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REHABILITATION PROTOCOL

Achilles Tendon Repair

Rehabilitation Protocol — For Acute Surgical Repair (Open or MIS)

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> This protocol is a general guideline and does not replace individualized medical advice. Timelines vary with the procedure performed, healing, and individual factors. Always follow the specific instructions from your surgeon and physical therapist, which take precedence over this document.

Overview

Acute Achilles tendon ruptures most commonly occur in active adults in their 20s–40s during recreational sport. Surgical repair restores tendon continuity and length-tension relationship of the gastroc-soleus complex.

MODERN REHABILITATION EMPHASIZES

- **Early protected weight bearing**
- **Early controlled range of motion**
- **Avoidance of prolonged immobilization**

KEY PRINCIPLES

- Level I evidence supports accelerated functional rehabilitation without increased rerupture risk when properly supervised
- Progression is **criteria-based**, not calendar-driven

Why Early Motion and Early Weight Bearing Matter — But Must Be Protected

Modern Achilles rehabilitation emphasizes **early range of motion (ROM)** and **early weight bearing** because controlled mechanical loading improves tendon healing. Gentle, protected movement stimulates collagen organization, reduces stiffness, improves circulation, and helps prevent muscle atrophy. Studies have shown that when performed in a structured and protected manner, early functional rehabilitation does **not** increase rerupture rates and leads to excellent long-term outcomes.

However, there is an important distinction between **early loading** and **unrestricted loading**. If too much stress is placed on the tendon too soon — especially excessive dorsiflexion stretching or aggressive weight bearing without protection — the healing tendon can lengthen. Tendon lengthening alters the normal length-tension relationship of the gastrocnemius-soleus complex. Excessive early strain can also disrupt collagen alignment, leading to atypical tendon remodeling and inferior mechanical properties.

EVEN A SMALL INCREASE IN TENDON LENGTH CAN LEAD TO

- Persistent weakness with push-off
- Loss of explosive power
- Reduced single-leg heel raise strength
- Difficulty returning to high-level sport

REHABILITATION IS A BALANCE

- Too little motion → stiffness and deconditioning
- Too much too soon → tendon elongation and strength loss

The goal, therefore, is **early but protected motion** — gradual dorsiflexion to neutral, progressive weight bearing in a boot with heel lifts, and structured advancement based on tissue healing and strength milestones. A carefully guided, criteria-based progression protects the repair while optimizing long-term strength and function.

Phase I: Protection & Early Healing

Weeks 0–2

GOALS

- Protect repair
- Minimize swelling
- Promote incision healing
- Prevent proximal deconditioning

IMMOBILIZATION

- Posterior splint in ~20° plantarflexion
- Strict elevation

WEIGHT BEARING

- Non–weight bearing

ACTIVITY

- Hip/core strengthening
- Straight leg raises
- Toe mobility
- Upper body conditioning

Phase II: Early Functional Rehabilitation

Weeks 2–6

TRANSITION (2 WEEKS POST-OP)

- Wound check
- Sutures removed once healed
- Transition to removable CAM boot with 2 cm heel lift (~20° PF)

WEIGHT BEARING

- Begin protected weight bearing at 2 weeks
- Progress to weight bearing as tolerated by 4 weeks if:
  - Pain controlled
  - No increased swelling
  - No wound issues

RANGE OF MOTION

- Active plantarflexion immediately
- Active dorsiflexion to **neutral only**
- **No passive DF stretching**
- Knee flexed during early DF exercises

THERAPY FOCUS

- Edema control
- Scar mobilization
- Seated bike (boot on)
- Gentle intrinsic activation
- Proximal strengthening

Phase III: Progressive Loading

Weeks 6–10

GOALS

- Normalize gait
- Restore 4-quadrant ankle ROM
- Begin strengthening

WEIGHT BEARING

- Wean from boot 6–8 weeks
- Transition to supportive shoe with heel lift

ROM

- Gradual passive dorsiflexion after 8 weeks
- Avoid aggressive stretching

STRENGTH

- Seated calf raises
- Isometrics → light isotonic PF
- Inversion/eversion strengthening
- Double-leg balance progression

Phase IV: Strength & Gait Restoration

Weeks 10–14

GOALS

- Restore strength symmetry
- Prepare for impact progression

STRENGTH CRITERIA TO ADVANCE

- 15–20 single leg heel raises
- No reactive swelling

INTERVENTIONS

- Eccentric plantarflexion emphasis

- Double-leg heel raises → single-leg progression
- Treadmill walking
- Begin walk/jog program (~12 weeks)

Phase V: Return to Running & Sport Progression

Weeks 14–24

GOALS

- Restore explosive strength
- Improve tendon load tolerance
- Prepare for sport-specific demands

ACTIVITIES

- Progressive running program
- Plyometrics (double → single limb)
- Agility drills
- Cutting and change-of-direction drills

CRITERIA FOR RUNNING

- Pain-free walking
- Symmetric gait
- ≥80% plantarflexion strength vs contralateral side

Phase VI: Full Return to Sport

4–6+ Months

Return is **criteria-based, not time-based.**

CLEARANCE REQUIREMENTS

- No mid-substance tenderness
- No swelling after high-load activity
- Symmetric ROM
- ≥90% strength vs contralateral limb
- Pain-free single-leg hop
- Sport-specific mechanics without compensation
- Psychological readiness

NOTE

- Elite cutting sports may require 6–9 months

Special Considerations

CHRONIC REPAIRS OR TENDON TRANSFERS

- Immobilization may extend to 4 weeks
- PT initiation may delay to 5–6 weeks
- Slower dorsiflexion progression

MIS VS OPEN REPAIR

- MIS often allows slightly more confident early motion
- Wound complications are lower with MIS

Expected Recovery Milestones

Timepoint	Expected Status
2 weeks	Protected WB initiated
6 weeks	Neutral DF achieved
12 weeks	Begin jog progression
4 months	Sport progression
6 months	Full sport participation (most patients)
12 months	≥80–90% strength recovery

Evidence Foundation

- Willits et al. Operative vs Nonoperative Treatment of Acute Achilles Tendon Ruptures Using Accelerated Functional Rehabilitation
- Costa ML et al. Early weight-bearing studies
- Kangas et al. Tendon elongation studies
- Jackson JB 3rd, Strasser NL, Gonzalez T, Park J. Management and Return to Play of the Elite Athlete for Common Sports-Related Injuries About the Ankle. J Am Acad Orthop Surg. 2025.