

# Pelvic Fractures in Cats & Dogs

## ANATOMY

Anatomically the pelvis is somewhat like a rectangular box. Front part of the pelvis is attached to spine by SI Joint (SI).

The Ilium (I) is the part of the pelvis that extends forward from the area of the hip joint.

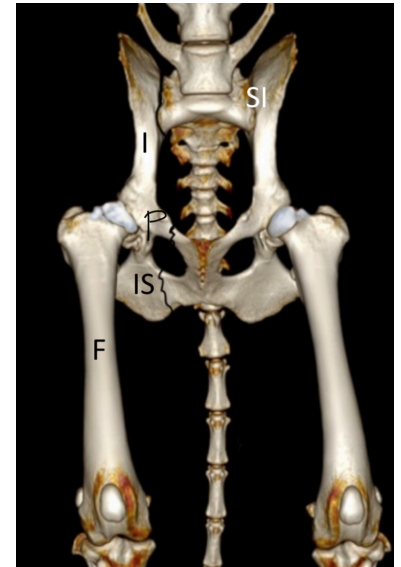
The Acetabulum (A) forms the cup of the hip joint.

The Pubis (P) is a strut like connection of the pelvis that connects the floor of the pelvis to the acetabulum.

The Ischium (IS) is a table-like portion of the back part of the pelvis.

The Femur (F) has a ball that fits into the cup or socket of acetabulum.

The colon, urethra, vagina, blood vessels & sciatic nerve pass through the canal of the pelvis. The sciatic nerve runs immediately below the SI joint, thus this nerve is susceptible to damage.



The pelvis consists of 2 symmetrical sets of bones that are fused together to form a solid bone.

The pelvis is attached to the lower part of the spine, called the sacrum, by a left & right SI joints.

Unlike the hip, knee, elbow & other joints, the SI joints have limited movement.

The sacrum consists of 3 vertebral bones that are fused together.

## SIGNS & DIAGNOSIS

A fracture is synonymous with a broken bone. Because the pelvis is like a box, it must be broken in 2 or more places for the pelvic bones to be unstable. Typically the pubis & ischium are fracture. When you have pelvic fracture(s), the affected pets will bear minimal to no weight on the fractured side of the pelvis. If both sides of the pelvis are fractured, then the pet may NOT be able to walk at all.

SI is a traumatic condition in which the pelvis has been torn off the spine. Bilateral SI luxation may occur with no additional fractures of the pelvis. SI usually is caused by a very traumatic blow to the hind end of an animal (i.e. Hit By Car [HBC]). Varying degrees of lameness on the side of the luxation. Pain is noted when the SI joint is palpated. The pelvis may feel crunchy (crepitant) when a force is applied to the front of the pelvis.

If the sciatic nerve was also injured, no or decreased sensation to the outside toe of the affected hindlimb will be noted; complete evaluation of the sciatic nerve may be difficult due to bruising of muscles & the nerve itself.

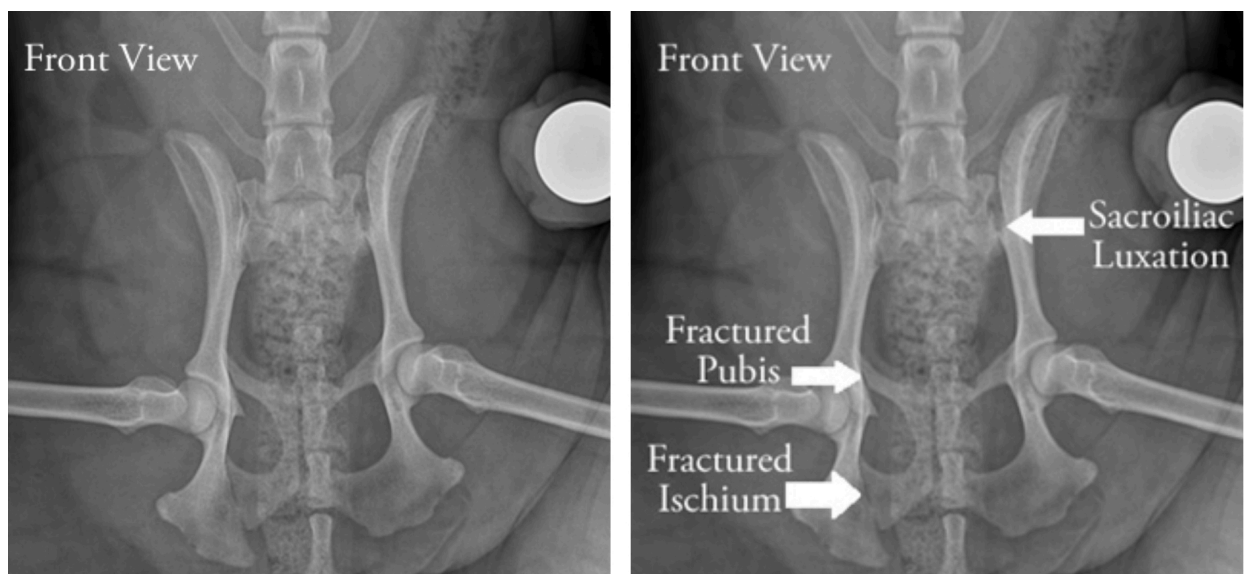
Damage to the sciatic nerve may occur from direct trauma to the pet during the accident or may occur if the nerve gets trapped between fractured bones. The surgeon will also evaluate the urinary tract to make sure that the bladder has NOT been ruptured.

## DIAGNOSTICS

Prior to surgery a Complete Blood Count (CBC) & chemistry profile will be performed.

Radiographs (x-rays) of the chest will be completed to rule out trauma to the lungs or ribs. Chest x-rays are made to ensure that there is no trauma to lungs, ribs & diaphragm. If the pet has complex fractures of the pelvis, CT scan may be needed for surgical planning purposes & to rule out other conditions that may NOT be evident such as spinal trauma. Should there be significant trauma to these other organs, surgery may be delayed so that your companion can safely undergo anesthesia & the surgical procedure.

Radiographs of the pelvis; the unfractured pelvis should fit within an imaginary box & if it does NOT, there is a fracture +/- dislocation the SI joint a part of the pelvis will be shifted outside this box. In this case, take note of the SI luxation & fractures of the pubis & ischium of the pelvis.



## TREATMENT (3 Options) = SI

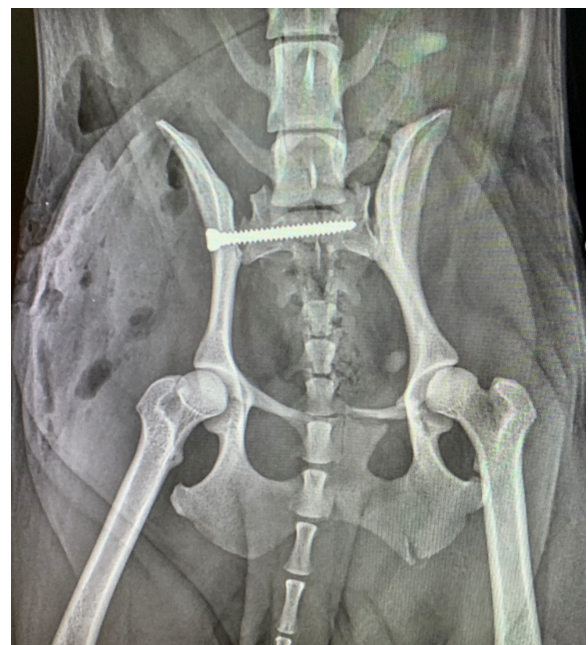
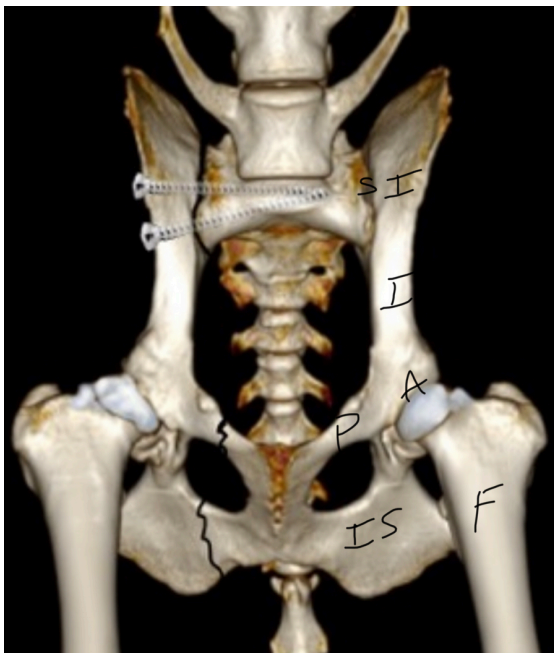
1. Conservative treatment is acceptable if only 1 side of the pelvis has been damaged & minimal displacement of the SI joint is present. These patients will be painful for a much longer time vs having the luxation surgically repaired.
2. Traditional surgery involves making an incision along the side of the pelvis & peeling the muscles off the bones to expose the SI joint. Screws are used to secure & stabilize the SI joint back onto the sacrum vertebrae.
3. Minimally invasive surgery involves manually reducing the joint back into place from the outside, making a small incision (~1 to 1.5 cm) over the side of the pelvis in the location of the SI joint & securing the SI joint in place with screw(s) with the aide of intra-operative fluoroscopy or digital radiography.

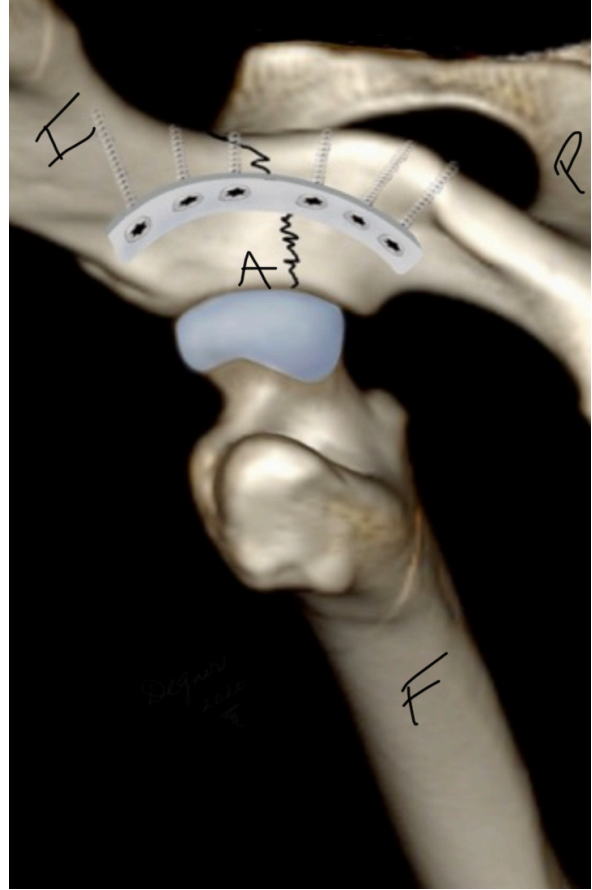
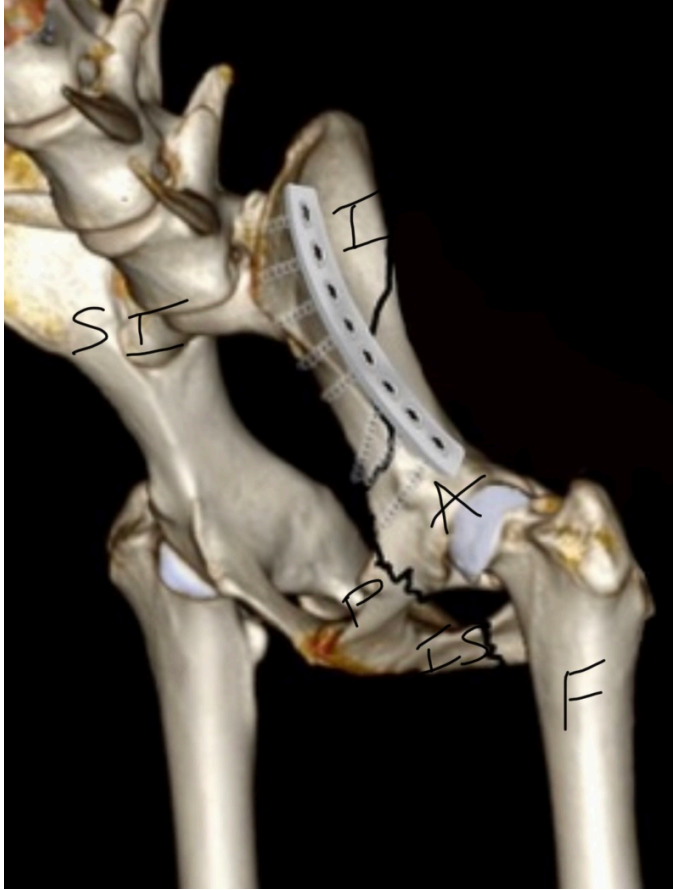
## SURGERY DESCRIPTION

How minimally invasive SI luxation is performed: The patient is placed on the x-ray table with the affected pelvis up. Digital radiographs are made (or fluoroscopy used) to assist the surgeon in the placement of the screws. The ilium is manually pushed back into place & a small pin is inserted. Next, a hole is drilled over sacral body & the position of the drill bit is radiographed. If the positioning is good, the drill bit is advanced deeply into the sacrum. The drill bit is removed & a screw (pre-measured screw length from the radiographs) is seated into the bones to hold the SI joint in place. Another screw is placed just behind the 1st screw using the same method if additional stability is needed.

The benefits of the minimally invasive approach is that a very small incision is used & there is minimal dissection of the soft tissues, resulting in less pain. In addition, the surgeon can very accurately place the screws into the body of the sacrum, thereby preventing damage to the nerves that are located in the spinal canal of the sacrum.

The length of time that it takes to perform the minimally invasive vs traditional surgery is similar.





### THE DAY OF SURGERY

In preparation for anesthesia, results of your companion's blood work will be reviewed. Our anesthesia & surgical team will prescribe a pain management program, both during & after surgery that will keep your companion comfortable. This may include a combination of general anesthesia, injectable analgesics, epidural analgesia, oral analgesics & anti-inflammatory medication.

### SURGERY

Fractures of the pelvis that involve the hip joint, ilium & the SI joint usually need to be repaired. Fractures of the ilium & acetabulum are repaired with a plate & multiple screws (see illustrations below). If the sciatic nerve function is impaired, surgery should be performed as soon as possible to release pressure off the nerve, in the hope to prevent permanent damage. Dislocation of the SI joint is repaired using one or two screws (see illustration above).



## HOME CARE

Limit activity until the fractures have healed. Provide a soft bed to prevent bed sores. Turn your pet from side to side, if your pet is very weak & cannot do this on his/her own. Use a towel as a sling to take your pet outside for elimination purposes. Check the incision for infection at least twice a day or more.

After surgery, you can continue to give your pet a prescribed pain reliever to minimize discomfort. It's also extremely important to limit your pet's activity & exercise level during this post-operative period.

Rehabilitation exercises can be done at your home or if you choose, by professionally trained therapists at an animal rehabilitation center. Rehabilitation therapy should be continued until your dog is bearing weight well on the operated limb (typically 2 - 4 weeks after surgery). Detailed instructions will be given to you after the surgery. Please follow up with 2-4 weeks with updates to your primary veterinarian &/or vet surgeon.

The 1st is scheduled at 2 weeks after the surgery & the second is at 6 - 8 weeks after the surgery; during the second visit the repaired bone will be x-rayed. By 8 weeks after surgery, most dogs & cats are fully weight-bearing on the operated limb, although exercise should be limited during the 1st 3 months after the procedure.

## RESULTS

Surgical repair of pelvic fractures has benefits of early pain relief, less collapse of the pelvic canal & impingement on organs that pass through the canal & relief of pressure off the sciatic nerve if it is entrapped. If present, nerve damage has been reported to recover in 81% of patients that have pelvic fractures. Uncommon complications after surgery may include break down of the repair (due to lack of exercise restriction), nerve damage, poor bladder control, & fecal incontinence.

## PROGNOSIS

Most patients heal well following surgical repair. It may take about 2 months for full recovery.

Patients that have sciatic nerve injury frequently will regain normal or near normal function; occasionally the function of the nerve does not come back & the pet does not have any useful function of the limb.

## COMPLICATIONS (+/-)

Complications of the condition of SI luxation or surgery to repair the luxation may include sciatic nerve damage, non-healing of the fractures, breakage of the screws, infection & anesthetic death. Pregnancy should be avoided as natural delivery of the puppies may not be possible due to scar tissue or callus formation in the pelvic canal (C-section is also an option if breeding is a must). Chronic constipation may occur if a lot of callus or scar tissue develops in the pelvic

canal. Entrapment of the urethra (tube from the bladder for urination) may occur by entrapment of this tube by fracture fragments.

#### INCISION

If a bandaid is covering the incision, please remove it in 5-7 days after surgery. When the incision is exposed, twice daily, check the incision for signs of infection: redness, swelling, pain or discharge.

Do NOT allow licking of the incision as this could cause an infection or open the incision. An Elizabethan collar (E-collar) obtained from us or a pet store or online, should be kept on your companion for 2 weeks to prevent licking of the incision.

#### FOLLOW-UP EXAM:

The 1st appointment at 2 weeks after surgery should be in person with your primary veterinarian. Please send us a photo of the incision & a video of your pet walking. Please send these to your pet's primary veterinary &/or surgeon's email or cell phone number.

Radiographs (x-ray) of the repaired pelvis should be done in 6-8 weeks to check the healing process. Please fast your pet starting at 10 PM, the night before the appointment, as sedation may be needed.

#### MEDS/RX(s):

A pain management protocol has been prescribed which should be very effective. If your pet seems to be uncomfortable (whining, restless), the most common cause for this is that your pet needs to urinate. Take your pet outdoors to eliminate. If your pet still seems painful, please give us a call.

#### ACTIVITY RESTRICTION x8 weeks

- Your pet may be groggy for a few days. He or she may whine or appear more anxious than usual; this may indicate pain/discomfort or side-effects of the medications. Please call your vet for assistance with medication adjustments or return for exam & additional pain Rx(s) as needed.
- Please keep your pet in a small area with secure footing (small room or penned off area with carpet) for the next 2 weeks or until he/she is very secure on his/her feet. Thereafter, he/she may be confined to one level of the house with no free access to stairs. Use baby gates, etc. to prevent access to stairs. Do NOT allow jumping on/off furniture. Confine to a small area/room/ crate when unattended. Please do NOT allow any playing, running or jumping. Use a short leash when going outside to urinate/ defecate.
- For the 1st few days, your pet may need assistance when walking on slippery floors; use a belt/ band under his/her belly to prevent slipping. Continue this protective measure until he/she is very strong on all legs.
- Your pet should start touching his/her toe down within the 1st 2 weeks. Thereafter, leg use should steadily improve each week. By 6 weeks, he/she should be 90% recovered. If he/she suddenly deteriorates or does NOT appear to be progressing well enough, please return to your vet for exam; x-rays may be needed to diagnose the problem.
- Your pet will feel like fully using the leg before the bone is healed. Please continue the restrictions during this difficult time when he/she is feeling "too" well! Failure to do so may cause serious healing problems.

## Discharge Instructions – Pelvic Fracture Repair

Surgery: Fracture Repair of Pelvis +/-Bone Plates &/or Bone Screws.

[FELINE]

Diet: If your companion will NOT eat the regular diet, Gerber baby food such as strained chicken or beef, canned tuna, canned gourmet cat food should be offered for 3 days & then wean back onto the regular diet over the next three days.

Bowel movements: Your companion may NOT have a bowel movement for the next 4 days after surgery. If your companion does NOT have a bowel movement after 4 days or is straining to defecate, constipation may be present. Unflavored Metamucil or Miralax, at a dose of 1/4 of a teaspoon, can be mixed in canned food (in each meal) as a laxative. If this treatment is NOT effective, other laxatives can be prescribed.

Provide a litter pan with a low entry to minimize pain when entering the litter pan. Pain associated with entering a litter pan can cause a cat to refuse using a litter pan & may result in long-term inappropriate eliminations around the house.

Exercise:

1. For the 1st 8 weeks after surgery, keep your pet confined to a small room that has no elevated surfaces to jump on. Cover all slippery floors in this room with throw rugs or indoor/outdoor turf carpet for the 1st 8 weeks after surgery. If this is NOT possible, put your pet in a large cage with the cat litter box within the cage. Do NOT provide knitted blankets that could entrap the toenails of the operated limb, & potentially injure the repaired fractured bone.
2. Strenuous activity may result in failure of the surgical implants to hold the fracture together.

[CANINE]

Diet: If your companion will NOT eat the regular diet, a home-made bland diet (50:50 mix of lean hamburger, chicken breast, lean turkey meat & a carbohydrate source such as rice, potato, or pasta) should be offered for 3 days & then wean back onto the regular diet over the next three days.

Bowel movements: Your companion may NOT have a bowel movement for the next 4 days after surgery. If your companion does NOT have a bowel movement after 4 days or is straining to defecate, constipation may be present. Unflavored Metamucil or Miralax at a dose of 1 teaspoon per 50lbs body weight can be mixed in canned food (in each meal) as a laxative. If this treatment is NOT effective, other laxatives can be prescribed.



#### Exercise:

1. Cover all slippery floors with throw rugs or indoor/outdoor turf carpet for the 1st 8 weeks after surgery.
2. Limit activity to very short leash walks for bowel & urinary purposes until the bone is healed (typically 2 months). Do NOT leave your companion off the leash for 2 months. No jumping, climbing stairs or rough-housing with other pets or people. Strenuous activity may result in failure of the surgical implants to hold the fracture together.
3. As long as your pet is bearing a moderate amount of weight on the limb, supervised walking around the house is permitted. Explosive activity such as running, sprinting, jumping, twisting/turning are NOT permitted as injury to the soft tissue or bone may occur. In addition, metal implants breakage may break or become dislodged from the bone.

#### LONG-TERM LIFESTYLE

- After the fracture is healed, there are no restrictions on activities for your pet. A gradual return to full function should occur, to allow for a smooth return of muscle function & strength following the restricted period.
- Once a fracture is well healed, there is minimal risk to that site in the future. The plate & screws do NOT create any problems in the vast majority of patients. Occasionally these stainless steel implants can become infected; it is believed these infections originate from bacteria normally found in the blood stream in patients with infections elsewhere in the body or from dental disease. Implants can also loosen or create bone pain caused by cold temperatures. On occasion metal implants will have to be removed months to years after the original surgery if they cause the patient problems. Please have your vet evaluate any lameness or pain you notice associated with the operated leg. This implant removal is rarely indicated, but will require a second surgical procedure that is NOT accounted for in the original surgery fees.

## REHABILITATION THERAPY [Feline/Canine]

(We can also recommend professional physical therapy assistance in the Sacramento area. Studies have shown that a formal program can decrease post-operative recovery time. Please let your vet know if you are interested in a referral).

“Our lives are often very busy, so if you must err, err on the "do less" side of these instructions. Less physical therapy will result in a slower return to function, but more aggressive physical therapy by a non-professional too early may result in failure of the implants & surgical repair.”

### COLD COMPRESS

- Week 1 (day 1, 2, 3) Cold Compress: Apply ice packs (wrapped in a cloth ie frozen peas or corn or cold gel pack) to the incision area twice to three times daily for 10-15 minutes for 3 days. [Ice pack by freezing 2 parts isopropyl alcohol to 1 part water in a ziplock bag]. Place a thin towel between the cold compress & the incision for patient comfort. The cold compress will reduce swelling, bruising & pain.

-only perform if no bandage has been applied.

### WARM COMPRESS

- Week 1 (day 4, 5, 6, 7) Warm Compress: Apply warm packs (warm water bottle or microwaved raw rice) to the incision area twice to three times daily for 10-15 minutes for 3-4 days. Monitor the temperature of the compress so that it does NOT burn the skin. Place a thin towel between the warm compress & the surgical site for patient comfort. This step helps to loosen connective tissue in preparation for PROM on day 4.

-only perform if no bandage has been applied.

- Week 2, 3, 4, +/-5, +/-6: Passive Range Of Motion (PROM) exercises are done by placing your pet on the side (lateral) then flexing & extending the hip joint 3 sessions daily for 5-10 minutes. Grip the foot with 1 hand & slowly & gently push the foot up into flexion of all other joints as well then hold for 5 seconds at a time. Slowly pull the foot & push the leg down & back into full extension of all joints; hold for 5 seconds. Repeat this motion 15-20 times twice daily. This exercise should NOT be performed to the point of pain or resentment. Continue 4 weeks.
- This step helps to break down adhesions & scar tissue so that your pet will attain normal or near normal range of motion. Also, flex & extend the knee & the ankle joints. Massage the muscles of the thigh & especially work on the muscles on the front of the thigh, because these may develop cramps (trigger points). This can be done after the passive range of motion session.

- After the range of motion exercises, apply a cold compress to the surgical site for 5 minutes. This step reduces inflammation.
- Week 3: Sit/stand Exercise—Have your pet repeatedly sit & stand for 15-20 repetitions 2 to 3 times daily. Use small treats to encourage participation. Do NOT push down on his/her rump. Continue for 4 weeks.
- Week 5: Stairs Exercises—Have your pet walk up & down a (flight of stairs or sidewalks) on a leash, in a slow, controlled manner such that your pet uses every step. Repeat 5 times 1 to 2 times daily. Continue for 4 weeks.
- Week 7: Active Exercise — Place your pet on a short leash & have him/her walk at your side. Walk outside on even/solid footing for 10-15 minutes 2 to 3 times daily. Continue for 4 weeks.
- Week 8: Hip Stretch Exercise—Perform this exercise on carpeting with 2 people assisting. If you have a large exercise ball (2-3ft diameter), place the front end of your dog across the ball. Slowly roll the ball forward so the hind quarters are stretched to the point when your pet takes a step forward with his/her hind feet. Slowly roll the ball backward so he/she steps backward. Repeat this slow-motion stretch for 15-20 repetitions 2 to 3 times daily. Continue for 2 weeks.
- Swimming is wonderful rehabilitation exercise (for some dogs) when performed correctly. You may allow controlled swimming after week 8. Controlled swimming requires that your pet NOT jump or leap into the water; walking into the water until it is deep enough to swim is required. Throwing balls to fetch often results in sudden jumping & lunging, which can cause serious problems in the healing phase. Do NOT over extend your pet; start with short excursions (5 minutes) & increase duration & frequency gradually.

If you would like assistance with your pet's exercise recovery, please let your veterinary team know so we can provide a referral to a local veterinary physical rehabilitation center. If you have any questions, please feel free to ask your primary veterinarian &/or veterinary surgeon.

TREAT Veterinary Surgery Service  
 Dr. Le-Nguyen, DVM (Practice Limited to Surgery)  
 (916) 230-8103  
 treatveterinarsurgeryservice@gmail.com  
<https://treatveterinarsurgeryservice.com>