

The Ups and Downs of Physical Therapy

The field of canine rehabilitation is growing in leaps and bounds. As a consequence, animal rehabilitators (i.e., human physical therapists, or PT's) and the public are placing ever more pressure on legislators across the country to eliminate the need for on-site veterinary supervision. Some PT's argue that a veterinarian referral is superfluous and puts up unnecessary roadblocks to direct access. Others accept that veterinary supervision can be valuable, but would prefer off-site supervision. Knowing where to draw the line requires accurate assessment of the relative risks and benefits to everyone involved. As with all other integrative healthcare approaches, the safety of non-veterinarian care for animals depends on ongoing involvement of the veterinarian in charge.

Three PT modalities with which veterinarians may be initially unfamiliar commonly appear in canine rehabilitation programs: therapeutic ultrasound, electrical stimulation, and hydrotherapy. While each of these modalities ultimately may prove to have value for dogs, veterinarians should know the risks and contraindications of each procedure before delegating care to a PT.

Therapeutic Ultrasound

Therapeutic ultrasound provides deep heat, and PT's use ultrasound to help muscles and collagen relax and elongate. Some claim additional non-thermal benefits such as tissue repair and fibroblast proliferation. Clinical applications include tendonitis, soft tissue pain, and muscle tension causing joint contracture, though they remain largely unsubstantiated by rigorous trials both for humans and animals.

Animals should not receive direct ultrasound exposure to pacemakers, reproductive organs, major cardiovascular or neural centers, epiphyses in growing animals, tumors, or contaminated wounds. There is also concern that intracapsular heating may accelerate destruction of articular cartilage in acute inflammatory joint disease.

However, even in patients appropriately selected, ultrasound done improperly can overheat tissue, causing "hot spots", especially over joints or bones. This occurs when the therapist keeps the transducer head stationary. It can also occur if the intensity is up too high. PT's treating animals may not recognize their signs of pain, and monitoring temperature elevations in underlying tissue is challenging without verbal feedback from the patient. Animals experiencing burning may whine or pull away. At this point, the therapist should either terminate the treatment or at least diminish the intensity. Ignoring these warning signs and continuing in order to deliver sufficient exposure may lead to inflammation or dermal necrosis. Furthermore, if practitioner removes the

transducer from the tissue surface while the device is emitting ultrasound, it can overheat and subsequently burn the animal. On-site veterinarians witnessing incorrect application of therapeutic ultrasound can intervene if the therapist is performing the procedure incorrectly, if an animal appears uncomfortable, or if an untoward outcome results.

Electrical Stimulation

Physical therapists frequently employ electrical stimulation for various applications: wound healing, muscle strengthening, and transdermal medication absorption, muscle relaxation, drainage of edema, and analgesia.

Contraindications are presence of a pacemaker, thrombus, infection, or neoplasm. As with ultrasound therapy, PT's must take extra precautions in animals with compromised sensitivity to pain as excessive input can burn tissue.

Darryl Millis, MS, DVM, and David Levine, PT, PhD, of the University Of Tennessee College Of Veterinary Medicine provide the following recommendations: "Precautions should be taken to avoid injury to the handler and animal. A muzzle should be applied and the animal placed in lateral recumbency during the initial treatment. In some cases, tranquilization may be necessary if the patient is anxious. We recommend that treatment only is given under the supervision of trained personnel."

Aquatic Therapy (Hydrotherapy)

Swimming facilities are making a splash in large and small animal rehabilitation, ranging from above ground pools to built-in systems to underwater treadmills. Swimming gives healthy dogs a means to improve their fitness and offers those recovering from orthopedic or neurologic trauma buoyancy while they regain muscle tone through movement.

Many unknowns remain in human and veterinary medicine about the most appropriate types of exercise to prescribe and the safest time intervals to impose post-surgery or after injury before starting programs such as swimming. Some PTs prefer underwater treadmills to swimming pools, as dogs placed in pools where they cannot feel the ground may become anxious and upset, causing further injury from uncontrolled thrashing. Even if they enjoy the pool, some dogs can endure only a few minutes of swimming, especially after long periods of debility and/or deconditioning. Ideally, one should monitor dogs' vital signs during aquatic therapy and adjust water temperature to the individual.

Aquatic therapy raises an additional concern: infectious disease. Underwater treadmills can be challenging to disinfect, as can swimming pools contaminated with fecal matter. Pools in which clients swim with their dogs may be violating

public health regulations, since *E. coli*, *Giardia*, *Cryptosporidium*, and leptospirosis can be transmitted across species. For example, the Colorado State Board of Health's document on swimming pools and mineral baths [Section 4.15] states that, for pools admitting humans, "Animals shall not be permitted in pool or pool area, except patrol dogs accompanying security or police officers, or guide dogs and service dogs accompanying blind, visually handicapped, deaf, partially deaf and otherwise physically disabled persons." Should feces be found in a pool used by humans at any time, the pool needs to be closed and disinfection procedures employed, taking up to 24 hours or more [Section 4.14].

Amidst the excitement and growth of canine rehabilitation, it is important to acknowledge the hazards and need for evidence-based justification. Jan Steiss, DVM, PhD, MPT provides a comprehensive synopsis of canine rehabilitation concerns at <http://www.ivis.org/advances/Vite/steiss2/IVIS.pdf>. The Physiotherapy Evidence Database (PEDro) at <http://www.pedro.fhs.usyd.edu.au/index.html> provides links to randomized controlled trials and systematic reviews on various physical treatments including rehabilitation. As of February 26, 2005, the site linked to 910 systematic reviews.