

# HAMSTRING STRAIN



## ■ ■ ■ Description

Hamstring strain is characterized by inflammation and pain in the back of the thigh along the hamstring muscles. There are three muscles that comprise the hamstring muscle group, going from the hip or upper thigh across the back of the knee to the leg. This structure is important for bending the knee, straightening the hip, and helping stabilize the knee. It is also important for running and jumping. These tendons feel like ropes in the back of the knee. This is the most common injury of the thigh.

Hamstring strains are usually grade 1 or 2 strains. A *grade 1 strain* is a mild strain. There is a slight pull without obvious tearing (it is microscopic tearing). There is no loss of strength, and the muscle-tendon unit is the correct length. A *grade 2 strain* is a moderate strain. There is tearing of fibers within the substance of the muscle or tendon or where the tendon meets the bone or muscle. The length of the muscle-tendon unit may be increased, and there is usually decreased strength. A *grade 3 strain* is a complete rupture.

## ■ ■ ■ Common Signs and Symptoms

- Pain, tenderness, swelling, warmth, or redness over the hamstring muscles at the back of the thigh
- Pain that worsens during and after strenuous activity
- “Pop” often heard in the area at the time of injury
- Muscle spasm in the back of the thigh
- Pain or weakness with running, jumping, or bending the knee against resistance
- Crepitation (a crackling sound) when the tendon is moved or touched
- Bruising in the thigh 48 hours following the injury
- Loss of fullness of the muscle or area of muscle bulging with complete rupture

## ■ ■ ■ Causes

- Strain from overuse or sudden increase in amount or intensity of activity
- Single violent blow or force to the back of the knee or the hamstring area of the thigh

## ■ ■ ■ Risk Increases With

- Sports that require quick starts (sprinting or running races and other track events (racquetball, badminton))
- Sports that require jumping (basketball and volleyball)
- Kicking sports and waterskiing
- Contact sports (soccer or football)
- Poor physical conditioning (strength and flexibility), including muscle imbalance
- Inadequate warm-up before practice or play
- Previous thigh, knee, or pelvis injury
- Poor technique
- Poor posture

## ■ ■ ■ Preventive Measures

- Appropriately warm up and stretch before practice or competition.
- Maintain appropriate conditioning:
  - Cardiovascular fitness
  - Thigh and hip flexibility
  - Muscle strength and endurance
- Use proper technique and posture.
- Wear proper protective equipment (knee or thigh pads).

## ■ ■ ■ Expected Outcome

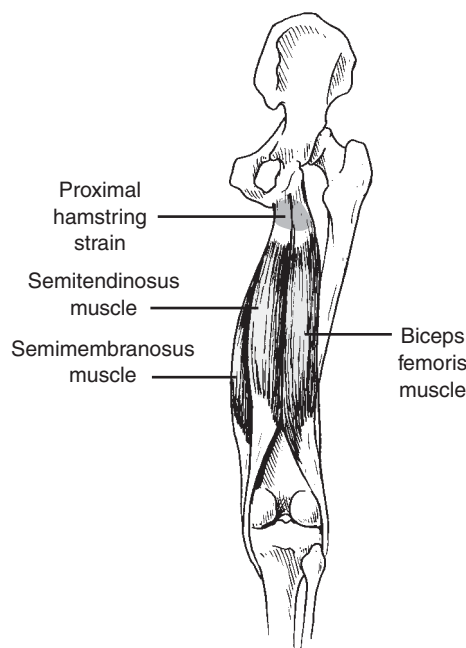
This condition is usually curable within 2 to 6 weeks if treated appropriately.

## ■ ■ ■ Possible Complications

- Prolonged healing time if not appropriately treated or if not given adequate time to heal
- Chronically inflamed tendon, causing persistent pain with activity that may progress to constant pain
- Recurrence of symptoms if activity is resumed too soon
- Proneness to repeated injury (in up to 25% of cases)

## ■ ■ ■ General Treatment Considerations

Initial treatment consists of medication and ice to relieve the pain, stretching and strengthening exercises (primarily straightening the knee), and modification of the activity that



**Figure 1**

From Shankman GA: Fundamental Orthopaedic Management for the Physical Therapy Assistant. St. Louis, Mosby Year Book, 1997, p. 203.

initially caused the problem. These all can be carried out at home, although referral to an athletic trainer or physical therapist for further evaluation and treatment may be helpful. An elastic bandage or neoprene (made of swimsuit-like material) sleeve may help reduce swelling and keep the muscles warm, alleviating symptoms. Crutches may be recommended, if the strain is severe and the athlete is limping, until the pain and inflammation settle down, usually for the first 24 to 72 hours. Surgery is necessary to reattach muscle-tendon if it pulls off bone (uncommon). Suturing or sewing torn muscle is usually not successful.

### ■ ■ ■ Medication

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take for the first 3 days after injury or within 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Topical ointments may be of benefit.
- Pain relievers may be prescribed as necessary by your physician. Use only as directed.
- Injections of corticosteroids may be given to reduce inflammation, although not usually for acute injuries.

### ■ ■ ■ Heat and Cold

- Cold is used to relieve pain and reduce inflammation. Cold should be applied for 10 to 15 minutes every 2 to 3 hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

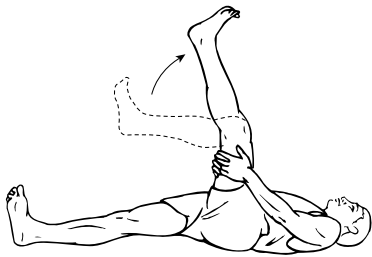
### ■ ■ ■ Notify Our Office If

- Symptoms get worse or do not improve in 2 weeks despite treatment
- New, unexplained symptoms develop (drugs used in treatment may produce side effects)

➤ **RANGE OF MOTION AND STRETCHING EXERCISES** • Hamstring Strain

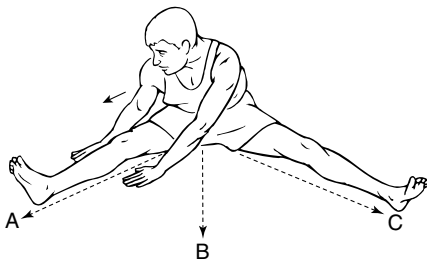
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or until your symptoms are resolved. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt.



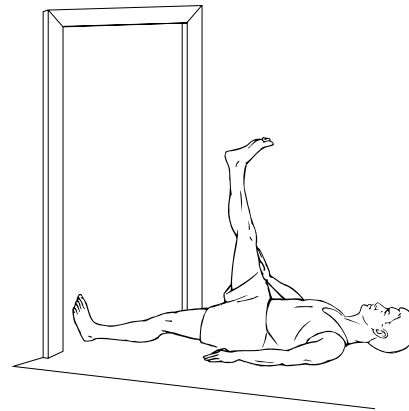
**FLEXIBILITY** • Hamstrings

1. Lie on your back with your leg bent and both hands holding on to it behind the thigh as shown.
2. Your hip should be bent to **90 degrees** and the thigh pointing straight at the ceiling.
3. Straighten out your knee as far as you can. Keep your thigh pointing straight toward the ceiling.
4. Keep the other leg flat on the floor.
5. Hold this position for \_\_\_\_\_ seconds.
6. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.



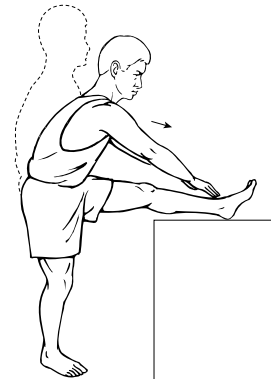
**FLEXIBILITY** • Hamstrings/Adductors, V-Sit

1. Sit on the floor with your legs spread as wide as possible in front of you. Your knees must be straight.
2. Lean over one leg with both hands. Keep your chest upright and reach for your toes. (Position A)
3. Hold this position for \_\_\_\_\_ seconds. Relax and return to your starting position.
4. Now reach forward between your legs. (Position B)
5. Repeat for Position C.
6. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.



**FLEXIBILITY** • Hamstrings, Doorway

1. Lie on your back near the edge of a doorway as shown.
2. Place the leg you are stretching up the wall, keeping your knee straight.
3. Your buttock should be as close to the wall as possible and the other leg should be kept flat on the floor.
4. You should feel a stretch in the back of your thigh.
5. Hold this position for \_\_\_\_\_ seconds.
6. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.



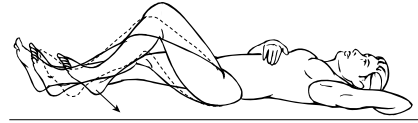
**FLEXIBILITY** • Hamstrings, Ballet

1. Stand and prop the leg you are stretching on a chair, table, or other stable object.
2. Place both hands on the outside of the leg you are stretching.
3. Make sure that your hips/pelvis are also facing the leg you are stretching.
4. Slide your hands down the outside of your leg.
5. Lead with your chest/breast bone. Keep your chest upright and back straight. Do not hunch over at the shoulders. Keep your toes pointing up.
6. You should feel a stretch in the back of your thigh.
7. Hold this position for \_\_\_\_\_ seconds.
8. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.

**> STRENGTHENING EXERCISES • Hamstring Strain**

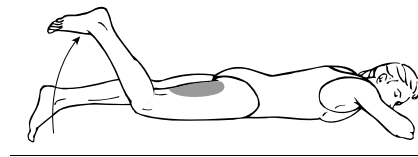
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or until your symptoms are resolved. Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.



**STRENGTH • Hamstring, Isometrics**

1. Lie on your back on the floor or a bed.
2. Bend your knee approximately \_\_\_\_\_ degrees.
3. Pull your heel into the floor or bed as much as you can.
4. Hold this position for \_\_\_\_\_ seconds. Rest for \_\_\_\_\_ seconds.
5. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.

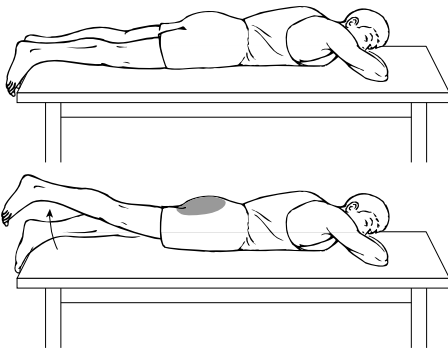


**STRENGTH • Hamstring, Curls**

1. Lie on your stomach with your legs out straight.
2. Bend knee to 90 degrees. Hold this position for \_\_\_\_\_ seconds.
3. Slowly lower your leg back to the starting position.
4. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.

**Additional Weights: OK TO USE DO NOT USE!!!**

**If okay'd by your physician, physical therapist, or athletic trainer, a \_\_\_\_\_ pound weight may be placed around your ankle for additional weight.**



**STRENGTH • Hip Extension**

1. Lie on your stomach with your legs straight out behind you.
2. Raise your leg up behind you from your hip. Keep your knee straight. Hold this position for \_\_\_\_\_ seconds.
3. Slowly lower your leg to the starting position.
4. Repeat exercise \_\_\_\_\_ times, \_\_\_\_\_ times per day.

Notes:

(Up to 4400 characters only)

Notes and suggestions