The anatomy of the knee

Tendons are strong cords of fibrous tissue that attach muscle to bones. The kneecap (patella) is attached to the quadriceps muscles at the top by the quadriceps tendon. The patella is attached at the bottom to the shinbone (tibia) by the patella tendon.

Both of these tendons work with the muscles in the front of your thigh (Quadriceps) to straighten your leg.

Tendinopathy

Tendinopathy means pain from a tendon it does not mean damage to the tendon although some structural changes may be seen. Tendinopathies are most often overuse injuries that have a gradual onset of pain; although they can also develop following a direct blow to the tendon.

Prolonged and repetitive stresses (e.g. exercise) on a tendon can result in a reaction in the tendon causing pain and sometimes swelling/thickening. This is a normal reaction that the body uses to reduce load on the tendon and does not mean it is damaged.

In the patella and quadriceps tendon, tendinopathies often occur following a period of increased activity such as a change in work or a new hobby, or in people who run or do sports, a change in training schedule.

What are the symptoms of Patella / Quadriceps tendinopathy?

Both of these problems tend to be aggravated by prolonged activities such as climbing/descending stairs; squatting; jumping or running. They can cause a build-up of pain during an activity. In some cases they give no pain during activity, but give pain sometime after the activity is stopped.

How is Patella / Quadriceps tendinopathy diagnosed?

You should expect your clinician to ask about your symptoms so they can understand how your problem affects you. They will perform a physical assessment where they test the movements and strength of your knee and look at tasks/movements you find difficult or painful. They may also assess other joints such as your hip and ankle and will likely assess the length of the muscles around your knee.
Are x-rays or scans needed?

X-rays are not helpful to diagnose this condition as tendons do not show up on them. Sometimes if your pain came on suddenly after a fall or other incident an ultrasound or magnetic resonance imaging (MRI) scan is requested.

What is the treatment for Patella / Quadriceps tendinopathy?

Tendons have a long healing process but most people who stick with tendon rehabilitation exercises will get back to their normal activity levels. Initial management is to try to reduce the actions that irritate your pain, for example if you go running you should reduce the speed or distance of this so that you do not feel worse after doing it.

Pain medication such as paracetamol can help manage your symptoms although should be combined with a graded exercise programme to rehabilitate your tendon.

There is poor evidence for patellar braces and a corticosteroid injection is not indicated in this condition.

Other types of injection and very occasionally surgery are used to try to help this condition however appropriate exercise is the most effective way to get better.

Self help exercises

Exercises should focus on increasing the strength of the quadriceps and its tendons as well as hip muscle strength, and sometimes flexibility of structures surrounding your knee such as your hamstrings; calf muscles and quadriceps muscles.

Start the program with the first stage exercises and progress onto the second stage when squatting/siting down slowly onto a chair, or going up/down stairs becomes pain free or just uncomfortable.

Once you have started the second phase keep going with the first phase exercises on the days you do not do the second phase ones.

If you have had this problem for a long time it may take 6-12 weeks to see significant improvement, so do not give up if you are not seeing benefit in the first few weeks.
First stage exercises

Main Exercise

**Type of exercise:** Static

**Reason to do this:** If squatting or stairs are painful. This exercise will help with pain and tendon strength.

**What to do:**
- 5 lots of 45 second holds in a bent knee position (see pictures).
- 2-3 times a day

**Progress to**
- Static mini squat with band or belt to allow you to squat back. Bend knees and hold.
- Progress to more knee bend as pain allows.
- It's okay for the exercise to be uncomfortable but it should not be very painful and you should not feel worse after doing it.

Assistance Exercise

**Type of exercise**

**Reason to do this**
- To strengthen the hip muscles that support the knees.

**What to do**
- 3 lots of as many lifts as you can do once a day.

- **Bridging** - Lie on your back with your knees bent at 45-90 degrees.
- Tighten your buttock muscles to push your hips up as in the picture.
- Hold for 2 seconds then slowly lower back to the ground.

- **Clam** - Lie on your side with knees together and bent up to 90 degrees.
- Keep heels together while lifting the upper knee as high as possible without moving you pelvis.
- Hold for 2 seconds then slowly lower back to the start.
**Second stage exercises**

**Main Exercises**

**Type of exercise:** Movement

**Reason to do this:** Once you can do a squat or step up with little pain.

**What to do:**

- 3 lots of 15 lifts per exercise. Taking 2-3 seconds to lower & 2-3 seconds to stand up.
- 3 non-consecutive days a week.
- Single leg dip / squat – Stand on one leg, bend knee and lower slowly to 90 degrees of knee bend. Hold onto something for balance if needed.
- If 15 lifts are too easy then add weight, by holding something heavy in each hand.
- Chair Squats – Stand in front of a chair, slowly lower yourself until your bottom just touches the chair then stand back up slowly keeping your knees over your feet.
- If 15 lifts are too easy then add weight
- Your therapist may also give you a resistance band to tie around your legs to make your hip muscles work more.

**Assistance Exercise**

**Type of exercise:** Movement

**Reason to do this:** To further strengthen the hip muscles that support your knee.

**What to do:**

- 3 lots of as many steps as you can manage.
- 3 non-consecutive days a week.
- X-band walks – Standing on an exercise band, cross band in front of body and then with a small squat, walk forwards keeping feet just beyond hip width apart.