

Post-Surgical  Step-by-Step

Home REHABILITATION Guide

Home Therapy Guide for Pet Owners

TTA

Tibial Tuberosity Advancement



PROVEN
WEEK-BY-WEEK
INSTRUCTIONS

- ✓ Therapies
- ✓ Strengthening Exercises
- ✓ Progress Calendar



Introduction to the Home Therapy Program Booklets

This booklet was developed to serve as a guide during this crucial post-operative healing time. Included within this booklet is a week-by-week protocol, which should be followed to the best of your ability.

To assist you in keeping track of the day-to-day “to do’s”, a daily calendar has been included. In addition, there are visual aids and descriptions to help guide you through the various therapy tasks. We also encourage you to check out our website **www.topdoghealth.com** where we have videos reviewing the various therapies and exercises. We hope that you find this booklet to be an indispensable resource during the next several weeks of your pet’s recovery.

Disclaimer: This booklet is not a substitute to a personal evaluation and therapy program created by a licensed veterinarian or certified canine rehabilitation practitioner. If your dog is injured during use of this Home Therapy Booklet, it is not the responsibility of TopDog Health. If injury occurs seek veterinary advice as soon as possible.

Warning: For your protection, we strongly encourage the use of **muzzles** during any of the hands-on therapy modalities.

Important: It cannot be emphasized enough that if restricted activity is indicated, you must do your absolute best to follow these guidelines. Dogs often want to increase their activity level because they are “feeling better,” but doing too much too soon can be detrimental to the surgical repair.



Home Therapy Program™

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Introduction to Canine Rehabilitation

Physical Therapy, as a profession, has been traced as far back as World War I. Over the last century, the profession has developed and evolved into one of the major cornerstones of modern day medicine. Physical Therapists' mastery of the musculoskeletal system and ability to treat movement dysfunctions has made them indispensable, especially in post-surgical cases.

Over the last decade, veterinary medicine has experienced tremendous growth in the level of medical care that it is able to provide to our patients. This is due in part to the equally overwhelming growth of the human-animal bond. Our animals are not just "pets," they are members of the family.

Interest in canine rehabilitation originated in the 1980s and due to public interest has gained tremendous momentum over the last ten years. In 1999, the First Symposium for Physical Therapy and Rehabilitation in Veterinary Medicine was held at Oregon State University. Animal physical therapy professional organizations are now recognized in more than ten countries.

Established in 2004, TopDog Health has set out to become the leader in the field of physical rehabilitation for animals. Spanning orthopedic, neurologic, and soft tissue injuries, as well as weight management. TopDog Health has developed physical rehabilitation treatment protocols to assist veterinary hospitals and pet owners by providing the best tools for their animals successful recovery and improved overall quality of life.

Preparing for the Homecoming

Here are a few tips on how to ensure a safe home environment

Preparing the House

It is important to have a plan on how and where you are going to restrict or confine your dog during this crucial post-operative period. Quality rest is as important as having a good therapy plan. Many owners incorporate one to the following:

- Dog crate
- Gated-off area, i.e., kitchen
- Room confinement

No Jumping

It is extremely important not to allow your dog to jump. Overextension of the stifle ("knee") could compromise the repair and slow healing time. Remember:

NO JUMPING on/off bed
 NO JUMPING on/off couch
 NO JUMPING up on you

No Stairs

Stairs, like jumping, will overstress the joint and inhibit repair. In the beginning stages, directly after surgery and until your veterinarian says it is okay, it is imperative that you do what you can to prevent your pet from going up and down stairs. However, if you have no way of avoiding stairs to get your dog into and out of the house, or your dog is too big to carry, you need to take the following precautions:

- Restrict: Make sure to have your leash attached before you open the door.
- Support: Use a towel as belly support or commercially available harness or belly support
- Limit: Block off all stairs that your dog could potentially have access to.



No Horsing Around

As much as you would like to play with your dog or have him play with other friends, this is not a good idea until your veterinarian gives you the green light to do so.

Walking Surfaces

Wood floors, tile, linoleum, etc. can all be very slippery to your recovering pet. Consider putting down some throw rugs with rubber backing or yoga mats to make it easier for your dog.

Normal

- Swelling around the incision and to the repaired leg (this should only last for the first 3-4 days following surgery)
- Bruising around the incision or on the leg
- A small amount of discharge from the incision that is clear or even a little blood tinged
- Discomfort on the repaired leg and around the incision
- The incision is slightly warm-to-the-touch

Abnormal

- Swelling that lasts longer than three to four days
- Bruising in areas other than the incision site
- Discharge that is not clear
- Large amounts of discharge
- Continuous bleeding
- Discomfort that is not alleviated with ice application and prescribed pain medication
- Discomfort that causes your pet to cry out or bite



The Week-by-Week Protocol

For Tibial Tuberosity Advancement (TTA)

The following weekly protocols have many benefits. It is important to follow these guidelines as closely as possible in order to:

- Speed the recovery of the weak limb
- Decrease pain and enhance healing of injured tissue
- Prevent further disuse muscle atrophy
- Restore normal range of motion
- Decrease possibility of further compensatory problems

WARNING

During all times outside of therapy STRICT CONFINEMENT IS MANDATORY. It is extremely important to follow this protocol as closely as possible to ensure proper recovery. Any form of excessive activity is PROHIBITED during this critical recovery period.

IMPORTANT

PERFORM ALL THERAPIES IN THE ORDER DESCRIBED

REMEMBER

All dogs will recover from surgery at a different speed. Check with your veterinarian about any specific precautions for your dog.

IMPORTANT

If at any time you feel that your pet is in discomfort due to the surgery call your veterinarian so they can prescribe the proper medications.

WEEK 1

1) Massage

Do for 5-10 minutes, 3-4 times/day
Refer to page 23

This is best done with your pet lying on his side on a comfortable surface. Start by gently rubbing the affected limb from the toes up the leg. If your pet is reluctant to have this done, try using less pressure or try again when he is calmer. Do not force any therapy.

2) Passive Range of Motion (PROM)

Do 10 repetitions, 3-4 times/day
Refer to page 24

The goal of PROM is to manually simulate the normal motions of each joint. This is best done after massage and with your pet laying on his side. Starting with the hip, gently extend and flex. Continue onto the knee and ankle. Be sure to support the leg carefully with your other hand while performing these movements. Do not force PROM. If your pet seems uncomfortable, stop and try again at another time.

3) Short and Slow Controlled Leash Walks

Do for 5 minutes, 3-4 times/day
Refer to page 28

At first, these walks should be for elimination purposes only. The slower your dog walks, the more likely they will place the repaired leg down while walking. If needed, use a support harness or towel under the belly to support your dog's hind end.

WARNING

DO NOT ALLOW YOUR DOG TO RUN, JUMP, OR CLIMB STAIRS!



4) Cold Therapy

Do for 10-15 minutes after exercise
Refer to page 21

Following the above therapy exercises it is important to apply cold therapy to the affected knee. You can use commercial gel ice packs or frozen vegetables. For most ice packs, wrap them in a towel, bag, etc. before applying.

NOTE

Three days after surgery you can begin applying Moist Heat prior to your dog's therapy session (see next page for description). **DO NOT** do this prior to three days post-op or if the swelling around the joint is still significant; wait a few more days to begin this modality.

WEEK 2

1) Moist Heat

Do for 10 minutes prior to exercise
Refer to page 22

For this therapy, a commercial moist heat product is advised. Moist heat has been shown to penetrate tissue better than dry heat. Several types of moist heat are available in most drug stores, i.e., gel, beads, rice, etc. Another way to provide moist heat is to take a washcloth and wet it with warm water. The heat should be warm enough to the touch but not so hot that it burns you when you are applying it to your dog's joint.

2) Massage

Do for 10 minutes, 3-4 times/day
Refer to page 23

3) Passive Range of Motion (PROM)

Do 15 repetitions, 3-4 times a day
Refer to page 24

4) Short and Slow Controlled Leash Walks

Do for 5-10 minutes, 3-4 times a day
Refer to page 28



WEEK 3

1) Moist Heat

Do for 10 minutes prior to exercise
Refer to page 22

2) Massage

Do for 10 minutes, 2-3 times/day
Refer to page 23

3) PROM, as needed

If your dog is getting out for his walks and is using his leg, you can discontinue PROM.

4) Slow Controlled Leash Walks

Do for 15-20 minutes, 3-4 times/day
Refer to page 28

5) Sit-to-Stand Exercises

Do 5-7 repetitions, 3-4 times/day
Refer to page 29

We call these “puppy squats.” Basically, you want to get your dog to sit down and immediately stand back up. This encourages extension/flexion of all joints in the rear legs and also works the muscles

surrounding the stifle (“knee”). Do this at a time when your dog is most likely to oblige, like when it is feeding time. If you have to use treats to get your dog to do this make sure they are low fat and low calorie or only give tiny pieces.

6) Discontinue Post-Therapy Icing

This can be discontinued as long as there is no apparent discomfort. However, the use of ice may be resumed post-therapy if your dog appears to be uncomfortable or swelling increases.



WEEK 4

1) Moist Heat, as needed

This does not need to be done 3-4 times/day anymore, if your dog seems to enjoy the heat, apply it 1-2 times/day, otherwise it can be discontinued.

2) Massage, as needed

3) PROM, as needed

If your dog is getting out for his walks and is using his leg, you can discontinue PROM.

4) Controlled Leash Walks

Increase to 20 minutes, 3-4 times/day
Refer to page 28

At this point, you can now begin to allow more freedom for your dog during walks-up to 10-15 feet on a leash. This encourages more intermittent trotting which is good to build up muscle girth and strength.

5) Sit-to-Stand Exercises

Increase to 10 repetitions, 3-4 times/day
Refer to page 29

6) Figure 8s

Do 10 repetitions, 3-4 times/day
Refer to page 36

To perform “Figure 8s,” simply walk as if you are following an imaginary 8 drawn onto the ground. If your dog has difficulty navigating the figure 8, make the circles larger. The purpose of “Figure 8s” is to increase muscle strength and encourage balance.

WARNING

If you notice any signs of lameness or discomfort while increasing any of the above-mentioned exercises, revert to the previous week’s level of activity. For example: During week three you notice that your dog becomes very fatigued after walking for 20 minutes. Return to walking for 10-15 minutes until your dog is able to tolerate this level of activity for a few days, and then try again to progress to 15-20 minutes.



WEEKS 5-8

1) Discontinue Moist Heat, PROM, and massage

This can be discontinued if your dog is using his limb consistently.

2) Controlled Leash Walks with Hill Work

Do controlled leash walks for 20-30 minutes, 3-4 times/day
Do hill work for 5-10 minutes, 1-2 times/day
Refer to page 31

Find an incline that is suitable for your dog to walk up and down. While on your daily walks, slowly walk your dog up and down this incline. Begin with about 5 minutes of hill work and slowly increase to 10 minutes after a few days. Hills are great for the quadriceps and hamstrings, which help support the knees.

3) Sit-to-Stand Exercises

Do 10-15 repetitions, 3-4 times/day
Refer to page 29

4) Figure 8s

Do 10-20 repetitions, 3-4 times/day
Refer to page 36

5) Curb Work

Do 10-20 feet, 3-4 times/day on walks

Curb work is basically stepping up and off a length of curb while on your walk with your dog. The curb should be appropriate for your dog's height. A small 10 to 30 pound dog should step on and off a curb that is about 2 inches high, a 40 to 70 pound dog should use a curb that is about 3 inches high and all larger dogs should use a curb that is about 3-5 inches high. Any surface that has some height can be used for this purpose; it does not have to be a curb but you do need a length of about 20 feet to perform this exercise, which is why curbs work best. While on your walk, simply step up and off the curb for a length of 10 to 20 feet, making an "S" pattern as you walk on and off the curb. Curb work is great to increase muscle strength, girth, and balance, as well as improve flexion and extension. Go at a pace that is comfortable for your pet. If your dog seems to have any difficulty with this exercise, do not perform it at this time.



WEEKS 9-12

Note

You are now nearing the end of total recovery; these next few weeks will be the strengthening period. These exercises can be used as a guide for you to challenge your dog in a variety of ways while regaining lost strength and muscle tone.

1) Stair work

Do 5-7 steps in a row, 1-3 times/day
Refer to page 33

At this stage, you can begin to incorporate stairs as a form of exercise. Start with your dog on a leash and, if needed, use a towel under the belly to support him. To start, walk slowly up three stairs, and then slowly walk back down. Increase the number of stairs and the frequency each week. DO NOT give your dog free access to the stairs yet, it is still too early. Always keep your dog on a leash while doing this exercise.

2) Supervised off-leash or long leash activity

As long as your veterinarian allows it, your pet can have some off-leash time under strict supervision. If you know your dog cannot be controlled from jumping or chasing balls, butterflies, toys, other dogs, etc. while off-leash, do not allow him to partake in any off-leash activities yet.

3) Controlled Leash Walks with hill work

Do 30 minutes total with 10 minutes on hills, 3-4 times/day
Refer to page 31

4) Sit-to-Stand exercises

Do 10-15 repetitions, 3-4 times a day
Refer to page 29

5) Figure 8s

Do 20 repetitions, 3-4 times/day on walks
Refer to page 36

6) Curb Work

Go 20 feet, 3-4 times/day

7) Jogging

Do intervals of 20 feet, 3-4 times/day

If possible, while on a walk get your dog to jog for a length of 20 feet and then stop. Jogging increases muscle strength and girth.

8) Swimming

Do 5-10 minutes, 1-2 times/week
Refer to page 34

Swimming can be performed as long as your veterinarian approves. It is best done in a controlled environment, preferably in a pool and under direct supervision. Your dog should be lifted into and out of the pool and held in place or allowed to swim with assistance for about two to five minutes. Your dog should not be allowed to jump into or out of water. Swimming is great for increasing muscle and range of motion. Your local canine rehabilitation facility is a great place to perform this exercise.



Therapy Modalities

Cold Therapy

Moist Heat Therapy

Massage

Passive Range of Motion

Stretching



Cold Therapy

The Indications of Cold Therapy:

Cryotherapy, the use of cold in healing, is the most underutilized therapy in veterinary medicine today. If you were to have knee surgery, you would leave the operating room with your leg immobilized in an inflatable icing unit and you would undergo aggressive icing thereafter. It should not be any different for your dog. Cryotherapy is extremely important for the first 72 hours after surgery. It is also important after an acute injury or strenuous exercise. It works by stimulating constriction of the blood vessels, thereby slowing circulation to the injured area and preventing many of the “bad” inflammatory mediators from harming tissue. The cold also slows nerve conduction velocity (i.e., slowing the pain signal), as well as decreasing localized swelling. All of these contribute to helping reduce pain.

The Benefits of Cold Therapy:

- Decreases inflammation
- Decreases pain
- Decreases healing time

How to perform Cold Therapy:

Any of the following can be used: commercial cold gel packs, ice wrapped in cloth, or a bag of frozen peas. Of all these, TopDog prefers the gel packs due to their ease of use and conforming nature. When icing, it is best to perform while your dog is lying on its side, relaxed. Place the cold source directly over or around the affected area. If your dog reacts to the direct application, try laying a towel between the cold source and the skin. Each icing session should last ten minutes.

Refer to the week-by-week protocol to determine how often cold therapy should be performed.



Moist Heat Therapy

WARNING

Before applying heat to your dog, test the surface temperature of the heating unit to your own skin and hold for 20 seconds. If it is not too hot for you, it should not be too hot for your dog.

The Indications for Moist Heat Therapy:

Moist heating is the second most underutilized therapeutic modality in veterinary medicine. Moist heat is recommended over dry heat due to the fact that the moisture allows the heat to penetrate deeper into tissue. Heat therapy is NOT to be used until 72 hours after surgery or injury. It is contraindicated during any acute inflammatory process, over open wounds, edema, or cancerous tissue.

The Benefits of Moist Heat Therapy:

- Increases blood flow
- Increases tissue metabolism
- Increases tissue stretchability
- Stimulates the healing phase
- Decreases pain

How to perform Moist Heat Therapy:

It is best to utilize moist heating prior to performing range of motion, stretching, and exercise to ensure full benefits. There are a number of commercial heating packs available today, such as those filled with corn, rice, etc. Many of these can be used as both hot and cold therapy aids. At TopDog, we use a variety of these products, and all can be purchased at your local pharmacy. Like cold therapy, it is easiest to perform the heat therapy while your dog is lying down and relaxing.

Refer to the week-by-week protocol to determine how often moist heat therapy should be performed.



Massage

The Indications for Massage:

Though having a certified massage therapist perform this therapy is ideal, you can perform many of the core massage techniques yourself and transfer the healing power of touch to your dog. It is important not to focus solely on the affected limb, but on the whole body. Remember, the other musculoskeletal parts of your dog's body have been compensating due to disuse of the affected leg. Over time, this puts extra strain on these body parts.

The Benefits of Massage:

- Psychologically beneficial because it enhances the human-animal bond
- Helps relieve stress and anxiety
- Decreases pain by stimulating endorphin release
- Improves circulation and lymphatic flow
- Decreases edema
- Decreases fibrosis by relieving contracture of the tendons and muscle
- Helps maintain muscle tone

How to perform Massage:

With your dog lying on its side, begin by gently stroking your dog to initiate relaxation. Applying medium pressure, run your hand over your dog's entire body, starting at the neck, moving down to the tail and down each limb for a total of four times. This should be done at the beginning and end of each session. Once your dog is relaxed, you can begin active massage/rubbing. Maintain the same depth of pressure throughout your movements. This active massage should always begin at the toes and work up the limbs.

Refer to the week-by-week protocol to determine how often to perform this modality.



Passive Range of Motion (PROM)

The Indications for Passive Range of Motion:

Passive Range of Motion, though a simple concept, is for many quite difficult to understand. It is defined as the use of an external force (i.e., human hands), that moves the joint through its available range of motion without muscle contractions. To better understand the concept, place your left hand around your right wrist. Now, without contracting any muscles in your right arm, use your left arm to guide your right elbow through its available range of motion. This type of therapy is extremely important for your dog's knee after surgery. If a joint stays in one position too long, the limb will lose flexibility. This increased stiffness can lead to a slower return to activities, even walking.

The Benefits of Passive Range of Motion:

- Improves joint motion after surgery
- Prevents joint contracture
- Prevents soft tissue inflexibility and shortening
- Prevents adhesions between soft tissue and bones
- Enhances joint lubrication

How to perform Passive Range of Motion:

It is extremely important to make sure that your dog is comfortable and relaxed prior to this exercise. Although PROM can be performed while your dog is standing, it is generally more relaxing and beneficial to have your dog lying on its side. It is very important to be gentle and not create any pain or discomfort. Support the limb both above and below the knee joint. Move the limb below the joint in a smooth and controlled fashion, while keeping above the joint steady. Gently move back and forth throughout the joint's full range of motion. Try to perform 20 repetitions if your dog will allow you, otherwise, perform the movements as best you can over a five-minute time period.

Refer to the week-by-week protocol to determine how often this modality should be performed.

Another Technique for PROM

First, think of how your leg moves while you pedal a bicycle. All of your joints benefit from this fluid movement. While your dog is lying comfortably and relaxed on its side, hold its foot to re-create this "bicycling" movement.



Flexion



Extension



Stretching

The Indications for Stretching:

Once an animal begins to not fully use its limb properly, several negative processes begin to take place. Aside from the negative effects on the joints, disuse adversely affects the muscle and other soft tissues, often times leading to muscle weakness and atrophy, contracture, adaptive shortening and potential adhesions. Proper stretching and range of motion can counteract many of these negative forces and should be taken very seriously. There are many different types of stretching, but for our purposes, we are going to focus on static-passive stretching. With this, you are going to place your dog's leg in a position (i.e., flexed or extended) and then hold it for 15 seconds. NOTE: It is important to understand that stretching is different from the passive range of motion exercises, because stretching involves gentle forcing of the tissue beyond its normal range of motion.

The Benefits of Stretching:

- Increases flexibility of joints
- Increases extensibility of muscle, tendons, and surrounding joint tissue
- Counteracts contracture forces



How to perform Stretching:

Like passive range of motion exercises, it is best to perform proper stretching while your dog is lying on its side. Effort should be made to have your dog as relaxed as possible during stretching. Make sure to properly support the leg above and below the knee. Gently manipulate the knee to the COMFORTABLE end of its normal range of motion in flexion. At the end you are going to apply JUST A TOUCH more pressure and HOLD this position for 15 seconds. Then allow the limb to return to a neutral position for 15 seconds. Repeat for a total of 10 times. Do this for both flexion and extension.

Refer to the week-by-week protocol to determine how often this modality should be performed. Good stretching should be incorporated at least 3 times/week.

Strengthening Exercises

Slow Controlled Leash Walks

Sit-to-Stand

Slow Controlled Hill Walks

Stairs

Swimming



Slow Controlled Leash Walks

The Indications for Slow Controlled Leash Walks:

There is a very large misconception about what a short controlled leash walk means. It does NOT mean clipping on the retractable leash and heading out for a leisure walk. What it does mean is that your dog must be kept on a short lead (i.e., very close to your body), so that you have complete control over your dog. These short, **SLOW** walks are no doubt one of the **MOST IMPORTANT EXERCISES** to be performed during the early recovery period. By walking **SLOWLY** you will be encouraging your dog to use the affected limb in a very careful manner. Too much activity during the initial phase of recovery can be detrimental, but walking for short distances is beneficial to keeping the muscles strong and the joints lubricated. Short walks are a positive emotional reward for the dog as well. Being upright and on all four limbs can do wonders to improve your dog's mood!

The Benefits of Slow Controlled Leash Walks:

- Encourages use of affected limb
- Decreases disuse atrophy
- Increases strength
- Decreases pain

How to perform Slow Controlled Leash Walks:

Use the pictures provided as a guideline for what is considered a short lead. Initially, the walks will be for elimination only. As time progresses, so will the duration of the necessary walks. It is very important to praise your dog when it is using the limb while walking. This will encourage your dog to use it normally. It is best to use a traditional leash instead of a retractable. Your dog should not be more than an arms length away.

Refer to the week-by-week protocol to determine how often this modality should be performed.



Sit-to-Stand (Puppy Squats)

The Indications for Sit-to-Stand:

This is a great exercise to perform at home, because in addition to strengthening the hind leg muscles, the Sit-to-Stand exercise will also improve overall range of motion of the hip, knee and hock joint. In order to gain the full benefit of this exercise, it requires practicing proper form. It is important to try to make this exercise as fun as possible and therefore should involve some treats and a positive emotional reward from you.

The Benefits of Sit-to-Stand:

- Strengthens and builds muscle mass of the major hind leg muscle groups
- Improves overall range of motion

How to perform Sit-to-Stand:

Ask your dog to sit in order to evaluate his form. Prior to and after surgery, many dogs will often sit with one leg out or lean to one side. They do this because they are experiencing discomfort or, for some dogs, that is just the way they have always sat.

Proper Sitting should be "Square" with both legs flexed and equally positioned under the dog's body.



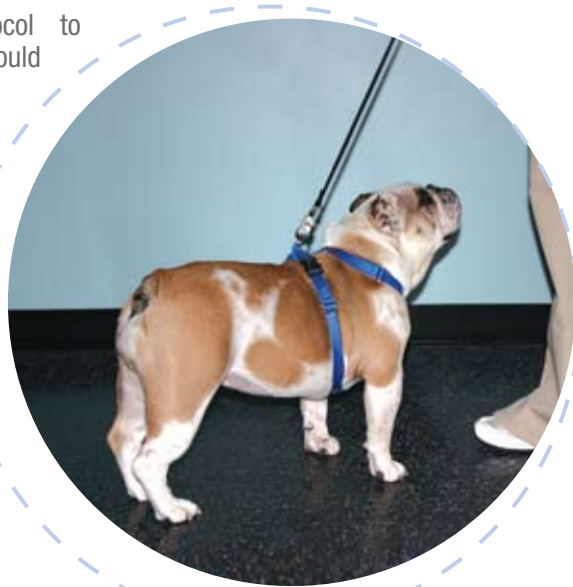
Proper Standing from the sit position should involve an equal push from both hind legs. Do not expect perfection the first time or even after the tenth time. Consistent repetition and practice, along with encouragement for proper form are the keys to success.

Refer to the week-by-week protocol to determine how often this modality should be performed.

Tip #1: Make sure you have good treats and remember it is not quantity, but quality that matters. Your dog will get the same joy out of a treat from you no matter the size. Tiny pieces are just as good, and are healthier for your dog.

Tip #2: Ask your dog to sit, wait 2-3 seconds and step back then ask him to come to you and sit again. Repeat. Best to perform outside or in a room with rugs.

Tip #3: If your dog sits with improper form you can perform this exercise with your dog standing along side a wall, with the affected limb on the inside. Remember that proper form is the most important aspect of this exercise. Therefore, if your dog only makes it down half way before compromising good form, then this is your starting point. Have your dog start to sit and then when you see the form change, have him stand immediately. Eventually, you will get your dog to sit squarely all the way down.



Slow Controlled Hill Walks

The Indications for Slow Controlled Hill Walks:

Walking on hills or slopes is a wonderful exercise to strengthen your dog's hind limbs. When walking up a hill, the majority of a dog's weight is shifted to the rear legs. This will increase weight bearing on the affected leg significantly. Therefore, this is a great strengthening exercise for the four major muscle groups of the hind legs. Walking uphill also improves hip and knee extension. Walking downhill is more difficult because it requires more flexion/extension of the hip, knee, and hock joint. In this way, it, too, is beneficial.

It is also beneficial to walk your dog perpendicularly across the hill with the affected leg on the downward side of the hill. This will force the dog to put a greater amount of weight on the affected leg.

The grade of the hill is a factor but any hill or slope can be used with caution. Watch your dog for signs of discomfort if you suspect the hill to be too steep and only do a portion of the hill or slope if it seems too long.

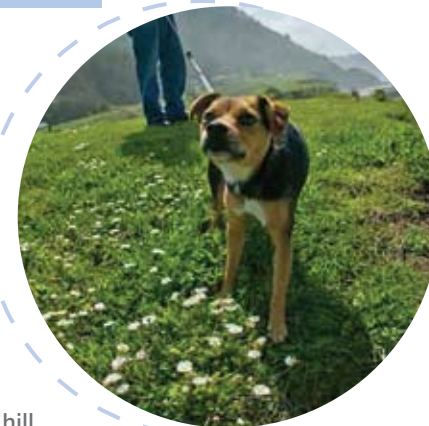
The Benefits of Slow Controlled Hill Walks:

- Encourages use of affected limb
- Decreases disuse/muscle atrophy
- Increases strength
- Rebuilds lost muscle mass
- Improves range of motion

How to perform Slow Controlled Hill Walks:

1) Uphill and Downhill:

Use a SHORT LEAD and walk SLOWLY up the hill. Make sure to closely observe that your dog is bearing weight on the affected leg. The slower you walk, the more likely your dog will put weight on it. Do the same while going downhill.



2) Walking Sideways:

Bring your dog halfway up the hill and stop. Turn your dog so the affected leg is closer to the bottom of the hill. Let your dog stand in this position for a minute or so before beginning the walk. Keep your dog on a SHORT lead and SLOWLY walk across the hill. Perform the horizontal walking exercise only after your dog has accomplished going up and down the hill several times

Refer to the week-by-week protocol to determine how often this modality should be performed.

NOTE

These are advanced exercises that should be performed only after your dog is able to walk on uneven surfaces with proper weight bearing.



Stairs

The Indications for Stairs:

Utilizing stairs as a therapeutic exercise can be extremely beneficial. At the same time, incorporating them too early post-op can also be dangerous and compromise your dog's recovery. Incorporating stairs into therapy should only be done after your dog is consistently and confidently using the limb during walking. Similar to the Sit-to-Stand exercise, climbing stairs utilizes all the major hind leg muscle groups. It also works on extension and flexion of the hind limbs.

The Benefits of Stairs:

- Strengthens and builds muscle mass of all major hind leg muscle groups
- Improves flexibility
- Improves overall range of motion

How to perform Stairs:

Whether you are utilizing stairs inside your home, in your apartment building, or outside at the park, it is going to be extremely important to have full control of your dog. Using the same techniques as the short controlled leash walks, you are going to walk up the stairs alongside your dog. Initially, attention should be on proper placement and comfort level of the affected leg.



Warning

At no time should your dog be allowed to go up or down stairs without supervision. When you are not there to help, the stairs should remain off limits. It is very easy for a dog to slip, fall, and re-injure itself. If your dog cannot be controlled walking up or down stairs, do not perform this exercise.

Refer to the week-by-week protocol to determine how often you should perform this modality.



Swimming

The Indications for Swimming:

Swimming is a fantastic overall exercise. It is very beneficial to the cardiovascular system, increases muscle strength and girth, improves range of motion, and helps with weight loss. Water is very soothing to muscles as well. However, swimming does have a larger impact on the joint flexion and range of motion than walking on a surface. For this reason, swimming should not be performed until weeks 8-12 of your dog's recovery and/or until your veterinarian approves this exercise.

The Benefits of Swimming:

- Increases muscle strength/girth
- Increases ROM
- Increases flexion/extension
- Increases cardiovascular strength
- Is very soothing to muscles and joints
- Provides a form of no impact exercise



How to perform Swimming:

Swimming can be performed as long as your veterinarian approves it in a controlled environment. This should be done in a pool and under direct supervision. Your dog should be lifted into and out of the water and held in place or allowed to swim with assistance for about two to five minutes. Your dog should not be allowed to jump into or out of the water. Your local canine rehabilitation facility is a great place to perform this exercise. Keep in mind that in the beginning, your dog may only be able to swim steadily for about two minutes. Swimming is a hard exercise; do not overdo it!

Refer to the week-by-week protocol to determine how often this modality should be performed.

Balance and Proprioceptive Exercises

The Indications for Balance and Proprioceptive Exercises:

Balance and proprioception are two closely related concepts.

Balance is your dog's ability to keep his body weight centered over its base of support. If too much weight is displaced away from the center of its body, your dog can lose its balance and possibly fall down.

Proprioception, on the other hand, is the dog's ability to know what position/orientation its legs and paws are in when standing and walking. Through a series of complicated neurologic connections, small sensors located within the joints relay messages to the brain about where the forelimbs and hind limbs are at all times. The brain then controls the muscles to help move the legs in order keep the body balanced. In humans, intact proprioception decreases the likelihood of us tripping, falling, and even twisting our ankles.

Proprioception loss in dogs can lead to slight dragging of the limb when trying to walk, tripping, decreased coordination, or improperly placing the foot down when stepping. Proprioception is usually diminished after surgery because the dog is not putting the injured leg down on the ground normally.

Activities that challenge your dog's balance are important for retraining proprioception. The surgically repaired leg will not only grow stronger as weight is placed onto it, but will also learn to sense what type of surfaces the foot is standing on. Although these exercises may look simple, they are actually quite challenging for your dog.

The Benefits of Balance and Proprioceptive Exercises:

- Increases proprioception for standing and walking properly
- Increases balance
- Increases coordination
- Encourages limb use
- Indirectly increases strength and stability of the limb



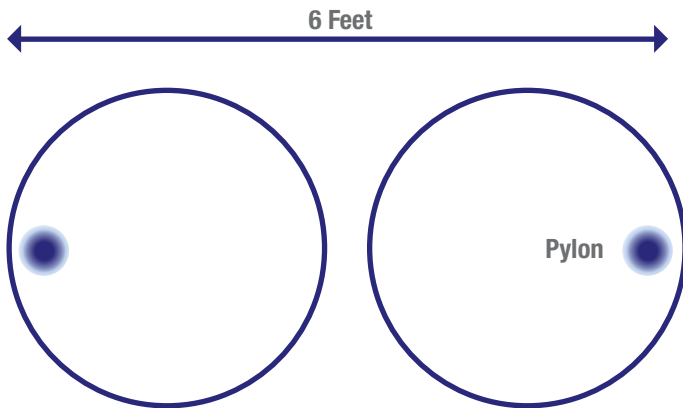
How to perform Balance and Proprioceptive Exercises:

1) Weight Shifting:

This simple and safe exercise can be performed both early on in your dogs recovery and continued with throughout their recovery. Weight shifting has many benefits but for our purpose it is to encourage weight bearing on the surgery leg. While standing over top of your dog's hind end you want to gently rock their hips back and forth slowly. Early on if your dog is not putting any weight on the leg there is no point in attempting this exercise. Once they are toe touching you can begin with this exercise. It is important to be gentle and rock evenly in both directions.

2) Figure 8s:

On a leash, slowly walk your dog in a Figure 8 pattern. This will encourage weight shifting to both sides, and challenge balance reactions when the Figure 8 turns are performed. Start with very wide turns and, over time, tighten the turns.



3) Outdoor Obstacles:

Use your imagination with this one, e.g., walking over tree branches, walking on mulch instead of grass, walking on gravel, over a garden hose or Hula hoops, etc.

Refer to the week-by-week protocol to determine how often this modality should be performed.

Additional Rehabilitation Modalities

Underwater Treadmill:

Underwater Treadmill Therapy provides the ability to strengthen muscles while minimizing stress on the joints and bones through the buoyancy of the water. In addition to building and strengthening muscles, the warm water environment helps to increase overall flexibility and range of motion. There is a tremendous amount of variability to an underwater treadmill, including speed, water depth, jet resistance, and adjustable incline.

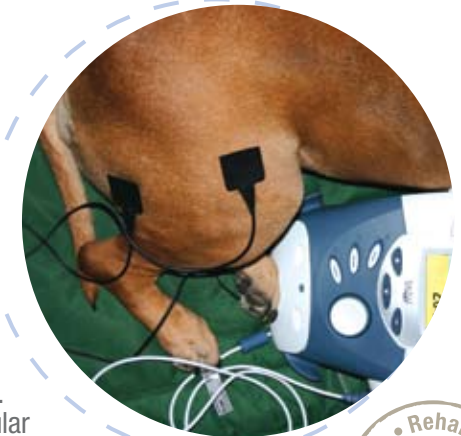


Current Pool Swimming:

Swimming builds physical strength and cardiovascular stamina without adding stress to arthritic and injured joints and tendons. Swimming prevents disuse muscle atrophy and is extremely beneficial for improving joint mobility and health.

Electrical Stimulation:

Electrical Stimulation (E-Stim) is the delivery of low-level electrical current, which results in muscle contraction and stimulation of superficial nerve fibers. E-Stim is used therapeutically for pain management, to prevent muscle atrophy following surgery or injury and to increase muscle strength. It is also used for neuro-muscular regeneration.



Therapeutic Ultrasound:

Therapeutic ultrasound is the use of sound waves for deep-tissue healing. This is great for musculoskeletal injuries including joint motion-limiting conditions, chronic arthritis, and various soft tissue injuries such as muscle strains, muscle tears or tendon injuries. The benefits are increased localized circulation, increased range of motion, increased wound healing time, decreased scar tissue, and decreased inflammation and pain.

Agility Course Work:

A variety of other modalities are often utilized for strengthening and balance/proprioceptive exercises such as balance boards, wobble boards, ladders, cavaletti poles, Thera-Bands and, land treadmills.



Home therapy Booklet Worksheet



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WEEK 2

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