

PATELLA FRACTURE REPAIR (SIMPLE)

Physical Therapy Protocol

PATIENT

SURGEON

Andrew L. Merritt, MD

DATE OF SURGERY

PT START DATE

For the patient

Your kneecap fracture was fixed solidly, so **you start bending on day 1**. Early motion prevents stiffness, the most common problem after kneecap surgery. **You can walk from day 1 with the brace locked straight**. Bend only while sitting or lying down, never while standing.

PROTOCOL AT A GLANCE

WEIGHT BEARING	Full weight as tolerated from day 1 with the brace locked straight . Crutches as needed for balance
BRACE	Locked straight for walking and sleep for 6 weeks , except to bend while sitting or lying. Weaned after the 6-week visit
MOTION GOALS	Bending from day 1 : 0–50° for 2 weeks, then about 10° a week to 90° by week 6 . Full motion by weeks 10–12
PHYSICAL THERAPY	Starts 5 to 7 days after surgery, 2 times a week at first
KEY PRECAUTIONS	Never bend the knee while it holds weight . No resisted leg extension until the X-ray shows healing (weeks 7–8)
RUNNING · SPORT	Running around weeks 14–16 . Cutting and jumping sports around 5 to 6 months

Recovery Timeline

Phase	When	PT visits	Focus
1	Weeks 0–2	2× a week	Brace locked; bending to 50°; quad activation
2	Weeks 3–6	2× a week	Bending 10° a week to 90°; walking in the locked brace
3	Weeks 7–12	2× a week	Brace weaned; full motion; strengthening
4	Week 13 to month 5	1–2× a week	Strength, jumping and landing, running from weeks 14–16
5	Months 5–6+	As needed	Sport drills, testing, 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

- **Who this is for.** Simple (transverse or minimally comminuted) patella fractures with stable ORIF (tension band, lag screws, or both), which supports immediate ROM and early weight bearing.
- **Advanced progression.** On the faster end of published pathways: 90° by week 6 (published protocols typically reach it by week 8). Published average return to sport is 7 months; this protocol targets 5–6 months for athletes with a successful repair and good quad recovery.
- **Immediate ROM.** Quad sets, patellar mobilization, and heel slides (0–50°) from day 1; then 10° a week to 90° at week 6.
- **WBAT locked in extension for 6 weeks.** Axial loading is safe with the brace locked. No weight bearing unlocked until surgeon clearance at week 6.
- **Patellar mobilization from day 1–2** in all 4 directions, to prevent peripatellar adhesions that limit ROM and cause persistent anterior knee pain.
- **Open-chain extension delayed until union.** No resisted open-chain knee extension (leg extension machine) until fracture union is confirmed on imaging, typically weeks 7–8. Start in a 90–45° arc.
- **Quad activation is the priority early.** NMES is provided at each PT visit, starting at the first visit; no home unit is needed. Quad sets every waking hour.
- **Return to sport.** No running before weeks 14–16; no cutting or jumping before months 5–6. Radiographic union is required before impact.

ROM progression schedule

When	ROM target	Notes
Weeks 0–2	0–50°	Heel slides to the 50° limit from day 1; WBAT locked
Week 3	0–60°	Advance 10°; adjust the bike seat
Week 4	0–70°	Bike: rocking or partial revolutions within the limit
Week 5	0–80°	Aquatherapy from weeks 4–5; WBAT locked through week 6
Week 6	0–90°	Surgeon review; brace unlock begins; 90° goal met
Weeks 7–10+	10° a week → full	120–130°+ by week 10, then full (equal to the other knee); open-chain extension from weeks 7–8

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Protection

Weeks 0–2

For the patient: what to expect

Walk and sleep with the brace **locked straight**. Bend only to 50°, sitting or lying down, at PT and at home. Tighten your thigh muscle every hour you are awake.

WEIGHT BEARING	WBAT with the brace locked in extension; crutches as needed for comfort
BRACE	Locked at 0° for walking and sleep. Unlocked only for ROM: supervised PT, and home heel slides to 50° (seated or lying) from day 1
MOTION	0–50°: active-assisted and active ROM to the limit; do not push beyond 50°

Goals

- Visible VMO contraction with a quad set by week 2
- 0–50° ROM without pain
- Effusion and pain controlled (aggressive cryotherapy)
- Full passive extension (0°); patellar mobility

Move on when

- ☐ ROM 0–50° without significant pain
- ☐ SLR without extensor lag
- ☐ Quad activation present (VMO visible or palpable)
- ☐ Effusion and pain controlled

Exercises

Exercise	How
Quad sets · ankle pumps	Quad sets against a towel roll (VMO activation) and ankle pumps, every waking hour
NMES	At each PT visit, starting at the first visit: 20–30 min, 10–15 reps × 10 sec contraction, 50 sec rest
Straight-leg raise	Once there is no extensor lag; hip flexion first, then all 4 planes
Heel slides · heel prop	Active-assisted heel slides to the 50° limit only, 3 × 15. Heel prop (supine): heel on a towel roll, nothing under the knee, 10–15 min, 2× a day
Patellar mobilization	All 4 directions from day 1–2; 2–3 min each, 1–2× a day; gentle, pain-free
Hip · conditioning	Side-lying abduction, adduction, external rotation, extension, 3 × 15; other leg and upper body throughout
Stationary bike	Once ROM ≥50° (typically week 2): seat high, no load; rocking or partial revolutions within the 50° limit
Cryotherapy	20 min on, 20 min off after each session; elevate the knee above heart level

Precautions

- ROM strictly limited to 50°; no gravity-assisted flexion
- No resisted knee flexion against gravity (no prone or seated curls) and no resisted open-chain extension
- Brace locked at 0° for all walking; no squats, step-ups, or loaded flexion
- Monitor for reactive effusion after each session

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Progressive ROM

Weeks 3–6

For the patient: what to expect

You'll add about 10° of bending a week, reaching 90° by week 6. The brace stays **locked straight for walking and sleep** until your 6-week visit. Don't push past the weekly limit, even if it feels easy.

WEIGHT BEARING	WBAT with the brace locked in extension through week 6; wean crutches as quad control improves
BRACE	Locked at 0° for walking and sleep through week 6 (surgeon review at week 6). Unlocked for PT and home heel slides to the weekly limit
MOTION	Advance 10° a week: 60° (week 3), 70° (week 4), 80° (week 5), 90° (week 6)

Goals

- 90° ROM by week 6
- Normal gait pattern in the locked brace
- Good quad control: SLR with progressive resistance
- Crutch wean, walking unaided in the locked brace
- Patellar mobility maintained in all planes

Move on when

- ☐ ROM 0–90° by week 6
- ☐ Surgeon clearance at week 6 to unlock the brace
- ☐ Good quad activation: SLR with resistance
- ☐ Normal gait in the locked brace
- ☐ Minimal reactive effusion

Exercises

Exercise	How
Heel slides	Active-assisted, to the weekly ROM limit; do not push beyond it
Stationary bike	Rocking or partial revolutions within the weekly limit; adjust seat height as ROM improves; low resistance. Full revolutions only once ROM reaches about 100–110°
Straight-leg raise	All 4 planes, with progressive resistance (0.5–1 lb a week)
Patellar mobilization	All 4 planes; more pressure as tolerated; focus on superior and inferior glides
Quad sets · NMES	Quad sets daily; NMES at PT visits
Standing hip · calf	Band hip abduction, extension, external rotation, 3 × 12; calf raises, both legs, 3 × 15
Aquatherapy	From weeks 4–5, once the incision is healed: deep-water walking; buoyancy offloads the patellofemoral joint
Short-arc quads (0–30°)	Only if cleared by the surgeon for early open-chain work in stable fixation

Precautions

- Advance ROM only 10° a week; do not push beyond the weekly target
- No resisted knee flexion against gravity
- No weight bearing with the brace unlocked until surgeon clearance at week 6
- No resisted open-chain extension until fracture union is confirmed (typically weeks 7–8)
- Reactive effusion: reduce activity and reassess

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Return to Loading

Weeks 7–12

For the patient: what to expect

After your 6-week visit the brace is unlocked and weaned. Once the X-ray shows the bone has healed, your therapist adds leg-extension strengthening. If your knee swells after exercise, back off and ice.

WEIGHT BEARING	Full; brace unlocked per surgeon clearance at weeks 6–8
BRACE	Wean as quad control and gait normalize; stop once walking symmetrically without support
MOTION	Progress to full ROM: 120–130°+ by week 10, full by week 12

Goals

- Full ROM (0–130°+), equal to the other knee
- Open-chain knee extension with progressive resistance
- Quad strength 55–65% LSI
- Normal gait without a device or brace
- Closed-chain exercise without reactive effusion

Move on when

- ☐ Full ROM (0–130°+), equal to the other knee
- ☐ Quad strength ≥60% LSI
- ☐ 8-inch step-down with symmetric mechanics and no pain (required gate for running)
- ☐ Normal gait without brace or crutch
- ☐ Minimal effusion

Exercises

Exercise	How
Open-chain knee extension	From weeks 7–8, once fracture union is satisfactory: 90–45° arc, 3 lb, adding 2–3 lb a week; full arc by weeks 10–12 per surgeon
Mini squats	0–60°, both legs, 3 × 15; progress to 0–90° by week 12
Leg press	Both legs, 0–60°, 3 × 12; widen the arc as ROM improves
Step-ups	4-inch step, forward and lateral, 3 × 10; from week 8
Stationary bike	Full revolutions once ROM reaches about 100–110°; progressive resistance; build to 30+ min
Elliptical	From week 10: low resistance, no incline
Balance · stairs	Single-leg balance: firm (30 sec) → eyes closed → perturbation. Stairs reciprocal without the rail (weeks 9–10)
Calf · hip · BFR	Calf raises, both legs → single leg; band and cable hip work; BFR optional for quad and hamstring hypertrophy
Aquatherapy · patellar mobs	Shallow-water walking and squats; patellar mobilization until full ROM

Precautions

- Open-chain extension: confirm union with Dr. Merritt first; begin in a 90–45° arc
- No running, jumping, or impact until the Phase 4 criteria are met
- Monitor for reactive effusion; reduce load if swelling increases
- No deep squatting (beyond 90°) until full ROM and no patellofemoral pain

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Advanced Strengthening and Return to Running

Week 13 to month 5

For the patient: what to expect

You'll build strength and learn to jump and land. **Running starts around weeks 14 to 16**, once you pass the tests below and Dr. Merritt clears you. No cutting or pivoting yet.

WEIGHT BEARING · BRACE	Full, unrestricted; brace discontinued
RUNNING	Walk-jog intervals from weeks 14–16, when all running criteria are met (below)

Goals

- Quad strength ≥ 70 –80% LSI
- Start and progress a return-to-run program
- Double-leg plyometrics progressing to single-leg
- Sport-specific movement preparation

Move on when

- ☐ Running without pain or effusion for 4+ sessions in a row
- ☐ Quad strength $\geq 75\%$ LSI
- ☐ Single-leg hop $\geq 75\%$ LSI
- ☐ At least months 4–5 after surgery

Exercises

Exercise	How
Squats · leg press	More depth and resistance; single-leg squat; single-leg press
Step-downs	8-inch step; eccentric quad emphasis; symmetric mechanics
Nordic hamstring curls	Eccentric hamstring loading
Double-leg plyometrics	Vertical, broad, and box jumps with controlled landing, from week 14
Walk-jog program	After a running mechanics screen (knee valgus, pelvic drop, trunk lean): 60 sec walk / 60 sec jog on a flat surface; progress weekly
Agility	Cone drills, lateral shuffles, from week 16
BFR	Continue for quad and hamstring hypertrophy

Running criteria: all required before the walk-jog program

- 8-inch step-down with symmetric mechanics and no pain
- Full ROM (0–130°+), equal to the other knee
- Quad strength $\geq 70\%$ LSI
- Minimal to no reactive effusion
- Surgeon clearance for running
- At least weeks 14–16 after surgery

Precautions

- No cutting, pivoting, or lateral agility before month 5
- No single-leg jump testing until double-leg plyometrics are pain-free and symmetric
- Monitor for anterior knee pain with more impact loading

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Return to Sport

Months 5–6+

For the patient: what to expect

Cutting, jumping, and full sport usually return after **5 to 6 months**, once you pass strength and hop tests and the X-ray shows full healing. Dr. Merritt must clear you first.

TIMELINE

Full weight bearing. No cutting or jumping before month 5; pivoting sport after months 5–6, when all criteria are met

Goals

- Quad strength $\geq 90\%$ LSI
- Single-leg hop battery $\geq 90\%$ LSI
- Full sport-specific movement at speed
- Surgeon clearance with confirmed radiographic union

Move on when

- ☐ All return-to-activity criteria met (next page)
- ☐ Clearance from Dr. Merritt

Exercises

Exercise	How
Sport training	Drills, conditioning, scrimmage
Change of direction	Cutting, deceleration, and direction change at progressive speed
Single-leg plyometrics	Hop progressions, reactive drills
Strength maintenance	2–3× a week; do not drop resistance training at return to sport
Eccentric quad program	Nordic drops, depth landing, high step-downs

Precautions

- Radiographic union required before clearance for cutting or jumping sport
- Full return to sport requires Dr. Merritt's clearance; do not clear on time alone
- Anterior knee pain or effusion at any phase: contact Dr. Merritt's office before progressing

Return to Activity

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)
Motion	Full, pain-free, equal to the other knee; no extension deficit
8-inch step-down	Symmetric mechanics, no knee pain, no valgus collapse
Effusion	None after functional activity
Radiographic union	Confirmed by Dr. Merritt before return to impact
Minimum time: running	Weeks 14–16 (quad ≥70% LSI, full ROM, 8-inch step-down, surgeon clearance)
Minimum time: cutting and jumping	Months 5–6 (radiographic union, ≥90% LSI strength, hop testing)
Clearance	Required; gradual, criteria-based return directed by Dr. Merritt

Clinical timeline summary

SUPERVISED PT	Starts 5–7 days after surgery
ROM	Day 1 (0–50°); 90° at week 6; full by weeks 10–12
PATELLAR MOBILIZATION	Day 1–2, all 4 directions
WBAT LOCKED	Weeks 0–6; week-6 surgeon review: brace unlock, fracture union
OPEN-CHAIN EXTENSION	Weeks 7–8, once union is confirmed (90–45° arc to start)
BIKE · ELLIPTICAL	Bike from week 2, partial revolutions within the weekly limit; full revolutions at about 100–110°. Elliptical from week 10
RUNNING	Weeks 14–16, after the 8-inch step-down gate, quad ≥70% LSI, full ROM, and surgeon clearance
PLYOMETRICS	Double-leg from week 14, once running is established
CUTTING · JUMPING · SPORT	Months 5–6: radiographic union and ≥90% LSI; criteria-based, directed by Dr. Merritt

All progressions are criteria-based. ROM advances 10° a week but should not be forced if there is reactive effusion. Anterior knee pain with loading is common; differentiate it from hardware irritation. Contact Dr. Merritt if anterior knee pain increases unexpectedly or effusion persists.