

Topical Review

Manual Therapy in Veterinary Rehabilitation



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As it matures, the field of animal rehabilitation is welcoming utilization of interventions that have proven efficacy in the specialty of physical therapy for human patients. More recently, manual therapy techniques have become more accepted. Range-of-motion and stretching techniques; mobilization or manipulation of soft tissues, peripheral joints, and the spine; neuromuscular facilitation techniques; techniques unique to osteopathy; chest physical therapy; manual lymphatic drainage techniques; and neural mobilization techniques are now commonly incorporated in clinical practice, and these interventions are more commonly cited in the veterinary literature. The following is a brief review of these manual therapy approaches including the goals, effects, indications, precautions, and contraindications.

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Manual therapy, a specialized niche of rehabilitation, is the application of skilled, goal-focused, passive or assisted active movement techniques through the hands of the therapist, usually a doctor of physical therapy (or physiotherapy), osteopathy, or chiropractic.¹ There are an innumerable variety of manual therapy techniques, some of which are proprietary and others without scientific research or clinical evidence. This article describes only those manual therapy techniques commonly utilized in the rehabilitation of human and animal patients and includes discussion on range-of-motion (ROM) and stretching techniques; mobilization or manipulation of soft tissues, peripheral joints, and the spine; neuromuscular facilitation techniques; techniques unique to osteopathy; chest physical therapy; manual lymphatic drainage techniques; and neural mobilization techniques. The techniques selected for discussion have demonstrated at least clinical efficacy if not peer-reviewed evidence to be beneficial to human (if not animal) patients. Though other manual therapy techniques exist, it is beyond the scope of this article to describe them fully.

The origins of manual therapy can be traced back to Hippocrates in the 4th century BC with early descriptions of spinal manipulation and traction techniques. As the practice of medicine evolved, “bone-setters” were called upon in England in the 18th century to reset and reduce fractures and joint dislocations. Osteopathic medicine was developed by Andrew Still in the United States in 1874, professing the “rule of the artery” in which disease was believed to be a manifestation of restriction or obstruction of blood or lymphatic flow. Restoring this flow would aid the body in healing itself. Meanwhile in 1897, Daniel David Palmer lectured on the “law of the nerve” in the development of chiropractic medicine. This “law” suggests that spinal subluxations interrupt the flow of nervous energy, leading to disease. The 20th century welcomed the mobilization and manipulation approaches, commonly utilized by physical therapists and popularized by Cyriax, Maitland, Kaltenborn, Mulligan, and Paris (among others) in Australia, New Zealand, Scandinavia, the United Kingdom, and the United States.² Though many of these techniques have origins in “schools” of osteopathy, chiropractic, or physical therapy, most

manual therapy practitioners utilize any or all of these treatment strategies, leading to a more blended, modern approach to manual therapy.

The Manual Therapy Evaluation

As manual therapy practitioners have a veritable tool chest of techniques at their disposal, a thorough and objective evaluation is necessary for effective therapeutic choices for positive outcomes. The practitioner examines the patient's functional abilities, postures, and gait and passive ROM (PROM) and flexibility; palpates soft tissues, joint lines, and bony prominences; applies special manual diagnostic tests (e.g., Ortolani), neurologic tests (i.e., reflexes, reactions, and proprioceptive tests), and tests assessing various aspects of motor control, including strength, balance, and coordination. The practitioner considers the potential origin of the patient's symptoms, treatment precautions, prognosis, neuromusculoskeletal pathophysiology, and medical history before the application of manual therapy techniques.^{1,3} All evaluations include at least a basic assessment of the patient's general health with examination of the integumentary, cardiovascular, and respiratory systems, while more extensive evaluation of the neurologic and musculoskeletal systems is incorporated into the rehabilitation evaluation. Though the differential diagnosis, history, and evaluation might suggest a purely orthopedic approach, the therapist treats the whole patient, not only bones and muscles.

A more targeted manual therapy evaluation tests spinal, peripheral joint, and soft tissue mobility when there is suspected involvement of these structures because of restricted active ROM, PROM, or soft tissue flexibility, or the presence of pain (i.e., tissue resistance or muscle guarding) with mobility testing or at the end feel.¹ Accessory motion testing may reveal motion limitations as well as joint dysfunctions, hypomobilities and hypermobilities, the presence of pain or sensitivity, normal or abnormal end feels, and soft tissue reactions (e.g., hypertonicity, hypotonicity, or spasm), which might also be helpful in the diagnostic process.³ Palpation also reveals symmetries and asymmetries of position and motion, the presence

of pain or swelling, and muscle development or atrophy. The results of this detailed examination will direct the therapist in the selection and application of appropriate manual therapy techniques.¹

The Biomechanics of Manual Therapy

Knowledge of normal anatomy, including muscle, tendon, and ligament origins and insertions and confident palpation skills are essential for the practitioner performing manual therapy on any animal.¹ As many of the joint and spinal manual therapy techniques replicate the movement of joint surfaces on each other, the therapist must have a thorough understanding of animal biomechanics (including osteokinematics and arthrokinematics) as well.^{1–3}

Arthrokinematics is the movement of joint surfaces occurring primarily as rolls, spins, and slides. These movements are also known as accessory or translatory motions. It is understood that the directions of rolls, spins, and slides occur in a predictable manner (in the normal, nonpathologic joint) based on joint surface anatomy and the convex–concave rule. Knowledge of the accessory motions, which are limited or painful, leads the manual therapy practitioner to choose a technique (as well as direction and amplitude of the applied technique) to achieve the intended therapeutic goal. Arthrokinematics is a science complementary to the concept of osteokinematics, which is the movement of bones, resulting in an alteration of the angle of the joint. Terms that describe osteokinematic motion include flexion, extension, abduction, and adduction.^{1–3}

Indications and Goals

The practitioner selects manual therapy techniques based on the objective rehabilitation evaluation and in order to achieve a specific therapeutic goal.

Therapeutic goals might include relief or reduction in pain or pain response, lubrication or nutrition of joint surfaces, or facilitation of muscle contractions. Improvements in joint or spinal ROM, soft tissue flexibility, motor control, muscle tone, or joint or spinal biomechanics area also common goals. Resolution, correction, or management of these articular, neural, and muscular impairments may lead to overall improved function.¹

Some diagnoses that might benefit from the application of manual therapy techniques include osteoarthritis, spondylosis, intervertebral disk disease, muscle strains, and tendinopathies.² Not all techniques are appropriate for treatment of all diagnoses. The manual therapy practitioner utilizes his or her clinical judgment and knowledge in choosing appropriate techniques.

Though there is little research or published clinical evidence in peer-reviewed publications on the efficacy or effectiveness of the application of manual therapy techniques in animals, there is a significant scientific basis for use in human patients as published in physical therapy (physiotherapy), osteopathy, and chiropractic journals. There are also practitioners who have pioneered techniques, derived from techniques used successfully in human patients, which have been instructed to and implemented by practitioners worldwide, for use with animal patients.^{1,3}

Outcomes are dependent upon the pathophysiology of the disorder or injury, age of the patient, comorbidities, tissue healing times, other interventions applied (i.e., medical, complementary, or rehabilitative), home instruction compliance, and persistence of the condition.^{1,2}

Contraindications and Precautions

Though each manual therapy approach has more specific contraindications and precautions, the following, in general, are conditions

in which the practitioner should take caution. Joint or spinal instability (e.g., atlantoaxial luxation or wobblers syndrome), new or unstable fractures, rheumatoid or active inflammatory arthritic conditions, osteoporosis, osteopenia, osteomyelitis, history of aneurysm, and local metastases (owing to the possibility of pathologic fractures) harbor significant precaution if not absolute contraindication for most forms of manual therapy.^{1,2} Any technique that might increase inflammation or pain is also contraindicated. In general, caution must be taken when applying manual therapy techniques in the animal patient owing to difficulty in communication or interpretation of signs of anxiety, stress, or pain.⁴ Caution should also be used when applying manual therapy techniques with an older patient (who might be osteoporotic or osteopenic), one who has been immobile for a prolonged period of time (owing to weakened tissues), a brachycephalic patient, or a young patient (with an immature skeleton and without growth plate closure). The practitioner assesses and reassesses the patient before, during, and following application of manual therapy techniques, noting especially if there is unexpected weakness, lethargy, increased pain, reduced weight bearing, or ataxia following treatment.¹

ROM and Stretching

The application of ROM techniques is used for improved ROM, for increased flexibility, for prevention of adhesions, remodeling, and realignment of periarticular fibrosis, and for improved muscle and soft tissue extensibility for both recovery from injury and surgery and for injury prevention.^{4,5} PROM is the motion of a joint performed without muscle contraction, using an external force to move the joint.⁴

PROM can decrease pain and improve rate of recovery when initiated immediately following surgery. The veterinary literature supports early application of ROM techniques in young dogs with distal femoral physeal fractures (to avoid tiedown of the quadriceps) as well as for treatment of reduced elbow ROM following fracture at the distal humeral condyle. Studies also support early ROM following surgery for cranial cruciate ligament rupture to achieve early stifle extension, which may be related to reduced lameness following surgery.⁴

Stretching is a manual technique that uses a sustained stretch or pressure to elongate soft tissues shortened as a result of a pathologic condition or prolonged immobilization.^{1,4} Recent investigations support even more prolonged stretches for elastic deformation and lengthening of fascial tissues as well as musculo-tendinous tissues.

In general, when applying ROM or stretching techniques, the practitioner stabilizes the proximal portion of the limb and moves the distal component or muscle insertion site until the end feel is noted. The manual therapy practitioner respects the variability of normal within the various breeds regarding joint and spinal ROM and soft tissue flexibility.¹

Soft Tissue Mobilization

Soft tissue mobilization has a goal of reducing tissue adhesions and improving mobility of tissues so as to enhance joint and spinal ROM and soft tissue flexibility.¹ Soft tissue techniques might be applied manually or through techniques referred to as “instrument-assisted soft tissue mobilization” (IASTM), using techniques and devices popularized by Graston and ASTYM, among others. These IASTM techniques offer a further benefit in initiating an inflammatory process, thus encouraging healing. In addition, IASTM has aided manual therapy practitioners in reducing the incidence of overuse injuries. These techniques have demonstrated beneficial effects in patients with chronic tendinopathies especially.

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