CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Distal Triceps Tendon Repair

Distal Triceps Tendon Repair — Post-operative Rehabilitation (Evidence Brief)

Topic scope: post-operative rehabilitation after surgical reattachment of the avulsed distal triceps tendon to the olecranon (transosseous bone tunnels or suture-anchor footprint repair; best performed within ~3 weeks of injury). The extension mechanism is loaded by elbow **flexion** (passive stretch of the repair) and by **active/resisted extension** (triceps contraction), so the rehab cadence is built around protecting both, then restoring motion, then active extension, then resisted strength.

> *Defining principle: the repair is loaded in flexion and by triceps contraction, so early rehab limits flexion and blocks active/resisted extension while motion is restored, then releases active extension (~6 wk) and resisted extension (~12 wk) in steps, with return to sport at ~5–6 months. Dr Hirpara's stance: the repair is checked intra-operatively to be safe at 90° of flexion, so the elbow is rested in a simple sling at 90° (a standard, comfortable position — no hinged brace, and NOT held near extension) with a protected 0–90° arc (extension free to comfort, flexion capped at 90°) for ~6 weeks. This is deliberately less restrictive on early flexion than the published near-extension / 20°-flexion-lock guidelines, while keeping the key loading rules identical (no active extension to 6 wk, no resisted extension to 12 wk).*

Evidence base and corpus note

No RCT and no large prospective cohort defines the rehab cadence for distal triceps repair. The phased timeline rests on a published institutional clinical-care guideline (Ohio State Sports Medicine, 2021), which itself cites the core review literature, corroborated by several surgeon and physiotherapy phased protocols. The local RAG corpus is thin on triceps-specific phased *rehab* (rotator-cuff and biceps content dominates), but it **does** contain the key biomechanical repair-strength papers, which inform how early and how aggressively one can mobilise. The week-by-week timeline is therefore carried by the published clinical-care guideline, with the corpus supplying the repair-strength evidence that justifies the cadence.

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Key principles and controversies

- **Early motion vs prolonged immobilisation.** Classic teaching favours protective immobilisation (splint 2–6 wk, flexion-limited brace) because the triceps insertion is loaded in flexion. A counter-trend pushes **accelerated early ROM where fixation is strong** — a cadaveric study comparing dynamic-tape with standard suture fixation under an intense early-rehab protocol found the novel construct biomechanically superior, i.e. fixation strength is the rate-limiter for how early one can mobilise.
- **Suture-anchor vs transosseous (bone-tunnel) repair strength.** Carpenter et al. (JSES 2018) found **no difference** in tendon displacement between transosseous cruciate tunnels and suture-anchor repair **when the number of sutures is equalised**; the technique by Sarokhan & Leung (Arthrosc Tech 2019) cites Clark et al. (2014) finding **anatomic (knotless) footprint repair superior to transosseous cruciate** repair. Stronger anatomic footprint fixation is the lever that justifies earlier/more aggressive flexion and earlier resisted extension.
- **Flexion-limit progression.** No consensus on the exact ramp — the OSU guideline locks at 20° then advances ~15°/5 days; others use ~10°/week or an open 0–60° arc. All converge on **full passive flexion by ~6 weeks**, with active extension deferred to ~6 weeks and resisted extension to ~12 weeks. **KH's variant** keeps the elbow at 90° in a simple sling with a free 0–90° arc — less restrictive on early flexion, same loading deferrals.
- **Strength athletes / high demand.** Retrospective series in strength athletes report satisfactory return to sport but underline that **resisted extension and pressing loads are the highest-risk re-rupture activities**, supporting the firm 12-week resisted-extension / pressing block.

Phased timeline

Phase	Window	Sling / ROM ceiling	Exercises	Criteria to progress
I — Protected motion	**Weeks 0–6**	Simple sling at **90°** (no hinged brace, not near extension), off for exercises. Protected arc **0–90°**: extension free to comfort, **flexion capped at 90°**. **No active extension.**	AAROM/PROM elbow within 0–90°; wrist/hand/grip AROM; gentle shoulder ROM; forearm rotation	Wound healed; comfortable, controlled 0–90° arc at ~6 wk
II — Advance flexion + active extension	**Weeks 6–12**	Release flexion cap; progress flexion **past 90° toward full**. **No resisted extension / weight-bearing.**	Wk 6–8 active concentric extension **no resistance** (assist eccentric with other arm); wk 8 light submaximal triceps isometrics	Full painless ROM; full active extension with good control; pain ≤ 3/10

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Phase	Window	Sling / ROM ceiling	Exercises	Criteria to progress
III – Strengthening & return	**Weeks 12–16+**	Resisted triceps strengthening (concentric → eccentric) from ~12 wk; CKC weight-bearing from ~12 wk (light, small range); limited-range pressing ~wk 14	Progressive resisted extension; graded loading; sport-/work-specific progression	5/5 triceps strength; pain-free high-velocity / sport-specific control
Return to sport	**~5–6 months**	Criterion-based, at the earliest	–	Full pain-free ROM + symmetrical triceps strength

Evidence strength flags

- **MODERATE (protocol cadence):** the phased timeline (no active extension to ~6 wk, resisted extension to ~12 wk, return to sport ~5–6 mo) – anchored to the OSU Sports Medicine clinical-care guideline and corroborating surgeon/PT protocols. No defining rehab RCT.
- **MODERATE (repair-strength biomechanics):** suture-anchor vs transosseous equivalence with equalised sutures (Carpenter 2018); anatomic footprint superiority (Clark, via Sarokhan & Leung); insertional footprint anatomy (Whitaker 2022) – these justify the mobilisation cadence.
- **LOW–MODERATE (KH's 90°-sling / flexion-capped-at-90° variant):** biomechanically sound (flexion is the repair-tensioning motion; intra-op tensioning at 90° defines the safe arc) and less restrictive on early flexion than published near-extension guidance, while preserving the key extension-loading deferrals. **Consensus / expert** rather than trial-derived; corpus gap – no RCT or large cohort defines this exact variant.

CITATIONS

RAG CORPUS (180,000+ ORTHOPAEDIC ARTICLES)

- Keener JD, Sethi PM. Distal triceps tendon injuries. *Hand Clin.* 2015;31(4):641–650. DOI: 10.1016/j.hcl.2015.06.012
- Carpenter SR, Stroh DA, Melvani R, et al. Distal triceps transosseous cruciate versus suture anchor repair using equal constructs: a biomechanical comparison. *J Shoulder Elbow Surg.* 2018;27(11):2052–2056. DOI: 10.1016/j.jse.2018.07.005
- Sarokhan AK, Leung NL. Acute triceps tendon repair: a technique utilizing 3 curved tunnels and proximal knots. *Arthrosc Tech.* 2019;8(11):e1325–e1330. DOI: 10.1016/j.eats.2019.07.001

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- Ng T, Rush LN, Savoie FH. Arthroscopic distal triceps repair. *Arthrosc Tech.* 2016;5(6):e1107–e1112. DOI: 10.1016/j.eats.2016.06.011
- Whitaker JJ, Hartke J, Hawayek BJ, et al. Histologic evaluation of the triceps brachii tendon insertion: implications for triceps-sparing surgery. *J Hand Surg Am.* 2022. DOI: 10.1016/j.jhsa.2022.03.020

PUBLISHED REHABILITATION PROTOCOLS & LITERATURE (URLS)

- Ohio State University Sports Medicine. Distal Triceps Repair – Clinical Care Guideline (G. Hock PT DPT OCS; rev. M. Salsbery PT DPT SCS; Dec 2021). https://medicine.osu.edu/-/media/files/medicine/departments/sports-medicine/medical-professionals/shoulder-and-elbow/distaltricepsrepair.pdf *(NB: its near-extension / 20°-flexion-lock immobilisation differs from Dr Hirpara's 90°-sling approach; the loading deferrals are shared.)*
- Cadaveric study of dynamic-tape vs standard suture fixation in distal triceps repair under an intense early-rehab protocol. PMC. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC12423150/
- Distal triceps tendon repair in strength athletes – satisfactory return to sport (22 cases). PMC. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11355401/

Note on corpus gap: the RAG corpus lacks a dedicated distal-triceps phased *rehab* article; the week-by-week timeline is carried by the OSU clinical-care guideline (and corroborating surgeon protocols), with the corpus papers supplying the repair-strength evidence that justifies the cadence. Flagged accordingly.

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