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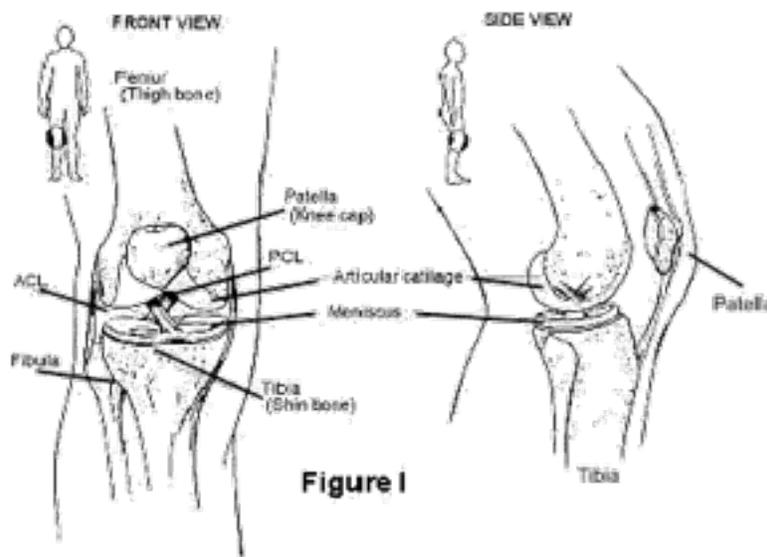
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**PATIENT GUIDE TO  
PATELLOFEMORAL PAIN SYNDROME  
“ANTERIOR KNEE PAIN”**

***WHAT IS PATELLOFEMORAL PAIN SYNDROME (PFPS)?***

Patellofemoral pain syndrome (PFPS) is a term used to describe pain originating from the region of the patella (kneecap) and femur (thigh bone) [Figures I & II]. It is an extremely common entity and probably the most common complaint of athletes and nonathletes presenting to the physicians who take care of knee problems. It is especially common in soldiers, and recent military recruits. Other names for this syndrome include: retropatellar pain, anterior knee pain, and chondromalacia patellae. None of these terms accurately describe the cause of this pain, which remains elusive and poorly understood.



***WHAT ARE THE SIGNS AND SYMPTOMS OF PFPS?***

Patients with patellofemoral pain syndrome describe pain primarily in the front of their knees. It may be unilateral or bilateral. Patients describe pain with stair climbing and especially going down the stairs. They frequently experience pain with prolonged sitting (watching a movie, riding on an airplane) and feel that they have to occasionally straighten their legs out to decrease discomfort. The pain is usually exacerbated by squatting and kneeling. It is generally an aching pain, but can become

sharp in nature and even be associated with a burning sensation. On occasion, patients may describe a sense that their knee may give out on them (pseudo giving way). This occurs particularly when going down the stairs. The onset of symptoms is frequently associated with the start of a new activity or increase in level of intensity of a pre-existing activity.

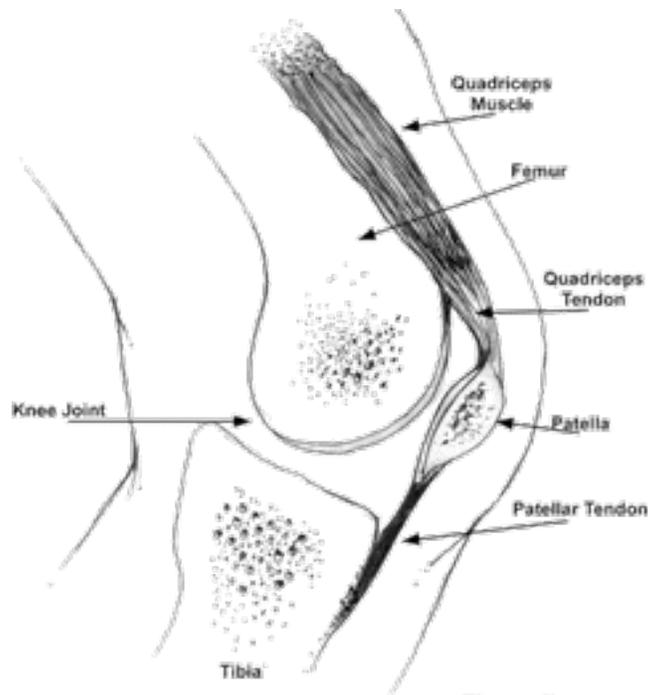


Figure II  
Side View of Knee Joint

### ***WHAT CAUSES PFPS?***

The differential diagnosis of anterior knee pain is extensive and includes prepatellar bursitis, patellar and quadriceps tendinitis, patellofemoral arthrosis, patellar subluxation and dislocation, knee ligamentous and meniscal pathology and rarely soft tissue and bony tumors. In the past, this entity was called "chondromalacia". Chondromalacia specifically means abnormal softening of the articular cartilage on the undersurface of the patella. This diagnosis requires direct surgical observation and therefore should not be used synonymously with patellofemoral pain syndrome.

With knee flexion and extension, the patella glides through a groove in the distal femur called the trochlea. When the bones in the lower leg are not lined up ideally, it can cause the gliding between the patella and femur to become abnormal. This "malalignment" can lead to overloading of the cartilage, generally on the out side of the knee. This abnormal lateral tracking can be painful and lead to accelerated wear between the surfaces of the bones. Eventually, the protective articular cartilage surface over the bone can wear away, leading to arthritic degeneration.

A dramatic example of maltracking between the patella and femur is patellar dislocation or subluxation (partial dislocation). These events are typically traumatic and may be caused either by an indirect mechanism (typically twisting of the body) or by a direct blow. Often a single instability episode becomes the precursor for recurrent instability episodes, particularly when the limb is malaligned to begin with.

Several anatomic and congenital factors may lead to a predisposition towards patellofemoral pain and/or instability. Tightness of the quadriceps muscles, hamstrings and iliotibial band, and relative weakness of the quadriceps muscle are probably the most common causes. Other factors that can contribute to this problem include femoral anteversion (excessive rotation of the hips), tibial torsion (excessive rotation of the shin bone), genu valgum (knock knees), genu recurvatum (hyperextended knee) and excessive pronation (flat feet).

### ***HOW IS PFPS TREATED?***

Treatment for patellofemoral pain syndrome involves a combination of activity modification, anti-inflammatory modalities and a comprehensive stretching and strengthening program. Surgical intervention is rarely necessary and is generally reserved for cases of recalcitrant instability or symptomatic malalignment.

To the extent that patellofemoral symptoms are caused by a change in activity level, or exacerbated by specific activity, activity modification is the mainstay of treatment. Treatment of acute onset of patellofemoral pain syndrome from a specific event, such as running a marathon or initiating a new exercise program, is relatively straightforward. In general, this would involve an initial period of rest, ice, over-the-counter anti-inflammatories and a slow, gradual resumption of activities in a progressive manner.

Chronic, recalcitrant patellofemoral pain syndrome is much more difficult to treat. It can be a frustrating problem for physicians and patients alike. The mainstay of treatment for chronic patellofemoral pain syndrome is a combination of quadriceps strengthening exercises in addition to quadriceps, hamstring and iliotibial band stretching exercises. It is often helpful to refer patients to a physical therapist for one or two sessions of hands-on instruction in the appropriate exercise program. Occasionally, electric stimulation, biofeedback and McConnell taping techniques are useful. Prolonged physical therapy with modalities such as ultrasound is generally not helpful or cost effective. Orthotics to correct pes planus and soft braces with patellar cut-outs may be indicated and provide modest symptomatic relief in selected cases.