

# ACLR (Quad Autograft) & Meniscal Repair Protocol

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## General Principles and Precautions

- **The "Meniscal Shear" Rule:** Strictly avoid knee flexion greater than 90 degrees for the first 6 weeks to protect the meniscal sutures.
  - **Weight-Bearing:** Weight-Bearing As Tolerated (WBAT) is permitted **ONLY with the brace locked in full extension (0 degrees)**.
  - **Donor Site Management:** Expect soreness at the superior patella from the quadriceps harvest. Early and frequent patellar mobilization is mandatory to prevent adhesions.
  - **Graft Protection:** No resisted open-chain knee extension (leg extension machine) for the first 12 weeks to minimize shear stress on the ACL graft.
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## Phase I: Maximum Protection (Weeks 0–2)

**Goals:** Protect the repair and graft, achieve 0 degrees of extension, and manage quadriceps inhibition.

- **Brace Use:** Brace **locked in full extension (0 degrees)** for all ambulation and sleep.
  - **Weight-Bearing:** WBAT with the brace locked in extension and use of crutches for stability.
  - **Range of Motion:**
    - **Extension:** Goal is 0 degrees (matching the opposite side) by day 7. Use prone hangs and towel rolls under the heel.
    - **Flexion:** Gradual progression (do not exceed 90 degrees).
  - **Exercises:**
    - **Quadriceps Activation:** Quad sets and Straight Leg Raises (SLR) in the brace. Use NMES (Electrical Stimulation) if quad inhibition is high.
    - **Patellar Mobilizations:** Essential to prevent harvest site scarring and stiffness.
    - **Ankle Pumps:** daily to prevent DVT.
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## Phase II: Early Mobilization (Weeks 2–6)

**Goals:** Reach 90-degree flexion milestone and protect meniscal sutures.

- **Brace:** Brace remains locked in extension for walking. It may be unlocked for seated exercises and ROM only.
  - **Motion Progression:**
    - **Flexion Goal:** Reach **90 degrees** by the end of Week 6. (Strict limit: Do not exceed 90 degrees).
    - **Stationary Bike:** Begin when flexion reaches 90 degrees. Start with no resistance and high seat height to ensure comfort.
  - **Strengthening:**
    - **Quad Sets/SLR:** Continue without lag.
    - **Soft Tissue:** Focus on the superior pole of the patella (quad harvest site) for mobility.
  - **Precautions:** **No** lateral movements, **No** single-leg loading, and **No** weight-bearing with a bent knee.
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## Phase III: Intermediate Strengthening (Weeks 6–12)

**Goals:** Discontinue brace, progress flexion, and build bilateral strength.

- **Brace:** Wean from the brace as quadriceps control allows (typically discontinued by Week 7-8).
  - **Motion Progression:**
    - **Flexion Goal:** Reach **120 degrees** by the end of Week 12.
  - **Strengthening (Bilateral Only):**
    - **Closed-Chain:** Begin mini-squats (0 to 45 degrees) and bilateral leg press.
    - **Hamstrings:** Begin gentle resisted curls. Note: Keep resistance light as the hamstrings pull on the posterior meniscus.
  - **Precautions:** **No lateral movements or single-leg loading** until the completion of week 12.
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## Phase IV: Advanced Loading (Weeks 12–16+)

**Goals:** Achieve full flexion, initiate single-leg tasks, and return to functional loading.

- **Motion Progression:**
    - **Flexion Goal:** Reach **Full Flexion** by Week 16.
  - **Strengthening (Initiate Week 12+):**
    - **Lateral Movements:** Initiate side-steps, monster walks, and lateral shuffles.
    - **Single-Leg Loading:** Begin single-leg squats, step-ups, and Bulgarian split squats.
  - **Running (Week 20+):** Requires full range of motion, no joint swelling, and at least 75 percent quadriceps strength symmetry.
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## Phase V: Return to Sport (Weeks 36+)

- **Contact Sports:** Typically 9 to 12 months for combined ACL and meniscal repairs to ensure full biological ligamentization and healing.
  - **Discharge Criteria:** Quadriceps and Hamstring strength greater than 90 percent of the uninvolved side.
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## Clinical Pearls for the Therapist

1. **Extension Priority:** Terminal extension (0 degrees) must be reached early. A knee that lacks full extension puts abnormal stress on a meniscal repair, increasing the risk of failure.
2. **Quadriceps Inhibition:** The combination of a quad-tendon harvest and a meniscal repair often causes significant muscle "shut-down." Frequent isometric quad sets (every hour) are the most important home intervention.
3. **No Deep Squats:** Even after Week 12, avoid weighted squats beyond 90 degrees to protect the posterior horn of the meniscal repair.