Appendix 1

((((frozen shoulder[Title/Abstract]) OR stiff shoulder[Title/Abstract]) OR adhesive capsul*[Title/Abstract]) OR shoulder periarthr*[Title/Abstract]) AND random*[Title/Abstract]

Appendix 2

Characteristics of the included trials

Study (Year)	Intervention groups	Patient's mean age, years (SD)[a]	Males/ Females	Mean duration of symptoms (SD)[a]	Outcome measures
Arslan et al. (2001) [1]	A. Intraarticular CS (n=10) B. NSAIDs plus PT (n=10)	A. 55.6 (12.2) B. 56.4 (7.1)	10/10	A. 4.6 (1.6) months B. 3.5 (1.7) months	Active and passive ROM, pain VAS
Badalamente et al. (2016) [2]	A. Placebo (n=15) B. Intraarticular CCH (n=45)	52 (N/M)	13/47	17 (N/M) months	Active and passive ROM, ASES, pain VAS
Bal et al. (2008) [3]	A. Intraarticular CS (n=40, 42 shoulders) B. Placebo (n=24)	A. 56.9 (9.56) B. 56.3 (8.16)	28/34	More than 6 weeks	Abduction ROM, passive ROM, SPADI, University of California-Los Angeles end-result scores, night pain VAS
Blockey et al. (1954) [5]	A. Placebo (n=16) B. Oral CS (n=16)	A. 52 (N/M) B. 58 (N/M)	18/14	A. 6.1 (N/M) months B. 5.1 (N/M) months	pain VAS, ROM
Buchbinder et al. (2004) [7]	A. Shoulder joint distension with Normal Saline and CS (n=25) B. Placebo (n=21)	A. 57.2 (8.6) B. 57.5 (8.1)	9/37	A. 118 days (range 102-194) B. 114 days (range 96-402)	SPADI, Problem Elicitation Technique, pain VAS, active ROM
Buchbinder et al. (2004) – 2 [8]	A. Oral CS (n=24) B. Placebo (n=26)	A. 53.5 (5.1) B. 55 (9)	15/35	A. 25.5 (13.3) weeks B. 21.1 (13.8) weeks	Overall, night, and activity related pain VAS, SPADI, Croft shoulder disability questionnaire, DASH, HAQ, SF-36, participant rated improvement, active ROM
Calis et al. (2006) [10]	A. Intraarticular SH (n=24, 27 shoulders) B. Intraarticular CS (n=25, 26 shoulders) C. PT (n=21) not used D. Observation (n=20) not used	A. 59.7 (9.81) B. 56.36 (11.3)	19/30	More than 1 month	Pain VAS, passive ROM, Constant-Murley score

Carette et al. (2003) [11]	A. Intraarticular CS plus PT (n=21) B. Intraarticular CS (n=23) C. Placebo (n=23) D. Placebo plus PT (n=23) not used	A. 54.9 (10.5) B. 55.4 (10) C. 56.5 (9.4)	24/43	A. 21.2 (14.9) weeks B. 21.2 (11) weeks C. 20.8 (11.2) weeks D. 20.3 (7.3) weeks	SPADI, SF-36, active and passive ROM
Cho et al. (2016) [13]	A. Intraarticular CS (n=36) B. Subacromial CS (n=37) C. Intraarticular and Subacromial CS (n=37)	A. 59.1 (7.9) B. 56 (9.4) C. 54.8 (8.3)	44/66	A. 5.3 (3.6) months B. 4.6 (3.5) months C. 5 (4.5) months	ASES, pain VAS, subjective shoulder value, passive ROM
Corbeil et al. (1992) [16]	A. Shoulder distension with lidocaine and CS plus PT (n=25) B. Intraarticular CS plus PT (n=20)	52.7 (range 43-78)	11/34	Less than 6 months	Pain intensity score, passive ROM
Dehghan et al. (2013) [19]	A. NSAIDs (n=28) B. Intraarticular CS (n=29)	A. 55.31 (7.7) B. 52.78 (6.72)	19/38	More than 6 months	Pain VAS, ROM
Kothari et al. (2017) [38]	A. PRP (n=62) B. Intraarticular CS (n=60) C. U/S (n=58) not used	A. 51.9 (10.1) B. 52.7 (8.6) C. 51.2 (11.7)	86/94	A. 4.1 (2.5) B. 5.2 (2.8) C. 4.7 (2.1)	Active ROM, pain VAS, QuickDASH
Lee et al. (2015) [42]	A. Shoulder joint distension with Hypertonic Saline and CS (n=32) B. Shoulder joint distension with Normal Saline and CS (n=32)	A. 56.5 (8.1) B. 53.7 (5.6)	23/41	A. 4.8 (5) months B. 6.5 (5.6) months	SPADI, passive ROM
Lee et al. (2017) [41]	A. Intraarticular CS (n=32) B. Shoulder joint	A. 53.8 (4.4) B. 55.9 (5.2)	24/40	A. 7.8 (1.7) months B. 8.2 (1.5) months	SPADI, pain VAS, passive ROM

	distension with NS and CS (n=32)				
Lim et al. (2014) [45]	A. Intraarticular CS (n=34) B. Intraarticular SH (n=34)	53.8 (range 37-77)	19/49	7.3 months (range 6-13)	Constant-Murley score, pain VAS, ASES, ROM
Lorbach et al. (2010) [47]	A. Oral CS plus PT (n=20) B. Intraarticular CS plus PT (n=20)	A. 52 (10) B. 50 (8)	17/23	11 (N/M) months	Constant-Murley score, SST, pain, function, and satisfaction VAS
Mattara et al. (1994) [48]	A. Transcutaneous NSAID patch (n=40) B. Placebo (n=40)	A. 54.7 (12.8) B. 54.8 (9.7)	20/60	A. 34.4 (54.2) months B. 26.3 (38) months	Spontaneous and movement pain VAS, ROM, overall clinical assessment of severity of the patient's condition, degree of intererference of their condition with daily activities, quality of sleep, and efficacy of treatment using a five or six-point scales, overall assessment of the therapeutic efficacy of the patches by investigators and patients
Oh et al. (2011) [50]	A. Intraarticular CS (n=37) B. Subacromial CS (n=34)	A. 55.7 (range 42-74) B. 58.3 (range 42-76)	32/39	A. 1.5-16 months B. 2-12 months	Pain VAS, Constant-Murley score, passive ROM
Park et al. (2013) [51]	A. Intraarticular CS (n=45) B. Shoulder joint distension with Normal Saline and SH (n=45)	A. 55.23 (4.69) B. 56.33 (5.92)	22/68	A. 5.31 (1.64) months B. 5.33 (1.64) months	SPADI, pain VAS, passive ROM
Prestgaard et al. (2015) [52]	A. Intraarticular CS (n=42) B. Intraarticular and Rotator interval CS (n=40) C. Placebo (n=40)	A. 53.2 (6.9) B. 55.0 (7.2) C. 55.4 (6.5)	44/78	A. 15.1 (4.6) weeks B. 15.0 (5.9) weeks C. 15.0 (5.6) weeks	SPADI, active ROM, night pain VAS, health-related quality of life (EQ-5D 3-level version), use of pain medication.
Ranalletta et al. (2016) [53]	A. Intraarticular CS plus PT (n=35)	A. 63.9 (9.1) B. 62.9 (12.2)	23/46	A. 12 weeks (range 8-24)	Pain VAS, ASES, abbreviated Constant-Murley score, QuickDASH, passive ROM

	B. NSAIDs plus PT (n=34)			B. 12 weeks (range 8-16)	
Rizk et al. (1991) [55]	A. Intraarticular CS plus PT (n=16) B. Subacromial CS plus PT (n=16) C. Placebo plus PT (Intraarticular and Subacromial groups) (n=16)	A. 55.9 (N/M) B. 52.3 (N/M) C. 57.7 (N/M) D. 54.1 (N/M)	28/20	A. 12.69 (N/M) weeks B. 14.13 (N/M) weeks C. Intraarticular 11.77 (N/M) weeks, Subacromial 13.86 (N/M) weeks	Pain VAS, passive ROM
Rovetta et al. (1998) [57]	A. Intraarticular CS and SH plus PT (n=16) B. Intraarticular CS plus PT (n=14)	A. 65.8 (9.1) B. 62.3 (13)	9/21	A. 7.7 (4) B. 9 (3.3)	ROM, pain VAS, ultrasound measurement of the joint capsule thickness
Ryans et al. (2005) [58]	A. Intraarticular and Subacromial CS plus PT (n=20) B. Intraarticular and Subacromial CS (n=19) C. Placebo plus PT (n=20) D. Placebo (n=19)	A. 53.6 (6.4) B. 52.3 (9.3) C. 52.6 (7.7) D. 55.2 (9.4)	32/46	A. 14.2 (4.4) weeks B. 12.2 (5.3) weeks C. 14.4 (4.4) weeks D. 14.9 (3.7) weeks	SDQ, pain and function VAS, passive external rotation
Schydlowsky et al. (2012) [63]	A. Subcutaneous Adalimumab (n=10) B. Intraarticular CS (n=8)	A. 51 (range 41-67) B. 51 (range 37-64)	5/13	More than 3 weeks	Active and passive ROM, Constant-Murley score, SPADI, SRQ
Shin et al. (2013) [64]	A. Subacromial CS plus PT (n=41) B. Intraarticular CS plus PT (n=42) C. Intraarticular and Subacromial CS plus PT (n=39) D. NSAIDs plus PT (n=36)	A. 53.9 (4.1) B. 55.1 (4.6) C. 56.3 (5.8) D. 57.3 (6.4)	57/101	A. 7.7 (3.3) months B. 7.4 (3.4) months C. 7 (2.6) months D. 6.8 (2.7) months	Pain and patient satisfaction VAS, ASES

Sun et al. (2018) [66]	A. Rotator interval CS (n=27) B. Intraarticular CS (n=24) C. Subacromial CS (n=26)	A. 52.6 (4.4) B. 55.1 (3.4) C. 54.2 (5.1)	31/46	A. 14.4 (4.3) B. 15.2 (5) C. 15.1 (4.8)	Pain VAS, Constant-Murley score, DASH, passive ROM
Tveitå et al. (2008) [69]	A. Shoulder joint distension with Normal Saline and CS (n=39) B. Intraarticular CS (n=37)	A. 52 (7) B. 51 (6)	31/45	A. 7 (4) motnhs B. 7 (4) months	SPADI, active and passive ROM
Yoon et al. (2013) [71]	A. Intraarticular CS – high dose (n = 20) B. Intraarticular CS – low dose (n = 20) C. Placebo (n = 11)	A. 54.2 (5.1) B. 52.2 (3.8) C. 55.9 (3.1)	27/24	A. 5.5 (2.5) months B. 4.7 (2.1) months C. 5.1 (3.1) months	SPADI, pain VAS, passive ROM
Yoon et al. (2016) [70]	A. Intraarticular CS (n = 29) B. Subacromial CS (n = 29) C. Shoulder joint distension with Normal Saline and CS (n = 28)	A. 53 (8) B. 57 (7) C. 54 (9)	26/60	A. 9 (6) months B. 9 (5) months C. 9 (6) months	Pain VAS, SST, Constant-Murley score, passive ROM

a: unless indicated otherwise
ASES: American shoulder and elbow surgeons score
CCH: Collagenase Clostridium Histolyticum
CS: Corticosteroids
DASH: Disabilities of arm, shoulder and hand score
HAQ: Health assessment questionnaire
NSAIDs: Oral non-steroidal anti-Inflammatory medication
PRP: Platelet rich plasma
PT: Supervized physiotherapy
ROM: Range of motion
SDQ: Shoulder disability questionnaire
SF-36: Short form 36 questionnaire
SH: Sodium Hyaluronate
SPADI: Shoulder pain and disability index
SRQ: Shoulder rating questionnaire

SST: Simple shoulder test
VAS: Visual analogue scale

Appendix 3

Intervention-related characteristics of the included trials

Study (Year)	Intervention groups	Medication and dosage	Duration	Radiologic guidance for injections
Arslan et al. (2001) [1]	A. Intraarticular CS (n=10) B. NSAIDs plus PT (n=10)	A. 1ml of methylprednizolone acetate (40 mg) B. Acemethazine 120 mg daily	A. A single injection B. Not reported	No
Badalamente et al. (2016) [2]	A. Placebo (n=15) B. Intraarticular CCH (n=45)	A. Placebo B. Combined 0.145 mg, 0.29 mg, 0.58 mg of CCH	A single injection	No
Bal et al. (2008) [3]	A. Intraarticular CS (n=40, 42 shoulders) B. Placebo (n=24)	A. 40mg methylprednisolone acetate; 1ml B. Placebo	A single injection	No
Blockey et al. (1954) [5]	A. Placebo (n=16) B. Oral CS (n=16)	A. Placebo B. Cortisone acetate syrup	A. Similar dosing with B B. 200 mg divided four times daily for the first three days, 100 mg until the fourteenth day, then tailed off in decrements of 12.5 mg every two days (complete dosage for four-weeks course being 2.5 g)	-
Buchbinder et al. (2004) [7]	A. Shoulder joint distension with Normal Saline and CS (n=25) B. Placebo (n=21)	A. 40 mg methylprednisolone acetate; 1 ml) and up to 82 ml normal saline was then injected (total volume 30–90 ml) B. Placebo	A single injection	Fluoroscopic guidance
Buchbinder et al. (2004) – 2 [8]	A. Oral CS (n=24) B. Placebo (n=26)	A. 30 mg of oral prednisolone (six 5 mg tablets) daily, as a single morning dose B. Placebo	A. Three weeks B. Three weeks	-
Calis et al. (2006) [10]	A. Intraarticular SH (n=24, 27 shoulders)	A. 30 mg SH B. 40 mg triamsinolone acetonide	A. Weekly for 2 weeks B. A single injection	No

	B. Intraarticular CS (n=25, 26 shoulders) C. PT (n=21) not used D. Observation (n=20) not used			
Carette et al. (2003) [11]	A. Intraarticular CS plus PT (n=21) B. Intraarticular CS (n=23) C. Placebo (n=23) D. Placebo plus PT (n=23) not used	40 mg triamcinolone hexacetonide; 2 ml	A single injection	Fluoroscopic guidance
Cho et al. (2016) [13]	A. Intraarticular CS (n=36) B. Subacromial CS (n=37) C. Intraarticular and Subacromial CS (n=37)	A. 4 ml of 1% lidocaine, 40 mg of triamcinolone acetonide B. 4 ml of 1% lidocaine, 40 mg of triamcinolone acetonide C. 4 ml of 1% lidocaine, 40 mg of triamcinolone acetonide equally divided	A single injection	Ultrasound guidance
Corbeil et al. (1992) [16]	A. Shoulder distension with lidocaine and CS plus PT (n=25) B. Intraarticular CS plus PT (n=20)	A. 20 ml of 1% lidocaine, 40 mg of triancinolone acetonide B. 40 mg triamcinolone acetonide; 1ml	A single injection	Fluoroscopic guidance
Dehghan et al. (2013) [19]	A. NSAIDs (n=28) B. Intraarticular CS (n=29).	A. 500 mg naproxen twice daily B. 40 mg triamcinolone	A. Not reported B. A single injection	Ultrasound guidance
Kothari et al. (2017) [38]	A. PRP (n=62) B. Intraarticular CS (n=60) C. U/S (n=58) not used	A. PRP with number of platelets 6.1±1.6 times higher than whole blood values B. 80 mg of methylprednisolone acetate (2 ml) C. 7 minutes of ultrasonic therapy (1.5 W/ cm2, 1 MHz, continuous mode)	A. A single injection B. A single injection C. On alternate days for 14 days	No
Lee et al. (2015) [42]	A. Shoulder joint distension with Hypertonic Saline and CS (n=32) B. Shoulder joint distension with	A. 5 ml of 1% lidocaine, 1 ml of 10 mg triamcinolone and Hypertonic saline solution (3% NaCl) B. 4 ml of 1% lidocaine, 1 ml of 10 mg triamcinolone and Normal saline solution (0.9% NaCl)	A single injection	Ultrasound guidance

	Normal Saline and CS (n=32)			
Lee et al. (2017) [41]	A. Intraarticular CS (n=32) B. Shoulder joint distension with NS and CS (n=32)	A. 3 ml of 1% lidocaine, 1 ml of 40 mg/ml triamcinolone B. 6 ml of 1% lidocaine, 1 ml of 10 mg triamcinolone and normal saline until no further distension	An intraarticular injection of CS was given before the initiation of the study, and the interventions were performed one time	Ultrasound guidance
Lim et al. (2014) [45]	A. Intraarticular CS (n=34) B. Intraarticular SH (n=34)	A. 1 ml of 1% lidocaine and 1 ml (40 mg) of methylprednisolone acetate B. 2 ml of SH; 10 mg/mL	A. A single injection B. Weekly for 3 weeks	No
Lorbach et al. (2010) [47]	A. Oral CS plus PT (n=20) B. Intraarticular CS plus PT (n=20)	A. Oral prednisolone B. 5 ml of bupivacaine (0.5%), 5 mL of mepivacaine (0.5%), and 40 mg of triamcinolone	A. Beginning with 40 mg and decreasing the dose every 5 days C. 3 Injections, at baseline, 4 and 8 weeks	Fluoroscopic guidance
Mattara et al. (1994) [48]	A. Transcutaneous NSAID patch (n=40) B. Placebo (n=40)	A. One transcutaneous, self-adhesive, non-woven, polyester-backed 40 mg flurbiprofen patch (10x13.6 cm) every 12 hours B. One non-medicated patch every 12 hours	14 days	No
Oh et al. (2011) [50]	A. Intraarticular CS (n=37) B. Subacromial CS (n=34)	1ml triamcinolone (40 mg), 4ml of 2% lidocaine, and 4 ml of normal saline	A single injection	Ultrasound guidance
Park et al. (2013) [51]	A. Intraarticular CS (n=45) B. Shoulder joint distension with Normal Saline and SH (n=45)	A. Mixture of 0.5% lidocaine (4ml) plus triamcinolone (40mg/mL; 1ml) B. 0.5% lidocaine (18ml) for capsular distension with high molecular weight sodium hyaluronate (10mg/mL; 2ml)	3 injections (once every 2 weeks)	Ultrasound guidance
Prestgaard et al. (2015) [52]	A. Intraarticular CS (n=42) B. Intraarticular and Rotator interval CS (n=40) C. Placebo (n=40)	A. 3.5 ml lidocaine 10 mg/mL into the rotator interval/anterior capsule and 1 mL triamcinolone hexacetonide 20 mg/mL + 2.5 ml lidocaine intraarticularly B. 0.5ml triamcinolone + 3ml lidocaine into the rotator interval and anterior capsule and 0.5 ml triamcinolone + 3 ml lidocaine intraarticularly	A single injection	Ultrasound guidance

		C. Placebo		
Ranalletta et al. (2016) [53]	A. Intraarticular CS plus PT (n=35) B. NSAIDs plus PT (n=34)	A. 12 mg of betamethasone and 2 ml of 1% lidocaine B. Diclofenac 75mg twice daily	A single injection	No
Rizk et al. (1991) [55]	A. Intraarticular CS plus PT (n=16) B. Subacromial CS plus PT (n=16) C. Placebo plus PT (Intraarticular and Subacromial groups) (n=16)	A. 1 ml of methylprednisolone (40 mg), 2 ml of 1% lidocaine B. 1 ml of methylprednisolone (40 mg), 2 ml of 1% lidocaine C. Placebo	Weekly for 3 weeks	No
Rovetta et al. (1998) [57]	A. Intraarticular CS and SH plus PT (n=16) B. Intraarticular CS plus PT (n=14)	A. 20 mg triamcinolone, and 20 mg sodium hyaluronate B. 20 mg triamcinolone	At 15-day intervals in the first month, and then monthly for 6 months	No
Ryans et al. (2005) [58]	A. Intraarticular and Subacromial CS plus PT (n=20) B. Intraarticular and Subacromial CS (n=19) C. Placebo plus PT (n=20) D. Placebo (n=19)	A. 20 mg triamcinolone (1 ml) and 2 ml normal saline B. 20 mg triamcinolone (1 ml) and 2 ml normal saline C. Placebo D. Placebo	A single injection	No
Schydlowsky et al. (2012) [63]	A. Subcutaneous Adalimumab (n=10) B. Intraarticular CS (n=8)	A. 4 ml of 1% lidocaine and 40 mg merhylprednisone acetate B. 1 ml subcutaneous adalimumab	3 injections (once every 2 weeks)	Ultrasound guidance in Group A
Shin et al. (2013) [64]	A. Subacromial CS plus PT (n=41) B. Intraarticular CS plus PT (n=42) C. Intraarticular and Subacromial CS plus PT (n=39)	A. 4 ml of 2% lidocaine and 40 mg of triamcinolone (1 ml) B. 4 ml of 2% lidocaine and 40 mg of triamcinolone (1 ml) C. 4 ml of 2% lidocaine and 40 mg of triamcinolone (1 ml) equally divided D. Aceclofenac 100mg twice daily	A. A single injection B. A single injection C. A single injection D. 6 weeks	Ultrasound guidance

	D. NSAIDs plus PT (n=36)			
Sun et al. (2018) [66]	A. Rotator interval CS (n=27) B. Intraarticular CS (n=24) C. Subacromial CS (n=26)	2 ml of 2% lidocaine and 40 mg of triamcinolone (1ml)	A single injection	Ultrasound guidance
Tveitå et al. (2008) [69]	A. Shoulder joint distension with Normal Saline and CS (n=39) B. Intraarticular CS (n=37)	A. 2 ml triamcinolone acetonide mg/ml, 4 ml bupivacaine hydrochloride 5 mg/ml, 3-4 ml contrast medium (lopromide), 20 ml saline B. 2 ml triamcinolone acetonide mg/ml, 3–4 ml bupivacaine hydrochloride 5 mg/ml, 3-4 ml contrast medium (lopromide)	3 injections (once every 2 weeks)	Fluoroscopic guidance
Yoon et al. (2013) [71]	A. Intraarticular CS – high dose (n = 20) B. Intraarticular CS – low dose (n = 20) C. Placebo (n = 11)	A. 4 ml of 10 mg/ml triamcinolone acetonide and 1 ml of 1% lidocaine B. 2 ml of 10 mg/ml triamcinolone acetonide and 1 mL of 1% lidocaine C. Placebo	A single injection	No
Yoon et al. (2016) [70]	A. Intraarticular CS (n = 29) B. Subacromial CS (n = 29) C. Shoulder joint distension with Normal Saline and CS (n = 28)	A. 1 ml of triamcinolone (40 mg), 4 ml of 2% lidocaine, and 5 ml of normal saline B. 1 ml of triamcinolone (40 mg), 4 ml of 2% lidocaine, and 5 ml of normal saline C. 1 ml of triamcinolone (40 mg), 4 ml of 2% lidocaine, and 40 ml of normal saline	A single injection	Ultrasound guidance

CS: Corticosteroids
NSAIDs: Oral non-steroidal anti-Inflammatory medication
PT: Supervized physiotherapy
CCH: Collagenase Clostridium Histolyticum
PRP: Platelet rich plasma
SH: Sodium Hyaluronate

Appendix 4

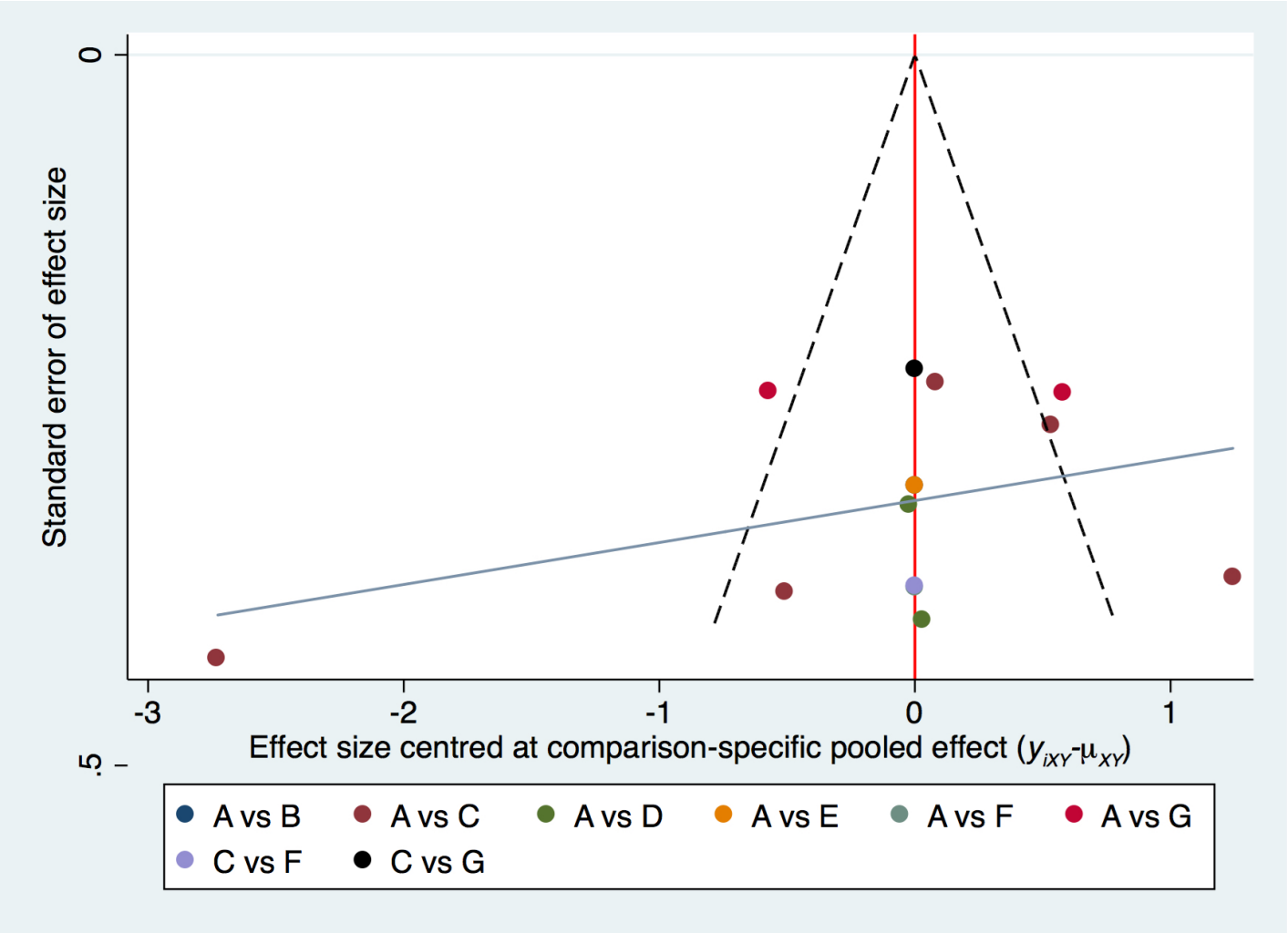
Risk of bias assessment of the individual randomized trials

Study (Year)	Randomization	Allocation concealment	Blinding of participants	Masking of personnel	Blinding of outcome assessors	Incomplete outcome data	Selective outcome reporting	Other bias
Arslan et al. (2001) [1]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Low risk
Badalamente et al. (2016) [2]	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Low risk	Unclear risk	Unclear risk
Bal et al. (2008) [3]	Low risk	Low risk	Low risk	High risk	Low risk	High risk	Unclear risk	Low risk
Blockey et al. (1954) [5]	High risk	Low risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Low risk
Buchbinder et al. (2004) [7]	Low risk	Unclear risk	Low risk	High risk	Low risk	Low risk	Unclear risk	Low risk
Buchbinder et al. (2004) – 2 [8]	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Low risk
Calis et al. (2006) [10]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Unclear risk	Low risk
Carette et al. (2003) [11]	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Unclear risk	Low risk
Cho et al. (2016) [13]	Low risk	Low risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk
Corbeil et al. (1992) [16]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Unclear risk	Unclear risk
Dehghan et al. (2013) [19]	Low risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk
Kothari et al. (2017) [38]	Low risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Unclear risk	Low risk
Lee et al. (2015) [42]	Low risk	Unclear risk	Low risk	Unclear risk	Unclear risk	High risk	Unclear risk	Low risk
Lee et al. (2017) [41]	Low risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Low risk	Low risk
Lim et al. (2014) [45]	Low risk	Low risk	Unclear risk	Unclear risk	Low risk	High risk	Unclear risk	Low risk
Lorbach et al. (2010) [47]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk
Mattara et al. (1994) [48]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Unclear risk
Oh et al. (2011) [50]	Low risk	Unclear risk	Unclear risk	Unclear risk	Low risk	High risk	Unclear risk	Low risk

Park et al. (2013) [51]	Low risk	Unclear risk	Low risk	Unclear risk	Low risk	Unclear risk	Unclear risk	Low risk
Prestgaard et al. (2015) [52]	Unclear risk	Unclear risk	Low risk	High risk	Low risk	Low risk	Low risk	Low risk
Ranalletta et al. (2016) [53]	Low risk	Low risk	High risk	High risk	Low risk	High risk	Unclear risk	Low risk
Rizk et al. (1991) [55]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Unclear risk	Low risk
Rovetta et al. (1998) [57]	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk	Unclear risk
Ryans et al. (2005) [58]	Low risk	Low risk	Low risk	Low risk	Low risk	High risk	Unclear risk	Low risk
Schydlowsky et al. (2012) [63]	Unclear risk	Low risk	High risk	High risk	High risk	High risk	Unclear risk	High risk
Shin et al. (2013) [64]	Low risk	Unclear risk	Unclear risk	Unclear risk	Low risk	Low risk	Unclear risk	Low risk
Sun et al. (2018) [66]	Low risk	Low risk	Unclear risk	Unclear risk	Low risk	Low risk	Unclear risk	Low risk
Tveitå et al. (2008) [69]	Low risk	Unclear risk	High risk	High risk	High risk	Low risk	Low risk	Unclear risk
Yoon et al. (2013) [71]	Low risk	Unclear risk	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Yoon et al. (2016) [70]	Low risk	Unclear risk	High risk	Unclear risk	Low risk	Low risk	Unclear risk	Low risk

Appendix 5

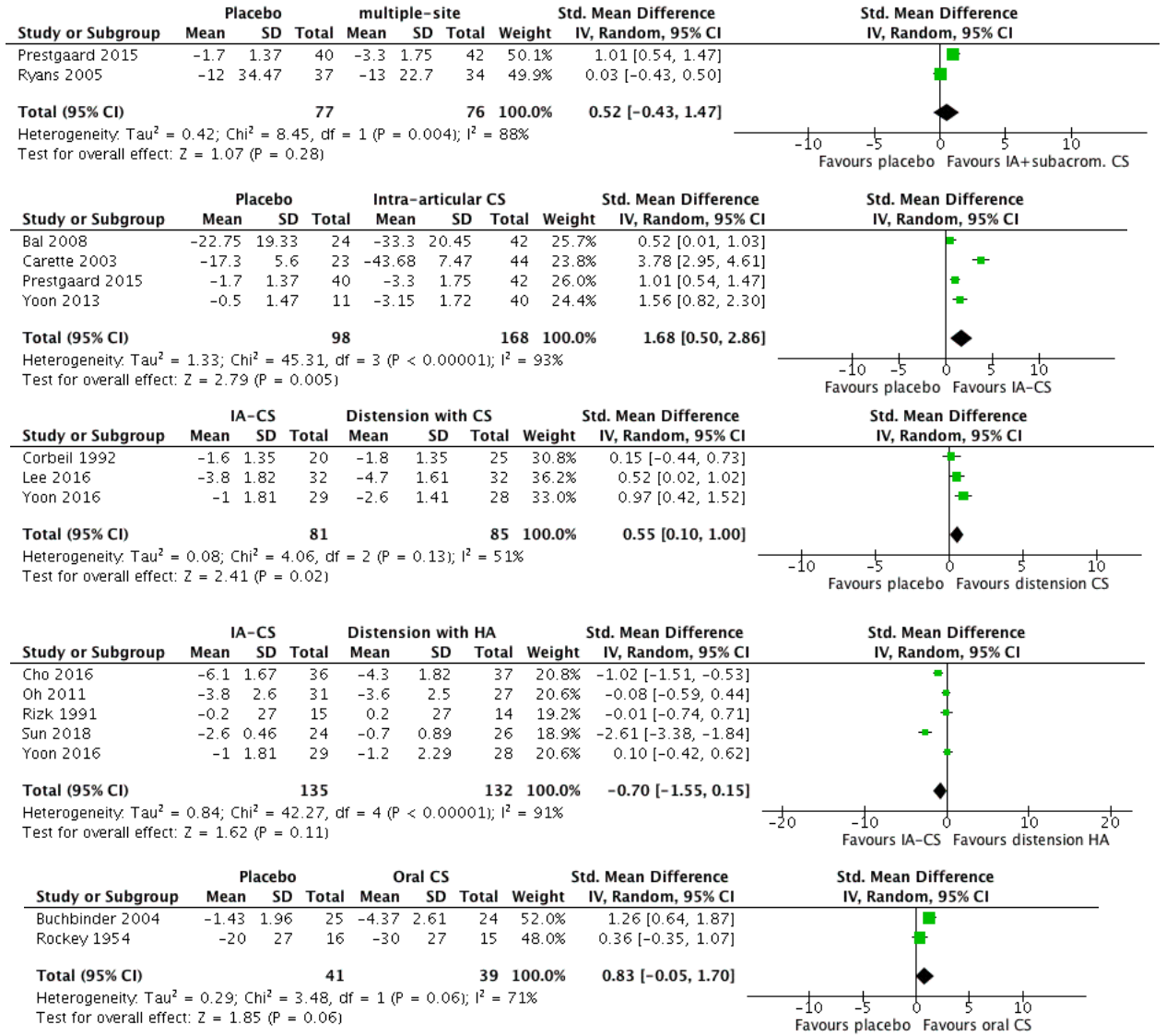
Funnel plot for the assessment of publication bias



A= Placebo
B= Collagenase Clostridium Histolyticum
C= intra-articular corticosteroids
D= Oral corticosteroids
E= Distension corticosteroids
F= Subacromial corticosteroids
G= Intra-articular + subacromial corticosteroids

The funnel plot, which refers to placebo-controlled studies, is presented for the assessment of pain relief in the short term.

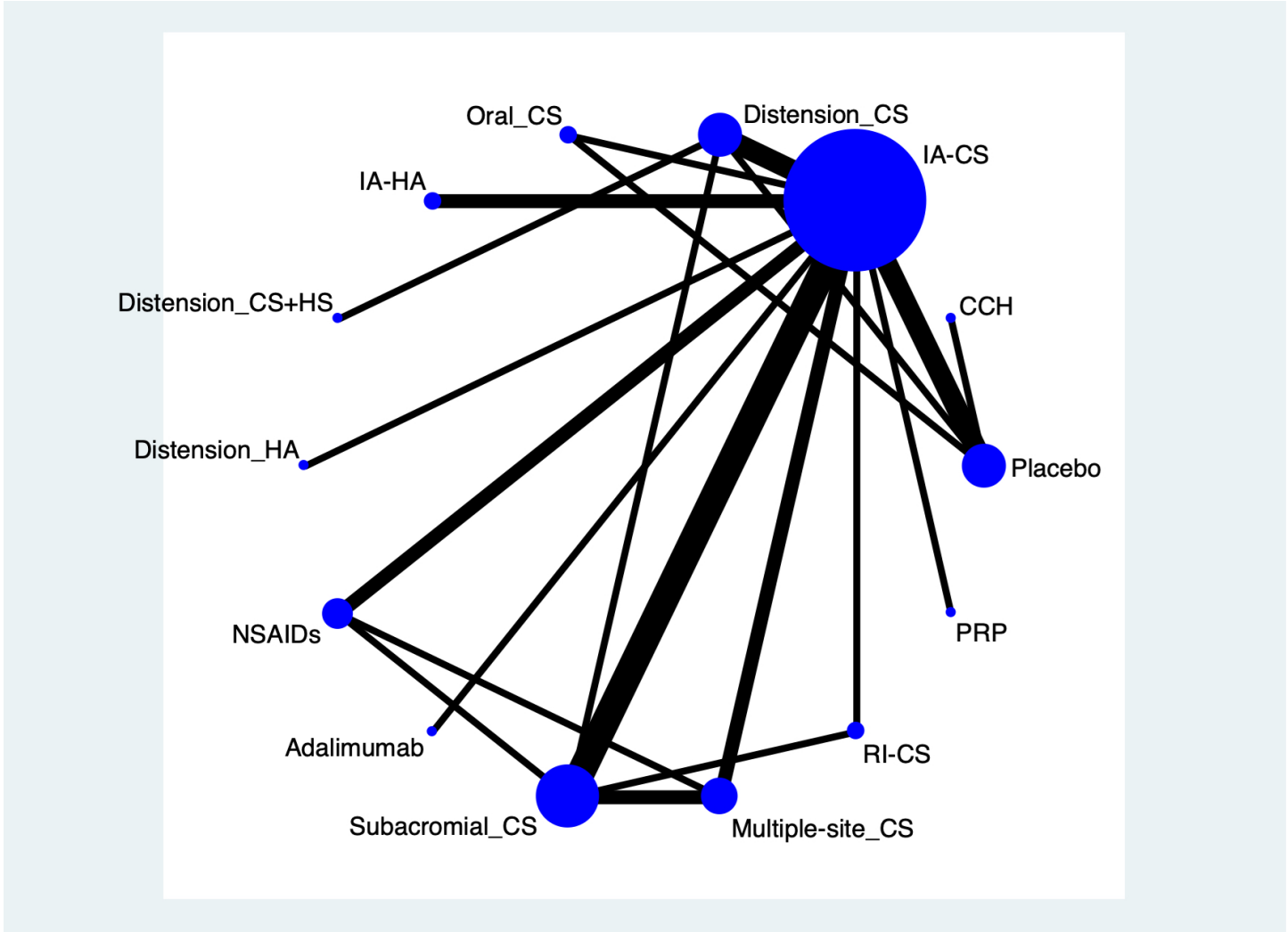
Appendix 6 Pair-wise comparisons for the assessment of pain relief



Forest plots of standardized mean differences for the assessment of pain relief in the short term. Vertical line shows no difference between the intervention groups. Statistically significant differences in favor of intra-articular steroid injections as well as distension with steroids are demonstrated. CS= Corticosteroid; HA= Hyaluronate; IA= Intra-articular.

Appendix 7

Network meta-analysis plot for the assessment of composite outcomes in the short term



Network meta-analysis plot for the assessment of composite outcomes in the short term. CS= Corticosteroids; IA= Intra-articular; HA= Hyaluronate; NSAIDs= Non-steroidal anti-inflammatory drugs; PRP= platelet-rich plasma; RI= Rotator interval; CCH= Collagenase Clostridium Histolyticum.

League table for the assessment of composite outcomes in the short term

Placebo												
0.88 (-2.06,3.82)	**PRP**											
5.25 (2.42,8.09)	**4.37 (0.72,8.03)**	**Multiple-site CS**										
1.50 (-0.64,3.64)	0.62 (-2.53,3.77)	**-3.75 (-6.70,-0.80)**	**Rotator interval CS**									
-0.61 (-2.40,1.19)	-1.49 (-4.42,1.45)	**-5.86 (-8.44,-3.27)**	**-2.11 (-3.86,-0.35)**	**Subacromial CS**								
-0.91 (-4.18,2.37)	-1.79 (-5.79,2.21)	**-6.16 (-10.09,-2.23)**	-2.41 (-5.87,1.06)	-0.30 (-3.57,2.97)	**Adalimumab**							
-5.39 (-7.63,-3.15)	**-6.27 (-9.49,-3.05)**	**-10.64 (-13.71,-7.57)**	**-6.89 (-9.13,-4.65)**	**-4.78 (-6.80,-2.77)**	**-4.48 (-8.01,-0.96)**	**NSAIDs**						
0.97 (-1.98,3.92)	0.09 (-3.65,3.82)	**-4.28 (-7.95,-0.62)**	-0.53 (-3.69,2.62)	1.57 (-1.37,4.52)	1.88 (-2.13,5.88)	**6.36 (3.14,9.58)**	**Distension with HA**					
-0.04 (-3.16,3.08)	-0.92 (-4.90,3.05)	**-5.29 (-9.17,-1.42)**	-1.54 (-4.94,1.86)	0.56 (-2.59,3.72)	0.87 (-3.36,5.09)	**5.35 (1.87,8.82)**	-1.01 (-4.99,2.97)	**Distension with CS+HS**				
0.48 (-1.80,2.77)	-0.40 (-3.64,2.85)	**-4.77 (-7.92,-1.61)**	-1.02 (-3.57,1.54)	1.09 (-1.19,3.37)	1.39 (-2.16,4.94)	**5.87 (3.24,8.51)**	-0.48 (-3.73,2.76)	0.53 (-3.00,4.05)	**IA-HA**			
0.31 (-1.70,2.31)	-0.57 (-3.89,2.74)	**-4.95 (-8.17,-1.72)**	-1.19 (-3.83,1.44)	0.91 (-1.46,3.28)	1.21 (-2.40,4.83)	**5.70 (2.98,8.41)**	-0.66 (-3.98,2.66)	0.35 (-3.18,3.88)	-0.18 (-2.93,2.57)	**Oral CS**		
0.59 (-1.04,2.22)	-0.29 (-3.25,2.66)	**-4.67 (-7.49,-1.84)**	-0.91 (-3.03,1.20)	1.19 (-0.51,2.89)	1.49 (-1.79,4.78)	**5.98 (3.74,8.21)**	-0.38 (-3.34,2.58)	0.63 (-2.03,3.29)	0.10 (-2.20,2.41)	0.28 (-2.04,2.60)	**Distension with CS**	
0.76 (-0.53,2.06)	-0.12 (-2.76,2.52)	**-4.49 (-7.02,-1.96)**	-0.74 (-2.46,0.98)	**1.37 (0.09,2.65)**	1.67 (-1.34,4.68)	**6.15 (4.31,7.99)**	-0.21 (-2.85,2.44)	0.81 (-2.17,3.78)	0.28 (-1.61,2.16)	0.46 (-1.55,2.46)	0.18 (-1.15,1.51)	**IA-CS**
0.28 (-2.40,2.96)	-0.60 (-4.58,3.37)	**-4.98 (-8.88,-1.07)**	-1.22 (-4.65,2.21)	0.88 (-2.34,4.11)	1.19 (-3.04,5.42)	**5.67 (2.17,9.16)**	-0.69 (-4.67,3.29)	0.32 (-3.79,4.43)	-0.21 (-3.73,3.32)	-0.03 (-3.38,3.32)	-0.31 (-3.45,2.83)	-0.49 (-3.46,2.49)

CCH

League table of standardized mean differences for the assessment of composite outcomes in the short term. CS= Corticosteroids; IA= Intra-articular; HA= Hyaluronate; NSAIDs= Non-steroidal anti-inflammatory drugs; PRP= platelet-rich plasma; RI= Rotator interval; CCH= Collagenase Clostridium Histolyticum.

Appendix 8

League table of standardized mean differences for the assessment of pain relief in the intermediate term

IA-CS									
0.72 (-1.65,3.10)	**PRP**								
4.62 (2.35,6.90)	**3.90 (0.61,7.19)**	**RI-CS**							
0.14 (-0.99,1.28)	-0.58 (-3.21,2.05)	**-4.48 (-6.98,-1.98)**	**Multiple-site CS**						
-1.13 (-2.29,0.03)	-1.85 (-4.49,0.79)	**-5.75 (-8.28,-3.22)**	-1.27 (-2.79,0.24)	**NSAIDs**					
-0.52 (-1.45,0.40)	-1.25 (-3.80,1.30)	**-5.15 (-7.43,-2.86)**	-0.67 (-1.94,0.61)	0.60 (-0.79,2.00)	**Subacromial CS**				
-0.14 (-2.54,2.26)	-0.86 (-4.24,2.51)	**-4.76 (-8.07,-1.46)**	-0.28 (-2.94,2.37)	0.99 (-1.68,3.65)	0.38 (-2.19,2.95)	**IA-HA**			
-0.80 (-3.39,1.79)	-1.52 (-5.04,1.99)	**-5.42 (-8.85,-1.99)**	-0.94 (-3.66,1.77)	0.33 (-2.50,3.15)	-0.28 (-2.98,2.42)	-0.66 (-4.19,2.87)	**Oral CS**		
0.11 (-1.08,1.31)	-0.61 (-3.27,2.05)	**-4.51 (-7.05,-1.97)**	-0.03 (-1.60,1.55)	1.24 (-0.40,2.89)	0.64 (-0.76,2.03)	0.26 (-2.42,2.93)	0.91 (-1.86,3.69)	**Distension with CS**	
-0.34 (-1.29,0.60)	-1.07 (-3.62,1.49)	**-4.96 (-7.40,-2.53)**	-0.49 (-1.72,0.75)	0.79 (-0.67,2.25)	0.18 (-1.02,1.38)	-0.20 (-2.78,2.38)	0.46 (-1.96,2.87)	-0.46 (-1.82,0.91)	**Placebo**

League table of standardized mean differences for the assessment of pain relief in the intermediate term. CS= Corticosteroids; IA= Intra-articular; HA= Hyaluronate; NSAIDs= Non-steroidal anti-inflammatory drugs; PRP= platelet-rich plasma.

Appendix 9

League table of standardized mean differences for the assessment of composite outcomes in the intermediate term

IA-CS										
0.72 (-2.85,4.30)	**PRP**									
5.17 (1.82,8.51)	4.44 (-0.45,9.34)	**Multiple-site CS**								
0.29 (-1.59,2.18)	-0.43 (-4.47,3.61)	**-4.88 (-8.60,-1.15)**	**Rotator interval CS**							
-1.02 (-2.72,0.68)	-1.75 (-5.70,2.21)	**-6.19 (-9.58,-2.80)**	-1.31 (-3.45,0.82)	**Subacromial CS**						
-1.41 (-5.24,2.42)	-2.13 (-7.37,3.11)	**-6.58 (-11.66,-1.49)**	-1.70 (-5.97,2.56)	-0.39 (-4.58,3.80)	**Adalimumab**					
-2.60 (-4.95,-0.24)	-3.32 (-7.60,0.96)	**-7.76 (-11.77,-3.75)**	**-2.89 (-5.60,-0.18)**	-1.57 (-4.21,1.06)	-1.18 (-5.68,3.31)	**NSAIDs**				
0.12 (-2.42,2.66)	-0.60 (-4.99,3.78)	**-5.05 (-9.25,-0.85)**	-0.17 (-3.33,2.99)	1.14 (-1.91,4.20)	1.53 (-3.06,6.13)	2.72 (-0.75,6.18)	**IA-HA**			
-0.61 (-4.56,3.34)	-1.33 (-6.66,4.00)	**-5.78 (-10.93,-0.62)**	-0.90 (-5.16,3.36)	0.41 (-3.83,4.66)	0.80 (-4.70,6.31)	1.99 (-2.58,6.56)	-0.73 (-5.43,3.97)	**Oral CS**		
-0.35 (-2.41,1.72)	-1.07 (-5.20,3.06)	**-5.52 (-9.37,-1.66)**	-0.64 (-3.31,2.03)	0.67 (-1.74,3.09)	1.06 (-3.29,5.41)	2.25 (-0.82,5.32)	-0.47 (-3.74,2.80)	0.26 (-4.00,4.53)	**Distension CS**	
-1.06 (-2.69,0.57)	-1.78 (-5.71,2.15)	**-6.23 (-9.92,-2.53)**	-1.35 (-3.63,0.93)	-0.04 (-2.29,2.22)	0.35 (-3.81,4.52)	1.54 (-1.28,4.35)	-1.18 (-4.20,1.84)	-0.45 (-4.05,3.15)	-0.71 (-3.00,1.58)	**Placebo**

League table of standardized mean differences for the assessment of composite outcomes in the intermediate term. CS= Corticosteroids; IA= Intra-articular; HA= Hyaluronate; NSAIDs= Non-steroidal anti-inflammatory drugs; PRP= platelet-rich plasma.

Appendix 10

Adverse effects reported in the included trials

Study (Year)	Adverse effects
Arslan et al. (2001) [1]	None
Badalamente et al. (2016) [2]	CCH injections: injection-site tenderness resolved in a mean of 5 ± 4 days, biceps ecchymosis resolved in a mean of 9 ± 5 days. 6 of 60 patients had mild injection-area edema, resolved in a mean of 1 ± 0.7 days
Bal et al. (2008) [3]	None
Blockey et al. (1954) [5]	One death from coronary occlusion is not clearly attributable to cortisone therapy
Buchbinder et al. (2004) [7]	1. Pain associated with procedure (5 patients) 2. Increased pain for up to 48 hours after procedure (4 patients) 3. Claustrophobia at time of procedure (2 patients) 4. Unsettled, anxious and hot (1 patient) 5. Shoulder noisy (fluid noises) (1 patient)
Buchbinder et al. (2004) – 2 [8]	1. Gastroinstestinal (16 in the corticosteroid and 5 in placebo group) 2. Central nervous system (15 in corticosteroid and 1 in placebo group) 3. Cardiovascular (7 in corticosteroid and 2 in placebo group) 4. Stress fracture foot (1 in placebo group)
Calis et al. (2006) [10]	Not reported
Carette et al. (2003) [11]	Not reported
Cho et al. (2016) [13]	1. Injection-related soreness on day 1 (1 patient) 2. Temporary facial flushing (3 patients)
Corbeil et al. (1992) [16]	Not reported
Dehghan et al. (2013) [19]	Not reported
Kothari et al. (2017) [38]	Self-limiting postinjection pain, <3 levels in VAS (1 in platelet rich plasma group, 2 in corticosteroid group)
Lee et al. (2015) [42]	Mild discomfort resulting from the needle injection and capsule distension in both groups.
Lee et al. (2017) [41]	1. Facial flushing on days 2 to 5 after injection (1 in corticosteroid and 2 in distension group) 2. Dizziness due to vasovagal reaction during the injection (3 in distension group)
Lim et al. (2014) [45]	1. Brief postinjection flare (1 in corticosteroid and 2 in hyaluronate group) 2. Local pruritus that resolved in 72 hours (1 in corticosteroid group)
Lorbach et al. (2010) [47]	None
Mattara et al. (1994) [48]	1. Tachycardia, minor furnculosis, cutaneous erythema, slight vasomotor flushes, headache, cough (8 patients in flurbiprofen group) 2. Changes in skin condition; furunculosis in th zone of application, erythema, redness (4 patients in flurbiprofen group)

	3. Mild sensations of warmth or chilliness (3 patients in placebo group) 4. Erythema and inflammation with redness (1 patient in placebo group)
Oh et al. (2011) [50]	Mild adverse effects were reported in 1 patient from each group (dizziness and a feeling of warmth just after the injection)
Park et al. (2013) [51]	No severe complications
Prestgaard et al. (2015) [52]	1. Major chest or shoulder pain during the first days after the intra-articular injection (2 patients in intraarticular and 1 in combined injection group) 2. Mild discomfort and pain (1 patient in intraarticular and 3 in combined injection group) 3. Elevated blood glucose (1 patient in combined injection group) 4. Rash (1 patient in placebo group) 5. Nausea (1 patient in placebo group)
Ranalletta et al. (2016) [53]	Facial flushing after the procedure, which resolved spontaneously (2 patients in injection group)
Rizk et al. (1991) [55]	Not reported
Rovetta et al. (1998) [57]	Not reported
Ryans et al. (2005) [58]	Not reported
Schydlowsky et al. (2012) [63]	1. Increased liver enzymes (1 patient in adalimumab group) 2. Paresthesias in the ring and small fingers (1 patient in adalimumab group)
Shin et al. (2013) [64]	1. Temporary skin color changes around the injection site (3 patients) 2. Steroid flare reaction (7 patients)
Sun et al. (2018) [66]	Temporary facial flushing within 15 minutes after injection which vanished later (1 patient in the rotator interval and 1 patient in the subacromial group)
Tveitå et al. (2008) [69]	1. Most patients reported "no pain" or "discomfort" when describing the procedure 2. Major pain during the injections (6 patients in injection group and five patients in distension group) 3. Mild adverse effects lasting only a few days were reported by 20 patients in the injection group and 14 patients in the distension group; flushing or disturbances in heat regulation (13 patients in injection group and 9 patients in distension group), minor loss of sensation and motor control in their affected arm (2 patients in each group), loss of sleep, nausea or dizziness 4. One patient in the distension group developed a glenohumeral joint infection which was identified 5 days after the last injection. He immediately underwent arthroscopic surgery and was treated with infusions of cloxacillin for two weeks, with a good result. 5. One patient in the injection group developed breast cancer during the study period.
Yoon et al. (2013) [71]	1. Facial flushing on days 1 to 5 after the injection (3 patients in high-dose group and 1 in low-dose group) 2. Dizziness due to vasovagal reactions during the injection (1 patient in placebo group and 1 in low-dose group).
Yoon et al. (2016) [70]	1. Temporary mild dizziness and nausea after the injection (2 patients in intrarticular and 1 patient in subacromial group) 2. Transient loss of sensation and motor control in the injected arm resolved a few hours after the injection (1 patient in distension group) 3. Transient hypotensive syncope immediately after the injection, recovered after several minutes (1 patient in distension group)