Deborah Gross Saunders, MSPT, CCRP, Diplomate ABPTS (Orthopedics), Wizard of Paws Physical Rehabilitation for Animals, LLC, Colchester, Connecticut

Rehabilitation of the Osteoarthritic Patient

A multimodal approach to the osteoarthritic patient is mandatory for optimal patient care. Such an approach includes pharmaceutical interventions (to reduce inflammation and control pain), weight management, nutriceuticals, client education, and physical rehabilitation.

Physical rehabilitation has demonstrated its success in humans with osteoarthritis for over 100 years.[1-3] In animals, rehabilitation for osteoarthritis has been explored in the laboratory and clinic, with very favorable results.[4-6] Depending on the desired goals, various approaches and treatments may be used. Treatments may reduce pain and inflammation, improve strength and range of motion, and improve balance and proprioception. After a comprehensive evaluation and assessment, the treatment goals and specific treatment plans are designed. The patient should be routinely reassessed to determine progress and readjust the goals as necessary.

Types of Treatments

Modalities

Various modalities may be used to treat many of the problems associated with osteoarthritis, such as pain, inflammation, muscle spasms, weakness, loss of range of motion, contractures, edema, and functional loss.

Cryotherapy is used in acute stages of osteoarthritis to decrease pain and acute edema. This type of treatment, which includes ice packs, ice wraps, ice massages, ice baths, or cold compression wraps and pumps, can remove as much as 4° C of intramuscular heat from surrounding tissues.[7] It is applied for 10 to 30 minutes depending on the application method.

Moist heat is typically used for more chronic cases of osteoarthritis; it reduces muscle spasms and increases the metabolic rate in and circulation to the region. It may be applied in the form of a moist hot pack, warm baths, warm towels, or hydrocollators. Typically, temperature increases about 3° C at the superficial level and 1° C approximately 3 cm below the skin. Applications last about 15 to 20 minutes, and the skin integrity must be continuously monitored. Heat is applied directly over the involved joint or joints (**Figure 1**). Any stretching or range-of-motion exercises should be performed during or directly after the application.

Electrical stimulation may be used for pain control, neuromuscular stimulation, edema con-

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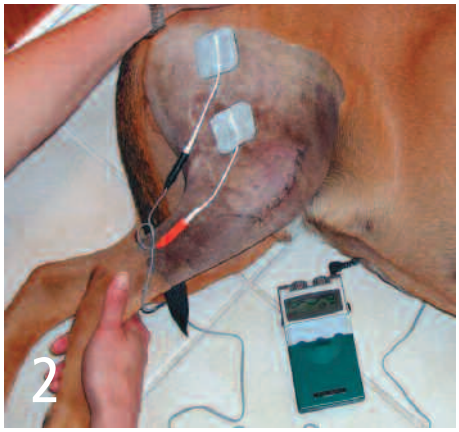
Moist hot pack application

trol, and functional return. For osteoarthritis, electrical stimulation is most often applied to control pain and assist in the reeducation of muscles. Electrical stimulation, or TENS (transcutaneous electrical nerve stimulation), is used to treat the area of pain. Electrodes are placed directly over the area of pain, nerve root distribution, acupressure points, or areas of referral (the areas should be shaved). Treatments are comfortable and generally last for 20 to 30 minutes; the patient should be continuously monitored for the duration of treatment.

Neuromuscular electrical stimulation is used over weak muscles or muscle groups to stimulate contraction. One electrode is placed over the motor point of the muscle and another along the muscle belly. Cocontractions can be elicited (eg, on the quadriceps and hamstrings), or electrically stimulated contractions may be timed with volitional contractions for function.

Laser therapy involves the direction of red and near-infrared light over an area to improve healing and to reduce pain, bacterial counts, and inflammation. Laser (originally an acronym for light amplification of the stimulated emission of radiation) treatments vary depending on the type of machines used. They effectively treat the pain and inflammation associated with osteoarthritis, and cause minimal to no side effects.[3,7] The probe is held directly over the area of pain, referral sites, acupuncture points, or dermatomal areas, and the treatment is administered in joules. The number of joules needed per area depends on the condition being treated (**Figure 2**).



Laser therapy to a stifle after cruciate surgery

Balance exercises for the hindlimb

Ultrasound therapy is a form of deep heat that penetrates up to 5 cm, depending on the setting of the unit. For safe and effective treatment, the patient's hair needs to be shaved. Ultrasound therapy may help decrease the pain associated with osteoarthritis and aid in the stretching and tissue extensibility that are often necessary after joint contractures or decreased range of motion. The effects of the heating associated with ultrasound typically last approximately 10 minutes after the treatment. Stretching and range-of-motion exercises should be performed during or immediately after therapy.

Joint mobilization reduces pain and restores range of motion in the osteoarthritic patient.[8] It may be applied to the spinal and peripheral joints and involves various grades of movements to decrease pain or increase range of motion, depending on the grade of movement. It is a commonly used, efficacious therapy in human medicine.

Therapeutic Exercises

Range of motion is often impaired in patients with osteoarthritis. Exercises to help restore range of motion are frequently part of the treatment plan for many patients.

Range-of-motion exercises should focus on one joint at a time and should be performed slowly. If one were to perform such exercises on the stifle, the stifle would initially be brought into flexion, held for a second or two, and then brought into extension and held for a second or two. The movement should be slow and calming to the dog and should be performed within its comfort range. Ideally, 2 or 3 sets of 10 should be performed.

Stretching exercises are a little more aggressive and are used to increase tissue extensibility. It is advisable to perform stretching exercises after the application of heat, the use of ultrasound therapy, or the performance of therapeutic exercises. Stretching exercises assist with joint contractures and are held for 10 to 30 seconds, depending on the patient's tolerance. They are then repeated up to 10 times. If one were to perform an abductor stretch to the hip, the dog would be in a laterally recumbent position and the hip would slowly be brought into abduction. The stretch would be held for 10 to 30 seconds and then repeated 3 to 10 times.

Balance and proprioceptive exercises are essential to any patient with osteoarthritis.[9,10]

The exercises concentrate on weight shifting, either manually as performed by the clinician or by putting the animal through exercises using a variety of surfaces. Balance or rocker boards and uneven surfaces, such as sand or low-level hills, may be used to challenge the patient's balance. Weight-shifting involves moving the dog's weight from one side of the body to another. For example, a dog with bilateral osteoarthritis of the hips would benefit from lateral rocking of both hips (**Figure 3**). The activity can be increased by lifting one limb or opposite limbs simultaneously. These exercises should be performed to tolerance and may be repeated 2 or 3 times throughout the day.

Aquatic therapy provides a variety of benefits, including heat, buoyancy, cohesion, and turbulence. Many patients with general arthritis can be submerged and benefit from the deep heat and weightlessness provided by the water. Swimming therapy assists with cardiovascular endurance, strength, pain reduction, balance and proprioception, and range of motion.

Aquatic therapy may also be performed in an underwater treadmill: The dog walks into a chamber, and the chamber is then filled with water to the desired height, depending on the amount of weight and energy expenditure the dog can tolerate. For example, filling the chamber with water to the level of the greater trochanter decreases the dog's body weight by more than half. Once the water level is determined, the treadmill is initiated at the appropriate speed—usually between 0.5 and 5 mph (**Figure 4**). Any type of aquatic therapy is strenuous so the dog's physiologic status must be monitored during sessions.

Additional types of therapeutic exercise may be used to focus on specific areas of weakness. An

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Underwater treadmill

Use of an exercise ball to strengthen the hindlimbs
Courtesy Monica Percival, Clean Run Productions

exercise ball may help strengthen the core muscles, forelimbs, or hindlimbs. **Figure 5** demonstrates a strengthening exercise for the hindlimbs. Most of the weight is supported by the ball, and a rocking motion allows the weight to be transferred on and off the hindlimbs. **Cavaletti rails** may be used to focus on range of motion, strength, and proprioception. The dog is gaited through the rails, and purposeful movement is the focus. **Leash walks** are also very beneficial for osteoarthritic patients and are often overlooked as a source of exercise. The patient's functional losses determine the frequency of walks. Sometimes, three 5-minute walks a day benefit the patient with severe deficits. Duration of the walks can then be gradually increased. After such a regimen, patients undergoing treatment will be able to advance their walking times and incorporate hills and uneven terrains.

Cost and Frequency

Treatments for osteoarthritis may vary depending on the determined goals for the dog, from 3 times a week to 1 visit every other week. A home program should always be clearly explained to the owners so that rehabilitation can continue to progress between treatments.

Cost of rehabilitation varies throughout the U.S. Initial evaluations may range in price from $75 to $200, and individual treatments may range from $35 to $100. Many centers offer package deals to help reduce the costs.

See Aids & Resources, back page, for references, contacts, and appendices.
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practice hotline

Psittacosis Risk — Alert

Pet retailer PetSmart has suspended bird sales at 775 stores in 46 states and pulled the animals from store displays. The move came after the Phoenix-based pet retailer found an unusually high number of cases of psittacosis, a bacterial disease found in birds available in their stores that can spread to humans through inhaled dried secretions. Customers who bought birds in late 2007 have been contacted.—*Washington Business Journal 1/4/08*

Parasite Control for Hay

Drought-stricken producers buying hay from out of state may need to take extra precautions regarding parasite control. Liver fluke cysts can survive on hay for a period of several months and animals that ingest them can become infected. Those purchasing hay or cattle from liver fluke-endemic regions in the West and Southwest should include liver fluke control as part of a strategic parasite control program, according to James Hawkins, Merial Veterinary Professional Services Associate Director.—*Press release 12/5/07*

New Resource — Information on Microchipping

The American Veterinary Medical Association has released 2 resources on microchipping. These resources—a backgrounder and answers to frequently asked questions—provide information on microchip types and standards; benefits and challenges; adverse reactions; microchips and cancer; references; where to look for more information; and answers to questions such as what a microchip is, how it is implanted into an animal, and what type of information it contains.—*www.avma.org/issues/microchipping/default.asp, accessed 1/8/08*