

ORUK

Frozen shoulder: Evidence based rehabilitation

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BESS/BOA Patient Care Pathways

Frozen Shoulder

**Amar Rangan, Lorna Goodchild, Jo Gibson, Peter Brownson,
Michael Thomas, Jonathan Rees and Ro Kulkarni**

Painful and debilitating condition

Leading to stiffness and disability

Active and passive external rotation of affected shoulder is limited

Radiographs excludes secondary causes e.g. glenohumeral arthritis

Exact cause is unknown

UNCERTAINTIES

What is the most effective treatment for frozen shoulder?

Amar Rangan *professor of orthopaedic surgery*^{1 2 3}, Nigel Hanchard *reader in orthopaedics*⁴, Catriona McDaid *senior research fellow*³

Non-Steroidal Anti-Inflammatory Drugs

Corticosteroid Injections

Oral Corticosteroids

Physiotherapy (6 - 12 weeks in primary care)

Hydro dilatation (Primary, intermediate and secondary care)

Manipulation under anaesthesia (MUA – Secondary care)

Arthroscopic capsular release (ACR – Secondary care)

CLINICAL EFFECTIVENESS OF NON-SURGICAL INTERVENTIONS FOR PRIMARY FROZEN SHOULDER: A SYSTEMATIC REVIEW

Catherine MINNS LOWE, PhD¹, Eva BARRETT, PhD², Karen MCCREESH, PhD³, Neasa DE BÚRCA, MSc⁴ and Jeremy LEWIS, PhD^{1,5}

Conclusion: Substantial evidence gaps remain for the non-surgical treatment of people with frozen shoulder.

Table 1| Summary of evidence for different treatments of frozen should

Intervention	Type of evidence	
Watchful waiting, with or without oral analgesia	Systematic review ¹⁵ : 1 non-randomised controlled study (n=77)	Insufficient evidence
Physiotherapy (manual therapy and exercises, thermotherapy, and electrotherapy)	Systematic review of manual therapy and exercise ¹⁹ : 30 RCTs, 2 quasi-RCTs (n=1836)	Insufficient to compare types of manual therapy or exercise with each other or treatment*
	Systematic review of electrotherapy (electrical, sound, light, or thermal energy) ²⁰ : 19 RCTs (n=1249)	Moderate evidence* that 8 weeks' low level laser therapy added to exercise benefits pain, function, and range of movement for mixed-stage frozen shoulder populations
Acupuncture	Systematic review ¹⁵ : 3 RCTs (n=509)	Insufficient evidence
Oral corticosteroid	Systematic review ¹⁷ : 5 RCTs (n=179)	Insufficient evidence to draw firm conclusions, especially compared with other treatments
Intra-articular corticosteroid injection	Systematic reviews ^{15,19} : 6 RCTs (n=457)	Moderate evidence* of benefit on pain, function, and disability compared with placebo for mixed-stage frozen shoulder populations, and of enhancement of effects by combination with manual therapy and exercise
Hydrodilatation with steroid injection (arthrographic distension)	Systematic review ¹⁵ : 3 RCTs (n=144)	Moderate evidence of benefit on one of two function and disability outcomes compared with placebo for mixed-stage frozen shoulder populations. Insufficient evidence to draw firm conclusions compared with other treatments
Manipulation of the shoulder joint under general anaesthesia	Systematic review ¹⁵ : 4 RCTs (n=257)	No evidence of benefit though insufficient evidence to draw firm conclusions.
Capsular release	Systematic review ¹⁵ : 2 case series	Insufficient evidence to draw firm conclusions

Does muscle guarding play a role in range of motion loss in patients with frozen shoulder?

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^c The University of Sydney, School of Public Health, Australia

^d Centre for Pain, Health and Lifestyle, Australia

^e University of Wollongong, Faculty of Medicine, Australia

^f The University of Sydney, Faculty of Medicine & Health, Discipline of Anatomy & Histology, Australia

5 Patients planned for ACR

Range of motion before and while under full anaesthesia

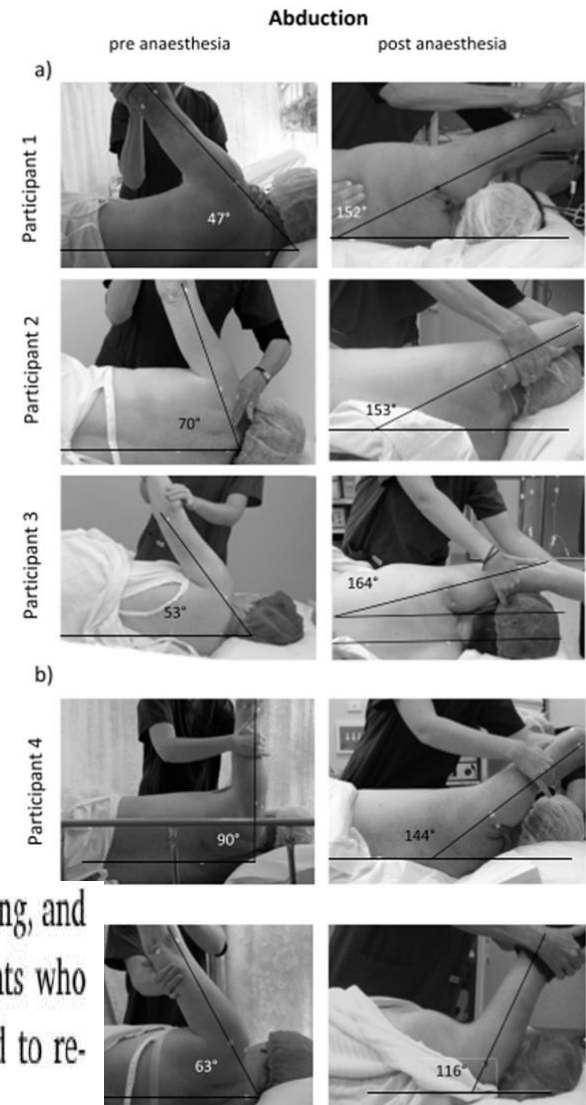
Minimal Improvement in ABD: 55 Degree

Maximal Improvement in ABD: 110 degree

Improvement in external rotation ROM: 15 - 40 Degree

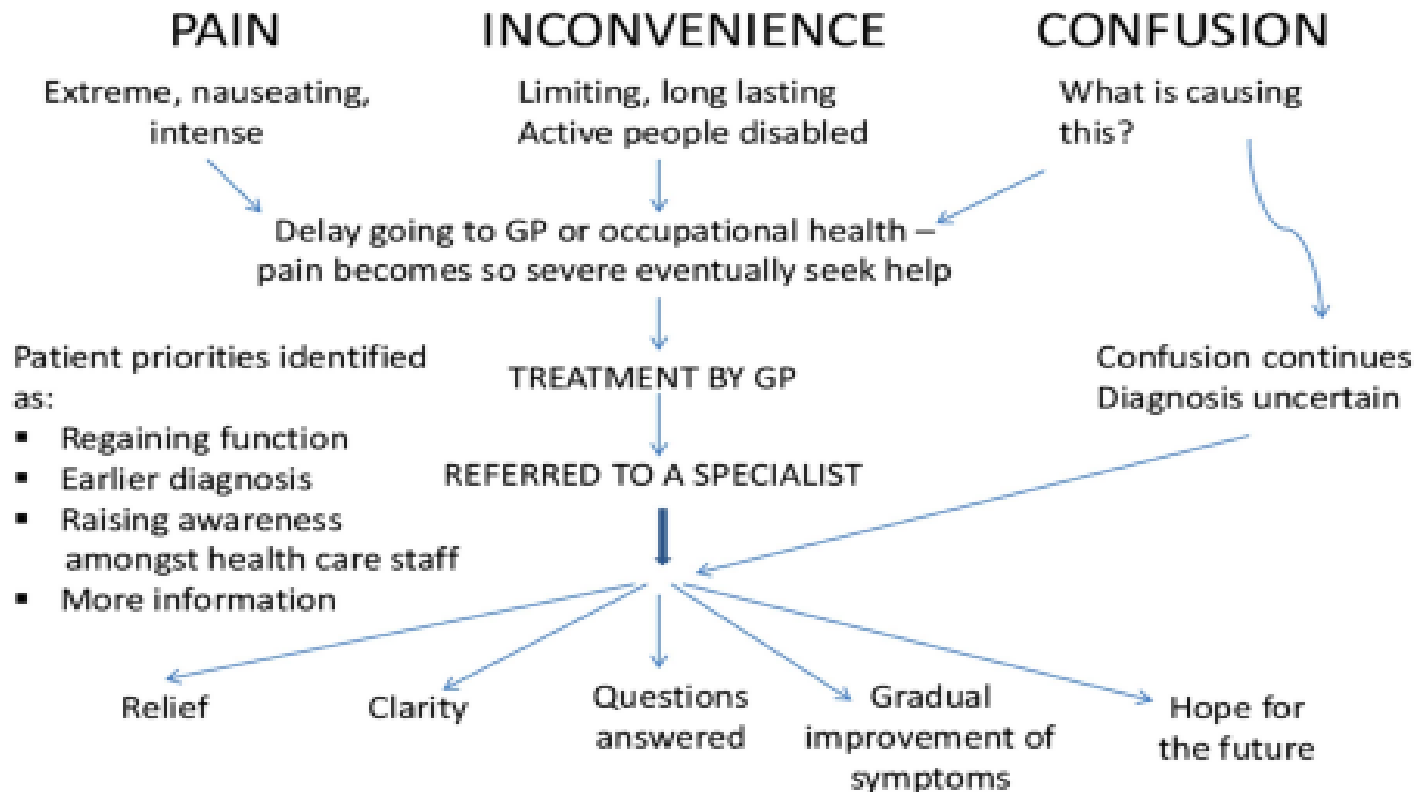
Muscle guarding can possibly explain part of ROM loss

Conclusion: This case series of five patients with frozen shoulder demonstrates that active muscle guarding, and not capsular contracture, may be a major contributing factor to movement restriction in some patients who exhibit the classical clinical features of idiopathic frozen shoulder. These findings highlight the need to re-consider our understanding of the pathoanatomy of frozen shoulder.



A qualitative study of patients' perceptions and priorities when living with primary frozen shoulder

Susan Jones,¹ Nigel Hanchard,¹ Sharon Hamilton,¹ Amar Rangan²



- Education – why, how long, what are my options
- Reduce fear avoidance
- Reinforce confidence in future
- Motivation to keep moving shoulder and full body
- Muscle activation & strengthening (rotator cuff and peri scapula)
- Functional progressions (power & endurance)

Management of adults with primary frozen shoulder in secondary care (UK FROST): a multicentre, pragmatic, three-arm, superiority randomised clinical trial



Amar Rangan, Stephen D Brealey, Ada Keding, Belen Corbacho, Matthew Northgraves, Lucksy Kottam, Lorna Goodchild, Cynthia Srikesavan, Saleema Rex, Charalambos P Charalambous, Nigel Hanchard, Alison Armstrong, Andrew Brooksbank, Andrew Carr, Cushla Cooper, Joseph J Dias, Iona Donnelly, Catherine Hewitt, Sarah E Lamb, Catriona McDaid, Gerry Richardson, Sara Rodgers, Emma Sharp, Sally Spencer, David Torgerson, Francine Toye, on behalf of the UK FROST Study Group



Pragmatic Multicentre Randomised Control Trial

500 patients with unilateral primary frozen shoulder

2:2:1 randomisation to compare:

MUA with steroid injection (n= 200), post procedure 6 - 12 physio sessions

ACR with MUA (n= 200), post procedure 6 - 12 physio sessions

Early Structured Physiotherapy following steroid injection (n=100), 6-12 sessions

Clinical effectiveness and cost effectiveness

Nested qualitative study

Management of adults with primary frozen shoulder in secondary care (UK FROST): a multicentre, pragmatic, three-arm, superiority randomised clinical trial



Amar Rangan, Stephen D Brealey, Ada Keding, Belen Corbacho, Matthew Northgraves, Lucksy Kottam, Lorna Goodchild, Cynthia Srikesavan, Saleema Rex, Charalambos P Charalambous, Nigel Hanchard, Alison Armstrong, Andrew Brooksbank, Andrew Carr, Cushla Cooper, Joseph J Dias, Iona Donnelly, Catherine Hewitt, Sarah E Lamb, Catriona McDaid, Gerry Richardson, Sara Rodgers, Emma Sharp, Sally Spencer, David Torgerson, Francine Toye, on behalf of the UK FROST Study Group



Results

All three treatments lead to significant improvements over 12 months

None were clearly superior

Patients with diabetes had worse outcomes

Early structured physiotherapy plus steroid injection (only non-surgical treatment)

Steroid injection followed by physiotherapy can be provided early, but patients are more likely to require further treatment

ACR is associated with higher costs and risks

MUA was the most cost effective

Physiotherapy for primary frozen shoulder in secondary care: Developing and implementing stand-alone and post operative protocols for UK FROST and inferences for wider practice

N.C.A. Hanchard^a, L. Goodchild^b, S.D. Brealey^c, S.E. Lamb^d, A. Rangan^{b,c,d,*}

^a *School of Health and Social Care, Teesside University, Middlesbrough TS1 3BX, United Kingdom*

^b *Department of Trauma & Orthopaedic Surgery, The James Cook University Hospital, Middlesbrough TS4 3BW, United Kingdom*

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^d *Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Oxford OX3 7LD, United Kingdom*

Ask the patient which of the following is their main problem today?

Pain more than stiffness - Pain is Predominant

Pain and stiffness equal - Pain is predominant

If stiffness is main problem – Stiffness is predominant

Phases will overlap with varying degree

Treatment should be modified to each patient needs

All the patients were given patient information leaflet on frozen shoulder and exercise booklet

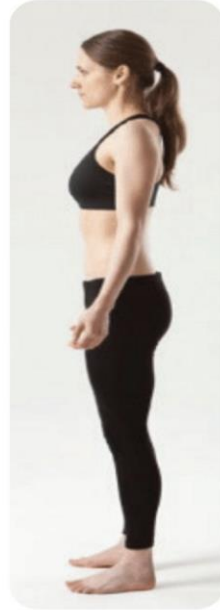
Must	Advice and education Manual shoulder mobilization Home Exercises (instruction & review)
Other	Acupuncture, TENS, trigger point therapy, hydrotherapy, posture correction, relaxation techniques, manual therapy cx & tx spine, heat, supervised exercises (gentle active/self assisted, function-based)
Not allowed	Brace, craniosacral therapy, deep friction, laser
Discouraged	Bowen therapy, shockwave therapy, ultrasound

Standing posture

Poor

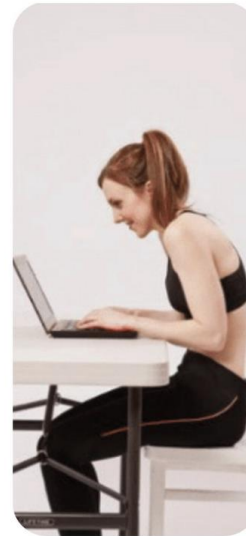


Good

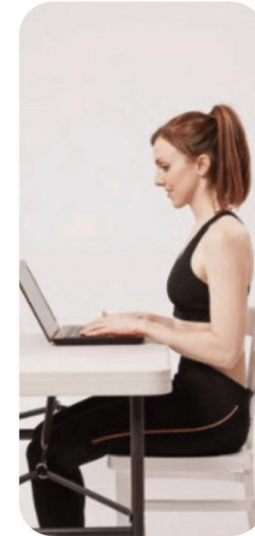


Sitting posture

Poor



Good



Pain predominant stage exercise



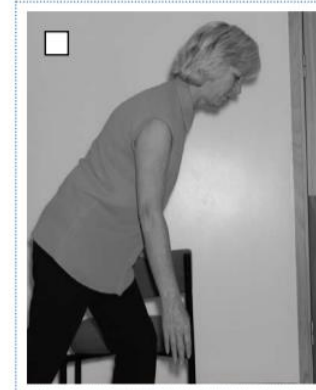
Range of movement



Shoulder shrugs

How many:
.....

How often:
.....



Pendular

How long:
.....

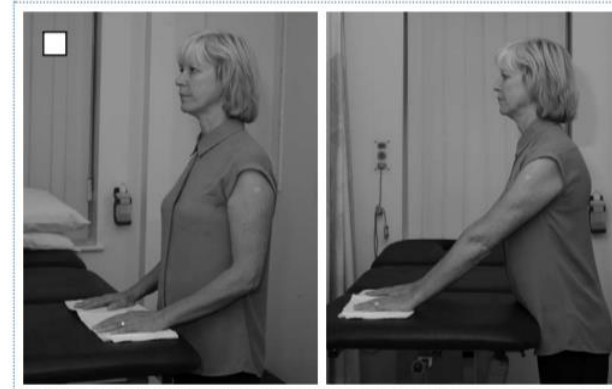
How often:
.....



Sternal lift

How many:
.....

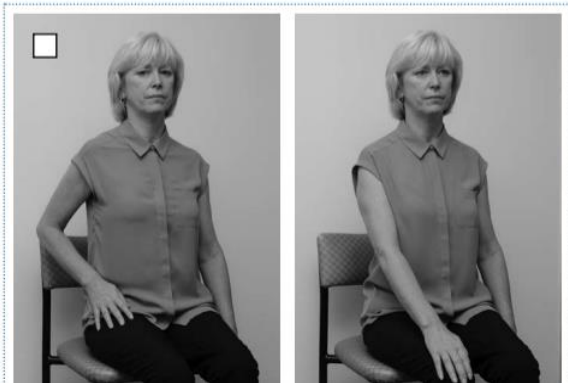
How often:
.....



Supported flexion 2

How many:
.....

How often:
.....



Supported flexion 1

How many:
.....

How often:
.....



Body on arm flexion

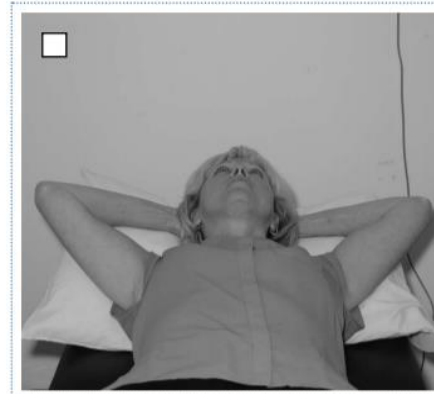
How many:
.....

How often:
.....

Stiffness predominant stage

Stiffness Predominant	
Must	Advice and education Manual shoulder mobilization Home Exercises (instruction & review) Supervised exercises (function based)
Other	Hydrotherapy, posture correction, soft tissue techniques, manual therapy cx & tx spine, supervised exercises (active/self assisted, function-based, stretching, strengthening)
Not allowed	Brace, craniosacral therapy, deep friction, laser, interferential, shockwave therapy,
Discouraged	Bowen therapy, shockwave therapy, ultrasound, mirror therapy and SWD

Gentle sustained stretches



How many:
Hold for how long:
How often:

How many:
Hold for how long:
How often:



How many:
Hold for how long:
How often:



How many:
Hold for how long:
How often:

How many:
Hold for how long:
How often:



Stiffness predominant stage exercises



Manipulation Under Anaesthesia, Arthroscopic Capsular Release, Hydrodilatation

	MUA	ACR
	Day case surgery, GA, nerve block, +/- intra op steroid injection	Day case surgery, GA, nerve block, +/- intra op steroid injection
ROM achieved during examination under anesthesia (EUA)	Document the ROM achieved under anesthesia 6 weeks ROM = EUA ROM (guide)	Document the ROM achieved under anesthesia, 6 weeks ROM = EUA ROM (guide)
Sling	No	For comfort only
Physio	Must start within 24 hrs, Exercises must be performed hourly basis	Must start within 24 hrs, Exercises must be performed hourly basis
Restrictions	No ROM restrictions ADL ASAP RTW /sports as able	No ROM restrictions, ADL ASAP RTW /sports as able

Etiopathology is unclear (inflammation, capsular contracture, muscle guarding, neoinnervation)

Frozen shoulder – Pain predominant and stiffness predominant

Patient education and advice forms important part of management

Home based exercises in pain predominant stage with in pain range

Function based exercises at the stiffness predominant stage at the end of the ROM in all planes

Physiotherapy exercises with steroid injection is beneficial

[\(237\) Frozen shoulder: which treatment should you choose? - YouTube](#)

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