



GOLDEN STATE ORTHOPEDICS & SPINE

ACL JOINT RECONSTRUCTION - PATELLAR TENDON

OVERVIEW

- Focus on protection of graft and fixation in early phases (Weeks 0-4)
- For ACL reconstruction with meniscal repair, defer to precautions in meniscal repair protocol.
- 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 extension for 1st week (when walking, sleeping). After Week 1, as quad function improves, begin unlocking brace. Goal: 90° flexion by end of Week 2 (should have full extension, able to SLR with solid, isometric quad contraction. Discontinue brace after Week 4
- Crutches: Weight-bearing as tolerated. Wean crutches by end of Week 1/mid-week 2

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° of flexion
- Restore normal gait on level surfaces

Brace (Total Length = 4 weeks):

- **Week 1: Brace locked in full extension for ambulation and sleeping**
- **Weeks 2-4:** Unlock brace (goal of 90° of flexion by Week 2) 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 normal gait mechanics and good quad control (no quad lag)

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 quad lag)

Exercises:

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



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ACL BTB PROTOCOL

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.



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)



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 done by sitting in a chair. Slide your foot backwards with the help of your other foot. **Stretch no further than 90 degrees.** Hold for 10 seconds. Repeat 25 times, 4-5 times per day.



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ACL BTB PROTOCOL (cont.)

- Heel slides
- Quad sets AND Hamstring curls

C. 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.

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

D. 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 per day.



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



E. 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.



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ACL BTB PROTOCOL (cont.)

F. HIP WORKOUT EXTENSION - BRACE

ON: 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.



G. HIP WORKOUT ABDUCTION - BRACE

ON: 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.



H. HIP WORKOUT ADDUCTION - BRACE

ON: 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.

- Closed Kinetic Chain quad strengthening activities as tolerated (Wall sit, Step-up)
- If available, after 2 weeks, add aquatic therapy (once sutures removed) to normalize gait, WB, and strength. Deep-water aqua-jogging for ROM and swelling.
- Stationary biking: Progress time and resistance

PHASE 2: Weeks 5-10

Criteria for advancing to Phase 2:

- Full Extension and Flexion to 90°
- Good quad set, SLR without extensor lag
- Minimal swelling/inflammation
- Normal gait on level surfaces



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GOALS:

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

EXERCISES:

- Continue with range of motion/flexibility exercises as appropriate
- Initiate 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



I. MINI SQUATS: Stand with your feet shoulder width apart while holding onto a table or counter-top. 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: You can also squeeze a ball between your knees while squatting. Make sure knees are kept over toes.

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

- Progressive hip, hamstring and calf strengthening as well as hamstring, gastric/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 training such as single leg balance/proprioception (ball toss, balance beam, mini-tramp)

TIDS (Partial):



NOT (Full):





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J. 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 at 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 the patellofemoral joint
- Normalize running mechanics
- Strength 70% of uninvolved lower extremity per isokinetic evaluation

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 treadmill running at about 12 weeks
- 25% to 50% effort to start
- Progress to ¼ to ½ mile per week, straight course
- 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



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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

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 and Crossovers
 - Figure 8 and shuttle running
 - 1 and 2-leg jumping, cutting, acceleration/deceleration, agility and 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