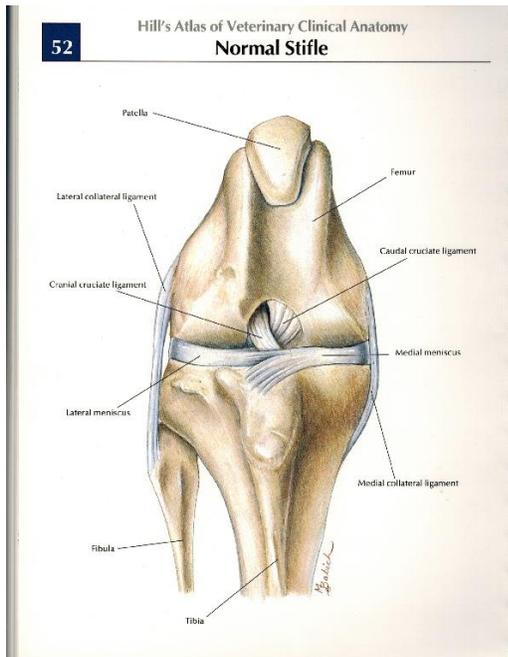




## Canine Total Knee Replacement

### The Canine Knee

The stifle is the joint formed by the femur, tibia and patella (“knee-cap”) and is a basic pulley system that allows the lower leg to swing in a backward and forward direction like a pendulum. Four ligaments prevent motion in other planes; two collateral ligaments that prevent side-to-side motion and two cruciate ligaments (because they cross each other) that prevent the tibia moving backward and forward independently of the femur. The cruciate ligaments also help limit internal and external rotation of the joint. Two other structures that help form the contact surface of the joint which are also very important are called the lateral and medial meniscus (plural: menisci).



The cranial cruciate ligament (aka the ACL in humans) frequently develops degenerative disease in dogs and is by far the most common orthopaedic disease in veterinary medicine. Untreated this disease will progress and lead to severe damage and degenerative joint disease. Failed treatment of cranial cruciate ligament disease is by far the most common reason for knee replacement to be considered.

### Canine TKR Indications

The expected outcome for patients undergoing Canine Total Knee Replacement (TKR) is complete return to normal function. Just like with total hip replacement, TKR patients are free of pain, lameness and arthritis and once healed, can be treated as a completely normal dog and resume normal activities.

Some patients are presented to our hospital for long-standing problems that have resulted in severe damage to the joint. In some cases we see patients for “second opinions” that have a history of post-operative problems, failed surgeries or highly complex knee problems. Occasionally during the course of what was expected to be a routine cruciate ligament repair case, arthroscopic findings may indicate severe, irreversible joint damage. For these patients, conventional therapy may be insufficient to provide them with a good long-term outcome and TKR may be the most appropriate treatment.

Good surgical candidates for TKR include patients with severe disease or damage to their knee who are not expected to have a good long-term outcome with more traditional, less aggressive treatment. It is important that these patients be free of other unmanaged



orthopaedic disease, such as hip dysplasia or untreated cruciate ligament disease in the other limb.

Ideally, the patient will not have had previous surgery on the limb in question, however it is possible to use TKR to revise a failed prior surgery. It is very important that if prior surgery has occurred, that the site be free of infection. Special pre-operative testing and bacterial cultures may be necessary for patients that have a prior surgical history.

There must be an absence of pre-operative skin infection and any patients with a history of skin disease should be treated with extra care. A course of pre-operative antibiotics will be prescribed as a precaution for TKR patients, as an implant infection is the most devastating possible complication.

## Weight, Diet and TKR

In any patient with any orthopedic disease, the most important factor impacting the development of disease, prognosis and treatment is the weight of the patient. This is true with respect to the relative weight of the dog (St. Bernard v. Chihuahua) but especially with respect to obesity. **Regardless of the orthopedic condition, failure to recognize and address issues of diet and obesity will result in treatment failure, no matter how much is invested in treatment and surgery.** Some surgeons have a policy of declining to perform surgery until obesity issues are resolved due to the higher complication rates, increased difficulty in performing procedures and sometimes demonstrated failure of compliance on behalf of the client. In the case of TKR,

obesity is an exclusion for surgery; ie. surgery cannot be performed until any weight-management issues are under control. It is important that the patient maintain a good body condition over their life-time to avoid long-term complications.

If necessary, the surgeon will provide specific dietary recommendations including a specific diet(s), strict feeding guidelines that include specific measuring instructions and complete diet counselling. Any complicating medical conditions such as hypothyroidism need to be diagnosed and treated. Failure to comply with dietary recommendations will preclude surgery from being scheduled.

Please also note, among many other hazards, raw food diets have been definitely demonstrated to be associated with increased rates of post-operative infection. Feeding of these diets will be considered an exclusion for surgery. Any patients being fed raw food diets must be off them completely at least 8 weeks preoperatively. Failing to disclose that your pet has been on one of these diets may put them at significant risk and may cause serious harm to the patient.

## Canine TKR Outcome

The expected outcome for patients undergoing Canine Total Knee Replacement (TKR) is complete return to normal function. Just like with total hip replacement, TKR patients are free of pain, lameness and arthritis and once healed, can be treated as a completely normal dog and resume normal activities.

In humans, TKR now exceeds hip replacement procedures by 3 to 1 and enjoys an incredibly high success rate with a low complication rate. This has to do with case selection and how surgery is managed. Patients are not scheduled for surgery until they meet the criteria for TKR, then one definitive procedure is performed in that patient. Ideally, if veterinary patients are handled in a similar manner, the same outcomes should be expected.

The implants are highly wear resistant and are expected to last the lifetime of the dog.

### Canine TKR Surgery

TKR involves replacement of the entire surfaces of the tibia and femur with titanium and polyethylene implants. In order to accomplish this, the cruciate ligaments, menisci and all articulating surfaces of the joint must be removed. Therefore, TKR is a “one-way street” – there is no way of reversing a knee replacement once this process has been started.

The surgery itself is extremely precise and great care must be taken during its execution, but it relatively straight-forward. The internal contents of the joint are removed. Cutting blocks are attached to the tibia and femur via small pins. The cutting blocks precisely guide the saw blade used to remove the joint surfaces and prepare the underlying bone-bed to accept implants. Femoral and tibial trial implants are applied to the prepared bone that allow the surgeon to assess implant fit, joint range of motion and soft-tissue balance.

The trials are then removed and the actual implants are applied. These implants may either be cemented or cementless depending on patient and surgical parameters. It should be noted that one system is not particularly superior to the other but is chosen based on the needs of

the patient and which is likely to provide the best outcome. The joint is again checked for range-of-motion, implant stability and soft-tissue balance and then closed routinely.



### Post-Operative Care

Client compliance with post-operative care is extremely important – **failure to meticulously follow instructions can, and usually does result in severe complications and treatment failure.** It is our preference whenever possible to provide complete and comprehensive case management for the entire post-op period. Patients are taken in for surgery at 8:15am the morning of and are discharged the following day at 9am. In our practise, we perform laser therapy during the first two weeks post-op to aid with recovery and pain management. Other pain management such as NSAIDs, opioids (codeine), etc, are provided as is a short course of antibiotics.

Rehabilitation is a crucial component of post-op management and is initiated immediately. Rehabilitation instructions are given at discharge and include passive range-of-motion exercises and controlled leash walks. As we have a canine rehabilitation facility on-site



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and a Certified Canine Rehabilitation Therapist, we are happy to offer a structured rehab program post-operatively. For out-of-town clients we are able to either make a recommendation to a canine rehabilitation therapist in your area or offer “tele-rehab” through our own program. Participation in a post-operative rehabilitation program with a certified canine rehabilitation therapist is mandatory.

Other than prescribed rehabilitation, absolute exercise restriction is necessary and off-leash activity is strictly forbidden. Unrestricted access to flights of stairs in the house is to be avoided, however going up and down exterior stairs to get in or out of the house is permissible (on-leash only!). Co

Sutures are removed after 14 days and post-op x-rays are taken at 8 weeks. If necessary owners are instructed to continue with prescribed rehabilitation and restrictions for whatever time period is necessary, after which normal activity may be resumed. For dogs with bilateral disease, the second surgery can be booked at 12 weeks post-op if the x-rays show sufficient healing and the patient is doing well.

## Complications

As with any surgical procedure, complications can and do occur. Unfortunately, the majority of complications that we see are induced by the owner wilfully not following the discharge instructions, so it is vitally important to follow the instructions as given. The discharge instructions are not difficult to perform but do require some regimentation and self-discipline to complete over the 10 to 12 week healing period. Occasionally, patient compliance can be challenging but can usually be managed with some extra assistance from our hospital staff. Discharge instructions are

provided the morning after surgery, which typically takes approximately 20-30 minutes and are provided in writing and highly detailed.

Some of the more common post-operative complications of these procedures include infection, implant loosening, collateral ligament damage, fractures and dislocations. Any complication involving a TKR is major and possibly catastrophic. A complication that cannot be resolved may result in either amputation or arthrodesis (fusion) of the knee.

Clients should be aware that the costs associated with the treatment of complications are the responsibility of the client and are not included in the cost of surgery. These costs may be substantial. They may also require corrective surgery and some situations may result in multiple surgeries. Clients must be well aware of these possibilities and consider them carefully when electing to proceed with a TKR.

## Cost

The cost of these procedures is as follows:

**Orthopedic exam:** \$450 + HST

(includes consult, sedation and whatever xrays are necessary)

**Total Knee Replacement** - \$4500 + HST

Note that 8-week post-op xrays are **not** included in the cost of surgery, sedation is necessary add \$150 + \$75 each x-ray + HST

Note that prices are subject to change and should be confirmed at booking.

**\*\*A non-refundable deposit of \$250.00 is due at the time of booking any orthopedic work-up and/or surgery.\*\***