



Patellofemoral Rehabilitation

Physical Therapy

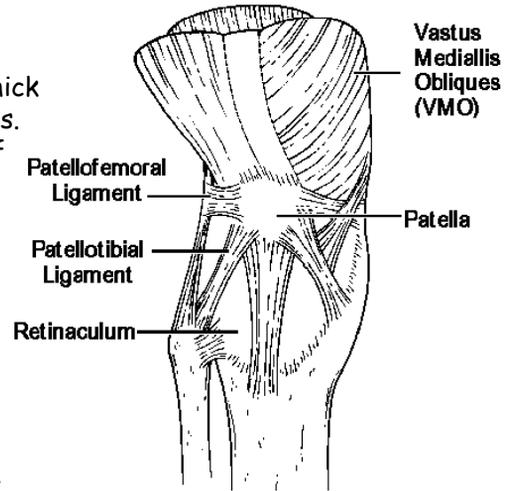


The Patellofemoral Joint (The Kneecap Joint)

The patellofemoral joint (PFJ) consists of the kneecap, (patella) which rides in a groove at the end of the thigh bone, (femur). The patella and femur are lined with a thick cartilage that cushions and lubricates between the bones. Patellofemoral Joint Syndrome is caused by irritation of the cartilage or the soft tissues around the kneecap.

Causes of Patellofemoral Joint Pain

1. Muscle weakness.
2. Tight muscles or ligaments.
3. Climbing hills or stairs.
4. Poor hip, knee, patella or foot alignment.
5. Running long distances, especially on hard surfaces.
6. Being overweight or out of shape.
7. Trauma to the knee such as surgery.
8. Wearing improper running shoes or old running shoes.



You are responsible for the ultimate success of treatment since you are the one doing the exercises. With time, patience and the proper treatment, you can usually control the knee pain. There is not one simple cure for PFJ Syndrome. Treatment can include any or all of the following:

Exercises: Strengthening the thigh muscles, (Quads & VMO), helps improve the patellar motion and decrease the joint irritation. Stretching tight muscles and ligaments around the patella, (ITB, Quads, Hamstrings, Calves), can also decrease the PFJ stresses. Your exercise program should be continued indefinitely as part of your regular fitness program.

Shoes: The shoes must fit your feet, have a good shock absorbing sole and arch support, especially when running. After 500 miles of running there is a 50% decrease in the shock absorbency & the shoes should be replaced.

Ice: With pain, heat or swelling after activity use ice. Ice packs for 20-30 minutes (if possible, wrapped with an ace bandage for gentle pressure) or Ice massage, rubbing the patellar borders with ice in a paper cup, for 5-7 minutes.

Rest: Avoid activities that increase your knee pain, (Soldiers should be given a profile to avoid painful activities). Never train or exercise with pain. Examples of activities that should be limited or avoided are; deep knee bends, prolonged sitting, stairs, running on hard surfaces or hills. Continue exercises and aerobics that don't aggravate your pain.

Brace: A brace may help you to run and exercise without pain. It should only be used during activities and it is only meant to be temporary during your rehabilitation phase.

Medications: Aspirin, (not Tylenol), or other anti-inflammatories like Motrin are very good at keeping inflammation down. Take as directed only. Stop taking the medication immediately if you have any stomach problems and consult your Doctor or Physical Therapist.

Smoking: Try to stop, it will help your tissues heal and be healthier for your knees and entire body.

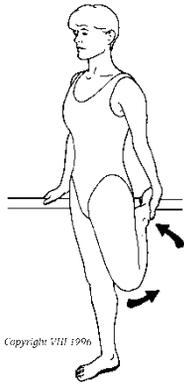
Stretching Exercises

Stretching should be done frequently. Stretch before & after exercise and activity. Hold each stretch 20-30 seconds, Do 3-6 repetitions. The stretches should be slow and static, no

bouncing or ballistic stretching.

□ Quad Stretches

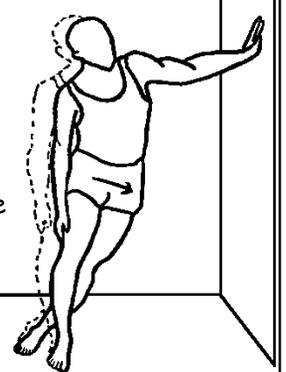
- † Stabilize yourself holding a wall, chair, etc.
- † Keep the back straight, pull the knee behind the hip joint then the foot into the buttocks.
- † Try to stretch along the outer thigh more than the inner muscle.



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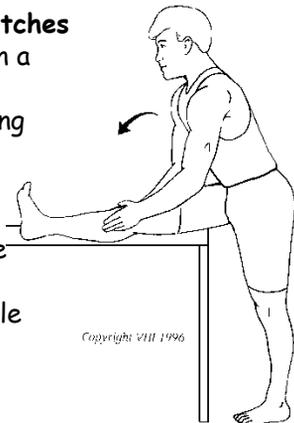
□ ITB Stretches

- † Support yourself on a wall or steady object.
- † Cross the far leg over the stretching leg.
- † Move the hips toward the wall and lean into the knee.
- † The stretch should be felt from the outside hip to the knee.



□ Hamstring Stretches

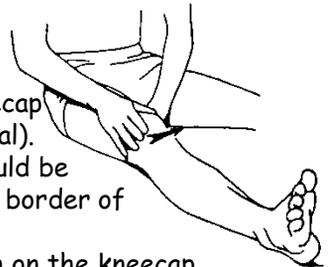
- † Prop the ankle up on a table, chair, etc.
- † Lean forward keeping the knee and back straight.
- † The kneecap stretches can be done at the same time if the quad muscle is relaxed.



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□ Kneecap Inside Glide

- † Can be done with the hamstring stretch but the thigh muscle must be relaxed.
- † Push with the thumb or the palm.
- † Push the outside border of the kneecap to the inside (medial).
- † The stretch should be felt at the outside border of your kneecap.
- † Never push down on the kneecap.



□ Kneecap Inside Tilt

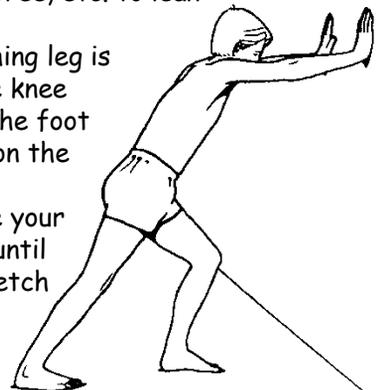
- † Push with the thumb or the palm.
- † Push the outside border of the kneecap up toward the ceiling using the thumb.
- † At the same time, using the palm of your other hand gently push the inside border of your kneecap down toward the floor.
- † Like the glide, you should feel the stretch at the outside border of



the kneecap.

□ Calf Stretches

- † Use a wall, tree, etc. to lean against.
- † The stretching leg is back, with the knee straight and the foot and heel flat on the floor.
- † Slowly move your hips forward until you feel a stretch at the calf muscle.

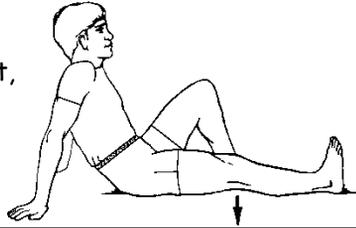


Strengthening Exercises

Strengthening exercises should be done 2 to 3 days per week. You should do 15 to 30 repetitions, and if using weight it should be light to moderate without causing joint pain. You should feel mild muscle fatigue at the end of each set. Do 3 to 4 sets. In general, strength and resistance exercises should be with low knee bends, (stopping at 45 degrees or before pain. Also the knee position should be over or behind the foot.

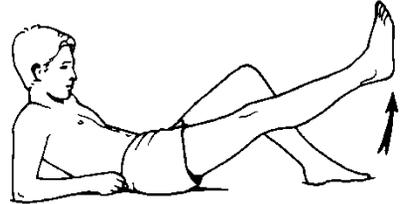
□ Quad Sets

- † Tighten the thigh muscle, emphasizing the VMO (the inside muscle of the quadriceps).
- † Use two fingers to feel the VMO contract, make the muscle as tight as you can.



□ Straight Leg Raises

- † Tighten the quad and VMO.
- † Lift the heel about 6 inches and hold for 5 seconds.
- † Let the leg down keeping the quad and VMO tight, then relax.



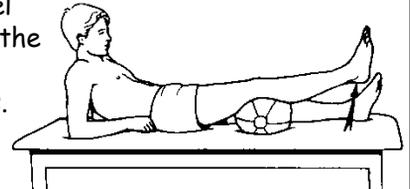
□ Hip Adduction

- † Tighten the quads and the VMO,
- † Lift the bottom leg up about 6 inches,
- † Lower slowly.
- ⊕ use ankle weights. ⊕ use rubber tubing.



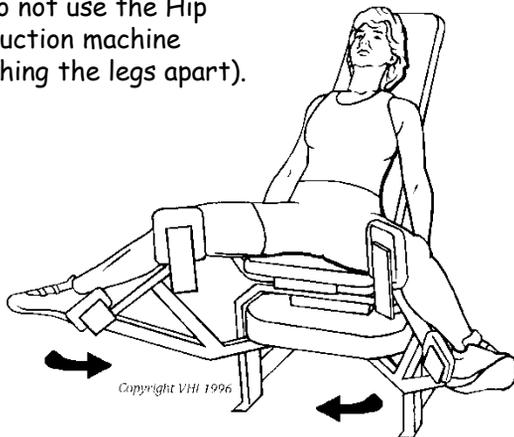
□ Short Arc Quads

- † Limit the arc to 30 degrees, or pain.
- † Tighten the quad muscle with emphasis on the VMO through the full arc.
- † Lift the heel straightening the knee.
- ⊕ use weights.
- ⊕ use tubing.



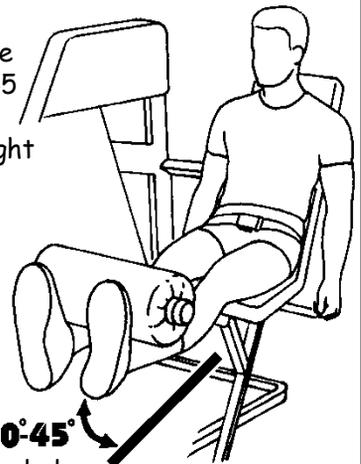
□ Hip Adduction Machine

- † Using the Hip Adduction machine,
- † Tightening the VMO first, then squeeze the thighs together.
- † Do not use the Hip Abduction machine (pushing the legs apart).



□ Knee Extension Machine

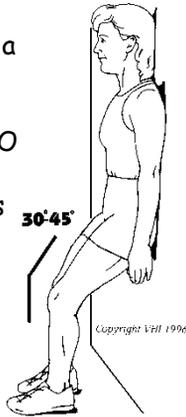
- † Limit the knee bend to a pain free range (about 30-45 degrees).
- † Use enough weight to get slight muscle fatigue at 15-30 reps without causing any joint pain.
- † Try one to two sets double leg then drop the weight and do **30°-45°** one to two sets single leg.
- † If you can't do this exercise without joint pain - Don't do it.



Strengthening Exercises

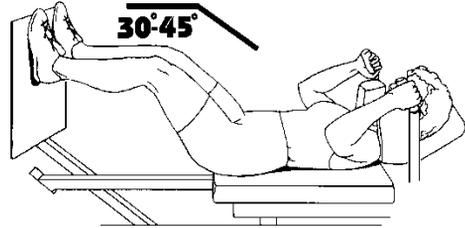
□ Wall Squats

- † Stand with your back against a wall and your heels about 12 to 20 inches from the wall.
- † Slowly squat, keeping the VMO tight.
- † Stop at about 30 -45 degrees or before you have knee pain.
- † Keep your knees over your ankle joints.
- † Hold the squat 5 seconds then press back up keeping the VMO tight.



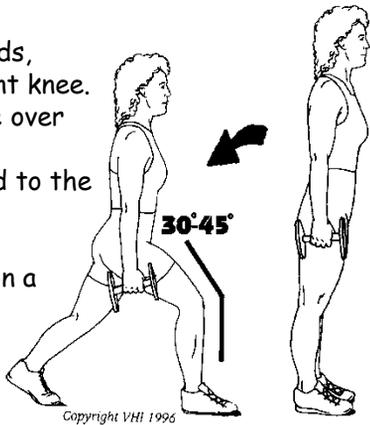
□ Flat or Inclined Leg Press Machine

- † Keep the knee over or behind the ankle,
- † Use a weight that causes muscle fatigue at 15-30 repetitions without joint pain.
- † Limit to the pain free range, (30-45°).
- † Concentrate on the VMO.



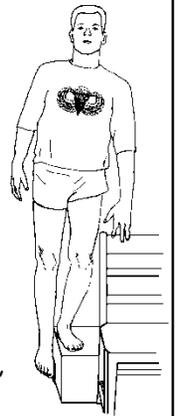
□ Lunges

- † Step backwards, bending the front knee.
- † Keep the knee over the ankle.
- † Limit the bend to the pain free range, (about 30-45°).
- † Concentrate on a tight VMO contraction.



□ Step Up

- † Can be done on stairs, a step stool or a stack of books.
- † Start with a step height that doesn't cause pain, and slowly increase the height.
- † Keep the knee over or behind the ankle joint.
- † Slowly step down and up using the quads and concentrating on the VMO.
- † Do 3 sets of 20-30 repetitions, gradually increase step height.



Aerobic Exercises

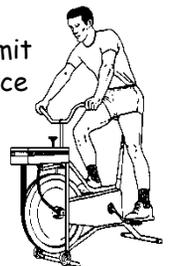
□ Swimming

Swimming or water aerobics place very little stress on the kneecap.



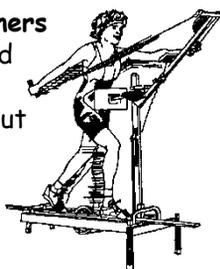
□ Biking

Keep the seat high so that you limit the bend in the knee. The distance between the bike seat and the handle bars can also effect the load on the kneecap, if the distance is too short it tends to increase kneecap stress.



□ Ski, Glide or Swing Trainers

These machines are very good for aerobic conditioning and increasing leg strength without putting a large load on the kneecap.



□ Stair Machines

Keep the knee over or behind the ankle by standing up straight or even leaning back slightly and holding the rails. Shortening your step also decreases kneecap stress. Push using the hip/gluteal muscles instead of the hamstrings which increase kneecap

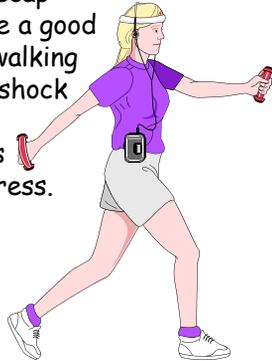
stress. Don't use if causing joint pain.

Physical Therapy

Aerobic Exercises

☐ Walking

Walking briskly is a good way to condition aerobically and keep kneecap stress to a minimum. Use a good pair of shock absorbing walking or running shoes, or add shock absorbing insoles. Also softer and level surfaces will decrease kneecap stress.



☐ Running

Running does put a high load on the kneecap but there are some things you can do to reduce the stress. Use a good pair of running shoes with a shock absorbing sole and a good arch support. Change shoes when they were out, about every 500 miles. Avoid running hills, especially downhill. Also try to stay on softer surfaces like grass, woodland paths or cinder tracks to decrease knee stress.



Remember, Don't Train With Joint Pain.

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Physical Therapy