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**Dwight D. Eisenhower Army Medical Center
Department of Orthopedics and Rehabilitation
Sling Weaning Philosophy
“DDEAMC DOR SWEAP Method”**

Sling Type and Procedure	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Standard Sling* 						
Shoulder Scope (Distal Clavicle Resections DCR, Subacromial Decompression SAD, Coracoplasty)	May Begin Coming out of the sling immediately. May need it for sleeping	Continue to wear in public areas or to work for safety.	Discharge.			
Biceps Tenotomy or Tenodesis	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places and work.	May continue to wear for comfort if pain or bicep cramping still an issue	Discharge		
Sport Post-op Sling ** 						
Pectoralis Major Repair	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises. 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places and work.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge	



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AC Joint Reconstruction (Weaver-Dunn, Modified Weaver-Dunn, Coracoclavicular Ligament Repair)	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises. 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places and work.	May continue to wear if pain persists out of the sling and requires the sling with sleeping.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge
Superior Labrum Anterior to Posterior (SLAP) Repair (1 or 2 anchors)	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises. 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge	
Small-Medium (<180° circumference) Capsular Stabilization Procedures [Labral Repair 1-4 Anchors (Ant/Post Bankart), Capsular Shift, Capsular Plication]	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises. 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge	
Medium-Large (>180° - 360° circumferential) Capsular Stabilization Procedures [Labral Repair >=5 Anchors (Ant/Post Bankart), Capsular Shift, Capsular Plication]	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises. 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	May continue to wear if pain persists out of the sling and requires the sling with sleeping.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge
Rotator Cuff Repair (Small <1cm - Medium 1-3cm)	May come out of the sling for hygiene purpose, to perform exercises. My begin 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge	
Rotator Cuff Repair (Medium 1-3cm - Large 3-5cm)	May come out of the sling for hygiene purpose, to perform exercises. My begin 1 hour trials out of the sling if no increased pain with the above.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	May continue to wear if pain persists out of the sling and requires the sling with sleeping.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge
Rotator Cuff Repair > 5cm (Large 3-5cm - Massive >5cm)	May come out of the sling for hygiene purpose. May come out of the sling to perform exercises.	May begin trials out of the slings 1-2 hours at a time 5-6 x day. May need it for sleeping. Continue to wear in public places and work.	May begin trials of being out of the sling throughout the entire day in controlled environments. Continue to wear in public places/work.	May continue to wear if pain persists out of the sling and requires the sling with sleeping.	Continue to wear sling while sleeping if 6-7 hours of uninterrupted sleep is not achieved.	Discharge

*Standard Sling - over the shoulder sling with arm resting on abdomen.

**Sport Post-op Sling - abduction pillow adjusted to approximately 30°-45° degrees abduction, slight horizontal adduction (0-5 degrees), in scapular plane, and in neutral rotation.



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The following criteria based items to warrant progression to the next week/phase. Each progression should be made close to the week and meet the following criteria. The above progression and below criteria is being tracked at DDEAMC Physical Therapy Department for future publication. The following abstract has been submitted to the American Physical Therapy Association Combined Sections Meeting 2013 for presentation and later for peer reviewed journal submission. "A Criterion Based Sling Weaning Progression and Outcomes Following Elective Shoulder Arthroscopy From a Sample of Active Duty Soldiers at a Large Military Hospital." The below progression criteria can be followed to assist the rehabilitation professional timely progress the patient out of the sling.

	Answering yes or no should be based over the past week.	Yes/No
1	Is the patient's subjective pain report on the 1-10 Visual Analog Scale decreasing?	
2	Is the patient's use of narcotics decreasing?	
3	Is the patient's PROM increasing gradually following the procedures based protocols?	
4	Is the patient's uninterrupted sleeping habits gradually reaching normal for them? - The patient may increase in 1 hour long increments. - The patient may also be progressing from sleep destination (e.g. recliner/couch, to elevated postures in bed to supine)	
5	Is the patient tolerating the progression out of the sling?	
6	*Is the patient compliant with procedure protocol precautions? - This is an absolute criterion. - If the patient is non-compliant and at risk of compromising the repair they are to stay in the sling.	
	*This criteria must be answered yes in order to progress. Of the first 5 criteria they must meet 4/5 to continue the progression.	

There are a few points to remember when progressing through the above series of events. Protocols for the procedures above will outline specific instructions on how PROM, AAROM, and AROM can be progressed. The patient should understand these restrictions and limitations. No lifting, no repetitive movements, no active movements above elbow (then shoulder) height as instructed by the physical therapist. The patient's tolerance and ability to accurately report their symptoms also play a role. If the patient shows signs of non-compliance they should be placed back in the sling. If the patient's pain from the initial post-operative day does not progressively decrease they should be educated and placed back in the sling. Sleep can be an enormous issue for the post operative shoulder patient. The patient, physical therapist, and surgeon should work together to reach a goal of 6-7 hours of uninterrupted sleep. Progressing with the sling donned from a recliner to the bed has been a successful series of locations. This should be a day to day assessment by the patient and physical therapist. The term "controlled environment" is a place where the patient's safety and the surgical repair are not compromised. The physical therapy clinic and the patient's home are examples where the patient can doff the sling for specific periods of time. The patient can continue an educated progression out of the sling as long as: the use of pain medication goes down, pain progressively decreases, uninterrupted sleep increases, PROM increases, as well as time (for physiological healing).

Also of note, many shoulder procedures have multiple areas addressed. The procedure with the longest sling weaning criteria should take priority. For example, if a patient has a rotator cuff repair and biceps tenodesis the patient should follow the path of the proper rotator cuff repair sling weaning criteria pattern. It is of the authors opinion (physical therapist and surgeon) that if a patient stays in a sling too long without periods of time out of the sling, it can be detrimental to the patient reaching certain goals and poor movement patterns can be developed.

References

DOR-SWeaP Justification

1. Sano H, Yamashita T, Wakabayashi I, et al. Stress Distribution in the Supraspinatus Tendon After Tendon Repair. Am J Sports Med. 2007;35:542-546.
2. Park MC, Jun BJ, Park CJ, et al. The Biomechanical Effects of dynamic External Rotator Cuff Repair Compared to Testing With the Humerus Fixed. Am J Sports Med. 2007;35:1931-1939.
3. Haktakeyama Y, Itoli E, Pradhan RL, et al. Effect of Arm Elevation and Rotation on the Strain in the Repaired Rotator Cuff Tendon. Am J Sports Med. 2001;29:788- 794.
4. Park MC, Pirolo JM, Park CJ, et al. The Effect of Abduction and Rotation on the Footprint Contact for Single-Row, Double-Row, and Modified Double-Row Rotator Cuff Repair Techniques. Am J Sports Med 2009;37:1599-1608.
5. Peltz CD, Sarver JJ, Dourte LM et al. Exercise following a Short Immobilization Period Is Detrimental to Tendon Properties and Joint Mechanics in a Rat Rotator Cuff Injury Model. J Orthop Res 2010;28:841-845.
6. Gerber C, Schneeberger AG, Beck M et al. Mechanical Strength of Repairs of the Rotator Cuff. J Bone Joint Surg. 1994;76:371-380.
7. Gates JJ, Gilliland J, McGarry MH, et al. Influence of Distinct Anatomic Subregions of the Supraspinatus on Humeral Rotation. J Orthop Res 2010;28:12-17.
8. Hsu AT, Chang JH, Chang CH. Determining the Resting Position of the Glenohumeral Joint: A Cadaver Study. JOSPT 2002;32:605-612.
9. Schneeberger AG, Von Roll A, Kalberer F, et al. Mechanical Strength of Arthroscopic Rotator Cuff Repair Techniques. J Bone Joint Surg Am. 2002;12:2152-2160.

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10. Culp LB, Romani WA. Physical Therapist Examination, Evaluation, and Intervention Following the Surgical Reconstruction of a Grade III Acromioclavicular Joint Separation. *Phys Ther.* 2006;86:857-869.
11. Penna J, Deramo D, Nelson CO. Determination of Anterior Labral Repair Stress During Passive Arm Motion in a Cadaveric Model. *Arthroscopy* 2008;8:930-935.
12. Kakwani RG, Mathews JJ, Kumar KM, et al. Rupture of the pectoralis major muscle: Surgical treatment in athletes. *International orthopedics.* 2007;31:159-163.

Early ROM Evidence

1. Sano H, Yamashita T, Wakabayashi I, et al. Stress Distribution in the Supraspinatus Tendon After Tendon Repair. *Am J Sports Med.* 2007;35:542-546.
2. Park MC, Jun BJ, Park CJ, et al. The Biomechanical Effects of dynamic External Rotator Cuff Repair Compared to Testing With the Humerus Fixed. *Am J Sports Med.* 2007;35:1931-1939.
3. Park MC, Pirolo JM, Park CJ, et al. The Effect of Abduction and Rotation on the Footprint Contact for Single-Row, Double-Row, and Modified Double-Row Rotator Cuff Repair Techniques. *Am J Sports Med* 2009;37:1599-1608.
4. Koo SS, Parsley BK, Burkhart SS, et al. Reduction of Postoperative Stiffness After Arthroscopic Rotator Cuff Repair: Results of a Customized Physical Therapy Regimen Based on Risk Factors for Stiffness. *J Arthrop Relat Surg.* 2011;2:155-160.
5. Kakwani RG, Mathews JJ, Kumar KM, et al. Rupture of the pectoralis major muscle: Surgical treatment in athletes. *International orthopedics.* 2007;31:159-163.