ACL (Allograft) Reconstruction

The following is a guideline for rehabilitation after ACL (Allograft) surgery. Specific guidelines are governed by the physician and the physical therapist.

Preoperative Phase:

Goals:

1. Diminish inflammation/swelling/pain
2. Restore normal range of motion (especially extension)
3. Restore voluntary muscle activation
4. Provide patient education to prepare patient for surgery (crutch training, functional brace fitting, protocol review)

First week after Surgery:

Goals:

1. Knee flexion ROM to at least 90o comfortably
2. Progress to full weight bearing
3. Normal gait with crutches/cane
4. Normalize balance/ proprioception abilities
5. Begin/enhance normalization of quadriceps recruitment

Post-op Day 1-3:

- Brace ROM: 0-90o as tolerated in NWB activities
- Weight Bearing: As tolerated with brace locked in extension using crutches
- Exercises:
    - Modalities PRN (ice 20 minutes out of every hour maximum)
    - Patella mobilization
    - Ankle pumps
    - Quadriceps/hamstring co-contraction at multiple angles, 10x10 2-3 times per day
    - SLR in brace (0 degrees) 2-3 time per day
    - Full extension with use of bolster under heel or prone leg over edge of table
    - Electrical Stimulation PRN until patient has good voluntary quadriceps contraction

Postoperative Day 4-7:

- Continue with above
- Standing or prone leg curls
- Closed chain exercises (weight shifting)

Weeks 2-4 Post-op:

Goals:

1. Quadriceps control (ability to perform good quad set and SLR)
2. Full passive and active knee extension, full flexion
3. Minimal joint effusion

4. Independent ambulation

2 Weeks Post-op:

- Start bike (with seat high)
- Discharge crutch(es) and post-op brace as quadriceps recruitment allows
- Issue functional ACL brace
- Encourage full ROM
- Initiate *lightweight* leg press machine as tolerated
- Initiate treadmill walking with focus on normal gait pattern
- Aquatic therapy if accessible (march fwd/bkwd, lateral steps, flutter kicks from hips)

3 Weeks Post-op:

- Continue as above, advancing weights with isotonics as tolerated
- Cable column exercises wearing functional brace (if good quad control present); retro walking, lateral walking/stepping, no cross over * *lateral movement to be preformed on stationary surface/floor (no treadmill)*
- Initiate shuttle leg press and calf raises, as tolerated
- Monitor PF joint

Weeks 4-5 Post-op:

Goals:

1. Range of motion should be full
2. Normal biomechanical gait pattern, without use of assistive device

All new exercises listed below should be performed with functional ACL brace on

- Progress previous exercises as tolerated
- Chair/wall squats (tibia perpendicular to floor)
- Stairmaster: start with shallow steps with feet flat and weight on heels. Progress depth as tolerated to normal step.
- Initiate proprioceptive exercises (unilateral balance, contrakicks) with brace

Weeks 6-7 Post-op:

All new exercises listed below should be performed with functional ACL brace on

- Progress previous exercises as tolerated
- Unilateral step up (forward and lateral): emphasize control on decent phase of step up
- Fitter
- Nordic Track (elliptical trainer)

Week 8-9 Post-op:

All new exercises listed below should be performed with functional ACL brace on

- Progress previous exercises as tolerated
- Lateral movements/stepping, shuffling, hopping, carioca * *lateral movement to be preformed on stationary surface/floor (no treadmill)*
- Isokinetic exercises: 180, 150, 120, 90, 60 degrees/sec 8 to 10 reps each up and down spectrum

- Initiate single leg squats (tibia perpendicular to floor)
- Slide board
- Lunges (tibia perpendicular to floor)
- Initiate eccentric quad exercises with manual resistance
- Begin with use of conventional weight-lifting equipment (i.e. smith machines, squat racks, etc.) Stress proper biomechanics to protect the graft.
- Start with lightweight and high repetitions and gradually progress to heavier weight, with decreased repetitions.

Week 10 Post-op

Functional brace to be worn during all activities listed below

- Progress previous exercises as tolerated
- Assessment of jogging on treadmill (wait for 4 months for this if hamstring or autograft used)
- Low-intensity vertical and lateral hopping to begin with, use both feet and progress to single leg ASAP
- Volume for plyometrics (this is not a conditioning exercise but a strength one) for rehabilitation. Wait for 4 months for this if hamstring or autograft is used.
- 40-60 foot contacts /session for beginners
- 60-80 foot contacts/session for intermediate
- 80-100+ foot contacts/session for advanced
- If plyometric exercise intensity is high, the volume must be decreased, give ample recovery time between sets
- 2-3 sessions a week, preferably on weight lifting days
- Initiate sport-specific activities under supervision of ATC or PT
- Emphasize plyometrics on single leg for speed and power

Return to Sport

- On Doctors Approval (usually no sooner than 3 months)
- Isokinetic testing results-quad difference less than or equal to 15 percent, power difference less than or equal to 15 percent
- Peak torque/BW ratio greater than or equal to 80 percent (if possible)
- Hamstring/quadriceps ratio greater than or equal to 60 percent, 85 percent or better on scores of functional tests
- No pain/PFPS signs and symptoms
- No swelling
- Able to perform desired activities at full speed

Testing Protocol

- Isokinetic Testing
    - 2 Speeds: 60 degrees/s and 240 degrees/s
    - 6 repetitions at the slow speed and 12 at the faster speed
    - 3 submax and 3 maximal contractions for warm up
    - Test unaffected, then affected
    - Functional testing (optional, only for those who intend to return to recreational or advanced sport)
- One-legged single hop

    - For distance, 2 test each leg, calculate the mean, involved/uninvolved x 100 percent
- One-legged time hop test
    - To 6 meters, 2 tests timed to nearest 0.01s, calculate the mean, uninvolved/involved x 100 percent
- Triple jump test
    - From stand still, three hops on one foot for total distance, 2 tests, calculate the men, uninvolved/involved x 100 percent