



1702 W FAIRVIEW AVE. • BOISE, ID 83702
(208) 957-7400 • FAX (877) 287-3117
gustavelorthopedics.com

TIBIAL TUBURCLE TRANSFER

Post-Operative Guidelines

Week 0-2

- MD initial post-op check 2-3 days after surgery.
- The knee will be quite swollen at this time.
- Use two crutches for walking, but try to put weight on the foot as you walk. You may be on crutches for up to 4 weeks, depending on muscle tone. Wear the knee immobilizer while up and walking.

Home Exercise Program:

- Remove the immobilizer for the exercises. Isometric quad exercises to help with muscle tone and swelling: quad sets, straight-leg raises, and short arcs.
- Resisted plantar flexion with surgical tubing to work on calf strength and help lower leg swelling.
- Range of motion exercises to restore flexion (bending) and extension (straightening). Work the flexion exercises to the point of just an easy stretch.
- Ice the knee for 10-15 minutes every few hours, or at least after doing the home exercise program.

Rehabilitation Exercises:

- Use quad sets, straight-leg raises, and short arcs to warm-up prior to rehab exercises (using electric stim or biofeedback if available).
- Depending on how the knee feels, the following exercises can usually be added by the 2nd or 3rd week:
- Leg press to about 60-70 degrees of flexion (double leg), hamstring curls (double leg) will be limited by the swelling, standing calf raises (double leg), leg extensions (double leg) performed only in the upper 1/3 of the range of motion. Standing knee extensions with tubing can be used as CKC quad exercise.
- If an "NK table" is available, single-leg hamstrings may be initiated with a light weight. Also, while seated on the NK table (or similar high chair position) perform Long Arc Quads: Let the leg hang down as far as possible and then straighten out fully, holding at the top position for 5 seconds.
- Hip abduction, adduction, and extension while lying down can be added to maintain hip strength during the early phase.

Aerobic Conditioning:

- Generally, during the first two weeks the knee is too stiff and sore for any aerobic conditioning.
- Easy stationary cycling can be started once knee flexes to 105 degrees. Before this point, easy range of motion work on the bike can be performed pedaling in partial circles in each direction.
- An Upper Body Ergometer (arm bike) can be used.
- Ice the knee after exercises.

Goals by end of week 2

- Range of motion: 0 – 95 degrees.

- Walking without crutches, but still using the immobilizer.
- Quad can contract fairly well.

Week 3

Home Exercise Program:

- Continue initial Home Exercise Program twice a day. Get more aggressive with the knee flexion range of motion stretches and add patella mobilizations.
- **Ice the knee after exercises.**

Rehabilitation Exercises:

- Continue with quad sets, straight-leg raises, and short arcs. Light ankle weights (2.5 to 5 pounds) can be added during this period. Knee should be able to go to full extension with the added weights.
- Continue with leg press, hamstrings, and leg extensions performed double leg. Add in single leg versions of these exercises if strength and soreness allows. Usually the single-leg extensions are too sore to perform. Instead, try doing eccentrics (raise weight with both legs, hold fully extended at the top with injured leg and then lower smoothly with just the injured leg).
- Seated hip abduction and adduction can be added.
- RDL's with light-weight can be added.
- Wall squats (leaning against a wall with a physio-ball behind the back) down to 60 to 70 degrees are initiated. Try to roll hips slightly under the ball during the descent and do not allow the knees to go out past the toes.
- Towards the end of this phase standing squats can be performed. Proper squat technique: let the hips move back slightly first and then let the knees bend, lean over slightly at the hips – keeping the back flat, feet are spaced just wider than the hips. Only drop down to 60 to 70 degrees.

Aerobic Conditioning:

- Easy stationary cycling (with the seat high) and low to moderate intensity on the elliptical machine or stair machine may be initiated.
- **Ice the knee after exercises.**

Goals by end of week 3:

- Range of motion: 0 – 110 degrees.
- Walk without immobilizer if strength and tone are sufficient.
- Swelling continues to decrease.

1 MONTH POST-OP

- MD recheck around 1 month post-op.

Home Exercise Program:

- Continue with Home Exercise Program. Light ankle weights can be added on one of the home sessions each day.
- **Ice the knee after exercises.**

Rehabilitation Exercises:

- If quad tone is good, discontinue quad sets during the warm-up, but continue with straight-leg raises and resisted short arcs.
- Continue rehab exercises as outlined above, increasing the resistance as technique and soreness allows. Alternate workouts with either single-leg extensions or eccentrics.
- Hamstring curls, calf raises may be performed more aggressively, while RDL's and leg press are moderate intensity, and leg extensions and squats are still light to moderate intensity.
- Front- and side-step ups on a 2" - 4" box and standing 4-way hip exercises can be added.

Aerobic Conditioning:

- Outdoor cycling on level ground to easy rolling hills
- Walking on level ground or treadmill
- Indoor cycling, elliptical machine, stair machine
- **Ice the knee after exercises.**

Goals for 1 month post-op:

- Range of motion: 0 – 125 degrees
- Quad tone and strength is sufficient to allow walking without the immobilizer.
- Swelling continues to decrease.

2 MONTHS POST-OP

- MD recheck at 2 months post-op

Home Exercise Program:

- Continue with resisted straight-leg raises and short arcs on the off-days from rehab.
- **Ice the knee after exercises.**

Rehabilitation Exercises:

- Continue with rehab exercises as discussed above. Continue to work just the upper 1/3 of the range on the leg extension exercises.
- If squats are progressing well, then standing single-leg ¼ squats can be added to the mix. This variation of the single-leg squat is to simply stand upright on one leg and squat down to where the knee goes just ahead of the plane of the toes. Maintain proper hip-knee-foot alignment. This position mimics the knee's position during running.

Aerobic Conditioning:

- Training with indoor cycling, elliptical machine and stair machine can be increased. Walking uphill on the treadmill is another option. Cycling outdoors can be increased to add moderate rolling hills – just keep a fast pedal cadence (80-100 rpm) going up the hills.
- Swimming with a flutter kick (freestyle or backstroke) okay now.
- **Ice the knee after exercises.**

Goals by 2 months post-op:

- Range of motion: 0 to 135.
- Good quad tone (rapid response).
- Minimal swelling.

3 MONTHS POST-OP

- MD recheck at 3 months post-op.

Home Exercise Program:

- Discontinue Home Exercise Program if muscle tone is equal between legs. If not, continue with resisted straight-leg raises and short arcs on off-days.

Rehabilitation Exercises:

- Continue to progress rehab exercises. Vary the choice and intensity of exercises to help prevent staleness. Continue working just the upper 1/3 of the range on the leg extensions.
- Another variation of the single-leg squat can be added. These are similar to lunges – except the back foot is placed up on a bench. The front foot is placed about 2.5' to 3' out in front. During the descent the back knee bends and the drops towards the floor, with the front knee staying well behind the toes. At first, you may hang onto something for support and balance.

Aerobic Conditioning:

- If no swelling is present and the muscles have good strength and cleared by your physician, you may begin pre-running drills. These exercises are designed to help get the knee accustomed to the

impact from running. The pre-running may involve some uphill running “intervals” on either a treadmill at 10%-20% grade, or up short hills outdoors (but always walking back down!)

- Cycling may be progressed as pain allows (typically minimal limitations at this time).
- **Ice the knee after exercises.**

Goals by 3 months post-op:

- Full range of motion.
- No swelling.
- Good strength with all exercises.

4 MONTHS POST-OP

- MD recheck, & possible isokinetic strength test for quads & hamstrings at 4 months post-op.

Home Exercise Program:

- Discontinue Home Exercise Program if muscle tone is equal between legs.

Rehabilitation Exercises:

- Continue with strength training program 2 or 3 days per week. Vary the program to maximize your progress. The rehab staff can discuss ways to design your program to fit your goals. There are several factors that can decide whether or not you should continue to work the quads in the upper 1/3. Discuss the options with your rehab specialist or physician.

Aerobic Conditioning:

- If strength is good and no swelling is present, you may be cleared to begin running on flat ground. Begin with 50 – 100 yard repeats at a moderate speed. Work up to 10 x 100 yards at a brisk pace and with short rest periods between repeats. Your running program can progress from here depending on your sport or activity.
- If desired, the running program can be advanced as swelling and pain allows. Avoid downhill running until after 5 months post-op.
- **Ice the knee after exercises.**

Goals for 4 months post-op:

- Continue strength training and increase fitness.
- Keep swelling/soreness to a minimum; advancing the program too fast can make the knee swollen and sore.

5 MONTHS POST-OP:

- MD recheck at 5 months post-op.
- Continue with strength training program.
- If running without pain or increased swelling, agility drills will be added.
- **Ice the knee after exercises.**

Goals for 5 months post-op:

- Stay focused on the training program.

6 MONTHS POST-OP:

- Recheck with MD and repeat of isokinetic test at 6 months post-op.
- Continue to progress the rehab/strength training exercises.
- **Ice the knee after exercises if any swelling persists.**

Goals:

- Gradual return to sport activities if strength is adequate and technique is good on agility drills. At this point you can work back into practices and eventually full competition.
- Maintaining strength is the key to long-term success from the surgery. Most patients continue to feel improvements for a couple of years if they continue with the strength exercises. Patients who stop doing the exercises often report a return of pain in the knee after a few months.