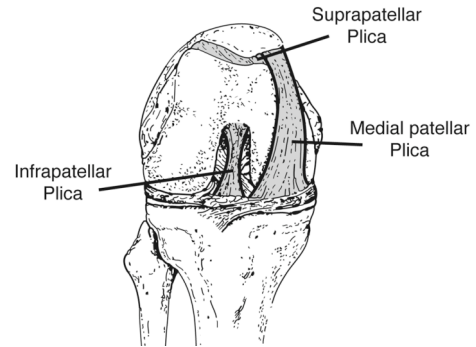


## PLICA SYNDROME

### Description

The plica is a fold of joint lining (synovial tissue) that is a remnant of tissue from embryologic development. During embryologic development, bands of tissue divide the limbs into joints. These bands may persist into adulthood in up to 60% of people, although it infrequently causes symptoms. Several different band types may exist. These bands may become thickened and inflamed, causing varying symptoms.



From Scuderi GR, McCann PD, Bruno PJ: Sports Medicine: Principles of Primary Care. St. Louis, Mosby, 1997, p. 370

### Common Signs and Symptoms

- Pain in the front of the knee, often toward the inside of the knee, especially with kneeling, squatting, sitting for long periods, arising from a sitting position, or walking or running up or down stairs or hills.
- Catching, locking, and clicking of the knee
- Pain and tenderness under the kneecap (patella)

### Causes

Trauma to the knee, either direct or with repetitive knee bending and straightening activity, causes thickening of the plica, and it loses its elasticity (becomes less stretchy). As a result, the plica pinches on the inner knee joint (medial femoral condyle) and inner patella. The pain is felt to be due to the pinching or pulling of the plica band, which has many nerve endings.

### Risk Increases With:

- Sports that require repeated, forceful straightening or bending of the knee (such as kicking and jumping)
- Repeated injuries to the knee
- Sports in which the knee may receive direct injury (volleyball, soccer, football) or that require prolonged kneeling

### Preventative Measures

- Proper padding can reduce direct injury to the fat pad
- Allow complete recovery before returning to sports

### Expected Outcome

Usually there is complete recovery with proper treatment

### Possible Complications

- Frequent recurrence of symptoms, resulting in chronically inflamed tissue and eventually a chronic problem

- Disability severe enough to diminish an athlete's competitive ability
- Delayed healing or resolution of symptoms, particularly if activity is resumed too soon
- Risks of surgery, including infection, bleeding, injury to nerves (numbness, weakness, paralysis), continued pain and pinching of the fat pad, and rupture of the patellar tendon

### **General Treatment Considerations**

Initial treatment consists of medications and ice to relieve pain and reduce inflammation, stretching and strengthening exercises (of the hamstrings and the quadriceps), and modification of the activity that produces the symptoms. These may be carried out at home, although occasionally referral to a physical therapist or athletic trainer may be indicated. Occasionally your physician may recommend an injection of cortisone to reduce the inflammation of the plica. Arch supports may also be recommended. Surgery is not usually necessary; it is usually reserved for cases in which symptoms persist despite conservative treatment. Surgery to remove the plica is usually performed arthroscopically on an outpatient basis (you go home the same day)

### **Medications**

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take within 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur
- Topical ointments may be of benefit
- Stronger pain relievers may be prescribed as necessary by your physician, usually only after surgery. Use only as directed and only as much as you need
- 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 for acute and chronic cases. 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 physicians, physical therapist, or athletic trainer. Use a heat pack or a warm pack soak.

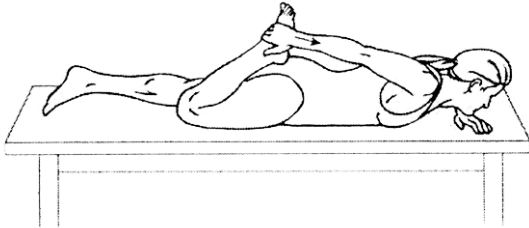
### **Notify Our Office If:**

- Symptoms get worse or do not improve in 2 weeks despite treatment
- Any of the following occur after you have surgery:
  - You experience pain, numbness, or coldness in the foot and ankle
  - Blue, gray, or dusky color appears in the toenails
  - You develop increased pain, swelling, redness, drainage, or bleeding in the surgical area
  - Sign of infection occur (headache, muscle aches, dizziness, or a general ill feeling with fever)
  - New, unexpected symptoms develop (drugs used in treatment may produce side effects)

## Range of Motion and Stretching Exercises

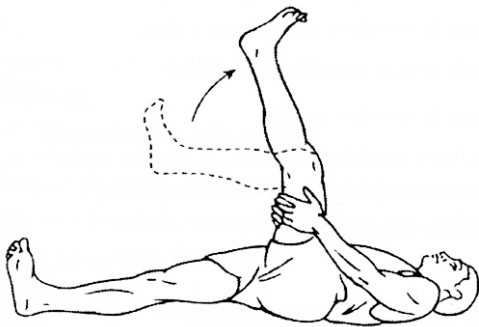
These are some of the *initial* exercises you may start with until you see your physician, physical therapist, or athletic trainer again, or until your symptoms are resolved. Please remember:

- 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



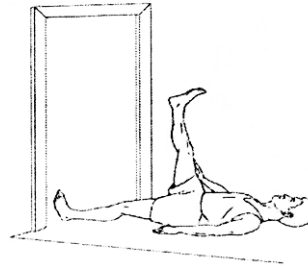
### Stretch – Quadriceps, Prone

1. Lie on your stomach as shown
2. Bend your knee, grasp your toes, foot, or ankle. If you are too “tight” to do this, loop a belt or towel around your ankle and grasp that.
3. Pull your heel toward you buttock until you feel a stretching sensation in the front of your thigh
4. Keep your knees together
5. Hold this position for 30 seconds
6. Repeat exercise 2 times, 2 times per day



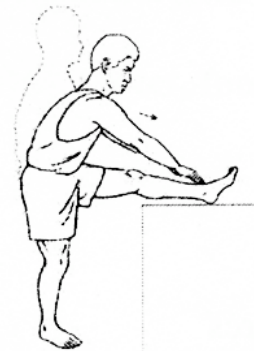
### Flexibility – Hamstrings

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 pointed straight toward the ceiling
4. Keep the other leg flat on the floor
5. Hold this position for 30 seconds
6. Repeat exercise 2 times, 2 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 30 seconds
6. Repeat exercise 2 times, 2 times per day



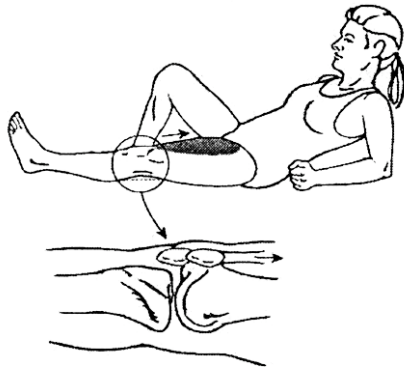
### Flexibility – Hamstrings, Ballet

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. Lead with your chest. Keep your chest upright and back straight. Do not hunch over at the shoulders. Keep your toes pointing up
5. You should feel a stretch in the back of your thigh
6. Hold this position for 30 seconds

## Strengthening Exercises

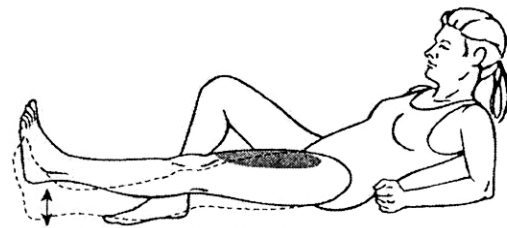
These are some of the *initial* exercises you may start with until you see your physician, physical therapist, or athletic trainer again, or until your symptoms are resolved. Please remember:

- 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.



### Stretch – Quadriceps, Isometrics

1. Lie flat or sit with your leg straight
2. Tighten the muscle in the front of your thigh as much as you can, pushing the back of your knee flat against the floor. This will pull your kneecap up your thigh, toward your hip.
3. Hold the muscle tight for 30 seconds
4. Repeat this exercise 2 times, 2 times per day



### Strength – Quadriceps, 7 count

**The quality of the muscle contraction in this exercise is what counts most, not just the ability to lift your leg**

1. Tighten the muscle in front of your thigh as much as you can, pushing the back of your knee flat against the floor
2. Tighten this muscle **harder**
3. Lift your leg/heel 4 to 6 inches off the floor
4. Tighten this muscle **harder again**
5. Lower your leg/heel back to the floor. Keep the muscle in front of your thigh as tight as possible
6. Tighten this muscle **harder again**
7. Relax
8. Repeat exercise 3 times, 2 times per day



### Strength – Quadriceps, Short Arcs

1. Lie flat or sit with your leg straight
2. Place a 4 inch foam roller under your knee, allowing it to bend
3. Tighten the muscle in the front of your knee as much as you can, and lift your heel off the floor
4. Hold this position for 30 seconds
5. Repeat exercise 2 times, 2 times per day