Altru Advanced Orthopedic ACL Rehabilitation Protocol

The intent of this protocol is to provide the therapist with a guideline for the post-op rehab of a patient who has had an ACL repair. It is not intended to be a substitute for appropriate clinical decision making regarding the progression of a patient’s rehab. The actual therapy plan of care must be based on the surgical approach, physical exam and findings, individual progress, any post-op complications, and/or co-morbidities. If a therapist needs assistance or has questions regarding the progression of a patient post surgically they should consult the referring surgeon.

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Treatment</th>
<th>Goals</th>
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| • NWB with crutches for first week  
• Wear knee immobilizer locked in extension, including at night (discontinue brace at night at 2 weeks) | • Supine wall slides, QS, SAQ, LAQ (90-45), SLR (example: 3 sets of 15 reps, stop if pain or improper form, 3 times per day for 1-2 weeks)  
• bike for ROM only  
• patellar mobilization, gait training  
• Cryotherapy and NMES prn | • PROM 0-90°  
• Active quad contraction |

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<th>Week 2-4</th>
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| • WBAT with knee immobilizer locked in extension, without crutches, as tolerated  
• No open chain TKE  
• Limit closed chain to 0-45° flex  
• D/C immobilizer when full extension and good quad control  
• Progress to functional brace as swelling permits and per MD  
• Initiate Exos programming as indicated | • Step-ups in pain free range (start 2" and progress), wall squats/sits, progress bike and stair master duration (10 min minimum).  
• Prone hangs if lacking extension, heel slides, bike for ROM, HS/HC stretches  
• NMR: SLS progression, weight shifts  
• Incision and soft tissue mobilization as needed, PF mobilization in flexion (if flexion limited)  
• Cryotherapy and NMES prn | • Knee flexion 90°  
• Full knee extension  
• Walking without crutches  
• Walking with full extension  
• SLR without extensor lag  
• Knee Outcome Survey (KOS)ADL score >65%  
• LEFS |
### Weeks 4-6
- No open chain TKE
- Limit closed chain 0-45° flex

- Wall squats progression to 45° flex, to single leg; lunges to 45° flex; treadmill walking, lateral stepping, retro-walking
- SLS progression, perturbation training
- Cryotherapy and NMES prn

- Knee flexion to 110°
- Quad strength >50% uninvolved
- Normal gait pattern

### Week 6-12
- FWB
- Measure and fit for functional brace as ordered by MD

- Progress exercises in intensity and duration
- Sports-specific activities-add in ball toss, ball drills, racquet swings, etc.

- Full AROM vs uninvolved
- Effusion ≤ 1+
- Quad strength >80%

### Week 12-16
- To be tested at 3mo, 6mo, and 9mo out:
  - Y balance test
  - DVJ
  - ACL-RSI

- Plyometrics: step-off box jumps, bounce jumps, etc.
- Agility exercises: lateral shuffle, skipping, etc. starting at low intensity
- Begin running progression on treadmill with functional brace (if all goals met and per MD)
- Transfer to fitness facility (if goals met)

- Maintain or gain quad strength (>80%)
- KOS sports >70%
- LEFS
- ACL-RSI

### Running Progression:
- Trace or less effusion, 80% or > strength, understand soreness rules

1. Treadmill/track walking
2. Treadmill walk/run intervals
3. Treadmill running/track: run straights walk turns
4. Track: run straights and turns
5. Run outside on path/road

- Progress until 2 miles tolerated without increased pain and swelling.
- No more than 4 times/week and only every other day.
- Do not progress more than 2 levels in 7 days.

### Weeks 16-20
- Progress plyometrics: jump downs progressing to 12", lateral hops, twist jumps, single leg jumps up to 6" box, etc.

- Independent running
- Controlled landings from 12" box (video as needed)
Progress agility: backwards running, figure 8 running wide to narrow, cutting, sport specific drills, etc.

Controlled single leg landing up to 6" box
Maintain gains in strength (> or = 90% to 100%)
HOP test (> or = 90-100%)
KOS sports (> or = 80%)

Functional Testing:
- 4 months post-op

Provide recommendations for changes in rehab
Provide info for return to sport

Cybex Test Goals:
- Can be tested at 6 mo, 9 mo, and 12 mo

<table>
<thead>
<tr>
<th>Peak Torque/BW %</th>
<th>Males</th>
<th>Females</th>
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<tbody>
<tr>
<td>60 deg/sec</td>
<td>110-115</td>
<td>80-95</td>
</tr>
<tr>
<td>180 deg/sec</td>
<td>60-75</td>
<td>50-65</td>
</tr>
<tr>
<td>300 deg/sec</td>
<td>30-40</td>
<td>30-45</td>
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</table>

Hop Test:
- Single hop for distance
- Triple hop for distance
- Cross-over hop for distance
- Timed Running T-Test
- Y-balance- anterior

Goals:
- Involved side must be greater than or equal to 90% of the uninvolved side for each individual hop test.
- No giving way, increased effusion, or increased pain.

Re-Testing:
- If a patient has 1 of 4 hop tests that they do not achieve 90% or > they may re-do ONLY 1 test using the same guidelines for application as above.
- Scoring and passing criteria remain the same as the original test

Weeks 20-24

- Single leg plyometrics
- Resisted running, full speed running, cutting, stopping
- Sport specific activities: by 5 months noncontact sport skills with team

- Return to full activity by 6 months for autograft and 9 months for allograft.
- Meet goals for HOP test and/or Cybex testing per MD order
**Precautions:**

<table>
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<tr>
<th>Patellar tendon graft</th>
<th>Be aware of patellofemoral forces and possible irritation with exercise.</th>
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<tbody>
<tr>
<td>Hamstring tendon graft</td>
<td>No resisted hamstring strengthening until 8-12 weeks.</td>
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<tr>
<td><strong>Below precautions for any secondary surgery or injury in addition to ACL repair:</strong></td>
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<tr>
<td>Partial meniscectomy</td>
<td>No modifications, progress per protocol above</td>
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<tr>
<td>Meniscal repair</td>
<td>No weight-bearing flexion beyond 45° for 4 weeks</td>
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<tr>
<td>Lateral release</td>
<td>Weight bearing in full extension permitted</td>
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<tr>
<td>Concomitant abrasion chondroplasty</td>
<td>Patellar mobs, ambulate NWB with crutches 2 weeks</td>
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<tr>
<td>Concomitant microfracture</td>
<td>WBAT with crutches 3-5 days, no modifications, progress per protocol above</td>
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<tr>
<td>MCL injury</td>
<td>NWB 2-4 weeks with crutches</td>
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<td>No weight-bearing activities in treatment for 4 weeks</td>
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<td>Restrict motion to sagittal plane until weeks 4-6 to allow MCL healing</td>
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<td>Perform exercises with tibia in IR in early phase</td>
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<td>Consider brace if severe sprain and pain</td>
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</table>
- **Posterolateral corner injury/PCL repair**
  - Nonrepaired ROM restrictions: Grade 1: no restrictions, Grade 2: 0-90° week 1, 0-110° week 2, Grade 3: 0-30° week 1, 0-90° week 2, 0-110° week 3.
  - Minimize ER torques and varus stress 6-8 weeks
  - Avoid hyperextension
  - No active knee flexion ROM for 6 weeks
  - No resisted knee flexion for 12 weeks
  - Delay running progression, hop testing, agility drills, and return to sport by 4 weeks.
  - Crutches and immobilizer used for 2 weeks following surgery.

- **ACL revision**

### Soreness Rules

<table>
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<tr>
<th>Criterion</th>
<th>Action</th>
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<tbody>
<tr>
<td>1. Soreness during warm-up that continues</td>
<td>2 days off, drop down 1 step</td>
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<tr>
<td>2. Soreness during warm-up that goes away</td>
<td>Stay at step that led to soreness</td>
</tr>
<tr>
<td>3. Soreness during warm-up that goes away but redevelops during session</td>
<td>2 days off, drop down 1 step</td>
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<tr>
<td>4. Soreness the day after lifting (Not muscle soreness)</td>
<td>1 day off, do not advance program to the next step</td>
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<tr>
<td>5. No soreness</td>
<td>Advance 1 step per week or as instructed by healthcare professional</td>
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