

## **ACL Reconstruction Rehabilitation Normal Protocol**

This rehabilitation protocol has been designed for patients following ACL reconstruction who anticipate returning to a high level of activity as soon as possible.

This protocol may be modified if the following concomitant procedures are performed:

- Meniscal repair
- Associated MCL or PCL reconstruction
- ACL reconstruction revision
- Articular cartilage damage or Microfracture

The protocol is divided into several phases according to postoperative weeks, and each phase has anticipated goals for the individual patient to reach.

The **overall goals** of the reconstruction and the rehabilitation are to:

- Establish good quadriceps activity
- Control joint pain, swelling, hemarthrosis
- Restore normal knee range of motion
- Restore a normal gait pattern and neuromuscular stability for ambulation
- Restore normal lower extremity strength
- Restore normal proprioception, balance, and coordination for daily activities
- Achieve the highest level of function based on the orthopedic and patient goals

Physical therapy is to begin day 1 post-op. It is extremely important for the supervised rehabilitation to be supplemented by a home exercise program where the patient performs the given exercises at home or at a gym facility. **Important post-op signs** to monitor:

- Swelling of the knee or surrounding soft tissue
- Abnormal pain response, hypersensitivity
- Abnormal gait pattern, with or without assistive device
- Limited range of motion
- Weakness in the lower extremity musculature (quadriceps, hamstring)
- Extreme pain, tenderness and/or swelling in the calf

**Return to activity** requires both time and clinical evaluation. To safely and most efficiently return to normal or high level functional activity, the patient requires adequate strength, flexibility, and endurance. Isokinetic testing and functional evaluations are both methods of determining a patient's readiness to return to activity.

## Phase 1: Week 1-2

| WEEK | ROM | EXERCISE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | GOAL    |
|------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 1-2  |     | Patellar mobs<br>CPM (as directed by MD)<br>Hamstring stretch (avoid with HS graft)<br>Gastoc-soleus stretch<br>Heel slides with towel/Wall slides<br>May begin stationary bicycle when 105° flexion is reached<br>(DO NOT use bike/force to increase flex; OK to force ext)<br>STRENGTH<br>Quad sets with Biofeedback 10 min (10" holds, 30 reps, 10x daily)<br>SLR flexion (may add weight if no quad lag present)<br>Sidelying hip abd/adduction<br>Multi-hip machine (flex, abd, add)<br>Bilateral/Single leg press (120-20°) (90-20° if meniscus involved)<br>Chair squats (0-90°)<br>Step-ups<br>Calf Raises<br>Notes: SLR: Perform quad set and lift 12 in off table, do not progress to functional activity until patient can perform 5' with 5 lbs w/out lag.<br>WEIGHT BEARING | 0-110°  |
|      |     | PWB to WBAT according to Dr. Grimshaw<br>Cone walk (forward only)<br>WBAT with crutches until quad control is gained<br>One crutch before FWB with no crutches<br>Eliminate quad avoidance pattern<br>BALANCE TRAINING<br>Weight shifts (side/side, fwd/bkwd)<br>Single leg balance on various surfaces, ie. air disc, foam pad<br>Double leg balance on tilt board, wobble board<br>MODALITIES<br>Electrical stimulation as needed (NMES, TENS)<br>Ultrasound/Soft tissue mobs to portals (once incisions are closed)<br>Ice 15-20 minutes with knee at 0° ext<br>BRACE<br>Will be progressively unlocked per MD orders<br>Remove brace to perform ROM activities at home                                                                                                               | PWB-FWB |

### GOALS OF PHASE:

- ROM 0-110°
- Restore voluntary muscle activation
- Control pain, inflammation, and effusion
- PWB to FWB as tolerated as determined by Dr. Grimshaw
- Restore full patellar mobility

## Phase 2: Week 2-4

| WEEK | EXERCISE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | GOAL                     |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 2-4  | <p>ROM</p> <p>Continue previous</p> <p>Foam roller for ITB/Quad</p> <p>Prone quad stretch</p> <p>Light hamstring stretch at wk 4 (HS graft only)</p> <p>STRENGTH</p> <p>Continue previous</p> <p>Prone hip extension</p> <p>Bilateral leg press (no ROM restrictions)</p> <p>Single leg press</p> <p>Side lying clams</p> <p>Front and Side Lunges</p> <p>Bicycle/EFX</p> <p>WEIGHT BEARING</p> <p>FWB with quad control</p> <p>Discontinue Crutches</p> <p>BALANCE TRAINING</p> <p>Continue previous</p> <p>Progress difficulty from Phase I</p> <p>MODALITIES</p> <p>Continue as needed</p> <p>BRACE</p> <p>Discontinue by week 3-4</p> <p>Measure for functional at week 4</p> | <p>0-125°</p> <p>FWB</p> |

### GOALS OF PHASE:

- ROM 0-125°
- Eliminate pain, inflammation, and effusion
- Improve muscular strength and endurance
- Restore proprioception

### Phase 3: Week 4-12

| WEEK | EXERCISE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | GOAL   |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 4-12 | <p>ROM</p> <p>Continue previous</p> <p>May add dynamic stretching program at week 8</p> <p>STRENGTH</p> <p>Continue previous</p> <p>Glute/ham drops</p> <p>Slide board reverse lunge</p> <p>Split squats</p> <p>Walking lunges</p> <p>Single leg eccentric leg press</p> <p>Hamstring curls</p> <p>Lateral step-downs</p> <p>Lateral lunges</p> <p>Monster walks</p> <p>Vertical Squats</p> <p>Straight-leg dead lifts</p> <p>Stool crawl</p> <p>Plyometric leg press/shuttle at week 8</p> <p>BALANCE TRAINING</p> <p>Continue previous</p> <p>Single leg stance with plyotoss</p> <p>Wobble board balance work-single leg</p> <p>½ Foam roller work</p> <p>AEROBIC CONDITIONING</p> <p>EFX</p> <p>Bicycle for endurance</p> <p>Progress into jogging program at week 8 (BTB) or week 12 (HS/Achilles)</p> <p>(must achieve full ROM, no pain or effusion)</p> <p>MODALITIES</p> <p>Ice 15-20 minutes as needed</p> <p>BRACE</p> <p>Functional Brace as needed</p> | 0-140° |

#### GOALS OF PHASE:

- Restore full knee ROM (0-140°)
- Increase lower extremity strength and endurance
- Restore functional capability and confidence
- Enhance proprioception, balance, and neuromuscular control

## **Phase 4: Week 12-16**

| <b>WEEK</b> | <b>EXERCISE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12-16       | <p>ROM</p> <p>Continue all stretching from previous phases</p> <p>STRENGTH</p> <p>Continue all strengthening activities from previous phases increasing weight and repetitions</p> <p>Progress plyometric drills</p> <p>BALANCE TRAINING</p> <p>Continue all single-leg activities increasing difficulty</p> <p>AEROBIC CONDITIONING PROGRAM</p> <p>Progress jogging/running program</p> <p>Swimming</p> <p>Backwards running</p> <p>FUNCTIONAL TRAINING</p> <p>Sport-specific drills</p> <p>Cutting/agility program</p> <p>Agility Ladder: 1, 2, 3, 4, 5, 6, 7, 8, 9</p> <p>Cone Drills: 1, 2, 3, 4, 5, 6</p> <p>Lateral movement</p> <p>Carioca, figure 8 drills</p> <p>MODALITIES</p> <p>Ice 15-20 minutes as needed</p> <p>BRACE</p> <p>Functional Brace as needed</p> |

### **GOALS OF PHASE:**

- Progress strength and endurance
- Enhance neuromuscular control
- Progress skill training
- Perform selected sport-specific activity

## **Phase 5: Week 16-36**

| <b>WEEK</b> | <b>EXERCISE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16-36       | <p>ROM<br/>Continue all stretching from previous phases</p> <p>STRENGTH<br/>Progress plyometric drills</p> <p>BALANCE TRAINING<br/>Continue all single-leg activities increasing difficulty</p> <p>FUNCTIONAL TRAINING<br/>Initiate Sports Metrics – (5 mo BTB, 7-8 mo Achilles, HS)<br/>Progress running/swimming program<br/>Progress plyometric program<br/>Progress sport training program<br/>Progress neuromuscular program</p> <p>MODALITIES<br/>Ice 15-20 minutes as needed</p> <p>BRACE<br/>Functional Brace as needed</p> |

### **GOALS OF PHASE:**

- Return to unrestricted sporting activity
- Achieve maximal strength and endurance
- Progress independent skill training
- Normalize neuromuscular control drills

At six month follow-up visit, a battery of functional tests may be performed to determine level of function. These will include single leg hop for distance, 40 yard figure 8 obstacle run, and isokinetic test at 60, 180, and 300°/sec.