

ACL RECONSTRUCTION – PATELLAR TENDON

DR ELRASHIDY – TRI-VALLEY ORTHOPEDICS

OVERVIEW

- Focus on protection of graft and fixation in primary phases (Weeks 0 - 4)
- With meniscal repair, defer to precautions in meniscal repair protocol (usually WBAT LOCKED IN EXTENSION x 6-8 weeks).
- The physician may alter time frames of brace-wear and use of crutches
- Supervised Physical Therapy for 4-6 months

GENERAL GUIDELINES

- Ok to shower on post-op day 3. **NO bathing/soaking knee** until cleared by physician
- Sleep with brace locked in extension x **1 week**
- **Brace guidelines:** Locked in full extension for 1st week (when walking and during sleep). Begin unlocking brace after Week 1 as quad function improves. Aim for 90° flexion by end of 2nd week (given patient has full extension, able to SLR with solid, isometric quad contraction). Discontinue brace after Week 4
- **Crutches:** Weight-bearing as tolerated. Aim to wean of crutches by mid-week 2 (patients should have full extension and isometric quad set/SLR)

PHASE 1: Post-Op Through Week 4

Goals:

- Protect graft and graft fixation with use of brace and specific exercises
- Minimize effects of immobilization
- Control inflammation and swelling (cryocuff/ice machine for first 2 weeks)
- Full extension to 90° flexion
- Restore normal gait pattern

Brace (Total Length = 4 weeks):

- **Week 1: Brace locked in full extension for ambulation and sleeping**
- **Weeks 2-4:** Unlock brace as quad function returns. Ok to d/c brace when sleeping after first post-op visit (Day 10-14)
- **After Week 4:** Wean from brace after Week 4, as patient demonstrates good quad control and normal gait mechanics

Weight-Bearing:

- Week 1: Weight-bearing as tolerated with crutches and brace
- Wean from crutches by 2 weeks and brace by 4 weeks as patient demonstrates normal gait mechanics and good quad control (defined as lack of quadriceps lag)

Exercises:

- Patellar mobilization/scar mobilization

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- Week 1: Maintain extension (see below). Increase flexion as tolerated (0°- 90° by end of Week 2)

A. Extension (straightening knee)



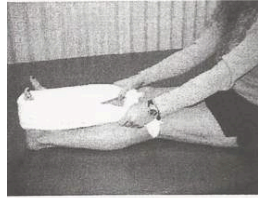
Lie on your stomach with your knee and lower leg hanging over the edge of the bed to stretch your knee straight. Hold 5-10 minutes, 4-5 times per day.

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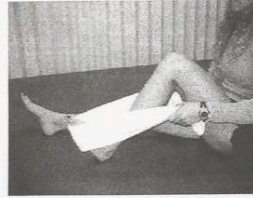


Lie on the bed with your ankle on a pillow. Let your knee relax down to stretch your knee straight. Avoid tightening your thigh muscle. Hold 5-10 minutes, 4-5 times per day.

B. Flexion (bending knee)



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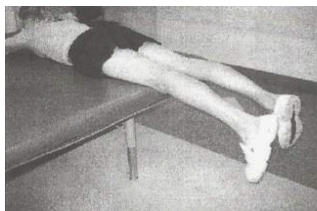
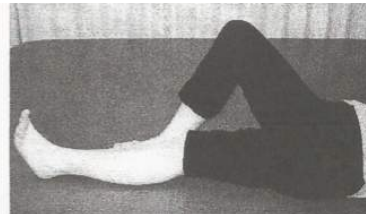
Lie on your bed with a loop of towel under your foot. Bend your knee **no more than 90 degrees** by sliding your heel toward your buttocks. Sustain the stretch for 3-5 seconds. Do 25 reps 4-5 times per day.



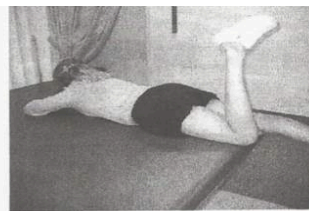
Flexion: Knee bending can also be accomplished by sitting in a chair. Slide your foot backwards with the help of your other foot. **Stretch no further than 90 degrees** Hold 10 seconds. Repeat 25 times 4-5 times daily

- Heel slides
- Quad sets and hamstring curls

D. Quad Sets: When you are able to stretch your knee completely straight you can do this exercise. With your knee completely straight, tighten your front thigh muscle (quad). Hold for 3-5 seconds, repeat 10-20 times, 4-5 times per day.



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Hamstring Curls: Lie on your stomach with your knees hanging off the end of the bed. Curl your lower leg up. You can use your other leg to help the operated leg back to the starting position. Hold 5 seconds and repeat 10 times, 1-2 times daily.

- Gastroc/Soleus stretching and strengthening
- Quad isometrics as 60° and 90°

VMO Isometrics: Sit with your knee with at least 70 degrees of bend in it. Squeeze a small ball or rolled towel between your knees while pushing your feet into the floor. Hold 5-10 seconds and repeat 10 times, 1-2 times daily.



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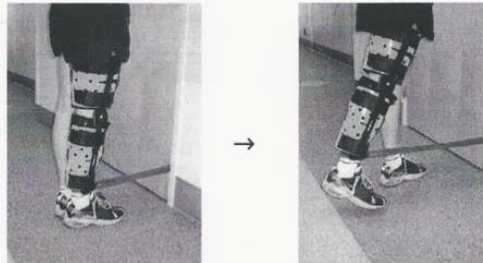
- SLR all planes: Brace on in full extension until quad strength sufficient to prevent extension lag. Add weight as tolerated to hip abduction, adduction and extension.



Straight Leg Raise – Brace On When you are able to stretch your knee completely straight you can do this exercise: With your knee completely straight and the brace on and with your other knee bent, lift the operated leg up as high as your other knee. Hold for 2-3 seconds, repeat 10-20 times, 4-5 times per day.

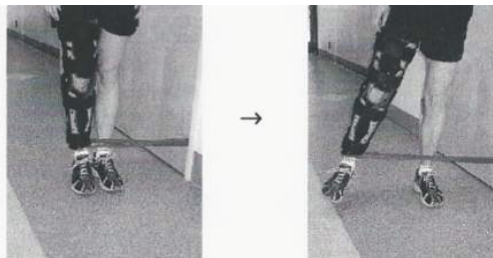
Hip Workout:

Extension Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Extend your leg backwards. Follow strength progression as above. Repeat with opposite leg.



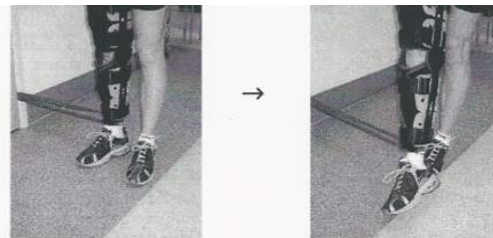
Hip Workout: Abduction:

Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Lift your leg out to the side. Follow strength progression as above. Repeat with opposite leg.



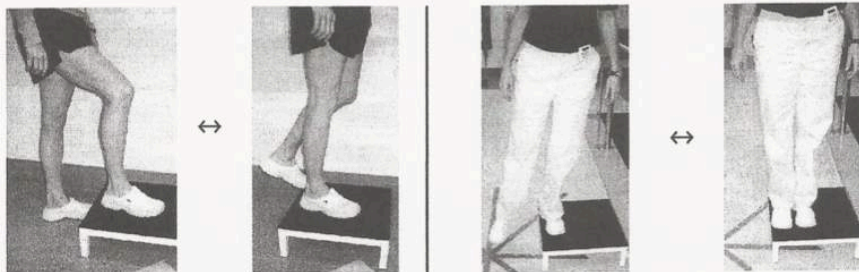
Hip Workout: Adduction:

Secure a loop of theraband in a door. Stand in the brace with the band around your ankle. Pull band across your body by crossing your leg. Follow strength progression as above. Repeat with opposite leg.



- Close Kinetic Chain quad strengthening activities as tolerated (Wall sit, Step-ups)

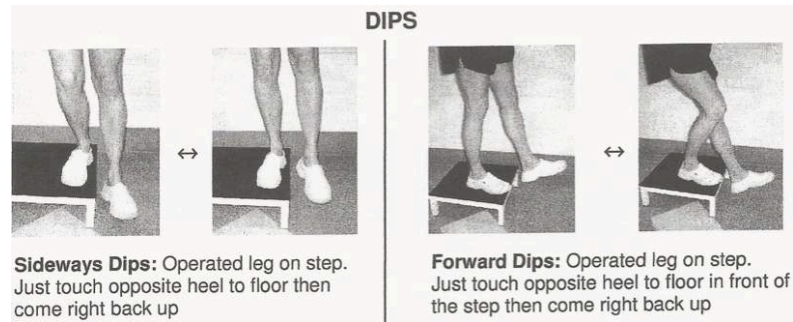
STEPUPS



Forward Step Ups: step up forward with the operated leg, then step back down onto your good leg.

Side Step Ups: step up sideways with the operated leg, then step back down onto your good leg.

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- If available, after 2 weeks add:
 - A) Aquatic therapy (once sutures removed) to normalize gait, WB, and strength. Deep-water aqua-jogging for ROM and swelling
 - B) Stationary biking: Progress time + resistance

PHASE 2: Weeks 5 - 10

Criteria for advancing to Phase 2:

- Full extension and minimum of flexion to 90°
- Good quad set, SLR without extension lag
- Minimal swelling/inflammation
- Normal gait on level surfaces

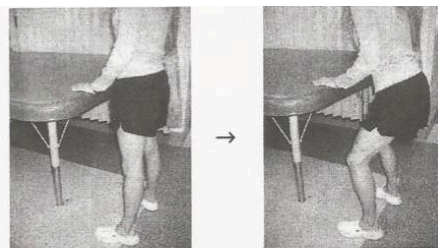
Goals:

- Restore normal gait with stair climbing
- Maintain full extension, progress towards full flexion
- Increase hip, quadriceps, hamstring and calf strength
- Increase proprioception

Exercises:

- Continue with range of motion/flexibility exercises as appropriate for the patient
- Continue CKC quad strengthening, progress as tolerated. Begin mini-squats (to 45°) and leg press (to 90°). **LOADING NOT TO EXCEED BODY WEIGHT UNTIL 6 WEEKS POST-OP.**

Mini Squats: Stand with your feet shoulder width apart while holding onto a table or countertop. Bend your knees until your knees are directly over your toes. Hold 5 seconds then return to the starting position. Follow strength progression as above. **Optional:** Can also squeeze a ball between your knees while squatting. Make sure knees are kept over toes.



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- Step ups at increased height, wall sits and **partial** lunges (Week 6)



THIS (Partial):

NOT (Full):



- Continue hip, hamstring and calf strengthening as well as hamstring, gastroc/soleus stretching
- Stairmaster (begin with short steps, avoid hyperextension)
- Nordic-Trac, Elliptical for conditioning
- Stationary Bike (progressive time and resistance). Progress to single-leg biking
- Begin proprioceptive activities such as single leg balance/proprioception (ball toss, balance beam, mini-tramp)

Single Leg Balance – Brace

Off: Start on level floor then progress to standing on a pillow. Progress from using your arms for support to no arm use. Try with eyes open then progress to eyes closed if you have good control and are safe.



- If available, pool-running (waist deep) or on unweighted treadmill @8-10 weeks

PHASE 3: Weeks 13 To 18

Criteria for advancing to Phase 3:

- No patellofemoral pain
- Minimum of 120° of flexion
- Sufficient strength + proprioception to initiate running
- Minimal swelling/inflammation

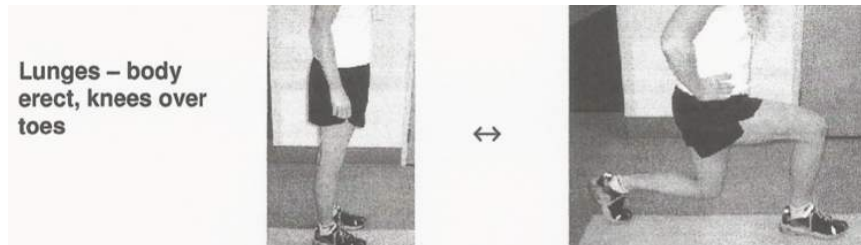
Goals:

- Full range of motion
- Improve strength, endurance + proprioception of extremity to prepare for sports
- Avoid overstressing graft
- Protect patellofemoral joint
- Normalize running mechanics
- Strength 70% of uninjured lower extremity per isokinetic evaluation

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Exercises:

- Continue flexibility and ROM exercises as appropriate for patient
- **OPTIONAL:** Knee extensions from 90° - 45° and progress to eccentrics
- ** (After 12 weeks, with 75% strength on leg press and HS Curl)**
- FULL Forward lunges



- Progress toward full weight-bearing running at about 12 weeks
 - ◆ 25% to 50% effort to start
 - ◆ Progress to ¼ to ½ mile per week, straight course
 - ◆ Backwards running 2—yards per ¼ mile forward running
- Begin swimming if desired
- Isokinetic test with anti-shear device @ 12 weeks to guide strengthening
- Progressive hip, quad, hamstring, calf strengthening
- Cardiovascular/endurance training via stairmaster, elliptical, bike
- Advance proprioceptive activities and agility drills

PHASE 4: Month 5 Through Month 6

Criteria for advancing to Phase 4:

- No significant swelling or inflammation
- Full, pain-free ROM
- No evidence of patellofemoral joint irritation
- Strength 70% of uninvolved lower extremity per isokinetic evaluation
- Sufficient strength and proprioception to initiate agility activities
- Normal running gait

Goals:

- Symmetric performance of basic and sport-specific agility drills
- Single hop and three hop tests 85% of uninvolved leg
- Quadriceps and hamstring strength at least 85% of uninvolved lower extremity per isokinetic strength test

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Exercises:

- Continue and progress flexibility and strengthening program based on individual needs and deficits
- Initiate plyometric program as appropriate for patient's athletic goals
- **Agility** progression including, but not limited to:
 - Side steps + Crossovers
 - Figure 8 and shuttle running
 - One-leg and two-leg jumping
 - Cutting/Acceleration/Deceleration/Sprints
 - Agility ladder drills
- Continue progression of running distance based on patient needs
- Initiate sport-specific drills as appropriate for patient

Phase 5: Post-op Months 6-7 = RETURN TO SPORT

♦ **DRIVING:**

- ♦ 1 week for automatic cars and left leg surgery
- ♦ 2-4 weeks for manual cars or right leg surgery

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