

Pacific Animal Wellness Services

info@pawsrehab.ca

Cruciate Ligament Injuries in Dogs

What is it?

Why does it happen?

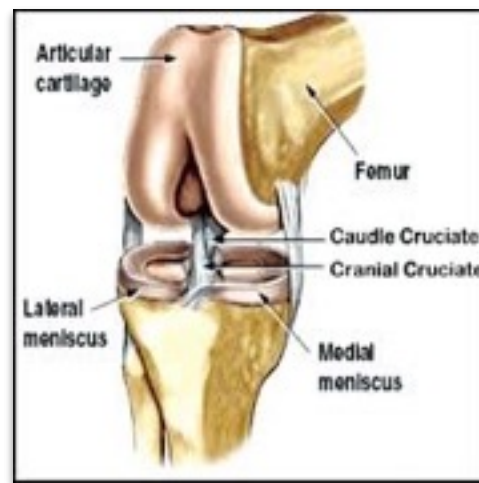
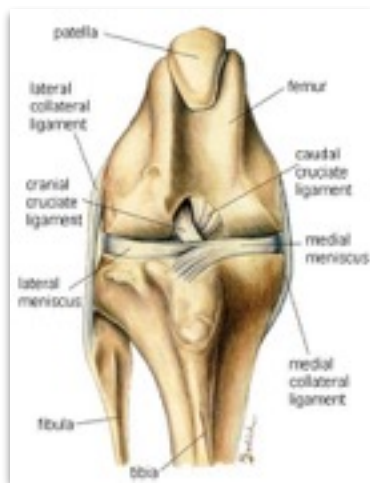
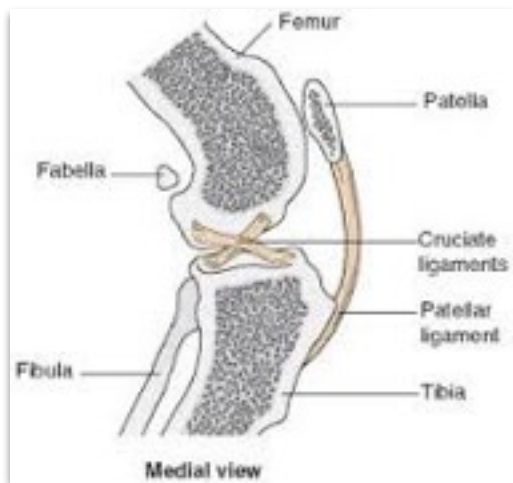
What are my treatment options

What is rehab and what are it's goals

Specific Recommendations

WHAT IS CRUCIATE INJURY?

A cruciate injury refers to injury to one of the two stabilizing ligaments inside the knee joint itself: the Anterior (Cranial) Cruciate Ligament (ACL) and the Caudal Cruciate Ligament (CCL). Most commonly it is the ACL that is either partially or fully ruptured. These ligaments are responsible for forward and backward stability of the knee as well as rotational stability. They are also involved in proprioception (spacial awareness) of the knee during motion (so the joint is properly balanced during motion and weight-bearing). An ACL or CCL injury may be full or partial and may be accompanied by tearing of the shock-absorbing cartilage Menisci which pads the middle of the joint.



WHY DOES IT HAPPEN?

While The final “rupture” may often follow an event (chasing a ball or squirrel...) it seems that the ligament ruptured because it was already failing. We used to think joint trauma was the main cause, but it seems that the majority of cruciate injuries in dogs are due to progressive weakening of the

ligament itself: eaten away by the products of inflammation within the joint. How/why that inflammation occurs in the first place is still unclear.

However, there are other **risk factors**:

Dogs with poor muscle condition/ fitness especially in the hind limb.

Dogs that are overweight.

Early spay/neuter which results in changes the angle of the knee in the adult dog, putting additional mechanical strain on the cruciate ligaments

Certain breeds are predisposed, especially large breeds (Retrievers, Newfies, Staffies, Mastiffs) while other breeds are protected (sighthounds, small breed).

Other limb pathology such as luxating patellas, hip pain, iliopsoas muscle injury, which results in poor quadriceps strength/ altered limb motion.

Certain exercise types- rapid and concussive sports injuries (some of these may be true traumatic avulsions of the cruciate ligament)

WHAT ARE THE TREATMENT OPTIONS

Treatment options can be divided into **Surgical** and **Non-Surgical (Conservative Management)**.

The most appropriate choice for each dog will depend on:

- *the weight, fitness and temperament of the dog
- *the intended use of the dog (sporting/ pleasure/ working)
- *whether or not the meniscus is torn (greatly increases pain of injury)
- *the time, commitment and ability of the owner to be able to do therapies/ exercise restrictions etc at home/ in clinic
- *cost/ availability of advanced surgeries and/or braces/ rehabilitation facilities

Generally speaking large, active and bouncy dogs would benefit from surgical options which will stabilize the knee far sooner than non-surgical options, and by doing so reduce the risk of the other knee rupturing also (which is usually said to be about 50%).

SURGICAL APPROACHES:

There are several different **surgical approaches** but they can be divided into “basic” Extracapsular Repair, and more advanced Biomechanical Techniques (TTA and TPLO):

1) **Extracapsular Stabilisation Surgeries** place heavy sutures outside of the joint capsule (no joint entry, unless assessing the meniscus) to provide joint stability while the body forms its own stabilising repair in the form of fibrosis/scar tissue and medial buttress (bone changes). The extracapsular suture will not provide much support after a year, so this is mostly buying time for the body to add its own stabilisation, and hopefully allow for enough motion that protective muscle build up is possible. Most first-opinion veterinary clinics will have this surgical option available, and of the surgical options this is the least costly.

Extra Capsular Stabilisation



TPLO



TTA



2) Biometric Surgeries: TTA and TPLO:

These “biometric” surgeries change the angle (biomechanics) of the joint so that the joint is inherently more stable: In the canine knee, load bearing makes the femur (thigh bone) want to slide off of the top tibia (Shin bone) because the surface of the tibia is not level; the ACL/CCL function to stop this slide from happening. So by surgically changing the bone structure and angle of the joint, the ACL/ CCL is no longer needed. These surgeries are available primarily at specialist clinics in Victoria and Vancouver (and further afield), although more and more primary veterinary clinics are also offering these options in house. Being much more technical, and requiring more specialist equipment, these surgeries are of course more costly, but they do appear (jury is still out) to result in a faster return to function (eg 12 weeks) and more reliable outcomes, especially for the active larger breed dog.

PAIN MANAGEMENT

Prescription pain medications (NSAIDs, Tramadol, Gabapentin etc) as well as other pain reliving modalities (**Acupuncture/ Laser/ Cryotherapy**) should be used in the early phase of injury, and continued for as long as necessary. Pain management is key to rehabilitation. (The old adage of “leave the pain in place so that dog doesn’t walk on it” is NOT appropriate, and instead inhibits return to function as well as increasing the risk of long lasting pathological pain that is challenging to address).

Modern pain management techniques during surgery (eg. local anesthetic blocks, epidurals, specific pain medications/ continuous rate infusion techniques) vastly shorten the time to return of movement and ability to begin rehabilitation. Pain management needs to continue post- operatively - ice packs, pain-patches, pain meds, laser and acupuncture to varying degrees are all important

NON SURGICAL TREATMENT OPTIONS FOR CRUCIATE INJURY

Non-surgical treatments main focus is to manage pain and use rehabilitation modalities that aim to strengthen the quadriceps (thigh) muscle mass so that the body uses this muscle to take the weight of motion dynamically rather than concussively on the bones of the unstable and damaged joint. In addition, these modalities help to normalise nervous system function (proprioception and balance). In some cases these may be used in lieu of surgery, and in other cases these are used in addition to surgery to improve outcomes and return to function.

NOTE: The time for adequate fibrosis and internal stabilisation of the knee without surgery is a good 9-12 months- that's IF there are no set backs!! During that time, exercise restriction, pain management and extreme caution in movement will be needed to prevent both re-injury AND injury to the other knee.

2) Nutraceuticals and supplements: These agents can reduce pain, reduce inflammation, improve joint lubrication. “Joint Protectors” such as glucosamine products (eg Recovery), Greenlipped Mussel extracts, and Cartrophen injections (prescription) which aim to reduce inflammation (and by doing so reduce pain and damage to the tissues), and reduce arthritic changes. Curcumen (Turmeric) is a natural anti-inflammatory and pain reliever. CBD products, while new and controversial, do seem to have pain relieving, anxiety relieving and tissue healing properties, and are likely to see promise in the future as more research comes available.

Hydrotherapy (water walking in underwater treadmill) is one of the few ways that muscle building and weight loss can be achieved in the early days without load bearing of the painful and unstable joint. In some cases this is started post surgically as soon as the incision has healed; in other cases it is started a few weeks later (as per the surgeons instructions). Non-Surgical patients can start hydrotherapy more-or-less right away once pain control is achieved. (Swimming, while a useful method of non-loadbearing exercise for fun and fitness, is of little use in building up the hindlimb muscles, which is key in the cruciate patient). Use of hydrotherapy as pre-hab (before surgery) especially in the overweight patient is of great benefit also.

Acupuncture, Massage/fascial releases, Therapeutic Laser, Shock wave, Cryotherapy (ice) are highly useful therapies which aim to manage pain, reduce swelling, speed healing, improve quality of healing and reduce muscle spasm. All this facilitates increased amounts of physical therapy and exercise to be allowed to speed up the muscle strengthening. These may be done daily to weekly to monthly depending on the stage of healing/pain.

Physical therapy exercises: These involve at-home Passive Range of Motion, Joint Compressions, Massage etc), proprioception exercises (cavaletti, balance discs, stairs etc):

Controlled Return to Exercise: leash walks of increasing duration, followed by hill, stairs, reverse walking etc) are all part of the rehab therapy. The use of a sling or harness such as the **Help-Em-Up Harness** can be of great use here in heavier dogs in the early days. **NO OFF LEASH WALKS/ UNCONTROLLED MOTION UNTIL CLEARED BY VET! WHY?** Because one silly awkward jump out of the car, jump at the delivery man, chase after a squirrel can obliterate months of painstaking treatments and exercise restriction (snakes and ladders: return to square 1!!).

Diet Management: strict attention to weight is critical. Many dogs with ACL injuries are overweight/ under-fit to begin with, but even if they weren't at time of injury, the rest required post-injury will significantly reduce their daily calorie requirement (minimum 12 weeks and often much longer than that). Thus, food intake must be reduced accordingly ("Pumpkin diet" is our favourite- but this can be discussed with us or your vet). **Hydrotherapy** is extremely helpful here in providing exercise (and fun!) and weight management especially in the exuberant dog who needs exercise to keep himself calm and happy.

External Braces and supports :

People often ask about external braces. In our experience they have not been the go-to initial therapy for a few reasons. The knee in the dog is a very awkward area to fit a brace because of the thick thigh which tapers to a very narrow hock (so braces slide down). There are various neoprene and other braces "on the market". The success of these would depend on them providing adequate support, and staying on, and so far we can't recommend any specific one. There are mail-away bespoke fitted brace options (eg OrthoPets), where your vet takes a cast and sends it away for fitting. The back and forth shipping proved a challenge there, especially as the thigh muscles change over time so re-fittings were often required.

We are lucky on the island to now have ISLAND ORTHOTICS in Victoria who will fit a brace for your dog (in their clinic) - these braces have proved useful in some cases, and their service is excellent. The challenge with any brace, over above the cost is how easy it is going to be for you / your family to be repeatedly putting the brace on and off, checking the fit for rubs and keeping it clean....So before embarking on that investment, take into account all the management issues in addition to the medical ones so you know you will actually be able to use it!

PRP/STEM CELL

This is an emerging and promising area of medicine. PRP involves harvesting a blood sample, separating out the platelets which act in a stem-cell like manor, and injecting them into joints/ tendons etc for better healing. Stem cell is similar but comes from harvested fat cells which are sent away for culture. Dr. David Lane at Points East West Veterinary Services in Vancouver/Squamish has been our go to for PRP, but more and more veterinary clinics are offering this service, as a stand alone treatment or in conjunction with surgery.

FAILURES: It is inevitable that some cases don't heal as planned. The body doesn't heal in a linear fashion, and medicine is an art as well as a science.

In the case of surgical methods: as with all surgeries, there are risks associated with general anesthesia as well as postoperative infections/ implant failures/ implant reactions etc. Sudden changes in comfort levels, worsening of lameness, changes in behaviour (aggression/ anxiety) post operatively warrant immediate contact with a veterinarian to assess for reactions/ infection/ pain etc.

A common cause of failure to return to normal/ good motion is the presence of concurrent orthopedic, myofascial or neuropathic pain sources. Examples are hip pain, back pain, iliopsoas (core) muscle pain, forelimb muscle pain, other hindlimb pain and tightness in the fascia. These may have been present prior to cruciate injury or may develop subsequently either as a result of trying to off-load the affected hindlimb or as a primary disease process in itself. Reassessment and addressing those issues will then be necessary.

Another common cause is systemic illness such as Hypothyroidism (underactive thyroid) which affects all aspect of body function, in particular muscle strength and energy levels (so we don't get the level of muscle build up we might expect after an exercise/ hydrotherapy program).

Nutritional deficiencies (B-vitamin/ Iron etc) from poor diet or poor digestive function/absorption can also have a bearing, so we often supplement with B-vitamins/ multivitamins as a precaution.

SUMMARY

So as you can see there are a myriad of therapies for cruciate injuries in the dog. In our experience the take home message is

- 1) There is no "1-size-fits-all treatment approach to cruciate injuries in dogs. Many factors must be weighed up to see what's right for your dog/ your circumstances.**
- 2) There is no quick fix therapy available no matter which way you go**
- 3) There is no "perfect" approach**
- 4) Pain relief (inflammatory, myofascial and neuropathic sources of pain) and muscle strength is a key factor regardless of other treatments, in restoring mobility and preventing further injury**

NOTE: this handout has been compiled by us as a courtesy to help owners understand the various treatment options and considerations about cruciate injury in dogs. It is not meant to be prescriptive nor exhaustive in nature. Every case, every circumstance has it's own unique set of variables to consider. This is where hands-on examination and case-specific discussions are also needed.

SPECIFIC RECOMMENDATIONS FOR YOU: