

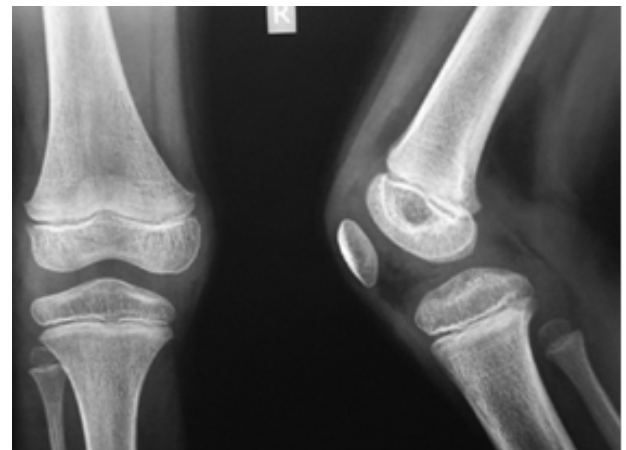
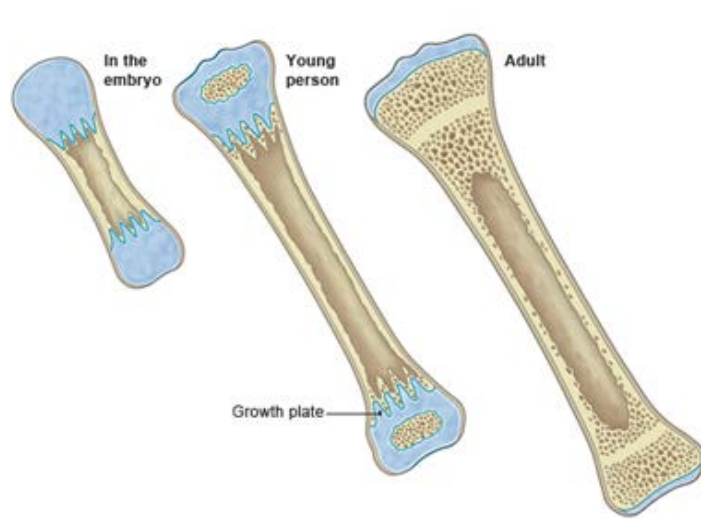
Adolescent Anterior Knee Pain

What is Adolescent Anterior Knee Pain?

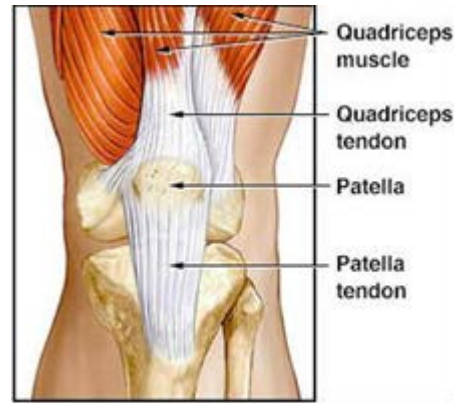
Anterior knee pain (AKP) is an umbrella term used to describe pain felt at the front of the knee or around the knee cap (patella). It can occur for a number of reasons but in under 18's is most often related to growth and growth spurts.

A long bone such as your femur (thigh bone) grows in length at either end in regions called growth plates. Growth occurs when cartilage cells divide and increase in number in these growth plates. These new cartilage cells push older, larger cartilage cells towards the middle of a bone. Eventually, these older cartilage cells die and the space they occupied is replaced with bone. When a bone has reached its full size, its growth plates are converted into bone (1).

Long bones showing growth plates



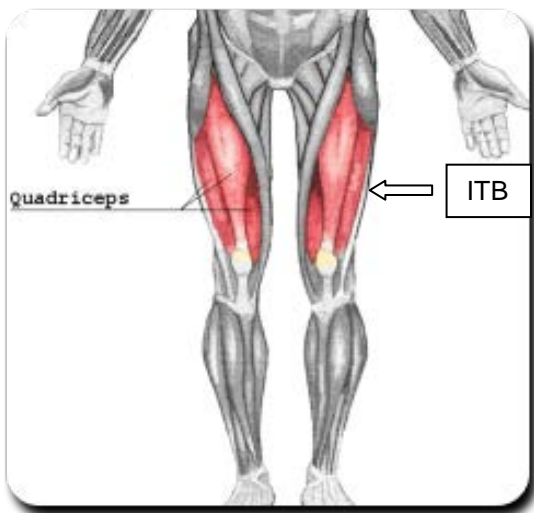
The average growth rate is 2 to 3 inches, or 7 to 8 centimetres, per year. When this growth of bone occurs all the surrounding soft tissues (muscle, ligament, tendons etc) need to stretch over the new length of bone. Sometimes if the bone growth is very quick or you use your muscles a lot by doing running and jumping sports the muscles can't fully stretch. When this happens the muscles pull at their tendons (tissues that attach muscle to bone) and cause knee pain.



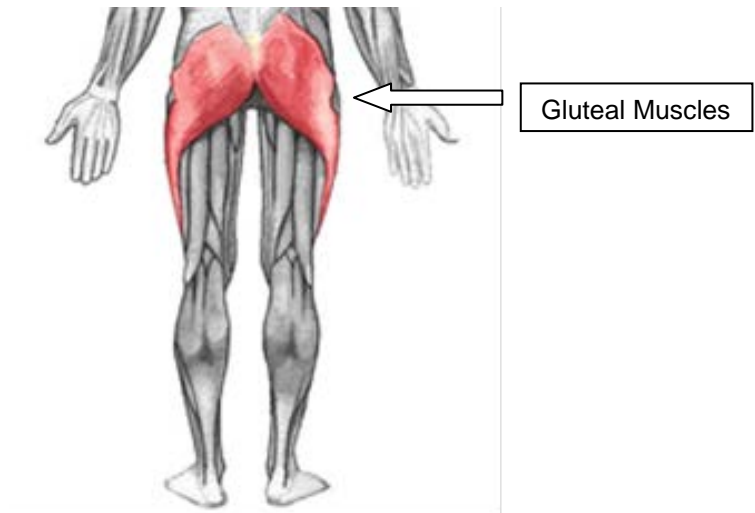
Knee joint – front view

Another factor that contributes to the pain is weakness of the muscles on the inside of your knee and around your buttocks. This weakness means other muscles have to work harder to give your hip and knee strength and so pull even more and increase your pain.

The structures that are most affected by tightness are called your quadricep muscles and iliotibial band (ITB) and the ones most affected by weakness are your gluteal muscles.



Leg muscles – front view



Leg muscles – back view

What are the symptoms of Adolescent Anterior Knee Pain?

The most common symptoms of AKP are pain around the knee cap (patella) and clicking on movement. Symptoms are often aggravated by prolonged activity such as walking, sports or sitting and can often be worse first thing in the morning and towards the end of the day.

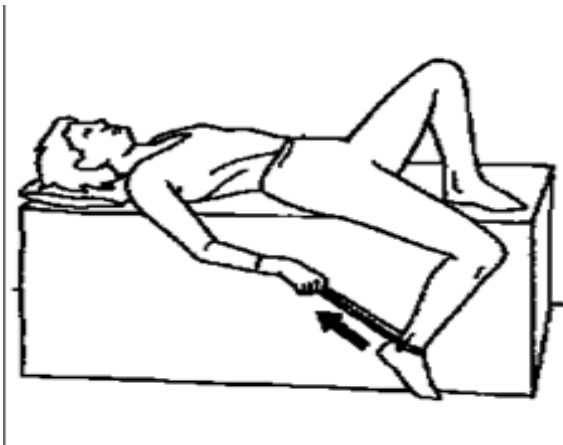
There is seldom anything to be done surgically for this condition and x-rays and scan are usually normal. The typical treatment for this condition is a course of physiotherapy exercises although the symptoms will commonly resolve once growth has stopped (16 years old for girls and 17 for boys).

Physiotherapy for Adolescent Anterior Knee Pain

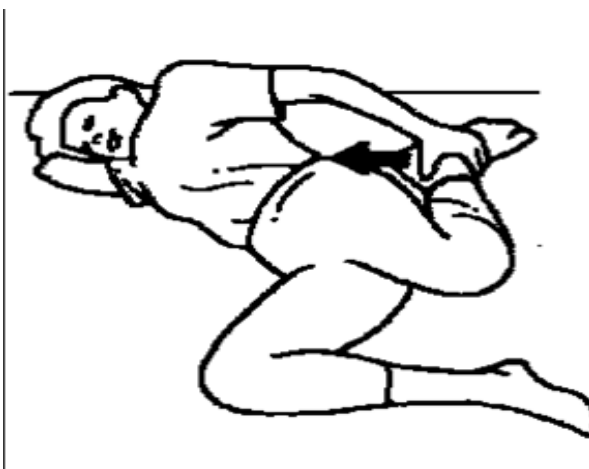
The best way to resolve this problem is to stretch the tight muscles and strengthen the weak ones as shown in this leaflet.

These exercises should be completed 3 times a day every day and should also be done before sport. It is normally advised that you do these exercises when you wake up, when you come back from school and then before you go to bed in the evening. This should cause the muscle weakness and tightness to resolve and allow the knee to move freely and effectively.

Exercises 1 & 2 – Quadriceps (thigh) stretches



- Lie on your back on a bed/table.
- Bend your knees and drop one leg over the side of the bed. Hold onto your ankle or a towel/band around your ankle.
- Gently draw your foot towards your buttock. You should feel the stretch in the front of your thigh.
- Hold for 30 seconds. Repeat 3 times a day



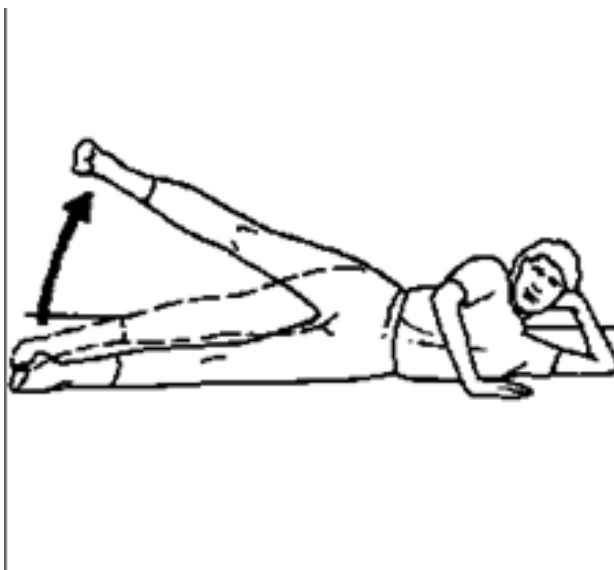
- Lie on your side with your legs bent.
- Take hold of your ankle, if you cannot comfortably reach your ankle then hold your trousers or put a towel/belt around your ankle, and gently draw your foot towards your buttock.
- You should feel the stretch in the front of your thigh.
- Hold for 30 seconds and repeat 3 times a day.

Exercise 3 - Thigh muscle exercise



- Sit with your knees and hips at 90° about a shoulder width apart. Put both hands (as fists) between your knees.
- Pull your toes up towards the ceiling and then squeeze your knees together.
- You should feel muscles tightening along the inside of your thigh/knee.
- Hold for 5 seconds.
- Repeat 5 times, 3 times a day.

Exercise 4 – Hip muscle exercise



- Lie on your side supporting yourself on your elbow, roll your top hip slightly forward and support yourself on your arm.
- Keep the top leg straight and your toes pointing down towards the floor/bed slowly lift your leg up towards the ceiling (leading with your heel). Make sure your leg stays in line with your body and then slowly return to the starting position.
- Next repeat the exercise with your leg slightly in front of you.
- Finally repeat the exercise with your leg behind you (make sure you roll your body further forwards when doing this).
- You should feel this working in your buttocks if not then you need to check the position of your foot and make sure your toes are pointing downwards.
- Repeat the exercise in each position 5-10 times, 3 times a day.

How quickly will my exercises start to make a difference?

Usually you won't feel any noticeable difference for at least 3 weeks, but your knee should start to feel normal again after about 8 weeks. If you find the exercises increase your knee pain or it hurts your knee to do them then you should stop doing them. If the exercises fail to work you should see your Consultant or GP to ask for a referral to physiotherapy for a more in depth assessment and individualised treatment programme.

How soon will I be able to return to normal activities?

If you are experiencing severe pain or you find that the exercises aren't being effective it is advisable to stop all sports for a few weeks whilst your body adapts to the growth and allow the muscles time to stretch. After a few weeks slowly reintroduce the exercises and sport and pace your return to previous level.

Sources of information

(1) <http://www.bbc.co.uk/science/humanbody/body/factfiles/bonegrowth/femur.shtml>

(2) http://www.childrenshealthnetwork.org/CRS/CRS/pa_growthpr_pep.htm

Important information

The information in this leaflet is for guidance purposes only and is not provided to replace professional clinical advice from a qualified practitioner.

Disclaimer

Please note this is a generic ESHT information sheet. If you have specific questions about how this relates to your child, please ask your doctor. Please note this information may not necessarily reflect treatment at other hospitals.

Your comments

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Hand hygiene

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After reading this information are there any questions you would like to ask? Please list below and ask your nurse or doctor.

Reference

Written by Lucy Allinson, Paediatric MSK Physiotherapist

The following clinicians have been consulted and agreed this patient information:

MSK Physiotherapy Paediatric special interest group

Mr Adrian Butler-Manuel, Consultant Orthopaedic Surgeon

Mr Kenneth Ross, Paediatric Consultant Orthopaedic Surgeon

Miss J Dartnell, Consultant Paediatric Orthopaedic Surgeon

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Responsible clinician/author: Jessica Pitman, Paediatric MSK Physiotherapist

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