

Rehabilitation Protocol: ACL Prehabilitation (Pre-Surgical)

Goal: enter surgery with a **“quiet” knee** – restored motion, normal gait, and the best achievable quadriceps strength and neuromuscular control. Patients who reach these milestones before surgery recover faster and have better outcomes. Avoid recurrent giving-way and high-risk pivoting activities to protect the menisci and cartilage. These exercises continue into Phase I after surgery. Please contact our office with any questions or concerns.

Concomitant MCL injury: avoid valgus stress and side-lying hip adduction until cleared by our office.

☐ **Phase I – Acute / Irritable Knee: first 1–3 weeks after injury, or until the knee is quiet**

- **Effusion control:** Ice and elevate the entire leg above the heart, 20 minutes several times daily; compression sleeve; avoid prolonged standing and provocative activity
- **Extension (first priority):** Heel props (towel under heel, not knee) or prone hangs, 20–30 minutes 3–4× daily; low-load long-duration stretching. Never place a pillow under the knee alone.
- **Flexion:** Heel slides and wall slides, 10–20 reps 3–4× daily; seated assisted flexion within comfort (slight discomfort acceptable, stop for pain)
- **Patellar mobility:** Patellar glides in all directions; ankle pumps 15 reps hourly
- **Quadriceps activation:** Quad sets (5-second hold, 12 reps 3× daily); hamstring sets and hamstring/quad co-contraction; straight leg raises without quad lag (12 reps 3× daily); NMES if activation is poor
- **Hip and calf:** Prone SLR, side-lying hip abduction, bridges, clamshells; double-leg heel raises (2 seconds up, 4 seconds down)
- **Gait:** Two crutches, WBAT, until walking without a limp; full extension at heel strike
- **Conditioning:** Stationary bike once flexion allows a full revolution

☐ **Phase II – Strength Restoration: 2–6 weeks**

- **Progress load only with controlled swelling** – an effusion that increases after exercise means the load was too high
- **Closed chain:** Quarter squats progressing to squats, leg press, wall sits, forward and lateral step ups – progress depth and load
- **Open chain knee extension:** Progressive strengthening as tolerated (no graft to protect; goal is maximal quadriceps strength)
- **Hamstrings:** Bridges, hamstring curls (prone then standing), Romanian deadlifts – the dynamic restraint to anterior tibial translation
- **Balance:** Single-leg stance progressing to unstable surfaces; no twisting on the planted foot
- **Conditioning:** Bike, elliptical; swimming once comfortable (no breaststroke kick)

☐ **Phase III – Pre-Operative Optimization: until surgery (ideally ≥4–6 weeks of total prehab)**

- **Progressive resistance:** Heavy lower extremity strength training 2–3× per week (leg press, squats, knee extension, hamstring curls)
- **Single leg:** Single-leg press, single-leg squats, lunges, step downs with attention to alignment
- **Neuromuscular:** Balance and perturbation training; controlled straight-line agility (ladder) if the knee is stable and quiet
- **Functional:** Straight-line jogging may be appropriate with a quiet, stable knee; no cutting, pivoting or contact
- **Education:** Review the post-operative protocol, crutch and brace use, home setup and expectations for the first two weeks after surgery

Pre-Operative Milestones

- Full extension symmetric to the opposite side; flexion within 10° of the opposite side
- Minimal or no effusion; normal gait without assistive device; SLR without extensor lag
- Quadriceps strength $\geq 80-90\%$ of the uninvolved side when measurable; no recurrent instability with ADLs

Contact Our Office

- Recurrent giving-way, inability to regain extension, persistent large effusion or a mechanical block (possible displaced meniscus tear) – these may change surgical timing or plan