

ACL Reconstruction (BTB Autograft)

High Yield Information / Timeline Summaries:

ROM: 0-120 degrees x 2 weeks -> no restrictions after 2 weeks

Weightbearing: Full weightbearing with brace locked straight x 2 weeks; Brace unlocked at physical therapist discretion when appropriate quadriceps control

Brace: Lock straight for sleep x 4 weeks; Lock straight for ambulation for minimum 2 weeks.

May discontinue brace at 4-6 weeks – dependent on comfort and therapy progress

Return to Sport Brace: ACL return to sport bracing is optional, but brace should be fitted around 5-6 months post-operatively and utilized when patient begins sport-specific/agility drills around 6 months post-operatively.

Driving: R knee: 5-6 weeks – based on therapy progress

L knee: 1-2 weeks – when appropriate motion achieved and off of pain medication

Estimate of Return to Activities (subject to therapy progress):

Jogging: 3 months

Golfing: 5 months, progress each week - (chip/putt -> high irons -> low irons -> driving)

Outdoor Biking, Hiking, Running: 6 months

Agility/Sport-Specific Drills: 6 months

Full Cutting/Pivoting (contact): 9 months

Return to Sport Criteria:

1. ROM Full
2. No effusion
3. Single leg squat with good form
4. Dynamic neuromuscular control with multi-plane activities at high velocity without pain or swelling
5. Quadriceps strength $\geq 90\%$ of contralateral side – Biodex if available
6. Vertical jump test, single leg hop tests (distance and timed test over 20ft) $\leq 5\%$ deficit compared to contralateral lower extremity
7. DorsaVi Limb Symmetry $> 90\%$ Limb Symmetry Index (LSI) on AMI and Acceleration/Deceleration Testing (If available)
8. Y-Balance $\geq 95\%$ (mean of 3 trials in anterior, posterolateral, posteromedial)

Therapy protocol and timeline do not change with the addition of lateral extraarticular tenodesis (LET), but if you did undergo this procedure in addition to your ACL reconstruction, please make sure to keep the lateral incision well-padded to prevent irritation from brace.

Postop	Goals	Precautions	Exercises
GENERAL POST-OP COURSE PRECAUTIONS	<p>Protect graft during recovery</p> <p>Obtain early ROM</p> <p>Emphasis on full passive extension</p>	<p>0-90° for 2 weeks, then advance as tolerated</p> <p>Hinged brace on at all times x 6 weeks</p>	
Weeks 0-2 PT 2x/week HEP daily	<p>Full passive knee extension</p> <p>Diminish pain and effusion</p> <p>Initiate early controlled motion (Goal: 0-90)</p> <p>Restore patellar mobility – superior patella glide with quad set</p> <p>Straight leg raise independently for transfers</p> <p>Ambulate with 2 crutches out of brace using proper supervised gait mechanics</p>	<p>WBAT w/ brace locked straight (may unlock in PT)</p> <p>Brace locked at 0° for sleep and when ambulating outside of PT</p> <p>ROM: 0-120°</p> <p>Avoid open chain terminal knee extension</p> <p>Do not lift extremity by heel</p>	<ol style="list-style-type: none"> 1. Gait training WBAT with crutches 2. Patellar mobilizations inf/sup; med/lat 3. Isometric quad sets; NMES 4. Supine/Prone knee extension stretch 5. A/AA/PROM knee flexion 6. SLRs all planes (No ADD if MCL repair/recon) 7. HS/Gastroc stretch 8. Weight shifts; BAPS; heel raises, mini squats 0-30° 9. Standing/prone HS curl 10. Ice, e-stim, elevation, ankle pumps for edema control, and vasopneumatic compression 11. BFR 2x weekly 12. Brace adjustment and education
Weeks 2-3 PT 2x/week HEP daily	<p>Full passive knee extension</p> <p>Diminish pain and effusion</p> <p>Continue advancing motion</p> <p>Ambulate with proper gait with use of crutches</p> <p>Passive/ AAROM beyond 90°</p> <p>Decrease effusion < 2 cm of contralateral knee at mid patella</p> <p>Ambulate with 2 crutches out of brace using proper supervised gait mechanics</p> <p>Double leg squat to 30° with equal weight distribution and 0° of valgus collapse</p>	<p>WBAT w/ brace locked straight until cleared by PT</p> <p>Brace locked at 0° for sleep</p> <p>ROM: 0-120°</p> <p>Avoid open chain terminal knee ext</p> <p>Do not lift extremity by heel</p>	<ol style="list-style-type: none"> 1. Decrease use of crutches with gait training if quad strength permits 2. As quad control improves unlock brace 0- 100° 3. Bike, heel slides, and wall slides for ROM 4. NMES for quad recruitment/ facilitation 5. CKC ex's low weight/high rep: double leg shuttle, leg press, 45° wall sits (tibia vertical), standing TKEs with resistance 6. Progress SLRs with weights 7. Progress proprioceptive ex's: SL balance 8. Gait training: cup walking, Fwd/Retro TM 9. Cont. edema control, vasopneumatic compression, ice, e-stim, elevation 10. Continue BFR 2x weekly 11. Hip flexor stretching (Supine)

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<p>Weeks 3-4 PT 2-3x/week HEP daily</p>	<p>Week 4 D/C crutches and brace; FWB with no AD</p> <p>Maintain full extension</p> <p>AROM > 125° FL</p> <p>Non-supported unilateral stance > 30 sec.</p> <p>MMT > 3+/5 Q; 3+/5 HS</p> <p>DL squat to 90° and return to standing with 0° of valgus collapse</p> <p>SL squat to 30° with less than 10° of valgus collapse</p> <p>Maintain scar mobility</p>	<p>WBAT</p> <p>Full ROM</p> <p>May discontinue brace when cleared by PT</p> <ol style="list-style-type: none"> 1. Avoid PFJ / Patellar Tendon pain 2. Avoid OKC terminal knee extension 3. Avoid deep knee squatting 	<ol style="list-style-type: none"> 1. Progress CKC ex's: single leg mini-squats, step-ups, standing 5pt reach, ball wall squats, incline squats 2. Progress proprioceptive ex's stable & unstable surfaces (half foam roll, mini-tramp, airex, BOSU, 360) 3. Resistive bike 4. Begin 4 way hip strengthening when able to perform SLR with 10# without extensor lag 5. Initiate isotonic Leg press (Low load/High Reps) 6. Isometric knee ext 90°-45° with submax manual resistance 7. AROM knee ext 90°-45° with minimal resistance without compensation 8. Progress gait training 9. Scar and patellar tendon mobilization 10. Continue BFR 2x weekly
<p>Weeks 5-7 PT 2-3x/week HEP daily</p>	<p>Normal gait; no AD</p> <p>Maintain full knee extension</p> <p>AROM = contralateral side</p> <p>Ascend stairs unsupported with normal reciprocal gait</p> <p>Perform ADLs without pain</p> <p>Eccentric leg press (4 sec) 1 x body weight ≤ 10° valgus collapse</p> <p>SL to 45° knee flexion with less than 10° of valgus collapse</p>	<p>Avoid PFJ/patellar tendon pain ≤ 3/10</p> <p>Avoid painful activities</p> <p>No running</p> <p>No jumping</p> <p>No cutting/pivoting</p>	<ol style="list-style-type: none"> 1. Progress CKC PRE's: increase resistance & ROM to 90° on stable and unstable surfaces 2. Progress proprioceptive ex's: mini-tramp with weighted ball toss 3. (6 weeks) AROM knee extension 90°-0° (full) with minimal resistance 4. Initiate stairmaster and/or elliptical 5. Progress to moderate load with isotonic leg press 6. Initiate eccentric leg press 7. Initiate limited range multidirectional lunges; progress to full lunge 8. Progress TM walking speed, incline, duration 9. Begin running in Alter G TM if available at 50-60% body weight 10. D/C brace/immobilizer at night 11. Prone quad stretch (wk 6) 12. BFR 1-2x weekly

<u>Postop</u>	<u>Goals</u>	<u>Precautions</u>	<u>Exercises</u>
Weeks 8-11 PT 2-3x/week HEP daily	Maintain full AROM MMT > 4/5 Q MMT > 5/5 HS SL squat to 45°-60° with ≤ 10° valgus collapse without raising heels Descend stairs unsupported with reciprocal gait	Avoid PFJ/patellar tendon pain ≤ 3/10 Avoid painful activities No jumping No cutting/pivoting	1. Progress CKC ex's: multidirectional lunges (sagittal, frontal, transverse), walking lunges, and light bilateral agility drills 2. Advance multiplanar proprioceptive training 3. AROM knee ext 90°-0° (full) with light resistance 4. Begin Fitter/slide-board 5. Slow form running with sports cord (4way) 6. BFR as needed
Weeks 12-14 PT 1-2x/week HEP daily	Y-balance test < 4 cm deficit in any direction (12 weeks) Jog nonantalgic > 5 min at > 5.5mph (14 weeks)	Criteria to begin jogging (12 weeks) 1. Y-balance test < 4 cm deficit in any direction 2. SL squat ≥ 30° with less than 10° valgus collapse ≥ 15 reps 3. Perform ≥ 15 SL heel raises 4. Perform SL bridge ≥ 15 reps 5. Quad girth symmetry ≥ 70% 6. SL repeated forward hop ≥ 15 reps 7. SL repeated vertical hop ≥ 15 reps	1. Lateral sports cord drills 2. Test Y Balance (12 weeks) 3. Begin T-Drill with shuffle only (12 weeks) 4. Isokinetic strength training Q/HS bilateral comparison 90°- 0° at 180°/s & 300°/s (12 weeks) (alternative: knee extension 10 rep max) 5. If 12 week testing has been passed: Initiate light double leg plyometric program: 4- square, tuck jumps, and jump rope 6. Advance multiplanar proprioceptive agility drills that are sport specific: T drill, box drill, cone agility drills 7. Initiate deceleration training (TM Decline, Sports Cord)
Weeks 15-19 PT 1-2x/week HEP daily	Independent with jog/run program Increase sport specific endurance	No cutting/pivoting No sports	1. Progress plyometric program; multidirectional, progress DL hop 2. Initiate DL to SL hop, focus on landing mechanics 3. Begin isokinetic training at 60°/s (16 weeks) (alternative: Train knee extension 5 rep max) 4. Progress sport specific training and agility 5. Progress to sprinting 6. Continue deceleration training with jogging

<u>Postop</u>	<u>Goals</u>	<u>Precautions</u>	<u>Exercises</u>
<p>Weeks 20-24 PT 1-2x/week HEP daily</p>	<p>Quad strength \leq 10% deficit compared to uninvolved knee with isokinetic testing or 5 rep max testing (week 20)</p> <p>$\leq 10^\circ$ knee valgus with DorsaVi Knee module (week 20)</p> <p>Pass Pro-Agility Shuttle Test within norms determined by PT (week 24)</p> <p>Unilateral hop tests \leq 5% deficit compared to contralateral LE (week 24):</p>	<p>No live sports</p> <p>No sport drills with opponent</p>	<ol style="list-style-type: none"> 1. Test isokinetic strength 60°/s, 180°/s, & 300°/s (week 20) (alternative test: 5 rep max knee extension) 2. Test DorsaVi Knee module if available (week 20) 3. T-Drill Test (week 20) 4. Pro Agility Shuttle Test (wk 24) 5. Functional hop tests: (wk 24) 6. Progress to single leg plyometric drills