

A Peer-Reviewed Journal

TODAY'S VETERINARY

P R A C T I C E

Cytology *of* NEOPLASIA

An Essential Component *of* Diagnosis

September/October 2012 Volume 2, Issue 5

INTERNAL MEDICINE

Practice Pearls

DEFEATING TICKS

Preventing Tick-Borne Disease

CANINE VACCINATION GUIDELINES

Key Points for Veterinary Practice

VetMed Communications Inc., P.O. Box 390, Glen Mills, PA 19342-0390
CHANGE SERVICE REQUESTED

Presorted Standard
U.S. Postage Paid
Lebanon Junction, KY
Permit No. 794

Subscribe FREE at tvjournal.com/subscribe



Early Rehabilitation: MODALITIES and EXERCISES

Debbie Gross Saunders, DPT, MSPT, CCRP,
Diplomate ABPTS

Read [Pain Assessment in Dogs & Cats](#) (March/April 2012, available at todaysveterinarypractice.com) for information on different methods of pain assessment, including pain scales, physical examination, and species-specific evaluation.



Physical rehabilitation of dogs is becoming more common in veterinary medicine. Rehabilitation tools may be employed on many levels for the canine client, starting with basic rehabilitation practices; then expanding based on the level of care the practice would like to offer.

A multimodal approach should be taken with every rehabilitation patient and consists of:

- Decreasing pain
- Increasing range of motion
- Increasing strength
- Restoring tissue function.

In addition, inflammation will need to be decreased in order for function to be restored.

Early rehabilitation modalities for patients that are post traumatic/athletic injury or surgery include:

- Cryotherapy
- Moist heat
- Laser therapy
- Range-of-motion and weight-shifting exercises
- Controlled walking
- Electrical stimulation
- Massage therapy.

CRYOTHERAPY

Indications. Cryotherapy, or ice therapy, is indicated in acute cases of inflammation, trauma, and pain, such as post injury or surgery. Application of cold decreases blood flow to the region of application and reduces inflammation, pain, metabolic rate, muscle spasms, and bleeding in the area (**Figures 1 and 2**, page 82).

Application. Cryotherapy may be applied through ice

packs (consider packs of frozen peas), ice compression pumps, ice massage, and ice compresses. Ice massage consists of massaging the affected area with ice cubes (or similar substance) for 5 to 7 minutes. Ice compresses and compression pumps combine two principles of rehabilitation—cold therapy and compression—to specifically prevent inflammation and swelling.

To prevent hypothermia, cold sensitivity, and frost bite, there should always be a barrier (ie, thin towel) between the ice and patient. This is especially true in dogs with thin or fair skin, such as Italian greyhounds and whippets, or those with shaved skin post surgery.

Cryotherapy should be applied for 10 to 20 minutes at a time, 3 to 5 times throughout the day. Therapy should be continued until discharge; owners should be instructed on how to apply cryotherapy at home. Cryotherapy should be utilized for the first 3 to 4 days post injury or surgery; then moist heat may be applied.

Postoperative Cases. Once a dog's core temperature has been restored, cryotherapy can be applied to promote postoperative healing by reducing inflammation. For example, in postoperative cranial cruciate repair, cryotherapy may be applied to the stifle to assist in edema and pain control. However, be careful when using this modality on incisions, as it may irritate the incision and negatively affect healing. If cryotherapy is irritating the incision, it may become discolored and begin to open.

MOIST HEAT

Indications. Moist heat therapy is indicated for dogs with chronic conditions, such as arthritis, and in sub acute



Figure 1 and 2. Application of cryotherapy in two rehabilitation patients

phases of surgical and traumatic healing. In addition, tension and muscle spasms can be reduced through moist heat application. This therapy, which involves application of moist heat or warm hot packs to an area, decreases pain and causes vasodilation, increasing circulation and, thereby, promoting healing (**Figure 3**). Moist heat is more effective than dry heat because it has enhanced skin penetrating abilities.

Application. Moist heat therapy can be administered through warm hot packs, hot compresses, or warm water. Skin integrity should be monitored and care should be taken not to overheat or burn the dog, especially in patients with decreased sensation, increased body fat, or under sedation. Negative effects of heat therapy include increased redness, burning, and blistering.

There should always be a barrier (ie, thin towel) between the heat source and patient. Heat therapy materials should maintain a temperature between 150°F and 160°F. The veterinary professional or owner should monitor skin integrity to avoid burns or skin irritation.

Moist heat is typically applied for 15 to 20 minutes at a time, 3 to 4 times throughout the day. For postoperative patients, it is begun after 3 to 4 days of cryotherapy.

LASER THERAPY

Laser (light amplification by stimulated emission of radiation) therapy has become an increasingly popular modality in veterinary and human medicine (**Figures 4 and 5**). Laser therapy facilitates healing, increases DNA synthesis and cell proliferation, and decreases pain and inflammation.

Indications. Laser therapy may be applied to a wide variety of cases, including:

- Medical, orthopedic, and neurologic postoperative patients
- Geriatric patients with chronic arthritis
- Patients that require a substitution for or additional therapy to nonsteroidal anti-inflammatory drugs
- Patients that have undergone trauma
- Patients with unresponsive dermatologic conditions, such as lick granulomas.

The laser modality is available in various classes of

power, with class 3B and class 4 the most popular for rehabilitation. Dosages and treatments vary according to the unit and class of laser.

- Postoperative patients (ie, cranial cruciate repair) benefit from laser therapy immediately after surgery, with therapy being applied as soon as the last suture or staple is secured and then repeated the next day.
- Treatments for acute cases typically apply 4 to 6 joules/cm².
- For chronic conditions, such as arthritic joints, laser therapy may be applied directly to the affected joints and surrounding areas.
- Dosages for chronic conditions are slightly higher than acute conditions, typically 8 to 12 joules/cm².

ELECTRICAL STIMULATION

Indications. Electrical stimulation may be used for a variety of reasons, including pain management, muscle contraction, and edema control. For early rehabilitation, pain control is one of the more common utilizations of the modality.

Application. The patient's hair must be shaved and the skin cleaned prior to electrical stimulation. The machine parameters can be set for pain control, edema control, or neuromuscular electrical stimulation.

- **Pain Control:** Electrodes are placed directly on the affected area or region needing pain control. The typical administration period is 15 to 20 minutes.
- **Neuromuscular Conditions:** Neuromuscular electrical stimulation (NMES) is applied for 5 to 10 minutes on a 1:1, 1:3, or 1:5 ratio. For example, the muscle may contract for 10 seconds; then a rest period of 10, 30, or 50 seconds is used depending on the patient's condition.
- **Postoperative Therapy:** Typical postoperative treatments are performed on a 1:3 or 1:5 ratio. The electrodes are placed on a motor point and then distally on the muscle belly. For example, the motor point for the biceps femoris is just distal and caudal to the greater trochanter: one electrode is placed there and the distal electrode is placed on the muscle belly.



Figure 3. Application of moist heat therapy with hot pack



Figures 4 and 5. Class 4 laser being used to treat biceps tendonitis

MASSAGE THERAPY

Indications. Massage therapy may be used for pain management, relaxation, and edema control as well as “warm-up” prior to therapeutic exercises. Most dogs tolerate this therapy very well. Benefits include endorphin release, increased circulation and toxin excretion, relaxation and tension relief, increased range of motion and flexibility, and improved balance.

Application. A variety of massage techniques are used to achieve optimal benefits.

- *Compression* spreads the muscle fibers and increases circulation.
- *Direct pressure* helps relieve hypertonia and increase circulation to a specific area; it is a form of compression.
- *Effleurage*, a gliding stroke, is used to relieve fatigue or soothe the patient.
- *Friction* works in deeper layers of the tissue by compressing them against bone and/or creating heat; it helps remove waste deposits and stimulates tendons and ligaments.

- *Petrissage*, sometimes called kneading or rolling, stimulates nerve endings and helps remove fluids and waste.
- *Tapotement*, or percussion, relieves muscle atrophy.
- *Vibration* loosens tissue and joints.

EXERCISES

Range-of-Motion Exercises

Indications. The goal of these exercises is to slowly and carefully guide the affected joint through the available pain-free range of motion, eventually restoring as much range of motion as possible. These exercises are useful in orthopedic rehabilitation for both post-operative recovery and chronic conditions, such as femoral head and neck excision and arthritis, respectively.

Application. Typically, the joint is moved to the available range, the motion is paused, and then the joint returned to a normal position.

- For postoperative cranial cruciate repair, the stifle should be moved into flexion and held at the point of minimal resistance for 1 to 2 seconds; then restored to normal position. Stifle flexion and extension is performed in 3 sets of 10 repetitions (3 sets for flexion and 3 sets for extension), 3 times per day.
- *Passive* range-of-motion exercises should be followed up by *active* range-of-motion activities, if possible. For example, stepping over objects, such as cavalletti rails, is beneficial to stifle flexion.
 - » *Passive range-of-motion exercises* are performed by the veterinary professional or owner.
 - » *Active range-of-motion exercises* are performed by the patient.
- Range-of-motion exercises should be as pain free as possible. Inflammation and pain should be addressed through other rehabilitation modalities and/or pharmaceutical interventions.



Figure 6. Passive range-of-motion exercise: Manual hip extension stretching



Figure 7. Active range-of-motion exercise: Stretching of the hip flexors and back



Figure 8. Weight-shifting exercise being performed on a smooth surface

- » For example, cryotherapy, moist heat, laser, massage, or electrical stimulation may be used to reduce pain and inflammation prior to passive range-of-motion exercises.
- » Once pain and inflammation are reduced, range of motion should improve.
- Joint range of motion should be measured with a goniometer to help track progress. Each limb's range-of-motion can also be compared to the other for reference.
- While it is not always possible to obtain full range of motion if there are arthritic changes, the goal should be to obtain as much functional range of motion as possible.

Figures 6 and 7 (page 83) demonstrate a passive hip

For more information on the modalities discussed in this article, go to **today's veterinarypractice.com** and select Resources.

extension stretch and an active stretch for hip extension, respectively.

Weight-Shifting Exercises

The goal of these exercises is to encourage the dog to place weight on the affected limb or limbs (**Figure 8**, page 83). For example, a dog that has undergone orthopedic surgery needs to gradually increase weight bearing on the limb. Weight-shifting exercises can also be used for dogs that have arthritic conditions and those recovering from neurologic conditions.

A variety of surfaces should be used for these exercises, such as carpeted floors, smooth floors, and uneven surfaces. The patient needs to learn how to walk and balance on the surfaces it will encounter during everyday life. Daily activities should be incorporated into the rehabilitation process.

IN SUMMARY

There are a variety of exercises and rehabilitation modalities that can be performed in the early phases of rehabilitation and as part of an ongoing program for patients with chronic conditions. The goal is to incorporate a multimodal approach that provides a plan for rehabilitation as well as pain management and then communicate that plan to your patients' owners. See the **Rehabilitation Case Examples** for two approaches to rehabilitation using the modalities discussed in this article. ■

REHABILITATION CASE EXAMPLES

A multimodal approach is always the appropriate technique for rehabilitation.

POSTOPERATIVE CRANIAL CRUCIATE REPAIR

- A very common patient in the rehabilitation setting is one that has undergone cranial cruciate repair.
- *Initial treatments* include:
 - » Cryotherapy
 - » Moist heat
 - » Range-of-motion and weight-shifting exercises.
- *Laser therapy* may be utilized on the incision and over the stifle area to reduce inflammation and assist with wound healing; the dosage is 4 to 8 joules/cm².
- Recommended order of treatment is:
 1. Cryotherapy (moist heat may replace cryotherapy after 3–4 days)
 2. Laser therapy and massage
 3. Range-of-motion exercises
 4. Weight-shifting exercises
 5. Controlled leash walking.
- *Electrical stimulation* may be used for pain control, if necessary.
- *Neuromuscular electrical stimulation* may be used to improve muscle function, specifically the hamstring and quadriceps groups.

CHRONIC BILATERAL HIP & LUMBOSACRAL DISCOMFORT

- Another common patient requiring rehabilitation is the older dog with bilateral hip and lumbosacral issues.
- Appropriate treatments include:
 - » Moist heat
 - » Laser therapy and massage
 - » Gentle range-of-motion and weight-shifting exercises.
- The goals of treatment are always to:
 - » Reduce pain and inflammation
 - » Increase range of motion
 - » Increase strength and function.



Debbie Gross Saunders, DPT, MSPT, CCRP, Diplomate ABPTS, has been working in the field of small animal rehabilitation for over 17 years. She is on faculty for the University of Tennessee's Certificate Program in Canine

Physical Rehabilitation and owns Wizard of Paws Physical Rehabilitation for Animals, LLC (wizardofpaws.net). Dr. Gross Saunders has spoken at numerous national and international conferences, lectures, and seminars, most recently at the NAVC Conference, ACVS Veterinary Symposium, and Sixth International Symposium on Physical Therapy and Veterinary Medicine. She has also published numerous articles on canine physical rehabilitation.