

ACL RECONSTRUCTION

Lance E. LeClere, MD • Professor of Orthopaedic Surgery · Chief, Orthopaedic Sports Medicine · Vanderbilt University Medical Center

These guidelines are a **framework** for the post-operative rehabilitation program. They **do not** substitute for any specific restrictions or requirements determined through the necessary shared decision-making and collaboration between the operating surgeon and the treating rehabilitation team. This protocol is for an **isolated ACL reconstruction with no meniscal repair**.

BEFORE SURGERY

When feasible prior to surgery, it is recommended that patients have at least **0–120° ROM**, **no effusion**, and **≥80% of quadriceps and hamstring strength** compared with the unaffected limb.

PHASE 1

WEEKS 0–2

Protect the graft

PHASE 2

WEEKS 2–6

Full ROM & strength

PHASE 3

WEEKS 6–12

Neuromuscular retraining

PHASE 4

MONTHS 3–6

Return to run

PHASE 5

MONTH 9+

Return to sport

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PROTECT THE GRAFT · GENERALLY 0–2 WEEKS POST-OP

GOALS Protect the surgical graft · normal gait and stair ambulation · full knee extension and ≥110° knee flexion · good quadriceps control (≥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 the 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 at 10–14 days post-op per orthopaedics

CRYOTHERAPY

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

REHABILITATION

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

DAYS 1–7

QUAD CONTROL

- ♦ Calf pumps with theraband
- ♦ Heel slides (assisted as needed)
- ♦ Quad sets — use e-stim until the patient can do 10 SLRs without extension lag
- ♦ Supine passive extension with towel under heel
- ♦ Prone hangs as needed
- ♦ Gentle HS stretching
- ♦ UBE

PROUD MEDICAL TEAM FOR





DAYS 8–14

RESTORE MOTION

- ◆ 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 gait is normalized

FOLLOW-UP

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

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RESTORE MOTION & STRENGTH · GENERALLY 2–6 WEEKS POST-OP

GOALS Full knee ROM · minimal or no effusion · >80% quadriceps and HS strength compared with 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 orthopaedics' discretion
- ◆ May be removed during rehab at the therapist's discretion

REHABILITATION

- ◆ Continue Phase 1 exercises as needed
- ◆ Progress to the following exercises and increase intensity gradually when the patient is ready (no increase in knee pain or effusion since the previous session)
- ◆ Begin with lighter intensity and higher reps, progressing to higher intensity and lower reps

WEEKS 2–6

BUILD LOAD

- ◆ Stationary biking for conditioning; may add elliptical and/or rower gradually
- ◆ Beginner-level pool exercises primarily in the sagittal plane (no breaststroke or whip kick motion)
- ◆ General LE stretching (calf, HS, quads, hip flexors, 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 (e.g. foam pad), SL exercises, and exercises with reduced visual input

FOLLOW-UP

- ◆ Supervised rehab: 2–3× per week
- ◆ PT re-eval: every 3–4 weeks
- ◆ Ortho re-eval: ~12 weeks post-op

PROUD MEDICAL TEAM FOR





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NEUROMUSCULAR RETRAINING · 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 the patient is ready (no increase in knee pain or effusion since the previous session)
- ◆ Continue bike, elliptical, rower and/or stair machine for conditioning

WEEKS 6–9

PROGRESS STRENGTH

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

WEEKS 9–12

BEGIN PLYOMETRICS

- ◆ Progressive pool program as tolerated
- ◆ Progressive functional training
 - Two-legged plyometrics (shuttle jumps, jump roping)
 - Progress DL to SL
- ◆ Progressive LE and core strengthening
- ◆ Progressive neuromuscular training and balance exercises

TESTING

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

FOLLOW-UP

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

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RETURN TO RUN · GENERALLY 3–6 MONTHS POST-OP

GOALS Jog at own pace and distance without pain · ~90% strength return for quadriceps and HS compared with the uninvolved limb · hop test and Y-balance limb symmetry $>90\%$ · isokinetic testing limb symmetry $>85\%$ · meet occupational requirements at 6–9 months

PRECAUTIONS

- ◆ **NO PARTICIPATION** in sports or physically demanding military schools; at the discretion of the rehabilitation team

REHABILITATION

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

MONTHS 3–4

JOGGING PROGRAM

- ◆ 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 the uninvolved limb's max reps of 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
 - SL anterior and lateral jumps
 - Shuttle jumps progressing to box jumps

MONTHS 5–6

SYMMETRY TESTING

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

PROUD MEDICAL TEAM FOR



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FOLLOW-UP

- ◆ Supervised rehab: 1–2× 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 service fitness test at 9–12 months

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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 sport and military training without limitations

PRECAUTIONS

- ◆ **NO PARTICIPATION** in sports or physically demanding military schools until cleared for return to sport by the rehabilitation team

REHABILITATION

- ◆ Continue Phase 4 exercises as needed
- ◆ Progress in duration and intensity of exercise (no increase in knee pain or effusion since the previous session)
- ◆ Warm-up: 5–10 minutes on bike, elliptical or stairmaster
- ◆ General LE stretching (calf, HS, quads, hip flexors, 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 the patient's sport

RETURN TO SPORT EVALUATION
TESTING

- ◆ Hop test battery: single hop, triple hop for distance, crossover hop and 6-metre 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 the speed required for the specific sport
- ◆ Demonstration of sport-specific drills / activities
- ◆ 90% of contralateral values on hop tests

FOLLOW-UP

- ◆ Supervised rehab: 1–2× 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 military training (e.g. airborne school) based on the patient's functional performance and endurance. This time period will be directed by the orthopaedic surgeon and the physical therapist and **may require between 9–12 months before clearance without restrictions.**

REFERENCES

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PROUD MEDICAL TEAM FOR


Lance E. LeClere, MD

Orthopaedic Sports Medicine & Shoulder Surgery

Appointments

615-936-7846

Website
LanceLeClereMD.com
Vanderbilt
vumc.org/orthopaedics