

# Classic Physiotherapy



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## Aims of Physiotherapy and therapy treatment for a CCL repair

Overarching goal of Physiotherapy rehabilitation is to return the dog to pain free function, promote quality movement and to reduce secondary complications and compensations lifelong<sup>(9-13,21,26,27)</sup>.

We base our physiotherapy aims and treatment on the knowledge of much human research into orthopaedic rehabilitation as well as the small amount of formal veterinary research. In the human world it has been shown that early controlled mobility and rehabilitation work promotes tissue healing, bone healing and return to function with far less compensatory issues and complications<sup>(11,19,21,25,27)</sup>. Focus is on proprioception, neuromuscular control, co-contraction of joint stabilising muscles, strength preservation and gain<sup>(8,16-21,24,25)</sup>. Although the actual surgery is different for canine cruciate ligament issues, the principles of rehabilitation are the same.

Physiotherapy is not prescriptive, and each dog is assessed each time and relevant treatment options selected using knowledge of surgical procedures, tissue healing times, biomechanics, current presentation, owner lifestyle and the eventual role of the dog<sup>(28)</sup>. We also work within the protocols that each vet sets for post op restrictions. "Knowledge of the stages of tissue healing and of the strength of tissues is critical to avoid placing too much stress on the surgical site, yet some challenge to tissues must be provided to optimize the return to function." <sup>(16)</sup> – this is what physios do.

### **POST SURGERY 1- 7 days**

Depending on when the dog is sent home, some of these options can be done at the vet practice. Some of these techniques vet nurses have been trained to perform prior to discharge.

- Aims : controlled and well set up home environment; adjuncts to control pain<sup>1,6)</sup> and swelling<sup>(1)</sup>; maintain range of movement. Analgesics are not always able to completely control pain<sup>(6)</sup> so physiotherapy has options to adjunct this.
- Treatment options: home assessment and set up to promote controlled rehabilitation.
  - cold compression therapy – cryocuffs combining cold therapy and compression<sup>(1)</sup>
  - Passive gentle range of movement exercises, by a professional, to affected limb and massage to local muscles<sup>(13,28)</sup>.
  - Soft tissue treatment for muscle soreness elsewhere in body<sup>(29)</sup> (usually spinal and forequarter)
  - Showing the owner therapeutic walking on lead to benefit healing

### **POST SURGERY 3 - 10 days**

- Aims: promote owner compliance to restrictions (control and toileting); adjuncts to reduce pain<sup>(6)</sup>; promote healing; preserve muscle mass<sup>(9)</sup>; promote joint stability<sup>(24)</sup>; improve proprioception and neuromuscular control<sup>(8,18,20,24,25,29)</sup>; early controlled weight bearing on the limb<sup>(10,25)</sup>; prevent mechanically dysfunctional compensatory postures and movement strategies<sup>(10,21)</sup>; early identification of complications<sup>(13)</sup>.
- Treatment options: home assessment and reiteration to owners of management plans; pulsed magnetic therapy or laser for pain control adjunct<sup>(15)</sup> and muscle soreness and promotes healing; proprioception enhancement<sup>(8,18,20,24,29)</sup> including gentle range of movement exercises for stimulation of mechanoreceptors<sup>(28)</sup>, in standing perturbations and weight transfer<sup>(24,29,30)</sup>, sit to stand exercises

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for preserving muscle mass and neuromuscular control<sup>(10,22,30)</sup>; neuromuscular electrical stimulations (NMES)<sup>(7,17)</sup> if muscle atrophy has been significant prior to surgery;

## POST SURGERY 2 - 6 weeks

**Similar aims and treatment options as days 3-10 except that moving through this time frame focus is on increasing proprioception, neuromuscular control, promotion of quality weightbearing and controlled function** <sup>(27-30)</sup> .

**Of most importance is supporting the owner to continue to comply with restricted mobility – this is the most likely time for an owner to think the dog looks ok and allow more freedoms. Regular physiotherapy involvement will reduce this risk. Physio likely to see dog 2 to 3 times a week.**

- **Aims:** promote owner compliance to restrictions; adjuncts to reduce pain <sup>(4)</sup> ; promote healing; preserve muscle mass; promote joint stability and proprioception <sup>(8,18,20,24)</sup>; controlled weight bearing on the limb<sup>(10)</sup>; prevent mechanically dysfunctional compensatory postures and movement strategies <sup>(10,21)</sup>; early identification of complications<sup>(13)</sup>.
- **Treatment options:** supporting owners with management plans; proprioception enhancement <sup>(8,18,20)</sup> including perturbations, weight transfer, sit to stand <sup>(10,22)</sup>, latterly forelimbs on wobble cushions; sit to stand and lie exercises with quality of movement<sup>(10,24)</sup>; latterly proprioceptive tracts of flat surfaces with changing sensory input; neuromuscular electrical stimulations (NMES) <sup>(7,17)</sup> if muscle atrophy has been significant prior to surgery; soft tissue treatment of muscle soreness; gradual increase of lead walk (depending on discussions with vets) usually approx. 5 mins per walk per week <sup>(11,13)</sup>; walking 2 or 3 times a day depending on assessment - at slow pace to prevent mobility adaptations and ensure correct use of limb.
- **Hydrotherapy** <sup>(2,14)</sup> (once stitches removed) is beneficial, ideally the water treadmill to promote supported functional use of the limb, reduce compensatory spinal and contralateral muscle soreness; increases range of movement of operated limb and promotes muscle mass increase. Alongside Physiotherapy for land based functional rehabilitation, Hydrotherapy is an added bonus.

## POST SURGERY 6-14+ weeks

**With a good grounding of rehabilitation in the previous 6 weeks, the dog should be well on his way to a quality functional outcome. Focus is now on continuing to build up muscle strength, towards returning to function within his lifestyle. Fine proprioception and neuromuscular control are still an important part of this stage of rehabilitation.**

- **Aims:** promote owner compliance to continuing exercise restrictions; improve muscle mass & strength<sup>(9,10)</sup>; increase or maintain range of movement in joints <sup>(5)</sup> , fine tune joint stability and proprioception <sup>(8,18,20)</sup>; prevent mechanically dysfunctional compensatory postures and movement strategies<sup>(10,21)</sup>; identification of complications <sup>(13)</sup>.
- **Treatment options:** continuing to support owners with management plans; lead walk, increasing times, distance, surface, controlled turns, latterly speed and controlled off lead rehab<sup>(10,23)</sup>; proprioception enhancement and neuromuscular control <sup>(8,18,20,24)</sup> with wobble cushions, forelimbs on a step with trunk weight transfer (following a treat with head); 3 legged and two legged stance; proprioceptive

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tracks, latterly ground level pole work<sup>(5,24)</sup>; latterly - controlled introduction to other functions such as stairs, in and car<sup>(23,24)</sup>; quality of movement always paramount.

- Hydrotherapy continues to be beneficial especially the water treadmill to promote functional use of the limb, reduce compensatory spinal and contralateral muscle soreness; increases range of movement of operated limb and promotes muscle mass increase.

Overall throughout Physiotherapy rehab, controlled return to function is at the top of the list. Although there are expected healing and return to function times, every dog is different as is every injury and surgery but if at any time there is an indication that progress is being limited then the dog is referred back to the vet ASAP.

Dog's benefit from formal professional rehabilitation after any operation for cruciate ligament disease. Owners enjoy having physiotherapist involved in their dog's rehab as it helps them to maintain and journey through the full recovery of their dog.

## References

I did not have access to full articles of all of these so have not assessed them all myself. They have however been cited in a number of peer reviewed published articles and books. There are links on my website to some of these papers.

There is a paucity of evidence the formal professional rehabilitation has positive outcomes post surgery in animals.

1. Drygas K et al (2011), Effect of cold compression therapy on postoperative pain, swelling, range of motion, and lameness after tibial plateau levelling osteotomy in dogs; Journal of the American Veterinary Medical Association. May 15, 2011, Vol. 238, No. 10, Pages 1284-1291
2. Levine D et al (2010) Effects of partial immersion in water on vertical ground reaction forces and weight distribution in dogs. American Journal of Veterinary Research December 2010, Vol. 71, No. 12, Pages 1413-1416.
3. Ragetly C, et al (2008). Non-invasive determination of body segment parameters of the hind limb in Labrador Retrievers with and without cranial cruciate ligament disease. American Journal of Veterinary Research. September 2008, Vol. 69, No. 9, Pages 1188-1196
4. Gordon-Evans W et al (2011) Effect of the use of carprofen in dogs undergoing intense rehabilitation after lateral fabellar suture stabilization. Journal of the American Veterinary Medical Association. July 1, 2011, Vol. 239, No. 1, Pages 75-80
5. Holler, et al (2010). Kinematic motion analysis of the joints of the forelimbs and hind limbs of dogs during walking exercise regimens. American Journal of Veterinary Research. July 2010, Vol. 71, No. 7, Pages 734-740
6. Wiese A, et al (2005). Characteristics of pain and response to analgesic treatment in dogs and cats examined at a veterinary teaching hospital emergency service. Journal of the American Veterinary Medical Association. June 15, 2005, Vol. 226, No. 12, Pages 2004-2009
7. Sawaya S, et al (2008) Assessment of impulse duration thresholds for electrical stimulation of muscles (chronaxy) in dogs. AJVR. October 2008, Vol. 69, No. 10, Pages 1305-1309

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8. **Hewett** et al (2002). Strategies for enhancing the proprioceptive and neuromuscular control of the knee. Clinical Orthopaedics and Related Research, 403 76-94. cited in 13
9. Francis et al (2002) Bone and muscle loss from disuse following ccl transection and stifle stabilisation surgery. Proceedings of 2<sup>nd</sup> International symposium on Rehabilitation and Physical Therapy in Veterinary Medicine. Knoxville TN, pp 203-204. cited in 13
10. Marsolais G, et al (2002) Effects of postoperative rehabilitation on limb function after cranial cruciate ligament repair in dogs. JAVMA May 1, 2002, Vol. 220, No. 9, Pages 1325-1330
11. Monk M, et al. (2006) Effects of early intensive postoperative physiotherapy on limb function after tibial plateau leveling osteotomy in dogs with deficiency of the cranial cruciate ligament. American Journal of Veterinary Research 67:3, 529-536
12. Taylor and Admason (2002) Stifle surgery and Rehabilitation. Proceedings of 2<sup>nd</sup> International symposium on Rehabilitation and Physical Therapy in Veterinary Medicine. Knoxville TN, pp 143-146. cited in 13
13. McGowan C, Goff L, Stubbs N, (2007) Animal Physiotherapy – Assessment, Treatment and Rehabilitation of Animals. Blackwell Publishing Ltd.
14. Marsolais G, et al (2003) Kinematic analysis of the hind limb during swimming and walking in healthy dogs and dogs with surgically corrected cranial cruciate ligament rupture. Journal of the American Veterinary Medical Association 222:6, 739-743.
15. **Cheng** et al, (2005) Ice and electromagnetic field therapy to reduce pain and swelling after radial fracture repair. J. Rehab medicine 37, 372-377.
16. **Davidson** J, et al (2005). Rehabilitation for the orthopaedic patient. Vet Clin North Am Small Anim Pract. 2005 Nov;35(6):1357-88
17. **Fitzgerald** et al, (2003). A modified NMES protocol for quads rehab following ACL repair. J Orthopaedic Sports Physical Therapy. 30(4).
18. **Lephart** et al (1997) The Role of Proprioception in the Management and Rehabilitation of Athletic Injuries. Am J Sports Med January 1997 vol. 25 no. 1 130-137
19. **Nash** et al (2004) Resting injured limbs delays recovery: a systematic review. J Fam Pract. 2004 Sep;53(9):706-12
20. **Swank** et al (1997) Re-establishing proprioception and neuromuscular control in the ACL-injured athlete. Journal of sport rehabilitation 1997 6 182-206\* **have full text**
21. **Ernst** et al (2000) Lower-Extremity Compensations Following Anterior Cruciate Ligament Reconstruction Physical Therapy vol. 80 no. 3 **251-260** \* **have full text**
22. **Salem** GJ (2003) Bilateral kinematic and kinetic analysis of the squat exercise after anterior cruciate ligament reconstruction. Arch Phys Med Rehabil. 2003 Aug;84(8):1211-6.
23. **Kvist** J (2004) Rehabilitation following anterior cruciate ligament injury: Current recommendations for sports participation, Sports Med 2004:34:269\* **have full text**
24. **Risberg**, et al (2001) Design and implementation of a neuromuscular training program following anterior cruciate ligament reconstruction. J Orthop Sports Phys 2001:31:620 \* **have full text**

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25. **Wilk** KE, et al (2003) Recent advances in the rehabilitation of isolated and combined anterior cruciate ligament injuries. *Orthop Clin NAm* 2003;34:107
26. Jerram & Walker (2003) Cranial cruciate ligament injury in the dog: pathophysiology, diagnosis and treatment. *New Zealand Veterinary Journal*. Volume 51, Issue 4
27. Baltzer, W. (2020). Rehabilitation of companion animals following orthopaedic surgery. *New Zealand Veterinary Journal*, 68(3), 157–167. <https://doi.org/10.1080/00480169.2020.1722271>
28. Shaw KK (2017). Physical rehabilitation for canine patients post cranial cruciate ligament surgery. *Companion Animal* Vol. 22, No. 12  
<https://www.magonlinelibrary.com/doi/abs/10.12968/coan.2017.22.12.714>
29. Spinella G, et al (2021). Cranial Cruciate Ligament Rupture in Dogs: Review on Biomechanics, Etiopathogenetic Factors and Rehabilitation. *Vet. Sci.* **2021**, 8(9), 186; <https://doi.org/10.3390/vetsci8090186>
30. Brantberg I, et al (2024). The Effect of Therapeutic Exercise on Body Weight Distribution, Balance, and Stifle Function in Dogs following Stifle Injury. *Animals* 2024, 14(1), 92; <https://doi.org/10.3390/ani14010092>