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ACL Reconstruction, Hamstring Autograft or Allograft (Isolated, No Meniscal Repair)

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This is the rehabilitation plan I ask your physical therapist to follow after your ACL Reconstruction, Hamstring Autograft or Allograft (Isolated, No Meniscal Repair). Bring it to your first therapy visit. It is a framework, not a prescription: your therapist adjusts the pace to how you are healing, and anything we discussed in the office takes precedence over what is printed here. If something on this page does not match what we talked about, ask me.

Operation	ACL Reconstruction, Hamstring Autograft or Allograft (Isolated, No Meniscal Repair)
Physical therapist	Please send progress notes to the office and call with any question about the plan.

NOTE: When feasible prior to surgery, it is recommended that patients have at least 0-120° ROM, no effusion and >= 80% of quad and hamstring strength as compared to the unaffected limb.

Phase 1 - generally 0-2 weeks post-op

GOALS

- Protect surgical graft
- Normal gait and stair ambulation
- ROM: full knee extension and >= 110° knee flexion
- Good quadriceps control (achieve >= 20 SLRs with no lag)
- Minimize pain and swelling

PRECAUTIONS

- Wear brace AT ALL TIMES (even while sleeping)
- NO OPEN KINETIC CHAIN strengthening exercises
- NO RUNNING

CRUTCHES

- WBAT
- D/C when sufficient quad control and normal gait are both achieved

BRACE

- Remains locked at 0° for WB activity only until patient is able to do 20 SLRs without an extension lag
  - If able to, then open brace to current ROM

NOTE: Knee ROM would be limited the first 6 weeks post-op for an ACLR with meniscal repair

WOUND

- Post-op dressing remains intact until post-op day #2 (~48 hours after surgery)
- Shower after post-op day #2 (no need to cover the incision site)
- DO NOT SUBMERGE knee in water until 4 weeks post-op and incisions have fully healed
- Suture/staple removal @ 10-14 days post-op per Ortho

CRYOTHERAPY

- Cold with compression/elevation as needed (ice with compression wrap)

REHABILITATION

- Begin scar massage after incision has healed and scar is formed
- Perform the following rehabilitation exercises; progress as tolerated

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REHABILITATION - DAYS 1-7

- Calf pumps with theraband
- Heel slides (assisted as needed)
- Quad sets (use e-stim until patient is able to do 10 SLRs w/o extension lag)
- Supine passive extension with towel under heel
- Prone hangs as needed
- Gentle HS stretching
- UBE

REHABILITATION - DAYS 8-14

- Patellar mobilizations after suture/staple removal
- THEREX for restoration of quad function and hip/core strengthening
- Stationary bike for ROM; progress to biking for conditioning
- Ankle ROM and proprioceptive training
- Progressive ankle strengthening
- Mini squats 0-45° or as tolerated
- Multi-angle hip and thigh isometrics until able to perform isotonics
- Gait training as needed until normalized gait

FOLLOW-UP

- Supervised rehab: 2-3x per week
- PT re-eval: weekly
- Ortho re-eval: ~2 to 4 weeks post-op

Phase 2 - generally 2-6 weeks post-op

GOALS

- Full knee ROM
- Minimal or no effusion
- > 80% quadriceps and HS strength compared to the uninvolved limb
- Functional strength and control in daily activities

PRECAUTIONS

- DO NOT SUBMERGE knee in water until 4 weeks post-op and incisions have fully healed
- NO RUNNING

BRACE

- Wear brace at Ortho's discretion
- May be removed during rehab at therapist's discretion

REHABILITATION

- Continue Phase 1 exercises as needed
- Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)

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- Recommend exercises begin with lighter intensity and higher reps with progression to higher intensity and lower reps

REHABILITATION - WEEKS 2-6
- Stationary biking for conditioning; may add elliptical and/or rower gradually
- Beginner level pool exercises primarily in the sagittal plane (i.e. no breaststroke or whip kick motion)
- General LE stretching (i.e. calf, HS, quads, hip flexors, and hip abductors/adductors)
- Progressive strengthening
  - Thigh musculature with emphasis on knee extension; progress with loading and ROM
  - Hip extension, abduction, and adduction
  - Plantarflexion
  - Core musculature
  - DO NOT neglect the patient's overall fitness condition

NEUROMUSCULAR TRAINING
- THEREX on an unstable surface (i.e. foam pad), SL exercises, and exercises with reduced visual input

FOLLOW-UP
- Supervised rehab: 2-3x per week
- PT re-eval: every 3-4 weeks
- Ortho re-eval: ~12 weeks post-op

Phase 3 - generally 6-12 weeks post-op

GOALS
- Maintain full knee ROM
- Minimal or no effusion
- Progress strengthening and neuromuscular retraining
- DL hop in place without pain using good form

PRECAUTIONS
- NO RUNNING

REHABILITATION
- Continue Phase 2 exercises as needed
- Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in knee pain or effusion since the previous exercise session)
- Continue bike, elliptical, rower, and/or stair machine for conditioning purposes

REHABILITATION - 6-9 WEEKS
- Continue beginner level pool exercises primarily in the sagittal plane (i.e. no breaststroke or whip kick motion)
- General LE stretching (i.e. calf, HS, quads, hip flexors, and hip abductors/adductors)
- Progressive strengthening
- Progressive neuromuscular training and balance exercises

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REHABILITATION - 9-12 WEEKS
- Progressive pool program as tolerated
- Progressive functional training
  - 2-legged plyometrics (i.e. shuttle jumps and jump roping)
  - Progress DL to SL
- Progressive LE and core strengthening
- Progressive neuromuscular training and balance exercises

TESTING
- SL squat to >= 60° for max reps and >= 80% of non-surgical limb

FOLLOW-UP
- Supervised rehab: 2-3x per week
- PT re-eval: monthly
- Ortho re-eval: ~12 weeks post-op

Phase 4 - generally 3-6 months post-op

GOALS
- Jog at own pace and distance without pain
- ~90% strength return for quadriceps and HS compared to uninvolved limb
- Hop test and Y-balance limb symmetry > 90%
- Isokinetic testing limb symmetry > 85%
- Meet occupation requirements at 6-9 months

PRECAUTIONS
- NO PARTICIPATION in sports or physically demanding training programs; at the discretion of the rehabilitation team

REHABILITATION
- Continue Phase 3 exercises as needed
- Progress in duration and intensity of exercises (i.e. no increase in knee pain or effusion since the previous exercise session)

REHABILITATION - MONTHS 3-4
- Progressive balance training as needed
- Progressive LE and core strengthening
- Progressive jogging program
  - Begin on Alter-G if available
  - Criteria for run progression: pain-free hopping and ability to perform >= 90% of uninvolved limb max reps SL squats to >= 60° knee flexion
  - Increase time and/or distance no more than 10%-20% per week
- Progressive functional, neuromuscular, plyometric, and agility training:
  - Jumping, hopping, directional jogging, cariocas, shuffles, etc.
  - SL anterior and lateral jumps
  - Shuttle jumps progressing to box jumps

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REHABILITATION - MONTHS 5-6

- Biodex isokinetic testing: until > 90% symmetry
- Hop test battery: until > 90% symmetry in hop for distance, triple hop for distance, crossover hop, and 6-meter timed hop
- Y-balance test: until > 90% symmetry
- Movement quality assessments: Landing Error Scoring System (LESS), Functional Movement Screen (FMS), etc.

FOLLOW-UP

- Supervised rehab: 1-2x per week
- PT re-eval: monthly
- Ortho re-eval: ~6 months post-op

MISCELLANEOUS

- After 6 months post-op, Phase 4 exercises are continued and gradually increased in intensity and duration as tolerated
- Pass a return-to-sport / fitness test at 9-12 months

Phase 5 (return to sport) - generally 9 months post-op

GOALS

- Sport-specific training without pain or swelling
- Mitigate future injury risk
- Hop test and Y-balance limb symmetry > 90%
- Isokinetic testing limb symmetry > 90%
- Full return to sports/athletics and demanding physical work without limitations

PRECAUTIONS

- NO PARTICIPATION in sports or physically demanding training programs until cleared for return to sport by the rehabilitation team

REHABILITATION

- Continue Phase 4 exercises as needed
- Progress in duration and intensity of exercise (i.e. no increase in knee pain or effusion since the previous exercise session)
- Warm-up: 5-10 minutes on bike, elliptical, or stairmaster
- General LE stretching (i.e. calf, HS, quads, hip flexors, and hip abductors/adductors)
- Progressive LE and core strengthening
- Progressive balance training as needed
- Progressive jogging program
  - Increase time and/or distance no more than 10%-20% per week
- Progressive agility and plyometric training
- Incorporate drills/activities specific to patient's sport

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RETURN TO SPORT (RTS) EVALUATION

- Hop test battery: single hop, triple hop for distance, crossover hop, and 6-meter timed hop
- Isokinetic strength (60°/sec)
- Vertical jump
- Deceleration shuttle test

RTS CRITERIA

- No functional complaints
- Confidence when running, cutting, and jumping at speed required for specific sport
- Demonstration of sport-specific drills/activities
- 90% contralateral values on hop tests

FOLLOW-UP

- Supervised rehab: 1-2x per week as needed
- PT re-eval: monthly
- Ortho re-eval: ~9-12 months post-op

MISCELLANEOUS

- Progress activities for return to sport/collision sports or aggressive physical training (e.g. tactical or military training) based on the patient's functional performance and endurance. This time period will be directed by the Ortho Surgeon and the Physical Therapist. This may require between 9-12 months before cleared without restrictions.

References

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- Wilk KE, Macrina LC, Cain EL, Dugas JR, Andrews JR. Recent advances in the rehabilitation of anterior cruciate ligament injuries. J Orthop Sports Phys Ther. 2012; 42(3): 153-171.
- Wright RW, Haas AK, Anderson J, et al., MOON Group. Anterior cruciate ligament reconstruction rehabilitation: MOON guidelines. Sports Health 2015; 7(3): 239-243.

Abbreviations

AROM / AAROM / PROM: active / active-assisted / passive range of motion. ROM: range of motion. ER / IR: external / internal rotation. ABD / ADD: abduction / adduction (away from / toward the midline). FLEX / EXT: flexion / extension. WBAT / PWB / TTWB / NWB: weight bearing as tolerated / partial / toe-touch / non-weight bearing. SLR: straight leg raise. HS: hamstrings. ITB: iliotibial band. UE / LE: upper / lower extremity. UBE: upper body ergometer (arm bike). BAPS: balance board. BFR: blood flow restriction training. PREs: progressive resistance exercises. D/C: discontinue. prn: as needed. POD: post-operative day. TENS: transcutaneous electrical nerve stimulation. ADLs: activities of daily living.

Source

Adapted from Defense Health Agency, Tri-Service Post-Operative Rehabilitation Guidelines, "DHA ACL Reconstruction Rehab", May 2020, published by William Beaumont Army Medical Center at https://william

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