Evidenztabelle

1.1

Inhalt: 1 Literaturstelle

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Prodromidis, A. D. et al. Is There a Genetic Predisposition to Frozen Shoulder?: A Systematic Review and Meta- Analysis. JBJS Rev. 4. . 2016			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 4 Study type: systematic review and meta-analysis Databases: literature search of MEDLINE, EMBASE, and CINAHL databases Search period: A systematic literature search of MEDLINE/PubMed(1879 to present), Excerpta Medica Database/EMBASE (1947 to present), and Cumulative Index to Nursing and Allied Health Literature/CINAHL (1961 to present)databases was conducted from their year of inception to May 2014 Inclusion Criteria: combinations of keywords: “frozen,” “shoulder” and “adhesive,” “capsulitis,” and “shoulder.” Exclusion Criteria: no language limit, reviews, noncomparable studies, and case reports were excluded	Population: 9 relevant studies, between n=37 und n=1828 patients Intervention: Rates of Frozen Shoulder Among Relatives (Family History) Racial Predilection for Frozen Shoulder Association of Frozen Shoulder and HLA-B27 Comparison:	Primary: Rates of Frozen Shoulder Among Relatives (Family History) Racial Predilection for Frozen Shoulder Association of Frozen Shoulder and HLA-B27 Secondary: Results: - 11.6% prevalence of frozen shoulder in twin pairs and demonstrated a heritability of 42% for frozen shoulder - showed that 20% of patients with frozen shoulder had a positive family history involving a firstdegree relative - patients with frozen shoulder included a substantially higher number of white patients (76%) - being born in the British Isles or having parents or grandparents born in the British Isles were risk factors for frozen shoulder - significantly higher rates of HLA-B27 positivity in patients with frozen shoulder as compared with controls (risk ratio, 3.28) Author's Conclusion: The limited evidence points toward a genetic link to frozen shoulder	Hakim AJ, Cherkas LF, Spector TD, MacGregor AJ. Genetic associations between frozen shoulder and tennis elbow: a female twin study. Rheumatology (Oxford). 2003 Jun;42(6):739-42. doi: 10.1093/rheumatology/keg159. Epub 2003 Apr 30. PMID: 12730529. Vastamäki H, Kettunen J, Vastamäki M. The natural history of idiopathic frozen shoulder: a 2- to 27-year followup study. Clin Orthop Relat Res. 2012 Apr;470(4):1133-43. doi: 10.1007/s11999-011-2176-4. Epub 2011 Nov 17. PMID: 22090356; PMCID: PMC3293960. Wang K, Ho V, Hunter-Smith DJ, Beh PS, Smith KM, Weber AB. Risk factors in idiopathic adhesive capsulitis: a case control study. J Shoulder Elbow Surg. 2013 Jul;22(7):e24-9. doi: 10.1016/j.jse.2012.10.049. Epub 2013 Jan 24. PMID: 23352186. Rizk TE, Pinals RS. Histocompatibility type and racial incidence in frozen shoulder. Arch Phys Med Rehabil. 1984 Jan;65(1):33-4. PMID: 6607044. Bulgen DY, Hazleman BL, Voak D. HLA-B27 and frozen shoulder. Lancet. 1976 May 15;1(7968):1042-4. doi: 10.1016/s0140-6736(76)92219-4. PMID: 57450. Noy S, Dekel S, Orgad S, Efter T, Mizrachi Y, Gazit E. HLA-B27 and frozen shoulder. Tissue Antigens. 1981 Feb;17(2):251. doi:

			10.1111/j.1399-0039.1981.tb00695.x. PMID: 7233422. Seignalet J, Sany J, Caillens JP, Lapinski H. Absence d'association entre HLA-B27 et la rétraction capsulaire de l'épaule [Lack of correlation between frozen shoulder and HLA-B27 (author's transl)]. Sem Hop. 1981 Nov 8-25;57(41-42):1738-9. French. PMID: 6272411.
Methodical Notes			
Funding Sources: - COI: - Study Quality: good Heterogeneity: good Publication Bias: - Notes: authors' self rating: Level of Evidence: Prognostic Level IV (because of evidence level of included studies III-IV, because of different tested aspects and different results of these studies) authors' conclusion: there is a lack of unbiased genetic approaches to address the etiology of the condition			

1.2

Ryan, V. et al. The pathophysiology associated with primary (idiopathic) frozen shoulder: A systematic review. BMC Musculoskelet Disord. 17. 340. 2016			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematic review Databases: Medline, Embase, CINAHL, AMED, BNI and Cochrane Library Search period: inception - 2nd May 2014 Inclusion Criteria: Studies on primary Frozen Shoulder with combinations of imaging, histological or biochemical analysis of the glenohumeral joint Exclusion Criteria: Participants with any form of secondary frozen shoulder, such as diabetes, rotator cuff disease or trauma. previous	Intervention: Comparison:	Primary: Secondary: Results: Thirteen observational studies (involving 417 shoulders) were included in the review. Eight studies reported magnetic resonance imaging or arthrography findings and 5 recorded histological findings. When reported mean ages of the participants ranged from 40.0 to 59.8 years. Duration of symptoms ranged from 0 to 30 months. The majority of studies (n = 7) were assessed to be of moderate risk of bias, two studies at high risk and the remaining four were rated as low risk of bias. Study characteristics were	Sofka CM, Ciavarra GA, Hannafin JA, Cordasco FA, Potter HG. Magnetic resonance imaging of adhesive capsulitis: correlation with clinical staging. HSS J. 2008;4(2):164–9. doi:10.1007/s11420-008-9088-1. Lho YM, Ha E, Cho CH, Song KS, Min BW, Bae KC, et al. Inflammatory cytokines are overexpressed in the subacromial bursa of frozen shoulder. J Shoulder Elbow Surgery. 2013;22(5):666–72. doi:10.1016/j.jse.2012.06.014. Carbone S, Napoli A, Gumina S. MRI of adhesive capsulitis of the shoulder: distension of the bursa in the superior subscapularis recess is a suggestive sign of the pathology. Eur J Radiol. 2014;83(2):345–8. doi:10.1016/j.ejrad. 2013.10.017. Carrillon Y, Noel E, Fantino O, Perrin- Fayolle O, Tran-Minh VA. Magnetic resonance imaging findings in idiopathic adhesive capsulitis of the shoulder. Rev Rhum Engl Ed. 1999;66(4):201–6. Kilian O, Pfeil U, Wenisch S, Heiss C, Kraus R, Schnettler R. Enhanced alpha 1(I) mRNA expression in frozen shoulder and dupuytren tissue. Eur J Med Res. 2007;12(12):585–90. Li JQ, Tang KL, Wang J, Li QY, Xu HT, Yang HF, et al. MRI findings for frozen shoulder evaluation: is the thickness of the coracohumeral ligament a valuable diagnostic tool? PLoS One.

interventions directly to the shoulder joint (e.g. steroid injections, arthrographic distension, capsular release, manipulation under anaesthesia)		poorly reported and there was widespread variety observed between studies in respect of data collection methods and inclusion criteria employed. Pathological changes in the anterior shoulder joint capsule and related structures were commonly reported. Imaging identified pathological changes occurring in the coracohumeral ligament, axillary fold and rotator interval. Obliteration of the subcoracoid fat triangle also appeared to be pathognomonic. Histological studies were inconclusive but suggested that immune, inflammatory and fibrotic changes where associated with primary frozen shoulder. Author's Conclusion: This systematic review presents a summary of what is currently known about the tissue pathophysiology of primary frozen shoulder. Further studies that use standardised inclusion and exclusion criteria and investigate changes in naïve tissue at different stages of the condition are required.	2011;6(12):e28704. doi:10.1371/journal. pone.0028704. Manton GL, Schweitzer ME, Weishaupt D, Karasick D. Utility of MR arthrography in the diagnosis of adhesive capsulitis. Skeletal Radiol. 2001;30(6):326–30. Song KD, Kwon JW, Yoon YC, Choi SH. Indirect MR arthrographic findings of adhesive capsulitis. AJR Am J Roentgenol. 2011;197(6):W1105–9. doi:10.2214/AJR.10.6099. Xu Y, Bonar F, Murrell GA, et al. Enhanced expression of neuronal proteins in idiopathic frozen shoulder. J Shoulder Elbow Surgery. 2012;21(10):1391–7. doi:10.1016/j.jse.2011.08.046. Zhao W, Zheng X, Liu Y, Yang W, Amirbekian V, Diaz LE, et al. An MRI study of symptomatic adhesive capsulitis. PLoS One. 2012;7(10):e47277. doi:10.1371/journal.pone.0047277. Bunker TD. Frozen shoulder: unravelling the enigma. Ann R Coll Surg Engl. 1997;79(3):210–3. Neviaser JS. Arthrography of the shoulder joint: study of the findings in adhesive capsulitis of the shoulder. Study of the findings in adhesive capsulitis of the shoulder. J Bone Joint Surgery. 1962;44-A:1321–59. Uhthoff HK, Boileau P. Primary frozen shoulder: global capsular stiffness versus localized contracture. Clin Orthop Relat Res. 2007;456:79–84. doi:10.1097/BLO.0b013e318030846d.
Methodical Notes			
Funding Sources: The Health Foundation (http://www.health.org.uk/) is gratefully acknowledged for providing funding to support this project. COI: none Study Quality: Two reviewers independently conducted the searches, screening, data extraction and assessment of Risk of Bias using the			

Cochrane Risk of Bias Assessment Tool for non-Randomised Studies of Interventions (ACROBAT-NRSI). Heterogeneity: Two reviewers (HB and VR) reviewed the articles for eligibility and inclusion with a third reviewer (JL) available in the event of consensus not being achieved. Article titles were used to identify relevant studies. Following this, eligibility was checked and recorded on a checklist designed for the review that incorporated PICO criteria. A data extraction form was developed for the review based upon the University of York, Centre for Reviews and Dissemination (2009) guidance. Publication Bias: A risk of bias tool specifically for use in pathophysiology reviews was not found, meaning there may be specific domains relevant for this type of review which have not been appraised or discussed. With only a minority of studies being assessed as low risk of bias, the findings of this review may contain systematic bias. Notes:

1.3

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Cho, C. H. et al. Biological Aspect of Pathophysiology for Frozen Shoulder. Biomed Res Int. 2018. 7274517. 2018			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Review article Databases: Search period: Inclusion Criteria: Studies on the biology of the pathophysiology of frozen shoulder Exclusion Criteria	Intervention: Comparison:	Primary: Secondary: Results: Although articles for the pathophysiology of frozen shoulder provide inconsistent and inconclusive results, they have suggested both inflammation and fibrosis mediated by cytokines, growth factors, matrix metalloproteinases, and immune cells. Proinflammatory cytokines and growth factors released from immune cells control the action of fibroblast and matrix remodeling is regulated by the matrix metalloproteinases and their inhibitors. The results of these studies will provide needed clarity into the control mechanism of the pathogenesis of frozen shoulder and help identify new therapeutic targets for its treatment. Author's Conclusion: Studies characterizing the pathophysiology of FS are inconclusive but suggest both inflammation and fibrosis of the joint capsule mediated by	

		cytokines, growth factors, MMPs, and immune cells. Variations in diagnostic criteria, timing of sampling, and techniques used for these analyses might affect the reported results and conclusions. To enhance our understanding for the disease continuum, better characterizing the biology of these processes at clearly defined stages will be needed. Further basic studies that use standardized protocols are imperative to identify the role of cytokines, growth factors, MMPs, and immune cells.	
Methodical Notes			
Funding Sources: COI: None Study Quality: Heterogeneity: Publication Bias: None Notes:			

1.4

Cui, J. et al. Molecular biology of frozen shoulder-induced limitation of shoulder joint movements. J Res Med Sci. 22. 61. 2017			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Review article Databases: not specified Search period: - Inclusion Criteria: Studies on molecular biology of frozen shoulder Exclusion Criteria:	Intervention: Comparison:	Primary: Secondary: Results: Inflammatory mediators, for example, COX-1, COX-2, IL-1, IL-6, TNF-α, etc., might play an important role in induction, regulation, and remission of inflammation. Inflammation gives rise to adhesion, edema, and pain, which lead to reduced activity of the shoulder joint and subsequent fibrosis of the shoulder joint and thickening and adhesion of the shoulder capsule. Cytokines such as IGF-2, ASIC, TGF-β, MMPs, and TIMPs might be involved in the fibrotic changes in frozen shoulder.	

		Particularly, the balance disorder between TGF-β and MMPs may play a very significant role in fibrosis development of the frozen shoulder. They contribute to increased expression of collagen Type I and Type III, fibrosis and the shoulder joint, contracture and thickening of the shoulder capsule, and eventually limitation of shoulder movements. hyperlipidemia maybe an independent risk factor for frozen shoulder but few studies about this currently. Some adipokine hormones, such as adiponectin and leptin, had been reported to have proinflammatory and catabolic roles in OA. It is worth to investigate whether they are associated with frozen shoulder. Author's Conclusion: Current molecular biological studies have largely proved that inflammation and fibrosis are the basic pathological changes of frozen shoulder. However, the trigger of frozen shoulder is still unclear, which might be immune reaction, degenerative changes, microinjury, etc. Future molecular biological studies on the limitation of shoulder movements in frozen shoulder may continue to focus on cytokines associated with inflammation and fibrosis as well as mechanisms of their interaction and regulation.	
Methodical Notes			

Funding Sources: Study supported by the National Natural Science Foundation of China; the Guangdong Provincial Science and Technology Department and the Shenzhen Science Technology Innovation Council. COI: none Study Quality: - Heterogeneity: Publication Bias: - Notes:

1.5

NEWCASTLE - OTTAWA Checklist: Case Control

Cui, J. et al. RNAsequence analysis of samples from patients with idiopathic adhesive capsulitis. Mol Med Rep. 16. 7665-7672. 2017			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Casecontrol study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates:	Total no. patients: 7 Patient characteristics: - Inclusion criteria: idiopathic adhesive capsulitis samples (part of shoulder capsule, subacromial bursa and synovial) control: normal tissues (some part of the shoulder capsule, subacromial bursa and synovial from the acromioclavicular dislocation patients). Exclusion criteria:	Interventions: Getting Samples. RNA-seq and quality analysis of raw data. Calculation of expression values and identification of differentially expressed genes. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway analysis. Protein-protein interaction (PPI) analysis. Cytoscape analysis. Comparison:
Notes	Author's conclusion: The data have provided important insights into the transcriptional regulation of gene expression. We found 24 genes to be downregulated and 147 genes to be up-regulated in disease tissues vs. controls, and this finding may be used to identify therapeutic targets. However, it is still necessary to validate the DEGs identified in this study in large patient populations and elucidate their specific functions in the pathogenesis of idiopathic adhesive capsulitis.		
Outcome Measures/results	Primary DEG Secondary	Results: A total of 188 DEGs were identified and it was observed that 150 of these were upregulated and 38 were downregulated. It was hypothesized that various nutrient associated proteins may be associated with idiopathic adhesive capsulitis. The Matrix metalloproteinase family of proteins (MMPs), may exhibit a key role in the formation of abnormal collagen cross-links.	

1.6

Xu, Q. et al. Association of MMP3 genotype with susceptibility to frozen shoulder: a case-control study in a Chinese Han population. Genet Mol Res. 15. . 2016			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Case-Control study	Funding sources: Conflict of Interests: none Randomization: Blinding: Dropout rates:	Total no. patients: 255 Patient characteristics: Inclusion criteria: Insidious onset of pain and stiffness with a clinical reduction in the range of motion, a >50% reduction in	Interventions: DNA samples from the peripheral blood of all participants. The SNPs were then genotyped using Real- Time PCR. Comparison:

		external rotation, and without an underlying radiologic abnormality. All patients were required to have had symptoms for a minimum of 3 months. Exclusion criteria: Inappropriate diagnosis of idiopathic frozen shoulder. Other medical conditions that may complicate the pathologic process.	
Notes:	Author's conclusion: The data demonstrated that the MMP3 rs650108 variant was significantly associated with increased frozen shoulder susceptibility in a Chinese Han population.		
Outcome Measures/results	Primary Association between MMP3 polymorphisms and haplotypes and frozen shoulder. Secondary	Results: The rs591058, rs650108, and rs679620 polymorphisms in the MMP3 gene were genotyped in 112 subjects diagnosed as having frozen shoulder and in 143 healthy controls. rs650108 was found to be significantly associated with an increased risk of frozen shoulder. For other single nucleotide polymorphisms, no statistically significant associations with frozen shoulder were found.	

1.7

Lho, Yun-Mee et al. Inflammatory cytokines are overexpressed in the subacromial bursa of frozen shoulder. Journal of Shoulder and Elbow Surgery. 22. 666-672. 2013			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Case-control	Funding sources: Tha authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article. Conflict of Interests: - Randomization: - Blinding: - Dropout rates:	Total no. patients: 21 Patient characteristics: Inclusion criteria: Global restriction of passive shoulder motion with normal findings on plain radiographs No pathologic findings regarding the rotator cuff, labrum, long head of the biceps, or acromioclavicular joint on magnetic resonance imaging No risk factors such as diabetes, cardiovascular disease, or thyroid disease. The diagnosis of frozen shoulder was confirmed by arthroscopic findings of hypervascular synovitis and a thickened rotator	Interventions: Patients underwent shoulder arthroscopy. A joint capsule specimen was taken from the rotator interval, and a subacromial bursa specimen was taken from the site between the supraspinatus and the acromion. Total RNA was extracted from the joint capsule and subacromial bursa specimens for gene analysis. Tissue samples were also embedded in paraffin for immunohistochemistry analysis. Comparison:

		interval and capsule. Exclusion criteria:	
Notes:	Author's conclusion: Elevated levels of inflammatory cytokines in the subacromial bursa may be associated with the pathogenesis of inflammation evolving into fibrosis.		
Outcome Measures/results	Primary Expression of inflammatory citokines (IL-1a, IL-1b, TNF-a, COX-1, and COX-2) Secondary	Results: IL-1a, IL-1b, TNF-a, COX-1, and COX-2 were expressed at significantly high levels in the joint capsules of the frozen shoulder group compared with those of the control group. Intriguingly, IL-1a, TNF- a, and COX-2 were also expressed at significantly high levels in the subacromial bursae of the frozen shoulder group compared with those of the control group. Immunohistochemical analysis showed increased expression of COX-2 in both the joint capsules and subacromial bursae of the frozen shoulder group.	

1.8

Ha, Eunyoung et al. Melatonin Plays a Role as a Mediator of Nocturnal Pain in Patients with Shoulder Disorders. The Journal of Bone and Joint Surgery-American Volume. 96. e108-1-6. 2014			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Case-control	Funding sources: he biospecimens for this study were provided by the Keimyung Human Bio- Resource Bank, a member of the National Biobank of Korea, which is supported by the Ministry of Health, Welfar and Family Affairs. Conflict of Interests: - Randomization: - Blinding: - Dropout rates: -	Total no. patients: 53 Patient characteristics: - Inclusion criteria: All patients with a rotator cuff tear or frozen shoulder had persistent symptoms, including nocturnal pain, despite having had a minimum of three months of conservative treatment. Exclusion criteria: Patients who had been treated with a corticosteroid injection within a month before surgery were excluded.	Interventions: joint capsule samples were obtained from the rotator interval, and subacromial bursa samples were obtained from the site between the supraspinatus and the acromion with the use of arthroscopic punch forceps. Synovial tissue from patients with knee osteoarthritis was obtained for in vitro study involving the use of primary cultured fibroblast-like synoviocytes. Assessment of messenger RNA (mRNA) and expression or protein level of MTNR1A, MTNR1B, and ASIC3. With the use of primary cultured synoviocytes investigation of the effect of melatonin as a pain mediator. Comparison:
Notes	Author's conclusion: melatonin may play a role as a mediator of nocturnal pain with a rotator cuff tear or frozen shoulder, and this effect may be mediated via melatonin receptors.		
Outcome Measures/results	Primary MTNR1A, MTNR1B, and ASIC3	Results: MTNR1A, MTNR1B, and ASIC3 expression was significantly increased in both	

	expression Secondary in vitro: effect of melatonin as a pain mediator (expression of MTNR1A and MTNR1B in primary cultured fibroblast-like synoviocytes treated with proinflammatory cytokines).	the rotator cuff tear and frozen shoulder groups compared with the control group of patients with shoulder instability. Interleukin-1b (IL-1b) and tumor necrosis factor-a (TNF-a) significantly stimulated the expression of MTNR1A and MTNR1B in primary cultured fibroblast-like synoviocytes treated with proinflammatory cytokines. Melatonin treatment at a physiological concentration (10 nM) induced ASIC3 expression and IL-6 production. Treatment with luzindole, a melatonin-receptor antagonist, reversed melatonin- stimulated ASIC3 expression and IL-6 production

1.9

Kalson, N. S. et al. Reduced telomere length is associated with fibrotic joint disease suggesting that impaired telomere repair contributes to joint fibrosis. PLoS One. 13. e0190120. 2018			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: Case-control study	Funding sources: This work was supported by MR/ K1001949/1 and WT086755MA to DAM to fund fibrosis research work in Newcastle; NK is supported by grants from the Wellcome Trust and Royal College of Surgeons of Edinburgh; Wellcome Trust, European Community's Seventh Framework Programme to FW (FP7/2007-2013). The study also receives support from the National Institute for Health Research (NIHR)- funded BioResource, Clinical Research Facility and Biomedical Research Centre based at Guy's and St Thomas' NHS Foundation Trust in partnership with King's College London. SF is funded by the Pain Relief Foundation and FW by Arthritis Research UK and EU FP7 Painomics project. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the	Total no. patients: 5200 Patient characteristics: 1992-2008 Inclusion criteria: TWins UK register: Responses to the questions 'Have you ever had pain or stiffness in the following joints? left knee/right knee/left hip/right hip'; 'have you undergone a total knee or total hip replacement?'; and 'been diagnosed with frozen shoulder or Dupuytren's con-tracture?' (fibrotic conditions Exclusion criteria:	Interventions: Mean leukocyte telomere length (LTL) was measured using a qPCR-based technique Comparison: Association between the three traits of interest (joint stiffness, TJR and fibrotic conditions) and telomere length.

	manuscript. Conflict of Interests: - Randomization: - Blinding: Participants were not aware of a specific hypothesis related to joint stiffness or joint replacement being tested in this study, nor was the temporal relationship of the traits explored. Dropout rates: -		
Notes	Author's conclusion: Defects in telomere repair contribute to joint fibrosis, and that fibrosis shares a common mechanistic pathway in different organs. Therapeutic strategies to combat telomere shortening may offer novel treatments for fibrotic joint disease.		
Outcome Measures/results	Primary Telomere length Secondary	Results: Multivariable logistic regression analyses showed a significant association between telomere length and fibrotic conditions (hip stiffness, knee stiffness and frozen shoulder, $p = \leq 0.002$) even after taking age into account. No association was found between TJR and telomere length.	

Ryan, V. et al. The pathophysiology associated with primary (idiopathic) frozen shoulder: A systematic review. BMC Musculoskelet Disord. 17. 340. 2016			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematic review Databases: Medline, Embase, CINAHL, AMED, BNI and Cochrane Library Search period: inception - 2nd May 2014 Inclusion Criteria: Studies on primary Frozen Shoulder with combinations of imaging, histological or biochemical analysis of the glenohumeral joint Exclusion Criteria: Participants with any form of secondary frozen shoulder, such as	Intervention: Comparison:	Primary: Secondary: Results: Thirteen observational studies (involving 417 shoulders) were included in the review. Eight studies reported magnetic resonance imaging or arthrography findings and 5 recorded histological findings. When reported mean ages of the participants ranged from 40.0 to 59.8 years. Duration of symptoms ranged from 0 to 30 months. The majority of studies (n = 7) were assessed to be of moderate risk of bias, two studies at high risk and the remaining four were	Sofka CM, Ciavarra GA, Hannafin JA, Cordasco FA, Potter HG. Magnetic resonance imaging of adhesive capsulitis: correlation with clinical staging. HSS J. 2008;4(2):164–9. doi:10.1007/s11420-008-9088-1. Lho YM, Ha E, Cho CH, Song KS, Min BW, Bae KC, et al. Inflammatory cytokines are overexpressed in the subacromial bursa of frozen shoulder. J Shoulder Elbow Surgery. 2013;22(5):666–72. doi:10.1016/j.jse.2012.06.014. Carbone S, Napoli A, Gumina S. MRI of adhesive capsulitis of the shoulder: distension of the bursa in the superior subscapularis recess is a suggestive sign of the pathology. Eur J Radiol. 2014;83(2):345–8. doi:10.1016/j.ejrad. 2013.10.017. Carrillon Y, Noel E, Fantino O, Perrin- Fayolle O, Tran-Minh VA. Magnetic resonance imaging findings in idiopathic adhesive capsulitis of the shoulder. Rev Rhum Engl Ed. 1999;66(4):201–6. Kilian O, Pfeil U, Wenisch S, Heiss C, Kraus R, Schnettler R. Enhanced alpha 1(I) mRNA expression in frozen shoulder and dupuytren tissue. Eur J Med Res. 2007;12(12):585–90. Li JQ, Tang KL, Wang J, Li QY, Xu HT, Yang HF, et al. MRI findings for frozen shoulder

diabetes, rotator cuff disease or trauma. previous interventions directly to the shoulder joint (e.g. steroid injections, arthrographic distension, capsular release, manipulation under anaesthesia)		rated as low risk of bias. Study characteristics were poorly reported and there was widespread variety observed between studies in respect of data collection methods and inclusion criteria employed. Pathological changes in the anterior shoulder joint capsule and related structures were commonly reported. Imaging identified pathological changes occurring in the coracohumeral ligament, axillary fold and rotator interval. Obliteration of the subcoracoid fat triangle also appeared to be pathognomonic. Histological studies were inconclusive but suggested that immune, inflammatory and fibrotic changes where associated with primary frozen shoulder. Author's Conclusion: This systematic review presents a summary of what is currently known about the tissue pathophysiology of primary frozen shoulder. Further studies that use standardised inclusion and exclusion criteria and investigate changes in naïve tissue at different stages of the condition are required.	evaluation: is the thickness of the coracohumeral ligament a valuable diagnostic tool? PLoS One. 2011;6(12):e28704. doi:10.1371/journal. pone.0028704. Manton GL, Schweitzer ME, Weishaupt D, Karasick D. Utility of MR arthrography in the diagnosis of adhesive capsulitis. Skeletal Radiol. 2001;30(6):326–30. Song KD, Kwon JW, Yoon YC, Choi SH. Indirect MR arthrographic findings of adhesive capsulitis. AJR Am J Roentgenol. 2011;197(6):W1105–9. doi:10.2214/AJR.10.6099. Xu Y, Bonar F, Murrell GA, et al. Enhanced expression of neuronal proteins in idiopathic frozen shoulder. J Shoulder Elbow Surgery. 2012;21(10):1391–7. doi:10.1016/j.jse.2011.08.046. Zhao W, Zheng X, Liu Y, Yang W, Amirbekian V, Diaz LE, et al. An MRI study of symptomatic adhesive capsulitis. PLoS One. 2012;7(10):e47277. doi:10.1371/journal.pone.0047277. Bunker TD. Frozen shoulder: unravelling the enigma. Ann R Coll Surg Engl. 1997;79(3):210–3. Neviaser JS. Arthrography of the shoulder joint: study of the findings in adhesive capsulitis of the shoulder. Study of the findings in adhesive capsulitis of the shoulder. J Bone Joint Surgery. 1962;44-A:1321–59. Uhthoff HK, Boileau P. Primary frozen shoulder: global capsular stiffness versus localized contracture. Clin Orthop Relat Res. 2007;456:79–84. doi:10.1097/BLO.0b013e318030846d.
Methodical Notes			

Funding Sources: The Health Foundation (http://www.health.org.uk/) is gratefully acknowledged for providing funding to support this project. COI: none Study Quality: Two reviewers independently conducted the searches, screening, data extraction and assessment of Risk of Bias using the Cochrane Risk of Bias Assessment Tool for non-Randomised Studies of Interventions (ACROBAT-NRSI). Heterogeneity: Two reviewers (HB and VR) reviewed the articles for eligibility and inclusion with a third reviewer (JL) available in the event of consensus not being achieved. Article titles were used to identify relevant studies. Following this, eligibility was checked and recorded on a checklist designed for the review that incorporated PICO criteria. A data extraction form was developed for the review based upon the University of York, Centre for Reviews and Dissemination (2009) guidance. Publication Bias: A risk of bias tool specifically for use in pathophysiology reviews was not found, meaning there may be specific domains relevant for this type of review which have not been appraised or discussed. With only a minority of studies being assessed as low risk of bias, the findings of this review may contain systematic bias. Notes:

Lubis, A. M. et al. Matrix metalloproteinase, tissue inhibitor of metalloproteinase and transforming growth factorbeta 1 in frozen shoulder, and their changes as response to intensive stretching and supervised neglect exercise. J Orthop Sci. 18. 519-27. 2013			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 2 Study type: Casecontrol and RCT	Funding sources: Conflict of Interests: none Randomization: yes Blinding: no Dropout rates: -	Total no. patients: 100 Patient characteristics: Inclusion criteria: at least 50 % loss of general shoulder range of motion (ROM) and painful shoulder movement to all direction Exclusion criteria: Case: calcifying tendonitis and osteoarthritis of the shoulder not received corticosteroids or nonsteroidal anti-inflammatory drugs Control: no shoulder disorder medical history, physical examination, and/or standard laboratory and imaging examinations of rheumatoid arthritis, osteoarthritis, tumors, corneal ulceration, periodontitis, liver or lung fibrosis, atherosclerosis, multiple sclerosis, aortic aneurism, receiving MMP inhibitor, posttraumatic, diabetes mellitus or thyroid disease.	Interventions: 1. Serum levels of MMP-1, MMP-2, TIMP-1, TIMP-2, and TGFb1 from frozen shoulder and normal subjects by using ELISA. 2.Physical examination within the Frozen Shoulder group and randomization in stretching and supervised neglect. Comparison: Baseline evaluation showed a comparable abbreviated Constant score between intensive stretching and supervised neglect groups
Notes:	Author's conclusion: Serum levels of MMP-1, MMP-2, TIMP-1, TIMP-2, and TGF-b1 may be associated to frozen shoulder. Active stretching can improve frozen shoulder better than supervised neglect, as demonstrated by the improvement of Constant score.		

Outcome Measures/results	Primary Serum levels of MMP-1, MMP-2, TIMP-1, TIMP-2, and TGF-b1 from frozen shoulder and normal subjects. Secondary Serum levels of MMP-1, MMP-2, TIMP-1, TIMP-2, and TGF-b1 from stretching group and supervised neglect group before and after physical exercise. Abbreviated Constant score of stretching group and supervised neglect group before an after physical exercise.	Results: Baseline MMP-1 and MMP-2 levels were sig- nificantly lower, while TIMP-1, TIMP-2, and TGF-b1 levels were significantly higher in frozen shoulder group than in control. Increased MMPs and decreased TIMPs were significantly greater after intensive stretching than after supervised neglect exercise. Abbreviated Constant score improvement was significantly higher in intensive stretching group than in supervised neglect group.

1.10

Inhalt: 2 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Case Control

Booker, S. J. et al. The colonisation of the glenohumeral joint by Propionibacterium acnes is not associated with frozen shoulder but is more likely to occur after an injection into the joint. Bone Joint J. 99-B. 1067-1072. 2017			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: case control study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: 7/53 = 13%	Total no. patients: 46 Patient characteristics: patients were indentified pre-operatively in one clinic by three shoulder surgeons, no time specification Inclusion criteria: patients aged > 18 years with stage II idio-pathic frozen shoulder according to Codman's criteria4(stiffness, end range pain, night pain), who had failed con-servative treatment and those with recurrent instability ofthe shoulder requiring stabilisation Exclusion criteria: cognitive impair-ment, a history of cancer, previous surgery to the shoulder,a previous fracture of the shoulder and a previous disloca-tion of the shoulder in the	Interventions: patients undergoing either an arthroscopic capsular release or stabilisation Comparison: biopsies taken from the subcutaneous fat and capsule of the shoulder at the time of surgery

		frozen shoulder group only, or abody mass index of > 35 kg/m2. Patients found to haveunexpected abnormal intra-articular pathology at the timeof arthroscopy were also excluded	
Notes	Author's conclusion: This paper finds no evidence to suggest P. acnes causes frozen shoulder. Patients who harbour P. acnes in their fat and have a glenohumeral injection are likely to have their joint capsule also colonised by P. acnes.		
Outcome Measures/results	Primary The prevalence of P. acnes and other microbes was recorded Secondary influence of independent variables including a pre-operative glenohumeral injection, fat colonisation and gender,	Results: There was no statistically significant association between the surgical pathology and capsular colonisation with P. acnes (p = 0.18)	

NEWCASTLE - OTTAWA Checklist: Cohort

Bunker, T. D. et al. Association between Propionibacterium acnes and frozen shoulder: a pilot study. Shoulder Elbow. 6. 257-61. 2014			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: prospective cohort study	Funding sources: Funding was received from The Royal Devon and Exeter Research Fund. This covered the cost of the microbiological processing. All other costs were part of the patients' normal care. No influence on the study design came from the funding source. Conflict of Interests: Declaration of conflicting interests None Randomization: - Blinding: - Dropout rates: -	Total no. patients: 10 Recruiting Phase: - Inclusion criteria: diagnosed with stage II idiopathic frozen shoulder (severe pain, night pain, stiffness), normal radiographs, over 18 Exclusion criteria: history of cancer, previous shoulder surgery, previous fracture/dislocation, bmi>35	Interventions: two biopsies of tissue of shoulder capsule Comparison: two biopsies of subcutaneous fat of same patient
Notes	small cohort (10 patients) Author's conclusion: rejection of null hypothesis that there is no relation between infection and fs		
Outcome Measures/results	Primary extneded culture an PCR for microbial nucleic acid Secondary	Results: 8 of 10 patients had positive findings in extended culture	

Inhalt: 1 Literaturstelle

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Alsubheen, S. A. et al. Effectiveness of Nonsurgical Interventions for Managing Adhesive Capsulitis in Patients With Diabetes: A Systematic Review. Arch Phys Med Rehabil. . . 2018			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 1 Study type: This systematic review evaluated the effectiveness of nonsurgical interventions for managing adhesive capsulitis (AC) in patients with diabetes on pain, function, and range of motion Databases: Data Sources: MEDLINE and other databases were searched for studies published in the last 20 years Search period: see 3.1 Inclusion Criteria: Randomized controlled trials (RCTs) that assessed AC in people with diabetes and implemented 1 or a combination of physiotherapeutic interventions, corticosteroids, and manipulation under anesthesia (MUA) were eligible for inclusion Exclusion Criteria: Studies that included participants with other shoulder disorders such as rotator cuff tendinitis or osteoarthritis were not eligible for inclusion. Further, studies that excluded patients with diabetes or included patients with diabetes	Population: Trials that included adult participants aged 18 years or older with a stated diagnosis of AC and diabetes (both types) were eligible to be included in this review Intervention: Trials that randomly implemented 1 or a combination of the following nonsurgical interventions were eligible for inclusion in this review: physiotherapeutic interventions, corticosteroid injection, MUA, hydrodilatation, and suprascapular nerve block Comparison: Because of the lack of similar interventions, a narrative synthesis was conducted, and metaanalyses were not performed	Primary: Studies that assessed at least 1 outcome measure that is validated and commonly used to examine shoulder pain or function were eligible for inclusion. These measures could include measures of shoulder pain using visual analog scale (VAS), measures of ROM using standard or electronic goniometer, and measures of shoulder function and disability such as the Shoulder Pain and Disability Index (SPADI), Constant Shoulder Score (CSS), American Shoulder and Elbow Surgeons (ASES), and Simple Shoulder Test questionnaires. Secondary: - Results: Our search strategy generated 165 articles on MEDLINE and 650 articles in total (fig 1). After applying the inclusion and exclusion criteria, 10 studies were eligible to be included. Of these 10 studies, 2 studies were excluded because the full study was not published (conference abstracts). Eight studies were evaluated, and data from these studies were extracted and summarized in table	Kim YS, Lee HJ, Lee DH, Choi KY. Comparison of high- and low-dose intra-articular triamcinolone acetonide injection for treatment of primary shoulder stiffness: a prospective randomized trial. J Shoulder Elbow Surg. 2017 Feb;26(2):209-215. doi: 10.1016/j.jse.2016.09.034. Epub 2016 Nov 30. PMID: 27914846. Ekim AA, İnal EE, Gönüllü E, Hamarat H, Yorulmaz G, Mumcu G, Yılmazer Ş, Kaya DS, Kuzgun S, Çolak E, Orhan H. Continuous passive motion in adhesive capsulitis patients with diabetes mellitus: A randomized controlled trial. J Back Musculoskelet Rehabil. 2016 Nov 21;29(4):779-786. doi: 10.3233/BMR-160689. PMID: 27002662. Youssef AR, Ibrahim AM, Ayad KE. Mulligan mobilization is more effective in treating diabetic frozen shoulder than the Maitland technique. Int J Physiother 2015;2:804-10. Soliman AS, Mahmoud AM, Serry ZM, Dawood FG. Therapeutic effects of low-level laser and reflexology on adhesive capsulitis in elderly type 2 diabetic patients. Asian J Pharm Clin Res 2014;7:317-21. Dehghan A, Pishgooei N, Salami MA, Zarch SM, Nafisi-Moghadam R, Rahimpour S, Soleimani H, Owlia MB. Comparison between NSAID and intra-articular corticosteroid injection in frozen shoulder of diabetic patients; a randomized clinical trial. Exp Clin Endocrinol Diabetes. 2013 Feb;121(2):75-9. doi: 10.1055/s-0032-1333278. Epub 2013 Feb 20. PMID: 23426700. Roh YH, Yi SR, Noh JH, Lee SY, Oh JH, Gong HS, Baek GH. Intra-articular corticosteroid injection in diabetic patients with

treated in 1 group with patients without diabetes were also excluded from this review unless these studies' authors provided a subgroup analysis of patients with diabetes.		1. Among these 8 studies, 2 studies were translated from Chinese33 and Persian34 languages into English language by 2 native language speakers Author's Conclusion: Very low-quality Evidence indicated that a combination of physiotherapeutic interventions (exercises, modalities, mobilization), NSAIDs, and/or corticosteroid injections can have trivial to large effects in improving shoulder function or disability, ROM, and pain levels in managing AC in patients with diabetes.	adhesive capsulitis: a randomized controlled trial. Knee Surg Sports Traumatol Arthrosc. 2012 Oct;20(10):1947-52. doi: 10.1007/s00167-011-1776-6. Epub 2011 Nov 24. PMID: 22113218. Liang Q, Huang K, Wang X, Li Y. [Linearly polarized near-infrared irradiation combined with aerothermotherapy for treatment of frozen shoulder in diabetic patients]. Nan Fang Yi Ke Da Xue Xue Bao. 2012 Sep;32(9):1294-6. Chinese. PMID: 22985567. Guity MR, Ghaznavi AR. Manipulation of idiopathic frozen shoulder with and without concomitant intra-articular corticosteroid injection. Tehran Univ Med J 2007;65:12-6.
Methodical Notes			
Funding Sources: Joy C. MacDermid was supported by a Canadian Institutes of Health Research Chair in Gender, Work and Health and the James Roth Chair in Musculoskeletal Measurement and Knowledge Translation COI: - Study Quality: good Heterogeneity: good Publication Bias: - Notes: - lack of similar interventions - conclusion is limited due to the high risk of bias			

1.12

NEWCASTLE - OTTAWA Checklist: Case Control

Cho, C. H. et al. Serial Comparison of Clinical Outcomes After Arthroscopic Capsular Release for Refractory Frozen Shoulder With and Without Diabetes. Arthroscopy. 32. 1515-20. 2016			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective comparative study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: 8 of 45 lost to f/u (22,9%)	Total no. patients: 37 Patient characteristics: patients who underwent MUA andarthroscopic circumferential capsular release for re-fractory frozen shoulder between January 2007 andDecember 2011 Inclusion criteria: diagnosis of frozen shoulder, definedas limitation of motion by greater than 50% of that ofthe unaffected shoulder; absence of intrinsic andextrinsic shoulder pathology	Interventions: MUA andarthroscopic circumferential capsular releas Comparison: patients with diabetes taking medications for glucose control

		confirmed by magneticresonance imaging or ultrasonography; and persistentpain and limited motion despite a minimum of3 months of conservative treatment including medications, local injections including intra-articular or sub-acromial injections, or physiotherapy Exclusion criteria: bilateral involvement, autoimmunedisorders, and secondary frozen shoulder with thepresence of intrinsic or extrinsic shoulder pathologyincluding postsurgical, post-traumatic rotator cuff tears;glenohumeral arthritis; or cervical disk disorders	
Notes:	small number of patients Author's conclusion: These results provide supportive evidence suggestingthat the diabetes group had slower postoperativefunctional recovery until 12 months postoperatively,although arthroscopic capsular release for refractoryfrozen shoulder with and without diabetes yieldedsatisfactory clinical outcomes at thefinal follow-upexamination		
Outcome Measures/results	Primary The evaluation of clinical outcomes (ROM) wasconducted by an independent research coordinator. Thevisual analog scale (VAS) pain score; University of Cali-fornia, Los Angeles (UCLA) score; and American Shoulder and Elbow Surgeons (ASES) score were assessed. Secondary	Results: Both groups showed statistically significant improve-ment in VAS pain score, UCLA score, and ASES scoreduring the serial follow-up periods Slower improvement of ROM of diabetes group There were no significant differences between the 2groups in any assessed outcomes at thefinal follow-upexamination	

Mehta, S. S. et al. Comparative outcome of arthroscopic release for frozen shoulder in patients with and without diabetes. The Bone & Joint Journal. 96-B. 1355-1358. 2014			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: prospective case control study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: -	Total no. patients: 42 Patient characteristics: consecutive patients who underwentarthroscopic capsular release between 2007 and 2011 Inclusion criteria: lobal restric-tion of active and passive movements of the 1356S. S.	Interventions: arthroscopic capsularrelease as a day case under general anaesthesia in conjunc-tion with an intrascalene block Comparison: The study group

		MEHTA, H. P. SINGH, R. PANDEYTHE BONE & JOINT JOURNALshoulder, especially external rotation, (reduced to < 50% ofthat of the contralateral normal shoulder,) pain was presentboth at rest and movement and radiographs confirmed noother pathology. All patients underwent a trial of non-operative treatment including non-steroidal antiinflammatorymedication, steroid injections, physiotherapy and homeexercises for at least six months prior to surgery Exclusion criteria: Patients with a rheumatological disorder, cancer, neurolog-ical deficit, head injury and a disorder of the cervical spinewere excluded from the study. Patients with a history ofprevious surgery or manipulation of that shoulder werealso excluded	included patients with diabe-tes and a control group included patients whodid not have diabetes
Notes:	Author's conclusion: These results may be used when counselling diabetic patients for the outcome after arthroscopic treatment of frozen shoulder		
Outcome Measures/results	Primary modified Constant score was used as the outcome measure Secondary	Results: The results in diabetics were significantly worse than those in nondiabetics six months post-operatively ($p < 0.01$) with a tendency towards persistent limitation of movement two years after operation	

1.13

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Sabzevari, S. et al. One-stage surgical treatment for concomitant rotator cuff tears with shoulder stiffness has comparable results with isolated rotator cuff tears: a systematic review. J Shoulder Elbow Surg. 26. e252-e258. 2017			
Evidence Level/Study Types	P-I-C	Outcomes/Results	Literature References
Evidence level: 3 Study type: systematic review Databases: databases including MEDLINE, Embase, Cochrane Library, and Scopus Search period: last	Population: A total of 571 shoulders (460 shoulders in non-stiff group and 111 in stiff group) were included in these studies Intervention: The non-stiff group (isolated RCT) underwent	Primary: forward flexion, internal rotation, external rotation, abduction, pain, strenght, retear, CS, ASES, SST, complications (not all criteria in all studies) Secondary: Results: There were significant differences in preoperative ROM	Cho NS, Rhee YG. Functional outcome of arthroscopic repair with concomitant manipulation in rotator cuff tears with stiff shoulder. Am J Sports Med 2008;36:1323-9. http://dx.doi.org/10.1177/0363546508314402 Ho WP, Huang CH, Chiu CC, Lee CH, Chen CH, Leu TH, Chuang TY. One-stage arthroscopic repair of rotator cuff tears with shoulder stiffness. Arthroscopy. 2013 Aug;29(8):1283-91. doi: 10.1016/j.arthro.2013.05.024. PMID: 23906268. McGrath JP, Lam PH, Tan MT, Murrell GA. The effect of concomitant glenohumeral joint capsule release during rotator cuff repair--a

search was performed on September 3, 2016 Inclusion Criteria: We included studies with level of evidence of I to IV that met all 3 following criteria: (1) compared the 2 arms of isolated RCT vs. RCT with concomitant shoulder stiffness, (2) received no physical therapy before surgery, and (3) reported data of preoperative and postoperative ROM and functional outcomes at 3, 6, and at least 12 months after arthroscopic surgery Exclusion Criteria: Exclusion criteria were studies with 1 arm other than the specified arms, follow-up of <1 year, and lacking data of functional outcome and ROM.	RCR with or without acromioplasty in all studies. The stiff group (RCT with concomitant shoulder stiffness) underwent RCR, acromioplasty, and MUAin 1 study,4 whereas the other 3 studies added capsular release along with these interventions. Comparison: The non-stiff group (isolated RCT) underwent RCR with or without acromioplasty in all studies. The stiff group (RCT with concomitant shoulder stiffness) underwent RCR, acromioplasty, and MUAin 1 study,4 whereas the other 3 studies added capsular release along with these interventions.	between stiff and non-stiff groups. At final follow-up, there were no statistical differences in all ROM between the 2 groups Author's Conclusion: Concomitant surgical treatment of nonmassive RCT and moderate shoulder stiffness in 1 stage may have comparable results to the surgical treatment of RCT in patients without preoperative stiffness	comparative study. J Shoulder Elbow Surg. 2016 May;25(5):714-22. doi: 10.1016/j.jse.2015.10.005. Epub 2016 Jan 27. PMID: 26826766. Oh JH, Kim SH, Lee HK, Jo KH, Bin SW, Gong HS. Moderate preoperative shoulder stiffness does not alter the clinical outcome of rotator cuff repair with arthroscopic release and manipulation. Arthroscopy. 2008 Sep;24(9):983-91. doi: 10.1016/j.arthro.2008.06.007. PMID: 18760204.
Methodical Notes			
Funding Sources: - COI: The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article Study Quality: good Heterogeneity: - Publication Bias: - Notes: Four level III studies met the inclusion criteria			

Welche Literatur ? Laut LL 117 Neviaser, stimmt nicht

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Suh, C. H. et al. Systematic review and meta-analysis of magnetic resonance imaging features for diagnosis of adhesive capsulitis of the shoulder. Eur Radiol. 29. 566-577. 2019			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 3 Study type: Meta-Analyse (Fall-Kontroll-Studien) Databases: MEDLINE/EMBASE, studies limited in english Search period: 01.02.2018 Inclusion Criteria: "adhesive capsulitis" or "frozen shoulder" were combined with "magnetic resonance imaging" or "magnetic resonance arthrography" as follows: [("adhesive capsulitis") OR ("frozen shoulder")] AND [(magnetic resonance imaging) OR (MR imaging) OR (MRI) OR (magnetic resonance arthrography) OR (MR arthrography)] Exclusion Criteria: Animal study Not in field of interest Review articles/guidelines /consensus/statements Case reports/letters /editorials/conference /abstracts	Population: In total, 15 studies were included, and 74 overlapping descriptors were subsumed under six features. Intervention: MRT Comparison: demographic and clinical characteristics of patients, including the mean age, sex, patient number, patient popula- tion, and clinical features; study characteristics, including authors, publication years, affiliations, patient recruitment dura- tions, the study design, the reference standard, and blinding to the reference standard; MR characteristics, including the scanner type, technical parameters, and interpretations; and the diagnostic performance of MRI features of ACS, which was based on a 2 × 2 table including the number of true-positive, false-positive, false-negative, and true-negative results. If two or more reviewers independently assessed the diagnostic ac- curacy, the result with the highest accuracy was extracted.	Primary: diagnostic accuracy of MRI features of ACS Secondary: - Results: n total, 15 studies were included, and 74 overlapping descriptors were subsumed under six features. All six features were found to be informative for ACS diagnosis [coracohumeral ligament thickening: DOR, 13; 95% CI, 6-29; fat obliteration of the rotator interval (RI): DOR, 8; 95% CI, 3-24; RI enhancement: DOR, 44; 95% CI, 14-141; axillary joint capsule enhancement: DOR, 52; 95% CI, 27-98; inferior glenohumeral ligament (IGHL) hyperintensity: DOR, 31; 95% CI, 8-115; IGHL thickening: DOR, 28; 95% CI, 11-70]. The sensitivity and specificity of enhancement of the RI and axillary joint capsule and IGHL hyperintensity were > 80%. Author's Conclusion: Six informative MRI features for ACS diagnosis were identified in this study with RI and axillary joint capsule enhancement and IGHL hyperintensity showing the highest diagnostic accuracy. Informative features observed on non-arthrogram MRI can be as helpful as features observed on	Ahn KS, Kang CH, Kim Y, Jeong WK (2015) Diagnosis of adhesive capsulitis: comparison of contrast-enhanced MRI with noncontrast-enhanced MRI. Clin Imaging 39:1061–1067 Carbone S, Napoli A, Gumina S (2014) MRI of adhesive capsulitis of the shoulder: distension of the bursa in the superior subscapularis recess is a suggestive sign of the pathology. Eur J Radiol 83:345–348 Carrillon Y, Noel E, Fantino O, Perrin-Fayolle O, Tran-Minh VA (1999) Magnetic resonance imaging findings in idiopathic adhesive capsulitis of the shoulder. Rev Rhum Engl Ed 66:201–206 Chi AS, Kim J, Long SS, Morrison WB, Zoga AC (2017) Noncontrast MRI diagnosis of adhesive capsulitis of the shoulder. Clin Imaging 44:46–50 Connell D, Padmanabhan R, Buchbinder R (2002) Adhesive capsulitis: role of MR imaging in differential diagnosis. Eur Radiol 12:2100–2106 Emig EW, Schweitzer ME, Karasick D, Lubowitz J (1995) Adhesive capsulitis of the shoulder: MR diagnosis. AJR Am J Roentgenol 164:1457–1459

		direct magnetic resonance arthrography for ACS diagnosis	Gokalp G, Algin O, Yildirim N, Yazici Z (2011) Adhesive capsulitis: contrast-enhanced shoulder MRI findings. J Med Imaging Radiat Oncol 55:119–125 Gondim Teixeira PA, Balaj C, Chanson A, Lecocq S, Louis M, Blum A (2012) Adhesive capsulitis of the shoulder: value of inferior glenohumeral ligament signal changes on T2-weighted fat-saturated images. AJR Am J Roentgenol 198:W589–W596 Jung JY, Jee WH, Chun HJ, Kim YS, Chung YG, Kim JM (2006) Adhesive capsulitis of the shoulder: evaluation with MR arthrography. Eur Radiol 16:791–796 Lee SY, Park J, Song SW (2012) Correlation of MR arthrographic findings and range of shoulder motions in patients with frozen shoulder. AJR Am J Roentgenol 198:173–179 Mengiardi B, Pfirrmann CW, Gerber C, Hodler J, Zanetti M (2004) Frozen shoulder: MR arthrographic findings. Radiology 233:486–492 Sasanuma H, Sugimoto H, Fujita A et al (2017) Characteristics of dynamic magnetic resonance imaging of idiopathic severe frozen shoulder. J Shoulder Elbow Surg 26:e52–e57 Song KD, Kwon JW, Yoon YC, Choi SH (2011) Indirect MR arthrographic findings of adhesive capsulitis.

			AJR Am J Roentgenol 197:W1105–W1109 Yoon JP, Chung SW, Lee BJ et al (2017) Correlations of magnetic resonance imaging findings with clinical symptom severity and prognosis of frozen shoulder. Knee Surg Sports Traumatol Arthrosc 25:3242–3250 Zhao W, Zheng X, Liu Yet al (2012) An MRI study of symptomatic adhesive capsulitis. PLoS One 7:e47277
Methodical Notes			
Funding Sources: Kein Funding COI: The authors of this manuscript declare no relation- ships with any companies, whose products or services may be related to the subject matter of the article. Study Quality: • meta-analysis • performed at one institution Heterogeneity: Substantial heterogeneity was considered present for four features, namely fat obliteration of RI, RI enhancement, IGHL hyperintensity, and IGHL thickening. However, the threshold effect was not shown (Table 4). Considerable heterogeneity was not observed for axillary joint capsule enhancement. Publication Bias: Regarding patient selection, 11 studies [15–23, 25, 26] were considered to have a high bias risk because they were case-control studies with nonconsecutive en- rollment. The index test in all studies [12–26] was evaluated after blinding from the reference standard. An unclear bias risk was considered for 12 studies [12–15, 18–21, 23–26] using clinical or radiological criteria for reference standard assessment and 14 studies [12–15, 17–26] that did not report the time interval be- tween MRI and the reference standard. Notes:			

4.3

NEWCASTLE - OTTAWA Checklist: Case Control

Ahn, K. S. et al. Diagnosis of adhesive capsulitis: comparison of contrast-enhanced MRI with noncontrastenhanced MRI. Clin Imaging. 39. 1061-7. 2015			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fall-Kontroll	Funding sources: kA Conflict of Interests: Nein Randomization: Nein Blinding: Ja Dropout rates: 0	Total no. patients: 103 (53 Kontrollen) Patient characteristics: Januar bis Oktober 2011 Inclusion criteria: Klinische Diagnose einer Schultersteife Exclusion criteria: previous history of trauma (n = 3) and operation (n = 2), neoplasm (n = 18), infection (n = 7), inflammatory arthritis (n = 5), calcific tendinitis (n = 8), neuropathy including brachial plexus pathology (n = 2), and images obtained with	Interventions: MRT mit und ohne KM Comparison:

		an inappropriate protocol for evaluation of shoulder internal derangements (n = 4)	
Notes:	Author's conclusion: Non-CE and CE MRI are helpful in confirming the clinical diagnosis of AC. CEMRI may improve assessment of the rotator interval and diagnostic confidence in patients with AC.		
Outcome Measures/results	Primary Signalstärke/Dicke Gelenkkapsel, KM-Aufnahme Signalveränderungen des Rotatorenintervalls Secondary	Results: Axillary capsular thickening and T2 hyperintensity (sensitivity=92-94%; specificity=53-64%), and enhancement of the axillary capsule and rotator interval (sensitivity=92-98%; specificity=38-64%) were helpful in diagnosing AC. Inter-observer reliability was highest with axillary joint capsule enhancement.	

4.4

Inhalt: 4 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Case Control

Cheng, X. et al. Adhesive Capsulitis of the Shoulder: Evaluation With US-Arthrography Using a Sonographic Contrast Agent. Sci Rep. 7. 5551. 2017			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fall-Kontroll	Funding sources: National Natural Science Foundation of China (81571700) Conflict of Interests: kA Randomization: Nein Blinding: Ultraschall (2 Radiologen), Dropout rates: 0	Total no. patients: 90 (45 Kontrollen) Patient characteristics: Oktober 2013 bis September 2015 Inclusion criteria: FS: Clinical diagnosis of frozen shoulder, and MRI confirmation of the diagnosis MR examination performed less than 24 hours after USarthrography; US and US-arthrography of the shoulder performed at our institution according to a standardized protocol. Exclusion criteria: previous shoulder surgery or systemic inflam- matory arthritis (e.g., rheumatoid arthritis, seronegative spondyloarthropathy, and psoriatic arthritis) diagnosis of rotator cuff tear.	Interventions: Ultraschall (+/- direkte Arthrgraphie mit Sono-KM) Comparison: natives MRT
Notes:	Author's conclusion: Consequently, US-arthrography was more effective method than US for assessment of AC. Filling defects of joint cavity and synovitis-like abnormality in the joint are characteristic US- arthrography findings for diagnosing AC		
Outcome Measures/results	Primary -thickness of CHL and inferior	Results: Patients with AC had a significantly thickened coracohumeral ligment (CHL, 3.1	

	glenohumeral capsule were obtained, rotator interval abnormality and biceps sheath effusion was observed and characterized as present or absent - Rotator interval abnormality was diagnosed with the detecting of hypoechoic echotexture or increased vascular flow in rotator interval. - Quantitative criteria included volume of the injection fluid, the maximal height and depth of the axillary recess were determined on long-axis view (anatomic sagittal oblique plane) images (Fig. 2), and the width of this structure was determined on transverse (anatomic axial oblique plane) images (Fig. 3). The volume of the axillary recess was calculated in milliliters by using the equation for elliptical volume, v = 0.52 (hwd), where h is height, w is width, and d is depth. The following qualitative criteria were evaluated and characterized as present or absent: (a) filling defects of joint cavity (Fig. 4), (b) synovitis-like abnormality in the joint, (c) extravasation of contrast material into the muscle around the needle track, (d) extravasation of contrast material into rotator cuff and/or subacromilsubdeltoid (SASD) bursa. Synovitis-like abnormality was diagnosed on the basis of evidence of synovial irregularity and/or fibrous debris floating	mm) and inferior capsule (3.5 mm) on US, and a decreased volume of axillary recess (1.14 ml) on US-arthrography compared with the control subjects (1.59 ml). Filling defect (91.1%) and synovitis-like abnormality (75.6%) in the joint on US-arthrography were more sensitive than that of rotator interval abnormality (71.1%), thickened CHL more than 3 mm (64.4%), thickened inferior capsule more than 3.5 mm (66.7%) on US respectively for diagnosis of AC.

	in the joint fluid MRT: (a) thickening of the CHL to 4 mm or more, (b) thickening of the capsule and synovium greater than 3 mm in the axillary recess, (c) partial or complete obliteration of the subcoracoid fat triangle Secondary -	

Homsi, C. et al. Ultrasound in adhesive capsulitis of the shoulder: is assessment of the coracohumeral ligament a valuable diagnostic tool?. Skeletal Radiol. 35. 673-8. 2006			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fall-Kontroll	Funding sources: kA Conflict of Interests: kA Randomization: Nein Blinding: Nein Dropout rates: The CHL was visualized in 92 out of 121 shoulders in the asymptomatic group (76.0%), in 227 out of 360 shoulders in the painful shoulder group (63.0%), in 15 out of 17 shoulders in the adhesive capsulitis group (88.2%) and in 334 out of 498 shoulders overall (66.9%).	Total no. patients: 498 (17 FS, 360 Painful Shoulder, 121 Kontrollen) Patient characteristics: kA Inclusion criteria: Arthrographischer Nachweis FS Kontrollgruppe: absence of previous injuries, surgery or significant symptoms in the shoulder at any time. Painful Shoulder: referred for evaluation of myotendinous and/or bursal disorder. Exclusion criteria: FS: major trauma and/or surgery	Interventions: Ultraschall Arthrographie Comparison:
Notes:	Author's conclusion: CHL depic- tion can be achieved in a reasonable proportion of shoulders. A thickened CHL is suggestive of adhesive capsulitis. More studies are needed for clinical validation of these data.		
Outcome Measures/results	Primary CHL-Dicke Secondary Anatomic variation in pectoralis minor muscle insertion	Results: The CHL was visualized in 92 out of 121 shoulders in the asymptomatic group (76.0%), in 227 out of 360 shoulders in the painful shoulder group (63.0%), and in 15 out of 17 shoulders in the adhesive capsulitis group (88.2%). The average thickness of the CHL was significantly greater in adhesive capsulitis (3 mm) than in the asymptomatic (1.34 mm) and painful (1.39 mm) shoulders. No significant difference was found between asymptomatic and painful shoulders.	

Lee, J. C. et al. Adhesive capsulitis: sonographic changes in the rotator cuff interval with arthroscopic correlation. Skeletal Radiol. 34. 522-7. 2005			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fall-Kontroll	Funding sources: kA Conflict of Interests: kA Randomization: Nein Blinding:	Total no. patients: 30 FS, 10 Normale Kontrolle, 100 V.a. RMR Patient characteristics: 3	Interventions: Ultraschall-Untersuchung (Bmode/ Doppler) Arthroskopie (10 von

	Radiologe und Chirurg nicht Dropout rates: 0	Jahre (a.e. 2002-2005) Inclusion criteria: history of shoulder pain and stiffness for longer than 15 weeks that was increasing in nature and most severe at rest, as well as restricted motion greater than 30o in two or more planes on examination. Exclusion criteria: abnormal radiograph, a history of rheumatoid arthritis, or previous shoulder surgery or trauma. Exclusion criteria for the control group were any clinical suspicion of adhesive capsulitis, a history of poly-myalgia rheumatica, or previous trauma	30 FSPatienten zusätzlich MRT) Comparison:
Notes:	Author's conclusion: Sonography can provide an early accurate diagnosis of adhesive capsulitis by assessing the rotator interval for hypoechoic vascular soft tissue.		
Outcome Measures/results	Primary Veränderungen des Rotatorenintervalls, Bizepssehne, sGHL Secondary -	Results: Twenty-six patients (87%) demonstrated hypoechoic echotexture and increased vascularity within the rotator interval, all of whom had had symptoms for less than 1 year. Three patients had hypoechoic echotexture but no increase in vascularity, and one patient had a normal sonographic appearance. All patients were shown to have fibrovascular inflammatory softtissue changes in the rotator interval at arthroscopy commensurate with adhesive capsulitis. None of the volunteers or the patients with a clinical diagnosis of rotator cuff tear showed such changes.	

Tandon, A. et al. Sonography in diagnosis of adhesive capsulitis of the shoulder: a case-control study. J Ultrasound. 20. 227-236. 2017			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Fall-Kontroll	Funding sources: kA Conflict of Interests: Nein Randomization: Nein Blinding: Ja (Ultraschalluntersuchung und MRT) Dropout rates: kA	Total no. patients: 90 (30 Kontrollen, 30 Painful shoulder (tendon, bursal and joint pathology)) Patient characteristics: kA Inclusion criteria: Sixty patients who presented to the orthopedic out-patient department with shoulder pain were included, and 30 controls were age- and sex-matched	Interventions: Ultraschall- und MRT-Untersuchung Comparison:

		subjects with no shoulder complaints. Exclusion criteria: All patients who refused consent, had a history of major trauma, surgery to the shoulder, and patients in whom MRI was contraindicated were excluded from the study	
Notes:	Author's conclusion: Sonography revealed a high accuracy for diagnosing AC of the shoulder and in differentiating it from other causes of painful shoulder. It, thus, has the potential to be adopted as a preferred imaging modality.		
Outcome Measures/results	Primary Veränderungen der Gelenkkapsel, des Rotatorenintervalls, und des CHL inklusive Dynamischer Untersuchungen in der Ultraschalluntersuchung. Secondary -	Results: Sonographic visualisation of CHL (96.7%) and its mean thickness (1.2 mm) were highest in the AC group (p \ 0.01). A cut-off value of 0.7 mm was found to be accurate (sensitivity 93.1%, specificity 94.4%) for diag- nosing AC. Increased soft tissue in the rotator interval was seen in the AC group and had a high sensitivity of 86.2% and specificity of 92.8%. On dynamic scanning, restriction of external rotation was specific (sensitivity 86.2%, speci- ficity 92.8%), whereas restriction in abduction was non- specific (specificity 6.7%). Inter-observer agreement was substantial for CHL visualisation (kappa 0.66). Overall, sonography, using multiple parameters, revealed a high sensitivity and specificity (100 and 87%, respectively) for diagnosis of AC of the shoulder.	

6.1

OXFORD (2011) Appraisal Sheet: RCT

Abd Elhamed, H. B. et al. Effect of strengthening lower trapezius muscle on scapular tipping in patients with diabetic frozen shoulder: a randomized controlled study. Biomedical research (india). 29. 442?447. 2018		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: randomized controlled study Number of Patient: 35 Recruitung Phase: Rekrutiert wurden Patienten, die in einer Poliklinik der Fakultät für Physiotherapie der Universität Kairo überwiesen wurden. Inclusion Criteria: Die Einschlusskriterien waren Patienten, die Schulterschmerzen und Einschränkungen im ROM hatten oder einer Dauer von mindestens 3 Monaten und bei denen innerhalb der letzten 3 Monate keine andere Behandlung als Analgetika	Intervention: Die Patienten erhielten 3 Sitzungen/W für 4 w. Die Patienten der Gruppe A:15 hatten die traditionelle Behandlung in Form von therapeutischem Ultraschall, Mobilisierung und Heimprogramm. Comparison: Gruppe B: 15 Patienten hatten Kräftigungsübungen für die unteren Trapezfasern des Trapezius sowie traditionelle Behandlungen.	Primary: Die Ergebnisvariablen funktioneller Schmerz und ROM Secondary: nicht genannt/erhoben Results: Die Ergebnisse zeigten im Vergleich zur Vorbehandlung für die Gruppe A eine offensichtliche Verringerung der Skapularkippung ((A-T)-Abstand) an allen getesteten Positionen in der Nachbehandlungsphase. Zusätzlich zeigte sich nach der Behandlung eine signifikante Verbesserung der Skapulakippung ((A-T)-Distanz von der Supineposition, der Rückenlage mit Skapula-

verschrieben wurde und keine röntgenologischen Auffälligkeiten aufanteroposterioren, axillären oder skapulösen Röntgenaufnahmen der Schulter gefunden wurden Exclusion Criteria: Ausschlusskriterien waren bilaterale Schulterbeteiligung, Vorgeschichte früherer Operationen an der Schulter, Schulterfraktur, Krebs, glenohumerale oder akromioklavikuläre Arthritis, Entzündungsstörungen, Blutungsstörungen, Vorliegen von schwerer Osteoporose, Lungenerkrankungen, jegliche neuromuskulären Störungen, Schwangerschaft und mangelnde Bereitschaft zur Teilnahme an der Studie		Retraktion, der Stehposition und der Stehposition mit Skapula-Retraktion) der Gruppe B im Vergleich zur Gruppe A. Die Ergebnisse zeigten eine signifikante Verbesserung der Skapulierspitze ((A-T)-Distanz) der Gruppe B im Vergleich zur Gruppe A. Author's Conclusion: "Die Stärkung der Fasern des unteren Trapezius und das traditionelle Physiotherapie-Programm führen bei Patienten mit DFS zu einer Verbesserung der Skapularkippung mehr als die traditionelle Physiotherapie allein"
Methodical Notes		
Funding Sources: Keine Angaben COI: Keine Angaben Randomization: Dreißig Patienten mit DFS wurden nach dem Zufallsprinzip in zwei gleiche Gruppen eingeteilt, indem ein gemischtes Kartenspiel verwendet wurde. Blinding: keine Angaben Dropout Rate/ITT-Analysis: Keiner der Probanden schied nach der Randomisierung aus der Studie aus. Notes:		

Balci, N. C. et al. Acute effect of scapular proprioceptive neuromuscular facilitation (PNF) techniques and classic exercises in adhesive capsulitis: a randomized controlled trial. J Phys Ther Sci. 28. 1219-27. 2016		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 4 Study type: a randomized controlled trial Number of Patient: 53 Recruitung Phase: Subjects were recruited for this study from the Baskent University Department of Physical Medicine and Rehabilitation outpatient clinic between March to July 2014. Inclusion Criteria: Diagnosed as unilateral AC (Stage II) with magnetic resonance imaging by a doctor; Pain in the shoulder for at least 3 months Exclusion Criteria: History of shoulder surgery or manipulation under anesthesia; Neurologic deficits affecting shoulder functioning during daily activities, Pain or disorders of the cervical spine, elbow, wrist, or hand; Other pathological conditions involving the shoulder (rotator cuff tear, tendinitis, etc.)	Intervention: The intervention was applied in a single session. PNF and physiotherapy modalities (PNF group, n=18): The therapist applied a hot pack, TENS, and US before scapular PNF. A classic exercise group and physiotherapy modalities (classic exercise group, n=18): In the classic exercise group, the physiotherapy modalities were applied using the same procedure as described above. After the physiotherapy modalities, stretching strengthening exercises were assigned to the patients. Comparison: Only physiotherapy modalities (control group, n=17) The intervention was applied in a single session. In the control group, the therapist applied physiotherapy modalities using the same procedure as described above. No exercise	Primary: Scapular dyskinesis - Lateral Scapular Slide Test (LSST) was assessed before and immediately after the one-hour intervention. The power analysis for our study showed a power of 90% with scapular dyskinesis as the primary outcome. --> ansonsten keine weitere Unterscheidung in primäre und sekundäre Outcomes Secondary: Pain intensity - VAS, Active shoulder flexion and abduction ROM - goniometer, and function - The Simple Shoulder Test (SST) were assessed before and immediately after the onehour intervention. Results: There were significant differences in VAS results in the PNF and control groups ($p<0.05$), but not in the classic exercise group ($p>0.05$). After the intervention, the VAS results showed no significant differences between any groups ($p>0.05$). The

	program was carried out for this group.	LSST results of the groups before and after the intervention showed no significant differences shown (p>0.05). We found that there were significant improvements in shoulder ROM in all groups (p<0.05). However, shoulder flexion and abduction ROM results showed no significant difference between groups after the intervention (p>0.05). Before and after the intervention, there were statistically significant differences in the SST results of all the groups (p<0.05). After the intervention, the SST results showed no significant difference between the groups (p>0.05). Author's Conclusion: Proprioceptive neuromuscular facilitation, classic exercise, and physiotherapy modalities had immediate effects on adhesive capsulitis in our study. However, there was no additional benefit of exercises in one session over physiotherapy modalities. Also, an effective treatment regimen for shoulder rehabilitation of adhesive capsulitis patients should include scapular exercises. In conclusion, all groups showed improvements in shoulder motions and functionality. Pain intensity was reduced in the capular PNF and control groups, but not in the classic exercise group. There were no change in LSST scores as a result of the interventions. No significant difference was found between the groups in our investigation of the immediate effects of the treatment methods. Although stretching exercises are very important in AC, we did not apply stretching in this study because scapular PNF patterns and techniques affect shoulder ROM by enhancing the scapular rhythm.
Methodical Notes		
Funding Sources: not mentioned COI: not mentioned Randomization: Simple randomization and a random-number table were used as the method of sequence generation for patients. Blinding: - Dropout Rate/ITT-Analysis: The intervention was applied in a single session: no drop out Notes: The intervention was applied in a single session: initial effects of scapular proprioceptive		

neuromuscular facilitation techniques and classic exercise interventions → deshalb um ein Level weiter abgestuft

Celik, D. Comparison of the outcomes of two different exercise programs on frozen shoulder. Acta Orthop Traumatol Turc. 44. 285-92. 2010		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 4 Study type: RCT Number of Patient: 22 weibliche und 7 männliche Patienten Recruitung Phase: Die Patienten wurden zum ersten Mal von verschiedenen Orthopäden der Istanbul Faculty of Medizin, Abteilung für Orthopädie und Traumatologie, die auf die Schulter spezialisiert sind. Inclusion Criteria: Einschlusskriterien waren: 1) ROM in Außenrotation, Abduktion und Beugung weniger als 50% im Vergleich zur anderen Schulter; 2) normale Röntgenaufnahme (anteroposterior, lateral); 3) sekundäre Schultersteife mit MRT, die einen kleinen Riss der Rotatorenmanschette zeigt; und 4) sekundäre Schultersteife mit Typ II subakromiales Impingement-Syndrom bei körperlicher Untersuchung und MRT. Exclusion Criteria: Ausschlusskriterien waren: 1)Radikulopathie, 2) Thoracic-Outlet- Syndrom, 3)rheumatologische Erkrankungen, 4) Frakturen und Tumore der oberen Extremität und 5) neurologische Erkrankungen, die Muskelschwäche in der Schulter verursachen.	Intervention: Die Übungsprogramme der Gruppen waren wie folgt: Gruppe I: Glenohumeral ROMÜbungen. Comparison: Gruppe II: Glenohumerale ROMund SkapulothoracaleÜbungen.	Primary: Die Ergebnisse der Behandlung wurden mit modifiziertem Constant score und visueller Analogskala (VAS) vor Beginn der Behandlung und nach 6 und 12 Wochen ausgewertet; die ROM (Flexion und Innen- und Außenrotation) wurde mit einem Goniometer passiv in den gleichen Intervallen gemessen. Secondary: Nicht angegeben Results: Beide Gruppen einzeln betracahtet: Bei der getrennten Auswertung der Gruppen zeigten beide Gruppen am Ende der 6- und 12- wöchigen Behandlung nach dem modifizierten Constant-Score, VAS und ROM-Befund eine signifikante Verbesserung. Als die Gruppen verglichen wurden, gab es keinen statistisch signifikanten Unterschied im modifizierten Constant-Score in den Wochen 0, 6 oder 12. Die VAS war nach 6 Wochen in Gruppe II verbessert; der Unterschied war statistisch signifikant (p=0,05). Nach 12 Wochen zeigte Gruppe II im Vergleich zu Gruppe I ein verbessertes ROM der Flexion; dieser Unterschied war ebenfalls statistisch signifikant (p=0,005) Author's Conclusion: Zusammenfassend gibt die Autorin an, dass skapulathorakale Übungen zusätzlich zu glenohumeralen Übungen wirksam sein können, um Schmerzen zu lindern und das glenohumerale ROM zu erhöhen, indem sie den skapulohumeralen Rhythmus fixieren
Methodical Notes		
Funding Sources: nicht genannt COI: nicht genannt Randomization: Ja, die Patient*innen wurden randomisiert. Blinding: nein Dropout Rate/ITT-Analysis: n.a. Notes: Keine vergleichbaren Gruppen, keine Verblindung, mehr Frauen als Männer, in einer Gruppe doppelt so viele mit sek. Frozen Shoulder		

Dundar, U. et al. Continuous passive motion provides good pain control in patients with adhesive capsulitis. Int J Rehabil Res. 32. 193-8. 2009		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: RCT Number of Patient: 57 Patienten mit primär gefrorener Schulter wurden in diese Studie eingeschlossen. Recruitung Phase: nicht näher erläutert Inclusion Criteria: Die Diagnose einer Schultersteife wurde auf der Grundlage der Anamnese, der körperlichen Untersuchung, der Röntgenbefunde und gelegentlich der Magnetresonanztomographie gestellt. Wenn der Verdacht auf eine Pathologie der Rotatorenmanschette bestand, wurde eine Magnetresonanztomographie der Schulter durchgeführt Patienten mit allmählich zunehmenden Schulterschmerzen und Steifheit [primäre Schultersteife mit Phase 1 (schmerzhafte Phase) und/oder Phase 2 (steife Phase)] wurden in die Studie eingeschlossen. Exclusion Criteria: Patienten mit Rotatorenmanschettenpathologie wurden von der Studie ausgeschlossen. Fälle von sekundärer Schultersteife und Patienten mit einer steifen Schulter in Verbindung mit einer Fraktur, Arthritis, abnormalen Röntgenaufnahmen der Schulter oder einem signifikanten Trauma wurden ausgeschlossen.	Intervention: Die erste Gruppe (n= 29) (CPM-Gruppe) erhielt CPM-Behandlungen durch eine allmähliche Erhöhung der Bewegung für 1 h einmal täglich für 20 Tage während eines Zeitraums von 4 Wochen (5 Tage pro Woche). Alle Patienten in beiden Gruppen wurden außerdem in ein standardisiertes Heimübungsprogramm eingewiesen, das aus passiven ROM- und Pendelübungen bestand und bis zur 12. Woche täglich durchgeführt wurde. Die Heimübungen wurden von einem Physiotherapeuten bei einer Gelegenheit vorgeführt und anschließend schriftlich beraten. Comparison: Die zweite Gruppe (n= 28) (CPT-Gruppe) erhielt ein tägliches physiotherapeutisches Behandlungsprotokoll durch einen Physiotherapeuten, einschließlich aktiver Dehnungs- und Pendelübungen für 1 h einmal täglich für 20 Tage über einen Zeitraum von 4 Wochen (5 Tage pro Woche).	Primary: Alle Patienten wurden hinsichtlich Schmerzen (Visuelle Anologeskala) in Ruhe, Schmerzen bei Bewegung, Schmerzen in der Nacht, Messung des ROM (Schulterbeugung, Abduktion, Innen- und Außenrotation wurden beurteilt), konstanter funktioneller Schulter-Score und des Schulter-Schmerz- und Behinderungsindex (SPADI) bewertet. Alle Beurteilungsparameter wurden zu Studienbeginn sowie in den Wochen 4 und 12 gemessen. Secondary: nicht näher erläutert Results: Die Ergebnisse der Wochen 4 und 12 zeigten eine signifikante Verbesserung für alle Parameter in beiden Gruppen. Wenn wir jedoch die prozentualen Veränderungen der VASScores (Schmerzen in Ruhe, bei Bewegung und in der Nacht) und der Schulter-Schmerzindex- Scores sowohl in Woche 4 als auch in Woche 12 im Vergleich zu den Werten vor der Behandlung verglichen, war die Schmerzreduktion in der CPM-Gruppe signifikant besser. Der Vergleich der prozentualen Veränderungen anderer Parameter zeigte keinen signifikanten Unterschied zwischen den beiden Gruppen. Author's Conclusion: Zusammenfassend deuten die Ergebnisse dieser Studie darauf hin, dass die CPM-Behandlung in der frühen Phase der Behandlung der Adhäsiv-Kapsulitis eine bessere Schmerzkontrolle bietet als das CPTProtokoll. Die Ergebnisse weisen jedoch auch darauf hin, dass eine CPM-Anwendung keine Überlegenheit gegenüber der CPT am Schulter-ROM, der funktionellen Fähigkeit, aufweist. Daher glauben wir, dass die CPM routinemässig während adhäsiver Kapsulitisrehabilitationsprogramme mit CPT eingesetzt werden könnte
Methodical Notes		
Funding Sources: keine COI: keine Randomization: nicht näher beschrieben, wie methodisch randmosiert wurde Blinding: nicht näher erläutert Dropout Rate/ITT-Analysis: Notes:		

Horst, R. et al. Activity- vs. structural-oriented treatment approach for frozen shoulder: a randomized controlled trial. Clin Rehabil. 31. 686-695. 2017		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: Double-blinded, randomized,	Intervention: Two therapists treated their patients at an	Primary: The McGill pain questionnaire (pain) and

experimental study Number of Patient: 66 Recruitung Phase: Before being enrolled in the study, potential participants received oral and written information about the study and had to provide written informed consent. Following, patients were asked to complete a questionnaire describing their case history and symptoms to assess eligibility. Inclusion Criteria: Patients who had been diagnosed with limited range of motion, pain in the shoulder region and had received a prescription for physiotherapy treatment at the Krakow Rehabilitation Centre in Krakow, Poland, by an orthopaedic specialist. No limitations pertaining to age and gender were made. Exclusion Criteria: Patients were excluded if they had additional symptoms of dizziness and a case history of headaches, pain and/or limited range of motion in the cervical spine and/or temporomandibular joint.	activity level (activity-oriented group) (n = 33). Patients receiving treatment during the performance of activities. All subjects received a total of 10 therapeutic sessions in a time period of two weeks for a duration of 30 minutes each. Comparison: The other two therapists treated their patients at a structural level (structuraloriented group) (n = 33). The structural-oriented group was treated at the structural level according to conventional physical therapy methods: Manual therapy and proprioceptive neuro-muscular facilitation techniques. All subjects received a total of 10 therapeutic sessions in a time period of two weeks for a duration of 30 minutes each.	modified Upper Extremity Motor Activity Log (ADL) were used for patient's subjective evaluation. Tests for range of motion were performed using a 12-inch plastic BASELINE goniometer. The muscle testing procedures from Daniels and Worthingham were applied to assess strength of all major muscles of the shoulder. Secondary: - Results: The study was conducted between 2011 and 2012. In more than half of the outcomes, the activityoriented group experienced significantly greater improvements in comparison with the structural-oriented group. The activity-oriented group revealed significantly greater improvements in the performance of daily life activities and functional and structural tests compared with the group treated with conventional therapy after 10 days of therapy and at the three-month follow-up ($p < 0.05$). Regarding the activities of daily living, a greater percentage of the activity-oriented group compared with the structural-oriented group was able to perform activities number 4 and 5 after two weeks of intervention and activities number 1, 3 and 5 at 3-month followup ($p < 0.05$). Concerning pain, the activity-oriented group had a significantly greater reduction from baseline to the 3-month follow-up than the structural-oriented group ($p < 0.05$). With respect to range of motion, significant group differences in favour of the activityoriented group were found for changes in *adduction, and external and internal rotation* from baseline to the second and third assessment. Changes in muscle strength of the flexors, adductors, abductors, internal rotators and external rotators from baseline to the end of the intervention and to the three-month follow-up were significantly higher in the activity-oriented group

		compared with the structural-oriented group ($p < 0.05$). Author's Conclusion: Clinical messages: An activity-oriented therapy programme has a larger and much more prolonged beneficial effect than structurally oriented therapy. Therapy based on performing activities seems to be more effective for pain reduction and the ability to perform daily life activities than conventional treatment methods.
Methodical Notes		
Funding Sources: The authors received no financial support for the research, authorship, and/or publication of this article. COI: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. Randomization: Prior to the first treatment, participants were randomly assigned to one of the two treatment groups by drawing a sealed envelope, which entailed either an even or an odd number. Patients who drew an even number were assigned to the activity-oriented group. Those who drew an odd number were assigned to the structural-oriented group. Blinding: One blinded therapist, who had no knowledge of which intervention the patients received, performed all tests. Participants in both groups did not receive any information about the kind of intervention or treatment they were receiving. Dropout Rate/ITT-Analysis: A total of 66 patients were statistically analysed,six patients were excluded. Notes:		

Kraal, T. et al. Corticosteroid injection alone vs additional physiotherapy treatment in early stage frozen shoulders. World J Orthop. 9. 165-172. 2018		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: RCT Number of Patient: 21 Recruitung Phase: Inclusion Criteria: Patients were eligible for participation if they exhibited clinical signs of FS, including pain and stiffness of the involved shoulder without preliminary trauma persisting for more than three months. The required level of pain was a minimum score of six out of ten on a numeric pain scale. Restriction of the passive ROM of the shoulder joint of more than 30° in external rotation and a second sirection (i.e., abduction and/or forward flexion) when compared to the unaffected contralateral side was required for inclusion. Conventional radiographs of the shoulder joint and ultrasound studies were used to rule out osteoarthritis and rotator cuff ruptures. Exclusion Criteria: Corticosteroid injection in the shoulder joint region in the previous 6 wk, previous surgery to the shoulder,	Intervention: Within two weeks after inclusion, patients in both study groups received an ultrasound-guided glenohumeral joint injection of 1 mL kenacort 40 mg in 4 mL lidocaine 1%, administered by an experienced radiologist. Both groups were informed about the possible self-limiting nature of FS, and received counseling about optional analgesics like acetaminophen, nonsteroidal anti-inflammatory drugs or tramadol, if needed. The non- PT group did not receive PT. Advice was given to try to use the affected arm in daily life activities within their pain limits. Comparison: Within two weeks after inclusion, patients in both study groups received an ultrasound-guided glenohumeral joint injection of 1 mL kenacort 40 mg in 4 mL lidocaine 1%, administered by an experienced radiologist. Both groups were informed about the possible self-limiting nature of FS, and received counseling about optional	Primary: Shoulder Pain and Disability Index (SPADI) at the 26 wk follow-up Secondary: Pain on average last week, and pain at night were scored on a ten-point numeric pain-rating scale (NPRS). Health-related quality of life was assessed using the RAND-36[31,32]. Passive ROM was measured in the standing position with the use of a goniometer. External rotation was measured in the horizontal plane, with the elbow at the side. Abduction was measured in the frontal plane and anteflexion in the sagittal plane. Patient satisfaction about their change in pain and function was assessed on a five-point Likert scale (“worse’’, ‘‘unchanged’’, ‘‘unsatisfactory improved’’, ‘‘satisfactory improved’’ and ‘‘good to very good improved”) Results: Twenty-one patients were included, 11 patients in the non-PT and ten in the PT group, with a mean age of 52 years. Both treatment groups showed a significant

systemic inflammatory disease, neurological disorder with impairment of the upper limb, and the use of anticoagulation therapy using a therapeutic dosage.	analgesics like acetaminophen, nonsteroidal anti-inflammatory drugs or tramadol, if needed. The non- PT group did not receive PT. Advice was given to try to use the affected arm in daily life activities within their pain limits. Patients in the PT group were referred to a participating physiotherapy clinic. All participating physiotherapists treated the referred study patients according to a standardized protocol, twice a week with a maximum duration of three months. This physiotherapy protocol was composed after a thorough literature review by the participating shoulder surgeons in accordance with two experienced shoulder-treating physiotherapists. The aim of the PT was to increase ROM of the shoulder, decrease pain, and restore the function of the shoulder for daily activities. Tissue irritability of the shoulder joint was taken into account to guide the intensity of the treatment. Passive mobilization techniques were used, except for Maitland grade five mobilizations. Attention was paid to scapulothoracic movement, with the purpose to improve the scapulohumeral kinematics. Also, active and autoassisted stretching techniques were part of the physiotherapy program. If there was an increase in pain lasting for more than four hours after the PT session, the next session had to be less intense. Hot packs, icing, and massage techniques were allowed to reduce pain. Transcutaneous electrical nerve stimulation, pulsed electromagnetic field, infrared, dry needling and medical taping were not allowed due to the lack of evidence of these treatment modalities in the treatment of FS.	improvement at 26 wk for SPADI score (non-PT: P = 0.05, PT: P = 0.03). At the 6 wk follow-up, median SPADI score was significant decreased in the PT group (14 IQR: 6-38) vs the non-PT group (63 IQR: 45-76) (P = 0.01). Pain decreased significantly in both groups but no differences were observed between both treatment groups at any time point, except for night pain at 6 wk in favor of the PT group (P = 0.02). Significant differences in all three ROM directions were observed after 6 wk in favor of the PT group (P ≤ 0.02 for all directions). A significantly greater improvement in abduction (P = 0.03)and external rotation (P = 0.04) was also present in favor of the PT group after 12 wk. RAND-36 scores showed no significant differences in healthrelated quality of life at all follow-up moments. At 26 wk, both groups did not differ significantly with respect to any of the outcome parameters. No complications were reported in both groups. Author's Conclusion: Additional physiotherapy after corticosteroid injection improves ROM and functional limitations in early-stage FSs up to the first three months
Methodical Notes		
Funding Sources: No information provided COI: No information provided Randomization: Yes Blinding: Yes Dropout Rate/ITT-Analysis: No dropouts Notes:		

Leung, M. S. et al. Effects of deep and superficial heating in the management of frozen shoulder. J Rehabil Med. 40. 145-50. 2008		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: A singleblinded, randomized controlled study Number of Patient: 30 Recruitung Phase: The diagnosis of frozen shoulder in the stiffness phase was made by an orthopaedic surgeon. Inclusion Criteria: Subjects were included if they had experienced shoulder pain and limited shoulder movement for at least 8 weeks. Exclusion Criteria: Subjects were excluded if they had a history of trauma to the shoulder, acute signs of inflammation over the shoulder, intrinsic shoulder pathology, were taking analgesic or antiinflammatory drugs, had metal implants, impaired sensation of hot and cold, were pregnant, or had a cardiac pacemaker.	Intervention: (i) Shortwave Diathermy (SWD) plus stretching (n = 10); (ii) Hot pack (HP) plus stretching (n = 10) A shortwave diathermy machine (Curapuls 419, Enraf Nonius, The Netherlands) with an operating frequency of 27.12 MHz was used to deliver the deep heating treatment. The subjects were positioned comfortably sitting on a wooden chair with their back and affected arm supported. A pair of disc electrodes was placed on the anteriorposterior aspects of the affected glenohumeral joint, separated by a hand'sbreadth from the surface of the body. The intensity of the current was adjusted according to the subject's subjective feeling of comfortable warmth. If the level of perceived heating changed during the application, the machine's output was adjusted to maintain the sensation of comfortable warmth throughout the treatment. For the HP group, an electrical hot pack sized 35.5 × 68.5 cm was used to deliver superficial heating. The temperature was set at 63°C. The subjects were informed that the only purpose of the heating was to produce a feeling of comfortable warmth. If they felt that the heat was excessive, the temperature of the electrical HP was adjusted immediately to ensure that the heat remained at a comfortably warm level only throughout the treatment. The subjects in the SWD and HP groups received the respective treatments 3 times per week for 4 weeks. Each treatment session lasted for 20 min. Immediately after the heat treatment, subjects were asked to perform 4 stretching exercises in the following fixed sequence. Comparison: (iii) stretching exercises alone (n = 10) All treatment groups received a standard set of shoulder	Primary: The American Shoulder and Elbow Surgeons (ASES) assessment form was used to measure the treatment outcomes in the present study. Pain level Activities of daily living Shoulder ROM Assessments were made prior to treatment at the baseline, at sessions 6 and 12, and at the 4-week follow-up session. Secondary: - Results: A significant improvement was seen in all groups in all outcome measures except for that of shoulder flexion range. The improvement in the shoulder score index and in the range of motion was significantly better in the deep heating group than in the superficial heating group. By session 12, the shoulder score index in the SWD group had increased by 63.4%, compared with 45.2% in the HP group and 38.4% in the stretching alone group. The overall within-group difference across the study period was significant in the 3 groups ($p < 0.001$). The between-group difference was significant ($p = 0.046$). There was no significant difference between the HP group and stretching alone group ($p > 0.05$). By session 12, the shoulder flexion range had increased by 13.9% in the SWD group and 3.5% in the HP group. By contrast, the range in the stretching alone group decreased by 4.2%. The within-group difference across the study period was significant only in the SWD group ($p = 0.002$) and a post hoc test showed that the range achieved by the SWD group was significantly wider than that achieved by the HP group ($p =0.025$). A between-group difference was found in session 6 ($p = 0.007$), session 12 ($p = 0.049$), and in the follow-up session ($p = 0.031$). However, after an adjustment was made using the Bonferroni Correction

	stretching exercises. stretching in external rotation, in flexion, followed by stretching in hand-behind-theback and cross-body adduction. They were asked to repeat the stretches 4 times. Each stretch was sustained for 30 sec, with 10 sec rest between each stretch. The subjects were asked to perform the stretching exercises at home every day.	(adjusted p-value = 0.0125), a significant group difference was maintained only in session 6. By session 12, the SWD group demonstrated a 14.5% gain in shoulder external rotation with arm by side, compared with 21.1% in the HP group and 22.6% in the stretching groups (Table IV). The overall within-group difference across the study period was significant (p = 0.008). There was significant between-group difference in the external rotation range (p = 0.009). The post hoc test showed that the SWD group achieved a greater external rotation range than did the HP group (p = 0.007). In all 3 treatment groups, the external rotation range of the shoulder with arm in 90° abduction tended to increase during the study period (within-group p = 0.011). By the 4-week follow-up session, the SWD group demonstrated a 17.4% cumulative increase, compared with 14.2% for the HP group, and 15.3% for the stretching alone group. The between-group difference was statistically significant among the 3 treatment groups (p = 0.021). The post hoc test indicated that the range in the SWD group was significantly greater than in the HP group (p = 0.016). The hand-behind-back distance decreased progressively over time (Table IV). By the 4-week follow-up session, there was a cumulative decrease in the group mean of 51.2% in the SWD group, 26.5% in the HP group, and 18.8% in the stretching group. The within-group difference across the study period was significant (p < 0.001). There was significant between-group difference in the hand-behind-back range (p = 0.004). The post hoc test showed that the gain in the hand-behind-back range achieved by the SWD group was significantly greater than that achieved by the HP group (p = 0.003). Author's Conclusion: The addition of

		deep heating to stretching exercises produced a greater improvement in pain relief, and resulted in better performance in the activities of daily living and in range of motion than did superficial heating.
Methodical Notes		
Funding Sources: not mentioned COI: not mentioned Randomization: Randomization was performed using an on-line randomization plane (http://www.randomization.com). Blinding: The rater was blinded to the group allocation. Dropout Rate/ITT-Analysis: None of the participants in any of the treatment groups dropped out throughout the study period. Notes: Merkmale --> Alter, Geschlecht: Es gab keine signifikanten Unterschiede zwischen den 3 Gruppen (alle p < 0,05) --> falsche Angabe der Signifikanz: p müsste größer als 0.05 sein, damit keine Unterschiede vorliegen. Gruppen sind augenscheinlich ähnlich. No significant difference (p > 0.05) was found among all of the outcome measures at the baseline. --> Gruppen sind hier z. T. augenscheinlich nicht ähnlich, obwohl der p-Wert "stimmt". Bsp. ROM Flex 129° - 118° - 138°, ROM AR 50° - 28° - 40°		

Mohamed, Ayman et al. Effect of Dynamic Scapular Recognition on Shoulder Range of Motion in Patients With Adhesive Capsulitis. Archives of Physical Medicine and Rehabilitation. 98. e57-e58. 2017		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: A test-retest randomized controlled study design was used. Number of Patient: 60 Recruitung Phase: All patients in this study were selected from the out patient clinic of Faculty of Physical Therapy, Beni-Suef University. All patients participated in this study after signing their informed consent for this study. This study was approved by the ethics committee of faculty of Physical Therapy, Beni-Suef University. Patients were recruited from April 2016 to December 2016. This study was prospectively registered with the registration number PACTR201602001463334 on 07/02/2016. Eighty patients were initially examined. Fifteen patients did not participate in this study. The excluded patients included ten patients (11.8%) who did not meet the selection criteria and four patients (5.9%) who participated only in the baseline assessment and did not continue the study. Ten patients did not meet the inclusion criteria because of new shoulder dislocations (4), subluxations (3), rheumatic disease (1), or shoulder surgery (2). Only sixty-six patients met these inclusion	Intervention: The physical therapy programmes for the two groups were equal in duration (40 min, 3 sessions/week for two months). Both the control and study groups received hot packs for 20 min and scapular mobilization for 5 min. The study group performed a dynamic scapular recognition exercise for 15 min. The scapular recognition exercise was performed by using an audible biofeedback device with wireless motion sensors (ViMove motionsensor system, DorsaVi, Victoria, Australia). The motion sensor was placed on the top of the spine of the scapula. The patient was asked to perform the maximum possible active shoulder abduction and try to concentrate on the movement of the scapula. The patient was encouraged to increase the movement of the scapula by increasing the volume of sound emitted by the device. The greater the movement of the scapula, the louder the sound produced by the biofeedback device. This exercise was performed for 20 min. All patients in this study approved of the frequency of 3 sessions/week and complied with their assigned treatments.	Primary: The primary outcome measure was scapular upward rotation. Secondary: The secondary outcome measures were the ROMs of shoulder flexion, abduction and external rotation as well as Shoulder pain and disability index (SPADI) scores. Results: Within-groups comparison After two weeks, there was a significant difference in scapular upward rotation in the study group ($P < .05$). This difference remained significant after two months and at the follow-up measurements in comparison to the baseline measurements ($P < .05$). In the study group, the means, standard deviation and (95% CI) at baseline, after two weeks, after two months and after six months were 15.36 ± 12.34, 19.83 ± 6.76 (16.78–21.36), 24.52 ± 7.67 (20.43–25.62), and 21.45 ± 7.81 (18.22–23.67), respectively. In the control group, after two weeks, there was no significant difference ($P > .05$). However, the difference became significant after two months in comparison to the baseline ($P < .05$). At follow-up, this difference remained significant in comparison to the baseline measurements. In the control group, the means, standard

criteria. Inclusion Criteria: The primary inclusion criterion was the inability of the patient to elevate the arm above 100 degrees in the plane of the scapula. Other inclusion criteria included unilateral shoulder adhesive capsulitis with these criteria, a limitation in both active and passive shoulder ROM and the presence of pain that interfered with performing activities of daily living. Exclusion Criteria: The exclusion criteria included the presence of any shoulder condition that is a contraindication for exercising the shoulder joint, such as cancer, active infection, active inflammatory disease, recent dislocations, subluxations, surgery and fractures around the shoulder region. Additionally, the patients were excluded if they had no signs of scapular dyskinesis.	The total number of sessions for all patients in each group was 24 sessions. Compliance in this study was defined as attendance of 22 sessions out of 24 sessions (92%). All patients met the compliance requirements of this study. The reasons given for missed exercise sessions were sickness (91%), ailing family members (6%) and weather conditions (3%). Comparison: In addition to hot packs and scapular mobilization, the control group performed a placebo active shoulder exercise with the uninvolved shoulder for 15 min. These active ROM exercises were performed in both the flexion and abduction directions for 20 repetitions/set, 5 sets/session.	deviation and (95% CI) at baseline, after two weeks, after two months and after six months were 16.44 ± 8.94, 17.34 ± 12.15 (14.29–21.76), 21.38 ± 10.35 (18.23–24.79), and 19.02 ± 7.72 (16.90–22.25), respectively. After two weeks, in the study group, there were significant differences in the ROMs of shoulder flexion and abduction ($P < .05$), and there was a nonsignificant difference in shoulder external rotation ($P > .05$). After two months and at the follow-up, there were significant differences in shoulder ROM of flexion abduction and external rotation in comparison to the baseline measurements ($P < .05$). In the study group, the means, standard deviation and (95% CI) for shoulder flexion at baseline, after two weeks, after two months and after six months were 89.03 ± 7.37, 98.12 ± 8.53 (95.09–101.76), 110.13 ± 11.73 (107.65–113.35), and 108.12 ± 10.11 (105.78–111.03), respectively. These values for shoulder abduction were 76.67 ± 6.02, 90.11 ± 11.12 (86.98–-93.05), 100.24 ± 7.83 (97.76–103.54), and 93.63 ± 8.23 (90.21–96.83), respectively. These values for shoulder external rotation were 44.13 ± 11.54, 50.32 ± 7.13 (48.56–54.13), 61.07 ± 8.03 (58.71–64.32), and 59.54 ± 11.01 (56.38–62.81), respectively. In the control group, after two weeks, there were nonsignificant differences in the ROMs of should flexion, abduction and external rotation ($P < .05$). After two months, there were significant differences in shoulder ROM of flexion, abduction and external rotation ($P > .05$). At the follow-up, the differences in shoulder ROM of flexion and abduction remained significant ($P < .05$), while the difference in shoulder external rotation was nonsignificant ($P > .05$). In the control group, the means, standard deviation and (95% CI) at baseline, after two

		weeks, after two months and after six months were 87.76 ± 12.37, 90.32 ± 9.16 (87.29–93.36), 99.40 ± 14.23 (96.37–101.86), and 97.52 ± 10.22 (94.76–- 101.19), respectively. These values for shoulder abduction were 76.40 ± 10.41, 85.13 ± 10.33 (81.45–87.55), 95.33 ± 12.16 (92.78–98.55), and 91.34 ± 7.24 (88.54–-94.06), respectively. These values for shoulder external rotation were 43.80 ± 11.38, 49.03 ± 9.56 (47.82–53.18), 56.21 ± 11.12 (53.02–60.09), and 50.38 ± 6.54 (47.92–-53.03), respectively. Shoulder pain and disability index: After two weeks, there were significant differences in both the study and control groups ($P < .05$). These differences remained significant after two months in both groups in comparison to the baseline measurements ($P < .05$). At follow-up, the difference remained significant for the study group ($P < .05$), while in the control group, this difference became nonsignificant once again ($P > .05$) in comparison to the baseline measurements. In the study group, the means, standard deviation and (95% CI) at baseline, after two weeks, after two months and after six months were 70.97 ± 3.45, 80.40 ± 10.23 (78.02–84.74), 91.00 ± 12.35 (88.54–94.77), and 89.34 ± 9.75 (86.70–93.24), respectively. In the control group, the means, standard deviation and (95% CI) at baseline, after two weeks, after two months and after six months were 72.32 ± 11.23, 77.34 ± 8.90 (74.45–80.65.08), 82.11 ± 8.29 (79.40–86.06), and 80.50 ± 12.14 (77.64–83.31), respectively. Between-group comparisons For scapular upward rotation, there were significant differences between the study and control groups after two weeks, after two months and after six months ($P < .05$). The mean differences (95% CI) of scapular upward rotation at

		baseline, after two weeks, after two months and after six months were 1.08, 2.49 (1.43–4.56), 3.14 (1.02–5.77) and 2.43 (1.34–5.29), respectively. For shoulder ROM results, there were significant differences in shoulder flexion and abduction between the study and control groups after two weeks, after two months and after six months ($P < .05$), while the difference between the control and study groups for shoulder external rotation was nonsignificant after two weeks ($P > .05$), and it was significant after two months and after six months ($P < .05$). The mean differences (95% CI) of shoulder flexion at baseline, after two weeks, after two months and after six months were 1.27, 7.80 (4.53–9.43), 10.73 (7.33–12.54), and 10.60 (6.92–13.67), respectively. These values for shoulder abduction were .27, 4.98 (2.56–6.23), 4.91 (2.02–7.78), and 2.29 (.99–5.67), respectively. These values for shoulder external rotation were .33, 1.92 (.20–4.32), 4.86 (2.12–7.80), and 9.16 (6.97–12.23), respectively. Regarding the SPADI results, there was a significant difference between the study and control groups after two weeks, two months and at follow-up ($P < .05$). The differences between the study and control groups are shown in Figure 6 and Table 3. The mean differences (95% CI) of SPADI at baseline, after two weeks, after two months and after six months were 1.35, 3.06 (1.98–6.45), 8.89 (5.43–11.86), and 8.84 (5.74–-11.26), respectively. Author's Conclusion: This study showed that a dynamic scapular recognition exercise significantly improves scapular upward rotation and the ROMs of shoulder flexion and abduction after two weeks. After two months and six months, this exercise improves scapular upward rotation; the ROMs of shoulder flexion, abduction, and external

		rotation; and SPADI scores. These improvements can persist for a period of six months after the exercise is performed.
Methodical Notes		
Funding Sources: Not mentioned COI: No potential conflict of interest was reported by the authors. Randomization: Patients were randomly assigned to 4 permuted blocks using computer software to balance the sample sizes among the two groups (study group and control group). The randomization was performed by a college staff member who was not involved in this study. Blinding: For reliable double blinding, two different licensed physical therapists who were blinded to the study procedures participated in this study. One of them performed the assessment, and the second performed the treatment. "Placebo" in control group Dropout Rate/ITT-Analysis: The data analysis was based on intention-to-treat analysis. Sixty-six patients met these inclusion criteria. Only sixty patients completed the whole study, including the six-month follow-up. Notes: A test-retest randomized controlled study design was used. →Test-retest method not further explained.		

Rawat, P. et al. Effect of rotator cuff strengthening as an adjunct to standard care in subjects with adhesive capsulitis: A randomized controlled trial. J Hand Ther. 30. 235-241 e8. 2017		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 42 Recruitung Phase: Menschen mit Kapselentzündung, die für Physiotherapie vorgesehen waren, wurden aus den ambulanten und stationären Abteilungen des Kasturba Medical College, Hospitals, Mangalore, rekrutiert. Inclusion Criteria: Die Patienten wurden eingeschlossen, wenn sie 1-3 Monate lang Schmerzen und Steifheit, eine Einschränkung des ROM in der Außenrotation, Abduktion und Flexion von weniger als 50% im Vergleich zur anderen Schulter, Schmerzen im Schlaf, Schwierigkeiten bei der Pflege, Verbandstätigkeiten und Aktivitäten in Schulterhöhe, hinter dem Rücken und über Kopf aufwiesen. Exclusion Criteria: Ausschlusskriterien waren Arthrose oder Anzeichen von Knochenschäden aufgrund von Trauma auf den Röntgenaufnahmen der betroffenen Schulter, Hypermobilität und Instabilität, neurologische Störungen, die Muskelschwäche in der Schulter verursachen, alle lokalen (Entzündung oder Infektion) oder systemischen (zerebrovaskulärer Unfall oder Myokardinfarkt) Erkrankungen, Nervenspannungstests an den	Intervention: Eine Gruppe erhielt TENS und Mobilisierung Comparison: Die andere Gruppe erhielt TENS, Mobilisierung und Rotatorenmanschettenverstärkung.	Primary: Schmerz, ROM und Funktion waren die primären Ergebnisse, die zwischen den beiden Gruppen analysiert wurden. Secondary: Zu Beginn der Studie war nur die Kraft der Schulteradduktoren zwischen den beiden Gruppen signifikant unterschiedlich (Tabelle 4). Beide Gruppen zeigten nach 4 Wochen Intervention einen hochsignifikanten Unterschied in der Kraft (P=.00). Im Vergleich zwischen den Gruppen nahm die Kraft in der Versuchsgruppe in allen Muskelgruppen mit Ausnahme der Beugemuskeln signifikant zu. Results: Nach der Behandlung: Am Ende von 4 Wochen (12 Behandlungssitzungen) wurden in der Versuchsgruppe hochsignifikante Veränderungen bei Schmerz, Funktionsniveau und Schulter-ROM mit Ausnahme der Beugung festgestellt Author's Conclusion: Es gab nicht nur statistisch signifikante Veränderungen bei Schmerz, Funktion und ROM, sondern auch eine klinisch signifikante Zunahme der ROM des Schultergelenks in der Gruppe, die zusätzlich zu TENS und Mobilisierung des Schultergelenks bei Patienten mit adhäsiver Kapsulitis eine Kräftigung der Rotatorenmanschettenmuskulatur erhielt.

oberen Extremitäten reproduzieren die berichteten Symptome, und Schulterschmerzen können bei veränderten Nervenspannungspositionen verstärkt oder vermindert werden, oder Schulterschmerzen werden mit palpatorischer Provokation der relevanten peripheren Nerveneinklemmungsstelle reproduziert.		
Methodical Notes		
Funding Sources: nicht näher erläutert COI: nicht benannt Randomization: Insgesamt wurden 42 Patienten ausgewählt und nach dem Zufallsprinzip in 2 Gruppen eingeteilt Blinding: Qualifizierte Prüfer, die gegenüber der Gruppenzuteilung verblindet waren, führten die Messungen an der Baseline und in Woche 4 durch. Dropout Rate/ITT-Analysis: n.a. Notes:		

Russell, S. et al. A blinded, randomized, controlled trial assessing conservative management strategies for frozen shoulder. J Shoulder Elbow Surg. 23. 500-7. 2014		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: A Blinded, Randomised, Controlled Trial Number of Patient: 75 Recruitung Phase: All patients gave written informed consent before participating in the study. Eligible patients were all new referrals to the physiotherapy department with a diagnosis of frozen shoulder. Patients were assessed and inclusion and exclusion criteria verified. Inclusion Criteria: Age 40 to 70 years Patients reported local shoulder pain, frequently present either over the anteromedial aspect of the shoulder extending distally into the biceps region or over the lateral aspect of the shoulder extending into the lateral deltoid region. Symptoms were present for at least 3 months. Spontaneous onset of a painful stiff shoulder Marked loss of active and passive global shoulder motion, with at least 50% loss of external rotation Normal findings on anteroposterior and axillary radiographs of the glenohumeral joint Exclusion Criteria: Pathologic findings or glenohumeral osteoarthritis on radiographic evaluation Clinical evidence of significant cervical spine disease History of significant trauma to the	ntervention: 1: exercise class plus home exercises (Exercise Class, n=25) The exercise class group treatment consisted of group therapy scheduled twice per week for the 6-week intervention period. All patients were given careful instruction and demonstration of each exercise by a supervising physiotherapist. Patients performed a 50-minute exercise circuit composed of 12 stations. Each 4-minute station was designed to facilitate range of motion exercises at the shoulder and thoracic spine. Stick, pulley, and ball techniques were used to address forward elevation, abduction, extension, and internal and external rotation. There was an additional station for scapula setting exercises and 2 stations addressing trunk rotation and side flexion. Exercise sheets were given to ensure compliance and to aid in understanding of the circuit. 2: individual multimodal physiotherapy plus home exercises (Multimodal Physiotherapy, n=24) The individual multimodal physiotherapy group received 2 sessions of individual physiotherapy treatment per week for the 6-week intervention period. The	Primary: shoulder function Constant- Murley Score: The score combines subjective and objective measures to produce a 100-point score, comprising four parameters: activities of daily living, range of motion, pain and strength. After baseline evaluation, outcome measures were taken at 6 weeks, 6 months, and 1 year. Secondary: pain and function: Oxford Shoulder Score general health: SF-36 emotional distress: Hospital Anxiety and Disability Scale (HADS) Results: A repeated-measures ANOVA demonstrated a significant improvement in both Constant and Oxford scores for all groups between the different time intervals ($P < .001$). At 6 weeks, the exercise class group demonstrated an improvement in Constant score to a mean of 71.5 (60-89). By 1 year, the exercise class group had improved Constant score to a mean of 88.1 (71-96) compared with the home exercise group score of 72.0 (49-91). This was a significantly greater improvement in the exercise class group than in either the individual multimodal physiotherapy group ($P < .001$) or the home exercise group ($P < .001$). The difference between the exercise class and

shoulder Local corticosteroid injection or any physiotherapy intervention to the affected shoulder within the last 3 months Cerebrovascular accident affecting the shoulder Inflammatory joint disease affecting the shoulder Bilateral frozen shoulder due to possible underlying systemic cause Thyroid disease Any coronary event, post– coronary artery bypass, or catheterization before the clinical appearance of frozen shoulder Prior surgery, dislocation, or fractures on the affected shoulder Active medicolegal involvement	physiotherapist was a specialist in musculoskeletal physiotherapy with 11 years of subspecialization in shoulder therapy. The treatment program was based on local practice and expert opinion, in the absence of a clear consensus in the literature. 34 There was no attempt to standardize this group, and management decisions were made on an individual patient basis as determined by the treating physiotherapist. Treatment could be adjusted according to the severity of symptoms. It included Maitland mobilizations that were progressed as the condition improved, soft tissue massage, myofascial trigger point release, heat, and stretches. The physiotherapy treatment period was limited to 6 weeks, after which all patients continued with the home exercise program. Comparison: 3: home exercises alone (Home Exercise, n=26) The Home Exercise group received instruction on the specific shoulder exercises in the information booklet. All patients were given standardised advice and instructed in an identical home exercise programme. The information booklet included the home exercises, a description of frozen shoulder pathology, advice on sleep, posture and pain relief.	home exercises exceeded MCID at each postintervention time point. Although significant, the difference between the exercise class and individual physiotherapy groups did not meet the MCID of 15 points. This significant improvement was also demonstrated within each of the Constant score domains of activities of daily living range of motion, pain, and strength (Table II). The exercise class also showed a greater improvement than the individual multimodal physiotherapy and home exercises groups on the Oxford score (P = .037; P < .001). There was a significant improvement from baseline in forward elevation and external rotation in all 3 groups. The improvement was significantly greater in both of the physiotherapy intervention groups over the home exercise group at all time points (P < .001). There were no significant differences between the exercise class and individual physiotherapy groups in terms of range of motion at any stage. The individual multimodal physiotherapy group showed significantly better Constant scores (P ⅟□ .002) and Oxford scores (P < .001) than the home exercise group at all time points. A pairwise comparison showed a significant difference between 6 weeks and 6 months (P < .001), 6 weeks and 1 year (P < .001), and 6 months and 1 year (P < .001) for both the Constant and Oxford scores for all groups. This demonstrates a continued improvement over time. All pretreatment and most post-treatment Oxford scores, Constant scores, and HADS anxiety and depression scores were strongly correlated (P < .001). HADS anxiety and depression scores were significantly higher preoperatively compared with any of the post-treatment time periods (P < .001). Pairwise comparison between the individual groups showed no

		significant difference between the physiotherapy intervention groups (exercise class and individual multi-modal), but both groups showed significant improvements in HADS anxiety score over the home exercise group (exercise class: mean difference -2.195, P < .001; individual multimodal physiotherapy: mean difference -1.509, P = .024). There were no significant differences between the groups on HADS depression score. Within the domains of the SF-36, there was no significant difference demonstrated between the groups in the general health, physical function, role limitations due to health or emotional problems, or vitality domains. There was a significant improvement in bodily pain (P ⅟□ .011), mental health (P ⅟□ .009), and social function (P < .001) over time on repeated-measures ANOVA test. Pairwise comparisons demonstrated a significant improvement in bodily pain between the exercise class group and home exercise group (P ⅟□ .032). There were no other significant differences between the treatment groups for any of the domains of the SF-36 outcome measure at any time point. No patient underwent surgery or reported any other interventions during the time frame of the study. Author's Conclusion: This study demonstrates that an exercise class, aimed at a rapid recovery rate with a minimum number of interventions, provides superior patient-reported outcomes in relieving the signs and symptoms of frozen shoulder compared with those having individual multimodal physiotherapy or performing home exercises. However, standard multimodal physiotherapy remains a good alternative and has been demonstrated to be significantly better than unsupervised exercise at home. A group exercise class provides superior outcomes in

		relieving the signs and symptoms of frozen shoulder. However, standard multimodal physiotherapy remains a good alternative and has been demonstrated to be significantly better than unsupervised exercise at home. We would recommend a trial of physiotherapy for stiffness- predominant frozen shoulders before more invasive measures are considered.
Methodical Notes		
Funding Sources: The authors, their immediate families, and any research foundation with which they are affiliated did not receive any financial payments or other benefits from any commercial entity related to the subject of this article. COI: Not mentioned Randomization: 75 patients where randomly assigned one of three groups. An independent statistician generated the assignment scheme using computer-generated permuted block randomisation. A random block length (chosen with equal probability from blocks of length six, nine or 12) was used. Blinding: A single independent physiotherapist, who was blinded to the treatment groups, made all assessments. Dropout Rate/ITT-Analysis: 4 patients droped out, all were included in the analysis on an intention to treat basis. Notes:		

6.2

Sun, Y. et al. Steroid Injection Versus Physiotherapy for Patients With Adhesive Capsulitis of the Shoulder: A PRIMSA Systematic Review and Meta-Analysis of Randomized Controlled Trials. Medicine (Baltimore). 95. e3469. 2016			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: SR Databases: Pubmed, Embase, and Cochrane library, and reference lists were also reviewed for randomized controlled trials (RCTs) comparing steroid injection and physiotherapy for patients with ACS. Search period:	Population: Adult with either primary or secondary Adhesive Capsulitis of the shoulder Intervention: steroid injection Comparison: Physiotherapy (defined as noninjectable conservative treatments, including but not limited to electrotherapy, shockwave, and	Primary: Functional improvement, i.e., Shoulder Pain and Disability Index, or The American Shoulder and Elbow Surgeons score Secondary: pain relief, passive external rotation, and adverse effect Results: Nine RCTs including 453 patients were identified. From 6–7 weeks to 24–26 weeks postintervention, no superiority	Lee M, Haq AM, Wright V, et al. Periarthritis of the shoulder: a controlled trial of physiotherapy. Physiotherapy 1973; 59:312–315. Calis M, Demir H, Ulker S, et al. Is intraarticular sodium hyaluronate injection an alternative treatment in patients with adhesive capsulitis? Rheumatol Int 2006; 26:536–540. Van Der Windt DA, Koes BW, Deville W. Corticosteroid injections were superior to physiotherapy for painful stiff shoulder. Evidence-Based Med 1999; 4:118. Bulgen DY, Binder AI, Hazleman BL, et al. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. Ann Rheum Dis 1984; 43:353–360. Carette S, Moffet H, Tardif J, et al. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. Arthritis Rheum 2003; 48:829–838. http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/468/CN-00413468/frame.html Maryam M, Zahra K, Adeleh B, et al. Comparison of corticosteroid injections, physiotherapy, and combination therapy in treatment of frozen shoulder. Pakistan J Med Sci 2012; 28 4: http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/895/CN-00903895/frame.html

December 2015 Inclusion Criteria: population: adult with either primary or secondary ACS; intervention: steroid injection; comparison: physiotherapy. Physiotherapy was defined as non-injectable conservative treatments, including but not limited to electrotherapy, shockwave, and acupuncture; outcome measures: primary outcome was functional improvement, i.e., Shoulder Pain and Disability Index, or The American Shoulder and Elbow Surgeons score, while secondary outcomes were pain relief, passive external rotation, and adverse effect; and study	acupuncture)	was noted in favor of either steroid injection or physiotherapy for functional improvement (SMD 0.28; 95% CI -0.01–0.58; P=0.06) or pain relief (SMD -0.10; 95% CI -0.70–0.50; P=0.75). Steroid injection provided more improvement in passive external rotation at 24 to 26 weeks (3 studies, SMD 0.42; 95% CI 0.11–0.72; P=0.007) but not at 6 to 7 weeks (4 studies, SMD 0.63; 95% CI 0.36–0.89; P¼0.32) or 12 to 16 weeks (3 studies, SMD -0.07; 95% CI -0.79–0.65; P=0.85). Steroid injection was as safe as physiotherapy for patients with ACS (risk ratio 0.94; 95% CI 0.67–1.31). Author's Conclusion: This is a further systematic review and meta-analysis of 9 RCTs to evaluate the efficacy and safety of steroid injection compared with physiotherapy for patients with ACS. The	Arslan S, Celiker R. Comparison of the efficacy of local corticosteroid injection and physical therapy for the treatment of adhesive capsulitis. Rheum Int 2001; 21:20–23. http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/774/CN-00374774/frame.html Ryans I, Montgomery A, Galway R, et al. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology (Oxford) 2005; 44:529–535. Dacre JE, Beeney N, Scott DL. Injections and physiotherapy for the painful stiff shoulder. Ann Rheum Dis 1989; 48:322–325.

design: RCT in English. Comparisons were performed at 3 follow-up time points, 6 to 7, 12 to 16, and 24 to 26 weeks. Exclusion Criteria: No information provided		present results showed that both interventions had similar effect in improving glenohumeral function, increasing passive external rotation, and decreasing pain for ACS. Steroid injection was as safe as physiotherapy	
Methodical Notes			
Funding Sources: This work was supported by grants from the National Natural Science Foundation of China (Nos. 81472142). The funder, Jiwu Chen, was responsible for this article. COI: The authors have no conflicts of interest to disclose Study Quality: Given the nature of interventions, all patients and clinicians were not blindly to treatments. Four studies did not mention the method of concealment.14,44,47,48 Two studies, in which the data at follow-up was not suitable for metaanalysis, did not compare the baseline data between 2 intervention groups. Intention-to-treat method was employed in only 2 studies. The included studies satisfied 3 to 8 criteria of 10 items in the checklist. Heterogeneity: Results are heterogenous Publication Bias: Publication bias not evaluated Notes:			

6.3

Page, M. J. et al. Manual therapy and exercise for adhesive capsulitis (frozen shoulder). Cochrane Database Syst Rev. . CD011275. 2014			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic Review Databases: Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL Plus, ClinicalTrials.gov and the WHO ICTRP Search period: May 2013 Inclusion Criteria: We included randomised controlled trials (RCTs) and quasirandomised trials, including adults with adhesive capsulitis, and comparing any manual therapy or exercise intervention versus placebo, no intervention, a diJerent type of manual therapy or exercise or any	Intervention: Comparison:	Primary: Main outcomes of interest were participant-reported pain relief of 30% or greater, overall pain (mean or mean change), function, global assessment of treatment success, active shoulder abduction, quality of life and the number of participants experiencing adverse events Secondary: Results: The best available data show that a combination of manual therapy and exercise may not be as eJective as glucocorticoid injection in the short-term. It is unclear whether a combination of manual	Buchbinder R, Youd JM, Green S, Stein A, Forbes A, Harris A, et al. Efficacy and cost-effectiveness of physiotherapy following glenohumeral joint distension for adhesive capsulitis: a randomized trial. Arthritis and Rheumatism 2007;57:1027–37. Bulgen DY, Binder AI, Hazleman BI, Dutton J, Roberts S. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. Annals of the Rheumatic Diseases 1984;43:353–60. Carette S, Moffet H, Tardif J, Bessette L,

other intervention. Exclusion Criteria:		therapy, exercise and electrotherapy is an eJective adjunct to glucocorticoid injection or oral NSAID. Following arthrographic joint distension with glucocorticoid and saline, manual therapy and exercise may confer eJects similar to those of sham ultrasound in terms of overall pain, function and quality of life, but may provide greater patientreported treatment success and active range of motion. Author's Conclusion:	Morin F, Frémont P, et al. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. Arthritis and Rheumatism 2003;48:829–38. Celik D. Comparison of the outcomes of two different exercise programs on frozen shoulder. Acta Orthopaedica et Traumatologica Turcica 2010;44:285–92. Chan S, Hill R, Kerr J. Passive joint mobilisation: does it enhance outcome of adhesive capsulitis of the shoulder following corticosteroid injection?. International Musculoskeletal Medicine 2010;32:58–67. Chauhan V, Saxena S, Grover S. Effect of deep transverse friction massage and capsular stretching in idiopathic adhesive capsulitis. Indian Journal of Physiotherapy & Occupational Therapy 2011;5:185–8. Cheing GLY, So EML, Chao CYL. Effectiveness of electroacupuncture and interferential electrotherapy in the management of frozen shoulder. Journal of Rehabilitation Medicine 2008;40:166–70. Dacre JE, Beeney N, Scott DL. Injections and physiotherapy for the painful stiff shoulder. Annals of the Rheumatic Diseases

			1989;48:322–5. Manual therapy and exercise for adhesive capsulitis (frozen shoulder) (Review) 40 Copyright © 2014 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. Dundar U, Toktas H, Cakir T, Evcik D, Kavuncu V. Continuous passive motion provides good pain control in patients with adhesive capsulitis. International Journal of Rehabilitation Research 2009;32:193–8. Ghosh TK, Bera AK, Hossain ME, Sarkar PS. Comparison of results of three different methods of treatment for adhesive capsulitis of shoulder. Journal of the Indian Medical Association 2012;110(11):827–8. Guler-Uysal F, Kozanoglu E. Comparison of the early response to two methods of rehabilitation in adhesive capsulitis. Swiss Medical Weekly 2004;134:353–8. Harsimran K, Ranganath G, Ravi SR. Comparing effectiveness of antero-posterior and postero-anterior glides on shoulder range of motion in adhesive capsulitis-a pilot study. Indian Journal of Physiotherapy & Occupational Therapy 2011;5:69–72. Johnson AJ, Godges JJ, Zimmerman GJ, Ounanian LL. The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients

			with shoulder adhesive capsulitis. Journal of Orthopaedic and Sports Physical Therapy 2007;37:88–99. Ma T, Kao MJ, Lin IH, Chiu YL, Chien C, Ho TJ, et al. A study on the clinical effects of physical therapy and acupuncture to treat spontaneous frozen shoulder. The American Journal of Chinese Medicine 2006;34:759–75. Maricar NN, Chok B. A comparison of the effect of manual therapy with exercise therapy and exercise therapy alone for stiff shoulders. Physiotherapy Singapore 1999;2(3):99–104. Maryam M, Zahra K, Adeleh B, Morteza Y. Comparison of corticosteroid injections, physiotherapy, and combination therapy in treatment of frozen shoulder. Pakistan Journal of Medical Sciences 2012;28:648–51. Nellutla M, Gin P. Comparative study between efficacy of PNF movement patterns versus conventional free exercises on functional activities among patients with chronic periarthritis of shoulder. Indian Journal of Physiotherapy & Occupational Therapy 2011;5:62–7. Nellutla M, Giri P, M'Kumbuzi VRP, Patel HC. PNF movement patterns compared to the use of conventional free exercises to improve joint ROM in chronic

			peri-arthritis of the shoulder. Indian Journal of Physiotherapy & Occupational Therapy 2009;3:31–4. Nicholson GG. The effects of passive joint mobilization on pain and hypomobility associated with adhesive capsulitis of the shoulder. Journal of Orthopaedic and Sports Physical Therapy 1985;6:238–46. Pajareya K, Chadchavalpanichaya N, Painmanakit S, Kaidwan C, Puttaruksa P, Wongsaranuchit Y. Effectiveness of physical therapy for patients with adhesive capsulitis: a randomized controlled trial. Journal of the Medical Association of Thailand 2004;87:473–80. Rainbow DM, Weston JP, Brantingham JW, Globe G, Lee F. A prospective clinical trial comparing chiropractic manipulation and exercise therapy vs. chiropractic mobilization and exercise therapy for treatment of patients suffering from adhesive capsulitis/frozen shoulder. Journal of the American Chiropractic Association 2008;45:12–28. Ryans I, Montgomery A, Galway R, Kernohan WG, McKane R. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology 2005;44:529–35.

			Samnani M. Passive exercises coupled with therapeutic activities-a comparative study in the management of frozen shoulder. Indian Journal of Occupational Therapy 2004;36: 37–40. Sharad KS. A Comparative study on the efficacy of end range mobilization techniques in treatment of adhesive capsulitis of shoulder. Indian Journal of Physiotherapy & Occupational Therapy 2011;5:28–31. Shrivastava A, Shyam AK, Sabnis S, Sancheti P. Randomised controlled study of Mulligan's vs. Maitland's mobilization technique in adhesive capsulitis of shoulder joint. Indian Journal of Physiotherapy & Occupational Therapy 2011;5: 12–5. Sirajuddin M, Quddus N, Grover D. Comparison of anterior versus posterior glide mobilisation techniques for improving internal rotation range of motion in shoulder adhesive capsulitis. Indian Journal of Physiotherapy & Occupational Therapy 2010;4:152–7. Tanaka K, Saura R, Takahashi N, Hiura Y, Hashimoto R. Joint mobilization versus self-exercises for limited glenohumeral joint mobility: randomized controlled study of management of rehabilitation. Clinical Rheumatology 2010;29:1439–44. van der Windt D, Koes BW, Deville W, Boeke AJP, de Jong BA, Bouter LM.

			Effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulder in primary care: randomised trial. British Medical Journal 1998;317:1292–6. Vermeulen HM, Rozing PM, Obermann WR, le Cessie S, Vliet Vlieland TP. Comparison of high-grade and low-grade Manual therapy and exercise for adhesive capsulitis (frozen shoulder) (Review) 41 Copyright © 2014 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. mobilization techniques in the management of adhesive capsulitis of the shoulder: randomized controlled trial. Physical Therapy 2006;86:355–68. van den Hout WB, Vermeulen HM, Rozing PM, Vliet Vlieland TP. Impact of adhesive capsulitis and economic evaluation of high-grade and low-grade mobilisation techniques. Australian Journal of Physiotherapy 2005;51: 141–9. Wen L. Analysis on effect of functional exercises to promote rehabilitation of patients with periarthritis of shoulder. Chinese Nursing Research 2009;23:1925–6. Yan 2005 {published data only} Yan F. Comparison of dumbbell gymnastics and barehanded exercise in ameliorating the

			symptoms of shoulder periarthritis. Chinese Journal of Clinical Rehabilitation 2005; 7:187–9. Yang JL, Chang CW, Chen SY, Wang SF, Lin JJ. Mobilization techniques in subjects with frozen shoulder syndrome: randomized multiple-treatment trial. Physical Therapy 2007;87:1307–15. Yang Yang JL, Jan MH, Chang CW, Lin JJ. Effectiveness of the end-range mobilization and scapular mobilization approach in a subgroup of subjects with frozen shoulder syndrome: a randomized control trial. Manual Therapy 2012;17:47–52.
Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Maund, E. et al. Management of frozen shoulder: a systematic review and cost-effectiveness analysis. Health Technol Assess. 16. 1-264. 2012			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: SR Databases: MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, Cumulative Index to Nursing and Allied Health (CINAHL), EMBASE, Science Citation Index, BIOSIS Previews, Physiotherapy Evidence Database (PEDro), Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effects (DARE), Health Technology Assessment (HTA) database, Cochrane Central Register of Controlled Trials (CENTRAL), PASCAL,	Population: Participants with idiopathic (primary) frozen shoulder were included. The authors took a pragmatic approach and included studies based on the authors' definition of frozen shoulder to ensure identification of all relevant evidence. Intervention: - physical therapies (including physiotherapy, acupuncture, chiropractic and osteopathy interventions); physiotherapy encompasses a wide range of techniques including mobilisation, biofeedback, ultrasound and laser	Primary: pain (e.g. at rest, on movement, at night) range of movement (e.g. internal and external rotation, elevation) function and disability quality of life; time to recovery return to work and recreation adverse events Secondary: Not specified Results: The searches yielded 8883 citations. Thirty-two relevant studies were identified, one of which was a cost–utility analysis conducted alongside a separately published study of effectiveness. Six studies evaluated steroid injection. The majority of the available data were	Primary: pain (e.g. at rest, on movement, at night) range of movement (e.g. internal and external rotation, elevation) function and disability quality of life; time to recovery return to work and recreation adverse events Secondary: Not specified Results: The searches yielded 8883 citations. Thirty-two relevant studies were identified, one of which was a cost–utility analysis conducted alongside a separately published study of effectiveness. Six studies evaluated steroid injection. The majority of the available data were

Manual, Alternative and Natural Therapy (MANTIS), Latin American and Caribbean Health Sciences Literature (LILACS) and NHS Economic Evaluation Database (NHS EED). In addition, information on studies in progress, unpublished research or research reported in the grey literature was sought by searching a range of relevant databases including Conference Proceedings Citation Index: Science, Health Management Information Consortium (HMIC), ClinicalTrials.gov and National Technical Information Service (NTIS). Furthermore, the reference lists of relevant systematic reviews were checked to identify further studies. Search period: Databases were searched from inception up to March 2010 Inclusion Criteria: Population: Participants with idiopathic (primary) frozen shoulder (adhesive capsulitis) as defined by the authors, with or without diabetes Intervention: Physical therapies, arthrographic distension, steroid injection, sodium hyaluronate injection, MUA, capsular release, watchful waiting Comparator: Any of the above, no treatment or placebo Outcomes: Pain; ROM; function and disability; quality of life; time to recovery, return to work and recreation; adverse events Study design:	therapy and all therapies falling under the physiotherapy umbrella were included - distension - steroid and other shoulder injections such as sodium hyaluronate - MUA - capsular release (arthroscopic and open) - the approach of 'watchful waiting' (as defined by the authors but including education and advice about mobilisation within pain limits, home exercise and use of pain relief). Comparison: Studies using any of the above treatments as a comparator (including studies comparing different regimens of the same intervention), no treatment or placebo were included. The two exceptions to this were acupuncture and sodium hyaluronate. Dose-ranging studies of sodium hyaluronate were excluded. Studies of acupuncture were included only when the comparator was one of the other interventions of interest in the review. Therefore, studies comparing more than one type of acupuncture or comparing acupuncture to an alternative therapy such as moxibustion were excluded.	from two multiarm studies that were of satisfactory quality, although one had some risk of bias. Both studies evaluated a single intra-articular steroid injection in patients with frozen shoulder of < 6 months' duration. The comparators were home exercise alone, physiotherapy alone (both with placebo injection) and steroid injection followed by physiotherapy. For pain there was a short-term statistically significant benefit with steroid injection compared with placebo (SMD –1.15, 95% CI –1.62 to –0.67; two RCTs).There was no difference compared with physiotherapy (SMD –0.22, 95% CI –0.65 to 0.20; two RCTs). When steroid injection was provided in conjunction with physiotherapy, there was an added benefit for pain over physical therapy alone (SMD –0.98, 95% CI –1.43 to –0.52; two RCTs). There was also benefit with the combined intervention over steroid injection alone (SMD –0.75, 95% CI –1.20 to –0.29; two RCTs), although there was substantial heterogeneity. The results for function and disability and range of movement were broadly consistent with the results for pain. Based on a single study, there was no statistically significant benefit for quality of life with a steroid injection alone compared with placebo or	from two multiarm studies that were of satisfactory quality, although one had some risk of bias. Both studies evaluated a single intra-articular steroid injection in patients with frozen shoulder of < 6 months' duration. The comparators were home exercise alone, physiotherapy alone (both with placebo injection) and steroid injection followed by physiotherapy. For pain there was a short-term statistically significant benefit with steroid injection compared Maund, E., Craig, D., Suekarran, S., Neilson, A., Wright, K., Brealey, S., . . . McDaid, C. (2012). Management of frozen shoulder: a systematic review and costeffectiveness analysis. 16(11), 1-264

RCTs; in the absence of randomised trials, quasi-experimental studies (i.e. with a control group). If controlled trials were not available for MUA or capsular release, case series of at least 50 participants Studies of economic evaluations: Full economic evaluations that also met the population and intervention inclusion criteria Exclusion Criteria: No information proveded (despite the inclusion criteria)		physiotherapy alone. However, there was a benefit for quality of life when physiotherapy was added to steroid injection compared with placebo and physiotherapy alone. There was no evidence of benefit for the combined intervention over steroid injection alone. Author's Conclusion: There may be short-term benefit from adding a single intra-articular steroid injection to home exercise for patients with primary frozen shoulder of < 6 months' duration. In the same population there may also be benefit from adding physiotherapy (including mobilisation in 8–10 sessions over 4 weeks) to a single steroid injection.	
Methodical Notes Funding Sources: Funding for this study was provided by the Health Technology Assessment programme of the National Institute for Health Research. COI: One author (Amar Rangan) has received consultancy fees from DePuy International relating to shoulder replacement prostheses. A division of DePuy is involved in marketing products for surgical treatment of the frozen shoulder. The other authors report no conflicts of interest. Study Quality: Data from studies with a low risk of bias were sparse, in particular for the more invasive treatments (MUA, distension and capsular release). Twenty-eight RCTs, one quasi-experimental study (for 'supervised neglect') and two case series (for capsular release) were included. A total of 18 studies did not report an adequate method of randomisation (therefore these studies described as RCTs may have been quasi-experimental studies); 24 did not report an adequate method of allocation concealment; and 13 did not have blinded outcome assessment. For most of the studies it was unclear whether they were adequately powered to detect a statistically significant difference between groups. Across most trials there did not appear to be systematic methods for recording of adverse events. Heterogeneity: Results were heterogenous Publication Bias: No informition provided Notes:			

Noten, S. et al. Efficacy of Different Types of Mobilization Techniques in Patients With Primary Adhesive Capsulitis of the Shoulder: A Systematic Review. Arch Phys Med Rehabil. 97. 815-25. 2016			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic Review Databases: PubMed, Web of Science Search period: Nov 2014 Inclusion Criteria: Adult patients with primary AC of the	Population: This review addressed 810 patients with primary AC with a mean age varying between 47.134 and 58.9 years. Intervention: The following types of mobilization	Primary: Most studies reported the effect of mobilization techniques on pain and ROM.Pain was measured using a visual analog scale or Likert Scale. In addition, the Constant	Vermeulen HM, Rozing PM, Obermann WR, le Cessie S, Vliet Vlieland TP. Comparison of high-grade and low-grade mobilization techniques in the management of

shoulder, in any stadium The study assessed the efficacy of all kinds of articular mobilization techniques The outcome measure is pain or ROM to assess the efficacy of the treatment Clinical trials published in full text Exclusion Criteria: Secondary AC of the shoulder Manipulations under anesthesia of the affected shoulder Case reports, reviews, letters to the editor, clinical trials, trial of an intervention, and retrospective studies	techniques were evaluated: angular mobilization, translational mobilization, spine mobilizations combined with glenohumeral stretching and both angular and translational mobilization, high-intensity techniques beyond the pain threshold, Cyriax approach, Mulligan technique, and Maitland technique Comparison:	Murley Score described pain and ROM after treatment. Secondary: Results: Overall, mobilization techniques have beneficial effects in patients with primary AC of the shoulder, with strength of conclusions varying between moderate and preliminary evidence Author's Conclusion:	adhesive capsulitis of the shoulder: randomized controlled trial. Phys Ther 2006;86: 355-68. Dundar U, Toktas H, Cakir T, Evcik D, Kavuncu V. Continuous passive motion provides good pain control in patients with adhesive capsulitis. Int J Rehabil Res 2009;32:193-8. Diercks RL, Stevens M. Gentle thawing of the frozen shoulder: a prospective study of supervised neglect versus intensive physical therapy in seventy-seven patients with frozen shoulder syndrome followed up for two years. J Shoulder Elbow Surg 2004;13:499-502. Johnson AJ, Godges JJ, Zimmerman GJ, Ounanian LL. The effect of anterior versus posterior glide joint mobilization on external rotation range of motion in patients with shoulder adhesive capsulitis. J Orthop Sports Phys Ther 2007;37:88-99. Doner G, Guven Z, Atalay A, Celiker R. Evalution of Mulligan's technique for adhesive capsulitis of the shoulder. J Rehabil Med 2013; 45:87-91. Yang JL, Chang CW, Chen SY, Wang SF, Lin JJ. Mobilization techniques in subjects with frozen shoulder syndrome: randomized multiple-treatment trial. Phys Ther 2007;87:1307-15. Gaspar PD, Willis FB. Adhesive capsulitis and dynamic splinting: a controlled, cohort study. BMC Musculoskelet Disord 2009; 10:111.

			Guler-Uysal F, Kozanoglu E. Comparison of the early response to two methods of rehabilitation in adhesive capsulitis. Swiss Med Wkly 2004;134:353-8. Yang JL, Jan MH, Chang CW, Lin JJ. Effectiveness of the end-range mobilization and scapular mobilization approach in a subgroup of subjects with frozen shoulder syndrome: a randomized control trial. Man Ther 2012;17:47-52. Paul A, Rajkumar JS, Peter S, Lambert L. Effectiveness of sustained stretching of the inferior capsule in the management of a frozen shoulder. Clin Orthop Relat Res 2014;472:2262-8. Kumar A, Kumar S, Aggarwal A, Kumar R, Das PR. Effectiveness of Maitland techniques in idiopathic shoulder adhesive capsulitis. ISRN Rehabil 2012;2012:1-8. Buchbinder R, Youd JM, Green S, et al. Efficacy and costeffectiveness of physiotherapy following glenohumeral joint distension for adhesive capsulitis: a randomized trial. Arthritis Rheum 2007; 57:1027-37.
Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

6.4- 6.7

Inhalt: 18 Literaturstellen

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Arroll, B. et al. Corticosteroid injections for painful shoulder: a meta-analysis. Br J Gen Pract. 55. 224-8. 2005

Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic review and meta-analysis of randomised controlled trials Databases: Cochrane Controlled Trials Register, Medline, EMBASE, hand searches and author contacts. Search period: The Cochrane Controlled Trials Register, Medline 1966–2004, and EMBASE 1980–2004 databases Inclusion Criteria: The selection criteria required that the studies be randomised controlled trials in which the effectiveness of corticosteroids could be assessed. This included studies of corticosteroids versus placebo or NSAIDs, and studies of local anaesthetic and corticosteroids versus local anaesthetic. The participants needed to have a diagnosis of frozen shoulder or rotator cuff tendonitis of any duration. The outcome needed to include improvement, Exclusion Criteria:	Population: Seven studies were reviewed for corticosteroids versus placebo and three for corticosteroids versus nonsteroidal antiinflammatory drugs (NSAIDs). Intervention: Comparison:	Primary: The outcome was improvement of symptoms. Secondary: Results: The relative risk for improvement for subacromial corticosteroid injection for rotator cuff tendonitis was 3.08 (95% confidence interval [CI] = 1.94 to 4.87). The number needed to treat based on the pooled relative risk was 3.3 (95% CI = 1.8 to 7.7) patients to obtain one improvement. The relative risk for high dose (50 mg of prednisone or more) was 5.9 (95% CI = 2.8 to 12.6). The relative risk for improvement with steroids compared with NSAIDs was 1.43 (95% CI = 0.95 to 2.16). The number needed to treat for corticosteroids versus NSAIDs was 2.5 (95% CI = 1 to 9) for one significant study. The relative risks for intra-articular steroid injection for rotator cuff tendonitis were not statistically significant Author's Conclusion: Subacromial injections of corticosteroids are effective for improvement for rotator cuff tendonitis up to a 9-month period. They are also probably more effectivethan NSAID medication. Higher doses may be better than lower doses for subacromial corticosteroid injection for rotator cuff tendonitis.	Adebajo AO, Nash P, Hazleman BL. A prospective double blind dummy placebo controlled study comparing triamcinolone hexacetonide injection with oral diclofenac 50 mg TDS in patients with rotator cuff tendinitis. J Rheumatol 1990; 17: 1207–1210. Blair B, Rokito AS, Cuomo F, et al. Efficacy of injections of corticosteroids for subacromial impingement syndrome. J Bone Joint Surg 1996; 78: 1685–1689. De Jong BA, Dahmen R, Hogeweg JA, Marti RK. Intra-articular triamcinolone acetonide injection in patients with capsulitis of the shoulder: a comparative study of two dose regimens. Clin Rehabil 1998; 12(3): 211–215. Petri M, Dobrow R, Neiman R, et al. Randomised, double-blind, placebo-controlled study of the treatment of the painful shoulder. Arthritis Rheum 1987; 30: 1040–1045. Plafki C, Steffen R, Willburger RE, Wittenberg RH. Local anaesthetic injection with and without corticosteroids for subacromial impingement syndrome. Int Orthop 2000; 24(1): 40–42. Vecchio PC, Hazleman BL, King RH. A double-blind trial comparing subacromial methylprednisolone and lignocaine in acute

			rotator cuff tendinitis. Br J Rheumatol 1993; 32(8): 743–745. Berry H, Fernandes L, Bloom B, et al. Clinical study comparing acupuncture, physiotherapy, injection and oral anti-inflammatory therapy in shoulder-cuff lesions. Curr Med Res Opin 1980; 7:121–126. White RH, Paull DM, Fleming KW. Rotator cuff tendinitis: comparison of subacromial injection of a long acting corticosteroid versus oral indomethacin therapy. J Rheumatol 1986; 13: 608–613.
Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

Blanchard, V. et al. The effectiveness of corticosteroid injections compared with physiotherapeutic interventions for adhesive capsulitis: a systematic review. Physiotherapy. 96. 95-107. 2010			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: SR Databases: MEDLINE, CINAHL, AMED, EMBASE, Cochrane Central Register of Controlled Clinical Trials, Physiotherapy Evidence Database (PEDro), the Meta-register of Controlled Clinical Trials, the National Research Register (NRR) and the National Recognition Information Centre Search period: Bis Woche 23 2009 Inclusion Criteria: RCT, Studien mit Personen 18 Jahre alt oder älter mit Diagnose adhäsive Capsulitis oder Frozen shoulder, Studien mit randomisierter Zuteilung zu Corticosteroid Inj. alleine oder Physiotheraoie (definiert als [nicht ausschließlich] pass/akt Mobilisation, akt Übungen,	Population: Personen 18 Jahre alt oder älter mit Diagnose adhäsive Capsulitis oder Frozen shoulder Intervention: Corticosteroid Inj. (alleine) Comparison: Physiotheraoie (definiert als [nicht ausschließlich] pass/akt Mobilisation, akt Übungen, Krafttraining und Elektrotherapie)	Primary: ein klinisch relevantes und valides Outcome mit nachgewisener Änderungssensititvität welches mindestens einmal post Therapie innerhalb von 48 h erhoben wurde (z B Schmerz, Range of Motion [Außenrotation], Disability und Funktion) Secondary: nicht definiert Results: Six studies were deemed eligible for inclusion in the final review. All had evidence of random allocation to either an injection group or a physiotherapeutic intervention group. There were some differences between the studies with regard to both the corticosteroid injections and physiotherapeutic interventions. Standardised mean	Ryans I, Montgomery A, Galway R, Kernohan WG, McKane RA. Randomised controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology 2005;44: 529–35. Carette S, Moffet H, Tardif J, Bessette L, Morin F, Fremont P, et al.Intraarticular corticosteroids, supervised physiotherapy or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo controlled trial. Arthritis Rheum 2003;48:829–38. van der Windt DAWM, Koes BW, Deville W, Boeke AJP, de Jong BA,

Krafttraining und Elektrotherapie), ein klinisch relevantes und valides Outcome mit nachgewisener Änderungssensititvität welches mindestens einmal post Therapie innerhalb von 48 h erhoben wurde Exclusion Criteria: Studien mit Personen mit anderen Schulterbeschwerden (nicht Adhäsive Capsulitis oder Frozen shoulder), wenn keine randomisierte Zuordnung zu den Gruppen erfolgte		differences and effect estimates were calculated for three of the included studies at various follow-up periods. There was a medium effect for corticosteroid injections compared with physiotherapeutic interventions for the outcomes of pain, passive external rotation and shoulder disability at 6 weeks. There was only a small effect in favour of corticosteroid injections for pain, passive external rotation and shoulder disability at 12 to 16 weeks and 26 weeks, and pain and shoulder disability at 52 weeks. Author's Conclusion: The results of this review suggest that corticosteroid injections have greater effect in the short term compared with physiotherapeutic interventions. This decreased over time, with only a small effect in favour of injections in the longer term. The results of this review must be interpreted with some caution due to the limited number of studies and differences in the interventions between the studies.	Bouter LM. Effectiveness of corticosteroid injections versus physiotherapy for treatment of painful stiff shoulder in primary care: randomised trial. BMJ 1998;317:1292–6. Dacre JE, Beeney N, Scott DL. Injections and physiotherapy for the painful stiff shoulder. Ann Rheum Dis 1989;48:322–5. Arslan S, Celiker R. Comparison of the efficacy of local corticosteroid injections and physiotherapy for the treatment of adhesive capsulitis. Rheumatol Int 2001;21:20–3. Bulgen D, Binder A, Hazleman B, Dutton J, Roberts S. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimes. Ann Rheum Dis 1984;43:353–60.
Methodical Notes			
Funding Sources: Funding: No sources of funding. COI: Conflict of interest: None declared. Study Quality: Heterogeneity: Publication Bias: Nicht untersucht Notes:			

Challoumas, D. et al. Comparison of Treatments for Frozen Shoulder: A Systematic Review and Meta-analysis. JAMA Netw Open. 3. e2029581. 2020			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic Review and Meta-analysis Databases: Medline, EMBASE,	Population: total of 65 eligible studies with 4097 participants that were included in	Primary: ROM, PAIN, DASH, SPADI Secondary: Results: only the administration of intra-	Arslan S, Celiker R. Comparison of the efficacy of local corticosteroid injection and physical therapy for the treatment of adhesive capsulitis. Rheumatol Int. 2001;21(1):20-23. doi: 10.1007/s002960100127 Bal A, Eksioglu E, Gulec B, Aydog E, Gurcay E, Cakci A. Effectiveness of corticosteroid injection in adhesive capsulitis. Clin Rehabil.

Scopus, and CINHAL Search period: until 2020 Inclusion Criteria: Studies with a randomized design of any type that compared treatment modalities for frozen shoulder with other modalities, placebo, or no treatment were included.Systematic Reviews and Meta-analyses Exclusion Criteria:	the systematic review, 34 studies with 2402 participants were included in pairwise meta-analyses and 39 studies with 2736 participants in network metaanalyses. Intervention: Included studies had a randomized design of any type and compared treatment modalities for frozen shoulder with other treatment modalities, placebo, or no treatment. Comparison:	articular (IA) corticosteroid was associated with statistical and clinical superiority compared with other interventions in the short-term for pain (vs no treatment or placebo: MD, -1.0 visual analog scale [VAS] point; 95% CI, -1.5 to -0.5 VAS points; P < .001; vs physiotherapy: MD, -1.1 VAS points; 95% CI, -1.7 to -0.5 VAS points; P < .001) and function (vs no treatment or placebo: SMD, 0.6; 95% CI, 0.3 to 0.9; P < .001; vs physiotherapy: SMD 0.5; 95% CI, 0.2 to 0.7; P < .001). Subgroup analyses and the network meta-analysis demonstrated that the addition of a home exercise program with simple exercises and stretches and physiotherapy (electrotherapy and/or mobilizations) to IA corticosteroid may be associated with added benefits in the mid-term (eg, pain for IA coritocosteriod	2008;22(6):503-512. doi: 10.1177/0269215508086179 Bulgen DY, Binder AI, Hazleman BL, Dutton J, Roberts S. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. Ann Rheum Dis. 1984;43(3):353-360. doi: 10.1136/ard.43.3.353 Calis M, Demir H, Ulker S, Kirnap M, Duygulu F, Calis HT. Is intraarticular sodium hyaluronate injection an alternative treatment in patients with adhesive capsulitis? Rheumatol Int. 2006;26(6):536-540. doi: 10.1007/s00296-005-0022-2 Carette S, Moffet H, Tardif J, et al.. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. Arthritis Rheum. 2003;48(3):829-838. doi: 10.1002/art.10954 Cho CH, Kim H, Bae KC, Lee D, Kim K. Proper site of corticosteroid injection for the treatment of idiopathic frozen shoulder: results from a randomized trial. Joint Bone Spine. 2016;83(3):324-329. doi: 10.1016/j.jbspin.2015.06.014 Dacre JE, Beeney N, Scott DL. Injections and physiotherapy for the painful stiff shoulder. Ann Rheum Dis. 1989;48(4):322-325. doi: 10.1136/ard.48.4.322 Dehghan A, Pishgooei N, Salami MA, et al.. Comparison between NSAID and intra-articular corticosteroid injection in frozen shoulder of diabetic patients; a randomized clinical trial. Exp Clin Endocrinol Diabetes. 2013;121(2):75-79. doi: 10.1055/s-0032-1333278 Gam AN, Schydlowsky P, Rossel I, Remvig L, Jensen EM. Treatment of “frozen shoulder” with distension and glucorticoid compared with glucorticoid alone: a randomised controlled trial. Scand J Rheumatol. 1998;27(6):425-430. doi: 10.1080/030097498442244 Khallaf SF, Hussein MI, El-Barbary AM, et al.. Efficacy of ultrasonography guided intra-articular steroid injection of the shoulder and exercising in patients with adhesive capsulitis: glenohumeral versus subacromial approaches. The Egyptian Rheumatologist. 2018;40(4):277-280. doi: 10.1016/j.ejr.2018.01.005 Koh PS, Seo BK, Cho NS, Park HS, Park DS, Baek YH. Clinical effectiveness of bee venom acupuncture and physiotherapy in the treatment of adhesive capsulitis: a randomized controlled trial. J Shoulder Elbow Surg. 2013;22(8):1053-1062. doi: 10.1016/j.jse.2012.10.045 Kraal T, Sierevelt I, van Deurzen D, van den Bekerom MP, Beimers L. Corticosteroid injection alone vs additional physiotherapy treatment in early stage frozen shoulders. World J Orthop. 2018;9(9):165-172. doi: 10.5312/wjo.v9.i9.165 Lee PN, Lee M, Haq AM, Longton EB, Wright V. Periarthritis of the shoulder: trial of treatments investigated by multivariate analysis. Ann

		with home exercise vs no treatment or placebo: MD, -1.4 VAS points; 95% CI, -1.8 to -1.1 VAS points; P < .001). Author's Conclusion: The findings of this study suggest that the early use of IA corticosteroid in patients with frozen shoulder of less than 1-year duration is associated with better outcomes. This treatment should be accompanied by a home exercise program to maximize the chance of recovery.	Rheum Dis. 1974;33(2):116-119. doi: 10.1136/ard.33.2.116 Lee DH, Yoon SH, Lee MY, Kwack KS, Rah UW. Capsule-preserving hydrodilatation with corticosteroid versus corticosteroid injection alone in refractory adhesive capsulitis of shoulder: a randomized controlled trial. Arch Phys Med Rehabil. 2017;98(5):815-821. doi: 10.1016/j.apmr.2016.10.012 Lee S, Lee S, Jeong M, Oh H, Lee K. The effects of extracorporeal shock wave therapy on pain and range of motion in patients with adhesive capsulitis. J Phys Ther Sci. 2017;29(11):1907-1909. doi: 10.1589/jpts.29.1907 Lo MY, Wu CH, Luh JJ, et al.. The effect of electroacupuncture merged with rehabilitation for frozen shoulder syndrome: a single-blind randomized sham-acupuncture controlled study. J Formos Med Assoc. 2020;119(1 Pt 1):81-88. doi: 10.1016/j.jfma.2019.03.012 Ma T, Kao MJ, Lin IH, et al.. A study on the clinical effects of physical therapy and acupuncture to treat spontaneous frozen shoulder. Am J Chin Med. 2006;34(5):759-775. doi: 10.1142/S0192415X06004272 Mobini M, Kashi Z, Bahar A, Yaghubi M. Comparison of corticosteroid injections, physiotherapy, and combination therapy in treatment of frozen shoulder. Pak J Med Sci. 2012;28(4):648-651. Accessed November 30, 2020. http://pjms.com.pk/index.php/pjms/article/view/2059 Oh JH, Oh CH, Choi JA, Kim SH, Kim JH, Yoon JP. Comparison of glenohumeral and subacromial steroid injection in primary frozen shoulder: a prospective, randomized short-term comparison study. J Shoulder Elbow Surg. 2011;20(7):1034-1040. doi: 10.1016/j.jse.2011.04.029 Park GY, Hwnag SE. Comparison of intraarticular steroid injection with and without capsular distension in adhesive capsulitis of the shoulder. J Korean Acad Rehabil Med. 2000;24(6):1174-1179. Accessed November 30, 2020. https://www.koreamed.org/SearchBasic.php?RID=2323604 Park C, Lee S, Yi CW, Lee K. The effects of extracorporeal shock wave therapy on frozen shoulder patients' pain and functions. J Phys Ther Sci. 2015;27(12):3659-3661. doi: 10.1589/jpts.27.3659 Prestgaard T, Wormgoor ME, Haugen S, Harstad H, Mowinckel P, Brox JI. Ultrasound-guided intra-articular and rotator interval corticosteroid injections in adhesive capsulitis of the shoulder: a double-blind, sham-controlled randomized study. Pain. 2015;156(9):1683-1691. doi: 10.1097/j.pain.0000000000000209

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van der Windt DA, van der Heijden GJ, de Winter AF, Koes BW, Devillé W, Bouter LM. The responsiveness of the Shoulder Disability Questionnaire. Ann Rheum Dis. 1998;57(2):82-87. doi: 10.1136/ard.57.2.82
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Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

Shang, X. et al. Intra-Articular versus Subacromial Corticosteroid Injection for the Treatment of Adhesive Capsulitis: A Meta-Analysis and Systematic Review. Biomed Res Int. 2019. 1274790. 2019			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Meta analysis RCT`s Databases: PubMed, EMBASE, Cochrane Database, and Web of Science) and two Chinese databases (Wan Fang and China National Knowledge Internet) Search period: until 2018 Inclusion Criteria: RCTs or quasi-RCTs comparing IA injection and SA injection of corticosteroid for the treatment of adhesive capsulitis; (2) published in peer-reviewed journals; (3) included more than one kind of outcome assessment parameters, such as visual analogue scale (VAS) for pain, Constant score, range of motion (ROM), Shoulder Pain and Disability Index (SPADI), and American Shoulder and Elbow Surgeon (ASES) score; (4) full text and the data were available Exclusion Criteria: 1) review articles, basic science studies including cadaver studies, comments including editorial articles, protocols or letters; (2) regarding shoulder pain due to other causes rather than idiopathic adhesive capsulitis, such as rotator cuff tears,	Population: 512 patients Intervention: comparison between IA injection and SA injection of corticosteroid injection for the treatment of adhesive capsulitis Comparison: comparison between IA injection and SA injection of corticosteroid injection for the treatment of adhesive capsulitis	Primary: Primary Outcome Measurements of the VAS, Constant Score, ASEA Score, and ROM Secondary: average time for pain relief Results: ,e pooled effect showed that there was no significant difference in the primary outcomes between IA injection and SA injection, with an exception of VAS at 2-3 weeks (P □ 0.02) and ROM of internal rotation at 8–12 weeks (P □ 0.02). According to the results of subgroup analyses, the differences of VAS and ROM of internal rotation did not last beyond the 2-3- week time period. Additionally, SA injection had the advantage of avoiding adverse reactions from the corticosteroid, especially in avoiding a large fluctuation of serum blood glucose levels Author's Conclusion: When corticosteroid injection is used to treat adhesive capsulitis, both injection sites can be selected. However, due to the scarcity of related studies, more rigorous trials are needed to confirm the current findings.	C.-H. Cho, D. H. Kim, K.-C. Bae, D. Lee, and K. Kim, “Proper site of corticosteroid injection for the treatment of idiopathic frozen shoulder: results from a randomized trial,” Joint Bone Spine, vol. 83, no. 3, pp. 324–329, 2016. T. E. Rizk, R. S. Pinals, and A. S. Talaiver, “Corticosteroid injections in adhesive capsulitis: investigation of their value and site,” Arch Phys Med Rehabil, vol. 72, no. 1, pp. 20–22, 1991. J. H. Oh, C. H. Oh, J.-A. Choi, S. H. Kim, J. H. Kim, and J. P. Yoon, “Comparison of glenohumeral and subacromial steroid injection in primary frozen shoulder: a prospective, randomized short-term comparison study,” Journal of Shoulder and Elbow Surgery, vol. 20, no. 7, pp. 1034–1040, 2011. S.-J. Shin and S.-Y. Lee, “Efficacies of corticosteroid injection at different sites of the shoulder for the treatment of adhesive capsulitis,” Journal of Shoulder and Elbow Surgery, vol. 22, no. 4, pp. 521–527, 2013. D. Ghorai, R. Pramanik, A. K. Palit et al., “A comparative study of efficacy of

calcific tendonitis, hemiplegia, or cervical radiculopathy; (3) studies comparing the effect of corticosteroid injection with other medication (nonsteroidal anti-inflammatory drugs,NSAIDs), acupuncture, physiotherapy, arthroscopic release,or hydrodilatation; (4) studies related to the comparison of different types of corticosteroid and different doses of corticosteroid, rather than different approaches of administration;(5) studies with a follow-up of less than 2 weeks; (6) abstract publications only.			ultrasound-guided intra-articular steroid injection through glenohumeral versus subacromial approach in the treatment of adhesive capsulitis," IJPMR, vol. 25, no. 3, pp. 77–82, 2014. J. P. Yoon, S. W. Chung, J.-E. Kim et al., "Intra-articular injection, subacromial injection, and hydrodilatation for primary frozen shoulder: a randomized clinical trial," Journal of Shoulder and Elbow Surgery, vol. 25, no. 3, pp. 376–383, 2016. T. Goyal, A. Singh, P. Negi, and B. Kharkwal, "Comparative functional outcomes of patients with adhesive capsulitis receiving intra-articular versus sub-acromial steroid injections: case-control study," Musculoskeletal Surgery, vol. 103, no. 1, pp. 31–35, 2018. Y. Sun, S. Liu, S. Chen, and J. Chen, ",e effect of corticosteroid injection into rotator interval for early frozen shoulder: a randomized controlled trial," ;e American Journal of Sports Medicine, vol. 46, no. 3, pp. 663–670, 2018. S. F. Khallaf, M. I. Hussein, A. M. El-Barbary, and R. M. El Khouly, "Efficacy of ultrasonography-guided intra-articular steroid injection of the shoulder and excercising in patients with adhesive capsulitis: glenohumeral versus subacromial approaches," ;e Egyptian Rheumatologist, vol.

			2018, no. 40, pp. 277–280, 2018
Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

Song, A. et al. Glenohumeral corticosteroid injections in adhesive capsulitis: a systematic search and review. PM R. 6. 1143-56. 2014			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: Systematic search and review Databases: PubMed (1966-present), Embase (1947-present), Web of Science (1900–present), and the Cochrane Central Register of Controlled Trials Search period: see above until 2014 Inclusion Criteria: clinical trials, prospective studies, and retrospective studies that specifically evaluated intra-articular corticosteroid injections, both alone and in combination with other treatment modalities, for shoulder adhesive capsulitis. We included studies that were not randomized control trials because our review was not a meta-analysis Exclusion Criteria	Population: 25 studies were identified for inclusion. The final yield included 7 prospective studies, 16 randomized trials, and 2 retrospective studies Intervention: articular corticosteroid injections, both alone and in combination with other treatment modalities Comparison:	Primary: passive and active range of motion measures, visual analog scale (VAS), shoulder disability questionnaire (SDQ), shoulder pain and disability index (SPADI), SF-36 (Short Form 36 Health Survey), and Constant-Murley score. Secondary: Results: Author's Conclusion: Corticosteroid injections offer rapid relief of pain and improved range of motion in the shortterm (particularly in the first 6 weeks) although long-term outcomes seem to be similar to other treatments including placebo. This is likely because the natural history of adhesive capsulitis is to spontaneously resolve over time. Hence, corticosteroid injections may offer pain relief in the initial phases of adhesive capsulitis when patients have the most pain. Also, seven of 8 studies using imageguided injections in this review found ROM improvements within 12 weeks. Image-guided corticosteroid injections increase the accuracy of the	Sharma R, Bajekal R, Bhan S. Frozen shoulder syndrome: A comparison of hydraulic distension and manipulation. Int Orthop. 1993; 17:275–278. [PubMed: 8125660] Oh JH, Oh CH, Choi J-A, Kim SH, Kim JH, Yoon JP. Comparison of glenohumeral and subacromial steroid injection in primary frozen shoulder: a prospective, randomized short-term comparison study. J Shoulder Elbow Surg. 2011; 20(7):1034–1040.10.1016/j.jse.2011.04.029 [PubMed: 21816628] Buchbinder R, Hoving JL, Green S, Hall S, Forbes A, Nash P. Short course prednisolone for adhesive capsulitis (frozen shoulder or stiff painful shoulder): a randomised, double blind, placebo controlled trial. Ann Rheum Dis. 2004; 63(11):1460–1469.10.1136/ard.2003.018218 [PubMed: 15479896] Tveitå EK, Tariq R, Sesseng S, Juel NG, Bautz-Holter E. Hydrodilatation, corticosteroids and adhesive capsulitis: a randomized controlled trial. BMC Musculoskelet Disord. 2008; 9:53.10.1186/1471-2474-9-53 [PubMed: 18423042] De Carli A, Vadalà A, Perugia D, et al. Shoulder adhesive capsulitis: manipulation and arthroscopic arthrolysis or intra-articular steroid injections? Int Orthop. 2012; 36(1):101– 106.10.1007/s00264-011-1330-7 [PubMed: 21833684] Ahmad I, Askar Z, Durrani Z, et al. Intraarticular injection of methylprednisolone for idiopathic frozen shoulder. J Med Sci. 2009; 17(1):16–18. 31. Arslan, Çeliker R. Comparison of the efficacy of local corticosteroid injection and physical therapy for the treatment of adhesive capsulitis. Rheumatol Int. 2001; 21(1):20–23.10.1007/

		injection, which may improve shoulder outcomes. However, there is limited data on the clinical efficacy ultrasound or fluoroscopically guided injections to make conclusions on their added benefit over non-image guided injections. The necessity and efficacy of image-guided corticosteroid injections, by ultrasound or otherwise, in the management of adhesive capsulitis warrants further investigation.	s002960100127 [PubMed: 11678298] Carette S, Moffet H, Tardif J, et al. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: A placebocontrolled trial. Arthritis Rheum. 2003; 48(3):829–838.10.1002/art.10954 [PubMed: 12632439] Ryans I, Montgomery A, Galway R, Kernohan WG, McKane R. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatol Oxf Engl. 2005; 44(4):529–535.10.1093/rheumatology/keh535 Kivimäki J, Pohjolainen T. Manipulation under anesthesia for frozen shoulder with and without steroid injection. Arch Phys Med Rehabil. 2001; 82(9):1188–1190.10.1053/apmr.2001.24169 [PubMed: 11552189] Jacobs LG, Smith MG, Khan SA, Smith K, Joshi M. Manipulation or intra-articular steroids in the management of adhesive capsulitis of the shoulder? A prospective randomized trial. J Shoulder Elbow Surg. 2009; 18(3):348–353.10.1016/j.jse.2009.02.002 [PubMed: 19393928] Gam AN, Schydlowksy P, Rossel I, Remvig L, Jensen E. Treatment of “Frozen Shoulder” with distension and glucorticoid compared with glucorticoid alone. Scand J Rheumatol. 1998; 27:425–30. [PubMed: 9855212] De Jong B, Dahmen R, Hogeweg J. Intra-articular triamcinolone acetonide injection in patients with capsulitis of the shoulder: a comparative study of two dose regimens. Clin Rehabil. 1998; 12:211–215. [PubMed: 9688036] Lorbach O, Anagnostakos K, Scherf C, Seil R, Kohn D, Pape D. Nonoperative management of adhesive capsulitis of the shoulder: Oral cortisone application versus intra-articular cortisone injections. J Shoulder Elbow Surg. 2010; 19(2):172–179.10.1016/j.jse.2009.06.013 [PubMed: 19800262] Rizk TE, Pinals RS, Talaiver AS. Corticosteroid injections in

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Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

Wang, W. et al. Effectiveness of corticosteroid injections in adhesive capsulitis of shoulder: A meta-analysis. Medicine (Baltimore). 96. e7529. 2017			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Meta-Analysis Databases: PubMed, Web of Science, Cochrane library Search period: until 2016 Inclusion Criteria: RCT or prospective, nonrandomized, controlled	Population: 225 patients Intervention: injection group included 115 patients and placebo group included 110 patients. Comparison:	Primary: pain relief Secondary: ROM Results: The overall pooled data demonstrated that, compared with placebo as control treatment, intra-articular corticosteroid injections were more effective in reducing	Bal A, Eksioglu E, Gulec B, et al. Effectiveness of corticosteroid injection in adhesive capsulitis. Clin Rehabil 2008;22:503–12. Carette S, Moffet H, Tardif J, et al. Intraarticular corticosteroids,

trials.primary adhesive capsulitis, the intervention was intra-articular injection of corticosteroid, the control procedure was sham injection, oral medications or no procedure Exclusion Criteria:		the pain score at 0 to 8 weeks, but there was no difference between the injection group and the control group at 9 to 24 weeks. Improvement of ROM in the injection group was greater than that of the control group both at 0 to 8 and 9 to 24 weeks Author's Conclusion: Intra-articular corticosteroid injections were more effective in pain relief in the short term, but this pain relief did not sustain in the long term. Intra-articular corticosteroid injection resulted in greater improvement in passive ROM both in the short and the long terms.	supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. Arthritis Rheum 2003;48:829–38. Bulgen DY, Binder AI, Hazleman BL, et al. Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. Ann Rheum Dis 1984;43:353–60. Lorbach O, Anagnostakos K, Scherf C, et al. Nonoperative management of adhesive capsulitis of the shoulder: oral cortisone application versus intra-articular cortisone injections. J Shoulder Elbow Surg 2010;19:172–9. Ryans I, Montgomery A, Galway R, et al. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology (Oxford) 2005;44:529–35
Methodical Notes			
Funding Sources: COI: Study Quality: Heterogeneity: Publication Bias: Notes:			

OXFORD (2011) Appraisal Sheet: RCT

Ahn, J. K. et al. Effects of Ultrasound-guided intra-articular ketorolac injection with capsular distension. J Back Musculoskelet Rehabil. 28. 497-503. 2015		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: retrospective Study Number of Patient: 121 Recruitung Phase: years 2009 - 2012 Inclusion Criteria: duration 3-9 months, passive ROM restriction Exclusion Criteria: rotator cuff tear and other pathologies	Intervention: US guided IA Injection (ketorolac) with capsular distension vs. steroid injektion Comparison:	Primary: SPADI, ROM VAS Secondary: Results: SPADI, VNS and passive ROM were improved 1, 3 and 6 months after the last injections in both groups. The statistical differences were not observed in SPADI, VNS between groups ($p< 0.05$). Successful treatment rate were not significantly different between the groups as well as in 1, 3 and 6 month outcomes. However, greater improvement was found in a matter of range

		of motion in patients receiving IA ketorolac injection with capsular distension than participants receiving US-guided IA steroid injection alone. Author's Conclusion: IA ketorolac injection with capsular distension was shown to be a treatment method as effective as the steroid injection alone in pain relief and functional improvement in patient with frozen shoulder and more improvement in passive abduction and external rotation than steroid injection alone at 3 and 6 months
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Carette, S. et al. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. Arthritis Rheum. 48. 829-38. 2003		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 93 Recruitung Phase: 1 year Inclusion Criteria: age > 18 years, symptoms duration > 1 year shoul Exclusion Criteria: adhesive capsulitis was secondary to another cause, including inflammatory, degenerative, metabolic, or infectious arthritis, cerebrovascular accident, or fracture. Patients who had a known blood coagulation disorder or an allergy to radiologic contrast material	Intervention: i.a. cortisone injection following physiotheray or pt alone Comparison:	Primary: ROM, SPADI Secondary: Results: At 6 weeks, the total SPADI scores had improved significantly more in groups 1 and 2 compared with groups 3 and 4 (P 0.0004). The total range of active and passive motion increased in all groups,with group 1 having significantly greater improvement than the other 3 groups. At 3 months, groups 1 and 2 still showed significantly greater improvement in SPADI scores than group 4. There was no ifference between groups 3 and 4 at any of the followup assessments except for greater improvement in the range of shoulder flexion in group 3 at 3 months. At 12 months, all groups had improved to a similar degree with respect to all utcome measures. Author's Conclusion: single intraarticular injection of corticosteroid administered under fluoroscopy combined with a simple home exercise program is effective in improving shoulder pain and disability in patients with adhesive capsulitis. Adding supervised physiotherapy provides faster improvement in shoulder range of motion. When used alone, supervised

		physiotherapy is of limited efficacy in the management of adhesive capsulitis.
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Goyal, T. et al. Comparative functional outcomes of patients with adhesive capsulitis receiving intra-articular versus sub-acromial steroid injections: case-control study. Musculoskelet Surg. . . 2018		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 105 Recruitung Phase: Inclusion Criteria: Age 40–60 years, either sex Clinical diagnosis of adhesive capsulitis based on global restriction of range of motion (ROM) to at least < 50% of normal Symptoms not explained by rotator cuff lesion, biceps tendinitis or cervical spine athology Stage I and II disease with duration of symptoms more than 3 weeks and < 6 months Exclusion Criteria: Previous shoulder capsular surgery History of steroid injection(s) into affected shoulder Osteoarthritis changes in GH joint on plain radiographs History of shoulder trauma or prolonged shoulder immobilisation Skin changes suggestive of Sudeck's dystrophy in the affected extremity Uncontrolled blood sugars in Diabetes mellitus Cardiac surgery, history of angina or myocardial infarction in last 6 months Inability to provide informed consent Allergy to local anaesthetic agents	Intervention: 1. Patients receiving 40 mg of methylprednisolone acetate as intra-articular injection (n = 35) followed by physical therapy. 2. Patients receiving 40 mg of methylprednisolone acetate as sub-acromial injection (n = 35) followed by physical therapy. 3. Patients receiving only physical therapy (heat, passive stretching exercises and wall climbing) and no injections (n = 35). Comparison:	Primary: . Constant shoulder score and Shoulder Pain and Disability Index (SPADI). • Visual analogue scale for pain. • Range of movement (ROM Secondary: Results: There was a statistically significant improvement in VAS scores in group 1 and 2 at 3, 6, 12 weeks and 6 months compared to that before the injections. There was no statistically significant improvement in the group 3 at 3 and 6 weeks, but improvement was noticed at 12 weeks and 6 months. There was no statistically significant difference in VAS, CS score, SPADI and ROM between groups 1 and 2 at 3, 6, 12 weeks and 6 months. These scores were significantly better in group 1 and 2 compared to group 3 at 3, 6, 12, weeks and 6 months. Author's Conclusion: Corticosteroid injections into the sub-acromial space and into the glenohumeral joint produce similar results in terms of pain relief and improvement in function in patients with adhesive capsulitis
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Lorbach, O. et al. Nonoperative management of adhesive capsulitis of the shoulder: oral cortisone application versus intra-articular cortisone injections. J Shoulder Elbow Surg. 19. 172-9. 2010		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: randomized study Number of Patient: 40 Recruitung Phase: follow up: 0, 4, 8, 12 weeks and 6 and 12 months Inclusion Criteria: ideopathic stage 2 capsulitis of the shoulder Exclusion Criteria: Patients with surgery of the affected shoulder, insulindependent diabetes	Intervention: Intra-articular cortisone injections vs. Oral cortisone application Comparison: Intra-articular cortisone injections vs. Oral cortisone application	Primary: CS Score, SST, active and passive ROM Secondary: Results: In the patients treated with oral glucocorticoids, significant improvements were found for the CM score (P < .0001), SST (P¼.035), VAS (P < .0001), and range of motion (P < .05) at the 4-week followup. The patients treated with an intra-articular

mellitus, osteoarthritis, or other contraindications against cortisone		glucocorticoid injection series also significantly improved in the CM score (P < .0001), SST (P < .0001), the VAS (P < .0001), and range of motion (P < .05) after 4 weeks. These results were confirmed at all other follow-up visits. Superior results were found for intraarticular injections in range of motion, CM score, SST, and patient satisfaction (P < .05). Differences in the VAS for pain and function were not significant (P > .05). Author's Conclusion: The use of cortisone in the treatment of idiopathic shoulder adhesive capsulitis leads to fast pain relief and improves range of motion. Intra-articular injections of glucocorticoids showed superior results in objective shoulder scores, range of motion, and patient satisfaction compared with a short course of oral corticosteroids.
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Oh, J. H. et al. Comparison of glenohumeral and subacromial steroid injection in primary frozen shoulder: a prospective, randomized short-term comparison study. J Shoulder Elbow Surg. 20. 1034-40. 2011		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: a prospective, randomized short-term comparison study Number of Patient: 71 patients with primary frozen shoulder Recruitung Phase: Between January 2007 and August 2008 Inclusion Criteria: patients with shoulder pain and a limitation of both active and passive motion in at least 2 directions (abduction and forward flexion <100, external rotation <20, or internal rotation Exclusion Criteria: The study excluded 4 patients with a fullthickness rotator cuff tear, 7 with a partial-thickness rotator cuff tear, 10 with calcific tendinitis, 1 with osteoarthritis of the shoulder, and 1 with a greater tuberosity fracture of the humeral head	Intervention: Patients were divided into 2 groups by the site of the steroid injection: GH joint (GH group), which comprised 37 patients, or the SA space (SA group) Comparison: preinjection and 3, 6, and 12 weeks after injection	Primary: Pain score using a visual analog scale (VAS) and the Constant score for subjective function Secondary: ROM Results: The GH group showed lower pain VAS at 3 weeks, but no statistical difference was found between the 2 groups at 6 and 12 weeks. Improvement in pain was evident at every follow-up visit compared with the preinjection evaluation. There was no significant difference between the 2 groups with respect to the Constant score or ROM at serial follow-up. Author's Conclusion: The GH (gleno-humeral) steroid injection was not superior to a SA (subacromial) injection for patients with primary frozen shoulder
Methodical Notes		
Funding Sources: - COI: - Randomization: yes Blinding: intervention not, outcome measurements blinded Dropout Rate/ITT-Analysis: 8 from 71 Notes:		

Prestgaard, T. et al. Ultrasound-guided intra-articular and rotator interval corticosteroid injections in adhesive capsulitis of the shoulder: a double-blind, sham-controlled randomized study. Pain. 156. 1683-91. 2015		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 122 Recruitung Phase: baseline until 26 weeks after intervention Inclusion Criteria: age 25 - 75 yearr, pain > 6 months Exclusion Criteria: other disease	Intervention: 42 patients to intra-articular injection, 40 patients to combined intra-articular/interval injection, and 40 patients to sham injection Comparison:	Primary: pain, SPADI Secondary: Results: For both corticosteroid injection groups, there was a significant difference compared with sham injection at week 6. The mean group difference (adjusted for gender, age, dominant arm, and duration) in change in shoulder pain for the intra-articular vs sham injection was -1.7 (95% confidence interval, -2.7 to -0.6, P = 0.002) and -2.1 (95% confidence interval, -3.2 to -1.1, P = 0.0001) for the combined injection vs sham injection. The significant group differences were maintained at week 12 but not at week 26. Similar results were found for the secondary outcome measures (night pain, Shoulder Pain and Disability Index). Differences between the corticosteroid groups were not significant at any time. Author's Conclusion:
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Ranalletta, M. et al. Corticosteroid Injections Accelerate Pain Relief and Recovery of Function Compared With Oral NSAIDs in Patients With Adhesive Capsulitis: A Randomized Controlled Trial. Am J Sports Med. 44. 474-81. 2016		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 74 Recruitung Phase: 2012 - 2013 Inclusion Criteria: patients aged 18 years or older, restriction of passive motion of greater than 30 in 2 or more planes of movement, stage 2 adhesive capsulitis (freezing stage) according to the classification of Hannafin and Chiaia,20 at least 1 month of pain duration, and availability of radiographs and MRI or (if MRI was contraindicated) ultrasonography of the affected shoulder to exclude secondary causes of adhesive capsulitis Exclusion Criteria: secondary adhesive capsulitis including inflammatory or infectious	Intervention: randomized to receive either intraarticular injections with betamethasone or oral NSAIDs. Comparison: Clinical outcome was documented at baseline and after 2, 4, 8, and 12 weeks and comprised a visual analog scale (VAS) for pain, the American Shoulder and Elbow Surgeons (ASES) Shoulder Score, the abbreviated Constant-Murley score, and the abbreviated Disabilities of the Arm, Shoulder and Hand (QuickDASH) score for function. Passive range of motion was measured with a goniometer	Primary: see above Secondary: Results: Patients treated with corticosteroid injections achieved faster pain relief compared with control patients during the first 8 weeks after treatment (P\.001). However, no significant difference in pain was observed among the groups at final follow-up.Likewise, shoulder function and motion improved significantly in both groups at all follow-up points. Shoulder function scores and most motion parameters improved faster in the injection group up to week 8 (P\.001). Again, no significant differences in function or motion were seen at final follow-up. Author's

arthritis, previous fracture, rotator cuff lesion, previous corticosteroid injection or previous surgery in the affected shoulder, bilateral adhesive capsulitis, and moderate to severe glenohumeral osteoarthritis.		Conclusion: In patients with adhesive capsulitis, a single corticosteroid injection applied without image control provides faster pain relief and earlier improvement of shoulder function and motion compared with oral NSAIDs
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

Ryans, I. et al. A randomized controlled trial of intra-articular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology (Oxford). 44. 529-35. 2005		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: RCT Number of Patient: 80 Recruitung Phase: Inclusion Criteria: patients aged 18 yr or older with a painful shoulder, in the fifth cervical (C5) dermatome distribution, of more than 4 weeks and less than 6 months duration, and with limitation of active and passive range of movement greater than 25% in abduction and external rotation compared with the other shoulder Exclusion Criteria: Patients were excluded if their pain was less than 4 weeks duration as such patients may have had spontaneous recovery in the early stages. Patients with symptoms of more than 6 months duration were not considered as patients in the chronic stages of this condition and may require a different therapeutic approach. Those who had had a previous intra-articular injection or prior physiotherapy for this episode of shoulder pain were also excluded. The presence of restriction of active and passive range of movement in both external rotation and glenohumeral abduction was taken to indicate a diagnosis of capsulitis as opposed to rotator cuff tendinopathy. Patients with limitation in only one of these planes of movement were therefore excluded. We also excluded patients with evidence of glenohumeral osteoarthritis on plain X-ray, clinical evidence of a complete rotator cuff tear (i.e. positive drop-off sign or weakness of	Intervention: Group A: injection of triamcinolone 20mg (1 ml) and normal saline 2 ml and physiotherapy treatment (injection and physiotherapy group). Group B: injection of triamcinolone 20 mg (1 ml) and normal saline 2 ml and no physiotherapy treatment (injection only group). Group C: injection with normal saline 3 ml and physiotherapy (physiotherapy group). Group D: injection of normal saline 3 ml and no physiotherapy (placebo group). Comparison: Group A: injection of triamcinolone 20mg (1 ml) and normal saline 2 ml and physiotherapy treatment (injection and physiotherapy group). Group B: injection of triamcinolone 20 mg (1 ml) and normal saline 2 ml and no physiotherapy treatment (injection only group). Group C: injection with normal saline 3 ml and physiotherapy (physiotherapy group). Group D: injection of normal saline 3 ml and no physiotherapy (placebo group).	Primary: SF-38, ROM, Pain Scale Secondary: Results: Corticosteroid injections leads to fast pain relief. Physiotherapy leads to faster improvement of ROM. Author's Conclusion: In the treatment of adhesive capsulitis of the shoulder, corticosteroid injection is effective in improving shoulderrelated disability at 6 weeks following treatment. Physiotherapy treatment is effective in improving the range of external rotation at 6 weeks after commencement of treatment. Longer-term outcome of treatment is difficult to assess because of loss to follow-up; however, failure of treatment is less likely with a combination of physiotherapy and corticosteroid injection.

the rotator cuff muscles), clinical evidence of significant cervical spine disease, history of significant trauma to the shoulder or a history of inflammatory joint disease or of a cerebrovascular accident affecting the study shoulder. Those with bilateral adhesive capsulitis were excluded as bilateral symptoms may suggest an underlying systemic cause, and we excluded patients with a contraindication to triamcinolone injection.		
Methodical Notes		
Funding Sources: none COI: none Randomization: yes Blinding: yes Dropout Rate/ITT-Analysis: 39% Notes:		

Sharma, S. P. et al. Adhesive capsulitis of the shoulder, treatment with corticosteroid, corticosteroid with distension or treatment-as-usual; a randomised controlled trial in primary care. BMC Musculoskelet Disord. 17. 232. 2016		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 106 Recruitung Phase: Inclusion Criteria: Included patients had to be above 18 years of age, should be able to understand and speak Norwegian, and have no contraindication for use of corticosteroids. Patients should have reduced passive range of motion (PROM) with a reduction of more than 30 % of two of three shoulder movements and none of the three movements (Abduction = ABD, External rotation = ER and Internal rotation = IR) should be normal. Exclusion Criteria: Patients with diabetes, asthma, pregnant women and breast feeding mothers were excluded from the study	Intervention: Corticosteroid injections, corticosteroid injection + hydrodilatation, treatment as usual Comparison: Corticosteroid injections vs corticosteroid injection + hydrodilatation vs treatment as usual	Primary: SPADI, VAS, ROM Secondary: Results: faster pain relief and recovery of ROM after corticosteroid injection, no effect of hydrodilatation Author's Conclusion: four injections with corticosteroid with or without distension, given with increasing intervals during 8 weeks, were better than treatment-as-usual in adhesive capsulitis of the shoulder. However, in the long run no difference was found between any of the groups, indicating that natural healing takes place independent of treatment.
Methodical Notes		
Funding Sources: none COI: none Randomization: yes Blinding: no Dropout Rate/ITT-Analysis: Notes:		

Shin, S. J. et al. Efficacies of corticosteroid injection at different sites of the shoulder for the treatment of adhesive capsulitis. J Shoulder Elbow Surg. 22. 521-7. 2013		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: RCT Number of Patient: 191 Recruitung Phase: 3 y Inclusion Criteria: age of 18 years or older, shoulder pain with limitation of both active and passive shoulder	Intervention: group 1: 1 intraarticular corticosteroid and local anaesthetic injection group 2: 1 subacromial corticosteroid and local anaesthetic injection group 3: half dose intraarticular half	Primary: ases, vas, rom Secondary: Results: equal pain reduction and patient satisfaction after 24 months in all groups, faster pain reduction with corticoid injection inedependent of injection site

movement in at least 2 directions (forward flexion <120 or 50% restriction of contralateral external rotation and internal rotation), duration of shoulder pain greater than 3 months, and the availability of nonspecific radiographic and ultrasound findings of the affected shoulder Exclusion Criteria: patients found to have a shoulder disorder in the subacromial space or the glenohumeral joint, those with bilateral adhesive capsulitis, those with a history of shoulder injury or surgery, and those with an arthritic change of the glenohumeral joint.	dose subacromial group 4: oral pain medication aceclofena 2x/d Comparison:	Author's Conclusion: equal pain reduction and patient satisfaction after 24 months in all groups, faster pain reduction with corticoid injection inedependent of injection site
Methodical Notes		
Funding Sources: none COI: none Randomization: yes Blinding: no Dropout Rate/ITT-Analysis: Notes:		

Yoon, S. H. et al. Optimal dose of intra-articular corticosteroids for adhesive capsulitis: a randomized, triple-blind, placebo-controlled trial. Am J Sports Med. 41. 1133-9. 2013		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: RCT Number of Patient: 53 Recruitung Phase: 2010 - 2011 Inclusion Criteria: Eligible participants were men or women between the ages of 20 and 70 years who had adhesive capsulitis with a normal radiograph finding of the affected shoulder and restriction of passive motion of greater than 30 in 2 or more planes of movement,4 stage 2 of adhesive capsulitis (freezing stage) according to Hannafin and Chiaia,12 at least 1 month of pain duration, and average pain intensity during a day defined as a score of 3 points or more on a 10-cm visual analog scale (VAS) rated from 0 (no pain) to 10 (worst imaginable pain) Exclusion Criteria: secondary adhesive capsulitis (secondary to other causes including inflammatory, metabolic, or infectious arthritis; cerebrovascular accident;tumor; or fracture), rotator cuff lesion on both physical and ultrasonographic examinations, full-thickness tear of the rotator cuff on ultrasonographic examination, previous corticosteroid injection	Intervention: Participants (n = 53) with primary adhesive capsulitis in the freezing stage were randomly assigned to receive ultrasound-guided intra-articular injections with 40 mg triamcinolone acetonide (high-dose group, n = 20), 20 mg triamcinolone acetonide (low-dose group, n = 20), or placebo (n = 13). Comparison:	Primary: SPADI, Pain (VAS) Secondary: Results: There were no significant differences in demographic and clinical characteristics at baseline between the 3 groups. Repeated-measures analysis of variance and post hoc tests showed improvement in SPADI and VAS scores and in flexion, abduction, and internal rotation especially for the low- and high-dose groups compared with the placebo. Yet, no significant difference was found between the 2 different corticosteroid dose groups Author's Conclusion: This study shows that there were no significant differences between the highand low-dose corticosteroid groups, indicating the preferred use of a low dose in the initial stage

at the affected shoulder, and medication such as an antiplatelet agent or anticoagulant with the exception of those who agreed to stop for a minimum of 5 days before the injection		
Methodical Notes		
Funding Sources: COI: Randomization: Blinding: Dropout Rate/ITT-Analysis: Notes:		

NEWCASTLE - OTTAWA Checklist: Case Control

Kumar, K. et al. Is there a short-term benefit from an intra-articular steroid injection in female patients with adhesive capsulitis of the shoulder treated with physiotherapy?. J Orthop Surg (Hong Kong). 25. 2309499017690463. 2017			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: retrospective case control study	Funding sources: - Conflict of Interests: - Randomization: no Blinding: no Dropout rates: 63 patients fulfilledthe inclusion criteria. Of these 63 patients, 22 patientswere excluded because of missing data in the chart	Total no. patients: 63 Patient characteristics: 4-year period in one hospital Inclusion criteria: progressive painful decrease or complete loss of active andpassive range of motion, positive external rotation test, dullor aching pain in the shoulder area, anterior and posteriorshoulder tenderness, history of night or rest pain for at leastthree months but less than one year and inability to sleep onthe affected side Exclusion criteria: inflammatory arthritis including rheumatoidarthritis; uncontrolled diabetes mellitus; failure to completethe physiotherapy course; bilateral shoulder pain; any his-tory of previous trauma to the affected side; Parkinson'sdisease; newly diagnosed hyperthyroidism, hypothyroid-ism and malignant disorders; and other causes of secondaryadhesive capsulitis including rotator cuff injury, cerebro-vascular accident and cardiovascular disease	Interventions: Twenty patients with a mean age of 55.1+7.3 (range41–71) were managed with physiotherapy without firstreceiving an injection and constitute the 'PT only'group. The remaining 21 patients with a mean age of52.4+8.5 (range 44–74) received a single steroidinjection during their first presentation to the clinic andwere then managed further with physiotherapy and con-stitute the 'PTþINJ' group Comparison: final assessment 12 weeks after intervention
Notes:	Author's conclusion: The results of this study suggest that theintra-articular injection of a single dose of cortisone has no significant short-		

	term benefit in female patients with idiopathicadhesive capsulitis managed with physiotherapy	
Outcome Measures/results	Primary Outcome measures included the visual analogue scale (VAS) and measurement of range of motion Secondary	Results: At final assessment (12 weeks), significant between-group differences were identified for the 'PT only' group forflexion (p¼0.01) and abduction (p¼0.008). When comparing the mean change from the initial assessment, a significantbetween-group difference was observed for abduction (p¼0.03)

6.8

Buchbinder R, Green S, Youd JM, Johnston RV. Oral steroids for adhesive capsulitis. Cochrane Database Syst Rev. 2006 Oct 18;(4):CD006189. doi: 10.1002/14651858.CD006189. PMID: 17054278.

Buchbinder R, Hoving JL, Green S, Hall S, Forbes A, Nash P. Short course prednisolone for adhesive capsulitis (frozen shoulder or stiff painful shoulder): a randomised, double blind, placebo controlled trial. Ann Rheum Dis. 2004 Nov;63(11):1460-9. doi: 10.1136/ard.2003.018218. PMID: 15479896; PMCID: PMC1754804.

6.9

Kraal, T. et al. Corticosteroid injection alone vs additional physiotherapy treatment in early stage frozen shoulders. World J Orthop. 9. 165-172. 2018		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: RCT Number of Patient: 21 Recruitung Phase: Inclusion Criteria: Patients were eligible for participation if they exhibited clinical signs of FS, including pain and stiffness of the involved shoulder without preliminary trauma persisting for more than three months. The required level of pain was a minimum score of six out of ten on a numeric pain scale. Restriction of the passive ROM of the shoulder joint of more than 30° in external rotation and a second sirection (i.e., abduction and/or forward flexion) when compared to the unaffected contralateral side was required for inclusion. Conventional radiographs of the shoulder joint and ultrasound studies were used to rule out osteoarthritis and rotator cuff ruptures. Exclusion Criteria: Corticosteroid injection in the shoulder joint region in the previous 6 wk, previous surgery to the shoulder, systemic inflammatory disease,	Intervention: Within two weeks after inclusion, patients in both study groups received an ultrasound-guided glenohumeral joint injection of 1 mL kenacort 40 mg in 4 mL lidocaine 1%, administered by an experienced radiologist. Both groups were informed about the possible self-limiting nature of FS, and received counseling about optional analgesics like acetaminophen, nonsteroidal anti-inflammatory drugs or tramadol, if needed. The non- PT group did not receive PT. Advice was given to try to use the affected arm in daily life activities within their pain limits. Comparison: Within two weeks after inclusion, patients in both study groups received an ultrasound-guided glenohumeral joint injection of 1 mL kenacort 40 mg in 4 mL lidocaine 1%, administered by an experienced radiologist. Both groups were informed about the possible self-limiting nature of FS, and received counseling about optional analgesics like acetaminophen,	Primary: Shoulder Pain and Disability Index (SPADI) at the 26 wk follow-up Secondary: Pain on average last week, and pain at night were scored on a ten-point numeric pain-rating scale (NPRS). Health-related quality of life was assessed using the RAND-36[31,32]. Passive ROM was measured in the standing position with the use of a goniometer. External rotation was measured in the horizontal plane, with the elbow at the side. Abduction was measured in the frontal plane and anteflexion in the sagittal plane. Patient satisfaction about their change in pain and function was assessed on a five-point Likert scale ("worse'', ''unchanged'', ''unsatisfactory improved'', ''satisfactory improved'' and ''good to very good improved") Results: Twenty-one patients were included, 11 patients in the non-PT and ten in the PT group, with a mean age of 52 years. Both treatment groups showed a significant improvement at 26 wk for

neurological disorder with impairment of the upper limb, and the use of anticoagulation therapy using a therapeutic dosage.	nonsteroidal anti-inflammatory drugs or tramadol, if needed. The non- PT group did not receive PT. Advice was given to try to use the affected arm in daily life activities within their pain limits. Patients in the PT group were referred to a participating physiotherapy clinic. All participating physiotherapists treated the referred study patients according to a standardized protocol, twice a week with a maximum duration of three months. This physiotherapy protocol was composed after a thorough literature review by the participating shoulder surgeons in accordance with two experienced shoulder-treating physiotherapists. The aim of the PT was to increase ROM of the shoulder, decrease pain, and restore the function of the shoulder for daily activities. Tissue irritability of the shoulder joint was taken into account to guide the intensity of the treatment. Passive mobilization techniques were used, except for Maitland grade five mobilizations. Attention was paid to scapulothoracic movement, with the purpose to improve the scapulohumeral kinematics. Also, active and autoassisted stretching techniques were part of the physiotherapy program. If there was an increase in pain lasting for more than four hours after the PT session, the next session had to be less intense. Hot packs, icing, and massage techniques were allowed to reduce pain. Transcutaneous electrical nerve stimulation, pulsed electromagnetic field, infrared, dry needling and medical taping were not allowed due to the lack of evidence of these treatment modalities in the treatment of FS.	SPADI score (non-PT: P = 0.05, PT: P = 0.03). At the 6 wk follow-up, median SPADI score was significant decreased in the PT group (14 IQR: 6-38) vs the non-PT group (63 IQR: 45-76) (P = 0.01). Pain decreased significantly in both groups but no differences were observed between both treatment groups at any time point, except for night pain at 6 wk in favor of the PT group (P = 0.02). Significant differences in all three ROM directions were observed after 6 wk in favor of the PT group (P ≤ 0.02 for all directions). A significantly greater improvement in abduction (P = 0.03)and external rotation (P = 0.04) was also present in favor of the PT group after 12 wk. RAND-36 scores showed no significant differences in healthrelated quality of life at all follow-up moments. At 26 wk, both groups did not differ significantly with respect to any of the outcome parameters. No complications were reported in both groups. Author's Conclusion: Additional physiotherapy after corticosteroid injection improves ROM and functional limitations in early-stage FSs up to the first three months
Methodical Notes		
Funding Sources: No information provided COI: No information provided Randomization: Yes Blinding: Yes Dropout Rate/ITT-Analysis: No dropouts Notes:		

Maund, E. et al. Management of frozen shoulder: a systematic review and cost-effectiveness analysis. Health Technol Assess. 16. 1-264. 2012			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: SR Databases: MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, Cumulative Index to Nursing and Allied Health (CINAHL), EMBASE, Science Citation Index, BIOSIS Previews, Physiotherapy Evidence Database (PEDro), Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effects (DARE), Health Technology Assessment (HTA) database, Cochrane Central Register of Controlled Trials (CENTRAL), PASCAL, Manual, Alternative and Natural Therapy (MANTIS), Latin American and Caribbean Health Sciences Literature (LILACS) and NHS Economic Evaluation Database (NHS EED). In addition, information on studies in progress, unpublished research or research reported in the grey literature was sought by searching a range of relevant databases including Conference Proceedings Citation Index: Science, Health Management Information Consortium (HMIC), ClinicalTrials.gov and National Technical Information Service (NTIS). Furthermore, the reference lists of relevant systematic reviews were checked to identify further studies. Search period:	Population: Participants with idiopathic (primary) frozen shoulder were included. The authors took a pragmatic approach and included studies based on the authors' definition of frozen shoulder to ensure identification of all relevant evidence. Intervention: - physical therapies (including physiotherapy, acupuncture, chiropractic and osteopathy interventions); physiotherapy encompasses a wide range of techniques including mobilisation, biofeedback, ultrasound and laser therapy and all therapies falling under the physiotherapy umbrella were included - distension - steroid and other shoulder injections such as sodium hyaluronate - MUA - capsular release (arthroscopic and open) - the approach of 'watchful waiting' (as defined by the authors but including education and advice about mobilisation within pain limits, home exercise and use of pain relief). Comparison: Studies using any of the above treatments as a comparator (including studies comparing different regimens of the same intervention), no treatment or placebo were included. The two exceptions to this were acupuncture and sodium	Primary: pain (e.g. at rest, on movement, at night) range of movement (e.g. internal and external rotation, elevation) function and disability quality of life; time to recovery return to work and recreation adverse events Secondary: Not specified Results: The searches yielded 8883 citations. Thirty-two relevant studies were identified, one of which was a cost–utility analysis conducted alongside a separately published study of effectiveness. Six studies evaluated steroid injection. The majority of the available data were from two multiarm studies that were of satisfactory quality, although one had some risk of bias. Both studies evaluated a single intra-articular steroid injection in patients with frozen shoulder of < 6 months' duration. The comparators were home exercise alone, physiotherapy alone (both with placebo injection) and steroid injection followed by physiotherapy. For pain there was a short-term statistically significant benefit with steroid injection compared with placebo (SMD –1.15, 95% CI –1.62 to –0.67; two RCTs).There was no difference compared with physiotherapy (SMD –0.22, 95% CI –0.65 to 0.20; two RCTs). When steroid injection	Primary: pain (e.g. at rest, on movement, at night) range of movement (e.g. internal and external rotation, elevation) function and disability quality of life; time to recovery return to work and recreation adverse events Secondary: Not specified Results: The searches yielded 8883 citations. Thirty-two relevant studies were identified, one of which was a cost–utility analysis conducted alongside a separately published study of effectiveness. Six studies evaluated steroid injection. The majority of the available data were from two multiarm studies that were of satisfactory quality, although one had some risk of bias. Both studies evaluated a single intra-articular steroid injection in patients with frozen shoulder of < 6 months' duration. The comparators were home exercise alone, physiotherapy alone (both with placebo injection) and steroid injection followed by physiotherapy. For pain there was a short-term statistically significant benefit with steroid injection compared Maund, E., Craig, D., Suekarran, S., Neilson, A., Wright, K., Brealey, S., . . . McDaid, C. (2012). Management of frozen shoulder: a systematic review and costeffectiveness analysis. 16(11), 1-264

Databases were searched from inception up to March 2010 Inclusion Criteria: Population: Participants with idiopathic (primary) frozen shoulder (adhesive capsulitis) as defined by the authors, with or without diabetes Intervention: Physical therapies, arthrographic distension, steroid injection, sodium hyaluronate injection, MUA, capsular release, watchful waiting Comparator: Any of the above, no treatment or placebo Outcomes: Pain; ROM; function and disability; quality of life; time to recovery, return to work and recreation; adverse events Study design: RCTs; in the absence of randomised trials, quasi-experimental studies (i.e. with a control group). If controlled trials were not available for MUA or capsular release, case series of at least 50 participants Studies of economic evaluations: Full economic evaluations that also met the population and intervention inclusion criteria Exclusion Criteria: No information proveded (despite the inclusion criteria)	hyaluronate. Dose-ranging studies of sodium hyaluronate were excluded. Studies of acupuncture were included only when the comparator was one of the other interventions of interest in the review. Therefore, studies comparing more than one type of acupuncture or comparing acupuncture to an alternative therapy such as moxibustion were excluded.	was provided in conjunction with physiotherapy, there was an added benefit for pain over physical therapy alone (SMD –0.98, 95% CI –1.43 to –0.52; two RCTs). There was also benefit with the combined intervention over steroid injection alone (SMD –0.75, 95% CI –1.20 to –0.29; two RCTs), although there was substantial heterogeneity. The results for function and disability and range of movement were broadly consistent with the results for pain. Based on a single study, there was no statistically significant benefit for quality of life with a steroid injection alone compared with placebo or physiotherapy alone. However, there was a benefit for quality of life when physiotherapy was added to steroid injection compared with placebo and physiotherapy alone. There was no evidence of benefit for the combined intervention over steroid injection alone. Author's Conclusion: There may be short-term benefit from adding a single intra-articular steroid injection to home exercise for patients with primary frozen shoulder of < 6 months' duration. In the same population there may also be benefit from adding physiotherapy (including mobilisation in 8–10 sessions over 4 weeks) to a single steroid injection.	

Methodical Notes Funding Sources: Funding for this study was provided by the Health Technology Assessment programme of the National Institute for Health Research. COI: One author (Amar Rangan) has received consultancy fees from DePuy International relating to shoulder replacement prostheses. A division of DePuy is involved in marketing products for surgical treatment of the frozen shoulder. The other authors report no conflicts of interest. Study Quality: Data from studies with a low risk of bias were sparse, in particular for the more invasive treatments (MUA, distension and capsular release). Twenty-eight RCTs, one quasi-experimental study (for 'supervised neglect') and two case series (for capsular release) were included. A total of 18 studies did not report an adequate method of randomisation (therefore these studies described as RCTs may have been quasi-experimental studies); 24 did not report an adequate method of allocation concealment; and 13 did not have blinded outcome assessment. For most of the studies it was unclear whether they were adequately powered to detect a statistically significant difference between groups. Across most trials there did not appear to be systematic methods for recording of adverse events. Heterogeneity: Results were heterogenous Publication Bias: No informition provided Notes:

6.10

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Buchbinder, R. et al. Arthrographic distension for adhesive capsulitis (frozen shoulder). Cochrane Database Syst Rev. . CD007005. 2008			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 2 Study type: systematic review Databases: We searched the Cochrane Musculoskeletal Review Group Register, CENTRAL, MEDLINE, CINAHL, and EMBASE to November2006, unrestricted by date or language Search period: In the original review, we searched the literature from 1966 untilFebruary 1999. For this update, we searched the following sourcesfrom 1999 to November 2006 (e Inclusion Criteria: Randomised controlled trials (RCTs) or quasirandomised	Population: Five trials with 196 people were included Intervention: arthrographic distension using steroid and air to distension using air alone and to steroid injection alone, arthrographic distension using steroid and saline Comparison: One threearm trial(47 participants) compared arthrographic distension using steroid andair to distension using air alone and to steroid injection alone. One trial (46 participants) compared arthrographic distension usingsteroid and saline to placebo. Two trials (45 and 22 participants) compared arthrographic distension using steroid to steroid injectionalone. One trial (36 participants) compared	Primary: All clinically relevant outcomes measured in the trials were consid-ered. Primary outcomes were pain (at night, at rest, and on movement) and function or disability assessment. Secondary: econdary measureswere range of motion (active or passive, including different directions of movement such as flexion, extension, abduction (move-ment away from the body), external rotation, internal rotation,elevation of affected shoulder and hand behind back); severityofthe disorder; analgesic use; adverse events; time to recovery or re-currence; and	Buchbinder R, Green S, Forbes A, Hall S, Lawler G. Arthrographic joint distension with saline and steroid improves function and reduces pain in patients with painful stiff shoulder: results of a randomised double-blind placebocontrolled trial. Annals of Rheumatic Disease 2004;63: 302–9. Corbeil V, Dussault R, Leduc B, Fleury J. Adhesive capsulitis of the shoulder: a comparative study of arthrography with intra-articular corticotherapy and with or without capsular distension [Capsulite retractile de l'epaule: etude comparitive de l'arthrographie avec corticotherapie intra–articulaire avec ou sans distension capsulaire]. Canadian Association of Radiologists Journal 1992;43:127–30. Gam AN, Schydlowsky P, Rossel I, Remvig L, Jensen EM. Treatment of "frozen shoulder" with distension and glucocorticoid compared with glucocorticoid alone. Scandinavian Journal of Rheumatology 1998;27:425–30. Jacobs L, Barton M, Wallace W, Ferrousis J, Dunn W, Bossingham D. Intra-articular distension and steroids in the management of capsulitis of the shoulder. BMJ 1991;302: 1498–501.

controlled clinical trials (CCTs: methods of allocating participants toa treatment which are not strictly random, e.g. date of birth, hos-pital record number or alternation) were eligible for inclusion inthis systematic review. Studies were included in which adult participants were describedas having adhesive capsulitis, frozen shoulder, painful stiff shoulderor periarthritis, generally defined as the presence of pain withrestriction of active and passive glenohumeral joint movements Exclusion Criteria: Studies that included mixed populations of participants withshoulder pain were only eligible for inclusion provided thatresultsfor the adhesive capsulitis participants were presented separatelyor > 90% of participants in the study had adhesive capsulitis	arthrographic distension using steroid and saline plus physical therapy to physical therapy1Arthrographic distension for adhesive capsulitis (frozenshoulder) (Review)Copyright © 2009 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd. alone	any other measures. Results: The trial with low risk of bias demonstrated that distensionwith saline and steroid was better than placebo for pain (number neededto treat to benefit (NNTB) = 2), function (NNTB = 3) and range of movement at three weeks. This benefit was maintained at sixand 12 weeks only for one of two scores measuring function (NNT = 3). A second trial with high risk of bias also reported thatdistension combined with physical therapy improved range of movement and median percent improvement in pain (but not pain score)at eight weeks compared to physical therapy alone. Three further trials, all at high risk of bias, reported conflicting, variable effectsof arthrographic distension with steroid compared to distension alone, and arthrographic distension with steroid compared to intra-articular steroid injection. The trials reported a small number of minor adverse effects, mainly pain during and after the procedure. Author's Conclusion: There	Khan AA, Mowla A, Shakoor MA, Rahman MR. Arthrographic distension of the shoulder joint in the management of frozen shoulder. Mymensingh Medical Journal 2005;14:67–70.

		is “silver” level evidence that arthrographic distension with saline and steroid provides short-term benefits in pain, range ofmovement and function in adhesive capsulitis. It is uncertain whether this is better than alternative interventions. Undergoing distension with steroid and saline solution compared to placebo (fake distension);- May improve pain at three weeks.- May improve disability at three, six and 12 weeks.Undergoing distension with steroid and saline solution compared to ordinary injection with steroid;- May not lead to any difference in pain and disability.We often do not have precise information about side effects andcomplications. Possible minor side effects may include pain orclaustrophobia at the time of the procedure and fluid noises in the shoulder.	
Methodical Notes			
Funding Sources: Cochrane Musculoskeletal Group COI: - Study Quality: Five trials with 196 people were included. Only one trial was at low risk of bias. Heterogeneity: Trials included similar study participants, but quality and reporting of data were variable. Publication Bias: - Notes:			

Saltychev, M. et al. Effectiveness of Hydrodilatation in Adhesive Capsulitis of Shoulder: A Systematic Review and Meta-Analysis. Scand J Surg. 107. 285-293. 2018			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References

Evidence level: 2 Study type: systematic review and meta-analysis Databases: literature search on medline, Embase, scopus, cochrane central, web of science, and CINAHL databases was done Search period: databases were searched in September 2017 Inclusion Criteria: The inclusion and exclu-sion criteria varied mildly being quite similar in the majority of the studies Exclusion Criteria: The inclusion and exclu-sion criteria varied mildly being quite similar in the majority of the studies	Population: The sizes of intervention groups varied from 8 to 60 patients with predominance of people of middle age (mostly women) Intervention: hydrodilatation (combined with corticosteroid) Comparison: different studies: - corticosteroid alone - treatment as usual or contrast alone - manipulation - hydrodilatation combined with hyaluronate - hydrodilatation combined with interscalene block - manipulation with corticosteroid	Primary: variable: shoulder ROM, use of analgesics, and symptom severity; use of anal-gesics; ROM change; and pain severity Secondary: Results: the lower 95% confidence interval for the effect of hydrodilatation on pain severity was 0.12 indicating small effect size and mean number needed to treat 12. the pooled effect of hydrodilatation on disability level was insignificant 0.2 (95% confidence interval: −0.04 to 0.44). the lower 95% confidence interval for the effect of hydrodilatation on the range of shoulder motion was close to zero (0.07) indicating small effect size with mean number needed to treat 12. the amount of injected solution did not have a substantial effect on pain severity or range of shoulder motion Author's Conclusion: according to current evidence, hydrodilatation has only a small, clinically insignificant effect when treating adhesive capsulitis	Buchbinder R, Green S, Forbes A et al: Arthrographic joint distension with saline and steroid improves function and reduces pain in patients with painful stiff shoulder: Results of a randomised, double blind, placebo controlled trial. Ann Rheum Dis 2004;63:302–309. Gam AN, Schydlowsky P, Rossel I et al: Treatment of “frozen shoulder” with distension and glucorticoid compared with glucorticoid alone. A randomised controlled trial. Scand J Rheumatol 1998;27:425–430. Park G, Hwnag S: Comparison of intraarticular steroid injection with and without capsular distension in adhesive capsulitis of the shoulder. J Korean Acad Rehabil Med 2000;24:1174–1179. Khan A, Mowla A, Shakoor M et al: Arthrographic distension of the shoulder joint in the management of frozen shoulder. Mymensingh Med J 2005;14:67–70. Quraishi N, Johnston P, Bayer J et al: Thawing the frozen shoulder. A randomised trial comparing manipulation under anaesthesia with hydrodilatation. J Bone Joint Surg Br 2007;89:1197–1200. Tveitå E, Tariq R, Sesseng S et al: Hydrodilatation, corticosteroids and adhesive capsulitis: A randomized controlled trial. BMC Musculoskelet Disord 2008;9:53. Park K, Nam H, Lee J et al: Treatment effects of ultrasoundguided capsular distension with hyaluronic acid in adhesive capsulitis of the shoulder. Arch Phys Med Rehabil 2013;94:264–270. Reza SS, Bijan F, Asghar HA et al: Treatment of frozen shoulder: A double blind study ccomparing the impact of triamcinolone injection alone or in association with joint distention. Res J Pharmaceut Biol Chem Sci 2013;4:226–234. Lee DH, Yoon SH, Lee M et al: Capsule-preserving hydrodilatation with corticosteroid versus corticosteroid injection alone in refractory adhesive capsulitis of shoulder: A randomized controlled trial. Arch Phys Med Rehabil 2016;98:815–821. Mun SW, Baek CH: Clinical efficacy of hydrodistention with joint manipulation under interscalene block compared with intra-articular corticosteroid injection for frozen shoulder: A prospective randomized controlled study. J Shoulder Elbow Surg 2016;25:1937–1943. Sharma S, Baerheim A, Moe-Nilssen R et al: Adhesive capsulitis of the shoulder, treatment with corticosteroid,

			corticosteroid with distension or treatment-as-usual; A randomized controlled trial in primary care. BMC Musculoskelet Disord 2016;17:232. Yoon J, Chung S, Kim J et al: Intra-articular injection, subacromial injection, and hydrodilatation for primary frozen shoulder: A randomized clinical trial. J Shoulder Elbow Surg. 2016;25:376–383.
Methodical Notes			
Funding Sources: The author(s) received no financial support for the research, authorship, and/or publication of this article COI: M. Saltychev, et al.8DECLARATIOn OF COnFLICTInG InTERESTSThe author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article Study Quality: of the 270 records identified through search, 12 studies were included in qualitative and quantitative analysis and seven were included in a meta-analysis Heterogeneity: the heterogeneity level i2 was acceptable from 0% to 60% Publication Bias: Of the assessed studies, eight were considered to have low risk and four were consid-ered to have high risk of systematic bias Notes:			

6.11

Ahmed Zaky Hussein & Robert A. Donatelli (2016) The efficacy of radial extracorporeal shockwave therapy in shoulder adhesive capsulitis: a prospective, randomised, double-blind, placebo-controlled, clinical study, European Journal of Physiotherapy, 18:1, 63-76, DOI: 10.3109/21679169.2015.1119887

Park C, Lee S, Yi CW, Lee K. The effects of extracorporeal shock wave therapy on frozen shoulder patients' pain and functions. J Phys Ther Sci. 2015 Dec;27(12):3659-61. doi: 10.1589/jpts.27.3659. Epub 2015 Dec 28. PMID: 26834326; PMCID: PMC4713765.

6.12

Dogru, H. et al. Effectiveness of therapeutic ultrasound in adhesive capsulitis. Joint Bone Spine. 75. 445-50. 2008		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 1 Study type: RCT Number of Patient: 49 Patienten mit adhäsiver Kapsulitis wurden randomisiert in US (n = 25) und Schein-US (n = 24) Gruppen eingeteilt. Recruitung Phase: Nicht näher benannt/erwähnt. Inclusion Criteria: Die Kriterien für den Einschluss in die Studie waren (1) Schulterschmerz von mindestens 3 Monaten Dauer ohne schwerwiegendes Trauma, (2) 25% Verlust der Schulterbewegung in allen Ebenen, (3) Bewegungsschmerz mit einem Mindestwert der visuellen Analogskala (VAS) von 40 mm, (4) normale Befunde auf Röntgenbildern des Glenohumeralgelenks und (5)	Intervention: Oberflächliche Hitze (Hot Pack, HP) und Übungsprogramm wurde beiden Gruppen verabreicht. Ultraschall bei der USGruppe und der imitierende Ultraschall bei der Schein US-Gruppe. Die Patienten erhielten ein tägliches Physiotherapieprogramm innerhab von 2 Wochen (außer am Wochenende). Nach dem körperlichen Therapieprogramm ein Übungsprogramm für zu Hause, bestehend aus Codman-Übungen, aktive ROM und Dehnungsübungen (für beide Gruppen empfohlen). Einhaltung der Heimübung Programm wurde während 3 Monaten täglich auf einer Karte	Primary: Nach der Vorbehandlung wurden bei den Patienten der Schulter- ROM und der Bewegungsschmerz (VAS), der Schulterschmerz- und Behinderungsindex (SPADI) und die Kurzform-36 (SF-36) ausgewertet. Das Schulter-ROM, der Schmerz und der SPADI wurden nach der 10. Sitzung der Behandlung (Nachbehandlung) und im 3. Monat (Kontrolle) erneut bewertet, während der SF-36-Fragebogen nur als Kontrolleuntersuchung ausgeführt wurde. Secondary: nicht näher benannt Results: Neunundvierzig Patienten mit einem Durchschnittsalter von 55,3 +/- 7,6 Jahren wurden in die Studie aufgenommen.

Abwesenheit von Arthritis, Malignität und Erkrankungen wie Herzerkrankungen, Infektionen und Gerinnungsstörungen. Exclusion Criteria: Patienten mit sekundärer adhäsiver Kapsulitis aufgrund von Rissen, Frakturen und Luxationen der Rotatorenmanschette und reflexsympathische Dystrophie wurden aus der Studiengruppe ausgeschlossen	aufgezeichnet. Patienten wurden alle 2 Wochen telefonisch angerufen und an die Leistung erinnert die Übungen zu machen und wurden täglich auf einer Karte verzeichnet. Comparison: Das selbe Programm wie in der Interventionsgruppe nur mit Placebo- US.	Die demographischen Merkmale der Patienten sind in Tabelle 1 aufgeführt. Es gab keinen statistisch signifikanten Unterschied zwischen den Gruppen in Bezug auf Alter und Geschlecht. Obwohl die Krankheitsdauer in der US-Gruppe länger war, war der Unterschied nicht signifikant. Achtzehn der Patienten (36,7%) hatten Diabetes mellitus. Die Charakteristika der Patienten mit Diabetes mellitus waren ähnlich wie bei den anderen Patienten. Author's Conclusion: Unsere Ergebnisse deuten darauf hin, dass die US im Vergleich zu den Schein-USA keinen relevanten Vorteil bei der Behandlung der adhäsiven Kapsulitis bieten. Die Einschränkung unserer Studie liegt möglicherweise in der relativ geringen Anzahl von Patienten in jeder Gruppe. Um die Wirksamkeit von US bei adhäsiver Kapsulitis zu klären, sind randomisierte plazebokontrollierte Studien an größeren Populationen erforderlich.
Methodical Notes		
Funding Sources: Nicht näher benannt COI: nicht benannt Randomization: Forty-nine patients with adhesive capsulitis were randomized to US (n = 25) and sham US (n = 24) groups. Blinding: Alle Patienten wurden von ein und demselben Arzt untersucht, der gegenüber den Behandlungsgruppen blind war. Fünfzig der Patienten wurden fortlaufend nummeriert und entweder der Ultraschall- (US) Gruppe oder Placebo- (Schein-US) Gruppe durch einen andere Arzt zugewiesen. Dropout Rate/ITT-Analysis: Vierzehn der Patienten erfüllten die Aufnahmekriterien nicht und drei verweigerten die Teilnahme wegen des Transports. Notes:		

Ebadi, S. et al. Does ultrasound therapy add to the effects of exercise and mobilization in frozen shoulder? A pilot randomized double-blind clinical trial. J Bodyw Mov Ther. 21. 781-787. 2017		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 2 Study type: A pilot randomized doubleblind clinical trial Number of Patient: 50 Recruitung Phase: Der Versuch wurde in einem Universitätskrankenhaus durchgeführt. Klinik für Physiotherapie (Krankenhaus Firouzgar, Teheran, Iran). Patienten mit der Diagnose der primären adhäsive Kapsulitis wurden angeschrieben und gebeten, die Einverständniserklärung zu lesen um an der Studie teilnehmen zu können. Nach	Intervention: Die eigentliche Ultraschall-Therapiegruppe erhielt kontinuierlichen Ultraschall; 3 MHtz , 1,5 w/cm2 für 6 Minuten über die anterioren und posterioren Aspekte der glenohumeralen Kapsel (3 Minuten auf einer durchschnittliche Fläche von 6 cm2 auf jeder Seite) mit Sonopuls 492 (ENRAF Nonius, Niederlande) . Der Ultraschallkopf wurde kreisförmig mit einer Geschwindigkeit von etwa 3 cm/sec. bewegt. Comparison:	Primary: Der Schmerz (VAS) und der Oxford Shoulder Score Fragebogen wurden vor der Behandlung, früh nach der Behandlung gemessen, und nach 3 Monaten seit der letzten Behandlungssitzung . Secondary: Active Range of Motion (Vorwärtsbeugung, Abduktion, Innenund Außenrotation) wurde mit einem Standard-Universalgoniometer gemessen. Results: Die Mittelwerte von dem Oxford Shoulder Score und VAS

einer gründlichen Untersuchung der Patienten durch den Arzt und später noch einmal durch den Therapeuten in der Physiotherapie-Klinik, wurden 50 Patienten für die Studie aufgenommen. Inclusion Criteria: Die Einschlusskriterien waren : Alter zwischen 40-70 Jahren; mit der Diagnose primär idiopathisch adhäsive Kapsulitis; die Beteiligung nur einer Seite; Schulterschmerzen und Bewegungseinschränkung für mindestens 3 Monate vor der Studie ; keine systemischen Erkrankungen (Diabetes, rheumatoide Arthritis, etc.) ; keine spezifische psychische Störung; Patient hat keine physiotherapeutische Behandlung erhalten, während der letzten 6 Monate und keine schmerzstillenden Medikamente während der Studie verwendet. Exclusion Criteria: Ausschlusskriterien: Patienten, die nicht mehr bereit sind, die Studie fortzusetzen, und Nichteinhaltung einer der Einschlusskriterien während für die Studie.	Das Ultraschallgerät war für die Scheingruppe eingeschaltet, damit das Licht an war, aber der Ausgang war auf Null und der Kopf wurde nach dem gleichen Muster und für die gleiche Dauer bewegt wie bei der Ultraschall-Gruppe. Die Einstellungen des Ultraschallgeräts wurden von der Physiotherapie-Assistentin vorgenommen.Um den Therapeuten und den Patienten (der den Bildschirm des Geräts nicht sehen konnte) verblindet zu halten.	nahmen in beiden Gruppen mit der Zeit ab und führten zu einer signifikante Verbesserung ($p < .05$). Es gab keine signifikante Interaktion zwischen den Gruppen beim Oxford Shoulder Score; Die Veränderungen des ROM waren während der 10 Behandlungssitzungen gleich Author's Conclusion: Diese Studie legt nahe, dass kontinuierlicher 3-MHz-Ultraschall, der 6 Minuten lang um die Schulterkapsel herum angewendet wird, nicht zu den Vorteilen eines spezifischen halb-überwachten Übungsprogramms plus Mobilisation bei Patienten, die seit mehr als 3 Monaten an primärer adhäsiver Kapsulitis leiden.
Methodical Notes		
Funding Sources: Öffentliche Fördergelder COI: Die Autoren erklären, dass es keine Interessenkonflikte gibt. Randomization: Die Patienten wurden nach dem Zufallsprinzip in 2 Gruppen von Ultraschalltherapie (kontinuierlicher Ultraschall) und Schein-Ultraschalltherapie (Schein-Ultraschall) unter Verwendung zufällig generierter Behandlungszuweisungen innerhalb versiegelter undurchsichtiger Umschläge, die von einem Statistiker, der nicht an der Rekrutierung beteiligt war. Blinding: Verblindet über Umschläge Dropout Rate/ITT-Analysis: 10 Dropouts nach PT Untersuchung Notes:		

6.13

Leung, M. S. et al. Effects of deep and superficial heating in the management of frozen shoulder. J Rehabil Med. 40. 145-50. 2008		
Population	Intervention - Comparison	Outcomes/Results
Evidence level: 3 Study type: A singleblinded, randomized controlled study Number of Patient: 30 Recruitung Phase: The diagnosis of frozen shoulder in the stiffness phase was made by an orthopaedic surgeon. Inclusion Criteria: Subjects were included if they had experienced shoulder pain and limited shoulder movement for at least 8 weeks. Exclusion Criteria: Subjects were	Intervention: (i) Shortwave Diathermy (SWD) plus stretching (n = 10); (ii) Hot pack (HP) plus stretching (n = 10) A shortwave diathermy machine (Curapuls 419, Enraf Nonius, The Netherlands) with an operating frequency of 27.12 MHz was used to deliver the deep heating treatment. The subjects were positioned comfortably sitting on a wooden chair with their back and affected arm supported. A	Primary: The American Shoulder and Elbow Surgeons (ASES) assessment form was used to measure the treatment outcomes in the present study. Pain level Activities of daily living Shoulder ROM Assessments were made prior to treatment at the baseline, at sessions 6 and 12, and at the 4-week follow-up session. Secondary: - Results: A significant improvement was seen in all groups in all

excluded if they had a history of trauma to the shoulder, acute signs of inflammation over the shoulder, intrinsic shoulder pathology, were taking analgesic or antiinflammatory drugs, had metal implants, impaired sensation of hot and cold, were pregnant, or had a cardiac pacemaker	pair of disc electrodes was placed on the anteriorposterior aspects of the affected glenohumeral joint, separated by a hand'sbreadth from the surface of the body. The intensity of the current was adjusted according to the subject's subjective feeling of comfortable warmth. If the level of perceived heating changed during the application, the machine's output was adjusted to maintain the sensation of comfortable warmth throughout the treatment. For the HP group, an electrical hot pack sized 35.5 × 68.5 cm was used to deliver superficial heating. The temperature was set at 63°C. The subjects were informed that the only purpose of the heating was to produce a feeling of comfortable warmth. If they felt that the heat was excessive, the temperature of the electrical HP was adjusted immediately to ensure that the heat remained at a comfortably warm level only throughout the treatment. The subjects in the SWD and HP groups received the respective treatments 3 times per week for 4 weeks. Each treatment session lasted for 20 min. Immediately after the heat treatment, subjects were asked to perform 4 stretching exercises in the following fixed sequence. Comparison: (iii) stretching exercises alone (n = 10) All treatment groups received a standard set of shoulder stretching exercises. stretching in external rotation, in flexion, followed by stretching in hand-behind-theback and cross-body adduction. They were asked to repeat the stretches 4 times. Each stretch was sustained for 30 sec, with 10 sec rest between each stretch. The subjects were asked to perform the stretching exercises at home every day.	outcome measures except for that of shoulder flexion range. The improvement in the shoulder score index and in the range of motion was significantly better in the deep heating group than in the superficial heating group. By session 12, the shoulder score index in the SWD group had increased by 63.4%, compared with 45.2% in the HP group and 38.4% in the stretching alone group. The overall within-group difference across the study period was significant in the 3 groups ($p < 0.001$). The between-group difference was significant ($p = 0.046$). There was no significant difference between the HP group and stretching alone group ($p > 0.05$). By session 12, the shoulder flexion range had increased by 13.9% in the SWD group and 3.5% in the HP group. By contrast, the range in the stretching alone group decreased by 4.2%. The within-group difference across the study period was significant only in the SWD group ($p = 0.002$) and a post hoc test showed that the range achieved by the SWD group was significantly wider than that achieved by the HP group ($p = 0.025$). A between-group difference was found in session 6 ($p = 0.007$), session 12 ($p = 0.049$), and in the follow-up session ($p = 0.031$). However, after an adjustment was made using the Bonferroni Correction (adjusted p-value = 0.0125), a significant group difference was maintained only in session 6. By session 12, the SWD group demonstrated a 14.5% gain in shoulder external rotation with arm by side, compared with 21.1% in the HP group and 22.6% in the stretching groups (Table IV). The overall within-group difference across the study period was significant ($p =0.008$). There was significant between-group difference in the external rotation range ($p = 0.009$). The post hoc test showed that the SWD group achieved a greater external

		rotation range than did the HP group (p = 0.007). In all 3 treatment groups, the external rotation range of the shoulder with arm in 90° abduction tended to increase during the study period (within-group p = 0.011). By the 4-week follow-up session, the SWD group demonstrated a 17.4% cumulative increase, compared with 14.2% for the HP group, and 15.3% for the stretching alone group. The between-group difference was statistically significant among the 3 treatment groups (p = 0.021). The post hoc test indicated that the range in the SWD group was significantly greater than in the HP group (p = 0.016). The hand-behind-back distance decreased progressively over time (Table IV). By the 4-week follow-up session, there was a cumulative decrease in the group mean of 51.2% in the SWD group, 26.5% in the HP group, and 18.8% in the stretching group. The within-group difference across the study period was significant (p < 0.001). There was significant between-group difference in the hand-behind-back range (p = 0.004). The post hoc test showed that the gain in the hand-behind-back range achieved by the SWD group was significantly greater than that achieved by the HP group (p = 0.003). Author's Conclusion: The addition of deep heating to stretching exercises produced a greater improvement in pain relief, and resulted in better performance in the activities of daily living and in range of motion than did superficial heating.
Methodical Notes		
Funding Sources: not mentioned COI: not mentioned Randomization: Randomization was performed using an on-line randomization plane (http://www.randomization.com). Blinding: The rater was blinded to the group allocation. Dropout Rate/ITT-Analysis: None of the participants in any of the treatment groups dropped out throughout the study period. Notes: Merkmale --> Alter, Geschlecht: Es gab keine signifikanten Unterschiede zwischen den 3 Gruppen (alle p < 0,05) --> falsche Angabe der Signifikanz: p müsste größer als 0.05 sein, damit keine Unterschiede vorliegen. Gruppen sind augenscheinlich ähnlich. No significant difference (p > 0.05) was found among all of the outcome measures at the baseline. --> Gruppen sind hier z. T. augenscheinlich nicht ähnlich, obwohl der p-Wert "stimmt". Bsp. ROM Flex 129° - 118° - 138°, ROM AR 50° - 28° - 40°		

6.14

OXFORD (2011) Appraisal Sheet: Systematic Reviews

Page, M. J. et al. Electrotherapy modalities for adhesive capsulitis (frozen shoulder). Cochrane Database Syst Rev. . CD011324. 2014			
Evidence Level/Study Types	P - I - C	Outcomes/Results	Literature References
Evidence level: 1 Study type: Systematic Review (Cochrane) Databases: CENTRAL, MEDLINE, EMBASE, CINAHL Plus and the ClinicalTrials.gov and World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) clinical trials registries Search period: until May 2014 Inclusion Criteria: Types of studies We included randomised controlled trials (RCTs) of any design (for example parallel, cross-over, factorial) and controlled clinical trials using a quasi-randomised method of allocation, such as by alternation or date of birth. Reports of trials were eligible regardless of the language or date of publication. Types of participants We included trials that enrolled adults (> 16 years of age) with adhesive capsulitis (as defined by the trialists) for any duration. We included trials enrolling participants with various soft tissue disorders only if the results for the participants with adhesive capsulitis were presented separately or if 90% or more of participants in the trial had adhesive	Population: We included trials that enrolled adults (> 16 years of age) with adhesive capsulitis (as defined by the trialists) for any duration. We included trials enrolling participants with various soft tissue disorders only if the results for the participants with adhesive capsulitis were presented separately or if 90% or more of participants in the trial had adhesive capsulitis. We excluded trials including participants with a history of significant trauma or systemic inflammatory conditions such as rheumatoid arthritis, osteoarthritis, hemiplegic shoulders, and pain in the shoulder region as part of a complex myofacial neck/shoulder/arm pain condition. Intervention: We included trials comparing any electrotherapy modality to placebo, no treatment, a different electrotherapy modality, or any other intervention. Examples of eligible electrotherapy modalities included therapeutic ultrasound, LLLT, TENS, PEMF, interferential current, phonophoresis,	Primary: Main outcomes • Participant-reported pain relief of 30% or greater (amoderate clinically important difference) • Overall pain (mean or mean change measured by VAS, numerical or categorical rating scales) • Function. Where trialists reported outcome data for more than one function scale we extracted data on the scale that was highest on the following a priori defined list: (1) Shoulder Pain and Disability Index (SPADI); (2) Croft Shoulder Disability Questionnaire; (3) Constant Score; (4) Short Form-36 (SF-36) Physical Component Score; (5) Health Assessment Questionnaire; (6) any other function scale • Global assessment of treatment success as defined by the trialists (for example proportion of participants with significant overall improvement) • Active shoulder abduction (measured in degrees or other) • Quality of life as measured by generic measures (such as components of the SF-36) or disease-specific tools • Number of participants experiencing any adverse events Secondary: • Night	Battisti 2007 {published data only} Battisti E, Bianciardi L, Albanese A, Piazza E, Rigato M, Galassi G, et al. The new magnetic therapy TAMMEF in the treatment of simple shoulder pain. La Clinica Terapeutica 2007;158:397-401. Bumin 2001 {published data only} Bumin G, Can F. Effects of iontophoresis and phonophoresis methods on pain in cases with shoulder periarthritis. Pain Clinic 2001;13:159-62. Calis 2006 {published data only} Calis M, Demir H, Ulker S, Kirnap M, Duygulu F, Calis HT. Is intraarticular sodium hyaluronate injection an alternative treatment in patients with adhesive capsulitis?. Rheumatology International 2006;26:536-40. Carette 2003 {published data only} Carette S, Moffet H, Tardif J, Bessette L, Morin F, Frémont P, et al. Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebocontrolled trial. Arthritis and Rheumatism 2003;48:829-38. Cheing 2008 {published data only}

capsulitis. We excluded trials including participants with a history of significant trauma or systemic inflammatory conditions such as rheumatoid arthritis, osteoarthritis, hemiplegic shoulders, and pain in the shoulder region as part of a complex myofacial neck/shoulder/arm pain condition. Types of interventions We included trials comparing any electrotherapy modality to placebo, no treatment, a different electrotherapy modality, or any other intervention. Examples of eligible electrotherapy modalities included therapeutic ultrasound, LLLT, TENS, PEMF, interferential current, phonophoresis, iontophoresis, and continuous short wave diathermy. Trials primarily evaluating the effect of a manual therapy or exercise intervention were excluded and are included in a separate Cochrane review. Exclusion Criteria:	iontophoresis, and continuous short wave diathermy. Trials primarily evaluating the effect of a manual therapy or exercise intervention were excluded and are included in a separate Cochrane review. Comparison:	pain measured by VAS, numerical or categorical rating scales • Pain on motion measured by VAS, numerical or categorical rating scales • Other range of motion (ROM) measures for example flexion, external rotation and internal rotation (measured in degrees or other such as hand behind back distance in centimetres). Where trialists reported outcome data for both active and passive ROM measures we extracted the data on active ROM only • Work disability • Requiring surgery, for example manipulation under anaesthesia, arthroscopy Results: Nineteen trials (1249 participants) were included in the review. Four trials reported using an adequate method of allocation concealment and six trials blinded participants and personnel. Only two electrotherapy modalities (lowlevel laser therapy (LLLT) and pulsed electromagnetic field therapy (PEMF)) have been compared to placebo. No trial has compared an electrotherapy modality plus manual therapy and exercise to manual therapy and exercise alone. The two main questions of the review were investigated in nine trials. Low quality evidence from one trial (40 participants) indicated that LLLT for six days may result in improvement at six days. Eighty per cent	Cheing GLY, So EML, Chao CYL. Effectiveness of electroacupuncture and interferential electrotherapy in the management of frozen shoulder. Journal of Rehabilitation Medicine 2008;40:166-70. Dewan 2011 {published data only} Dewan A, Sharma R. Effectiveness of transcutaneous electrical nerve stimulation and interferential electrotherapy in adhesive capsulitis. Pb Journal of Orthopaedics 2011;12(1):64-71. Dogru 2008 {published data only} Dogru H, Basaran S, Sarpel T. Effectiveness of therapeutic ultrasound in adhesive capsulitis. Joint, Bone, Spine 2008;75:445-50. Ghosh 2012 {published data only} Ghosh TK, Bera AK, Hossain ME, Sarkar PS. Comparison of results of three different methods of treatment for adhesive capsulitis of shoulder. Journal of the Indian Medical Association 2012;110(11):827-8. Guler-Uysal 2004 {published data only} Guler-Uysal F, Kozanoglu E. Comparison of the early response to two methods of rehabilitation in adhesive capsulitis. Swiss Medical Weekly 2004;134:353-8. Kanai 2006 {published data only} Kanai S, Taniguchi N. Effect of polarity exchangeable permanent magnet on frozen shoulder pain. Pain Clinic 2006;18:37-45. Leclaire 1991 {published data only}

		(16/20) of participants reported treatment success with LLLT compared with 10% (2/20) of participants receiving placebo (risk ratio (RR) 8.00, 95% confidence interval (CI) 2.11 to 30.34; absolute risk difference 70%, 95% CI 48% to 92%). No participants in either group reported adverse events. We were uncertain whether PEMF for two weeks improved pain or function more than placebo at two weeks because of the very low quality evidence from one trial (32 participants). Seventy-five per cent (15/20) of participants reported pain relief of 30% or more with PEMF compared with 0% (0/12) of participants receiving placebo (RR 19.19, 95% CI 1.25 to 294.21; absolute risk difference 75%, 95% CI 53% to 97%). Fifty-five per cent (11/20) of participants reported total recovery of joint function with PEMF compared with 0% (0/12) of participants receiving placebo (RR 14.24, 95% CI 0.91 to 221.75; absolute risk difference 55%, 95% CI 31 to 79). Moderate quality evidence from one trial (63 participants) indicated that LLLT plus exercise for eight weeks probably results in greater improvement when measured at the fourth week of treatment, but a similar number of adverse events, compared with placebo plus exercise. The mean pain score at four weeks was 51	Leclaire R, Bourgouin J. Electromagnetic treatment of shoulder periarthritis: a randomized controlled trial of the efficiency and tolerance of magnetotherapy. Archives of Physical Medicine and Rehabilitation 1991;72:284-7. Lee 1973 {published data only} Lee M, Haq AM, Wright V, Longton EB. Periarthritis of the shoulder: a controlled trial of physiotherapy. Physiotherapy 1973;59:312-5. Leung 2008 {published data only} Leung MS, Cheing GL. Effects of deep and superficial heating in the management of frozen shoulder. Journal of Rehabilitation Medicine 2008;40:145-50. Maryam 2012 {published data only} Maryam M, Zahra K, Adeleh B, Morteza Y. Comparison of corticosteroid injections, physiotherapy, and combination therapy in treatment of frozen shoulder. Pakistan Journal of Medical Sciences 2012;28:648-51. Pajareya 2004 {published data only} Pajareya K, Chadchavalpanichaya N, Painmanakit S, Kaidwan C, Puttaruksa P, Wongsaranuchit Y. Effectiveness of physical therapy for patients with adhesive capsulitis: a randomized controlled trial. Journal of the Medical Association of Thailand 2004;87:473-80. Rigato 2002 {published data only} Rigato M, Battisti E, Fortunato M, Giordano N. Comparison

		points with placebo plus exercise, while with LLLT plus exercise the mean pain score was 32 points on a 100 point scale (mean difference (MD) 19 points, 95% CI 15 to 23; absolute risk difference 19%, 95% CI 15% to 23%). The mean function impairment score was 48 points with placebo plus exercise, while with LLLT plus exercise the mean function impairment score was 36 points on a 100 point scale (MD 12 points, 95% CI 6 to 18; absolute risk difference 12%, 95% CI 6 to 18). Mean active abduction was 70 degrees with placebo plus exercise, while with LLLT plus exercise mean active abduction was 79 degrees (MD 9 degrees, 95% CI 2 to 16; absolute risk difference 5%, 95% CI 1% to 9%). No participants in either group reported adverse events. LLLT's benefits on function were maintained at four months. Based on very low quality evidence from six trials, we were uncertain whether therapeutic ultrasound, PEMF, continuous short wave diathermy, Iodex phonophoresis, a combination of Iodex iontophoresis with continuous short wave diathermy, or a combination of therapeutic ultrasound with transcutaneous electrical nerve stimulation (TENS) were effective adjuncts to exercise. Based on low or very low quality	between the analgesic and therapeutic effects of a musically modulated electromagnetic field (TAMMEF) and those of a 100 Hz electromagnetic field: blind experiment on patients suffering from cervical spondylosis or shoulder periarthritis. Journal of Medical Engineering & Technology 2002;26:253-8. Ryans 2005 {published data only} Ryans I, Montgomery A, Galway R, Kernohan WG, McKane R. A randomized controlled trial of intraarticular triamcinolone and/or physiotherapy in shoulder capsulitis. Rheumatology 2005;44:529-35. Stergioulas 2008 {published data only} Stergioulas A. Low-power laser treatment in patients with frozen shoulder: preliminary results. Photomedicine and Laser Surgery 2008;26:99-105. Taverna 1990 {published data only} Taverna E, Parrini M, Cabitza P. Laser therapy versus placebo in the treatment of some bone and joint pathology. Minerva Ortopedica e Traumatologica 1990;41:631-6.

		evidence from 12 trials, we were uncertain whether a diverse range of electrotherapy modalities (delivered alone or in combination with manual therapy, exercise, or other active interventions) were more or less effective than other active interventions (for example glucocorticoid injection). Author's Conclusion: Based upon low quality evidence from one trial, LLLT for six days may be more effective than placebo in terms of global treatment success at six days. Based upon moderate quality evidence from one trial, LLLT plus exercise for eight weeks may be more effective than exercise alone in terms of pain up to four weeks, and function up to four months. It is unclear whether PEMF is more or less effective than placebo, or whether other electrotherapy modalities are an effective adjunct to exercise. Further high quality randomised controlled trials are needed to establish the benefits and harms of physical therapy interventions (that comprise electrotherapy modalities, manual therapy and exercise, and are reflective of clinical practice) compared to interventions with evidence of benefit (for example gluco corticoid injection or arthrographic joint distension).	

Methodical Notes
Funding Sources: none COI: none declared Study Quality: We included randomised controlled trials (RCTs) of any design (for example parallel, cross-over, factorial) and controlled clinical trials using a quasi-randomised method of allocation, such as by alternation or date of birth. Reports of trials were eligible regardless of the language or date of publication. Heterogeneity: Due to heterogeneity of the interventions, comparators and outcomes, we were unable to conduct any meta-analyses. Non-synthesised summary data and effect estimates (with 95% CIs) of all outcomes were presented either in the Data and analyses or Additional tables sections. Publication Bias: Due to the inability to conduct any meta-analyses, we did not undertake any of our planned sensitivity analyses or formal investigations of publication bias (that is using funnel plots). Notes:

7.2

Inhalt: 2 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Case Control

Barnes, C. P. et al. Short-term outcomes after arthroscopic capsular release for adhesive capsulitis. J Shoulder Elbow Surg. 25. e256-64. 2016			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Case series Level IV	Funding sources: supported by Premier Specialists (data collection), St George Hospital (research infrastructure support), and UNSW, Australia (Independent Learning Project student support). Conflict of Interests: GACM has received research grant funding from Arthrocare/Smith and Nephew. All other authors, their im- mediate families, and any research foundation with which they are affiliated have not received any financial pay- ments or other benefits from any commercial entity related to the subject of this article. Randomization: no random Blinding: no Dropout rates: -	Total no. patients: 133 Patient characteristics: Jan 2001 - May 2014 Inclusion criteria: The criteria used for a clinical diagnosis of idiopathic adhesive capsulitis were a painful, stiff shoulder for a duration of at least 4 weeks; restriction of passive range of motion with a loss of function; and pain that disturbed sleep or made it difficult to lie on the affected side in the absence of other causes for the pain and restricted motion of the shoulder. Patients included in this study must have been admitted to surgery for an arthroscopic capsular release performed by the senior author and they must have attended a minimum of 1 followup clinic. Exclusion criteria: Patients were excluded if the affected shoulder had had a previous fracture, a previous or concurrent rotator cuff tear or repair, calcific tendinitis, prior surgery	Interventions: Arthroscopic release The anterior-inferior aspect of the capsule was then cut com- pletely, approximately 2 mm lateral to the glenoid labrum. After this, an appropriate location for a posteriorinferior portal was established using a spinal needle. After the portal was made, the posterior-inferior portion of the capsule was released. This ideally resulted in a complete 360° capsular release. The arm was then manipulated and the new range of motion assessed; 10 mL of Depo- Medrol with lidocaine (40 mg/mL methylprednisolone acetate and 10 mg/mL lidocaine hydrochloride Comparison: passive external rotation of the shoulder at 6 months after arthroscopic release

		to the shoulder, evidence of moderate or grade II or more glenohumeral joint arthritis, or previous sepsis	
Notes:	Author's conclusion: Patients who underwent an arthroscopic capsular release for idiopathic adhesive capsulitis experienced significant reductions in pain, improvements in range of motion, and improvements in overall shoulder function in the first postoperative week. These immediate improvements in pain and function continue to improve at 6, 12, and 24 weeks postoperatively.		
Outcome Measures/results	Primary passive external rotation of the shoulder at 6 months after arthroscopic release. Secondary Secondary out- comes included examiner-determined range of motion (forward flexion, abduction, and internal rotation) and strength (internal ro-tation, external rotation, supraspinatus, subscapularis, and adduction). Patient-reported outcomes included changes in frequency of activ- ity pain, resting pain, and extreme pain; magnitude of rest pain, overhead pain, and sleep pain; difficulty with activities behind the back or above the head; shoulder stiffness; overall shoulder satisfaction; and level of activity at work and level of sport played at 1 week, 6 weeks, 12 weeks, and 24 weeks after surgery.	Results: immediate improvements in pain, functional outcomes, and range of motion ($P < .0001$). External rotation increased from 21° ± 17° (mean ± standard deviation) to 76° ± 17° at 1 week. Passive range of shoulder motion improved at 1 week, deteriorated slightly at 6 weeks, and then continued to improve at 12 and 24 weeks.	

Le Lievre, H. M. et al. Long-term outcomes after arthroscopic capsular release for idiopathic adhesive capsulitis. JBone Joint Surg Am. 94. 1208-16. 2012			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Retrospective Study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: -	Total no. patients: 115 Patient characteristics: April 1997 - December 2004 Inclusion criteria: The criteria for a diagnosis of idiopathic adhesive capsulitis7,10,16-20	Interventions: The anterior and inferior capsule were cut lateral to the glenoid labrum with use of a 3-mm suction wand or with a 4-mm arthroscopic punch.

		were (1) a painful stiff shoulder for at least four weeks; (2) restriction of passive external rotation of at least 50% compared with the contralateral shoulder; (3) difficulty using the affected arm, with restriction of movement and loss of function; and (4) pain at night causing a sleep disturbance and inability to lie on the affected side. For inclusion in this study, patients were required to have undergone an arthroscopic capsular release for idiopathic adhesive capsulitis performed by the senior author (G.A.C.M.), and a minimum five-year follow-up period. Exclusion criteria: The exclusion criteria included (1) evidence of glenohumeral joint arthritis at the primary procedure, (2) a full-thickness rotator cuff tear, (3) any fracture involving the shoulder girdle, (4) diabetes, (5) a history of a motor vehicle accident as a cause of the initial injury, (6) previous surgery to the involved shoulder, and (7) an unwillingness or inability to attend long-term follow-up evaluations.	The tissue in the rotator interval was released to the anterior border of the long head of the biceps muscle and medially to the base of the coracoid process under direct vision. A portion of the intraarticular subscapularis tendon was also divided15 to improve shoulder motion outcomes. The inferior and posterior aspects of the capsule were released, to achieve a complete 360 release. After the release, the arthroscope was removed, a gentle manipulation was performed, and shoulder motion was assessed. The glenohumeral joint was injected with 10 mL of Depo-Medrol with Lidocaine. Comparison: A comparison was made between the contralateral (nonoperatively treated) shoulder and the operatively treated shoulder with respect to shoulder motion at five years or more
Notes:	Author's conclusion: Patients with idiopathic adhesive capsulitis treated with an arthroscopic capsular release had early significant improvements in shoulder range of motion, pain frequency and severity, and function. These improvements were maintained and/or enhanced at seven years. In contrast to results reported for nonoperative treatment, shoulder range of motion at seven years was equivalent to that in the contralateral shoulder		
Outcome Measures/results	Primary The effect of arthroscopic capsular release on patientreported frequency and magnitude of pain with activities five years or	Results: At a mean follow-up of seven years (range, five through thirteen years), forty-three patients (forty-nine shoulders) had significant improvement with regard to pain frequency and severity, patient-reported shoulder function, stiffness, and difficulty in completing activities compared with the findings at the initial	

	more after the surgery Secondary the long-term effect of arthroscopic capsular release on patient-reported pain frequency and magnitude of pain at rest and at night, difficulty reaching behind the back or above the head, level of activity at work and level of sport played, overall shoulder stiffness, overall patient satisfaction, complications, and shoulder motion compared with that at the preoperative evaluation and at one, six, twelve, twenty-four, and fifty-two weeks and five years or more postoperatively	presentation ($p < 0.001$) and the one-year followup evaluation ($p < 0.01$ to $p < 0.001$). Shoulder motion also improved ($p < 0.001$) and was comparable with that of the contralateral shoulder. There were no complications.

7.4

Inhalt: 3 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Case Control

Gerber, C. et al. Arthroscopic treatment of shoulder stiffness. Clin Orthop Relat Res. . 119-28. 2001			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: a retrospective case controlled cohort study	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: -	Total no. patients: 45 patients, consisting of 9 idiopathic, 21 post opreative,and 15 posttraumaic frozen shoulder - patients Patient characteristics: Inclusion criteria: patients who did not improve with conservative therapy after at least 3 months (average 8 months), depending on the degree of pain and evidence of improvement. Exclusion criteria:	Interventions: operated in a lateral decubitus position To not damage the humeral head and the glenoid, the capsulotomy was started as early as possible (before attempts at full inspection of the joint). superoinferior, transected the superior glenohumeral ligament, the coracohumeral ligament base, and parts of the middle glenohumeral ligament. The middle and inferior glenohumeral ligaments then were divided, posterior capsule also was divided at a distance of

			approximately 5 mm from the glenoid rim. In patients with posttraumatic shoulder stiffness a bursoscopy was added. After completion of capsulotomy and division of subacromial adhesions, manipulation with the patient under general anesthesia was done. Postoperatively, the patients were treated with an interscalene catheter for 2 to 4 days1 and passive physical therapy was done. a rehabilitation program with emphasis on the anterior elevation Comparison: Classification According to Etiology
Notes:	Author's conclusion: Arthroscopic release is an effective method for treatment of shoulder stiffness; however, the ultimate outcome is related directly to the severity of stiffness regardless of the etiology.		
Outcome Measures/results	Primary Constant-Murley score pre-and postoperative. pain, ROM, work incapacity Secondary To evaluate the statistical significance of changes of each measured variable from the preoperative to the postoperative values within each group, the nonparametric, paired Wilcoxon signed rank test was used.	Results: The results stratified according to the etiology of stiffness showed that the outcome after treatment of idiopathic stiffness was better than after postoperative stiffness and that the results of treatment for posttraumatic stiffness were least favorable. The difference between preoperative state and followup, however, was not statistically significantly different from one group to another. All groups improved significantly and to a similar degree but the final outcome was related to the initial degree of disability	

Holloway, G. B. et al. Arthroscopic capsular release for the treatment of refractory postoperative or post-fracture shoulder stiffness. J Bone Joint Surg Am. 83-A. 1682-7. 2001			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective Study	Funding sources: n.g. Conflict of Interests: n.g. Randomization: - Blinding: - Dropout rates: -	Total no. patients: 135 Patient characteristics: April 1994 - March 1997 Inclusion criteria: n.c.g. Exclusion criteria: Thirtyone patients undergoing arthroscopic capsular release were excluded from the study. Nine of these patients had	Interventions: The glenohumeral joint was injected with 3 mL (18 mg) of betamethasone at the end of the procedure. A closed manipulation under anesthesia was performed in all patients, first in forward flexion, by

		insulin-dependent diabetes, and ten had substantial degenerative arthritis of the glenohumeral joint. Two patients had a persistent fullthickness rotator-cuff tear at the time of the arthroscopic capsular release, and one patient had an anterior capsulorrhaphy at the time of an arthroscopic posterior capsular release. One patient had a seizure disorder with recurrent postoperative dislocations that made follow-up data unreliable. Six patients were lost to follow-up, and two patients with incomplete preoperative data were excluded.	elevating the arm in the sagittal plane while the surgeon stabilized the scapula by placing one hand along its axillary border. The arm was then passively forward flexed in the sagittal plane to the maximum possible extent. Next, passive external rotation was performed in 0° of abduction, followed by external rotation in 90° of abduction. At each position, the scapula was manually stabilized and the rotation of the shoulder was performed by rotation of the humerus at the elbow level, rather than at the level of the forearm or hand, in order to protect the elbow ligaments. Lastly, internal rotation in 90° of abduction and cross-body adduction were performed. Arthroscopic capsular release was performed if the manipulation under anesthesia did not restore at least 80% of the range of motion of the normal, contralateral shoulder in all planes. hooked electrocautery (Linvatec, Largo, Florida) is used to release first the rotator interval, the superior glenohumeral ligament, and the coracohumeral ligament. The superior aspect of the capsule is released just superior to the glenoid until the overlying supraspinatus muscle belly can be seen. At the anterior border of the supraspinatus, a fullthickness capsulotomy is continued through the

			rotator interval. At the superior border of the subscapularis, the electrocautery is brought deep to the subscapularis, and the anterior aspect of the capsule is incised down to the fivethirty position, approximately 5 mm lateral to the glenoid labrum. Capsulotomy near the glenoid rim in the inferior pouch minimizes the risk of injury to the axillary nerve because the nerve is closest to the capsule at the midpoint between the capsule's glenoid and humeral insertion sites. Manipulation in forward elevation and abduction-external rotation after anterior capsular release often releases the inferior pouch. The arthroscope is next placed in the anterior-superior portal, and the posterior aspect of the capsule is released in the midportion of the capsule through the posterior-superior portal. An accessory posterior-inferior portal can be used to release the remaining portion of the inferior pouch. Manipulation in internal rotation and 90° of abduction helps to complete the posterior release. The subacromial space was debrided whenever scar tissue was visualized within it. If adequate range of motion, especially in external rotation, cannot be obtained after capsular release, subacromial scarring is often the cause. The subacromial space should be explored and debrided to free

			the rotator cuff. Often heavy scarring connects the acromion and the deep deltoid fascia to the underlying rotator cuff. Complete débridement of this scar is important to regain full range of motion. The coracoacromial ligament is routinely released at the base of the coracoid. Subacromial débridementwas performed in six of the thirty-three shoulders in the postoperative group. All six shoulders in the post-fracture group required formal débridement of the subacromial space to regain maximum range of motion. Two of the eleven shoulders in the idiopathic group had débridement of the subacromial space, not to improve motion but to treat bursal surface rotator-cuff tears. Comparison: -
Notes:	Author's conclusion: Arthroscopic capsular release was as effective for improving range of motion in patients with postoperative contracture of the shoulder as it was in patients with idiopathic and postfracture contracture. However, there was less improvement in the subjective scores for pain, function, and patient satisfaction in the postoperative group		
Outcome Measures/results	Primary M-ASES, ROM active and passive Secondary -	Results: At a mean of twenty months (range, twelve to forty-six months) after the operation, fifty patients were available for assessment of function and range of motion of the involved shoulder. At the time of follow-up, each group had a significant improvement in the scores for pain, patient satisfaction, and functional activity as well as in the overall outcome score ($p < 0.01$). Comparison of the scores among the different groups revealed that all had a similar degree of improvement in range of motion of the involved shoulder, but patients with postoperative frozen shoulder had significantly ($p < 0.05$) lower scores for pain ($p < 0.03$), patient satisfaction ($p < 0.004$), and functional activity ($p < 0.002$) than did those with idiopathic or post-fracture frozen shoulder	

Jerosch, J. et al. Mid-term results following arthroscopic capsular release in patients with primary and secondary adhesive shoulder capsulitis. Knee Surg Sports Traumatol Arthrosc. 21. 1195-202. 2013

Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Therapeutic retrospective case series study, Level IV.	Funding sources: - Conflict of Interests: - Randomization: - Blinding: - Dropout rates: -	Total no. patients: 167 Patient characteristics: n a Inclusion criteria: stiff shoulder more than 6 month , ineffective cons. treatment in primary AND secondary frozen shoulders Exclusion criteria: -	Interventions: arthroscopic 360 degree capsular release [13]. Thirty-one patients required an additional subacromial decompression, 10 patients required an addi- tional AC-joint resection, 7 patients required calcium deposits removal, 4 patients had an implant removal, and 3 patients required an additional rotator cuff repair. Comparison: -
Notes:	Author's conclusion: This study demonstrates that arthroscopic capsular release in resistant patients with primary and secondary adhesive capsulitis can be considered an effective therapeutic choice with minimal complications, to effectively reduce pain and improve movement in all planes.		
Outcome Measures/results	Primary Evaluation of the shoulders was done with the constant score by an independent examiner Secondary	Results: Both groups (primary and secondary adhesive capsulitis) experienced a significant (p \ 0.05) improvement for all ranges of motion immediately postoperative, as well as at the time of follow-up.	

7.5

Inhalt: 2 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Case Control

Barnes, C. P. et al. Short-term outcomes after arthroscopic capsular release for adhesive capsulitis. J Shoulder Elbow Surg. 25. e256-64. 2016			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: Case series Level IV	Funding sources: supported by Premier Specialists (data collection), St George Hospital (research infrastructure support), and UNSW, Australia (Independent Learning Project student support). Conflict of Interests: GACM has received research grant funding from Arthrocare/Smith and Nephew. All other authors, their im- mediate families, and any research foundation with which	Total no. patients: 133 Patient characteristics: Jan 2001 - May 2014 Inclusion criteria: The criteria used for a clinical diagnosis of idiopathic adhesive capsulitis were a painful, stiff shoulder for a duration of at least 4 weeks; restriction of passive range of motion with a loss of function; and pain that disturbed sleep or made it difficult to lie on the affected side in the absence of other	Interventions: Arthroscopic release The anterior-inferior aspect of the capsule was then cut com- pletely, approximately 2 mm lateral to the glenoid labrum. After this, an appropriate location for a posteriorinferior portal was established using a spinal needle. After the portal was made, the posterior-inferior portion of the capsule was released. This ideally resulted in a complete 360°

	they are affiliated have not received any financial pay- ments or other benefits from any commercial entity related to the subject of this article. Randomization: no random Blinding: no Dropout rates: -	causes for the pain and restricted motion of the shoulder. Patients included in this study must have been admitted to surgery for an arthroscopic capsular release performed by the senior author and they must have attended a minimum of 1 followup clinic. Exclusion criteria: Patients were excluded if the affected shoulder had had a previous fracture, a previous or concurrent rotator cuff tear or repair, calcific tendinitis, prior surgery to the shoulder, evidence of moderate or grade II or more glenohumeral joint arthritis, or previous sepsis	capsular release. The arm was then manipulated and the new range of motion assessed; 10 mL of Depo- Medrol with lidocaine (40 mg/mL methylprednisolone acetate and 10 mg/mL lidocaine hydrochloride Comparison: passive external rotation of the shoulder at 6 months after arthroscopic release.
Notes:	Author's conclusion: Patients who underwent an arthroscopic capsular release for idiopathic adhesive capsulitis experienced significant reductions in pain, improvements in range of motion, and improvements in overall shoulder function in the first postoperative week. These immediate improvements in pain and function continue to improve at 6, 12, and 24 weeks postoperatively.		
Outcome Measures/results	Primary passive external rotation of the shoulder at 6 months after arthroscopic release. Secondary Secondary out- comes included examiner-determined range of motion (forward flexion, abduction, and internal rotation) and strength (internal ro- tation, external rotation, supraspinatus, subscapularis, and adduction). Patient-reported outcomes included changes in frequency of activ- ity pain, resting pain, and extreme pain; magnitude of rest pain, overhead pain, and sleep pain; difficulty with activities behind the back or above the	Results: immediate improvements in pain, functional outcomes, and range of motion ($P < .0001$). External rotation increased from 21° ± 17° (mean ± standard deviation) to 76° ± 17° at 1 week. Passive range of shoulder motion improved at 1 week, deteriorated slightly at 6 weeks, and then continued to improve at 12 and 24 weeks	

	head; shoulder stiffness; overall shoulder satisfaction; and level of activity at work and level of sport played at 1 week, 6 weeks, 12 weeks, and 24 weeks after surgery.	

NEWCASTLE - OTTAWA Checklist: Cohort

Smith, C. D. et al. Arthroscopic capsular release for idiopathic frozen shoulder with intra-articular injection and a controlled manipulation. Ann R Coll Surg Engl. 96. 55-60. 2014			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 3 Study type: prospective cohort study	Funding sources: - Conflict of Interests: no Randomization: no Blinding: - Dropout rates: -	Total no. patients: 136 Recruiting Phase: November 2005 and ending in May 2010 Inclusion criteria: arthroscopically proven stage II idiopathic frozen shoulder,12 with exclusion of other disease by arthroscopy The initial evaluation included completion of the Oxford shoulder score (OSS) questionnaire, a de- tailed history and a standardised examination with a record of range of motion at Patent with id. frozen shoulder Exclusion criteria: previous open or closed shoulder surgery, fractures or radiotherapy eg stiff- ness secondary to trauma, previous surgery, rotator cuff disease, radiotherapy	Interventions: 136 patients with a decreased capsular volume, angiogenesis, a thickened capsule and ro- tator interval filled with fibrotic tissue who underwent arthroscopic capsular release. Comparison: -
Notes:	Author's conclusion: This large series demonstrates that arthroscopic capsular release is a safe procedure, with rapid improvement in pain and a marked improvement in range of motion.		
Outcome Measures/results	Primary Pain, ROM, Oxford SS, function, complications, contralaterale symtoms Secondary s a	Results: Fifty per cent achieved good pain relief within a week and eighty per cent within six weeks of arthroscopic capsular release. The mean preoperative visual analogue scale pain score was 6.6 and the mean postoperative score was 1.0. The mean time to achieving good pain relief was 16 days following surgery. No patient could sleep through the night prior to surgery while 90% reported having a complete night’s sleep at a mean of 12 days after surgery. The mean postoperative Oxford shoulder score was 38/48 and the mean improvement was 19.2.	

Langzeitprognose der Frozen Shoulder

Inhalt: 3 Literaturstellen

NEWCASTLE - OTTAWA Checklist: Cohort

Hand, C. et al. Long-term outcome of frozen shoulder. J Shoulder Elbow Surg. 17. 231-6. 2008			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: cohort study	Funding sources: no. Conflict of Interests: no. Randomization: not applicable. Blinding: Dropout rates:	Total no. patients: 269 Recruiting Phase: 1997-2002 Inclusion criteria: primary frozen shoulder Exclusion criteria: secondary frozen shoulder	Interventions: Comparison:
Notes:	Author's conclusion: 6% suffer from longterm symptoms after primary frozen shoulder. More women than men (1.6 vs 1) mainly 6th decade of life. No recurrence.		
Outcome Measures/results	Primary Oxford Shoulder Score Secondary	Results: 59 % no symptoms 35 % mild symptoms 6 % severe symptoms on average 4.4 years after onset of symtpoms	

Leppala, J. et al. Adhesive capsulitis of the shoulder (frozen shoulder) produces bone loss in the affected humerus, but long-term bony recovery is good. Bone. 22. 691-4. 1998			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective Trial	Funding sources: none Conflict of Interests: none Randomization: none Blinding: none Dropout rates: Dropout rates:	Total no. patients: 53 Recruiting Phase: aktive Phase versus 9 years after FS Inclusion criteria: Exclusion criteria:	Interventions: none Comparison: active phase vs 9 years after FS
Notes:	Author's conclusion: this study indicates that adhesive capsulitis of the shoulder results in significant bone loss in the humerus of the affected extremity, but in the long term, capsulitisinduced bone loss shows good recovery.		
Outcome Measures/results	Primary Bone density proximal humerus, humeral shaft, radial shaft, ulnar shaft, and distal forearm of both upper extremities Secondary	Results: significant difference in active phase. good recovery in long term	

Vastamaki, H. et al. The natural history of idiopathic frozen shoulder: a 2- to 27-year followup study. Clin Orthop Relat Res. 470. 1133-43. 2012			
Evidence Level/Study Types	Methodical Notes	Patient characteristics	Interventions
Evidence level: 4 Study type: retrospective analysis	Funding sources: non Conflict of Interests: non Randomization: non Blinding: Dropout rates:	Total no. patients: 83 Recruiting Phase: 2-27 years Inclusion criteria: no treatment, non-operativ, manipulation Exclusion criteria: operation, trauma, Cuff disease etc.	Interventions: manipulation under anaesthesia Comparison: no treatment vs nonoperative vs manipulation
Notes:	Author's conclusion: non treatment group better than recently reported. 94% with good results in tests.		

Outcome Measures/results	Primary CMS, ROM, VAS Secondary	Results: I: average 15 months, 94% ROM Recovery to contralateral side, 51% total recovery, 94% mild symptoms; CMS 83 II: average 20 months, 91% ROM Revovery, 44% total recovery, CMS 81 III: 91% ROM recovery, 30% total recovery, CMS 82

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