

Shoulder Distention Arthrogram

Introduction

Frozen shoulder (FS), also known as adhesive capsulitis, is a condition characterised by the spontaneous onset of shoulder pain accompanied by progressive stiffness and functional limitation. It is associated with capsular fibrosis, adhesion formation, and thickening of the glenohumeral joint capsule. The condition is typically self-limiting, with symptoms resolving over a period of 2–3 years (Buchbinder et al., 2008). It is strongly associated with metabolic syndromes such as diabetes (Hernigou and Scarlat, 2026). Distension arthrogram (DA) is a minimally invasive procedure in which fluid is injected into the glenohumeral joint to distend or rupture the joint capsule. The aim is to reduce pain and improve range of movement. The injected solution may include a combination of saline, local anaesthetic, corticosteroid, contrast medium, and air.

The procedure is typically performed under local anaesthetic, takes approximately 15 minutes, and is usually conducted on an outpatient basis, allowing the patient to return home immediately.

Indications for surgery include persistent shoulder pain and stiffness.

Scope of practice

These guidelines are designed to guide physiotherapists when treating patients following this surgical procedure. They were produced by a process of systematic review of the current evidence-based literature, medical and peer consultation. They were correct at the time of writing. They are general guidelines and any specific instructions in the post-operative notes must take precedence. They are not a substitute for sound clinical reasoning and good communication with the consultant team, and patients should always be treated on a case-by-case basis.

Aim

The aim of these guidelines is to provide physiotherapy staff with a series of recommendations from the current evidence base to assist them in the management of patients who have undergone this surgical procedure.

Literature review question

What is the appropriate post-operative management following distension arthrogram, from day of surgery through outpatient physiotherapy in order to maximise outcome?

Search Process

The databases below were searched between 2020 and 2025 (June). The titles and abstracts of all identified studies were assessed to determine whether they were pertinent to the research question. Databases are outlined below.

Total number of articles selected: 8.

Total number of articles discarded: 37 after removing duplicates between databases and screening titles.

See Appendix 1 for flowchart regarding search results.

CASP checklists used: Systematic review and randomised control trial (RCT) checklists.

Databases:

Data Base	Dates	Limitations
Cinahl	2020 to 2025	English
Embas	2020 to 2025	English
AMED	2020 to 2025	English
Cochrane	2020 to 2025	English
Medline	2020 to 2025	English

Inclusion/ Exclusion Criteria:

-English language articles. Published between January 2020 and June 2025

Key Words:

Distension arthrogram	Capsular Distension
Adhesive capsulitis	Physiotherapy
Capsular Release	Exercises
Shoulder arthrography	Manual therapy
Distension arthrography	Mobilisations, Surgery
Hydrodilation	Frozen shoulder

Results

At the time of writing 8 research articles were identified for use in these guidelines. These articles show that DA/ hydrodilatation are effective in increasing ROM and managing pain (in short to mid-term) and are more effective combined with post procedural physiotherapy. Limitations include small sample sizes, lack of research into long term outcomes and lack of standardisation of treatment protocols.

There is minimal evidence surrounding management of FS following DA and there is little documented on physiotherapy management following the procedure. Therefore, the current guidelines reflect current practice and expert opinion based on audit results.

Recommendations

There are two groups following distension arthrography:

Group 1: have full/ almost full return of ROM and are largely painfree

Group 2: have a reduction in pain +/- small improvement in ROM

- Physiotherapists should consider that evidence conditionally supports in-person physiotherapy following glenohumeral joint injection (high or low volume).
- Physiotherapists should consider integrating advice regarding lifestyle factors e.g. diabetes, into treatment sessions.
- Should be seen within 1 - 5 days of DA.

Group 1:

Goals	Recommendations	Grade of evidence
Regain function in shoulder and return to hobbies/ activities	• HEP • 1-2 treatment sessions before PIFU or discharge	A

LOTHIAN PHYSIOTHERAPY ORTHOPAEDIC GUIDELINES

Group 2:

Goals	Recommendations	Grade of evidence
Maximise AROM	- Regular physiotherapy follow up: this can be tailored to the patient but could be up to twice per week. Frequency of physiotherapy should be a shared decision, with patients made aware of potential risks of intensive versus non-intensive treatment. - It should be noted it can take 12 weeks for there to be improvement following distension arthrogram. Continue physiotherapy over this period. - Physiotherapy can include stretching exercises, active or active-assisted ROM exercises, manual therapy, pool-based exercises, Biodex for CPM. - Consider advising use of heat prior to ROM exercises to increase elasticity in the soft tissues.	B
Improve shoulder function	- Exercises to address any deficit in rotator cuff power or altered scapulohumeral rhythm. - Functional exercises for patient specific goals.	B

Expectations

Expectations of DA include having a reduction in pain +/- improvements in ROM.

References

Aldin, T. (2025) 'Distention Arthrogram Audit Report', iMSK shoulder and elbow.

Available from Tara Aldin, email: tara.aldin@nhs.scot.

Buchbinder, R., Green, S., Youd, J.M., Johnston, R.V. and Cumpston, M. (2008) 'Arthrographic distension for adhesive capsulitis (frozen shoulder)', Cochrane Database of Systematic Reviews, (1), CD007005. Available at: <https://doi.org/10.1002/14651858.CD007>

Debeer, P., Commeyne, O., De Cupere, I., Tijskens, D., Verhaegen, F., Dankaerts, W. and Kiekens, G. (2021) 'The outcome of hydrodilatation in frozen shoulder patients and the relationship with kinesiophobia, depression, and anxiety', *Journal of Experimental Orthopaedics*, 8(1), p. 85. Available at: <https://doi.org/10.1186/s40634-021-00394-3>

Forsythe, B., Agarwalla, A., Puzzitiello, R.N., Sumner, S., Romeo, A.A. and Verma, N.N. (2021) 'Efficacy of arthroscopic surgery in the management of adhesive capsulitis: A systematic review and network meta-analysis of randomized controlled trials', *Arthroscopy: The Journal of Arthroscopy & Related Surgery*, 37(7), pp. 2281–2297. Available at: <https://doi.org/10.1016/j.arthro.2020.09.041>

Halabchi, F., Mazaheri, R., Seif-Barghi, T. and Mansournia, M.A. (2025) 'Shoulder adhesive capsulitis: Clinical aspects and practical algorithmic approach', *Current Orthopaedic Practice*, 36(3), pp. 1–13. Available at: <https://doi.org/10.1097/BCO.0000000000001303>

Hasegawa, A., Mihata, T., Fukunishi, K. and Neo, M. (2021) 'Does the timing of surgical intervention impact the clinical outcomes and overall duration of symptoms in frozen shoulder?', *Journal of Shoulder and Elbow Surgery*, 30(4), pp. 836–843. Available at: <https://doi.org/10.1016/j.jse.2020.07.023>

Hernigou, P. and Scarlat, M.M. (2026) 'The diabetic shoulder: association between diabetes mellitus and adhesive capsulitis — a systematic review and meta-analysis', *International Orthopaedics*. Available at: <https://doi.org/10.1007/s00264-026-06793-4>

Makki, D., Al-Yaseen, M., Almari, F., Monga, P., Funk, L., Basu, S. and Walton, M. (2021) 'Shoulder hydrodilatation for primary, post-traumatic and post-operative adhesive capsulitis', *Shoulder & Elbow*, 13(6), pp. 649–655. Available at: <https://doi.org/10.1177/1758573220977179>

Version: 2

Authors: Aoife McCavana and Jack Banfield

Date: 10/06/26

Date for review: August 2030

LOTHIAN PHYSIOTHERAPY ORTHOPAEDIC GUIDELINES

Poku, D., Hassan, R., Migliorini, F. and Maffulli, N. (2023) 'Efficacy of hydrodilatation in frozen shoulder: A systematic review and meta-analysis', *British Medical Bulletin*, 147(1), pp. 121–147. Available at: <https://doi.org/10.1093/bmb/ldad018>

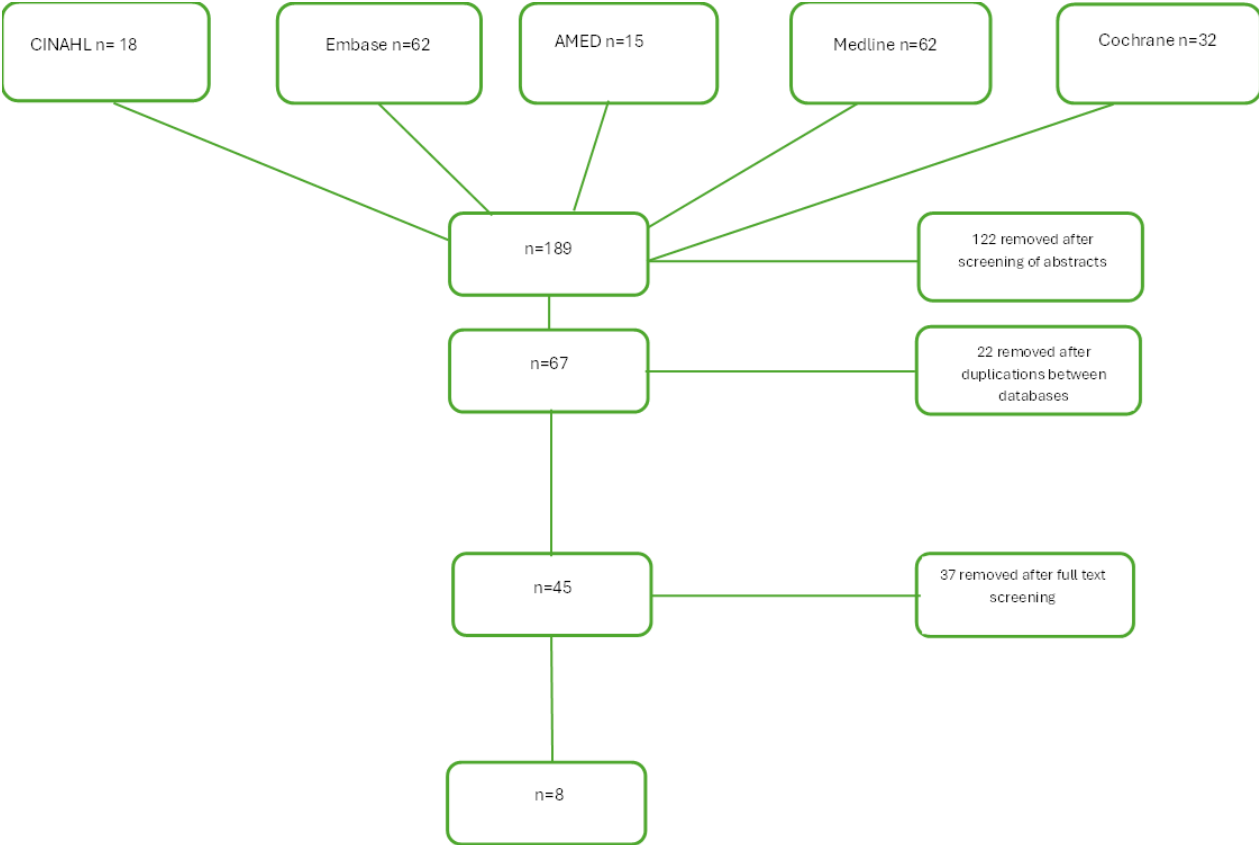
Rex, S.S., Kottam, L., McDaid, C., Brealey, S., Dias, J., Hewitt, C.E. and Rangan, A. (2021) 'Effectiveness of interventions for the management of primary frozen shoulder: A systematic review of randomized trials', *Bone & Joint Open*, 2(9), pp. 773–784. Available at: <https://doi.org/10.1302/2633-1462.29.BJO-2021-0060.R1>

British Elbow and Shoulder Society (2025) 'British Elbow and Shoulder Society patient care pathway: Frozen shoulder'

Willmore, E.G., Millar, N.L. and van der Windt, D. (2022) 'Post-surgical physiotherapy in frozen shoulder: A review', *Shoulder & Elbow*, 14(4), pp. 438–451. Available at: <https://doi.org/10.1177/1758573220965870>

Appendices

Appendix 1.



Appendix 2.

Levels of Evidence

Evidence from at least one RCT
Expert opinions

A
B