



Goals of Rehabilitating Cranial Cruciate Ligament Rupture (CCL) (aka ACL in people)

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Rehabilitation of pets with cruciate ligament ruptures, otherwise known as cranial cruciate ligament (CCL) or anterior cruciate ligament (ACL) tears should only be conducted by qualified personnel. The ideal professionals to rehabilitate pets are the unique collaboration of a veterinarian and a physical therapist both certified in canine rehabilitation, just as we do at California Animal Rehabilitation (CARE.) It is of utmost importance that one or ideally both of these professionals guide pet therapy. This rough guide to rehabilitation can be used for pets that are post-operative or for people that are choosing rehabilitation as a surgical option for their pets. We have had great success with both groups. A ruptured cruciate ligament can mean a full or partial tear. None of the ligament remains attached in a full tear. A partial tear may be more painful than a full tear due to stretch of the remaining ligament strands that are still intact. It may progress to a full tear or may scar and remain approximately 80% of its original strength.



Sadly, there is a 50% chance of rupturing the other knee within 1 year of the initial injury. No surgery can repair or replace the affected ligament and a knee with a fully or partially torn cruciate ligament may regain stability by thickening of the joint capsule. With rehabilitation, the affected knee may develop less arthritis. The other knee which is typically at risk for cruciate ligament injury may even be spared because of the hind limb strengthening and improvement in joint mobility and joint health that occurs.

A ruptured cruciate ligament generally presents in one of two ways; either an acute presentation, or a chronic presentation. In acute presentations, the dog is suddenly non-weight

bearing or intermittently toe-touching lame on the affected leg. There is usually a mild to moderate amount of swelling and heat in the knee, and the joint can be very painful to touch. In chronic presentations of this injury, the degenerative ligament has usually had damage or fraying in the past, may not be painful or swollen, and able to bear weight most of the time. The affected leg may be only occasionally lame, off-weighted at a stance, and typically worse after exercise. In the chronic form, arthritis is usually already present. In fact, once the CCL is ruptured, arthritis will ensue. Goals for rehabilitation are adjusted for the short term (first eight weeks of therapy to address the injury and compensatory issues) and long term (for the life of the pet, proper exercises, nutrition and supplements are of key importance for slowing the progression of arthritis.)



These two presentations can vary in the initial phase of treatment, but the basic restrictions and goals of rehabilitation remain the same whether the dog is managed conservatively or surgically. At California Animal Rehabilitation, we have had great success in rehabilitating pets for cruciate ruptures (both acute and chronic, full and partial tears) as a surgical alternative. Confine your pet to a small bathroom or crate when you are not home, and restrain the pet from jumping, running or rough playing for at least eight weeks. During the first two

weeks, use a leash for short trips outside and any stairs. If no signs of increased lameness occur, slowly build duration of walks to ten minutes by the end of eight weeks, on flat land and easy terrain.

The first goal of rehabilitation is to decrease any pain within the first ten days. In acute injuries, the swelling and inflammation can be the sole or major cause of the pain. If the injury has occurred within ten days, it is appropriate to use ice four to five times per day for fifteen minutes per session to help reduce swelling. Apply ice with a dishtowel between the pack and the knee. Also, anti-inflammatories can be prescribed by the veterinarian to relieve the pain in the short-term. At California Animal Rehabilitation, we do not use anti-inflammatory drug therapy past the first ten to fourteen days of injury in order for the body to heal and scar itself, we don't want to delay healing.



In chronic presentations, unless the most recent aggravation to the knee has occurred within three days, ice may be uncomfortable and we recommend using it as a natural anti-inflammatory only immediately following therapeutic exercises. Managing pain is key in any phase of the rehabilitation process and joint supplements and medications should be used as needed and your veterinarian may help with this.

Rehabilitation medicine utilizes three major concepts for rehabilitating the cruciate tear patient. Number one is pain management, which can include the use of: manual work, medications, supplements for joints, proper nutrition, strengthening, acupuncture and other modalities. Number two is increasing comfortable range of motion, we address this through active exercises that are appropriate including water therapy and via manual techniques. The third is strengthening which comes after the last two. We strengthen by using proper active exercise, modalities, supplements and proper nutrition.

In terms of pain management, rehabilitation clinics for pets utilize several of the same modalities used in people for reducing acute and chronic pain. These include therapeutic laser therapy, transcutaneous electrical neuromuscular stimulation (TENS), electrical stimulation (E-stim), PST (pulsed signal therapy), thermal therapy, and therapeutic ultrasound. Acupuncture is also a great adjunct to pain management. It causes a release of endorphins into the blood stream, but also stimulates serotonin release, and stimulates nerve fibers that are faster than pain receptor fibers to transmit a signal to the brain that blocks the pain transmission pathway.



The second goal is to maintain or increase range of motion. Range of motion is the area between full flexion (bending) and full extension (straightening) of the knee. Range of motion can be decreased due to swelling, pre-existing osteoarthritis in the joint, or disuse of the limb and carriage of the limb in a higher or more flexed position than normal. The abnormal posture may cause a decrease in hip and ankle range of motion, in addition to shoulder and back pain. All of these issues need to be simultaneously addressed. Therapists perform joint mobilizations to encourage circulation, to decrease pain and swelling, and to increase range of



motion. Therapists and also owners should perform passive range of motion (PROM) exercises for both ankles, knees, and hips. Move each joint to comfortable straightening (extension) and bending (flexion) and hold within the pet's pain tolerance, at the point where they notice it, for fifteen seconds, repeat three times, twice daily. Flex the ankle by pushing up on the paw, and allow the knee to flex at the same time while taking the ankle to the rear end. The hip can be flexed by taking the knee toward the ribs, and then extended by taking the leg back toward the tail, like frog-legged position.

The underwater treadmill is a form of hydrotherapy that is used to encourage range of motion in all 4 limbs, while reducing the weight-bearing load by eight percent. It is especially good for increasing extension of the knee which we see as the biggest range of motion problem and therefore causes the limp in the patient. In contrast, free swimming encourages flexion in the knee which may help with this range but does not help with weight bearing which is why we don't recommend this. Standing in water (up to the pets' hip level) can also help to minimize swelling and pain.

The third goal is to prevent or halt muscle weakening by strengthening. If this is a chronic presentation, the muscle is likely smaller on the affected leg. Strengthening can be accomplished through thoughtful, controlled exercises and use of modalities. Neuromuscular electrical stimulation (NMES) is the use of an electrical current to stimulate a particular muscle or muscle group to contract, to prevent muscle breakdown and also to manage pain. Underwater treadmill use is a way to strengthen without pain as well. Encouraging the pet to sit with the affected leg squarely under the body will help strengthen the leg, and promote good range of motion. Sit to stand exercises in proper posture can be initiated in sets of five, twice daily. Lateral weight shifts encourage weight bearing, to do this, support the torso and rock the hips back and forth, and side to side for 30-second intervals, three times, twice daily. The pet should go on leashed potty walks that are less than five minutes only. Discussing a good diet with good, high quality protein source will help give your pet the building blocks for regaining strength.

These first two goals of pain management and increasing range of motion should come close to being accomplished within the first four weeks of injury or surgery. Assuming weight bearing is noticeably better, after four weeks, the next step is to increase controlled exercises. An example of an exercise to do is putting a bootie or other irritant on the unaffected hind limb and walking for short periods (one to two minutes twice daily) to encourage weight-bearing. Another exercise is lifting one of the unaffected hind limbs off the ground for similar effect. Walking up-



hills or unstable surface walks (sand, gravel, mud, or snow) for five minute intervals can be initiated. We increase duration of the underwater treadmill at this point and continue our aggressive pain management and range of motion approach.

At around eight weeks, the strength in the affected limb should be marginally less than that in the unaffected limb. Given only a slight lameness, begin two -leg standing , including the unaffected hind and opposite front leg and the unaffected hind leg and the same-side front leg for 15 seconds, three times, twice daily. Also, stepping over obstacles and eventually crawling under others is a good way to develop better functional control and strength over movement in the affected limb. A more challenging exercise to integrate would include three-leg standing while holding up the unaffected leg and gently rocking the torso. Gradually return to normal daily activities at around twelve to sixteen weeks, depending on progress. Unfortunately, out of control play, running, jumping, fetching, squirrel chasing, etc. is severely discouraged long term. Your pet may be comfortable and pain free but to keep them this way, lifestyle changes are in order. Let's get rehabbing!!