

Appendix

Physical therapy guideline: active rehabilitation after reverse shoulder arthroplasty

Phase	Physical therapy	Aim	Remarks
1 (0 – 1 weeks)	<p>Physical therapy starting day 1 postoperative, guided by pain, focus on:</p> <ul style="list-style-type: none"> - Elbow, wrist and hand function - Scapula setting - Guided active shoulder movement (max. 90° anteflexion): raising arms over each other, swinging, external rotation with stick (in supine position) <p>Advice: 1) pillow may be used under the upperarm/elbow while sleeping supine; and 2) cold packs may be used (2-3 times a day)</p>	<ol style="list-style-type: none"> 1. Decrease swelling and pain 2. End of 1st week: <ul style="list-style-type: none"> - ≥45° anteflexion - ≥45° abduction - passive, if possible active 	<p>Day 0-1 shoulder sling</p> <p>Day 2: no sling needed Sling only for short moments to relieve any pain</p> <p>Start outpatient physical therapy directly after hospital discharge</p>
2 (2 – 4 weeks)	<p>Start mobilizing the glenohumeral joint, no range of motion (ROM) restrictions: pain guided anteflexion, abduction and external rotation</p> <p>Exercise therapy focused on improving ROM and muscle activation:</p> <ul style="list-style-type: none"> - Extend exercises from 1st week - Isometric exercises of deltoid muscle - (Guided) active exercises of deltoid muscle* 	<ol style="list-style-type: none"> 1. Decrease swelling and pain 2. ROM recovery and muscle activation 3. End of week 4: <ul style="list-style-type: none"> - ≥70° anteflexion - ≥70° abduction - passive, if possible active 	No sling
3 (4 – 6 weeks)	<p>Glenohumeral joint mobilization</p> <p>Exercise therapy focused on improving ROM and muscle activity:</p> <ul style="list-style-type: none"> - Pulley, bench slides (later on wall slides)** - Strengthen deltoid muscle: start from a lying position, progress to (half) sitting and standing - Strengthen scapula-thoracal muscles to optimize scapula position - If the function of the cuff is still present, add exercises for cuff muscles 	<ol style="list-style-type: none"> 1. Obtain function and ROM 2. End of week 6: <ul style="list-style-type: none"> - ≥90° anteflexion - ≥80° abduction - passive, if possible active 	Study follow up six weeks postoperative
4 (7 – 12 weeks)	<p>Mobilizing glenohumeral joint, targeting preoperative values or contralateral side</p> <p>Exercise therapy focused on progressing ROM, muscle function, coordination and stability:</p> <ul style="list-style-type: none"> - Strengthen deltoid muscle 	<ol style="list-style-type: none"> 1. Recovery to optimal ROM, muscle strength and endurance 2. End of week 12: <ul style="list-style-type: none"> - >90° anteflexion - >80° abduction - passive, if possible active 	<p>Resume mild physical work related activities, if applicable</p> <p>Study follow up three months postoperative</p>

	<ul style="list-style-type: none"> - Strengthen scapula-thoracal muscles - Strengthen all other shoulder muscles - Activities of daily living (ADL) training 	3. Participate in ADL and back to work	<i>Focus on quality of movement</i>
5 (>12 weeks)	Improve ROM and optimize strength, start participating in ADL / work / sports		
Regime:	<ul style="list-style-type: none"> • Sling first day postoperative and if needed during the first week (daytime only) • Allowed to sleep on affected side if tolerated • Driving car and riding bicycle only with sufficient arm muscle control, in consultation with the physical therapist • Lifting close to body 		
* Active exercise of deltoid muscle, gradual progression ^{6 13}	<p>a) Supine position, bring arm to upright position (assisted by contralateral arm), try to keep this position (figure 3a)</p> <p>b) Keep arm straight and move with comfortable, short arc from upright position (figure 3b)</p> <p>Progression:</p> <ul style="list-style-type: none"> - Amplitude of movement is, pain guided, gradually increased, if shoulder mobility and control increase - Same movement performed with a small weight (0.5 to 1 kg) - Moving the arm against gravity, starting in a semi-sitting position to a sitting position: first within a short amplitude and without any weights 		
** Bench slides progressing to wall slides	<p>a) Bilateral bench slide: patient sitting in front of bench, moving both hands (on a towel/ball) forward and back (anteflexion, figure 3c)</p> <p>Progression:</p> <ul style="list-style-type: none"> - Patient sits alongside bench and performs unilateral bench slide; progressing with trunk forward flexion - Patient performs bench slides using elastic band for resistance - Bench placed in a sloping position, bench slides in a standing position - Wall slides, first by using both arms <p>b) Wall slides with the operated arm using a towel/ball (figure 3d)</p> <p>Progression:</p> <ul style="list-style-type: none"> - Movement amplitude gradually increasing - Use elastic band for resistance - Lift hand away from wall in elevated position 		
Figure 3a. Arm upright	Figure 3b. Moving straight arm	Figure 3c. Bench slide	Figure 3d. Wall slide
			