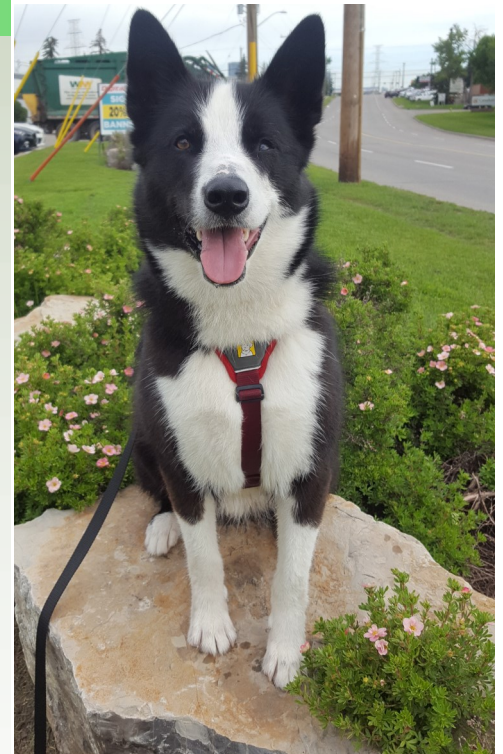




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Cruciate Conservative Management

This issue will highlight conservative management of cruciate ligament deficiency in dogs. All practitioners involved in small animal health care are well aware of the fact that some animals are not surgical candidates, either due to age, poor health, an inadequate state of fitness, because of financial constraints, or owner's beliefs. This subset of patients deserves a chance at optimal function just as those that are prime candidates with owners willing and able to bear the financial burden or surgery. Patients who need to return to sport or work in a timely manner, or patients who are unable to follow the constraints of a lengthy rehabilitation program would be prime candidates for better suited surgery. This issue outlines the goals and treatment suggestions for each phase of rehabilitation of the canine ACL deficient stifle. It also discusses additional therapies and considerations for maintaining a healthy joint post rehab. Keep on reading to find out more!

Inside this issue

After a cruciate tear.....	2
Human literature.....	2
Phase 1: Protection.	3
Phase 2: Early strength training.....	5
Phase 3: Intense strength training..	5
Phase 4: Return to sport.....	5
Bracing.....	6
Additional considerations.....	6



Canine Fitness Centre
4515 Manhattan Rd SE
403-204-0823
www.caninefitness.com

What happens in a dogs' leg after a cruciate tear

In dogs, the primary clinical signs observed after CCL rupture include pain, joint effusion and muscle atrophy which are all believed to alter motor control and muscle activation patterns. Altered muscle activation patterns or amplitudes within the muscles responsible for stifle stabilization may induce recruitment of regional muscles which can contribute to overuse injuries and compensatory gait abnormalities. The CCL rupture contributes directly to increased joint instability, altered muscle activation and subsequent dysfunctional pelvic limb kinematics and kinetics. The contralateral unaffected pelvic limb may also be affected by quadriceps muscle inhibition which could contribute to the high prevalence of contralateral CCL rupture. Compensatory mechanisms or alternative gait strategies may also contribute to overuse and rupture of the contralateral CCL by producing increased tibial shear forces and increased strain on the CCL. Degeneration of the contralateral CCL occurs in 40 to 50% of dogs 6 to 16 months after the initial CCL disease diagnosis. It is important to address alterations in the whole body, or at least contralateral limb in an effort to maximize return to function and minimize long-term morbidity associated with CCL disease in dogs.



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What we know from human literature

Successful management of the ACL deficient knee in humans centres on some common goals: Early activity modification, neuromuscular knee rehabilitation, and strength training. It is appropriate to stage the rehabilitation goals and activities throughout rehabilitation. Time alone is not the signal for advancement from one program to another, and attention should be paid to range of motion (ROM), strength, fluidity of performance of functional activities, as well as functional testing. Using the goals for each phase of rehabilitation of an ACL deficient human knee, treatment regimes can be proposed for canine rehabilitation.

Several studies have shown significant proprioceptive deficits to affect both the cruciate deficient or surgically reconstructed knee as well as the contralateral normal knee. Early papers report conservative treatment of human ACL deficiency to be unsuccessful or only successful in older or inactive patients. However, successful treatment of non-surgical ACL-deficient knees has been shown to be possible with specifically targeted rehab programs.

Phase 1: Protection (Weeks 1-4)

The goal and treatment suggestions for Phase 1 (Protection Phase) of the Canine ACL-D stifle are increasing range of motion, increasing muscle function using movement synergies, increasing proprioception and decreasing pain and effusion.

Goal	Suggestion
Increase ROM	Passive range of motion flexion and extension; tummy rubs into extensions; 'square' sitting practice.
Increase muscle function using movement synergies and utilizing motor learning transfer	Active sitting down to a stool, toe pinches in side lying, leash walking to toilet progressing to 5 minutes and increasing time by 3-5 minutes per week (if no increase in joint inflammation found), weight shifting exercises, balance board exercises (front legs on the board), standing on soft surfaces and balance, 3-leg standing, step ups, walking in circles or figure-of-8 patterns.
Increase proprioception	Joint compressions; Grades 1-2 joint mobilizations.
Decrease pain and effusion	Icing, passive & active range of motion within pain tolerance, joint compressions, Grades 1-2 joint mobilizations, neuromuscular electrical stimulation (NMES), modalities for reducing inflammation (laser, ultrasound, magnetic field therapy).



Phase 2: Early Strength Training (Weeks 5-8)

Goal	Suggestion
Full ROM	As previously in the protection phase, may add toe-touch hanging or extension on the stairs, may add sitting practice on a stool or platform.
Normal Gait	Walking with a 'disturbance' on the unaffected foot: obstacle walking or trotting, steep up-hill walking or trotting.
Increase motor control (neuromuscular training) and strength	Underwater treadmill or swimming exercise, NMES or manual tapping on quadriceps or gluteals with 3-leg standing, NMES or manual facilitation on/of hamstrings with sitting practice, side stepping or back stepping over a pole, stepping up backwards, walking backwards, any of the above land exercises on a soft surface: hill walking, stairs walking.
Load: 50—60% of uninjured limb	Increase time and duration of exercise above



Phase 3: Intense Strength Training (Weeks 9-12)

Goal	Suggestion
Increased strength, and motor control (neuromuscular training)	Continue most challenging exercises from above; Walking with a weight on the affected leg (open kinetic chain training); Trotting up-/down-hills; Walking on uneven surfaces; Recall running between two people; Tug of war—straight line backward and forwards; Step ups or Squat blocks
Increase Load: 70—80% of uninjured limb (increasing by 10% nearer end of stage)	Increase time and duration of exercises above; perform exercises above with a weight pack



Phase 4: Intensive Strength Training and Return to Sports (13 - 16 weeks)

Goal	Suggestion
Increased strength	Continue most challenging exercises from above; destination jumping exercises from a stand (plyometrics)
Increased coordination	Agility-type training
Increased ability in sport-specific activities	Short distance ball retrieves; 1 or 2 agility-type pieces of equipment; avoid play with other dogs until close to 6 months or longer and start with only short intervals.
Load 80% of uninjured leg (increasing by 10% nearer end of stage)	Increase time and duration of exercises above; perform exercises above with a weight pack.



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Bracing

A stifle brace can act as another form of assistance for cruciate deficiencies. They are designed to help support the stifle joint and improve the dog's function. The brace is worn when the dog is out for walks or engaging in other types of activity. The stiffness of the hinge influences stifle joint mechanics and supports the stifle during the fibrosis and recovery phase. Stifle joint biomechanics have been shown to improve following orthosis implementation compared to CCL deficient joints without bracing. Owners are sent home with a program that will improve dogs strength, endurance, proprioception and neuromuscular control of the limb. It is important to continue with therapist-led exercises and other therapies such as underwater treadmill, electrical muscle stimulation, joint mobilizations and myofascial techniques. Research has demonstrated that owner satisfaction for stifle bracing is high and comparable to satisfaction with surgical intervention for CCL deficiencies. The

biggest concern with bracing is the protection of the meniscus. There are other potential complications such as persistent lameness, skin lesions, patient intolerance of the device and the need for a subsequent surgery. Owners are advised to be cautious for 9 months to a year post-injury, again in an attempt to avoid meniscal tear-



Additional Considerations

Preventing a meniscal tear is one of the greatest considerations in conservative management. A meniscal injury may inhibit success of the outlined regimen. Preventing osteoarthritis (OA) should be an important goal for all animals that have suffered a joint trauma. Human studies have found a correlation with glucosamine use and a reduction in joint space narrowing and erosive effects of OA over a period of three years. Canine studies have found that the use of a glucosamine / chondroitin sulfate mixture can enhance synthesis and turn-over of the matrix of proteoglycans and collagen and hence can have a protective effect against synovitis and associated bone remodeling. Cetylated fatty acids have also been shown in both

human and animal studies to modulate the immune response and inflammatory process of osteoarthritis and in turn improve ROM and overall function. Additionally excessive weight can impact the stresses on articular cartilage. A canine study found that dogs with hip OA that were fed 60% of their current calorie intake lost 11–18% of their body weight and experienced a significant decrease in hind limb lameness. As such, weight management should be deemed an integral part of rehabilitation of the cruciate-deficient dog.

*We'd love to help your patients find the best treatment plan possible!!
Give us a call!*

The Canine Fitness Centre Ltd.



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