



ACL Reconstruction Rehabilitation Protocol

Phase 1 (0-2 weeks post-op)

Rehabilitation Goals

- Protect surgical graft
- Normal gait and stair ambulation
- ROM: full knee extension and $\geq 110^\circ$ 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

- Weight Bearing as tolerated
- Discharge 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 4-6 weeks post-op for an ACLR with meniscal repair (usually $0-90$ degrees)

Wound

- Post-op dressing remains intact until post-op day #3 (~72 hours after surgery)
- Shower after post-op day #3 (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

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ACL Reconstruction Rehabilitation Protocol

Phase 1 (0-2 weeks post-op)

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

Days 1-7

- 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

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 isotonic
- Gait training as needed until normalized gait

FOLLOW-UP:

- PT re-eval: weekly
- Ortho re-eval: ~2 to 4 weeks post-op



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ACL Reconstruction Rehabilitation Protocol

Phase 2 (2-6 weeks post-op)

Rehabilitation 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 only if unable to do 20 SLR
- Should be removed during rehab

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



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ACL Reconstruction Rehabilitation Protocol

Phase 2 (2-6weeks post-op).

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



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ACL Reconstruction Rehabilitation Protocol

Phase 3 (6-12 weeks post-op)

Rehabilitation 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

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

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

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ACL Reconstruction Rehabilitation Protocol

Phase 3 (6-12 weeks post-op)

Testing

SL squat to $\geq 60^\circ$ for max reps and $\geq 80\%$ of non-surgical limb

Follow-Up

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



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ACL Reconstruction Rehabilitation Protocol

Phase 4 (3-6 months post-op)

Rehabilitation 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

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)

3-4 Months

- 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
- $\geq 90\%$ of uninvolved limb max reps SL squats to $\geq 60^\circ$ 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

5-6 Months

- 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.



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ACL Reconstruction Rehabilitation Protocol

Phase 4 (3-6 months post-op)

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



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ACL Reconstruction Rehabilitation Protocol

Phase 5 RETURN TO SPORT (9 months post-op)

Rehabilitation 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 military training without limitations

PRECAUTIONS

- **NO PARTICIPATION** in sports until cleared for return 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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ACL Reconstruction Rehabilitation Protocol

Phase 5 RETURN TO SPORT (9 months post-op)

Return to Sport Evaluation (RTS)

- 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

Return to Sport 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
- 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.



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