

BEAR ACL REPAIR WITH MENISCUS ROOT REPAIR

Physical Therapy Protocol

PATIENT

SURGEON

Andrew L. Merritt, MD

DATE OF SURGERY

PT START DATE

For the patient

You had **two repairs**: your own ACL, healing across the BEAR implant, and a meniscus root or radial tear. The root repair needs **no weight at all for 6 weeks**; one step can pull it loose. Bending stays at **90° or less for 6 weeks**. No running for **5 months**; sport takes **9 to 12 months**. You move on when your knee meets the goals.

PROTOCOL AT A GLANCE

WEIGHT BEARING	None for 6 weeks , not even toe-touch. Partial weight from week 6, full weight by weeks 10–12
BRACE	Locked straight on crutches and in sleep for 6 weeks . Off once you bend 110°. A sports brace only if prescribed
MOTION GOALS	Seated, to 45° for 2 weeks , then never past 90° until 6 weeks . Never forced
PHYSICAL THERAPY	Starts 5 to 7 days after surgery, 2 times a week . NMES and BFR at PT visits
KEY PRECAUTIONS	No forced stretching, no CPM. No loaded knee bend past 90° for 5 months
RUNNING · SPORT	Running no sooner than 5 months , after clearance and testing. Controlled cutting drills from week 30. Sport no sooner than week 36

Recovery Timeline

Phase	When	PT visits	Focus
1	Weeks 0–6	2× a week	No weight, 90° limit, NMES and BFR
2	Weeks 6–10	2× a week	Partial weight, brace unlocked, motion past 90°
3	Weeks 10–12	1–2× a week	Full weight, off crutches, gym strength
4	Weeks 12–20	1–2× a week	Advanced strength, loaded knee bend ≤90°
5	Weeks 20–30	1× a week + home program	Running from week 20, jumping and landing
6	Weeks 30–36	Weekly as needed	Controlled cutting drills, plyometrics
7	Weeks 36–52	Weekly as needed	Testing and return to sport

For the Therapist

Check the surgeon notes first. They override anything else in this protocol. Questions or setbacks: call (425) 656-5060.

Surgeon notes and special instructions

General principles

- **Criterion-based.** Advance only when the phase criteria **and** the minimum time are both met. Call us about setbacks.
- **Which repair governs.** The most restrictive combined protocol. The root or radial repair governs weight bearing: **strict NWB for 6 weeks** (axial load threatens the repair before it heals to bone), then PWB 25–50% from week 6 and full weight by weeks 10–12 per surgeon clearance; no WBAT until the repair is confirmed stable. The BEAR repair governs motion. Both agree on **0–90° through week 6**; motion advances past 90° from week 6. No weight-bearing squats, lunges, or loaded flexion past 90° **until month 5**.
- **Biologic healing.** Avoid excessive anterior tibial translation and torsional loads in weeks 0–12. No overpressure into extension. **No CPM, no manual PROM** in Phases 1–3; no scar massage until week 7.
- **Open-chain knee extension** follows the ACL reconstruction rule: none in the 0–40° arc before week 8, 90–40° only until about week 12, then full arc.
- **NMES is essential:** 10–15 reps × 10 sec contraction, 50 sec rest, at PT visits only (no home unit). **QI** (quadriceps index) targets: 60–80% by Phase 3, ≥80% to stop NMES and to run, ≥90% for sport. **BFR is strongly recommended during NWB** (quad sets, SLR, hip work) to limit atrophy; optional after.
- **Brace:** locked 0° for crutch walking and sleep to week 6 (seated motion 0–45° weeks 0–2, 0–90° weeks 2–6), then unlocked; weaned once AROM ≥110°. **Functional ACL brace only if Dr. Merritt prescribes it**; then worn until return-to-sport clearance.
- **Cold compression** 20 min on, 20 min off after every session. **Prehab** is strongly recommended when surgery is delayed or motion and quad control are not yet normal.

Procedures done at the same time

BEAR + LET (lateral extra-articular tenodesis)

- Dr. Merritt routinely adds an LET in high-risk patients to lower the re-tear rate.
- The BEAR protocol applies, with no significant timeline changes. Avoid aggressive resisted internal tibial rotation in Phase 1.

PHASE

1

Immediate Post-Op · Non-Weight-Bearing

Weeks 0–6

For the patient: what to expect

No weight on the leg for 6 weeks, not even your toes. Crutches carry all your weight, and the brace stays locked straight when you are up and when you sleep. Bend only while sitting, with your own muscles: to 45° for 2 weeks, then up to 90°, **never past 90°**. At PT, muscle stimulation and a BFR cuff keep your thigh from shrinking.

WEIGHT BEARING	Strict non-weight-bearing with crutches for 6 weeks (root repair governs)
BRACE	Locked 0° for crutch walking and sleep through week 6; unlocked for seated motion
MOTION	Seated active 0–45° weeks 0–2, 0–90° weeks 2–6; never past 90°. Active and active-assisted only

Goals

- Control effusion and pain; restore quad activation
- Protect both repairs: no axial load, no tibial translation stress
- Full passive extension, equal to the other side
- Limit quad and hamstring atrophy with BFR; maintain hip and core

Move on when

- ☐ Strict NWB maintained through week 6
- ☐ No extensor lag with SLR
- ☐ Flexion 90°
- ☐ Trace effusion or less; pain VAS ≤4/10

Exercises

Exercise	How
Quad sets with NMES	10–15 reps × 10 sec contraction, 50 sec rest; until QI ≥80%. Pair with the BFR cuff
Ankle pumps	From day 0; 20 reps an hour during NWB (clot prevention)
Heel prop	For full passive extension; no towel under the knee
Straight-leg raise	In the locked brace, only without an extensor lag; NMES or BFR may be added
Hip strengthening	Side-lying abduction, clamshells (ER); no prone hip extension or bridges until week 6; BFR may be added
Cold compression	20 min on, 20 min off after every session

Precautions

- No weight of any kind through week 6; a single step can disrupt the repair
- No flexion past 90° through week 6; no stationary bike before week 6
- No bridges, prone hip extension, or prone exercises through week 6 (they stress the root repair)
- No resisted or short-arc extension 0–30°; quad sets and locked-brace SLR are allowed
- No manual PROM or overpressure; no scar massage; no pivoting or rotational loads

PHASE

2

Early Rehabilitation · Partial Weight

Weeks 6–10

For the patient: what to expect

At 6 weeks you start putting **some weight** on the leg, a little more each week, with crutches. The brace is unlocked and you can bend past 90° while sitting. Standing exercises start once you are putting weight on the leg. Squats and lunges stay at 90° or less. No running or jumping.

WEIGHT BEARING	Partial (25–50% of body weight) from week 6; progress to full by weeks 10–12 once gait is normal, pain is minimal, and there is no extensor lag
BRACE	Unlocked from about week 6
MOTION	Progress past 90° toward full, symmetrical motion; active and active-assisted only

Goals

- Progress to full weight by weeks 10–12 with a normal gait
- Full or near-full, symmetrical motion
- Consistent SLR without extensor lag; QI toward 80%

Move on when

- ☐ Full weight, normal gait, no assistive device (weeks 10–12)
- ☐ Flexion $\geq 90^\circ$, full extension (0°)
- ☐ SLR ≥ 20 reps without lag
- ☐ QI progressing toward 80%; trace effusion or less

Exercises

Exercise	How
Long-arc quads	90–40° arc only (no 0–40° before week 8); add 2–3 lb a week
Straight-leg raise	All 4 planes
Partial squats	0–45°, support for both hands, once partial weight is established; no loading past 90° until month 5
Steps · stairs	Once partial weight is established: step-ups and step-downs on a 4-inch step; stairs with a rail
Stationary bike	From week 6: full revolutions with light resistance once flexion allows; rocking until then
Standing hip · calves	Once partial weight is established: band hip abduction, extension, ER; calf raises (seated anytime)
Aqua jogging	From week 8: deep water, flotation belt (no impact)
NMES · BFR	NMES at PT until QI $\geq 80\%$; BFR optional now that weight bearing has started

Precautions

- Progress weight bearing gradually; no WBAT until the repair is confirmed stable
- No weight-bearing knee flexion past 90° until month 5
- No overpressure, forced motion, or manual PROM; no open-chain extension 0–40° before week 8
- No running, jumping, or impact until month 5; use crutches until gait is normal

PHASE

3

Intermediate Strengthening

Weeks 10–12

For the patient: what to expect

You should now be on full weight and coming off crutches, and your knee should reach full motion. You'll build strength in the gym and add low-impact cardio. The brace comes off once you bend to about 110°. Squats and lunges stay at 90° or less. No running on land yet.

WEIGHT BEARING	Full; discontinue crutches once criteria are met
BRACE	Wean the hinged brace once AROM $\geq 110^\circ$
MOTION	Full motion expected; loaded flexion $\leq 90^\circ$ until month 5

Goals

- Full, symmetrical motion; walking without a device
- QI toward 60–80%
- Low-impact conditioning; neuromuscular control and proprioception

Move on when

- ☐ Full AROM equal to the other side, no lag
- ☐ SLR ≥ 20 reps; normal gait off crutches
- ☐ QI 60–80%; minimal effusion
- ☐ At least 12 weeks after surgery

Exercises

Exercise	How
Open-chain extension	90–40° arc only until about week 12; add 2–3 lb a week
Hamstring curls	Open chain, seated or prone, progressive resistance
Leg press	0–90°, both legs, then single leg; no loading past 90° until month 5
Lunges · step-downs	4–6-inch step; depth $\leq 90^\circ$ until month 5
Single-leg balance	Eyes open, progressing to perturbation
Conditioning	Bike with resistance; aqua jogging; elliptical (low resistance, no incline) from week 10
NMES · BFR · scar	NMES until QI $\geq 80\%$; BFR optional; scar massage once incisions are healed

Precautions

- No running, jumping, or impact until month 5 (meniscus repair)
- No cutting, pivoting, lateral agility, or plyometrics
- No manual PROM; open-chain extension 90–40° only

PHASE

4

Advanced Strengthening

Weeks 12–20

For the patient: what to expect

Strength work gets heavier, with single-leg exercises, but **keep loaded knee bends at 90° or less until 5 months**. Running waits until at least 5 months, and only after Dr. Merritt clears you. If your knee swells after a session, back off. No jumping or cutting yet.

WEIGHT BEARING	Full, no restrictions
BRACE	Functional ACL brace only if prescribed; wean per Dr. Merritt
RUNNING	Treadmill walk-jog once all running criteria are met; not before week 20 (month 5)

Goals

- QI ≥80% (quad and hamstring LSI)
- Prepare for the return-to-run program
- Single-leg strength, balance, and control

Move on when

- ☐ Running without pain or effusion, ≥4 sessions in a row
- ☐ QI ≥80%; single-leg balance 60 sec
- ☐ Single-leg hop height ≥50% (supervised clinic test only; no hop training until Phase 5)
- ☐ At least 20 weeks after surgery

Exercises

Exercise	How
Open-chain quad · hamstring	Full-arc extension and curls, progressive resistance
Leg press	0–90°, both legs and single leg
Step-ups · step-downs	Progress to a 6–8-inch step
Single-leg strength	Bulgarian split squats, single-leg squats; loaded knee bend ≤90° until month 5
Hip · neuromuscular	Hip in all planes (band, cable); balance with perturbation, BOSU, wobble board
Treadmill walk-jog	From week 20, once cleared: 60 sec walk / 60 sec jog, advance weekly
Conditioning · BFR	Bike, elliptical, swimming at rising intensity; BFR optional

Running criteria (all required)

Surgeon clearance · QI ≥80% (quad and hamstring) · no effusion with activity · full motion equal to the other side · at least 20 weeks (month 5) after surgery

Precautions

- No loaded knee bend past 90° until month 5
- No cutting, pivoting, lateral shuffles, or agility
- No jumping (including two-leg) until Phase 5
- Check effusion after each session; reduce intensity if it rises

PHASE

5

Running Progression

Weeks 20–30

For the patient: what to expect

From 5 months, once cleared, you'll build up straight-line running, then speed. You'll also learn to jump and land safely, first on two legs, then one. Land with your knee over your toes, not caving in. Still no cutting or pivoting.

WEIGHT BEARING	Full, no restrictions
BRACE	Functional ACL brace only if prescribed
RUNNING	Straight line, progressing speed; no cutting, pivoting, or lateral agility

Goals

- Running without pain or effusion at rising speed
- Symmetrical landing, two legs and one
- Hop tests $\geq 80\%$ LSI; strength toward $\geq 90\%$ LSI

Move on when

- ☐ Running without pain or effusion
- ☐ Single-leg balance ≥ 60 sec
- ☐ Hop tests $\geq 80\%$ LSI; QI $\geq 80\%$
- ☐ At least 30 weeks after surgery

Exercises

Exercise	How
Treadmill running	Intervals: add time, then speed, up to 75% of maximum
Jump to landing	Two legs; soft landing, knee over toes, no valgus
Hopping	Two legs, then single leg (in the functional brace if prescribed); add height and distance
Heavy strength	Open-chain quad and hamstring; leg press, split squat, single-leg squat; hip in all planes
Plyometric prep	Depth landings, jump to box, low box drops
Agility prep · neuromuscular	Lateral shuffle (no pivot) late in phase, per surgeon; perturbation, reactive drills

Precautions

- No cutting or pivoting until Phase 6
- Reactive swelling means too much load; reduce it
- Correct valgus collapse on landing before advancing

PHASE

6

Pre-Sport

Weeks 30–36

For the patient: what to expect

You'll start controlled cutting and change-of-direction drills at part speed, plus harder jumping and agility work. It is still practice, not competition. Full-speed cutting and team practice wait until you pass testing, no sooner than week 36.

WEIGHT BEARING	Full, no restrictions
BRACE	Functional brace for cutting and sport only if prescribed
RUNNING	Patterns up to 75% speed; add change of direction and sport-specific patterns

Goals

- Running at 85% of maximum speed without pain or effusion
- Hop tests $\geq 85\%$ LSI; QI $\geq 85\%$
- IKDC Q10 ≥ 8 (0–10 scale); maximum vertical jump without pain

Move on when

- ☐ Maximum vertical jump without pain
- ☐ Hop tests $\geq 85\%$ LSI (single, triple, crossover, timed 6-meter)
- ☐ Running at 85% speed without pain or effusion
- ☐ IKDC Q10 ≥ 8 ; QI $\geq 85\%$
- ☐ At least 36 weeks after surgery

Exercises

Exercise	How
Running	Advance to 85% of maximum; add 45° cuts and changes of direction
Plyometrics	Two-leg and single-leg jumps, bounding, reactive hops
Agility	Ladder drills with rising speed and complexity; sport-specific movement, non-competitive
Cutting and pivoting drills	Controlled, at 50–75% speed
Strength	Heavy quad, hamstring, hip; eccentrics: Nordic curls, RDL, high step-downs
Deceleration	Refine deceleration and landing mechanics

Precautions

- No full-speed cutting or contact before week 36 (Phase 7)
- No full team practice until return-to-sport criteria are met
- Watch for effusion or pain as activity rises

PHASE

7

Return to Sport

Weeks 36–52

For the patient: what to expect

Week 36 is the earliest return; 9 to 12 months is recommended before full cutting and pivoting sports. Dr. Merritt clears you once you pass strength, hop, and knee-score testing. If you feel nervous about returning, tell your therapist. Keep lifting at least twice a week.

WEIGHT BEARING	Full, no restrictions
BRACE	Functional brace for sport only if prescribed; do not stop it without Dr. Merritt's clearance
TIMELINE	Week 36 minimum; 9–12 months recommended for cutting and pivoting sport

Goals

- All return-to-sport criteria met
- QI ≥90%; hop tests ≥90% LSI
- IKDC Q10 ≥9; surgeon clearance

Move on when**Exercises**

Exercise	How
Sport-specific training	Drills, conditioning, team practice
Return to competition	Gradual: limited minutes, graduated exposure
Cutting · contact	Full-speed cutting and pivoting; contact drills (sport-dependent) after clearance
Maintenance	Strength ≥2× a week; neuromuscular and proprioception work
Psychological readiness	ACL-RSI or similar (recommended)

Precautions

- Do not rush: early return significantly increases re-injury risk
- Psychological readiness is part of return to sport; address fear-avoidance

Return-to-Sport Criteria

All criteria must be met before clearance.

Measure	Target
Quadriceps strength (isokinetic)	≥90% LSI
Hamstring strength (isokinetic)	≥90% LSI
Single-leg hop testing	≥90% LSI (single, triple, crossover, timed)
Single-leg balance	60 sec, eyes open, without loss of balance
Motion	Full and pain-free, equal to the other side; no extensor lag
Effusion	No reactive effusion after functional activity
Knee score	IKDC Q10 ≥9 (0–10 scale)
Minimum time: running	Week 20 (month 5) minimum (QI ≥80%, surgeon clearance, no effusion, full motion)
Minimum time: cutting · pivoting	Controlled drills from week 30; full speed from week 36. 9–12 months recommended
Clearance	Required from Dr. Merritt; criteria-based

Functional testing

- Strength: isokinetic quadriceps and hamstring testing
- Hop battery: single hop, triple hop, crossover hop, timed 6-meter hop
- IKDC Q10 knee score
- Psychological readiness: ACL-RSI or similar (recommended)

All progressions are criteria-based, not calendar-based. Minimum times must be met and functional criteria satisfied.