

PHASE I: Generally 0 - 4 weeks post-op

PHASE I GOALS: Protect surgical graft
Normal gait and stair ambulation
ROM: full knee extension, $\geq 120^\circ$ knee flexion

PRECAUTIONS: *Wear brace at all times (even while sleeping)*
***NO** open kinetic chain strengthening exercises*
***NO** running until 3-4 months post-op*

CRUTCHES: Weight-bearing as tolerated - (suggest a gradual increase as follows):
o Week 1: partial weight-bearing @ 25-50% body weight
o Week 2: partial weight-bearing @ 50-75% body weight
o Week 3: weight-bearing as tolerated @ 75-100% body weight

BRACE: Locked at 0° until able to do 15-30 SLRs without a lag. Then, open to current ROM.

WOUND: Post-op dressing remains intact until post-op day #5
May begin showering after post-op day #5 (no need to cover incision site)
***Do NOT** submerge knee in tub or pool for 4 weeks
Suture/staple removal @ 10-14 days per Ortho/PT

REHABILITATION: Frequent use of cryocuff and/or ice with lower extremity elevated
Begin patellar mobilizations (10 reps each direction TID) after suture/staple removal
Begin scar massage after incision site sloughs/scar is formed
Begin with the first 5 exercises below and add others gradually as tolerated

~Days 1-7
Calf pumping w/ tubing
Heel slides - assisted as needed
Static quad sets (with estim until patient able to do 10 SLRs without extension lag)
Supine passive extension with towel under heel (prone hangs as needed)
Gentle hamstring stretching

~Days 8-14
SLRs: All directions - may add light weight when pain free
Stationary bike for ROM - progress to biking for conditioning
Seated ankle disk training

~Days 15-28
Heel raise progression: begin bilateral heel raises - progress to unilateral
Double leg mini-squats ($0-45^\circ$) - progress to single leg
Gait training (cone walking, marching, retrowalking, cariocas, shuffles, etc.)
Forward, lateral, and retro step-ups (start with 2", progress as tolerated)
Leg press & hamstring curls (bilaterally with light weights)
UBE and/or well leg cycle

FOLLOW-UP: Physical Therapy: Weekly; Ortho: ~4 weeks post-op; Supervised rehab: 2-3 x per week

DOCUMENTATION: Precautions, pain level, medications and modalities
Observation: (incision sites) - Signs/symptoms of infection? Site healing well? Effusion?
Neurovascular status: Distal pulses, motor and sensation intact? Presence of calf pain?
Knee ROM, quadriceps function, & gait

PHASE II: Generally 2-4 months post-op

PHASE II GOALS: Full knee ROM and minimal or no effusion
≥ 80% quadriceps and hamstring strength compared to the uninvolved side
Hop without pain using good form

PRECAUTIONS: ***NO** open kinetic chain strengthening exercises*
***NO** running until 3-4 months post-op*

BRACE: Based on control of quad w/ SLR and normalization of gait cycle. Wear during PT

REHABILITATION: Continue phase I exercises as needed
Progress to the following exercises and increase intensity gradually when patient is ready (i.e., no increase in knee pain or effusion since the previous exercise session)
Note: all strengthening should be done with the brace on, starting with low weights, high repetitions, and in a painless ROM

~5-8 weeks Aggressive stationary biking for conditioning - may add elliptical gradually
Beginning level pool exercises - primarily sagittal plane exercises (No "whip" kicking)
General LE stretching (calf, HS, quads, HF, hip adductors)
Progressive standing balance exercises (body blade, plyoball, platform training, etc.) (progress in duration, intensity, double leg to single leg, etc.)
Progressive strengthening (calf press, leg press, squats (0-45°), HS curls, hip abd/add) (first set: 30 repetitions, then 1 additional set at the same weight to muscle failure)

~9-12 weeks Progressive pool program as tolerated
Elliptical and/or stairmaster
Progressive strengthening (calf press, leg press, squats (0-45°), HS curls, hip abd/add) (first set: 20 repetitions, then 2 additional sets at the same weight to muscle failure)

~13-16 weeks Progressive functional training (2 legged plyometrics, jump roping, etc.)
Progressive strengthening (calf press, leg press, squats (0-45°), HS curls, hip abd/add) (first set: 10 repetitions, then 2 additional sets at the same weight to muscle failure)
*Optional: If phase II goals are met by the ortho/PT evaluation at 12 weeks post-op (i.e., ≥ 80% quad & HS isokinetic peak torque (at 60° per second) compared to the uninvolved side, hop without pain using good form, full ROM, and no knee effusion), the patient may begin a clinic-supervised treadmill jogging program. Jogging may not exceed 10 minutes per session or 30 minutes per week.

FOLLOW-UP: PT: Bimonthly; Ortho: ~12 weeks post-op;
Supervised rehabilitation: 2-3 x per week as needed

DOCUMENTATION: Precautions
Pain level, medications, modalities
Effusion
Knee ROM, quadriceps function, & gait

PHASE III: Generally 5-6 months post-op

PHASE III GOALS: Jog at own pace and distance without pain
Strength return of ~90% for quadriceps and hamstring compared to uninvolved side

PRECAUTIONS: ***NO** participation in sports*

BRACE: Hinged knee sports brace (as needed per ortho)

REHABILITATION: Continue other phase II exercises as needed
Progress in duration and intensity of exercise only if there is no increase in knee pain or effusion since the previous exercise session.
Warm-up: 5-10 minutes (bike, elliptical, stairmaster)
General LE stretching: 5-10 minutes (calf, HS, quads, HF, hip adductors)
Progressive strengthening (calf press, leg press, squats (0-60°), HS curls, hip abd/add)
(first set: 6-8 repetitions, then 2 additional sets at the same weight to muscle failure)
Progressive balance training as needed
Progressive jogging program (increase time and/or distance no more than 10-20% per wk)
Progressive functional training: Begin at 25-50% intensity and progress gradually
(jumping, hopping, directional jogging, cariocas, shuffles, etc.)

FOLLOW-UP: PT: Monthly; Ortho: ~6 months post-op;
Supervised rehab: 1-2 x per week as needed

DOCUMENTATION: Pain level & medications
Effusion
Knee ROM & quadriceps function
Hop for distance
Isokinetic testing at 6 months post-op

MISCELLANEOUS: After 6 months post-op: Exercises in phase III are continued, gradually increasing intensity & duration as tolerated.
The recommendation is to wait until 9-12 months post-op to return to contact/collision Sports. This time period may be adjusted slightly by the surgeon and therapist according to patient progress.