

Appendix 6.1 Steroid injection

Study	Inclusion/exclusion criteria and diagnosis of FS			Participant characteristics (age, sex, diabetes)	Condition-related characteristics (duration and stage of FS, previous treatments, secondary FS)
<p>Bal 2008⁶⁸ RCT</p> <p><i>Country, setting and treatment provider:</i> Turkey; physical therapy and rehabilitation department of a hospital</p>	<p><i>Inclusion criteria:</i> Presence of shoulder pain with limitation of both active and passive movements of the glenohumeral joint of $\geq 25\%$ in at least two directions; aged 18–70 years; symptom duration between 6 weeks and 6 months; and no treatment other than analgesics in the last 6 months</p> <p><i>Exclusion criteria:</i> Uncontrolled diabetes mellitus, contraindications of injections and previous shoulder surgery</p> <p><i>Method of diagnosis:</i> NR</p> <p><i>Condition terminology used:</i> Adhesive capsulitis</p>			<p><i>Age (years), mean (SD):</i> Steroid injection: 56.9 (9.56); placebo injection: 56.3 (8.16)</p> <p><i>Female:</i> 44%</p> <p><i>Participants with diabetes?</i> Unclear/not reported</p>	<p><i>Duration of FS at baseline:</i> NR</p> <p><i>Stage of FS at baseline:</i> NR</p> <p><i>Previous treatments for FS:</i> NR</p> <p><i>Participants with secondary FS:</i> None reported</p>
Intervention 1	Intervention 2	Intervention 3	Control	Concomitant treatment and details of home exercise	
<p><i>Steroid injection:</i> intra-articular, posterior approach injection of methylprednisolone acetate, 40 mg, 1 ml. One injection only. 5-cm 21-gauge needle</p> <p><i>Home exercise</i></p>			<p><i>Placebo injection:</i> intra-articular, posterior approach injection of saline, 0.9% sodium chloride, 1 ml. One injection only. 5-cm 21-gauge needle</p> <p><i>Home exercise</i></p>	<p>Oral paracetamol (1500 mg/day) was recommended to patients when needed</p> <p><i>Home exercise:</i> Five sessions daily for 12 weeks (420 sessions in total) of home exercise consisting of pendulum circumduction and passive shoulder self-stretching in forward elevation, external rotation, horizontal adduction and internal rotation. When passive range of movement reached 90% of normal range the following exercises were added: isometric in all planes, theraband exercises (low, medium and high resistance), strengthening exercises for scapular stabilising muscles, and advanced muscle strengthening exercises with dumb-bells. Participants were advised to apply a heat pack before exercise and a cold pack after exercise</p>	

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<p>Carette 2003³⁵ RCT</p> <p><i>Country, setting and treatment provider:</i> Canada; outpatient rheumatology clinics at seven centres; all injections performed by trained radiologists and all physiotherapy supervised by physiotherapists with at least 3 years' experience of musculoskeletal disorders</p>	<p><i>Inclusion criteria:</i> Adhesive capsulitis defined as the presence of shoulder pain with limitation of both active and passive movements of the glenohumeral joint of $\geq 25\%$ in at least two directions (abduction, flexion, external rotation, internal rotation) compared with contralateral shoulder or with normal values. Patients eligible for inclusion if they met the definition for adhesive capsulitis and were aged ≥ 18 years, had been symptomatic for < 1 year and had a total SPADI score of ≥ 30. Partway through the trial patients with diabetes mellitus became eligible to be included</p> <p><i>Exclusion criteria:</i> Adhesive capsulitis secondary to another cause, including inflammatory, degenerative, metabolic or infectious arthritis, cerebrovascular accident or fracture. Known blood coagulation disorder or allergy to radiological contrast material</p> <p><i>Method of diagnosis:</i> Presence of pain and range of movement</p> <p><i>Condition terminology used:</i> Adhesive capsulitis</p>				<p><i>Age (years), mean (SD):</i> Steroid injection + PT: 54.9 (10.5); steroid injection: 55.4 (10.0); PT: 54.2 (8.3); placebo injection: 56.5 (9.4)</p> <p><i>Female:</i> 59%</p> <p><i>Any participants with diabetes?</i> Yes. Steroid injection + PT: $n = 2$ (9.5%); steroid injection: $n = 1$ (4.3%); PT: $n = 1$ (3.9%); placebo injection: $n = 2$ (8.7%)</p>	<p><i>Duration of FS at baseline (weeks), mean (SD):</i> Steroid injection + PT: 22.1 (14.9); steroid injection: 21.2 (11.0); PT: 20.8 (11.2); placebo: 20.3 (7.3)</p> <p><i>Stage of FS at baseline:</i> NR</p> <p><i>Previous treatments for FS:</i> NR</p> <p><i>Participants with secondary FS:</i> None reported</p>
Intervention 1	Intervention 2	Intervention 3	Control	Concomitant treatment and details of home exercise		
<p><i>Steroid injection + PT:</i> Injection of triamcinolone hexacetonide, 40 mg, 2 ml into shoulder joint space using fluoroscopic guidance (intra-articular) with patient in supine position with arm by their side and in internal rotation. One injection on day of randomisation only. 2.5- to 3-inch 21-gauge needle.</p> <p>PT: Patients with acute symptoms: 12 \times 1-hour sessions, three times per week for 4 weeks consisting of TENS, mobilisation techniques, active range of movement exercises, ice application. Patients with chronic-like symptoms: 12 \times 1-hour sessions, three times per week for 4 weeks consisting of ultrasound, mobilisation techniques, active and auto-assisted range of movement exercises, isometric strengthening exercises and ice application</p>	<p><i>Steroid injection:</i> Steroid injection as in combined intervention.</p> <p><i>Home exercise</i></p>	<p><i>PT + placebo injection:</i> Injection of saline, 2 ml into shoulder joint space using fluoroscopic guidance. One injection on day of randomisation only. PT only as in combined intervention</p> <p><i>Home exercise</i></p>	<p><i>Placebo injection:</i> Injection of saline, 2 ml into shoulder joint space using fluoroscopic guidance. One injection on day of randomisation only</p> <p><i>Home exercise</i></p>	<p>Patients were given a supply of paracetamol tablets. All other medications for the treatment of adhesive capsulitis were stopped</p> <p><i>Home exercise:</i> Home exercises of active and auto-assisted range of movement exercises in the planes of flexion, abduction, external rotation and internal rotation, 10 minutes twice daily for 12 weeks</p>		

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<p><i>Dacre 1989</i>⁶⁷ RCT</p> <p><i>Country, setting and treatment provider:</i> UK; physiotherapy was performed by a physiotherapist, the steroid was injected by a physician</p>	<p><i>Inclusion criteria:</i> Criteria of Bulgen et al. (1984): painful stiff shoulder for at least 4 weeks; inability to use arm with restriction of movement and loss of full function; pain at night causing sleep disturbance and inability to lie on affected side</p> <p><i>Exclusion criteria:</i> Patients with predisposing conditions were excluded</p> <p><i>Method of diagnosis:</i> Clinical diagnosis (examination, radiography and erythrocyte sedimentation rate)</p> <p><i>Terminology used:</i> Periarthritis of the shoulder; painful stiff shoulder</p>			<p><i>Age (years), mean:</i> Steroid injection: 55.8; PT: 53.0; steroid injection + PT: 58.8</p> <p><i>Female:</i> 55%</p> <p><i>Any participants with diabetes?</i> Yes. <i>n</i> = 3</p>	<p><i>Duration of FS at baseline:</i> NR</p> <p><i>Stage of FS at baseline:</i> NR</p> <p><i>Previous treatments for FS:</i> NR</p> <p><i>Participants with secondary FS:</i> None reported</p>
Intervention 1	Intervention 2	Intervention 3	Control	Concomitant treatment and details of home exercise	
<p><i>Steroid injection + PT:</i> 20 mg triamcinolone with 1 ml 2% lidocaine was injected anteriorly. Mobilisation was the mainstay of physiotherapy (4–6 weeks' duration). The specific method was chosen by the physiotherapist</p>	<p><i>Steroid injection:</i> 20 mg triamcinolone with 1 ml 2% lidocaine was injected anteriorly</p>	<p><i>PT:</i> Mobilisation was the mainstay of physiotherapy (4–6 weeks' duration)</p>		NR	
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<p><i>Rizk 1991</i>⁴² RCT</p> <p><i>Country, setting and treatment provider:</i> USA; one physician performed all injections</p>	<p><i>Inclusion criteria:</i> Total range of movement < 50% of normal range (i.e. < 320°), shoulder pain for < 6 months, nocturnal accentuation of pain, no effusion in the glenohumeral joint, no history of recent trauma, no previous injections in the involved shoulder, no history of allergy to local anaesthetics or steroids, absence of polyarthritis or neurological disease that cause shoulder pain, no evidence of alternative causes of shoulder pain revealed in radiography carried out after onset of pain and within 2 months of study entry</p> <p><i>Method of diagnosis:</i> Presence of symptoms</p> <p><i>Terminology used:</i> FS; adhesive capsulitis</p>			<p><i>Age (years), mean (range):</i> Total: 55 (40–70); steroid (anterior) + lidocaine + PT: 55.9; steroid (lateral) + lidocaine + PT: 52.3; lidocaine (anterior) + PT: 57.7; lidocaine (lateral) + physiotherapy: 54.1</p> <p><i>Female:</i> 41.7%</p> <p><i>Any participants with diabetes?</i> Unclear/NR</p>	<p><i>Duration of FS at baseline (weeks), mean (range):</i> Total: 13.2 (8 to 18)</p> <p><i>Stage of FS at baseline:</i> NR</p> <p><i>Previous treatments for FS:</i> NR</p> <p><i>Participants with secondary FS:</i> None reported</p>

Intervention 1	Intervention 2	Intervention 3	Control	Concomitant treatment and details of home exercise
<p><i>Steroid (anterior approach) + PT:</i> Once a week for 3 weeks intra-articular injection using the anterior approach (glenohumeral joint) of 1 ml repository aqueous suspension of methylprednisolone acetate (Depo-Medrol®), 40 mg/ml with 2 ml of 1% lidocaine. 1.5-inch, 21-gauge needle. Standardised weekly PT treatment for 11 weeks. Ultrasonic therapy of 1.5W/cm² for 7 minutes followed by therapeutic exercise (Codman and wall climbing)</p> <p><i>Home exercise</i></p>	<p><i>Steroid (lateral approach) + PT:</i> Same as for intra-articular steroid except using lateral approach (subacromial bursa)</p> <p><i>Home exercise</i></p>	<p><i>Two arms for placebo injection: intra-articular lidocaine (anterior approach) + PT:</i> Once a week for 3 weeks intra-articular injection using the anterior approach of 1% lidocaine. 1.5-inch, 21-gauge needle. PT as for steroid group; <i>intra-articular lidocaine (lateral approach) + PT:</i> Once a week for 3 weeks intrabursal injection using the lateral approach of 1% lidocaine. 1.5-inch, 21-gauge needle. PT as for steroid group.</p> <p><i>Home exercise</i></p>		<p>Advised to continue NSAIDs prescribed by physician. All patients were receiving NSAIDs, with only minor difference in frequency distribution of various drugs between the treatment groups. Propoxyphene and other drugs were discontinued before entry into the study</p> <p><i>Home exercise:</i> Instruction given in a home exercise programme (no further details provided)</p>
Study	Inclusion/exclusion criteria and diagnosis of FS	Participant characteristics (age, sex, diabetes)	Condition-related characteristics (duration and stage of FS, previous treatments, secondary FS)	
<p>Ryans 2005⁴¹</p> <p>RCT</p> <p><i>Country, setting and treatment provider:</i> UK; direct access shoulder assessment clinic run by a GP with a special interest in rheumatology at a local district hospital. Injections provided by the same experienced clinician, physiotherapy provided by a single therapist or a nominated deputy if unavailable</p>	<p><i>Inclusion criteria:</i> Aged ≥ 18 years with a painful shoulder in the fifth cervical (C5) dermatome distribution of > 4 weeks' and < 6 months' duration; presence of restriction of active and passive range of movement in both external rotation and glenohumeral abduction of > 25% compared with other shoulder.</p> <p><i>Exclusion criteria:</i> Previous intra-articular injection or previous physiotherapy for this episode of shoulder pain; limitation in only external rotation or glenohumeral abduction; evidence of glenohumeral osteoarthritis on radiography; clinical evidence of rotator cuff tear; history of significant trauma to the shoulder or history of inflammatory joint disease or of a cerebrovascular accident affecting the shoulder; bilateral adhesive capsulitis; patients with a contraindication to triamcinolone</p> <p><i>Method of diagnosis:</i> Radiography</p> <p><i>Terminology used:</i> Adhesive capsulitis</p>	<p><i>Age (years), mean (SD):</i> Steroid injection + PT: 56.3 (6.4); steroid injection: 52.3 (9.3); PT + placebo injection: 52.6 (7.7); placebo injection: 55.2 (9.4)</p> <p><i>Female:</i> 59%</p> <p><i>Any participants with diabetes?</i> Yes. Total: <i>n</i> = 5; steroid injection + PT: <i>n</i> = 1 (5%); steroid injection: <i>n</i> = 1 (5%); PT + placebo injection: <i>n</i> = 1 (5%); placebo injection: <i>n</i> = (11%)</p>	<p><i>Duration of FS at baseline (weeks), mean (SD):</i> Steroid injection + PT: 14.2 (4.4); steroid injection: 12.2 (5.3); PT + placebo injection: 14.4 (4.4); placebo injection: 14.9 (3.7)</p> <p><i>Stage of FS at baseline:</i> NR</p> <p><i>Previous treatments for FS:</i> NR</p> <p><i>Participants with secondary FS:</i> Unclear; 32% were reported to have experienced 'minor trauma'. No further details were provided</p>	

Intervention 1	Intervention 2	Intervention 3	Control	Concomitant treatment and details of home exercise
<p><i>Steroid injection + PT:</i> Injection of triamcinolone 20 mg, 1 ml and normal saline 2 ml using a combined non-guided approach to the shoulder: intra-articular, 1.5 ml injected by an anterior approach and 1.5 ml by a lateral approach. Physiotherapy consisted of eight sessions over 4 weeks: proprioceptive neuromuscular facilitation, Maitland mobilisations (which were progressed as the condition improved), standardised interferential modality and active exercise therapy with gym equipment</p> <p><i>Home exercise</i></p>	<p><i>Steroid injection only:</i> Injection of triamcinolone 20 mg, 1 ml and normal saline 2 ml using a combined non-guided approach to the shoulder: intra-articular, 1.5 ml injected by an anterior approach and 1.5 ml by a lateral approach</p> <p><i>Home exercise</i></p>	<p><i>PT + placebo injection:</i> Physiotherapy as for other group. Placebo injection of saline 3 ml using a combined non-guided approach to the shoulder: 1.5 ml injected by an anterior approach and 1.5 ml by a lateral approach</p> <p><i>Home exercise</i></p>	<p><i>Placebo injection:</i> Injection of saline 3 ml using a combined non-guided approach to the shoulder: 1.5 ml injected by an anterior approach and 1.5 ml by a lateral approach</p> <p><i>Home exercise</i></p>	<p>Patients who were not already taking analgesics were issued with 50×500-mg paracetamol tablets for pain relief with suggestion to take one to two tablets 4- to 6-hourly as required for pain and taking no more than a maximum of 8 tablets daily. Patients recorded all analgesic and anti-inflammatory medication taken in a medication diary</p> <p><i>Home exercise:</i> Patients were instructed by a physiotherapist in a home exercise programme using a video and home exercise instruction sheet</p>

FS, frozen shoulder; NR, not reported; PT, physiotherapy.