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Rehabilitation after Reverse Shoulder Replacement: Standard Protocol

Physiotherapy Guidelines

Reasons for standard protocol:

- Coexisting tendon repair → need to respect tendon healing timeframes
- Females >65 years old with osteopenia or osteoporosis → due to risk of acromion, spine of scapular and humeral shaft stress fracture
- Lateralisation of implant used → need to protect for longer

Immobilization/ Movement Restrictions:

Wear Sling	_____ weeks (If blank: Sling on day and night for 6 weeks, > 6 weeks: wean out of sling as tolerated)
Coexisting tendon Repair:	YES / NO Supra/Infra/Subscap/Teres
Initial Range of Movement (ROM) limitations	ER_____(If blank ER as tolerated) Other_____

Key-points for the therapist:

1. Outcomes after Reverse Shoulder Arthroplasty (RSA) vary between patients. There is no normal final ROM. **ROM should be gained in a pain free manner and not forced**. ROM may be limited throughout the rehabilitation process due to pain, post-operative capsulitis/stiffness and/or tendon oedema. Do not expect to achieve the same ROM as the unaffected side. As a guide, the average ROM achieved for flexion is 120 to 140° and 45° for ER, however this may not be feasible for all patients.
2. Extension, internal rotation (IR), and horizontal flexion (HF) ranges as well as combinations of these (such as hand behind back) are **contra-indicated in the first 12 weeks post-operatively** due to risk of prothesis dislocation. Patients should be educated to avoid activities such as "pushing yourself up from a chair" or "forced hand behind back" in this early post-operative phase.
3. Rehabilitation exercises should commence initially with active assisted then active range of motion drills. The initial focus is placed on regaining flexion then external rotation (ER) ROM (within limits specified above or as pain allows). IR, HF and hand behind back (HBB) are considered much later in rehabilitation as these motions can compression of soft tissue structures and may risk prothesis dislocation.
4. The therapist needs to be mindful of healing and loading timeframes for rotator cuff repairs if one has been performed in association with a patient's RSA.
5. Repetitive, unaccustomed and/or forced overhead use of the arm (especially flexion) can result in stress fractures/fractures to the acromion, scapula spine and/or humerus. Be aware of acromion or scapula spine pain that could suggest the onset of a stress fracture. If pain occurs speak to your surgeon.
6. Ideally, exercises (strength and ROM where possible) are performed in the scapula plane to enhance articulation of the reverse prothesis and encourage ease of motion.
7. Good scapula control is focus of early rehabilitation as it ensures a strong base of support on which the deltoids can function. A good scapula position needs to be maintained throughout all strengthening exercises.
8. Good deltoid function is a focus of rehabilitation. Due to the architecture of the RSA, the deltoid now provides the optimum moment arm to lift the upper limb and compensate for a non-functioning rotator cuff.

Loading guidelines:

The restrictions for loading the shoulder after RSA aim to avoid reactivity of the surrounding soft tissue structures and protect any associated rotator cuff repair. Loading refers to any increase demand on the shoulder and could include a progression in activities of daily living (ADLs), range of motion or strengthening exercises. Typically, formal loading of a shoulder post cuff repair (with isometrics, bands and weights) should not commence until **12 weeks**. When additional load is applied to the shoulder at any phase of rehabilitation, the therapist should be mindful if one or more of the following occur:

a) Night pain occurs/reoccurs/worsens (> VAS 2/10)
b) Morning stiffness occurs/reoccurs/worsens (VAS> 2/10)
c) Daytime ache occurs/reoccurs/worsens

If any of the above occur in association with additional load being applied to the shoulder, load needs to be reduced or ceased until discomfort has settled. This typically involves modifications of ROM exercises, temporary cessation of formal strengthening exercises and modifications of the patient's overall "life-loading" (ADLs).

General Loading Guide:

0-6 weeks: Sling, No load
6-12 weeks: Active assisted to active ("Life loading")
12-16 weeks: Gradually commence resistance as per loading guidelines above (weight of arm to 0.5 kg to 2 kg max) *
16-24 weeks: 2 to 4 kg * (max overhead 2 kg)
24 weeks +: As discussed with/guided by surgeon. Weights should be comfortably tolerated by the patient. Refer to loading guidelines below.

*IMPORTANT: See below for maximums for specific exercise drills. This is a guide only and the therapist should respect the individual's response to load. Repetitions and load may need to be reduced from the above/below and built up slowly.

Dosage Guide

Stretches:

10-reps as tolerated, 2 x day. Build from 1 to 5 sec holds as tolerated.

Loaded Exercises:

Motor control (1 x 10-15-20 reps, 2 x day- very light load) to
Endurance (2 x 15 reps, Every 2nd day to 1 x day- light-medium load) to
Strength (3 x 10-12 reps every 2nd day- medium-slightly heavier load).

Strengthening exercises should be performed with no pain during the exercise (muscle fatigue is acceptable). Typically, patients tolerate strengthening exercise earlier in the day as opposed to just before bedtime.

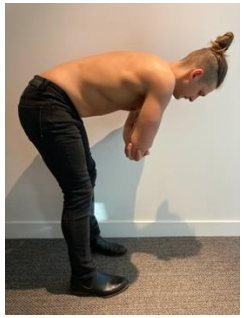
1-14days

Education

- Sling used during the day and at night-time and only removed to dress, shower, and complete exercises
- Pillow behind the upper arm can assist at night-time to avoid the arm dropping into shoulder extension (continue to wear sling)
- Heat may be utilized prior to exercise
- Ice may be applied post exercise
- Mild discomfort can be felt during stretches (but should not increase during repetitions) however, be alert to signs of tissue reactivity as per loading guidelines.
- Patient to AVOID extension, HBB, HF and IR in abduction. No "pushing yourself up from a chair" or "forced hand behind back" (0-12 weeks)
- IR with arm by side is permitted (i.e.: arm across belly in sling)

Range of Motion Exercise

- Active elbow flexion / extension/ pronation / supination
- Active wrist flexion / extension / hand gripping
- Supported pendular (arms supported/cradled at elbow). Affected arm may need to be in neutral rotation if internal rotation causes compression pain) Flexion (max 90°), circular motions (clockwise/anti-clockwise)-respecting pain
- Standing or sitting active assisted ER to what is comfortable but not beyond 0° ER.
- AVOID extension, HBB, HF and IR in abduction



Supported pendular

Active assisted External Rotation

2-6 weeks

Education

- Sling used during the day and at night-time and only removed to dress, shower, and complete exercises
- Patient to AVOID extension, HBB, HF and IR in abduction. No "pushing yourself up from a chair" or "forced hand behind back" (0-12 weeks)

Range of Motion Exercise

- Continue supported pendular exercises 90° (max) flexion.
- Continue elbow, wrist and hand exercises
- Gentle active assisted ER to neutral (0°) standing or sitting as tolerated. Do not force.
- AVOID Extension, HBB, HF and IR in Abduction

Strengthening Exercises

Neck

- Deep neck flexor strengthening supine or standing as required

Scapula

- *Gentle* scapula setting into a neutral position (with arm supported or in the sling)
- Position of scapula set is determined by observing any deficit in scapula posture on observation (e.g.: If patient scapula is sitting in excessive anterior tilt and protraction, then the scapula set would be into some posterior tilt and retraction).
- Adhere to loading guidelines and watch for any tissue reactivity.

6-12 weeks

Education

- Patient may wean out of the sling at 6 weeks. Optional use of the sling up until 12 weeks if discomfort persists.
- Patient and therapist to be mindful of loading guidelines above when progressing ROM and ADLs
- Patient to AVOID extension, HBB, HF and IR in abduction. No "pushing yourself up from a chair" or "forced hand behind back" (0-12 weeks)

Manual Therapy

- No manual therapy if night pain greater than VAS 2-3/10
- *Gently* massage around the shoulder girdle, cervicale spine, trigger points; supraspinatus, infraspinatus and as well as the neck if indicated (tolerance may vary)
- *Note: Avoid the biceps belly until night pain is nil and biceps not distended.*

Range of Motion Exercise

- Continue standing pendular exercises as warm up and progress to the following as comfortable:
- Supine active assisted flexion with bent elbow progressing to straight arm with stick (6-8 weeks: 120° max, > 8 weeks progress ROM as comfortable)
- If supine flexion not tolerated, then sliding the arm across a table (across gravity) recommended.
- Gentle active assisted ER (0 to 25°) to the limits set by the surgeon and as pain allows. Do not force. Can progress to supine assisted ER with a stick if comfortable.
- AVOID extension, HBB, HF and IR in abduction (0-12 weeks)

Strengthening Exercises

Neck

- Deep neck flexor strengthening supine or standing as required

Scapular

- Aim for symmetry of the unaffected side.
- Isotonic scapular setting drills elbow supported or with arms by the side if comfortable.
- Against gravity only. No load should be applied.

12-16 weeks

Education

- Sling may be removed permanently.
- Patient and therapist to be mindful of loading guidelines when progressing ROM, ADLs and strength exercises.
- Be aware of acromion or scapula spine pain that could suggest the onset of a stress fracture. If pain occurs speak to your surgeon.

Manual Therapy

- No manual therapy if night pain greater than VAS 2-3/10
- *Gently* massage around the shoulder girdle, trigger points; supraspinatus, infraspinatus and as well as the neck if indicated (tolerance may vary)
- *Note: Avoid the biceps belly until night pain is nil and biceps not distended.*

Range of Motion Exercise

- Continue to gradually increase active assisted flexion range of motion as comfortable. Can progress to active assisted flexion in standing with hands clasped together or using a stick (**elbow often needs to be slightly bent)** as tolerated. Do not force.
- ER ROM (0-20° Abd only) supine /sitting/ standing as tolerated.
- *Gentle* HBB ROM using a stick or towel. Action for HBB is active assisted in nature (gentle on/off gliding motion across the back with 0 -1 sec holds only). Be alert for any anterior shoulder pain and cease exercise if this occurs. A failure to regain HBB is more a product of the arthroplasty component and not physiotherapy. HBB exercises can be attempted but regaining HBB should not be expected and therefore not forced.
- Can encourage adduction/horizontal flexion (i.e.: washing under the opposite armpit). No forced adduction.

Active assisted flexion in standing

12-16 weeks

Strengthening Exercises

- All strengthening with respect to loading guidelines and dosage guide.
- When resistance increases (e.g.: yellow to red TheraBand), reduce repetitions initially and build up slowly.
- Ensure good scapula position is maintained through the exercise
- Perform exercises in the scapula plane where able
- Not ALL strengthening exercises below need to be performed. Load needs to be managed appropriately and patients may alternate between Day 1 (e.g.: TheraBands) and Day 2 (e.g.: weights) programs, loading day and complete rest day.

Neck

- Deep neck flexor strengthening supine or standing as required

Scapula

- Scapular setting drills progressed to arm by side if elbow was supported
- Once the patient can perform 15 to 20 scapula drills comfortably with the weight of the arm, load can be slowly applied with a weight (0.5 -1kg) in the hand.

Glenohumeral Joint

Flexion

- Supine flexion with bent elbow (pillow under the upper arm) Load= weight of arm (0kg) –0.5-1kg max) **OR/alternate**
- Standing (scapula plane) flexion with band (short lever "punch") to 45-50° of elevation as tolerated. Load= yellow→red TheraBand

Extension

- Standing Row (from flexion to elbow in line with side of body). Load = yellow→red TheraBand **OR/alternate**
- Bent over row 0-0.5-1-1.5-2 kg max

ER

(Note: Patient should be able to tolerate extension loading before commencing ER)

- Submaximal ER isometric. Commence 5 reps of 3 sec holds progressing to 20 reps 3 sec holds 1 x day. Monitor response to load. Progress to→
- Standing ER isotonic with TheraBand. initially commenced facing forward (as less load on the cuff) then progressed to side on. Commence with small range of motion (neutral to 30-40°) Load= yellow→red TheraBand

IR

- Submaximal IR isometric. Commence 5 reps of 3 sec holds progressing to 20 reps 3 sec holds 1 x day. Monitor response to load. Care if subscapularis repair. Progress to→
- Standing IR isotonic: Care if subscapularis repair. Ensure copes with isometric load first. Commence with small range of motion (Pain free ER ROM to neutral) Load = yellow→red TheraBand. Care if subscapularis repair.

Biceps curls / triceps extensions (0-0.5-1-1.5-2kg

16-24 weeks

Education

- Overhead activities of daily living using the arm should be progressed slowly to avoid acromion and/or scapula spine fractures.

Manual Therapy

- Gently massage around the shoulder girdle, trigger points; supraspinatus, infraspinatus and biceps belly as well as the neck if indicated.

Range of Motion Exercises

- Continue to gradually increase active flexion range of motion as comfortable. Do not force.
- Continue to progress gentle HBB if tolerated. Do not force.
- No forced adduction or HBB.
- ER ROM (0-20° Abd only) supine /sitting/ standing as tolerated. Note. ER ROM in higher ranges of Abd (e.g.: ER at 45 and 90° of Abd) is typically not tolerated by patients due to an absence of a large portion of the rotator cuff and are therefore *not* prescribed exercises. These patients will gain what is functionally achievable through elevation/flexion exercises as prescribed.

Strengthening Exercises

- All strengthening with respect to loading guidelines above (Refer to dosage guide).
- Maximum weights do not have to be achieved.

Neck

- deep neck flexor strengthening standing as required

Scapula

- Scapula setting: Increase weight to the hand as tolerated (1-1.5 kg-2 kg max)

16-24 weeks (cont)

Glenohumeral Joint

Flexion

- Supine bent elbow flexion (pillow under the upper arm) 2-2.5 kg **OR/alternate**
- Standing (scapula plane) flexion with band (short lever "punch") from 50-100 ° elevation Load= yellow→red TheraBand. Slowly increase angle of elevation. Do not push limits of motion.

Extension

- Standing Row to side of body. Load = Red→ Green TheraBand **OR/alternate**
- Bent over Row. Load =2-3-4kg max

ER

- Standing Isotonic ER: Red→ Green-TheraBand **OR/alternate**
- Side lie ER. – arm supported on towel, 0° abduction. Limit arc of motion initially (0-250g to 500g)

IR

- Standing Isotonic IR: Red→ Green-TheraBand
- Bicep curls / triceps extensions (1-1.5-2-3kg)

Flexion in Supine

24 Weeks +

Scapula setting: 3 kg max

Flexion:

- Supine flexion: Max 3 kg **OR/alternate**
- Standing or seated flexion (elbow bent) with weight to ROM tolerated by patient: Load = weight of arm to 0.5-1k-1.5g max.

Extension:

- Standing extension row to side of body with TheraBand if tolerated. Arm abducted to 45° – 90° of as tolerated. Load= yellow→red TheraBand. **OR/alternate**
- High bent over row if tolerated. Arm abducted to 45° (0.5-1-1.5-2 kg) to 90° 0.5-1-1.5-2 kg).

Principles of Discharge

- ROM and strength functional, satisfactory, and/or plateaued