



GUIDELINES FOR PEDIATRICIANS

ANTERIOR KNEE PAIN IN YOUNG ATHLETES

Issue 7

American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

Anterior knee pain describes chronic pain in any part of the extensor mechanism of the knee, including the quadriceps, patella, patellar tendon, and knee joint. This distinguishes it from structural knee pain, which is an acute, traumatic injury of the knee and implies damage to the knee's internal structure (acute damage to bones, ligaments, and cartilage). The syndromes of anterior knee pain include Osgood-Schlatter disease, patellofemoral pain syndrome, jumper's knee, and others. Because acute injury can occur in an athlete with underlying chronic knee pain, proper diagnosis is important in light of the quite different management of the 2 pain subgroups.

Despite their differing etiologies, anterior knee pain syndromes share some of the same historical, physical examination, and radiologic features. In addition, they also share the same initial nonoperative approach to management.

Doctor: This side of "Sports Shorts" is for your use; flip side is for photocopying and giving to your patient

	Anterior Knee Pain	Structural Knee Pain
History	<ol style="list-style-type: none"> 1. Pain is usually of gradual, insidious onset. There is sometimes a history of exacerbation with recent injury, but usually a history of pain before the injury can be elicited. 2. Pain is often associated with some preceding factor, such as recent rapid growth, hyperpronation of the foot, recent change in exercise intensity or duration, or recent change in equipment, shoes, running surface, etc. 3. The pain is worst at the start and completion of exercise. It is frequently relieved with rest. 4. Pain is often exacerbated by going up (and sometimes down) stairs, navigating hilly terrain, and keeping the knee flexed at 90° (the "classroom" or "theatre" sign). 5. There is no history of true locking, although a history of "giving way" is sometimes found. 	<ol style="list-style-type: none"> 1. Usually presents as acute pain in a previously normal knee or as a significant exacerbation or change in quality of an ongoing knee pain. 2. Pain is associated with an acute injury, sometimes with a history of hearing or feeling an audible "pop" or "crack." 3. Pain starts at the time of injury. It is often continuous pain that is not relieved with rest. 4. Pain usually precludes keeping the knee flexed or going up or down stairs. 5. Occasionally, true locking (often a sign of osteochondritis dissecans, meniscal injury, or ligament tear). "Giving way" or an unstable feeling of the knee is also common.
Physical Examination	<ol style="list-style-type: none"> 1. All can give some mild swelling, but true effusion is very rare. 2. Tenderness is often present at the tibial tuberosity or inferior pole of the patella or with patellar compression. Pain may be vague in character. 3. There is no loss of range of motion. 4. Hip range of motion should be normal. All cases of knee pain in children require careful evaluation of the hip, because referred hip pain can be a cause of knee pain. 	<ol style="list-style-type: none"> 1. Persistent or recurrent knee effusion can be present (often a sign of patellar dislocation, anterior cruciate ligament tear, or intra-articular fracture). 2. Tenderness can be present anywhere (especially deep) in the knee and is often present at the site of underlying pathology. Tenderness of the femoral condyles or joint line, with the knee flexed to 90°, suggests osteochondritis dissecans and demands radiographic evaluation. 3. There is loss of range of motion—painful flexion/extension. 4. Slipped capital femoral epiphysis often presents as referred pain in the knee (usually in obese males during early adolescence—8 to 14 years of age).
Radiography	<ol style="list-style-type: none"> 1. Radiography is usually only needed if osteochondritis dissecans is suspected or pain does not resolve with conservative treatment. 	<ol style="list-style-type: none"> 1. Radiography is usually needed to rule out fracture or epiphyseal injury.

Treatment of Anterior Knee Pain

- Rest, ice, nonsteroidal anti-inflammatory drugs until pain free (for initial symptomatic relief).
- Encourage cross-training (swimming, biking, water running, etc) to maintain cardiovascular fitness.
- Stretching and flexibility of quadriceps, hamstrings, and calves (see other side).
- Strengthening of quadriceps (quad sets, etc) (see other side).
- Consider benefits of physical therapy modalities (electrical stimulation, ultrasound, etc), gait assessment (orthotics), soft tissue treatments (patellar mobilization or taping), or bracing in certain clinical settings.
- Evaluate for hyperpronation and/or adequate footwear.

Reason for Orthopedic Referral

- 1) Features are consistent with structural knee pain.
- 2) There is persistent or recurrent knee swelling.
- 3) There is locking, instability, or restricted joint motion.
- 4) There is no improvement in 4 to 6 weeks of rehabilitation.

Patient may return to play if

- 1) Pain during activity is gone by the next morning.
- 2) There is no limping during running (tested in the office).
- 3) No ice or pain medication is needed before activity.
- 4) There is no swelling.
- 5) Comfortable in a squatting ("catcher's") stance (shows a full range of motion).

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GUIDELINES FOR PARENTS, COACHES, AND ATHLETES (KNEE PAIN)

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Rehabilitation activities are an essential part of therapy for the relief of knee pain and return to athletic activity. Rehabilitation involves several important parts.

Pain relief

It is very important to relieve the initial knee pain for comfort and to enable the performance of other rehabilitation exercises. Ice is effective in controlling pain and swelling after sports and after rehabilitation exercises. A bag of ice chips or frozen vegetables can be placed over the knee for 10 to 20 minutes, or water can be frozen in a paper cup and portion of the cup can be torn away to rub the ice over the knee. Ibuprofen can help ease pain and inflammation and can be used in the short term for pain relief after activity. Elevation of the knee above the level of the heart can also relieve swelling after activity.

Stretching

Knee pain often results from a decrease in flexibility in the quadriceps (front of the thigh), hamstring (back of the thigh), and calf (lower leg) muscles. Stretching these muscles is essential to help prevent or decrease future knee pain. Stretching should be done after warming the muscles with gentle exercise or soaking in a warm tub. Stretching should not be forced.



HAMSTRING STRETCHES

- A. Place foot on a raised surface. Reach for toes and gently work on straightening leg.
- B. Draw knee up to chin and hold while laying on back. Keep other leg straight. *(not pictured)*



QUADRICEPS STRETCHES

- C. While standing, grab ankle and pull toward buttocks.
- D. While standing, grab ankle with opposite hand and pull towards buttocks.



CALF STRETCHES

- E. Stand 2 feet from a wall, and keep back leg straight while bending front leg, and lean toward the wall.

Strengthening

Knee pain can be associated with a decrease in the size and strength of the quadriceps, and this muscle must be strengthened to allow return to optimal activity. Strengthening should be done several times a day and should not cause much pain.



STRAIGHT LEG LIFT

To do straight leg lifts, sit on the floor with your legs stretched out in front, and lean back on your elbows. Bend your left knee so the heel is next to your right leg and your left foot is flat on the floor. Tighten your right thigh so the knee is tight and stiff. When the thigh muscle is tight, lift your right leg straight up into the air until your knees lightly touch. Hold this position for 5 seconds, and then slowly lower your leg, keeping the knee stiff. Repeat 10 times, and then switch legs. Try to do 3 sets of 10 repetitions, alternating legs. Weight can later be added to the ankle to progress exercises.

See your doctor if

- 1) The pain is a result of a sudden injury during practice or play. See your doctor as soon as possible or go directly to an emergency department.
- 2) You have persistent pain lasting until the morning after activity.
- 3) There is a lot of swelling or a limit to range of motion of the knee.
- 4) True "locking" of the knee (unable to straighten it) occurs.
- 5) There is no improvement after the first 4 weeks of therapy or worsening during the first 2 weeks.

You may return to play if

- 1) Pain during activity is gone by the next morning.
- 2) There is no limping (interferes with normal protective reflexes).
- 3) You can bend and straighten the knee completely.
- 4) There is no noticeable swelling.
- 5) No ice or pain medication is needed before activity.

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