

Thawing the Frozen Shoulder

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Abstract

Clinical Scenario: Adhesive capsulitis is a condition where the glenohumeral joint and the scapular thoracic joint move cohesively instead of independently. This condition is associated with general shoulder pain, significant loss in range of motion (ROM), and decreased overall shoulder function. Generally, physiotherapy is used as the first treatment method, but corticosteroid injections are also commonly performed. **Focused Clinical Question:** In patients with adhesive capsulitis, what is the effect of corticosteroid injections versus a supervised physiotherapy regimen on ROM? **Search Strategy:** Studies were included if subjects showed symptoms for at least one month but no longer than six, ROM was limited in at least two planes, and subjects were 18 or older. Studies were excluded if subjects had previous treatment or surgery, other shoulder conditions, an allergy to anesthetic, or other pertinent medical conditions. The search was performed using the following databases: PubMed, ProQuest Nursing, and Cochrane Library. Search terms included but were not limited to: frozen shoulder, adhesive capsulitis, corticosteroid, and physiotherapy. Over 800 results were found, but the six studies that best fit the PICO question and inclusion criteria were chosen. **Evidence Quality Assessment:** The PEDro scores of the nine studies ranged from 5/10-9/10. All studies obtained an Oxford 2011 Level of Evidence score of 2. **Results and Summary of Search:** Corticosteroids have a significant effect in short-term treatment, which indirectly leads to an increase in ROM. Whereas for long-term success, physiotherapy seems to be the preferred treatment for directly increasing ROM. The greatest improvement in ROM was seen in active abduction, which ranged from 18.2° to 54.8° in the physiotherapy group and 16.3° to 46.3° in the corticosteroid group. All authors mentioned that a combination of strategies is most effective. The common weaknesses were lack of follow-up and minimal blinding. Several examiners simply followed up once or twice throughout the entire study. Just three out of nine studies blinded their subjects, four out of nine blinded their therapy administrators, and six out of nine blinded assessors. **Clinical Bottom Line:** A SORT grade of A was obtained. The effects achieved by corticosteroid injections and physiotherapy are comparable after long-term observation. Both treatments are effective for improving mobility and could be utilized by medical professionals working with a patient lacking ROM. Regaining lost ROM allows for easier performance of ADL's or athletic activities. **Implications:** Physiotherapy would be more beneficial in a setting where athletic trainers (ATs) are readily available, because an AT would have to refer the patient to a physician to receive a corticosteroid treatment. Some patients may receive multiple treatments, which costs time and money. If physiotherapy was chosen, the same AT could monitor the condition every day and give more consistent follow up, saving patients time and money in the long-term. **Word Count:** 455

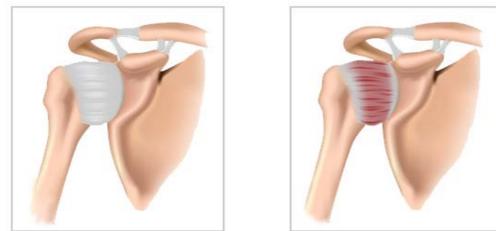


Figure 1. Visual representation of the irritated capsule associated with adhesive capsulitis. (<http://siouxfallsorthopedics.com/common-reasons-frozen-shoulder/>)

Clinical Scenario

- The condition is classified by extreme stiffness and immobility caused by adhesions and inflammation in the joint capsule.
- Common signs and symptoms of adhesive capsulitis include gradual loss of motion, pain with movement in all directions, stiffness, and disability.¹
- This condition affects approximately 2-5 percent of the US population.^{2,3}
- The most affected directions of movement are external rotation and abduction.^{4,5}
- Typically, the onset is spontaneous with no direct mechanism.^{2,4,6,7}
- Risk factors associated with developing the condition are being of the female gender, trauma, over 40 years of age, diabetes, long-term immobilization, thyroid conditions, stroke, MI's, or an autoimmune disease.²
- Goals of treatment are to relieve pain, restore ROM, and improve overall function.⁴
- Diagnosis is made by an evaluation of history and physical examination.⁴
- The condition lasts for an average of 2-3 years. However, approximately 40 percent of cases persist for longer than that time period.¹
- Common treatments include exercise, ultrasound, laser, electrical stimulation, intraarticular injections, or a combination of any of these methods.^{2,7}
- Physical therapy treatments included joint mobilizations, ice/hot packs, passive joint stretching, AROM exercises, Coddman exercises, and electrotherapy.^{1,2,3,4,5,6,7}
- Corticosteroid injections ranged from 20-60 mg of solution. The most common dosage being 40 mg.
- The most common solutions were a form of either methylprednisolone or triamcinolone.
- Injections were given either anteriorly, posteriorly, or laterally into the shoulder.

Focused Clinical Question

In patients with Adhesive Capsulitis, what is the effect of corticosteroid injections versus a supervised physiotherapy regimen on ROM?

Search Strategy

- Performed on several online databases including: PubMed, ProQuest Nursing, Cochrane Library, and CINAHL Plus
- Search terms within these databases included but were not limited to: frozen shoulder, adhesive capsulitis, corticosteroid treatment, and physiotherapy.
- Over 800 potential pieces of evidence were found.
- Potential articles were individually reviewed to determine if they fit the inclusion criteria, had a sufficient PEDro score, and were published after the year 1998.
- Studies were included if they were performed on human subjects, subjects showed signs and symptoms of the condition for at least one month but no longer than six months, range of motion was limited in at least two planes of movement, and subjects were 18 years of age or older.
- Studies were excluded if they used subjects who had previous injection treatment or surgery, other shoulder conditions (humeral fracture, rotator cuff tear, etc.), an allergy to anesthetic, or other pertinent medical conditions (pregnancy, arthritis, systemic inflammatory joint disease, etc.).

Evidence Quality Assessment

- The PEDro scores of the studies ranged from 5/10- 9/10
- All studies included obtained an Oxford validity score of 2.

Results and Summary of Search

Table 1. Comparison of ROM Measurements Between PT and CS Groups of Six Studies

Author	Therapy	Motion	Difference in ROM (°)	P-Value
Arslan ⁴	PT	P-ABD	53.9	P > 0.05*
		P-FLEX	47.7	
		P-IR	11.2	
		P-ER	28.9	
		A-ABD	54.8	
		A-FLEX	45	
	CS	A-IR	10	
		A-ER	26.5	
		P-ABD	50.1	P > 0.05
		P-FLEX	35.9	
		P-IR	11.3	
		P-ER	29.1	
A-ABD	46.3			
A-FLEX	34			
Bal ²	PT	A-IR	11.5	P > 0.05
		A-ER	25.5	
		P-FLEX	35	
		P-ABD	70	
		P-IR	42.5	
		P-ER	30	
	CS	P-FLEX	42.5	P < 0.001*
		P-ABD	72.5	
		P-IR	35	
		P-ER	40	
		A-FLEX	20.41	
		A-ABD	30.93	
Maryam ³	PT	A-ER	7.18	P = 0.986
		A-FLEX	29.73	
		A-ABD	38.83	
		A-ER	19.41	
		P-ER	26.5	
		P-FLEX	14.2	
	CS	P-ABD	21	P = 0.107
		P-ER	18.3	
		P-FLEX	16	
		P-ABD	12.9	
		A-FLEX	12.2	
		A-ABD	18.2	
Park ¹	PT	A-ER	14.1	P < 0.05*
		A-FLEX	12.5	
		A-ABD	16.3	
		A-ER	4.5	
		P-ER	3.1	
		P-ER	3.3	
	CS	P-ER	3.1	P < 0.05*
		P-ER	3.3	
		P-ER	3.1	
		P-ER	3.3	
		P-ER	3.1	
		P-ER	3.3	

Table 1. Change in ROM measurements over the course of six independent studies. ROM=range of motion, PT=physiotherapy, CS=corticosteroid, A=active, P=passive, ABD=abduction, FLEX=flexion, IR=internal rotation, ER=external rotation

* Results of the study were statistically significant

Results and Summary of Search

- Overall, corticosteroid injections and physiotherapy are similar in their effects on ROM.
- Five studies out of six claimed that a combination of both therapies is the most effective method for relieving symptoms.^{1,2,3,6,7}
- Patients receiving corticosteroid injections were more likely to have a quicker relief of other symptoms which allowed for a faster regaining of ROM.^{1,6,7}
- Patients who underwent physiotherapy took longer to regain ROM, however equivalent improvements were made.^{2,6,7}



Figure 2. Corticosteroid injections into the anterior aspect of the glenohumeral joint (<http://www.stemcelltherapynyc.com/traditional-injections/>)

Clinical Bottom Line

- Injections are favored for short-term results whereas physiotherapy leads to better long-term results.
- There are fewer risks of adverse effects, less need for follow up with a physician, and significant improvement from baseline measurements associated with physiotherapy as a treatment.
- In a setting with multiple ATs, physiotherapy would be more beneficial.
- Overall, the search earned a SORT grade of A.

Implications

- The condition is still poorly understood and requires more in-depth evaluation to obtain more information.
- The patient should be aware that the effects from corticosteroid injections are not permanent, and multiple injections may be needed.
- Future studies should include blinding of patients, assessors, and evaluators along with better follow-up of patients.

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