

Montefiore Pediatric Orthopedic and Scoliosis Center

Children's Hospital at Montefiore

Norman Otsuka MD – Eric Fornari MD

Jacob Schulz MD – Jaime Gomez MD – Christine Moloney PA

3400 Bainbridge Avenue, 6th Fl, Bronx, NY 10467 phone 718 920 2060 / fax 718 920 7799

1250 Waters Place, 11th Fl, Bronx, NY 10461

OSGOOD-SCHLATTER DISEASE

(Osteochondrosis, Apophysitis of the Tibial Tubercle)



■ ■ ■ Description

Osgood-Schlatter disease is characterized by inflammation of the growth plate of the leg just below the knee at the tibial tubercle, a prominence just below the kneecap. The tibial tubercle is the bony attachment on the large bone of the lower leg (tibia) of the big, powerful thigh muscle (quadriceps). The growth plate is an area of relative weakness, and injury to it occurs due to repeated stress or vigorous exercise. It is a temporary condition of the tibial tubercle that is uncommon after age 16.

■ ■ ■ Common Signs and Symptoms

- A slightly swollen, warm, and tender bump below the knee
- Pain with activity, especially straightening the leg against force (stair climbing, jumping, deep knee bends, or weight-lifting) or following an extended period of vigorous exercise in an adolescent. In more severe cases, pain occurs during less vigorous activity.

■ ■ ■ Causes

Osgood-Schlatter disease results from stress or injury to the tibial tubercle growth plate (which is still developing during adolescence), causing a flare-up. Repeated stress or injury interferes with development, causing inflammation.

■ ■ ■ Risk Increases With

- Overzealous conditioning routines, such as running, jumping, or jogging
- Being overweight
- Boys between 11 and 18
- Rapid skeletal growth
- Poor physical conditioning (strength and flexibility)

■ ■ ■ Preventive Measures

- Lose weight or maintain ideal body weight.
- Appropriately warm up and stretch before practice or competition.
- Maintain appropriate conditioning:
 - Muscle strength
 - Flexibility and endurance
 - Cardiovascular fitness
- Exercise moderately, avoiding extremes.
- Use proper technique.

■ ■ ■ Expected Outcome

Mild cases can be resolved with a slight reduction of activity level, whereas moderate to severe cases may require significantly reduced activity and, occasionally, immobilization for 3 to 4 months.

■ ■ ■ Possible Complications

- Recurrence of the condition in adulthood, with symptomatic bone fragments below the affected knee (ossicle)

- Persisting prominence (bump) below the kneecap

■ ■ ■ General Treatment Considerations

Initial treatment consists of medications and ice to relieve pain, stretching and strengthening exercises (particularly of the quadriceps and hamstrings), and modification of activities. Specifically, kneeling, jumping, squatting, stair climbing, and running on the affected knee should be avoided. The exercises can all be carried out at home for acute cases. Chronic cases often require a referral to a physical therapist or athletic trainer for further evaluation or treatment. Uncommonly, the affected leg may be immobilized for 6 to 8 weeks with a reinforced elastic knee support, casting, or a splint. A patellar band (a brace between kneecap and tibial tubercle on top of the patellar tendon) may help relieve symptoms. Surgery is recommended in the growing patient in the rare situation of failed conservative treatment. Surgery is occasionally necessary after skeletal maturity if the ossicle becomes painful.

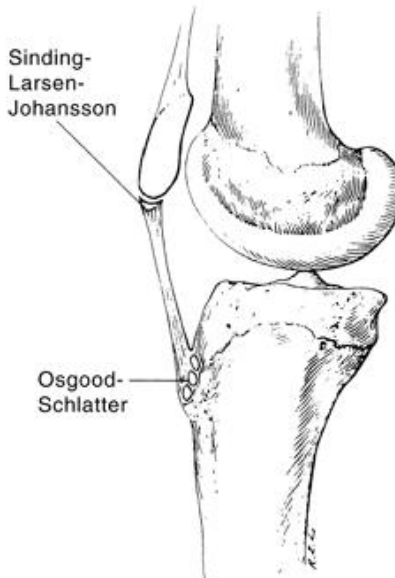


Figure 1

From Miller MD, Cooper DE, Warner JJP: Review of Sports Medicine and Arthroscopy. Philadelphia, WB Saunders, 1995, p. 61.

■ ■ ■ Medication

- Nonsteroidal anti-inflammatory medications, such as aspirin and ibuprofen (do not take within 7 days before surgery), or other minor pain relievers, such as acetaminophen, are often recommended. Take these as directed by your physician. Contact your physician immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.
- Cortisone injections are rarely, if ever, indicated. Cortisone injections may weaken tendons, so it is better to give the condition more time to heal than to use them.

■ ■ ■ Heat and Cold

- Cold is used to relieve pain and reduce inflammation for acute and chronic cases. Cold should be applied for 10 to 15 minutes every 2 to 3 hours for inflammation and pain and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

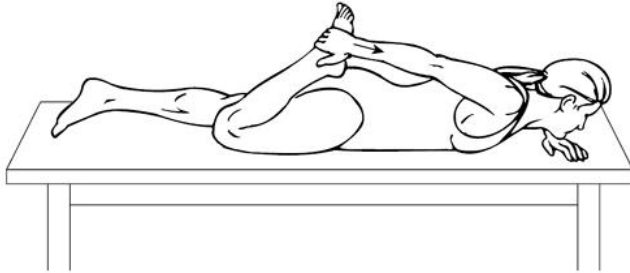
■ ■ ■ Notify Our Office If

- Symptoms get worse or do not improve in 4 weeks despite treatment
- You develop a fever greater than 101°F

➤ **RANGE OF MOTION AND STRETCHING EXERCISES** • Osgood-Schlatter Disease
(Osteochondrosis, Apophysitis of the Tibial Tubercle)

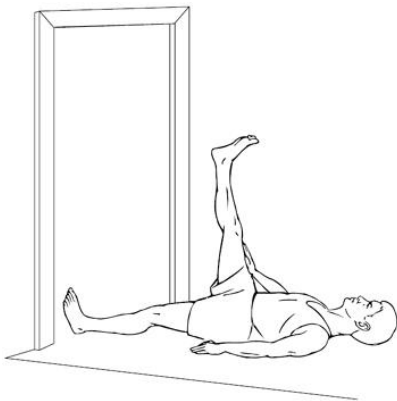
These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or until your symptoms are resolved. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A *gentle* stretching sensation should be felt



STRETCH • Quadriceps, Prone

1. Lie on your stomach as shown.
2. Bend your knee, grasping your toes, foot, or ankle. If you are too “tight” to do this, loop a belt or towel around your ankle and grasp that.
3. Pull your heel toward your buttock until you feel a stretching sensation in the front of your thigh.
4. Keep your knees together.
5. Hold this position for **30** seconds.
6. Repeat exercise **2** times, **3** times per day.



FLEXIBILITY • Hamstrings, Doorway

1. Lie on your back near the edge of a doorway as shown.
2. Place the leg your are stretching up the wall keeping your knee straight.
3. Your buttock should be as close to the wall as possible and the other leg should be kept flat on the floor.
4. You should feel a stretch in the back of your thigh.
5. Hold this position for **30** seconds.
6. Repeat exercise **3** times, **2** times per day.



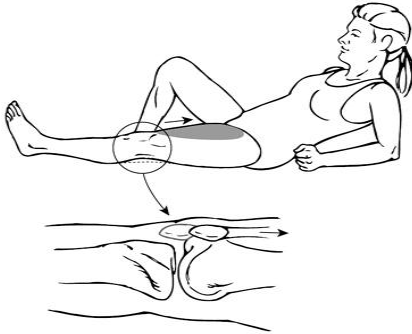
FLEXIBILITY • Hamstrings, Ballet

1. Stand and prop the leg you are stretching on a chair, table, or other stable object.
2. Place both hands on the outside of the leg you are stretching.
3. Make sure that your hips/pelvis are also facing the leg you are stretching.
4. Slide your hands down the outside of your leg.
5. Lead with your chest/breast bone. Keep your chest upright and back straight. Do not hunch over at the shoulders. Keep your toes pointing up.
6. You should feel a stretch in the back of your thigh.
7. Hold this position for **30** seconds.
8. Repeat exercise **3** times, **2** times per day.

➤ **STRENGTHENING EXERCISES** • Osgood-Schlatter Disease (Osteochondrosis, Apophysitis of the Tibial Tubercle)

These are some of the *initial* exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or until your symptoms are resolved. *If these exercises are painful, discontinue them and contact your physician, physical therapist, or athletic trainer.* Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as initially prescribed by your physician, physical therapist, or athletic trainer. Programe slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.



STRENGTH • Quadriceps, Isometrics

1. Lie flat or sit with your leg straight.
2. Tighten the muscle in the front of your thigh as much as you can, pushing the back of your knee flat against the floor. This will pull your kneecap up your thigh, toward your hip.
3. Hold the muscle tight for 5 seconds.
4. Repeat this exercise 10 times, 2 times per day.

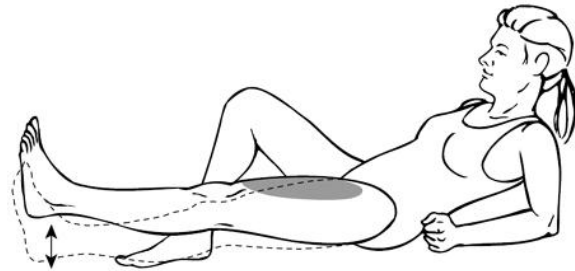


STRENGTH • Quadriceps, Short Arcs

1. Lie flat or sit with your leg straight.
2. Place a inch roll under your knee, allowing it to bend.
3. Tighten the muscle in the front of your knee as much as you can, and lift your heel off the floor.
4. Hold this position for 5 seconds.
5. Repeat exercise 10 times, 2 times per day.

Additional Weights: OK TO USE DO NOT USE!!!

If okay'd by your physician, physical therapist, or athletic trainer, a pound weight may be placed around your ankle for additional weight.



STRENGTH • Quadriceps, 7 Count

The quality of the muscle contraction in this exercise is what counts the most, not just the ability to lift your leg!

1. Tighten the muscle in front of your thigh as much as you can, pushing the back of your knee flat against the floor.
2. Tighten this muscle **harder** .
3. Lift your leg/heel 4 to 6 inches off the floor.
4. Tighten this muscle **harder again** .
5. Lower your leg/heel back to the floor. Keep the muscle in front of your thigh as tight as possible.
6. Tighten this muscle **harder again** .
7. Relax.
8. Repeat exercise 10 times, 2 times per day.