Anatomy:
The Patella (kneecap) is the moveable bone on the front of the knee, and it is wrapped inside a tendon that connects the large muscles on the front of the thigh to the tibia (shin bone) in the lower leg. The large quadriceps muscle ends in a tendon that inserts into the tibial tubercle, the bony bump at the top of your shin just below the patella. The tendon and the patella make up the extensor or quadriceps mechanism.

Tightening up the quadriceps muscles places a pull on the tendons of the quadriceps mechanism. This action causes the knee to straighten. The patella acts like a fulcrum to increase the force of the quadriceps muscles. The long bones of the femur (thigh bone) and tibia (shin bone) act as lever arms, placing force or load on the knee joint and surrounding soft tissues. The amount of load can be quite significant.

Causes/Mechanism of Injury:
Patellar tendonitis occurs most often as a result of stresses placed on the supporting structures of the knee. Running, jumping and repetitive knee flexion into extension (i.e. rising from a deep squat) contributes to this condition. Overuse injuries from sport activities is the most common cause but anyone can be affected, even those who do not participate in sports or recreational activities.

Outside/Extrinsic Factors:
- Inappropriate footwear
- Training errors – frequency, duration, intensity
  - Too much, too far, too fast, too long
- Surface or ground used for sport or event

Internal/Intrinsic Factors:
- Age
- Growth Spurts
- Flexibility
- Joint Laxity
- Malalignment of foot, ankle and leg
  - Increased Q-Angle – the angle formed by the patellar tendon and the axis of pull of the quadriceps muscle. Varies among sexes and is larger in women compared to men.
    - Angles more than 15° create more of a pull on the tendon, creating painful inflammation
  - Femoral Anteversion – a condition in which the femoral neck leans forward with respect to the rest of the femur, causing the leg to rotate internally (the knee and foot are twisting inward).
- Flat foot position
• Tracking abnormalities of patella
• Rotation of the tibia (tibial torsion)
• Leg length difference
• Muscle Imbalance – from the hip down the toes can impact the quadriceps muscle and affect the joint.

Symptoms:
Pain is usually located in the section of your patellar tendon between your kneecap (patella) and the area where the tendon attaches to your shinbone (tibia). The pain is most noticeable when moving the knee or trying to kneel. During physical activity, the pain may feel sharp, while after activity the pain may persist as a dull ache.

The pain in your knee may:
• Initially be present only as your begin physical activity or just after an intense workout
• Increase as you step up the intensity of your activity
• Progress to be present before, during and after physical activity
• Make going up and down stairs painful
• Become a constant ache that can make it difficult to sleep at night

Treatment/Management:
Most patients see improvement and relief with conservative non-operative treatment. This aims to reduce the strain on your tendon and then gradually build up the tendons strength. This can be accomplished with several techniques along with physical therapy.