

Total shoulder replacement, Reverse Shoulder Replacement and Hemi-arthroplasty

Introduction:

Shoulder replacement surgery comes in three main forms.

1. A hemiarthroplasty (half shoulder replacement) involves replacement of the humeral head only.
2. A total shoulder replacement involves the replacement of both the humeral head and Glenoid
3. A reverse shoulder replacement also replaces both the Glenoid and humeral head but involves a reversal of the normal geometry and is used in those cases with inefficient rotator cuff or compromised bone stock.

Recovery differs somewhat but all require a degree of soft tissue reconstruction and extensive rehabilitation.

Indications: Trauma and its sequelae, osteoarthritis, dislocation arthritis, rheumatoid arthritis, neoplasm, cuff tear arthropathy, congenital dysplasia, severe comminuted proximal humeral fractures. Primarily for pain relief, improved function, possible improved range of movement (ROM) but not necessarily.

Expected length of stay: 2 to 4 days. This is variable and depends on factors such as support at home and not just initial surgical outcome.

Surgeons: Mr Brown, Mr Reid, Mr Robinson, Mr Mackenzie, Mr Nicholson

Scope of Practice:

These guidelines are designed to assist physiotherapists when managing postoperative patients and have been compiled using a systematic review process and peer-to-peer consultation. The guidelines must be applied in the context of clinical assessment and each patient should be treated individually.

Aim:

The aim of these guidelines is to provide physiotherapy staff with a series of recommendations from the current evidence base to assist them in the management of patients who have undergone these surgical procedures.

Literature review question:

What is the physiotherapy rehabilitation post total shoulder replacement / reverse shoulder replacement?

Search Process:

Appraisal proves: the databases were searched between 2021 and 2025, as previous guidelines were searched up until 2020.

The titles and abstracts of all identified studies were assessed to determine whether they were pertinent to the research question. Relevant articles were crosschecked and duplicates were discarded.

Number of articles selected: 23

Total number of articles discarded: 16.

Databases:

Databases	Dates	Limitations
Embase	2021 to current	English
Cochrane	2021 to current	English
MEDLINE	2021 to current	English
AMED	2021 to current	English
CINAHL	2021 to current	English

Key Words: in various combinations

Shoulder	Physiotherapy
GHJ	Physical therapy
Glenohumeral Joint	Rehabilitation
Replacement	Post-operative
Hemiarthroplasty	Prognosis
Total	Function
Reverse	Strength
Anatomical	Range of motion
Arthroplasty	Activities of Daily Living

Results:

There continues to be a lack of in-depth evidence for post-shoulder replacement rehabilitation since the guidelines were previously reviewed. Some are based on expert opinion, case studies and anecdotal evidence. Common limitations in the studies from this literature search were the insufficient reporting of the rehabilitation protocols, how randomisation was carried out, and a lack of confidence intervals. There were four randomised control trials (RCTs), one prospective study, one research proposal, and one case study. The results from three of the RCTs (Hagen et al., 2020, Khalil et al., 2023, Chalmers et al., 2023) showed no significant effect of the intervention on outcomes, so there is no change to clinical rehabilitation guidance for these. The other RCT (Schick et al.,

2023) also did not find a significant improvement in their respective outcomes (home-based physiotherapy versus outpatient physiotherapy), however, this would support the effectiveness of favouring home-based physiotherapy to reduce strain on NHS outpatient services. The prospective randomized study (Lee et al., 2023) did show a short-term benefit to NMES (neuromuscular electrical stimulation) in the early phases of rehabilitation, but no long-term effects. The case study (Wadhokar et al., 2024) showed a positive effect of physiotherapy post-RSA recovery on range of motion and strength, but it's level of evidence is poor due to the nature of the study design. There is a variation on opinion on the optimum post-operative physiotherapy management, however the consensus supports early mobilisation to improve general function.

Information was extrapolated from the literature evaluation and consensus sought from expert consultation with orthopaedic surgeons and advanced physiotherapy practitioners in NHS Lothian.

These guidelines have been expanded from the previous guidelines covering the literature between 2008 to 2020. The previous literature search used as a point of reference.

REHABILITATION GUIDELINES FOR HEMIARTHROPLASTY AND TSA

To note: there is additional information for RSA at the end of these guidelines.

Key Points:

- Pre-op information is important – patients must be familiar with the stages of rehab (31)
- Rehabilitation should be individualised (31)
- Communication with the surgical team is important (4) particularly if there are any additional procedures carried out
- Timescales are approximate and will depend on the surgical procedure and individual patient progression and whether as a result of trauma

Pre-operative phase:

Goals

Maintain ROM and strength
Pain relief

Recommendations

AROM exercises and isometrics (35)
Consider heat, isometrics, relaxation (35) **C**

Further support for patients waiting for surgery can be found here: [Edinburgh Orthopaedics](#)

Early Phase (0-6 weeks)

The aim of this phase is to start recovering ROM and start recovering or maintaining scapular stability. The majority of papers recommend a sling for 4-6 weeks (off for hygiene and exercises) (4,5,7,20,22,29,39).

- Sling for 6 weeks, early passive flexion encouraged (assisted or pulley), no ER beyond neutral unless surgical instructions differ

Goals

Protect

Recommendations

Arm in sling for 6 weeks
Sling off for hygiene and exercises
(4,20,22,29,31,39)
Do not mobilise into pain (8)
Weight-bearing should be discouraged for the first 6 weeks **C**

Increase ROM

Exercises to begin immediately (4, 12, 19,30,31)
little and often (10)
Neck, elbow, wrist and hand active ROM
exercises (4,9,10,30,29,31)
Shoulder active assisted/passive ROM flexion
only
No ER beyond neutral for first 6 weeks
Pillows or a rolled up towel may be used under
the elbow to support arm from falling behind
midline (4)
Pendular exercises (4,9,10,31) **C**

Scapular re-education

Massage as required (10)
Scapula strengthening (4,9,10) in upright only
(no prone lying) **C**

Middle Phase (6-12 weeks):

The aim of this phase is to improve strength and continue pacing with light functional activities and exercises. Patients can wean from sling.

Goals

Increase ROM

Recommendations

Gradually increase active ROM with optimum
scapular control (4)
If able, begin gentle active HBB from week 8

	Continue passive ROM , gentle passive stretching and soft tissue work as required. ER can be progressed beyond neutral	C
Increase strength	Can begin isometric internal rotation (4,10,29,30) at week 8 Progress strengthening exercises from isometric to isotonic exercises (4,10,26,30) graduating from supine, adding light weights then progress to sitting and standing as able (8) Exercise band once satisfactory muscle strength achieved (23) Gentle closed chain exercises (4,9)	C
Function	Light functional activities (10) Avoid heavy lifting (10, 29)	C

Late stage (12 weeks – 6 months)

The aim is to regain strength, movement and allow maximal function, as limited by expectations

At 3 months, full flexion and 80% rotation can be expected- however be mindful that not all patients will achieve full ROM post surgery

Avoid heavy activities or pain provoking activities until 6 months (10,29)

Goals	Recommendations	
Increase ROM	Gradually increase ROM as able (29) Stretch if indicated (10)	C
Increase strength	Gradually progress strength as appropriate Rotator cuff strengthening (29, 31) Isokinetic rehab, if available, is recommended for younger patients with resurfacing, but not recommended for elderly patients with stemmed prosthesis (10)	C
Increase proprioception	Proprioceptive exercises (10)	
Function	Encourage self-management (35)	

It is clear from the evidence that patients with rotator cuff compromise do not do as well post operatively. Those with Rheumatoid arthritis may require modifications of the programme as auto assisted movements are often difficult. Following trauma rehabilitation

must take into consideration the amount of soft tissue damage. Expectations for these patients should therefore be modified accordingly.

Pain will continue to reduce for up to 6 months
IR/ER should continue to improve for up to 1 year (26)

Return to function

Return to driving around 3 Months (10, 29). Legally, a patient must not drive when in a sling. After 12 weeks the patient must self-declare fitness to drive and only drive when they are able to safely control the vehicle and perform an emergency stop.

4-6 months for return to golf (10); Average time 8.4 months (24)
Moderate/non-contact sports activities from 6 months (10, 37)

Physiotherapy intervention at 2-3 years post op may improve range and ADL function (34)

REVERSE TOTAL ARTHROPLASTY

The following guidelines were adapted from Blacknall & Neumann (1), 1 RCT (7) and 1 systematic review (3) as well as expert opinion from orthopaedic surgeons and Advanced Physiotherapy Practitioners in NHS Lothian and offer further guidance and recommendations for physiotherapy post reverse arthroplasty. These patients are rotator cuff deficient, which is the primary reason for selecting this surgery. The emphasis should be on deltoid training to compensate for deficient rotator cuff muscles.

Pre-operative phase:

Goals

Maintain ROM and strength
Pain relief

Recommendations

AROM exercises and isometrics (35)
Consider heat, isometrics, relaxation (35) **C**

Further support for patients waiting for surgery can be found here: [Edinburgh Orthopaedics](#)

Early phase (0-2 weeks)

The aim of this phase is to start recovering ROM, start recovering or maintaining scapular stability and recruit deltoid.

Goals	Recommendations
Protect	Arm in sling for 2 weeks with passive Assisted Flexion; off for hygiene and exercises (1,3) Weightbearing should be discouraged for the first 2 weeks Care with GHJ extension and HBB for first few weeks (1, 3) Pillows or a rolled-up towel may be used under the elbow to support arm from falling behind midline (4) B C
Increase ROM	Elbow, wrist and hand active ROM exercises (4,10,29,30) No external rotation beyond neutral 0-6 weeks Active assisted GHJ exercises in supine (1, 3, 14); individual gradual progression Standing shoulder rolls (1) Pendular exercises (1) BC
Scapular strengthening	Scapula strengthening (4,9,10) in upright only (no prone lying) C
Recruit deltoid	Static holds at 90 degrees flexion in supine (1) May perform ADLs below shoulder height such as eating or drinking C

Middle phase (2-6 weeks)

The aim of this phase is to gradually increase functional ROM of the arm and increase deltoid recruitment.

Goals

Recommendations

Protect

Sling for busy environments (1)

Wean from sling from week 2

Avoid supporting body weight with the involved limb, although some weight can go through the limb from week 2 (1, 3) **BC**

Increase ROM

Allow gradual increase in GHJ active ROM at patients own pace (3)

Active extension and HBB from week 6 (1) **C**

Increase Strength

Progress strength during 2-6 weeks stage with positional change and the use of gravity
Commence isometric deltoid in supine once available range achieved

Progress ER from supine to side lying (1)

Gentle Supine isometric IR and ER (1)

Scapular control exercises (1) **C**

Late phase (6-26 weeks)

The aim of this phase is to gradually increase functional use of the arm and increase deltoid recruitment.

Goals

Recommendations

Increase ROM

Progress active ROM as able (1)

Regular passive stretching is appropriate and required

Increase strength

Progress exercises from supine to sitting and from short lever to long lever (1)

GHJ strengthening with exercise band (1,7) or free weights (7) as able

Focused strengthening of periscapular muscles (1,26) and deltoid (7)

Increase reps and resistance as able (1, 3) **BC**

Function

Avoid sudden lifting or pushing (1)
Gradually progress functional use of the arm with
good patterning **BC**

Expectations of surgery

It is clear from the evidence that patients with rotator cuff compromise do not do as well post operatively. Those with Rheumatoid arthritis may require modifications of the programme as auto assisted movements are often difficult. Following trauma, rehabilitation must take into consideration the amount of soft tissue damage. Expectations for these patients should therefore be modified accordingly.

Pain will continue to reduce for up to 6 months (23)

IR/ER should continue to improve for up to 2 years (23). It is likely, however that there will be some long term compromise with HBB

Return to function

Return to driving around 3 Months (10, 29). Legally, a patient must not drive when in a sling. After 12 weeks the patient must self declare fitness to drive and only drive when they are able to safely control the vehicle and perform an emergency stop.

4-6 months for return to golf (10); Average time 8.4 months (24)

Moderate/non-contact sports activities from 6-12 months (8, 37)

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Reviewed by:

Date:

Date for review:

Levels of Evidence

Evidence from large randomised controlled trials (RCTs) or systematic review

(including meta-analyses)[†] A1

Evidence from at least one high quality cohort A2

Evidence from at least one moderate size RCT or systematic review A3

Evidence from at least one RCT B

Expert opinions C

Laboratory Evidence* D

† Arbitrarily, the following cut-off points have been used: large study size 50 patients per intervention group; moderate study size 30 patients per intervention group.

** Arbitrarily, added by Lothian Physiotherapy Musculoskeletal Network Group*

Modified from: MacAuley D and Best TM (2007) Evidence-based Sports

Medicine. 2nd Edition. BMJ Books. Blackwell Publishing. Oxford, UK.

Glossary

CASP Critical Appraisal Skills Programme

ER External rotation

HBB Hand behind back

IR	Internal rotation
ROM	Range of Movement
RSA	Reverse shoulder arthroplasty
TSA	Total shoulder arthroplasty