

Reverse Shoulder Arthroplasty

Reverse Shoulder Arthroplasty (Cuff-Tear Arthropathy / Arthritis) – Post-operative Rehabilitation Evidence

Topic scope: Post-operative rehabilitation after **elective reverse total shoulder arthroplasty (RSA / rTSA)** for rotator-cuff-tear arthropathy, glenohumeral arthritis with an irreparable cuff, or a massive irreparable cuff tear – **not** the acute proximal-humerus-fracture indication, where tuberosity healing imposes its own restrictions. The evidence base for the *operation* (when RSA is indicated, implant survivorship, complication profile) is extensive; the evidence base for the *rehabilitation protocol* is smaller but, unusually for shoulder surgery, now includes several randomised trials directly comparing immobilisation strategies.

Defining principle of this rehab: RSA rehabilitation is comparatively permissive and is increasingly run on an accelerated footing. Two features of the reconstructed joint explain why. First, the deltoid – not the rotator cuff – drives elevation after RSA; the design medialises and lowers the centre of rotation so the deltoid can elevate an arm that has no functioning cuff. Second, there is usually no subscapularis repair to protect (and many surgeons deliberately leave it unrepaired with a lateralised implant), so the external-rotation restriction that dominates anatomic-TSA rehab is far less central here. The principal early caution is therefore not tissue healing but component stability: a reverse prosthesis can dislocate, and the at-risk position is the combination of extension + adduction + internal rotation (the hand-behind-the-back / tucking-in-a-shirt movement). Early rehab accordingly protects against that position while otherwise encouraging motion. The sling is largely for comfort, support and dislocation-avoidance, and the published trial evidence shows that shortening or even omitting it does not increase the dislocation or complication rate.

Surgeon's protocol note: Dr Hirpara's protocol on this page is run on an accelerated footing, directly aligned with the randomised and cohort evidence below: a short ~2-week comfort sling (weaned off during the day; optional brief night use), active-assisted and active shoulder motion from the start (within defined limits, beginning supine/gravity-assisted), and deltoid + periscapular strengthening from ~week 4. The main early constraint is component stability, so the extension + adduction + internal-rotation (hand-behind-back) dislocation position is avoided for the first ~6 weeks while motion is otherwise encouraged. Elevation after RSA

is deltoid-driven, which is why strengthening is deltoid- and periscapular-focused. Follow the protocol your surgeon has set.

The operation, in brief

In a reverse replacement the normal anatomy is inverted: a **ball (glenosphere) is fixed to the shoulder blade** and a **cup is fixed to the top of the arm bone**. This moves the joint's pivot point down and in, which **lengthens and tensions the deltoid** and lets that muscle lift the arm even when the rotator cuff is gone – the situation in cuff-tear arthropathy. Because the implant, not the patient's own cuff, provides stability and power, the rehabilitation logic differs fundamentally from a cuff repair (where a healing tendon must be protected) and from an anatomic replacement (where a repaired subscapularis must be protected).

Evidence by theme

1. EARLY / ACCELERATED MOTION IS SAFE – MULTIPLE RANDOMISED TRIALS

This is the best-supported part of RSA rehabilitation, and it is unusually strong for a shoulder rehab question because it rests on **randomised controlled trials**, not just consensus:

- **Hagen et al. (2020), single-blind RCT, 107 shoulders** – randomised to **immediate** physical therapy (passive + active ROM from the start) versus **6-week delayed** therapy. **No difference** in final ROM, patient-reported outcomes, or **dislocation/complication rate** (early 7.1% vs delayed 9.1%). [RAG corpus – 10.1016/j.jse.2020.11.017]
- **Edwards / “two rehabilitation approaches” RCT, 61 patients (63 shoulders) – early active** (submaximal isometric deltoid work from week 2) versus **delayed active** rehab, both with a 6-week sling. Pain and overall function were equivalent at 3, 6 and 12 months, but the early-active group had **significantly better active forward flexion at 3 months** ($p = 0.019$) – i.e. earlier functional gain without added risk. [Literature – PMC8512973]
- **Lee et al. (2021), 357 shoulders** – randomised to **no immobilisation / early motion, 3-week sling, or 6-week sling**. **No difference** in patient-reported outcomes, satisfaction, pain or ROM; the immediate-motion group had the **lowest overall complication rate** (reported as ~4% vs ~24.6% in the 6-week cohort in the pooled systematic-review re-analysis). [via Sachinis 2024 SR]

A **systematic review** (Sachinis et al., 2024; 3 controlled trials, ~527 shoulders) concluded that **accelerated rehabilitation is safe and yields equivalent 12-month outcomes**, while cautioning that protocols should still be **individualised** by bone quality, age, diagnosis and surgical complexity rather than applied uniformly. [Literature – PMC11034463]

Evidence: MODERATE-STRONG (several RCTs + SR), though individual trials are modest in size.

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2. SLING DURATION CAN BE SHORTENED WITHOUT ADDED RISK

- A **large retrospective cohort (960 patients)** compared **2-week vs 6-week** sling immobilisation after RSA and found **no difference** in complication rate (12.0% vs 15.0%, $p = 0.21$), **dislocation rate** ($p = 0.79$), acromial stress fracture, loosening or infection; final flexion and ER were equivalent. The authors concluded **shorter immobilisation does not incur additional risk**. [Literature – PMC10638591]
- Published institutional protocols (e.g. Massachusetts General Brigham) have themselves **moved from a 6-week to a 4-week sling** standard, attributing the change to improved implant design. [Published protocol – MGH Sports Medicine]

Evidence: MODERATE (one large cohort + protocol trend; the question is now whether 6 weeks is necessary, not whether it is safe).

3. THE DELTOID DRIVES RECOVERY – AND FORMAL ACTIVE PT MAY ADD LITTLE

Because elevation depends on **deltoid recruitment** (with documented compensatory recruitment of upper trapezius, latissimus and posterior deltoid), strengthening is deltoid- and periscapular-focused rather than cuff-focused. Notably, a **multicentre RCT found that a formal active physical-therapy programme did not improve outcomes** over a home/self-directed programme after RSA – many patients recover well with a structured home programme and physiotherapist supervision rather than intensive hands-on active therapy. [RAG corpus – 10.1016/j.jse.2022.12.011] This supports a pragmatic, education-and-home-exercise model.

Evidence: MODERATE (RCT).

4. DISLOCATION: LOW BUT REAL, AND THE EARLY PROTECTIVE POSITION IS SPECIFIC

Dislocation is the relevant early **stability** complication (as opposed to the *tissue-healing* concern of a cuff repair). Corpus series on **dislocation following RSA** identify the at-risk position as **adduction + internal rotation + extension**, and identify **subscapularis insufficiency** and implant/soft-tissue tensioning as contributors to instability. [RAG corpus – 10.1016/j.jse.2016.12.073; 10.1016/j.jse.2008.12.013] This is precisely why early protocols – accelerated or conservative – **restrict reaching behind the back and forced internal rotation** while otherwise allowing supported elevation. The role of routine **subscapularis repair** in preventing dislocation is debated and interacts with glenosphere **lateralisation** (a lateralised design appears less reliant on subscapularis repair for stability). [RAG corpus – 10.5435/jaaos-d-16-00781]

Evidence: MODERATE (cohort/registry); the precaution itself is universal consensus.

5. CONTRAST WITH ANATOMIC TSA REHABILITATION

The American Society of Shoulder and Elbow Therapists (ASSET) consensus on **anatomic** TSA rehab centres on **protecting the subscapularis repair** – limiting passive external rotation and active internal rotation for ~6 weeks. [RAG corpus – 10.1016/j.jse.2020.05.019] After RSA that specific constraint is **usually absent or much reduced** (no cuff repair to protect; subscapularis often not repaired), which is the structural reason RSA rehab is more permissive in external rotation while being more attentive to the dislocation-position combination.

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Phased post-operative timeline

This table reflects **Dr Hirpara's protocol on this page** (the accelerated, ~2-week-sling approach). The right-hand column notes the published evidence that the protocol is grounded in.

Phase	Window	Sling	Shoulder motion	Strengthening	Accelerated-evidence basis
I – Protection	Week 0–3	Comfort/ support; wean off during the day from ~2 weeks; optional brief night use	Active-assisted and active as tolerated from the start (begin supine/ gravity-assisted; ER in scapular plane to tolerance; flexion/ scaption $\leq 120^\circ$; abduction $\leq 90^\circ$); no IR, no reaching behind back, avoid the dislocation position ; elbow/ wrist/hand active	–	RCTs show early active/AAROM from the start carries no added dislocation/ complication risk (Hagen 2020; Edwards)
II – Intermediate	Week 4–6	Off during the day; optional brief night use	Progress AAROM and AROM	Periscapular + deltoid activation and strengthening initiated (~week 4)	Early active deltoid work gives earlier functional gain without added risk (Edwards)
III – Intermediate cont.	Week 7–8	Discontinued	Progress AROM all planes; first gentle passive IR in scapular plane ($\leq 50^\circ$)	Deltoid + periscapular progressed; motor control	Cohort data: 2-week sling non-inferior to 6 weeks (no extra dislocations)
IV – Transitional	Week 9–11	–	Full passive ROM all planes	Resisted deltoid/ periscapular; dynamic stability; PNF; no lifting >5 kg	–
V – Advanced strengthening	Week 12–16	–	Maintain pain-free full ROM	Add rotator-cuff strengthening if a cuff repair was done ; functional	Resisted IR / eccentric / closed-chain typically from ~12 weeks

Phase	Window	Sling	Shoulder motion	Strengthening	Accelerated-evidence basis
				loading; no lifting >7 kg	

Return-to-activity anchors (from this protocol): driving ~6 weeks; light lifting from 6 weeks but **no heavy lifting for ~6 months**; swimming (breaststroke) 8 weeks / freestyle 12 weeks; golf ~3 months; sedentary work 6 weeks, manual work surgeon-guided. Published sport-return data after RSA are encouraging for **low-impact** activity (≈ 60–86% return; swimming ~84%, golf/fitness ~77%) but caution against **high-impact and contact** sport given prosthesis-loading and revision concerns. [Literature – PMC10043097]

Key controversies / evidence quality

- 1. Accelerated vs conservative rehab – and where this protocol sits.** The randomised evidence shows **early motion and shorter (or no) immobilisation are safe** and may give earlier functional gain, with equivalent 12-month outcomes. Dr Hirpara’s **~2-week comfort sling, active-assisted/active motion from the start, strengthening from ~week 4** protocol **aligns with this accelerated evidence**. The systematic review still endorses **individualisation** (bone quality, fixation, intra-operative stability, soft-tissue tensioning, any concomitant cuff repair), so the surgeon may dial the plan back for a borderline-stable construct, softer bone, or a concomitant repair. **The prescribed plan is the one to follow.**
- 2. Immobilisation duration.** Trial and large-cohort data show **2–4 weeks is non-inferior to 6 weeks** for dislocation and complications, which is why this protocol uses a short ~2-week comfort sling. Longer 6-week protocols persist elsewhere out of surgeon preference and construct-specific factors, with the low absolute dislocation rate making the question hard to power definitively.
- 3. Precautions.** The **extension + adduction + internal rotation** (hand-behind-back) restriction is **near-universal consensus** early on; the disagreement is about *how long*, and how much external-rotation freedom to allow (more than anatomic TSA, but bounded by soft-tissue tension).
- 4. Subscapularis repair.** Whether to repair it – and whether repair reduces dislocation – interacts with glenosphere lateralisation and remains debated; this in turn influences how restrictive early rehab needs to be.
- 5. Active physiotherapy intensity.** At least one RCT found **formal active PT did not beat a structured home programme**, supporting an education-led, home-exercise model with physiotherapist oversight rather than intensive hands-on therapy.

Evidence-strength flags (summary)

- **MODERATE–STRONG (RCT / SR):** accelerated/early-motion rehab is safe with equivalent 12-month outcomes (Hagen 2020 RCT; Edwards RCT; Lee 2021; Sachinis 2024 SR); formal active PT not superior to home programme (multicentre RCT).
- **MODERATE (large cohort):** 2-week sling non-inferior to 6-week sling for dislocation/complications (960-patient cohort); deltoid-driven recovery biomechanics.
- **CONSENSUS / WEAK:** the dislocation-position precaution (universal but not trial-quantified for duration); the **specific phase timings of this protocol** (drawn from published institutional protocols + surgeon preference, not a head-to-head rehab RCT); subscapularis-repair effect on instability (conflicting cohort data).

Citations

RAG CORPUS (180,000+ ORTHOPAEDIC ARTICLES) – REAL DOIS RETURNED BY SEARCH

- Hagen MS, et al. **Accelerated rehabilitation following reverse total shoulder arthroplasty.** *J Shoulder Elbow Surg / Semin Arthroplasty.* 2021. DOI: 10.1016/j.jse.2020.11.017
- **Active physical therapy does not improve outcomes after reverse total shoulder arthroplasty: a multi-center, randomized clinical trial.** *J Shoulder Elbow Surg.* 2023. DOI: 10.1016/j.jse.2022.12.011
- Kennedy J, et al. **The American Society of Shoulder and Elbow Therapists' consensus statement on rehabilitation for anatomic total shoulder arthroplasty.** *J Shoulder Elbow Surg.* 2020. DOI: 10.1016/j.jse.2020.05.019
- **Dislocation following reverse total shoulder arthroplasty.** *J Shoulder Elbow Surg.* 2017. DOI: 10.1016/j.jse.2016.12.073
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LITERATURE (URLS)

- Sachinis NP, et al. **Can we accelerate rehabilitation following reverse shoulder arthroplasty? A systematic review.** *Shoulder Elbow.* 2024. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11034463/>
- **A randomised trial comparing two rehabilitation approaches following reverse total shoulder arthroplasty** (early active vs delayed active). 2021. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8512973/>

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- **No difference in complications between two-week vs. six-week duration of sling immobilization after reverse total shoulder arthroplasty** (960-patient cohort). 2023. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10638591/>
- **Optimizing Outcomes After Reverse Total Shoulder Arthroplasty: Rehabilitation, Expected Outcomes, and Maximizing Return to Activities.** 2023. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10043097/>
- Kim Y-T, et al. **Four weeks of immobilisation after reverse shoulder arthroplasty yields outcomes comparable to six weeks.** *Clin Shoulder Elb.* 2024. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11546419/>

PUBLISHED REHABILITATION PROTOCOLS (BASIS FOR THE PHASE STRUCTURE)

- Massachusetts General Brigham Sports Medicine. **Rehabilitation Protocol for Reverse Shoulder Arthroplasty.** Revised December 2018. <https://www.massgeneral.org/assets/mgh/pdf/orthopaedics/sports-medicine/physical-therapy/rehabilitation-protocol-for-reverse-shoulder-arthroplasty.pdf>
- Brigham and Women's Hospital. **Reverse Total Shoulder Arthroplasty Protocol.** <https://www.brighamandwomens.org/assets/BWH/patients-and-families/pdfs/shoulder-reverse-total-shoulder-arthroplasty-protocol.pdf>