

# Knee Sprains and Strains

**Description:** Knee pain is often caused by ligament sprains, muscle strains, or irritated/damaged cartilage. These can be a result of a traumatic injury or stress over time.

- **Injuries:** Trauma, falls, or sports injuries can produce forces that tear, over stretch or compress the joint or the soft tissue.
- **Overuse:** Advancing too quickly in your sport or activity can overwhelm the body's ability to adjust and may lead to muscular fatigue and joint strain.
- **Muscular Weakness/Imbalance:** Muscles that are too weak for the demand and cannot support the joint may become injured or cause other muscles to strain to compensate.
- **Decreased Flexibility:** Tight muscles or restricted joint motion can lead to functional weakness or compressive force at the joint.
- **Posture:** Poor posture especially locking the knees and over pronation (flattened arches) of the feet can increase the stress around the knee.
- **Incorrect Footwear:** Shoes that are too worn or not suitable for your sport, body type, or feet can result in increased knee stresses.

## **Treatment:**

When injury occurs, appropriate rehabilitation is necessary to avoid re-injury and prevent chronic problems from developing. Here are some things to consider when rehabilitating your knee.

### 1) Control swelling

Follow the **RICE** principle:

**Rest-** Give your knee time to heal. Stop all activities that cause pain.

**Ice-** Use a bag of crushed ice or frozen peas for 20 minutes, 4 times a day.

**Compression-** An elastic bandage can provide support and reduce swelling.

**Elevate-** Elevate your knee above your heart to help reduce swelling.

### 2) Encourage pain free movement & flexibility (Figures 1-3)

- After an injury your knee may get stiff. Early movement will help regain your range of motion and decrease muscle weakness. Stretching helps maintain flexibility which also protects the joint.
- Weight bearing helps joints to heal. The goal is to be weight bearing as soon as possible without a limp. It may be necessary to use crutches or a cane at first to allow pain free walking and allow the swelling to diminish.

### 3) Strengthen and develop support for the injured knee (Figures 4-6)

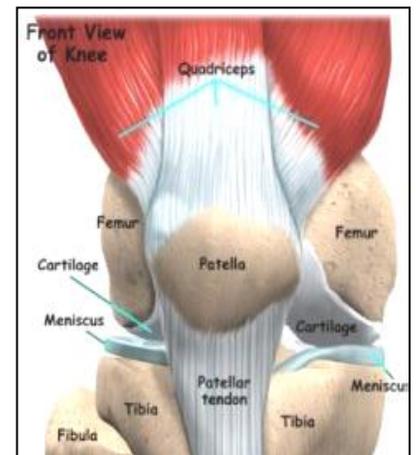
- The muscles about your knee must be strong before you return to your activities. Simple exercises can be done as shown on the back of the page. When appropriate exercises can be progressed with weight, elastic bands or weight machines.

### 4) Prevention

- Build your leg strength with a conditioning program appropriate for your sport or activity. Physical Therapists or Athletic Trainers can help you with specific exercises.
- Warm up before practice or competition. Stretch regularly, especially hamstrings, quads, calves & hip muscles.
- Wear appropriate shoes for the sport and your dimensions. Change running shoes after 300-500 miles.
- Increase your activity level no more than 5-10% per week and only 1 factor (intensity/speed, distance/duration, flat/hills) at a time (e.g. don't increase speed and distance simultaneously).

### 5) Return to sport or activity

- Before returning to your sport or activity you should be able to perform the specific movements required without pain (e.g. squatting, running, side to side motions, cutting & jumping).



*If your symptoms do not resolve within 2-4 weeks please contact your clinician.*



**UNIVERSITY HEALTH SERVICES** Tang Center  
>PHYSICAL THERAPY



# Knee Exercises



## Self Mobilization (Fig. 1)



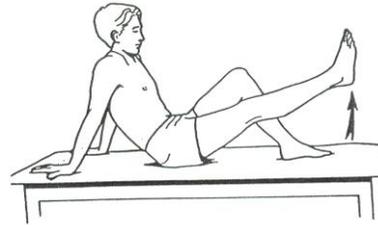
With good leg underneath involved leg, slowly straighten legs, hold then lower.

Hold: 10 seconds

Repeat: 10 times



## Quad Strengthening (Fig. 4)



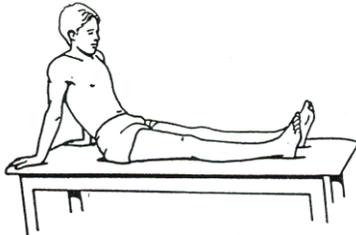
Tighten the muscles on the front of thigh and straighten the knee without locking it backwards. Maintain position while you lift the thigh about 12".

Hold: 10 seconds

Repeat: 3 sets of 10



## Quad Sets (Fig. 2)



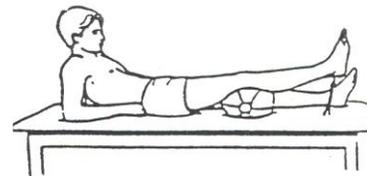
Tighten the muscles on the front of your thigh and straighten the knee without locking it backwards.

Hold: 10 seconds

Repeat: 10 times



## Short Arc Quads (Fig. 5)



Tighten the muscles on the front of your thigh. Straighten your knee while maintaining it on the ball or towel roll.

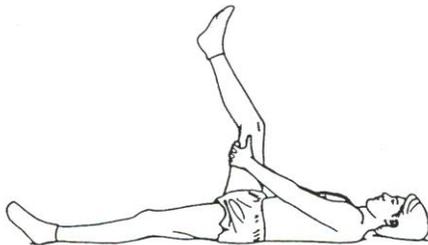
Hold: 10 seconds

Repeat: 3 sets of 10

**Stop if you feel pressure or pain in the knee**



## Hamstring Stretch (Fig. 3)



Pull the thigh towards your chest to about 90°. Straighten the knee until you feel a stretch in the back of your thigh.

Hold: 15 seconds

Repeat: 10 times



## Hamstring Curl (Fig. 6)



While keeping your thigh vertical, bend your knee to 90°. After holding, lower slowly.

Hold: 10 seconds

Repeat: 3 sets of 10

**Stop any exercise that increases your symptoms**