; whereas the veterinarian evaluates the patient to obtain a diagnosis and to prescribe medical or surgical treatment plans, the therapist evaluates the patient to create a physical rehabilitation treatment plan. This evaluation includes the assessment of muscle mass, joint motion, joint stability, and pain. For example, loss of range of motion may be present with elbow dysplasia, whereas loss of sensation and muscle atrophy may be observed with radial nerve injuries.