

Physical Rehabilitation of Dogs Following TPLO

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Physical rehabilitation for pets is still a rather new veterinary discipline, as it has only existed since approximately 2000. However, the discipline continues to grow, as does the awareness of benefits to dogs.

Although rehabilitation for [tibial plateau leveling osteotomy \(TPLO\)](#) is emphasized here, rehabilitation is beneficial in numerous other circumstances. Ask your veterinarian if rehabilitation is appropriate for your pet.

Cranial cruciate ligament disease is the most common orthopedic condition in dogs, and TPLO is often the surgery of choice. Early physical rehabilitation therapy should be considered part of the postoperative management of these dogs.

Physical rehabilitation in dogs who have had a TPLO can be divided into three phases for most dogs, and four phases for athletes.

Phase 1 begins immediately following surgery and extends until the acute trauma induced by surgery subsides. Different modalities are used in this phase to help manage pain and inflammation, and to encourage the dog to use the leg.

Phase 1 Goals

- Manage the trauma caused by surgery and inflammation
- Decrease pain
- Maintain joint range of motion
- Encourage use of the leg

Phase 1 Therapies

- Gently massage the leg to decrease swelling
- Apply cold packs to the surgery site 10 to 15 minutes several times daily
- Use passive range of motion exercises and stretch the hip and stifle



The rehabilitation veterinarian gets into the underwater treadmill too when the dog goes in for the first time to help the dog get used to it.
Photo by Karen James.

- Encourage use of the back limb with slow, controlled leash walks 3 to 4 times per day for 5 to 10 minutes, gradually increasing time as improvement is seen
- Therapeutic laser and transcutaneous electrical nerve stimulation (TENS) may assist in lessening pain

Phase 2 begins approximately 2 weeks after surgery and lasts until the dog has sufficient strength to begin Phase 3, or core strengthening. Phase 2 is focused on restoring musculoskeletal strength and maintaining or improving cardiovascular fitness. Muscle atrophy around the hind limb is often seen in varying degrees. This atrophy, combined with myofascial trigger points (painful knots in the muscle) produces muscle weakness and dysfunction in the leg. Myofascial trigger points create muscle dysfunction and weakness by inhibiting and altering muscle firing patterns, also known as motor control and timing. Joint dysfunction is seen with cranial cruciate ligament disease, and it can also affect muscle control and timing. The main goal of this phase is to begin to reverse the joint and muscle dysfunction. Formal rehabilitation should occur 2 to 3 days a week. On non-therapy days, owners should give passive stretching exercises and controlled leash walks.



Phase 2 Goals

- Address disuse atrophy and muscle dysfunction
- Improve/maintain cardiovascular fitness
- Address joint dysfunction
- Improve joint range of motion
- Increase dog's proprioceptive (knowledge of where one's limbs are and how they are positioned) awareness.

Phase 2 Therapies

- Give multiple sessions in an underwater treadmill. The speed is initially set to encourage the best gait pattern. Time and speed are incrementally increased the next session. Water levels can be varied to encourage increased action of the stifle and hip.
- Therapeutic exercises should encourage contractions of muscles in the hind leg and proprioceptive (knowledge of where one's limbs are and how they are positioned) awareness, such as small jumps, balance board, sit to stands, walking backwards, dancing, etc.
- Passive stretching of stifle and hips.
- Myofascial trigger point therapy using a type of acupuncture called dry needling is preferred; however, manual therapy and/or therapeutic laser can be used. In addition, the opposite leg should be evaluated. Usually this is performed weekly.



This dog received laser therapy immediately prior to his first treatment in the underwater treadmill. Photo by Karen James.

The goal of each therapy session is to push the patient further than the previous one while maintaining control of each exercise. Always monitor the dog for fatigue.

Phase 3 is a continuance of Phase 2. It usually begins after 8-12 sessions of Phase 2 and the patient is 5 to 8 weeks postoperative. The patient should be walking well with an intermittent to slight weight-bearing lameness that becomes more noticeable when trotting. The dog should have sufficient hind limb muscle strength that will allow more strenuous exercises. There should be no pain or discomfort when moving or touching the stifle joint; however, there may still be myofascial pain related to trigger points.



This phase is similar to the previous one, but is more demanding. Sessions in the underwater treadmill should be faster and longer, and done often at an incline. Land treadmill training can be started. Additionally, it's time to add exercises to strengthen the core body muscles.

In dogs, the core body muscles include all of the back muscles above and below the spine and, to a lesser degree, the abdominals. The core muscles serve as a foundation for the hind limbs and their weakness may increase the risk of injury, especially in athletes.

Phase 3 Goals

- Address disuse atrophy and muscle dysfunction
- Improve/maintain cardiovascular fitness
- Address joint dysfunction
- Improve joint range of motion
- Increase dog's awareness of his leg
- Improve the strength of his core body muscles

Phase 3 Therapies

- Have multiple sessions in the underwater treadmill. The speed initially set is to encourage the best gait pattern. Each session more can be asked of the patient. Water levels can be varied to encourage increased action of the stifle and hip.
- Provide therapeutic exercises to encourage muscle activation of pelvic limb muscles and proprioceptive awareness (small jumps, balance board, sit to stands, walking backwards, dancing, etc.).
- Passive stretching of stifle and hips.
- Provide weekly myofascial trigger point therapy – trigger point dry needling is preferred, however, manual therapy and/or therapeutic laser can be used. In addition to continued treatment of the leg, some treatment may be necessary in the opposite leg, core body muscles and/ or the front legs.
- Most of the therapeutic exercises previously described stimulate the core muscles to some degree. However, improved strengthening is accomplished by more demanding exercises by balancing on air-filled devices such as balance discs, peanuts, eggs, and doughnuts. Balancing exercises on these devices promote contractions of core muscles and leg muscles, and increase in proprioceptive awareness.

If this point ends your dog's rehabilitation, periodic re-evaluation by a veterinarian is recommended to make sure that no problems exist.

Phase 4

Phase 4 is directed more for the canine athlete rather than the pet. This phase usually begins following 20 sessions of rehabilitation and the patient is 9 to 12 weeks postoperative. Osteotomy healing should be better than 90% complete when this phase begins. Lameness should not be seen when the dog walks and at the trot is very slight or intermittent if seen at all. Once again, this continues the previous phase in that many of the exercises are repeated in a more strenuous and demanding fashion. More demanding core body strengthening, and longer and faster sessions in the underwater treadmill and on the land treadmill are the focus of this phase. Swimming for increased conditioning may begin. Treatment of myofascial trigger points continues if needed. Air-filled devices can be placed in sequence, creating an obstacle course for the dog to negotiate. This phase takes another 10 to 20 sessions of rehabilitation and lasts another 7 to 10 weeks.

Any rehabilitation veterinarian understands that it is difficult to restrain or control a canine athlete that is attempting a progressive return to competition. Therefore it is crucial to determine if the athlete has sufficient conditioning and strength to withstand brief episodes of full speed activity.

Following this phase, the athlete can be placed back into light work-related training. No lameness should be detected when the athlete returns. Periodic re-evaluation is recommended.

Rehabilitation lasts 9 to 12 weeks for dogs going through Phase 3, and 16 to 24 weeks for athletes going through Phase 4.

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