The Physical Root

Reverse Total Shoulder Replacement Rehabilitation Protocol

Criteria-based guidance for reverse total shoulder arthroplasty (rTSA)

Purpose

A clinician-facing framework for safe, progressive rehabilitation after uncomplicated primary rTSA. Timing is approximate. Progression is based on surgical indication, soft-tissue repair, bone quality, wound status, symptom irritability, deltoid and periscapular control, functional use, and the operating surgeon's instructions.

Protocol at a glance

Phase	Typical timing	Primary priorities
0. Readiness	Before surgery	Education, baseline measures, sling and home planning
1. Protection and mobility	Day 0 to week 2	Protect reconstruction, wound care, distal motion, safe ADLs and transfers
2. Protected motion	Weeks 2 to 6	Progress permitted PROM/AAROM, preserve deltoid, limit stress on repairs
3. Active control and strength	Weeks 6 to 12	Restore active elevation, deltoid/periscapular endurance, functional reach
4. Return to participation	Week 12+	Progressive resistance, task readiness and long-term joint protection

Design principles

- Use a criteria-based approach rather than calendar time alone.
- Follow the operative report for indication, approach, subscapularis status, tuberosity repair, biceps procedure, bone grafting, and surgeon-specific motion or loading limits.
- Protect against the characteristic rTSA instability position: combined shoulder extension, adduction, and internal rotation, especially during early healing.
- Progress deltoid and periscapular loading gradually; function after rTSA depends on efficient deltoid and scapulothoracic mechanics.
- Monitor the 24-hour response. Persistent pain, swelling, loss of function, or new tenderness warrants dose reduction and reassessment.

1. Scope, precautions, and clinical decision rules

Applies to: adults after uncomplicated primary rTSA. This document does not supersede the operative report, surgeon communication, facility policy, or individualized restrictions.

Adapt or obtain explicit clearance for: revision arthroplasty; rTSA for acute or chronic proximal humeral fracture; tuberosity repair; tendon transfer; glenoid or humeral bone grafting; intraoperative fracture; poor bone quality; axillary nerve compromise; infection; complex instability history; significant cardiopulmonary disease; cognitive impairment; or other comorbidity affecting protection or exercise safety.

Urgent and emergent escalation

Finding	Recommended action
Chest pain, severe shortness of breath, syncope, new confusion, or signs of stroke	Activate emergency response / call emergency services.
Possible infection or wound complication: drainage, dehiscence, spreading redness, increasing warmth, purulence, fever, chills, or abrupt pain increase	Contact the surgeon promptly; same-day assessment when clinically concerning.
Possible dislocation or fracture: sudden severe pain, deformity, altered contour, new inability to move the arm, acute shortening, or a traumatic event with functional loss	Support the arm, stop treatment, and obtain urgent surgical or emergency evaluation. Do not attempt reduction.
Possible acromial or scapular-spine stress fracture: new focal superior/posterior shoulder tenderness with abrupt loss of active elevation, often after increased deltoid loading	Stop shoulder loading, protect in the sling as directed, and contact the surgeon promptly for evaluation.
New or progressive motor/sensory deficit, hand ischemia, severe unremitting pain, or disproportionate swelling	Urgent surgical or emergency evaluation.

Medication and wound boundaries

Physical therapy should reinforce, not independently alter, the surgeon's instructions for analgesics, antibiotics, anticoagulation when prescribed, sling use, dressings, bathing, or driving. Avoid lotions, topical agents, soaking, or direct scar work until the incision is fully closed and cleared.

Key monitoring variables

- Pain location and behavior, including anterior shoulder, acromion/scapular spine, upper arm, neck, and rest/night symptoms.
- Incision status, edema, bruising, distal circulation, sensation, and hand function.
- Sling fit, sleep positioning, precaution adherence, and ability to complete essential ADLs safely.
- Permitted passive and active-assisted motion; deltoid activation; scapular mechanics; active elevation quality when cleared.
- Operative indication and repair status, especially fracture/tuberosity healing and subscapularis management.

2. Surgical factors and preoperative readiness

Variables that change progression

Surgical factor	Rehabilitation implication
Subscapularis repair	External rotation and active internal-rotation loading may be restricted. Confirm the permitted ER limit and timeline.
Fracture / tuberosity repair	Often requires slower motion and delayed active loading to protect healing tuberosities. Radiographic healing and surgeon clearance govern progression.
Tendon transfer	Follow the transfer-specific immobilization and activation restrictions; generic rTSA timelines are not sufficient.
Revision, bone graft, poor fixation, or intraoperative fracture	May require prolonged sling use, reduced ROM, delayed strengthening, or additional lifting restrictions.
Axillary nerve or deltoid impairment	Deltoid function is critical after rTSA. Document motor/sensory status and coordinate with the surgeon when activation is absent or declining.

Precaution communication

Document the exact sling schedule, PROM limits, active-motion restrictions, lifting limit, weight-bearing restrictions through the arm, and duration. If discharge instructions and the operative report conflict or are unclear, communicate with the surgical team before advancing.

Preoperative readiness

- Set expectations for protection, sleep, dressing, bathing, transportation, work, and the criteria-based nature of recovery.
- Record baseline pain, cervical and distal upper-extremity status, shoulder function, dominant side, home support, work demands, and patient-reported outcome measures.
- Fit or review sling use and teach supported positioning, distal ROM, safe transfers, and one-handed ADL strategies.
- Arrange equipment and caregiver support; identify fall risk and whether the nonoperative arm can safely assist with transfers and devices.

Suggested baseline measures

Patient-reported measures may include QuickDASH, ASES, SPADI, or PROMIS Upper Extremity. Record functional reach, hand-to-head and hand-to-pocket ability, cervical motion, elbow/wrist/hand motion, grip when appropriate, and relevant lower-extremity mobility for transfer safety.

3. Phase 1 - protection, symptom control, and safe function

Typical timing: day 0 through week 2. **Visits:** based on surgical pathway, medical need, repair complexity, and functional status.

Goals

- Protect the prosthesis, subscapularis or tuberosity repair when present, and healing incision.
- Control pain and edema and maintain distal upper-extremity mobility.
- Use the sling and complete bed mobility, transfers, dressing, hygiene, and home mobility safely.
- Prevent shoulder extension beyond the permitted position and avoid combined extension, adduction, and internal rotation.
- Establish an independent home program and clear escalation instructions.

Interventions

Domain	Examples and dosing guidance
Education / positioning	Sling fit and schedule; supported sleep in reclined or supine position; pillow support under the arm; avoid reaching behind the back, pushing up from a chair, or placing the operative hand behind the body.
Distal mobility	Hand opening/closing, wrist ROM, forearm rotation, and elbow flexion/extension as permitted by any biceps procedure. Cervical motion and gentle postural changes as appropriate.
Shoulder motion	No active shoulder motion unless explicitly cleared. Surgeon-permitted pendulum or passive elevation/external rotation may begin according to repair status. Keep motion comfortable and controlled.
Scapular / muscle activity	Gentle scapular setting without forced retraction; submaximal deltoid isometrics only if specifically permitted. Avoid shoulder internal-rotation resistance and weight bearing through the arm.
Dose	Several brief sessions daily are often better tolerated than one long session. Adjust volume according to pain, guarding, wound response, and next-day recovery.

Avoid

- Combined extension, adduction, and internal rotation, such as tucking in a shirt behind the back or reaching to the back pocket.
- Supporting body weight through the operative arm, pushing up from a bed/chair, or using the arm with a walker unless explicitly cleared.
- Lifting, carrying, sudden traction, or active shoulder elevation before clearance.
- Forceful stretching, aggressive glenohumeral mobilization, or painful end-range motion.

Phase 1 progression criteria

Progress when most are present	Hold, regress, or communicate when
Incision is stable; pain and swelling are controlled or trending down; sling and precautions are understood; distal motion is maintained; essential ADLs and transfers are safe; permitted PROM is tolerated.	Worsening drainage/redness; systemic symptoms; sudden deformity or loss of function; progressive neurological findings; new focal acromial/scapular-spine tenderness; repeated precaution violations; severe pain after routine activity.

Early protection trajectory

The reverse prosthesis is inherently different from an anatomic shoulder. Early success depends more on protection, safe function, and controlled permitted motion than on rapidly achieving maximal ROM.

4. Phase 2 - protected motion and early neuromuscular control

Typical timing: weeks 2 to 6. Entry depends on wound status, surgical indication, repair integrity, and surgeon-defined motion limits.

Goals

- Progress passive and active-assisted elevation within prescribed limits without provoking persistent irritability.
- Maintain external rotation within the surgeon-defined boundary and protect repaired internal rotators/tuberosities.
- Develop gentle deltoid and periscapular control without superior shoulder overload.
- Improve independence with waist-level ADLs while continuing required sling use.
- Maintain elbow, wrist, hand, cervical, and thoracic mobility.

Interventions

Domain	Progression options
PROM / AAROM	Supine assisted elevation in the scapular plane; therapist-guided elevation; table slides; external rotation with the arm supported and within the prescribed limit. Avoid forceful end range.
Scapular control	Gentle scapular clocks, supported retraction/depression without excessive effort, thoracic extension/rotation as appropriate.
Deltoid activation	Pain-free submaximal isometrics or supported active-assisted elevation only when cleared. Emphasize smooth mechanics rather than height.
Function	One-handed ADL strategies; gradual use of the operative hand at waist level if permitted; sling weaning only according to surgeon direction and environmental risk.
Conditioning	Walking, recumbent cycling, and lower-extremity exercise that protects the operative arm and avoids fall risk or arm weight bearing.

Sling-weaning and motion progression criteria

- Surgeon-defined immobilization period is complete and any fracture/tuberosity restrictions are satisfied.
- Incision is healed and no unresolved red flags are present.
- Permitted PROM/AAROM is performed without guarding, instability symptoms, or a sustained pain increase.
- Patient can maintain arm position safely during household mobility and sleep.
- No new focal acromial or scapular-spine tenderness.

Motion expectations

Functional elevation is a more appropriate goal than recreating normal native-shoulder ROM. External rotation and internal rotation behind the back may remain limited. Motion goals should reflect preoperative status, indication, implant design, repair constraints, and patient priorities.

5. Phase 3 - active motion, deltoid control, and foundational strength

Typical timing: weeks 6 to 12. Fracture, tendon transfer, revision, bone graft, or delayed healing pathways may enter later.

Goals

- Transition from assisted to active elevation with efficient scapulohumeral mechanics.
- Improve deltoid, periscapular, elbow, wrist, and hand endurance for light ADLs.
- Reduce shoulder hiking and trunk substitution during reach.
- Restore safe functional reach to head, face, tabletop, and light waist-to-shoulder tasks.
- Tolerate progressive activity without a sustained pain response or focal acromial tenderness.

Progressive loading menu

Capacity	Exercise examples	Progression signal
Active elevation	Supine to reclined to upright elevation; short-lever to longer-lever reach; supported wall or rail slides	Smooth deltoid-driven elevation with minimal shrug and no next-day flare.
Deltoid / scapular	Submaximal isometrics; light scaption; low row; extension to neutral; serratus and scapular-control tasks	Stable scapular mechanics and no focal superior shoulder pain.
External rotation	Isometric to light band ER in a protected range when cleared; posterior deltoid and remaining cuff activation	No instability/apprehension and no violation of repair-specific limits.
Internal rotation	Begin only after subscapularis/tuberosity clearance; isometric or light resistance within functional range	No anterior pain and no behind-the-back forcing.
Elbow / hand	Biceps loading after procedure-specific clearance; triceps, forearm, grip and dexterity tasks	Task tolerance without shoulder substitution or excessive load.

Loading framework

Use low loads and controlled repetitions initially. Progress one variable at a time: gravity position, lever arm, range, repetitions, sets, external load, or task complexity. A mild muscular response can be acceptable; escalating joint pain, loss of active elevation, increasing night pain, new focal acromial/scapular-spine tenderness, or a next-day flare indicates excessive dose and requires reassessment.

Common barriers and responses

Barrier	Clinical response
Shoulder hiking / poor elevation	Regress gravity demand or lever arm; improve thoracic position and scapular control; use supported active-assisted motion; assess deltoid and axillary nerve function.
Persistent anterior pain	Review subscapularis/biceps procedure, extension exposure, active IR load, transfer strategy, and exercise dose; communicate if persistent or worsening.
New acromial or scapular-spine pain	Stop deltoid loading and active elevation progression; protect the arm and contact the surgeon promptly.
Stiffness without irritability	Confirm surgeon limits; use frequent low-load assisted motion, positioning, and functional reach rather than forceful stretching.
Fear or low confidence	Use graded exposure, supported positions, clear precautions, task-specific practice, and objective progress measures.

6. Phase 4 - progressive strength and return to participation

Typical timing: week 12 and beyond. Higher-demand progression commonly continues for 4 to 6 months or longer.

Goals

- Meet individualized self-care, household, work, travel, and recreational demands.
- Build durable deltoid, periscapular, elbow, wrist, and hand capacity without overloading the acromion or prosthesis.
- Develop an independent program for shoulder function, posture, balance, and general conditioning.
- Use objective testing and task simulation to identify residual deficits and guide safe progression.
- Maintain realistic expectations for overhead endurance, behind-the-back reach, heavy lifting, impact, and long-term joint protection.

Participation guidance

Activity	Decision guidance
Driving	Requires surgeon clearance, no impairing medication, sling discontinuation, safe vehicle entry, adequate steering and emergency control, and compliance with local requirements.
Work	Use a graded plan based on lifting, carrying, pushing/pulling, overhead reach, repetition, vibration, fall risk, and shift length. Coordinate restrictions with the surgeon/employer.
Recreation	Walking, stationary cycling, lower-extremity training, light gardening, golf progression, and selected low-risk fitness activities may be appropriate after clearance.
Higher load / impact	Heavy lifting, repetitive overhead work, push-ups, hanging, contact sports, high-fall-risk activities, and forceful racquet/throwing tasks require individualized surgeon discussion and may be discouraged.
Long-term loading	Use both hands for heavier objects, keep loads close to the body, avoid sudden traction and repetitive high-load overhead activity, and comply with the surgeon's lifetime lifting guidance.

Discharge or transition criteria

- Patient goals are met or a safe independent plan is established.
- No unresolved red flags, instability symptoms, or unexplained regression.
- Functional active elevation and reach are stable and adequate for meaningful activities.
- Strength and task testing demonstrate sufficient capacity for intended demands, with residual deficits addressed in the plan.
- The patient can self-monitor loading and knows when to seek reassessment.

Recommended reassessment battery

Select measures that match the patient and setting. Options include active and passive elevation/external rotation; hand-to-head and hand-to-pocket reach; dynamometry for deltoid-plane elevation and rotation when appropriate; grip; selected functional reach or shelf tasks; and QuickDASH, ASES, SPADI, or PROMIS Upper Extremity. Use the same test position and protocol at each comparison.

Return-to-activity rule

Clearance should be based on healing status, active control, task capacity, symptom stability, fall risk, confidence, and surgeon guidance. A date on the calendar alone is not clearance.

7. Clinician documentation and communication checklist

At evaluation

- Procedure date, side, indication, surgeon, approach, implant/repair details available, sling schedule, ROM limits, lifting limits, arm weight-bearing status, and follow-up date.
- Medical history, medications relevant to safety, prior function, dominant side, home support, work/recreation demands, and goals.
- Incision and limb screen; pain/edema; cervical and distal neurovascular findings; transfers, ADLs, balance/fall risk, and precaution adherence.
- Baseline outcome measures and a plan for repeat testing.

At each progression point

- Objective change in symptoms, ROM, active elevation, scapular mechanics, muscle performance, and function.
- Exercise dose, gravity position, lever arm, external load, repetitions, sets, assistance, and response during and after treatment.
- Rationale for sling change, motion advancement, return-to-work plan, or activity progression.
- Education provided, patient understanding, adherence barriers, and shared decisions.
- Any communication with the surgeon or care team and the resulting plan.

Suggested communication triggers

Trigger	Examples
Immediate / emergency	Cardiopulmonary emergency signs, stroke signs, loss of distal perfusion, suspected dislocation or acute fracture, severe neurological change.
Same day	Significant wound drainage/dehiscence, systemic infection signs, sudden deformity, acute traumatic loss of function, uncontrolled pain.
Prompt non-emergent	New focal acromial/scapular-spine tenderness, abrupt loss of active elevation, progressive axillary-nerve findings, recurrent instability/apprehension, persistent worsening pain, inability to follow precautions.
Routine	Clarification of ROM limits, sling duration, subscapularis/tuberosity restrictions, lifting status, driving, work, aquatic therapy, or recreation.

Home-program communication principles

- Keep the program short enough to complete and specific enough to measure.
- Separate protection/positioning, distal motion, shoulder mobility, activation/strength, and conditioning instructions.
- State exact precautions and give a clear dose range and symptom-response rule.
- Update the program when an exercise is no longer challenging, no longer relevant, or repeatedly aggravating.
- Use teach-back and observe at least one full set of key exercises.

Quality marker

A successful protocol is not a checklist of exercises. It is a repeatable decision system linking surgical indication and repairs, examination findings, loading dose, functional goals, and the patient's response.

8. Evidence and protocol synthesis

This document is an original clinical synthesis. It reflects recurring elements in major academic rTSA pathways and contemporary shoulder-arthroplasty rehabilitation guidance, including initial protection, explicit repair-specific precautions, staged PROM/AAROM/AROM, gradual deltoid and periscapular loading, complication surveillance, functional testing, and criteria-based return to activity.

Primary protocol models consulted

Source family	Contributions reflected in this synthesis
University of Delaware / Delaware Physical Therapy Clinic shoulder arthroplasty rehabilitation principles	Criterion-based progression, objective functional assessment, scapular and deltoid performance, and task-based rehabilitation.
Massachusetts General Hospital rehabilitation protocol for reverse shoulder arthroplasty	Phase structure, dislocation precautions, staged mobility, deltoid/periscapular activation, strengthening, and return-to-function considerations.
The Ohio State University Wexner Medical Center reverse total shoulder arthroplasty clinical practice guidance	Clinical decision making, red flags, repair-specific precautions, staged motion and loading, and objective progression criteria.
American Society of Shoulder and Elbow Therapists and contemporary peer-reviewed rTSA rehabilitation literature	Protection principles, variability in immobilization and motion timing, complication awareness, functional recovery, and outcome measurement.
AAOS and contemporary enhanced-recovery principles	Patient education, complication awareness, interdisciplinary coordination, activity counseling, and long-term joint protection.

Important interpretation note

Institutional protocols differ in sling duration, PROM limits, initiation of active motion, subscapularis precautions, strengthening timelines, and return-to-activity language. Fracture-based rTSA and tendon-transfer pathways may differ substantially from elective primary rTSA. The operative report and direct surgeon instructions take precedence. Clinicians should verify the current edition of source protocols and applicable professional guidance before local adoption because institutional documents can be revised.

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