Rotator Cuff Repair: Non-Secure Repair

Sling	What can I do from day 1?	Restrictions?	Commence strengthening?
6 weeks	Active assisted/ supported within safe zone*	No formal strengthening until 12 weeks	Dependent on dynamic control and ROM – generally 12 weeks

* *Safe zone will be stipulated by the Surgeon in the operation notes. If this is not stipulated then limit mobilisation to anterior to the scapula plane below 80° elevation and 50% of ER (compared with other side) respecting pain and movement pattern until clarified. Exercises must be performed with the arm supported.*

Pre-operatively

- Teach active assisted/active supported mobilisation programme
- Teach elbow/wrist and hand exercises
- Advice re postural awareness / movement pattern correction
- Patient education regarding procedure and expectations

Factors that may affect progression rate;

- Pre-operative status/stiffness
- Age
- Tissue quality
- Associated procedures

Treatment note: *Directly following repair integrity relies essentially on the suture construct. Remember, remodelling repair tissue does not reach maximal tensile strength for a minimum of 12-16 weeks post repair*.

Acute phase (0-6 weeks[1])

[1]Timescales are general guidelines only and are dependent on individual patient factors and pre-operative status/history

Sling

This is worn for 6 weeks for comfort, to support the arm and avoid the arm being knocked into risk positions. The sling is removed to allow axillary hygiene and when the patient is doing their exercises.

Goals:

- Protect the integrity of the repair
- Optimise tissue healing
- Diminish pain and inflammation
- Maintain/regain safe zone active assisted ROM
- Prevent compensatory movement patterns that may compromise recovery
- Minimise muscle inhibition

Rehabilitation:

Avoid:

X Active supported/passive mobilisation outside safe zone

It is important to establish the safe zone from the post-operative notes (i.e. that which doesn't compromise the surgical repair) for mobilisation before commencing the active supported exercise programme.

***Treatment Note**: NB. The following are considerations for exercise inclusion however in reality these can be incorporated in 2-4 key exercises. Clinical reasoning of the patient's key issues will inform which factors are priorities. It is important not to prescribe too many exercises as this has been shown to impact adherence*.

- Elbow, wrist and hand exercises
- Active assisted/supported mobilisation within safe zone
- Sub maximal (<30% MVC) isometrics rotator cuff – must be pain-free
- Simple scapula mobilisation exercises e.g. shoulder shrug
- Closed kinetic chain exercises- minimal load and must be pain-free
- Encourage use of hand in sling (light activities)
- Cryotherapy if indicated

***Treatment note**: Research demonstrates that patients that engage with the hand of the operated arm, during the immobilisation phase, have better outcomes in terms of pain and function. However these should clearly be limited to unloaded activities and must respect pain.*

Criteria for progression:

- Well controlled pain
- Range of movement – safe zone range maintained/regained
- Absence of significant compensatory movement patterns

Treatment note:

The risk of re-tear *is greatest in the first 12 weeks post surgery. Groups with greater risk of re-tear include older patients, smokers, diabetics, those with minimal postoperative symptoms and those with tears > 3cm.*

TIP: *The principles of cross-education can be used early in the rehabilitation phase. Isometrics targeting the rotator cuff of the un-operated arm e.g. external rotation with the arm supported at 30 degrees of abduction in the scapula plane will help facilitate muscle activation patterns and cortical activation together with small strength gains in the operated limb.*

Intermediate stage (6-12 weeks[1])

Goals:

- Preserve integrity surgical repair
- Restoration functional range of movement including full elevation range
- Re-educate cuff recruitment and scapula control through range
- Prevent compensatory movement patterns that may compromise recovery
- Optimise kinetic chain

Avoid:

X Combined abduction/external rotation
X Forced end range mobilisation especially external rotation with arm by side
X Lifting/loading until 12 weeks
X Weight bearing through operated arm e.g. getting out of a chair
X Forced hand behind back/extension

Treatment note: *Patients who progress quickly with minimal end range pain must be reminded/educated to avoid early loading. The lack of symptomology can indicate increased risk of re-tear due to poor scar deposition. These patients should progress more slowly.*

Rehabilitation:

Avoid forced **passive** stretching into combined abduction/external rotation however can encourage active movement into this position as long as good control.

- Mobilisation capsular restriction (respecting restrictions)
- Progress cuff and scapula recruitment through range
- Progress kinetic chain integration

- Increase functional emphasis movement pattern correction
- Closed kinetic chain work to enhance co contraction

At this stage it is essential that any exercise prescription ensures that the patient is able to maintain good cuff and scapula control i.e. there should be no evidence of significant scapula winging, or compensatory muscle patterning during exercise execution. Continued patient education regarding transfer of good movement pattern to function is encouraged.

Criteria for progression:

- Pain-free functional range of movement
- Good control rotator cuff and scapula musculature through functional range

Late stage (12 weeks- 6 months[1])

Treatment note: *At 12-16 weeks remodelling phase is close to completion and repaired tissue is relatively mature. However the addition of specific strengthening should be guided by preoperative findings in terms of tissue quality, patient age and whether primary or revision surgery. Evidence shows that patient will continue to improve for 1-2 years after surgery in terms of function. Careful progression of loading is essential to avoid compromise of the surgical repair.*

Goals:

- Restore full active range of movement
- Establish optimal neuromuscular control shoulder girdle musculature
- Restore optimal cuff and scapula control through range and under load
- Optimise function specific power, strength and endurance
- Transference movement pattern correction and cuff/scapula control to functional task
- Return to full work/ sport and recreational activities

Rehabilitation:

Treatment note: *Introduction of functional strengthening must respect the patient's ability to maintain good upper quadrant control and should essentially be pain free. Loss of scapula control or adoption of compensatory patterns should not be ignored as to do so will potentially compromise the repair*.

- Ensure regain optimal range of movement into combined positions
- Enhance neuromuscular control through range and incorporated with kinetic chain
- Closed kinetic chain exercises with increased load
- Function specific strengthening and endurance exercises rotator cuff and scapula musculature

Patients returning to sport or with high functional demands may require more advanced strengthening to ensure they regain maximal tensile strength and functional endurance.

Criteria to progress:

- Pain-free with activities of daily living
- Tolerate late stage loaded exercises without pain or substitution
- Able to perform movement through full ROM without loss of scapula control

Expected Outcomes

The aim of these expected outcomes is to help clinicians set realistic expectations for patients in terms of timescales for recovery.

These reported outcomes are derived from a review of recent literature of Rotator Cuff Repair (RCR) Surgery. This included data on small to large tears however massive tears (≥5cm as documented in the literature) were excluded from this data collection.

Many of the studies compare different surgical techniques and there is a lack of consistency in post-operative rehabilitation. The literature does not currently demonstrate a significant clinical difference between more aggressive, early mobilisation regimes compared with slower programs that rely on a longer period of immobilization at 6 and 12 months postoperatively. However, a trend has been observed toward better early pain relief, ROM, and functional scores in patients treated with an early mobilisation programme at 6 and 12 weeks. Whilst there has been concern regarding a higher risk or re-tear in such regimens there is currently no evidence to support any detrimental effects.

The quality of literature is insufficient to draw an unequivocal conclusion as to what the expected course of outcome following RCR is, however the findings do suggest some typical patterns in recovery.

OUTCOME	**Rotator Cuff Repair (small to large tears).**			
Timescale post op	**6/52's**	**3/12's**	**6/12's**	**≥1year**
Pain Scores	**4.2**	**3.15 (2.6 – 3.7)**	**2.14 (1.1 – 3.2)** ***At rest:*** **0.6 (0.3 – 0.8)** ***At night:*** **1.3 (0.9 – 2)**	**1.6 (0.3 – 3)** ***At rest:*** **0.3 (0 – 0.6)** ***At night:*** **0.7 (0.2-1.2)**
ROM				
Flexion	**102° (77° – 126°)**	**138° (123° – 155°)**	**154° (147° – 161°)**	**159° (140° – 175°)**

External Rotation	**36° (34° ---38°)**	**48° (34° ---71°)**	**61° (50° ---77°)**	**62° (38° ---84°)**
Internal Rotation	**L2**	**T9 (T12-T8)**	**T10 (T12-T9)**	**T9 (T10-T8)**
Patient Satisfaction				**Excellent or very good in 88% patients.** **91---92 % Satisfaction**
Patient rated overall shoulder function			**4/5**	**4.3/5**
Return to Work/Function				**More than 85% patients returned to work before 6 months post op**
VAS Impairment	**5.3**	**4.5**	**3.4**	**2.**