Protecting Your Knees

Introduction

The exercises shown below are designed to help reduce stress on the knee by balancing muscle length, strength, increasing dynamic stability, and control.

There are many anatomical and dynamic factors potentially leading to patellofemoral pain. It is important to remember that prescribing one set of exercises will not capture all the various individual needs. If you have any concerns, consult a medical professional before beginning this or any other exercise program. In addition, you should be cautious when exercising and stop if you experience pain.
Self-Stretching

Hip Flexors (Front of thigh and hip)

- **Starting position**
  - Edge of your bed or a bench
  - Position yourself on your back
  - Hold knees to chest with hands
  - Lower back is against surface

- **Action**
  - Lower one leg with bent knee

- **Precaution**
  - The stretch is over top of the thigh, above the knee
  - Don’t arch your lower back
  - Don’t let leg move out to the side

- **Duration and repetition**
  - Hold 15 seconds
  - Alternate sides
  - Repeat 3 times
Self-Stretching

Quadriceps (Vastus Lateralis)

- **Starting position**
  - Sidelying with knees bent
  - Hold bottom knee
  - Hold top ankle

- **Action**
  - Pull top thigh back

- **Precaution**
  - Don’t arch low back
  - Keep top thigh in line with hip
  - Stop if you experience knee pain

- **Duration and repetition**
  - Hold 15 seconds
  - Repeat 3 times
**Hamstrings (Biceps Femoris)**

- **Starting position**
  - On back
  - Place strap over arch of foot
- **Action**
  - Pull straight leg up and slightly across midline of your body
- **Precaution**
  - Don’t let kneecap rotate inward
- **Duration and repetition**
  - Hold 15 seconds
  - Alternate sides
  - Repeat 3 times
Self-Stretching

Calf (Upper region)

- **Starting position**
  - Step position with back leg **straight**
  - Lean forward, support hands on wall
- **Action**
  - Press outside of heel down into floor
  - Tuck and push pelvis forward
- **Precaution**
  - Don’t arch low back
  - Don’t rotate the pelvis
  - Don’t drop the arch of back foot
- **Duration and repetition**
  - Hold 30 seconds
  - Alternate sides
  - Repeat 2 times
Self-Stretching

Calf (Lower region)

- **Starting position**
  - Step position with back leg **bent**
  - Lean forward, support hands on wall

- **Action**
  - Press outside of heel down into floor
  - Tuck and push pelvis forward

- **Precaution**
  - Don’t arch low back
  - Don’t rotate the pelvis
  - Don’t drop the arch of back foot

- **Duration and repetition**
  - Hold 30 seconds
  - Alternate sides
  - Repeat 2 times

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Self-Stretching

Outside kneecap (Lateral patellofemoral retinaculum)

• Starting position
  – Sit with leg slightly bent
  – Place fingers on outside of knee
  – Thumbs on inside of knee

• Action
  – Fingers gently pull kneecap towards inside of knee

• Precaution
  – Don’t press kneecap down against knee joint

• Duration and repetition
  – Slow movement
  – 5 times
  – Hold end position 5 seconds
Iliotibial Band (with Foam Roller)

- **Starting position**
  - Outside thigh on foam roller with knee straight
  - Foot of uninvolved leg on floor, use hands for support

- **Action**
  - Roll outside thigh up, down the foam roller

- **Precaution**
  - Don’t roll over hip bone or knee joint

- **Duration and repetition**
  - Slow movement
  - 5-10 times
  - < 1 minute
Self-Massage

Tensor Fasciae Latae (with Small Ball)

• Starting position
  – Lay on exercise mat, on side
  – Place a tennis ball under your pelvis

• Action
  – Roll pelvis 3 inches forward, backward

• Precaution
  – Should not feel pressure on bony prominences

• Duration and repetition
  – Slow movement
  – 5-10 times
  – <1 minute
From the Core to the Floor

Strengthening

Quadriceps (Front of thigh)

• Starting position
  – Sit with supported back and straight, relaxed legs in front
  – Thumb and fingers above kneecap
  – Gently push toward toes

• Action
  – Stop pressing kneecap down, then contract muscles up, away from toes

• Precaution
  – Don’t press on kneecap with fingers
  – Don’t lock knee (hyperextend)

• Duration and repetition
  – Hold contraction 10 sec
  – Alternate legs
  – 20 times

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From the Core to the Floor

Strengthening

Hip (Abduction and external rotation)

- **Starting position**
  - On exercise mat lay on side with legs slightly bent
  - Head, shoulders, pelvis, feet in line
  - Draw the navel to the spine
  - Straighten top leg, bring in line with body, toes slightly turned to ceiling
  - Lift top leg to hip level

- **Action**
  - Lift top leg above hip level then down

- **Precaution**
  - Don’t let top leg move forward or pelvis back
  - Don’t let kneecap rotate down

- **Duration and repetition**
  - Hold top position 5 seconds
  - 10 times

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Abdominal (Lower)

• Starting position
  – Lay on exercise mat on back
  – Draw navel into spine
  – Lift legs up into 90° (table top)

• Action
  – Slowly touch floor with one foot, return to 90°
  – Repeat with other foot

• Precaution
  – Don’t allow low back to arch
  – Place a pillow under head if you feel strain

• Duration and repetition
  – 5 times
  – Alternate legs
  – 3 sets
Single Leg Stance

- **Starting position**
  - Stand tall on one leg, other leg back
  - Draw navel to spine
  - Kneecaps face forward
  - Foot arch lifted off floor

- **Action**
  - Lift foot high

- **Precaution**
  - Don’t sink into standing hip
  - Don’t raise hip of lifted leg

- **Duration and repetition**
  - Hold 5 seconds
  - Alternate legs
  - 10 times
Toe Touches (Mini squat)

- **Starting position**
  - Stand tall on one leg, knee bent
  - Draw navel to spine
  - Kneecaps face forward
  - Foot arch lifted off floor

- **Action**
  - Reach and touch floor out to side
  - Return foot to original position

**Precaution**
- Don’t sink into standing hip
- Don’t let standing knee turn inward

- **Duration and repetition**
  - 10 times
  - Alternate legs
  - 2 sets
Quality Control

The benefit of these exercises is closely related to the quality of execution. Do them well, more is not necessarily better. Pay attention to your form!

These exercises comprise a generalized home program for patellofemoral pain. A comprehensive and progressive exercise program that is tailored to an individual with patellofemoral pain can only be implemented after a thorough evaluation of the anatomical and dynamic deficits.

Remember, if any of the exercises cause pain either during or after, please consult with your physician or physical therapist.

Hope this helps!

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