

# Recovery Stages After Multiligament Knee Reconstruction



Warren W. Nielsen, M.D., Jill K. Monson, P.T., O.C.S., Robert F. LaPrade, M.D., Ph.D., and Andrew G. Geeslin, M.D.

Multiligament knee injuries are severe limb-threatening injuries involving a tear of two or more of the major knee ligaments including the anterior cruciate ligament, posterior cruciate ligament, medial collateral ligament, and fibular (lateral) collateral ligament/posterolateral corner. Anatomic reconstructions can help restore joint stability, which is complemented by a postoperative rehabilitation program to maximize knee function. The postoperative recovery will likely be extended compared with single-ligament procedures and usually involves robust precautions. However, it can be started the day after the reconstruction procedure to include initiation of knee motion. The goals are similar to those of single-ligament procedures including gradual recovery of motion, strength, and load capacity; as well as symptom control, restoration of cardiovascular fitness, and long-term joint protection. These are achieved through a protocolized rehabilitation program that involves four phases: recovery phase, transition phase, rebuild phase, and restore phase. Their goals and milestones are incremental to achieve optimal patient outcomes. With a team-based approach to protocolized recovery between the patient, surgeon, and rehabilitation team, patient function and return to activities can be maximized.

## Bibliography

- Chahla J, Moatshe G, Cinque ME, Godin J, Mannava S, LaPrade RF. Arthroscopic anatomic single-bundle anterior cruciate ligament reconstruction using bone–patellar tendon–bone autograft: Pearls for an accurate reconstruction. *Arthrosc Tech* 2017;6:e1159-e1167.
- Chahla J, Nitri M, Civitarese D, Dean CS, Moulton SG, LaPrade RF. Anatomic double-bundle posterior cruciate ligament reconstruction. *Arthrosc Tech* 2016;5:e149-e156.
- Cruz RS, Mitchell JJ, Dean CS, Chahla J, Moatshe G, LaPrade RF. Anatomic posterolateral corner reconstruction. *Arthrosc Tech* 2016;5:e563-e572.
- Floyd ER, Carlson GB, Monson J, LaPrade RF. Multiple ligament reconstructions of the knee and posterolateral corner. *Arthrosc Tech* 2021;10:e1269-e1280.
- LaPrade RF, Chahla J, DePhillipo NN, et al. Single-stage multiple-ligament knee reconstructions for sports-related injuries: Outcomes in 194 patients. *Am J Sports Med* 2019;47:2563-2571.
- Levy BA, Dajani KA, Whelan DB, et al. Decision making in the multiligament-injured knee: An evidence-based systematic review. *Arthroscopy* 2009;25:430-438.
- Monson J, Schoenecker J, Schwery N, Palmer J, Rodriguez A, LaPrade RF. Postoperative rehabilitation and return to sport following multiligament knee reconstruction. *Arthrosc Sports Med Rehabil* 2022;4:e29-e40.

Department of Orthopedics and Rehabilitation, University of Vermont, Burlington, Vermont, U.S.A. (W.W.N., A.G.G.); Twin Cities Orthopedics, Edina, Minnesota, U.S.A. (J.K.M., R.F.L.); and Larner College of Medicine, University of Vermont, Burlington, Vermont, U.S.A. (A.G.G.).

Received August 4, 2025; accepted September 9, 2025.

Address correspondence to Andrew G. Geeslin, M.D., Department of Orthopedics and Rehabilitation, University of Vermont, 95 Carrigan Dr, Burlington, VT 05405, U.S.A. E-mail: [andrewgeeslinmd@gmail.com](mailto:andrewgeeslinmd@gmail.com)

© 2025 by the Arthroscopy Association of North America  
0749-8063/251642/\$36.00

<https://doi.org/10.1016/j.arthro.2025.09.001>

### Disclosures

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: W.W.N. reports board membership with *Arthroscopy*. J.K.M. reports board membership with the American Association of Sports Physical Therapists Education Committee and reports a consulting or advisory relationship with Smith & Nephew. R.F.L. reports a consulting or advisory relationship with Smith & Nephew and Ossur Americas; receives funding grants from Smith & Nephew and

Ossur Americas; and reports board membership with *American Journal of Sports Medicine*, *Journal of Experimental Orthopaedics*, *Journal of Orthopaedic & Sports Physical Therapy*, *Journal of Knee Surgery*, *Orthopaedic Journal of Sports Medicine*, and *Knee Surgery, Sports Traumatology, Arthroscopy*. A.G.G. reports a consulting or advisory relationship with Smith & Nephew; receives speaking and lecture fees from Smith & Nephew and Ossur Americas; receives travel reimbursement from Smith & Nephew, Ossur Americas, and Arthrex; serves on the *Arthroscopy* Editorial Board; and is the *Arthroscopy* Infographics Editor.

# Rehabilitation after Multiligament Knee Reconstruction

## Arthroscopy

The Journal of Arthroscopic and Related Surgery



### Multiligament knee injuries

- Potentially limb-threatening injuries that require complex reconstruction techniques
- Rehabilitation precautions and progressions should match the injury and surgical treatment
- Partnership between the surgeon and physical therapist is essential

### Rehabilitation phases

#### Recovery phase (0–6 weeks post-op)

##### Goals

- Joint protection (crutches, brace)
- Limited weight-bearing
- Pain and swelling control
- Restore knee ROM
- Maximize quadriceps activation

##### Milestones

- Effusion 1+, ROM 0–110/120°, strong quadriceps activation, 20+ SLR with no extensor lag



#### Transition phase (6–10 weeks post-op)

##### Goals

- Wean from crutches
- Acclimation to loading

##### Milestones

- Normal gait pattern with FWB for in-home and short distances
- Minimal to no joint irritability with initiation of body weight exercises



#### Rebuild phase (10 weeks–6 months post-op)

##### Goals

- Progressive tolerance to load
- Progressive training for LE strength and fitness
- CV fitness, proprioception, and overall work capacity

##### Milestones

- Full knee ROM, effusion  $\leq$  1+, and quadriceps strength LSI  $\geq$  70%
- Initiate jogging progression when all goals are achieved, usually after 4–6 months



#### Restore phase (6–12+ months post-op)

##### Goals

- Restore to the prior level of function
- Build upon strength, neuromuscular control, and cardiovascular endurance

##### Milestones

- Tolerance of dynamic strength exercises, LSI  $>$  90%, negative stress X-rays
- Criteria-based return to sport may require 12–18 months, depending on injury severity



### Summary

A team approach is needed among the patient, surgeon, and rehabilitation team.

Rehabilitation is initiated the day after MLKI reconstruction. Progression through the protocol should be gradual and based on task mastery and knee joint tolerance.

Functional testing is conducted to track recovery and guide protocol progression. This will inform a safe return to activity.

**Key abbreviations:** cardiovascular (CV), full weight-bearing (FWB), hamstring (HS), limb symmetry index (LSI), lower extremity (LE), range of motion (ROM), straight leg raise (SLR), post-operative (post-op), multiligament knee injury (MLKI)

Warren W. Nielsen, MD, Jill K. Monson, PT, Robert F. LaPrade, MD, PhD, Andrew G. Geeslin, MD

Abstract and disclosure of potential author conflicts of interest are available at <https://www.arthroscopyjournal.org/info>