



### SYMPTOMS

#### Pain

- Along the medial (inner) aspect of the kneecap or just below the kneecap
- When using stairs or going up/down hills
- Worse after prolonged sitting with the knees bent
- More of a dull ache
- Cracking or grating in the knee
- Eventually, knee may want to "catch" and may feel like it wants to give out

### DEFINITION

- Softening of the cartilage on the patella (kneecap)
- Roughening of the cartilage under the patella caused by the kneecap not tracking properly (patella does not glide smoothly over the femur/thigh bone)
- May also be referred to as Chondromalacia Patella
- One of the most common knee problems in running and other sports (may occur at any age)

### PRIMARY CAUSES

#### Excessive Pronation

- Pronation is a normal movement of the foot, that allows the arch to flatten to a degree, which helps the body to absorb shock and adapt to different ground surfaces.
- In analyzing one's gait, first contact is on the heel and outside of the foot, followed by a shift of body weight forward, toward the arch and toes.
- If the foot is weak or tired and/or the footwear is not supportive, then the arch can flatten more than normal, which is excessive pronation.
- Flattening of the arch (excessive pronation) increases stresses on the foot, which can further contribute to ankle, knee, hip and low back problems (a chain reaction).
- This repetitive, excessive pronation, is the main contributor to many lower extremity, overuse injuries

### CONTRIBUTING FACTORS

- Mechanical conditions including wide hips (females) knock knees, patella alta (high patella) and subluxating patella.
- Over pronation of the foot.
- Weakness of the quad, especially the VMO (Vastus Medialis Oblique Muscle) which runs along the inner aspect of the thigh and connects at the knee
- Overuse, or an increase in hill running or stair use
- Too large of a Q-angle at the knee (this is the angle of quad muscles effective pull on the kneecap). Less than 12 degrees is normal and greater than 15 degrees is abnormal

### TREATMENT - ADVICE GIVEN MOST OFTEN IN CURRENT LITERATURE

The 3 S's - Supporting, Stretching, and Strengthening, along with ICE and REST, have been found to be the simplest and most effective for these injuries.

- Supporting the foot with proper shoes and insoles, can prevent or help to eliminate the vast majority of lower extremity problems due to faulty biomechanics. One of the easiest and most effective solutions is to add a simple over the counter insole that provides forgiving support for both the arch and heel.
- Stretching of the hamstring, quad, calf and IT Band will help to decrease pressure at the kneecap.
- Strengthening of the quad, especially the VMO (vastus medialis oblique muscle) will help the kneecap to glide more correctly through the groove at the knee joint.
- Avoid downhill running or going up/down stairs.
- Avoid exercises done with the knee bent unless being done as an isometric
- Physical Therapy including exercise, ultrasound, iontophoresis and patellar mobilization

**THE FOLLOWING ARE A FEW HELPFUL EXERCISES. CHECK WITH YOUR DOCTOR FOR SPECIFICS ON YOUR CONDITION AND WHAT YOU SHOULD, OR SHOULD NOT DO FOR YOUR PROBLEM.**

#### QUAD STRETCH

Lay on side.  
Bend top leg and hold ankle/foot.  
Pull heel towards buttocks.  
(Stretch should be felt on the front of thigh)



#### HAMSTRING STRETCH

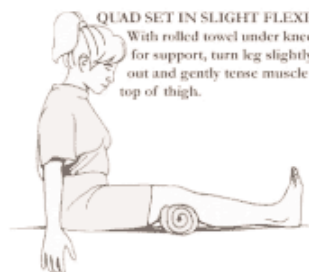
Lay on back.  
Clasp hand behind knee. Straighten knee as far as possible



(Stretch should be felt in back of thigh).

#### QUAD SET IN SLIGHT FLEXION

With rolled towel under knees for support, turn leg slightly out and gently tense muscle on top of thigh.



#### GASTROC STRETCH

Keep back leg straight, heel on floor with foot turned slightly outward. Lean toward wall until stretch is felt in calf.

