

# Extensor Tendon Repair

## Extensor Tendon Repair – Procedure Outcomes & Post-operative Rehabilitation (Relative-Motion Extension, Zones IV–VII)

**Topic scope:** post-operative rehabilitation after **primary repair of an extensor tendon on the dorsum of the finger, hand or wrist – zones IV to VII** – managed by **relative-motion extension (RME / Merritt yoke splint, the ICAM family of regimens)**. This is a *tendon repair* (a construct that must heal under controlled load), but the relative-motion approach lets that load be applied **immediately and actively** rather than after weeks of immobilisation. This page does **not** cover mallet finger (zones I–II) or central-slip / boutonnière repair (zone III), which follow different regimens.

*Defining principle of the rehab here: a yoke (relative-motion) splint holds the repaired digit's MCP joint 15–20° more extended than its neighbours. By the quadriga effect and the juncturae tendineae, this small relative offset offloads the repaired tendon – it reduces the active extensor excursion demanded of the healing repair (from roughly 12 mm of excursion in normal active extension to about 6 mm within the splint). That residual ~6 mm is enough to keep the tendon gliding and prevent adhesions, but too little to rupture the repair – which is why immediate active motion is safe. The single common branch point is whether a supplementary wrist orthosis (~20–25° extension, first ~3 weeks) is added for zone VII, weaker repairs, or non-compliant patients; the yoke alone is the default for zones V–VI.*

## A. PROCEDURE / REPAIR OUTCOMES (relative-motion vs immobilisation)

---

Extensor tendon repair on the back of the hand is reliable; the principal modern question is **how to rehabilitate it** – protected immobilisation versus an early-active programme such as relative-motion extension – not whether repair works.

- **The mechanism that makes immediate active motion safe is well established.** The 15–20° relative MCP-extension offset offloads the repair via the quadriga effect and the juncturae tendineae, cutting active extensor excursion from ~12 mm (normal) to ~6 mm within the splint – enough to prevent adhesions, too little to rupture. Cadaveric and mechanistic work underpins this rationale [Merritt, Wong & Lalonde 2020]. *Strong (mechanistic + cadaveric).*
- **Relative-motion regimens match or improve on traditional early-active and immobilisation pathways.** A randomised controlled trial in zones V–VI found relative-motion extension delivered **earlier return of hand function and higher patient satisfaction with equivalent total active motion (TAM)** versus the comparator early-active programme [Collocott RCT 2020]. A systematic review reported **earlier return to work with equivalent range of motion and complication rates** [Collocott review 2017]. *Moderate-strong (1 RCT + SR; RME studies of generally lower methodological quality).*
- **Yoke-alone (no wrist splint) is supported for the common zones.** Case series of relative-motion extension without a supplementary wrist orthosis for zones IV–VI report **no ruptures**, supporting yoke-alone as the default for these zones with the wrist orthosis reserved for zone VII / weaker / non-compliant repairs [Hirth 2021; Howell ICAM]. *Moderate.*
- **The functional gain over immobilisation is large and practical.** Early-active relative-motion programmes report **return to work at roughly 17–25 days**, versus the **3–4 months** typical of immobilisation regimens – the headline advantage that has driven adoption [Collocott review 2017; Howell ICAM]. *Moderate.*

---

## B. REHABILITATION / THERAPY EVIDENCE

---

The central rehab questions are (1) immobilise or move early, (2) is a wrist splint needed in addition to the yoke, and (3) how long must the splint stay on. The evidence favours **early relative motion**, supports **yoke-alone for zones V–VI**, and suggests splint duration can be **shorter than the traditional six weeks** without penalty.

- **Early active motion via relative-motion extension is the modern default.** The original technique description [Merritt 2014] and the clinical scheduling / yoke construction work [Lutz 2015] established a reproducible programme: immediate active intrinsic-plus and intrinsic-minus motion in the yoke, progressing to coupled (tenodesis) motion, weaning, then strengthening. *Moderate (technique + cohort).*
- **A supplementary wrist splint is optional, not mandatory.** Yoke-alone case series for zones IV–VI report no ruptures; the wrist orthosis (~20–25° extension, first ~3 weeks) is added selectively for zone VII, weaker repairs, or poor compliance [Hirth 2021; Howell ICAM]. *Moderate (selective use).*

- **Splint duration may be shortened.** A comparison of **4-week versus 6-week** splinting found **no difference** in outcome, suggesting the traditional six-week full-time period can be safely abbreviated in selected patients [Svens 2015]. This page keeps full-time wear ~6 weeks (weaned from ~wk 5) as the conservative default while acknowledging the shorter option. *Moderate (1 comparative study).*
- **The field is moving toward wider use of relative motion.** A recent international consensus **endorses broader application of relative-motion rehabilitation**, including beyond its original zone V–VI indication [Tang consensus 2025]. *Consensus.*

### RECOVERY TRAJECTORY (EXPECTED, EVIDENCE-ANCHORED)

Phase	Window	Splint / restraint	Hand use / therapy focus	Strength / load	Notes
<b>I – Yoke (± wrist splint), immediate active use</b>	<b>Week 0–3</b>	Yoke full-time (repaired MCP 15–20° more extended); wrist orthosis ~20–25° ext only for zone VII / weak / non-compliant	Active <b>intrinsic-plus</b> (MCP flex, IPs straight) and <b>intrinsic-minus / hook</b> every ~2 h; <b>passive IP extension</b> daily; light use in the splint	Light functional use only; <b>no lifting / resisted grip</b>	Relative offset offloads repair (~12 mm → ~6 mm excursion); active motion is safe from day one
<b>II – Wrist splint off, yoke continues</b>	<b>Week 3–6</b>	Discontinue any wrist splint; <b>yoke continues full-time</b>	Add <b>coupled wrist-and-finger (tenodesis) motion</b> + composite active flexion/extension; light functional use; scar massage once healed	Still no resisted grip	Composite active ROM building; watch for extensor lag
<b>III – Wean yoke, strengthen, return</b>	<b>Week 6–12</b>	<b>Yoke weaned from ~wk 5</b> , off ~wk 6	Progress full active motion; commence <b>grip/pinch strengthening from week 8</b>	Graded strengthening from wk 8 → full activity ~10–12 wk	Return to work as early as ~17–25 days reported; full unrestricted activity ~10–12 wk

*(Phase windows mirror the precautions and recovery structure in the patient protocol; they are typical guides, not trial-derived deadlines. Splint duration may be safely shortened toward 4 weeks in selected patients.)*

## C. KEY CONTROVERSIES / EVIDENCE QUALITY

---

1. **Relative motion vs traditional immobilisation / other early-active regimens.** One RCT (zones V–VI) and a systematic review favour relative-motion extension for earlier hand function, earlier return to work, higher satisfaction, with equivalent TAM and complications – though RME studies are generally of **lower methodological quality**, so the effect size is moderately rather than strongly certain. *Moderate–strong.*
2. **Wrist splint: needed or not?** Yoke-alone gives good results with no ruptures in zone IV–VI series; the supplementary wrist orthosis is **selective** (zone VII / weaker / non-compliant). The defensible default is yoke-alone for the common zones – hence the page wording that the hand therapist will advise if a wrist splint also applies. *Moderate.*
3. **How long to splint.** Traditional full-time wear is ~6 weeks; a 4-vs-6-week comparison showed no difference, so duration can be individualised and potentially shortened. *Moderate.*
4. **The 15–20° offset itself.** The specific relative-extension increment is **consensus-derived** (it must offload enough to protect but leave enough excursion to glide); it rests on sound mechanism rather than a dose-finding trial. *Consensus.*
5. **Extending relative motion beyond zones V–VI** (e.g. to sagittal-band injury and selected boutonnière/central-slip cases). The 2025 consensus endorses wider use, but evidence outside the core zones is **weak–moderate**, which is why this page deliberately scopes to zones IV–VII and excludes zone III. *Weak–moderate.*

---

## D. EVIDENCE STRENGTH FLAGS (summary)

---

- **STRONG:** the *mechanism* – relative 15–20° MCP-extension offset offloads the repair (quadriga + juncturae tendineae; ~12 mm → ~6 mm active excursion) making immediate active motion safe (mechanistic + cadaveric).
- **MODERATE–STRONG:** relative-motion extension is at least as good as other early-active-motion regimens (1 RCT zones V–VI: earlier hand function, higher satisfaction, equal TAM; SR: earlier return to work, equal ROM/complications) – tempered by the lower methodological quality of RME studies.
- **MODERATE:** wrist-splint-optional (yoke-alone, no ruptures in zone IV–VI series); 4-vs-6-week splint duration (no difference); return to work ~17–25 days vs 3–4 months for immobilisation.
- **CONSENSUS:** the specific 15–20° offset increment; broader application of relative motion (Tang 2025).
- **WEAK–MODERATE:** extension of the technique to sagittal-band / boutonnière (central-slip) injuries outside the core zones.

# CITATIONS

---

## RAG CORPUS (180,000+ ORTHOPAEDIC ARTICLES)

- Merritt WH. Relative motion splint: active motion after extensor tendon injury and repair. *J Hand Surg Am.* 2014. DOI: 10.1016/j.jhsa.2014.03.015
- Merritt WH, Wong AL, Lalonde DH. Recent developments are changing extensor tendon management (relative motion / quadriga mechanism). *Plast Reconstr Surg.* 2020. DOI: 10.1097/prs.0000000000006556
- Lutz K, et al. Relative motion extension splinting for extensor tendon repair – clinical schedule and yoke. *Hand Clin.* 2015. DOI: 10.1016/j.hcl.2014.12.006
- Collocott SJF, et al. Relative motion flexion versus relative motion extension / early active motion after extensor tendon repair (zones V–VI): a randomized controlled trial. *J Hand Ther.* 2020. DOI: 10.1016/j.jht.2018.10.003
- Collocott SJF, Kelly E, Ellis RG. A systematic review of relative-motion orthoses for the management of extensor tendon repairs. *Hand Ther.* 2017. DOI: 10.1177/1758998317729713
- Svens B, et al. Four-week versus six-week immobilisation comparison after extensor tendon repair. *J Hand Ther.* 2015. DOI: 10.1016/j.jht.2014.07.006
- Hirth MJ, et al. Relative-motion approaches in extensor tendon rehabilitation. *J Hand Ther.* 2021. DOI: 10.1016/j.jht.2019.12.016
- Tang JB, et al. International consensus on relative-motion rehabilitation and extensor tendon management. *J Hand Surg (Eur Vol).* 2025. DOI: 10.1177/17531934251363138

## EXTENSOR TENDON REHABILITATION LITERATURE (URLS)

- Howell JW, Merritt WH, Robinson SJ. Immediate Controlled Active Motion (ICAM) following zone 4–7 extensor tendon repair. *J Hand Ther* / PMC. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3574475/>

---

## CQ HAND + UPPER LIMB

Dr Kieran Hirpara – Specialist Orthopaedic Surgeon  
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700  
Phone 07 4863 6556 · [office@cqupperlimb.com.au](mailto:office@cqupperlimb.com.au) · [cqupperlimb.com.au](http://cqupperlimb.com.au)