



UNIVERSITY ORTHOPAEDIC CENTER, P.A.

ACL Reconstruction

Dr Longobardi

GOALS

- Protect ACL graft
- Decrease swelling w/ use of RICE and ankle pumps as recommended by your PT
- Achieve full knee extension on your 1st post-op visit. This is VERY, VERY, VERY IMPORTANT! If you have the ability to hyperextend on your normal side then the same will be expected on the surgical side.
- Achieve full knee extension with heel strike with every step when walking w/ crutches
- Achieve an excellent quad set. A good quad set is achieved when you can see the kneecap move up and down when the quad is contracted and relaxed. A good quad set can prevent painful “scarring down” across the patellar tendon
- Achieve good kneecap mobility. A kneecap that becomes immovable or “entrapped” will limit your ability to bend and straighten your knee as much as you would like
- Achieve full ROM equal to your normal side by 4-6 weeks after surgery
- Progress to using 12-20 pound ankle weights with straight leg raises. Your goal is to perform these exercises with 10% of your body weight
- Remain on your crutches for the appropriate period of time as recommended by your physician and PT. **You should be able to walk w/o a limp before discontinuing with your crutches**
- Achieve 90-100% strength levels compared to your normal side and also achieve equal thigh and calf circumference
- Achieve adequate levels of ability, coordination, flexibility, endurance, proprioception, and strength necessary to return to your desired level of activity
- Be compliant w/ outpatient rehab and your home exercise program

OTHER CONSIDERATIONS / GENERAL INFORMATION

- The first 2 weeks after ACL surgery is an important period of time regarding the success of your rehab in preventing painful “scarring down” across the patella tendon and joint capsule. It is much easier to prevent “scarring down” than to treat after it occurs. ROM will tend to regress b/t treatment sessions which makes your home program and participation play an important role in achieving more permanent progress. Loss of knee extension commonly occurs after a night’s sleep (esp w/ sidesleepers), so it is very important to get your knee as straight as possible before taking your first steps in the morning. **HAMSTRING STRETCHES, PRONE HANGS, AND BRIDGING WILL HELP YOU GET YOUR KNEE STRAIGHT.** If you start your day by walking on a flexed knee, it will usually become tighter, more swollen, and more painful throughout the day. Walking on a flexed knee also puts stress on the ACL graft along with creating a leg length discrepancy compared to your normal side.
- You should continue to work toward achieving your goals even after being discharged from PT. This is recommended until one year after surgery in a stepdown program, at a health club, gym or home gym. It may take as long as a year to get full return of your muscle mass.

REHABILITATION FOLLOWING ACL RECONSTRUCTION

Rehabilitation after reconstruction of the ACL has changed dramatically over the past 15 years. Original protocols emphasized limited ROM, restricted weight bearing, and a time period of 9 to 12 months before returning to athletic activity. Our present protocol emphasizes unrestricted ROM with an emphasis on early knee extension, progressive weight bearing after surgery, and a more expedient return to athletic activity. Current protocol is based on clinical research that revealed that non-compliant patient’s (those who did not follow the instruction outlined in the earlier, less aggressive protocols) actually progressed better than those who followed the protocol as prescribed. Patients who started early weight bearing and gained TKE earlier than instructed were able to get back to normal sooner than those who followed the more conservative approach. Continuing research and clinical studies have determined that ligamentous stability is not compromised by more aggressive rehab techniques. The gradual acceleration of post-op ACL reconstruction rehab is the result of these findings.

Our rehabilitation protocol consists of a pre-op phase and three post –op phases. It is important to realize that the goal of this structured rehab program is to return the patient to a pre-injury level of activity.

PRE-OP PHASE

<u>GOALS</u>	<u>PATIENT EDUCATION</u>	<u>EXERCISES</u>
1.decrease joint effusion 2.restore full ROM 3.strengthen quads and hams 4.normalize gait_ —	1. review and explain complete pre and post rehab program 2. emphasize importance or restoration of ROM and near normal strength 3. mentally prepare for post-op rehab ensuring understanding of basic principles of accelerated rehab	1.quad sets (QS) 2.SLR emphasize QS 3.leg curls 4.ham stretch includes prone hang, heel prop, bridging 5.ROM A/AA/PROM (wall slides, heel slides) 6.ankle pumps

PHASE I (0-4 Weeks)

(0-2 Weeks)

<u>HOME EXERCISE PROGRAM</u>	<u>CLINICAL INTERVENTION</u>	<u>WEIGHT BEARING</u>
1. RICE x 15 min q 3 hrs. 2. quad sets (QS) 3. SLR all planes emphasize QS 4. wall slides 5. heel slides 6. passive extension 7. patella mobs (emphasize superior-inferior) 8.FES 9. ankle pumps w/ elevation 10. hamstring stretch 11. prone hang 12. bridging 13. heel prop	ROM: PROM Bike self ROM (0 to tolerance to full ROM) AAROM Heel slides, wall slides plus AA flexion. (0 to tolerance to full ROM) NOTE: Achieve full extension or hyperextension equal to opposite side ideally 2-3 wks post-op MOBS: Knee extension, patella, soft/scar tissue PRE's: Active knee extension thru full ROM w/o resistance. Isometrics sub-max hams 10 x 6 seconds @ 10,30,50,70,90 degrees Isometrics sub-max quads 10 x 6 seconds @ 30,50,70,90 degrees HEP (as at left) MODALITIES: FES, biofeedback, cryotherapy	PWB w/ crutches (knee 0 degrees) Emphasize full K' extension at heel strike

(2-4 Weeks)

HOME EXERCISE PROGRAM	<u>CLINICAL INTERVENTION</u>	<u>WEIGHT BEARING</u>
Review and modify	<p>ROM: PROM bike self ROM (0 to full ROM) AAROM: heel slides, wall slides AA flexion (0 to full ROM)</p> <p>MOBS: K' extension, patella, soft/scar tissue</p> <p>FLEXIBILITY: Gastroc-Soleus, Hams 3 x 30 sec.</p> <p>PRE's: SLR all planes Ham curls 0 – 90 degrees emphasize eccentrics Quads: leg press 0 –90 degrees Calf raise Closed chain K' extension (kinetron) ¼ squats – bilateral Step-ups 3" Open chain K' extension w/o resistance (caution w/ PF irritation) Stationary bike for self ROM (minimal tension and caution w/ PF)</p> <p>BALANCE/PROPRIO: Single and multidirectional balance board (50-100% WB)</p> <p>EXERCISES: Swimming freestyle flutter kick only Nordic Track 5 minutes UE conditioning, trunk, contralateral LE Aquatic Therapy (gait training, ROM, strengthening exercises)</p> <p>MODALITIES: FES Biofeedback Cryotherapy</p>	PWB with crutches

PHASE II

(4-6 Weeks)

<u>GAIT</u>	<u>CLINICAL INTERVENTION</u>	<u>ROM</u>
<p>FWB with crutches w/normal gait; if meniscal repair, then PWB for full 6 weeks.</p>	<p>FLEXIBILITY: AAROM 0 – full ROM Gastroc and Hams 3x30 sec</p> <p>PRE's: same as weeks 0-4 Increase resistance Step-ups 6 “ K' extension w/o resistance Leg press 0-90 degrees Leg curl emphasize eccentrics Multi-hip Calf raises Stationary bike Nordic Track ¼ squats</p>	<p>MOBS: Patella glides freely in all directions, soft tissue mobs, XFM</p> <p>EXTENSION: Full motion should be present, if not continue aggressive stretching.</p> <p>FLEXION: continue to push to full ROM equal to opposite side (this should be achieved 6-8 wks post-op).</p>

(6-10 Weeks)

<u>GAIT</u>	<u>CLINICAL INTERVENTION</u>	<u>ROM</u>
<p>As above</p>	<p>PRE's: Progress leg curl 0-120 degrees Progress leg press 0-120 degrees Progress toward decreasing reps and increasing resistance for quads and hams (eccentrics) ½ squats at 8 weeks</p> <p>BALANCE/PROPRIO: Progress to single leg support on multi-directional balance board and BAPS/BREG board</p> <p>FUNCTIONAL TRAINING: Progress all exercises to include treadmill, cable column resistance 8 wks lateral mov't, resistance drills w/ cable column, Fitter, Euro-glide</p>	<p>As above</p>

PHASE III

(10 – 16 Weeks)

<u>WEEK</u> <u>10</u>	<u>CLINICAL INTERVENTION</u> Running drills in pool Running on land at comfortable pace x 10 minutes
<u>WEEK</u> <u>12</u>	<u>CLINICAL INTERVENTION</u> RUNNING: Progressive running “on land” Mini-tramp / treadmill running Resistive forward / retro running Resistive cariocas / side shuffles PRE’s: Progress with resistance on all exercises as per Phase II FUNCTIONAL TRAINING: Swimming, Nordic Track, Euro-Glide, jumping rope, Fitter, plyometrics, agility drills, slide board

(16-20 Weeks)

Continue all running drills as mentioned above w/ greater resistance, time and intensity.

Work conditioning

Functional Testing:

Supine squat leg press (equal strength)

Functional Jump Test: 15% of body height (hands behind back)

Functional Hop Test: 15% of uninvolved extremity (hands behind back)

LEFT test (Lower Extremity Functional Testing): males 90-100 seconds, females 120-135 seconds

Sport specific testing: plyometrics, functional and sports exercises

DISCHARGE CRITERIA

Subjective

1. pain free with ADLs all rehab, activities, agility activities and sport specific drills
2. no c/o stiffness during or after all above activities
3. no c/o giving way during all above activities

Objective

1. anthropometric measurements (joint line, 5 cm and 10 cm proximal < 1 cm effusion difference.
2. full PROM and AROM (0-135 degrees)
3. no quad lag
4. minimal PF crepitus/grating
5. ambulation, running, agility activities, etc w/o limp
6. KT 1000 if accessible
7. functional tests <10% of norms
8. sport specific tests
9. medical approval
10. Modified LEFT test (*refer to "Dr Longobardi Left Test"*)