

Diseases of the Hip

The Hip

The hip is a “ball and socket” type joint which allows for a wide range of motion in multiple planes. The head of the femur forms the “ball” that inserts into the acetabulum (the “socket”), which is a spherical recess in the pelvis. As with all joints there is a joint capsule, which is a sheet of fibrous tissue completely surrounding the entire joint and attaches both to the neck of the femur and the rim of the acetabulum. Within this “bag” is joint fluid, which lubricates and provides nutrition to the articular cartilage.

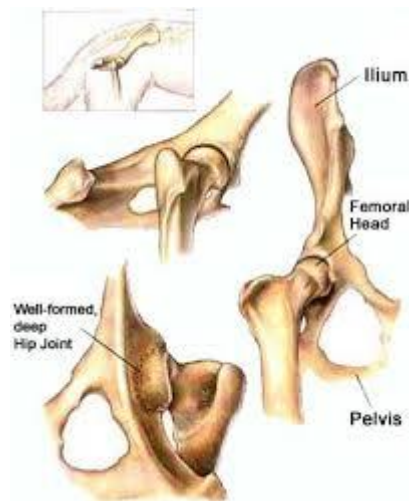
The joint is held in place and prevented from dislocating by a number of structures and surface tension created by the joint fluid itself. The joint capsule acts as a ligament to limit motion and there is a proper ligament connecting the femoral head to the centre of the acetabulum (both of these structures must tear in order for the hip to dislocate). Numerous large muscles have attachments very close to the joint or cross over it, providing significant stability as well.

Hip Dysplasia

Hip dysplasia is a developmental disease characterized by laxity of the hip or failure of the “ball” to seat well into the “socket”. In young patients this results in subluxation (i.e. partial dislocation) of the femoral head, which results in pain and mild to severe degenerative joint disease and arthritis as the patient ages. Hip dysplasia is a genetic disease that is influenced by other factors such as environment, diet, etc. It is estimated that millions of dogs in North America are affected with hip dysplasia

with associated costs to society in the hundreds of millions of dollars.

Hip dysplasia can occur in a dog of any breed, but tends to occur in larger dogs and both hips are often, but not always affected. Some breeds of dogs are predisposed to hip dysplasia: Labrador and Golden Retrievers, Newfoundlands, German Shepherds, and Bulldogs are some examples. Cats can also be affected.



Hip Dysplasia is a painful disease and can affect dogs at any age from four or five months and older. The pain results from catastrophic reduction of the head of the femur into the socket when the paw strikes the ground during locomotion. Damage to the cartilage and underlying bone results in inflammation, degeneration and remodelling of the joint and ultimately osteoarthritis as dogs age.

How Do I Know If My Dog Has Hip Dysplasia?

Only a veterinarian can diagnose hip dysplasia by performing a proper orthopedic examination and obtaining x-rays. A number of signs can occur that suggest hip dysplasia and any hind limb lameness that occurs in your dog should be evaluated. The vast majority of medium and large dogs presented for hind limb lameness do in fact have problems affecting their knee, however a significant number of those also have dysplastic hips. One retrospective study performed at a major university teaching hospital showed that of all large dogs presented for evaluation of hip problems 60% had hip problems, while 98% had torn ligament in their knee.



A 10 month-old dog with severe hip dysplasia. The hips are essentially dislocated. This case requires surgical management.

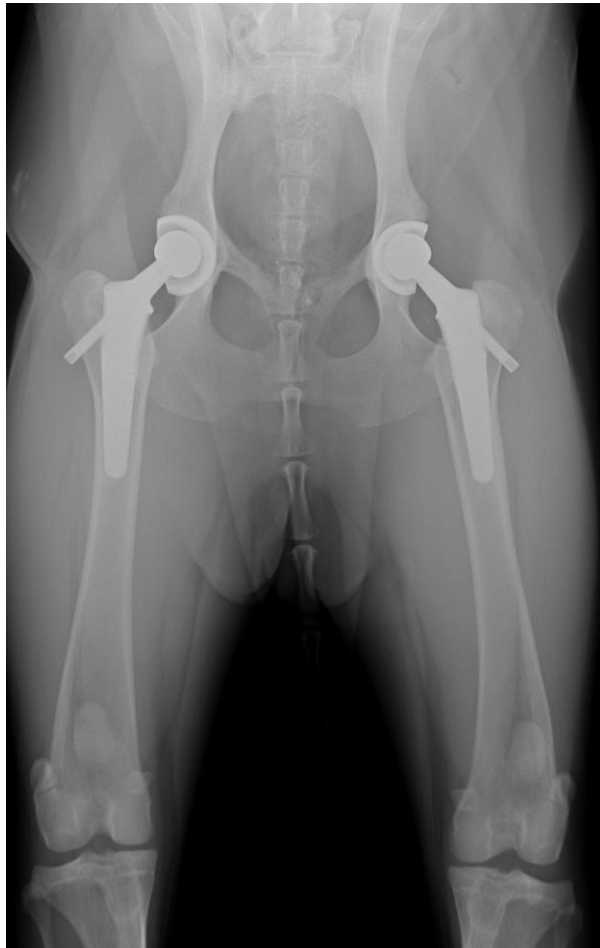
Numerous alterations to gait and mobility may be associated with hip dysplasia. Dogs with severe hip dysplasia may adopt a “bunny-hopping” gait where both hind limbs move together. As degenerative changes progress, affected dogs develop a short, stiff gait in the hind limbs, have difficulty with stairs and avoid or hesitate before jumping up onto furniture or into vehicles. These dogs are frequently described as “lazy” due to an apparent lack of desire to go for walks or engage in play activity for more than short periods of time.

Several physical exam findings are also associated with hip dysplasia. Affected dogs may have loss of muscle mass, particularly of the upper limb and haunches. Poor or restricted range of motion is a very common finding and dogs will often react painfully when their hips are extended during examination.

When you present your dog to our hospital for a lameness problem, a complete orthopedic examination is necessary to obtain a proper diagnosis. The lameness exam includes a gait evaluation including objective gait analysis using a Zebris instrumented treadmill, a complete physical examination including a detailed examination of all 4 legs with the dog awake, and a proper orthopedic examination. The orthopedic examination itself is a very detailed examination of all 4 limbs and all of the joints of those limbs. This examination must be performed under sedation and includes a number of manipulations and physical tests to determine the full extent of any existing orthopedic problems. Good quality, properly positioned radiographs (x-rays) of any affected limbs and joints are then obtained to assist diagnosis and plan appropriate treatment.

Radiographs are the most important diagnostic tool for diagnosing hip dysplasia or

other issues affecting the hip. Standard hip-extended view radiographs are typically obtained. This will adequately diagnose dogs with severe dysplasia or those that have degenerative changes present. These radiographs are also the basis for the older grading scheme historically used to determine severity. This grading system works on a 1 to 4 scale, with grade 4 being the most severe. It is important to recognize the limitations of this view – approximately 50% of younger dogs with hip dysplasia but no degenerative changes will appear normal and be misdiagnosed.



This dog has had bilateral hip replacements for severe hip dysplasia

PennHIP radiographs are a far more sensitive indicator of hip laxity and are used to calculate a “distraction index.” The distraction index is used to determine hip laxity and a predisposition to develop osteoarthritis later in life. These radiographs can accurately diagnose dogs 5 months of age and older and can be used to eliminate dogs from breeding who have this trait.

Management of Hip Dysplasia, Progression and Arthritis

Dogs with hip dysplasia exhibit a wide range of clinical signs from none to severe debilitating disease. The severity of radiographic changes does not correlate well with clinical signs – meaning that dogs can have severe changes on x-rays and little or no mobility problems. The opposite is also true – dogs can have minor radiographic changes yet have severe mobility problems.

As hip dysplasia is a developmental disease, this problem develops from birth and is a permanent condition. Hip dysplasia can become worse with time, especially as the hip degenerates and the acetabulum fills in with osteophytes (bone development that is the result of arthritis). The in-filling of the socket with bone causes it to become wider and shallower, worsening the laxity and clinical signs.

Degenerative joint disease that results from laxity, inflammation and inevitably arthritis is chronic and progressive. Clinical signs worsen with the passage of time and therefore dogs become more likely to display signs as they age. If detected early, numerous preventive measures can be taken that may dramatically alter the course of the disease. As with all



orthopaedic diseases, early detection and treatment can profoundly impact the outcome.

As the severity and clinical signs of hip dysplasia are highly variable, a wide range of treatment options may be appropriate depending on the case. These treatments can range from basic medical management through more aggressive medical management to surgery, including total hip replacement. Treatment is tailored to the individual needs of the patient. It is important to understand that as this is a progressive disease, as time passes it is likely that additional therapy will be required to manage clinical signs.

Trauma and Other Hip Diseases



Fracture malunion in a young dog. This dog had a fracture to the head of the femur that healed improperly, causing a severe gait abnormality and chronic pain. Surgical management was required for this case.

Trauma is also a common cause of hip issues, especially in younger patients. Trauma includes numerous fractures of the hip and dislocation of the joint. There can also be other developmental diseases that lead to severe hip problems as well. Some of these conditions can be repaired surgically but because there is a trauma that involves the joint itself, degenerative joint disease in these cases is inevitable. As many of these patients are young, this creates a concern for doing a primary repair and then possibly having to go back at a later date to perform a hip replacement, which will be more difficult and have a higher probability of complications in most cases. It is therefore typically the case in our hospital that we will opt for a single definitive surgery (hip replacement) which has a higher probability of a better outcome for these patients. This is managed on a case-by-case basis after a complete work-up and consult with the owner.

Medical Management

Medical management is necessary upon diagnosis to control clinical signs or prevent or slow progression of the disease. The nature of treatment will depend on the severity of disease and the goals of therapy. In some cases, the goal of therapy may be to slow or prevent the progression of disease and the development of clinical signs and prevent surgery. In other cases, it may be to slow the progression of the disease with the understanding that surgery is expected to be necessary in the future. In cases where surgical management is immediately pending, the goal is usually short-term pain management.



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Medical management may consist of one or more of the following: NSAIDS, laser therapy, joint diet/dietary management and chondro-protectants. Which therapies are chosen depends on the particulars of the case, the degree of arthritis present, the size of the dog and the client's preferences. It is important to understand that for patients not undergoing surgical management, long-term treatments are not optional – failure to comply with the specific diet and chondroprotectant regimen prescribed will result in more rapid progression and damage that is permanent and may lead to surgery. Some patients may also require other treatments such as occasional laser therapy or medication to keep them functioning normally. A brief description of these therapies is listed below.

Weight, Diet and Hip Dysplasia

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.** We will provide specific dietary recommendations including not only a specific diet(s), but strict feeding guidelines also that include specific measuring instructions and complete diet counselling. Any complicating medical conditions such as hypothyroidism need to be diagnosed and treated.

Joint Diets – Therapeutic diets are very commonly employed in the treatment of many diseases in veterinary medicine. These diets are intended to produce a clinically measurable impact just like any other treatment that we prescribe to treat disease. In the case of the diet, we prescribe for joint disease, multiple outcome measures have been described in the veterinary literature.

These diets are designed not only to deal with inflammation associated with joint disease but are excellent at addressing weight issues that will have the most impact on patient outcomes. The product that we use in our hospital is j/D®, produced by Hills. There is a companion diet, Metabolic plus Mobility® that we use to manage dogs with significant weight problems. We use these diets for specific reasons that are discussed in detail during our orthopedic consults. This is an essential component of the long-term care for these patients and will determine their outcome.

Chondroprotectants - Recent large-scale studies have shown that glucosamine and chondroitin have no therapeutic value unfortunately. However, since it is important that patients be on an effective long-term joint supplement, most surgeons have shifted their recommendations to a product called



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Flexadin, which has good evidence to support its use. This is usually prescribed and supplied in our hospital at the initial visit.

NSAID's - All dogs presented with clinical signs initially start on NSAID's as this is our primary means of immediately addressing pain and inflammation. While our other therapies are just as good at addressing these issues, they all take a significant amount of time to start having an effect – drug therapy is immediate. Often, we will withdraw the NSAID's if possible, when other therapies have had time to take effect. A number of options are available, including some newer products that have a reduced incidence of adverse effects.

Physiotherapy and Exercise

Regular moderate exercise is vitally important for dogs with hip dysplasia. Light exercise, particularly in the form of leash walks, light off-leash activity, and swimming have a significant and positive impact on dogs with hip dysplasia and secondary osteoarthritis. Exercise helps maintain joint health, especially range of motion, healthy muscle mass and overall mobility.

Helpful exercise periods for these dogs mean shorter duration and more frequent. Exercise periods ideally would involve 15–20-minute sessions about 3-4 times daily. Longer duration exercise periods should be avoided, as should vigorous or extreme activity. A very long walk daily is likely to accelerate problems rather than help them. “Weekend Warrior Disease” – doing no activity all week then playing hard all weekend – will have the most devastating impact.

In addition to light exercise, other physiotherapy may be prescribed for dogs with advanced clinical signs. Significant loss of range of motion is particularly evident in most dogs with hip dysplasia. Maintaining good range of motion is extremely important in these dogs and in fact improved range of motion is a major outcome measure in many orthopaedic diseases. A number of exercises and activities can be prescribed to assist with this.

Surgical Management of Hip Diseases

Femoral Head Ostectomy (FHO)

Femoral head ostectomy works by removing the femoral head and neck and interposing soft tissues between the femur and acetabulum. This will of course obliterate the hip joint completely, thereby eliminating pain associated with hip disease. Due to the large number of tendon attachments and heavy musculature surrounding the hip, the femur will pivot around this point and allow for function of the limb. This is a salvage procedure aimed at eliminating pain associated with the primary problem being treated.

There are numerous regarding this procedure. The majority of cats and dogs will be able to walk after this procedure, however no patient that receives an FHO has a normal gait afterwards. Most patients who receive an FHO will be able to function acceptably however 25% will have clinically detectable pain. This procedure was first published in 1960 and is currently the most common surgical treatment performed to surgically

address hip trauma or disease. The only study published to date on FHO that used objective gait analysis was published in 1978 and showed a good or excellent outcome in only 52% of patients. The equivalent procedure in humans is known as a Girdlestone procedure and was largely abandoned in the late 1960s when total hip replacement became available. Due to the extremely poor outcomes associated with this surgery in people it is now only considered in patients who are bed-ridden or confined to a wheelchair.

FHO is considered a historical procedure in our practice, and it is not offered as a primary treatment option. Aside from persistent pain in 30% of animals and permanent gait abnormalities in 100% of patients, there are numerous other issues including muscle-wasting and limb shortening of the affected limb. The currently accepted standard of care for surgical management of hip disease is total hip replacement, which is the treatment option offered in our hospital.

Despite these major concerns, it is true that if cases are being selected appropriately a patient receiving an FHO or who ends up with an FHO due to failure of a hip replacement will have a better outcome than would have been the case without surgery. Our hospital does not offer FHO as a primary treatment option and its use is restricted to patients who are not hip replacement candidates, patients where a hip replacement was attempted but could not be executed or a patient had a hip replacement but had to have the implants removed.



It is possible to convert an FHO to a hip replacement, however it is much more difficult to accomplish successfully and the complication rate is much higher than with primary hip replacement.

Total Hip Replacement (THR)

As the name implies, total hip replacement involves replacing the acetabulum (socket) and femoral head and neck (ball) with artificial implants. The diseased femoral head and neck are cut off, the acetabulum and femoral shaft are reamed out and replaced with artificial implants. These implants may be press-fit in-growth (biological fixation or BFX) or cemented (CFX) or a hybrid of both. The choice of CFX vs. BFX implants is dependant solely on patient factors that dictate the implants used; neither is necessarily superior to the other. The surgeon must be familiar with both



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systems and be able to switch between them as necessary.

Indications for THR include unsalvageable trauma, such as badly healed fractures and hip dislocations that are unable to be repaired, severe hip dysplasia with or without chronic degenerative changes, and FHO revision. THR can be performed on any dog or cat from 2Kg to 80Kg. Exclusions for surgery include obesity, unmanaged cruciate ligament disease or other orthopedic disease, incomplete or successful medical management of hip dysplasia, and skin infection. Obviously, most of these exclusions are temporary and allow surgery to occur on resolution. Age is not an exclusion; any healthy dog may be a candidate for THR.

THR is the only joint surgery in veterinary orthopedics where the expected outcome is completely normal function post-operatively. The goal of surgery is to return an injured or chronically lame dog to normal or near-normal function, including athletic, sporting and working dogs. A 2010 study using objective gait analysis demonstrated normal weight-bearing as early as 12 weeks post-operatively. Other more recent evidence also supports this finding. Compared with most other surgical options, particularly FHO, THR is clearly a superior option in most cases based on currently available evidence.

While the pay-off to the patient is extremely appealing, THR is not without risk. Very serious potential for complications limit performance of this procedure to only the most highly experienced and advanced orthopedic surgeons. Highly rigorous, expensive and complex training is involved not just for the surgeon, but for the entire

surgical team. A minimum of 3 to 4 highly trained people are required to ensure meticulous and precise performance of this procedure. In order to achieve certification, candidates must engage in months of intensive training and study.

Complications can be serious and lead not only to loss of the arthroplasty but may include fracture of the femur or pelvis, neurological injury and infection. The concept that a failed THR results in "an expensive FHO" is over-simplified. Reported complications also include dislocation, implant loosening, embolism, and implant displacement or subsidence. Complication rates with cemented implants have been reported at 12-13% and include luxation (4%), infection (1-2%) and aseptic loosening (2-3%). While a significant proportion of these complications would result in explantation of the implants, it has also been demonstrated that the outcome after implant removal is (in general) identical to that which would be seen with an FHO.

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.** We provide comprehensive case management for the entire post-op period. We appreciate that most clients are travelling considerable distances to receive care at our hospital. The specialized care and recheck examinations that are required post-operatively can only be provided by our



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specialized team and cannot be performed by your general practitioner. All follow-up care **must** be provided in our facility.

Pain management such as NSAIDs, opioids (codeine), bandaging, etc., are provided as is a short course of antibiotics. Physiotherapy is a crucial component of post-op management and instructions are given at discharge. Other than prescribed physiotherapy, 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!). Dogs are required to wear a Halti/Gentle Leader to prevent pulling on-leash during the recovery period.



Sutures are removed after 14 days and a recheck and post-op x-rays are obtained at 6 weeks post-op. If post-op performance and x-rays are within expectations, owners are instructed to continue with prescribed treatment and physiotherapy until 12 weeks post-op, at which point a final recheck and x-rays are obtained and, in most cases, instructions are given for return to normal activity. Annual rechecks (radiographs) are required as,

although uncommon, implant loosening, subsidence, wear and infection can occur long after implantation.

THR patients are able to walk on the affected limb within hours after surgery with assistance. Patients are usually able to weight-bear normally within 7 to 10 days and are on exercise restriction for 12 weeks post-operatively. Overnight hospitalization post-operatively is required in all cases. A detailed pre- and post-surgical consult is conducted for all patients where these requirements are reviewed in detail and provided in written form.

Cost

The cost of these procedures is as follows:

Orthopedic exam: \$850 + HST

(includes consult, sedation and whatever xrays are necessary)

Surgeries:

Total Hip Replacement (THR) \$6900 + medication + HST

Note that post-op x-rays are **not** included in the cost of surgery.

****A non-refundable deposit of \$500.00 is due at the time of booking any orthopedic work-up. Deposits for Total Hip Replacements are \$1500.00 due at time of booking and are 100% non-refundable.**

****Financing options are available. Please contact reception for further details.**



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NOTE: Surgical discharge with Dr. Rocheleau is scheduled for 8:30am the morning following surgery (unless otherwise stated). It is imperative that a patient's owner(s) be present at the hospital at this time. **Failure to do so will result in a missed surgical discharge and may lead to post-operative complications which will be at the expense of the owner(s).**