



Duke Sports Medicine

Pec Major Transfer Protocol

Jonathan Dickens, MD

3475 Erwin Rd, Durham NC 27705

P: 919-684-0493

F: 919-681-6357

Professor of Orthopedic Surgery

Sports Medicine: Knee, Shoulder, Hip

PHASE I: Generally 0 - 6 Weeks Post-Op

GOALS:	<ol style="list-style-type: none"> 1) Protect surgical repair 2) PROM: 0°-90° 3) Minimize pain, stiffness and swelling
PRECAUTIONS:	<p>No active use of arm x2 weeks post-op Weeks 3-6: No lifting more than 1lb at elbow/wrist</p> <p>No strengthening until at least 12 weeks.¹</p>
ROM	Weeks 0-6: PROM only, flexion within plane of scapular 0°-90°; all other motions progress by 10°-15° each week ¹
BRACE/SLING:	<p>Patient placed in custom ER brace or sling with abduction pillow for 6 weeks.³ Weeks 0-6: Wear brace at all times, even while sleeping</p> <p>Week 0-3: Patient to also have immediate off the shelf dynamic movement shoulder orthosis for scapular and postural stability.</p> <p>Week 3: Have patient measured for custom dynamic movement shoulder orthosis for scapular and postural stability to be used concurrently with custom ER brace. <i>Note that this is patient and surgeon specific given the need for stabilization of swelling prior to having a custom DMO made.</i></p>
WOUND:	<p>Post-op dressing remains intact until post-op day #5 May shower after post-op day #5 once dressing is removed Do NOT submerge shoulder in tub or pool for 4 weeks Suture removal or incision check @ 10-14 days post-op, per Ortho/PT</p>
CRYOTHERAPY:	<p>Cold with compression (e.g. CryoCuff, ice with compression wrap)</p> <ul style="list-style-type: none"> - every hour for 15 minutes for the first 24 hours, until acute inflammation is controlled - After acute inflammation is controlled: 3x per day for 15 minutes or longer as tolerated
REHABILITATION:	Frequent use of CryoCuff and/or ice

	<p>Begin scar massage after incision site sloughs/scar is formed</p> <p>Perform the following rehabilitation exercises</p> <p>Formal PT evaluation 1 week post-op. PT treatment sessions initiated at 4 weeks post-operatively once cleared by the surgeon.³</p>
~1-2 weeks	<p>PROM as per ROM Progression Guidance</p> <p>AROM of the elbow/wrist/hand with shoulder in neutral position</p> <p>Submaximal gripping exercises.</p> <p>Shoulder pendulums within plane of scapula (with arm in brace)</p>
~3-6 weeks	<p>Continue previous exercises as needed</p> <p>Scapular activation exercises (retraction/depression) with shoulder in neutral</p>
FOLLOW-UP:	<p>Supervised rehab: as needed</p> <p>Physical Therapist Re-evaluation: monthly</p> <p>Ortho Re-evaluation: 2 & 6 weeks post-op</p>

PHASE II: Generally 7-12 Weeks Post-Op

PHASE II GOALS:	<ol style="list-style-type: none"> 1) Full shoulder range of motion 2) Pain free activities of daily living
PRECAUTIONS:	<p>NO pushups, heavy lifting(>20lbs for 6 mo), or other sports participation⁶</p> <p>NO repetitive overhead use of shoulder</p> <p>Limit end ranges of abduction, external rotation, horizontal abduction</p> <p>Continue PROM progression guidance progressing to full shoulder ROM</p>
BRACE/SLING:	Discharge as per orthopedic surgeon guidance
REHABILITATION:	<p>Continue Phase I exercises as needed</p> <p>Progress to the following exercises and increase intensity gradually when patient is ready (i.e. no increase in shoulder pain or effusion since the previous exercise session)</p> <p>Strengthening is initiated when ROM is within 90% of the contralateral side. <i>Usually at 10-12 weeks post-operatively³</i></p> <p>*Note: all strengthening should be done starting with low weights, high repetitions, and in a painless ROM*</p>
~7-8 weeks	<p>Continue phase I exercises as needed</p> <p>Gentle submaximal shoulder isometrics in neutral</p> <p>Initiate AAROM shoulder flexion, abduction, IR/ER; <i>progress as tolerated by pain</i></p> <p>Progress to multi-planar AAROM exercises as per precautions considered</p> <p>Aerobic conditioning: bike, elliptical, or stairmaster; <i>as approved by surgeon</i></p>
~9-12 weeks	<p>Begin shoulder AROM within pain-free ranges as per precautions</p> <p>Continue shoulder submax isometrics progressing from neutral gradually</p> <p>Begin light resistance isotonic in neutral, flexion, and scapular plane to 90° or a pain-free range.</p> <p>Begin light scapular stabilization in neutral, supine 90°, prone, and against the wall.</p>

	Upper extremity weight bearing progression (Standing at wall or standing at table)
FOLLOW-UP:	Supervised rehab: 2-3x per week as needed Physical Therapist Re-evaluation: bimonthly Ortho Re-evaluation: ~12 weeks post-op

PHASE III: Generally 3-6 Months Post-Op	
GOALS:	1) > 90% shoulder strength return 2) Pushups at own pace without pain 3) Integrate into general PT/PRT exercise activities.
PRECAUTIONS:	NO participation in contact/collision sports 9 months post-op High-weight, low-repetition barbell bench pressing is discouraged indefinitely. Avoid heavy loads with horizontal abduction and abduction/external rotation combination.
SLING:	None
REHABILITATION:	Continue Phase II exercises as needed
<i>~3-4 months</i>	Multi-planar progressive resistance exercises in pain-free ranges Progress with multi-planar shoulder stabilization exercises Progress upper extremity weight bearing into quadruped to four point prone positions Begin gradual, low resistance upper extremity endurance training (i.e., UBE)
<i>~5-6 months</i>	Progress with UE dynamic mobility program: <ul style="list-style-type: none"> - Ball on wall vs. Theraball on Table - T-spine Shoulder Sweeps/Thoracic Spine Open Books - Alternating shoulder taps with patient in wall push-ups position - Double or Single Arm Serratus Press with Foam Roller - I's, Y's and T's Progressive duty specific or sports training exercises (i.e. upper extremity PT or PRT specific activity progression, throwing progression, ect.) Initiate push up progression if patient is able to demonstrate core stability and proper scapular control.
FOLLOW-UP:	Supervised rehab: 1-2x per week as needed Physical Therapist Re-evaluation: monthly Ortho Re-evaluation: ~6 months post-op
TESTING:	CKCUE Strength Test ^{4,5} UQ Y balance test ^{9,10}
DISCHARGE GOALS:	Full return to sports/athletics and military training without limitations
MISCELLANEOUS:	After 6 months post-op, exercises in Phase III are continued, gradually increasing intensity and duration as needed based on patient specific limitations and sport specific activities.

The recommendation is to wait a minimum of 6 months post-op to return to contact/collision sports or aggressive military training (i.e. airborne school). This time period may be adjusted slightly by the surgeon and therapist according to patient progress and functional outcomes.

References:

1. Elhassan BT. Pectoralis major transfer for the management of scapula winging secondary to serratus anterior injury or paralysis. *Journal of Hand Surgery*. 2014; 39(2): 353-361.
2. Manske RC, Prohaska D. Pectoralis major tendon repair post surgical rehabilitation. *N Am J Sports Phys Ther*. 2007;2(1):22-33.
3. Cusano A, Pagani N, Li X. Pectoralis major muscle transfer with the sternal head and hamstring autograft for scapular winging. *Journal of Arthroscopic and Related Surgery*.2017; 6(4): e1321-e1327.
4. Tucci, HT, Jaqueline M, Sposito G, Camarini MF, Oliveira AS. Closed kinetic chain upper extremity stability test (CKCUES test): a reliability study in persons with and without shoulder impingement syndrome. *BMC Musculoskeletal Disorders*, 2014; 15(1): 1-9.
5. Roush JR, Kitamura J, Waits MC: Reference values for the closed kinetic chain upper extremity stability test (CKCUEST) for collegiate baseball players. *N Am J Sports Phys Ther* 2007, 2(3):159–163.
6. Galano GJ, Bigliani LU, Ahmad CS, Levine WN. Surgical treatment of winged scapula. *Clin Orthop Relat Res*, 2008; 466(3):652-660.
7. Streit JJ, Lenarz CJ, Shishani Y, McCrum C, Wanner JP, Nowinski RJ, et al. Pectoralis major tendon transfer for the treatment of scapular winging due to long thoracic nerve palsy. *J Shoulder Elbow Surg* 2012;21:685-90.
8. Elhassan BT, Wagner ER. Outcome of the transfer of the sternal head of the pectoralis major with its bone insertion to the scapula to manage scapular winging. *J Shoulder Elbow Surg* 2015; 24(5): 733-740.
9. Westrick RB, Miller JM, Carow SD, Gerber JP. Exploration of the y-balance test for assessment of upper quarter closed kinetic chain performance. *Int J Sports Phys Ther* 2012; 7:139-147.
10. Gorman PP, Butler RJ, Plisky PJ, Kiesel KB. Upper quarter y balance test: reliability and performance comparison between genders in active adults. *J Strength Cond Res* 2012; 26:3043-3048.