CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Trigger Finger Release

Trigger Finger Release (A1 Pulley Release) — Surgical Outcomes & Post-operative Rehabilitation

Topic scope: (A) the place of surgery in stenosing tenosynovitis (trigger finger/thumb) after failed conservative care (splinting, corticosteroid injection), and (B) post-operative rehabilitation after **surgical division of the A1 pulley** — open or percutaneous. This is an **early-motion** pathway: nothing is reconstructed, the catching is mechanically abolished the moment the pulley is divided, and the rehab exists to keep the now-free tendon gliding and the finger joints supple while the wound heals.

> *Defining principle of the rehab here: A1 pulley release* ***removes the obstruction; it does not create a construct that needs protecting.*** *Once the pulley is divided the flexor tendon glides freely and triggering does not usually recur. So — unlike a tendon repair, and like a carpal-tunnel decompression — the pathway is* ***immediate active motion****: full active finger flexion/extension and tendon glides from the first days, oedema and scar care, early light functional use, and a quick return.* ***Most patients need no formal hand therapy at all****; supervised therapy is reserved for the minority with pre-existing joint stiffness, long-standing triggering, or slow recovery. The single branch point is whether the finger was already* ***stiff before surgery*** *(long-standing fixed flexion / PIP contracture) — those patients need active therapy to recover motion the release alone cannot restore.*

A. WHERE SURGERY SITS IN THE PATHWAY

Trigger finger is usually managed non-operatively first: activity modification, splinting, and **corticosteroid injection**, which resolves a substantial proportion of digits without surgery. Surgery (A1 pulley release) is reserved for digits that **fail injection, recur, or present with a fixed deformity**. The corpus contains the comparative evidence underpinning this stepped approach (percutaneous release vs steroid injection; one- vs two-injection regimens; corticosteroid solution choice) — *Moderate (RCT).* The rehab protocol on the patient page begins **after** that decision has been made, so this brief concentrates on the surgical and post-surgical evidence.

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B. SURGICAL OUTCOMES & RESOLUTION RATES

Open release of the A1 pulley is one of the most reliable operations in hand surgery. The mechanical problem — a thickened tendon catching under a tight pulley — is solved by dividing the pulley, and the result is durable:

- In a series of **1,598 open releases**, **fewer than 1% required a second operation** for persistent or recurrent triggering, with **no nerve injuries and no deep infections** [Bruijnzeel 2012]. About one digit in twenty had a documented post-operative problem, almost all minor and self-limiting (transient stiffness, scar tenderness). *Strong (large cohort).*
- Recovery of motion is **slower in patients with diabetes**, reinforcing the value of the exercise program in that group [Bruijnzeel 2012]. *Moderate.*
- A propensity-matched comparison with >3 years follow-up found **no recurrences after open release**, with median time to significant pain reduction of about one week and roughly half of patients back at work within ~2 weeks [Chanthanapodi 2025]. *Moderate.*

Take-home for rehab: because the operation itself abolishes the triggering, the rehabilitation is not "earning back" a surgical result — it is preventing the two things that *can* go wrong during healing: **tendon adhesion** and **joint stiffness**. Early glide and early extension are the levers.

C. OPEN vs PERCUTANEOUS RELEASE

Both techniques divide the same structure and converge to the same place.

- A **Level I meta-analysis of 8 RCTs (548 patients)** found **no significant difference between open and percutaneous release in revision, complication, or pain rates** — both are appropriate options [Casey 2024, *J Hand Surg Am*]. *Strong (meta-analysis of RCTs).*
- Larger RCT syntheses show percutaneous release confers **faster early functional recovery** — better short/mid-term Q-DASH, **~12 days earlier return to work**, and shorter analgesic use — while **long-term function, grip, motion and complication/revision rates are equivalent**. *Strong.*
- Percutaneous (including ultrasound-guided/sonographically-controlled) technique is supported by multiple corpus series for efficacy and safety, with the main theoretical risks being **incomplete release** and **digital nerve proximity**, mitigated by surface landmarks and imaging [corpus percutaneous series]. *Moderate.*

Rehab implication: the post-operative program is essentially the **same for both approaches** — early active motion, glides, oedema and scar care. The patient page applies regardless of whether the release was open or percutaneous; percutaneous patients simply tend to be comfortable and back to activity a little sooner.

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D. THE ROLE – AND LIMITS – OF POST-OPERATIVE HAND THERAPY

This is the central evidence point for the protocol, and it is one where "more therapy" is **not** automatically better.

- A **prospective RCT** compared 3 months of supervised rehabilitation after open release against a **self-directed home exercise program**: at six months, **overall function, motion and pain were similar between groups**. Supervised therapy added **further grip-strength recovery**, and the patients who clearly benefited from formal therapy were those whose **triggering had been present

> *12 months **pre-operatively and those in** housework/lighter-work roles [Saito 2023, J Clin Med]. Moderate (single RCT).*

- Published surgeon and hand-therapy protocols (e.g. University of Virginia Hand Center; Twin Cities Orthopedics) start **active and passive finger motion and tendon glides within the first days**, add **scar massage and desensitisation** once the wound is healed, and **reintroduce graded grip strengthening later** – precisely the staged structure of the patient page. *Consensus.*

Bottom line: a well-performed **home program carries most patients through**. Formal hand therapy is **reserved**, not routine – escalate it for long-standing pre-operative triggering, pre-existing joint stiffness/contracture, manual or fine-use occupational demands, or slow motion/grip recovery.

E. COMPLICATIONS

Serious complications are **uncommon (roughly <1–4% across series)** and most "complications" are minor, self-limiting healing phenomena:

- **Digital nerve injury** – the most feared complication, particularly relevant to **percutaneous** technique (blind division near the radial digital nerve of the thumb and index) and to scar/retraction in **open** release. Rare in experienced hands; transient paraesthesia is more common than true division [corpus complication series]. *Moderate.*
- **Incomplete release / persistent triggering** – failure to fully divide the A1 pulley (or an A2/FDS slip contribution); a recognised cause of revision, more often discussed with percutaneous technique. *Moderate.*
- **Recurrent triggering** – uncommon after adequate open release (<1% reoperation in the 1,598-digit series) [Bruijnzeel 2012]. *Strong.*
- **Infection** – usually superficial; deep infection rare (none in the large open series) [Bruijnzeel 2012]. *Strong.*
- **Bowstringing** – a rare complication from excessive proximal pulley loss (A1 **plus** encroachment on A2); largely avoided by limiting division to A1 [bowstringing case literature]. *Weak (case-level).*

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- **Stiffness / flexion contracture / "flare"** — the commonest *self-limiting* problem; transient PIP stiffness, scar tenderness and a post-operative inflammatory flare that settle with the motion, desensitisation and scar program. Recovery is slower in **diabetes**. *Moderate.* **This is the category the rehabilitation program actively targets.**

F. PHASED POST-OP TIMELINE (matches the patient protocol)

Phase	Window	Protection	Motion / use	Therapy add-ons	Notes
I — Immediate active motion & oedema control	**Day 0–2**	None beyond dressing	Active finger flexion/extension and **finger "pumps"** from day 1; tendon glides commenced	Elevation, ice, compression if provided; **desensitisation** (tap/rub over dressed wound) from day 1	Nothing reconstructed -> motion is the priority; manage swelling actively
II — Glide & joint motion	**Week 0–2**	None	Tendon glides (Series A/B), DIP & PIP **blocking**, composite extension; **firm passive stretch into extension**	Continue desensitisation	Goal: keep tendon gliding, prevent adhesion & stiffness; pain settles substantially (~1 wk) [Chanthanapodi 2025]
III — Scar maturation & function	**Week 2–4**	Light functional use only	Full active fist + full composite extension by ~3 wk; build light daily-living use	**Scar massage** (firm circles) once wound healed; heat before / ice after exercises	**No lifting/gripping/ weight-bearing to ~4 wk**; driving limited ~first week (full fist + safe control)
IV — Strengthening & return	**Week 4+**	None	Graded grip/ pinch (e.g. putty) once 4-wk precaution lifts -> full function	Supervised therapy **if** indicated (long-standing trigger, stiffness, slow recovery, occupational demand) [Saito 2023]	Manual workers return later than desk/light roles

Timings are criteria-based and drawn from published surgeon/hand-therapy protocols; they are typical, not trial-mandated.

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G. KEY CONTROVERSIES / EVIDENCE QUALITY

1. **Is routine post-op hand therapy necessary?** The best available evidence (Saito 2023 RCT) says **no for most** — home exercise matches supervised therapy on function/pain/motion at six months, with supervised therapy adding grip strength and benefiting a defined subgroup (long-standing trigger, lighter-work roles). The protocol's "therapy reserved, not routine" stance is evidence-aligned. *Moderate.*
2. **Open vs percutaneous.** Equivalent long-term outcomes and safety (Casey 2024 meta-analysis); percutaneous offers faster early recovery. The rehab is the same either way. The live debate is technique-side (nerve safety, completeness of release), not rehab-side. *Strong on equivalence.*
3. **The rehab protocol structure itself is consensus/expert**, built from surgeon patient-guidance documents plus one rehabilitation RCT — there is no large trial dictating exact phase timings.
4. **Diabetes modifies recovery** — slower motion recovery and a lower threshold to involve a hand therapist; not a different protocol, a different pace. *Moderate.*

H. EVIDENCE STRENGTH FLAGS (summary)

- **STRONG (meta-analysis / RCTs / large cohort):** open vs percutaneous equivalence in revision/complication/pain (Casey 2024, 8 RCTs); percutaneous faster early functional recovery (RCT syntheses); durability of open release (<1% reoperation, no nerve injury/deep infection in 1,598 digits, Bruijnzeel 2012).
- **MODERATE (single RCT / cohorts):** home exercise ~ supervised therapy at 6 months with grip-strength edge for supervised therapy (Saito 2023); percutaneous efficacy/safety series; slower recovery in diabetes; injection-vs- surgery comparative data.
- **WEAK / CONSENSUS:** the **post-operative rehabilitation protocol structure and exact phase timings** (surgeon/hand-therapy patient-guidance documents); bowstringing risk (case-level).

CITATIONS

RAG CORPUS (180,000+ ORTHOPAEDIC ARTICLES)

- Open Versus Percutaneous Fixation of Trigger Finger: Meta-Analysis of Clinical Outcomes. *J Hand Surg Am*. 2024. DOI: 10.1016/j.jhsa.2024.03.010
- Complications of Open Trigger Finger Release. *J Hand Surg Am*. 2010. DOI: 10.1016/j.jhsa.2009.12.040
- Differential Pulley Release in Trigger Finger: A Prospective, Randomized Clinical Trial. *Hand (N Y)*. 2021. DOI: 10.1177/1558944721994231
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- Ultrasound-Assisted Percutaneous Trigger Finger Release: Is It Safe? *Hand (N Y)*. 2008. DOI: 10.1007/s11552-008-9137-8
- Evaluation of Percutaneous First Annular Pulley Release: Efficacy and Complications. *J Hand Surg Am*. 2016. DOI: 10.1016/j.jhsa.2016.04.009
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- Percutaneous A1 pulley with corticosteroid injection for trigger finger release. *J Orthop Surg Res*. 2025. DOI: 10.1186/s13018-025-05776-2
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- Management of Pediatric Trigger Thumb and Trigger Finger. *J Am Acad Orthop Surg*. 2012. DOI: 10.5435/jaaos-20-04-206
- What's New in Hand Surgery. *J Bone Joint Surg Am*. 2024. DOI: 10.2106/jbjs.23.01343

TRIGGER FINGER SURGICAL & REHABILITATION LITERATURE (URLS)

- Saito T, et al. The Effectiveness of Rehabilitation after Open Surgical Release for Trigger Finger: A Prospective, Randomized, Controlled Study. *J Clin Med*. 2023;12(22):7187. https://pmc.ncbi.nlm.nih.gov/articles/PMC10671987/
- Bruijnzeel H, et al. Adverse Events of Open A1 Pulley Release for Idiopathic Trigger Finger. *J Hand Surg Am*. 2012;37(8):1650-1656. https://pubmed.ncbi.nlm.nih.gov/22763058/
- Casey JC, et al. Open Versus Percutaneous Fixation of Trigger Finger: Meta-Analysis of Clinical Outcomes. *J Hand Surg Am*. 2024;49(6):570-575. https://pubmed.ncbi.nlm.nih.gov/38727666/
- Chanthanapodi P, Aodsup S. Comparative results of percutaneous and open surgery for trigger fingers: a propensity score analysis. *Front Surg*. 2025;12:1509292. https://pmc.ncbi.nlm.nih.gov/articles/PMC11922895/
- Complications of Percutaneous Release of the Trigger Finger. PMC. https://pmc.ncbi.nlm.nih.gov/articles/PMC6485534/
- Trigger Finger. StatPearls, NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK459310/
- Bowstringing as a complication of trigger finger release. *J Hand Surg Am*. 1988. https://www.jhandsurg.org/article/S0363-5023(88)80097-2/abstract
- Trigger Finger (patient information). British Society for Surgery of the Hand (BSSH). https://www.bssh.ac.uk/patients/conditions/15/trigger_finger

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PUBLISHED REHAB PROTOCOLS (PATIENT-GUIDANCE — BASIS FOR THE PHASE STRUCTURE)

- University of Virginia Hand Center. Trigger Finger Release Guidelines (post-operative therapy protocol). https://med.virginia.edu/orthopaedic-surgery/wp-content/uploads/sites/242/2015/11/Triggerfingerreleaseprotocol.pdf
- Meletiou SD, Twin Cities Orthopedics. Post-operative Management of Trigger Release (A1 pulley release). https://tcomn.com/wp-content/uploads/2017/10/Trigger-Release-A1.pdf
- EmergeOrtho. Trigger Finger Release - Post-operative Instructions. https://emergeortho.com/wp-content/uploads/2022/06/Trigger-Finger-Release.pdf

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