Hardware Removal (Knee)

Physical Therapy After Implant Removal · General Guideline

Published rehabilitation protocols specific to hardware removal are limited, and there is no consensus on post-removal protection or weight-bearing limits; this is a general, evidence-informed guideline for progression as tolerated, based on the JAAOS review of hardware removal and institutional post-operative instructions. Recovery is driven by wound healing and quadriceps reactivation rather than tissue-healing phases.

AT A GLANCE

TIMELINE	2–6 weeks for return to most activity; full recovery of comfort and swelling may take longer
WEIGHT BEARING	WBAT immediately in nearly all cases; assistive device for the first few days as needed for comfort
KEY MILESTONES	Wound healed and sutures out ~2 weeks · normal gait without device by 1–2 weeks · return to work/daily activity 2–6 weeks by demand level
RETURN TO ACTIVITY	Most activity by 6 weeks; impact and torsional loading may be restricted by the surgeon because empty screw holes remain stress risers for up to ~4 months

KEY PRECAUTIONS

- Empty screw holes create a cortical stress riser and a transient refracture risk; the surgeon may restrict running, jumping, contact, or torsional activity for several weeks to months after removal of larger implants - confirm the individual restriction.
- Incisions through prior surgical scars carry a higher risk of delayed healing and dehiscence; protect the wound, monitor for drainage or erythema, and delay submersion until fully healed.
- Report increasing pain over the old fracture or implant site with new activity - evaluate before progressing loading.

Guideline only — individualize per intraoperative findings and patient response. Questions: contact Dr. Pettit's office.

PHASED REHABILITATION

PHASE 1 — WOUND HEALING & QUADRICEPS REACTIVATION	Weeks 0–2
GOALS	• Protect the incision and control post-operative swelling • Re-establish quadriceps activation and full knee ROM • Normalize gait and wean assistive device
INTERVENTIONS	• WBAT immediately; crutches or walker for the first few days only as needed, weaning as gait normalizes • Wound care per surgeon; elevation above heart level and cryotherapy for the first several days; avoid prolonged standing/walking initially • Quad sets, SLR (all planes), heel slides, and ankle pumps beginning day 1; ROM as tolerated with no restriction unless specified • Patellar and scar mobilization once the incision permits • Stationary bike without resistance for motion and effusion management
CRITERIA TO ADVANCE	• Incision healed without drainage; sutures removed (~2 weeks) • Full or pre-operative knee ROM restored • SLR without extensor lag and normal gait without assistive device

PHASE 2 — PROGRESSIVE STRENGTHENING & RETURN TO ACTIVITY	Weeks 2–6+
GOALS	• Restore quadriceps/hamstring strength and single-leg control • Return to occupational and recreational demands • Reintroduce impact only per surgeon guidance given screw-hole stress risers
INTERVENTIONS	• Progressive resistance: leg press, squats, step-ups, hamstring curls, calf raises, hip and core work • Stationary bike with resistance, elliptical, pool, and walking program for conditioning • Balance/proprioceptive progression to single-leg activities • Graded return to work: sedentary duties within ~2 weeks, physically demanding work by ~6 weeks as tolerated • Impact progression (jogging, plyometrics, contact sport) deferred until surgeon clearance, reflecting cortical remodeling of screw holes (up to ~4 months for larger implants)
CRITERIA TO ADVANCE	• Pain-free full ADL and work demands • Strength and single-leg control comparable to pre-operative baseline or contralateral limb • Surgeon clearance obtained before resuming impact or contact activity

GUIDING PRINCIPLES

This protocol follows criterion-based progression over rigid time-based advancement; phased rehabilitation balancing tissue healing with controlled stress application; objective milestones (ROM, strength LSI, functional testing) to guide phase transitions; individualization based on surgical findings, tissue quality, and patient factors; and ongoing surgeon–therapist communication throughout recovery.

REFERENCES

1. Busam ML, Esther RJ, Obremskey WT. Hardware Removal: Indications and Expectations. J Am Acad Orthop Surg. 2006;14(2):113-120.

2. Orthobullets. Symptomatic Hardware and Implant Removal (Trauma). https://www.orthobullets.com/trauma/422953/symptomatic-hardware-and-implant-removal

3. Ritterman SA. Lower Extremity Hardware Removal: Post-Operative Instructions. https://www.scottrittermanmd.com/pdfs/lower-extremity-hardware-removal.pdf

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For clinical use by licensed physical therapists treating patients of Robert Pettit, MD. This document is a rehabilitation guideline, not a substitute for clinical judgment. Progression must be individualized based on intraoperative findings, tissue quality, and patient response. Scan the QR code for the current version of this protocol.