

Frozen Shoulder

In frozen shoulder the sleeve of tissue around the joint becomes inflamed, thickens and tightens, which is why the shoulder becomes both painful and hard to move.

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What you're feeling

Frozen shoulder usually starts as a deep, dull ache that builds over weeks rather than appearing overnight. For most people the pain is the worst part at first, and it is often worst at night. Lying on that side becomes impossible, and broken sleep is one of the most exhausting parts of the whole condition.

Then the shoulder starts to lock up. You reach for a seatbelt, or up to a high shelf, or back to a pocket, and the arm simply stops. What makes frozen shoulder different from most shoulder problems is that the stiffness is not just you guarding against pain – the shoulder genuinely will not move, even if someone else lifts your arm for you. Losing the ability to turn your hand outwards, as if opening a door or putting your arm into a sleeve, is the most characteristic sign of all.

Most people are between about 40 and 60. Some remember a minor knock beforehand; many have no explanation at all. It is more common if you have diabetes or a thyroid condition, and if you have had it in one shoulder, there is a modest chance of the other one following later.

What's actually happening

Your shoulder joint sits inside a sleeve of tough tissue called the capsule. Normally that sleeve is loose and stretchy, which is what allows the shoulder to move further than any other joint in the body. In frozen shoulder the capsule becomes inflamed and then thickens and contracts, so the sleeve shrinks. The space inside the joint can end up less than half its normal size.

Despite the older name “adhesive capsulitis”, nothing is actually stuck together inside the joint. There are no glue-like adhesions. The tissue has tightened, which is a genuinely different problem, and it is why some surgeons argue the condition should simply be called a contracture – a tightening – of the shoulder.

Why it starts is still not properly understood, and it is honest to say so. There is good evidence that it is not purely a local problem with the shoulder. Studies of inherited risk show that type 1 diabetes genuinely causes

frozen shoulder rather than just being associated with it, and that the link runs through blood sugar rather than through weight or mechanical load. The tissue changes look strikingly similar to Dupuytren's disease in the hand, which is why the two often turn up in the same person.

Being honest about how long it takes

You will very likely read that frozen shoulder is self-limiting and resolves completely in around eighteen months to two years. We want to be straight with you: that reassurance is more confident than the evidence supports.

The idea that the condition passes neatly through three stages – freezing, frozen, then thawing – comes from a small study published in 1975, in which patients had their arms rested in slings for up to nine months. Unsurprisingly, shoulders treated that way became stiff and then loosened again once movement was allowed. When researchers went back and reviewed all the available studies, they could find no good evidence that untreated shoulders reliably pass through those stages and end up normal. In fact, no study has ever shown people getting back to a measured, genuinely normal range of movement without treatment.

What the evidence does show is more useful, and it is this: **most of the improvement you are going to get tends to happen early, and then progress slows and levels off.** That plateau can be permanent. Depending on which study you read, somewhere between a third and a half of people still have some ache or stiffness several years later, though for most of them it is mild and does not stop them doing what they want to do.

None of that means you will not get better. Most people improve a great deal. It does mean that “just wait, it will sort itself out” is not a neutral piece of advice, and that there is a reasonable case for treating the pain actively rather than simply enduring it.

What we can do about it

At Mater Private Hospital Rockhampton, Dr Kieran Hirpara will talk you through the options based on which is bothering you more – the pain or the stiffness – rather than trying to slot you into a numbered stage.

A steroid injection into the joint is the single best-supported treatment for the painful phase. Across a very large body of research it is the one treatment that reliably produces a difference in pain and function that patients actually notice, and it works within the first few weeks. Its honest limitation is that the advantage fades by around four to six months. It buys you comfort, sleep, and the ability to work at the shoulder – it does not cure the tightness.

Exercises and physiotherapy are worth doing, with realistic expectations. A simple home exercise programme has measurable value. What may surprise you is that how hard you push does not appear to matter: studies comparing firm, end-of-range stretching against gentle, pain-free movement found no difference in the results at six and twelve months – and, reassuringly, no evidence that pushing harder does damage. So work within what you can tolerate. Fighting through severe pain has not been shown to speed anything up.

Hydrodilatation, where fluid is injected to stretch the capsule from the inside, is widely used and low-risk. The research on it is genuinely mixed: one large review found it helped pain a little but not movement, another found the reverse. It is a reasonable option, but we will not oversell it.

Manipulation under anaesthetic means moving the shoulder through its full range while you are asleep, to stretch the tight capsule. In the largest trial comparing the main treatments, this came out as the best value option overall.

Keyhole capsular release involves surgically dividing the tight capsule under direct vision, rather than stretching it until it tears. Its main advantage is that it tends to be the most durable: across the published surgical series recurrent stiffness after a release is uncommon, whereas after a manipulation a meaningful proportion of shoulders tighten up again and need a second procedure. In the large UK trial, people who had a release were the least likely of the three groups to need any further treatment. Because it is an operation it carries a little more risk than the alternatives and costs more, and you should expect to feel sorer in the first few weeks than someone who had a manipulation – that early difference evens out by around six months.

Worth knowing: in that trial, all three approaches ended up within a few points of each other at one year. That is genuinely good news, because it means the decision can be made on what suits you, your other health conditions and your circumstances, rather than on one option being clearly better.

How Dr Hirpara usually sequences this. You will not be told to put up with it for a fixed number of months before anything can be offered. In practice he will usually suggest a steroid injection first, because for a lot of people that takes enough of the pain away to get on with life while the shoulder settles. If the injection does not give you adequate relief, he is happy to offer a capsular release from that point – he does not require you to have struggled on for nine or twelve months first. Given how shaky the “it always resolves on its own” reassurance turns out to be, there is little sense in spending a year in pain to find out which way yours will go.

What to expect

If you have an injection, expect the pain to ease over the first week or two. Use that window to keep the shoulder moving.

If you have a manipulation or a capsular release, most of the range you are going to regain comes back quickly – usually within the first four to six weeks – and there is generally little further change after about three months. Getting moving early matters, and physiotherapy normally starts within a day or two of the procedure. Most people are back to office-type work within one to three weeks.

If you have diabetes, it is fair to expect a slower and slightly less complete recovery than average, and worth knowing that a steroid injection can unsettle your blood sugars for a few days. Tell us if your control is difficult, because it changes what we recommend.

Recovery is measured in months, not weeks, whichever route you take. The most useful thing you can do is keep using the arm within comfortable limits and keep your sleep protected.

When to see someone

See your GP if shoulder pain is waking you at night or has not settled with a few weeks of rest, and ask specifically about frozen shoulder if the shoulder is becoming genuinely hard to move rather than just sore.

Ask for a specialist review sooner if you cannot turn your hand outwards, if you have diabetes, if the shoulder is affecting your work or driving, or if the pain is severe enough to stop you sleeping. There is no advantage in waiting a long time before getting the pain assessed.

Seek prompt medical attention if the shoulder becomes hot, red and swollen, if you feel unwell or feverish with it, if there is significant weakness or numbness in the arm, or if the pain started with a fall or an injury. Those features point away from frozen shoulder and towards something that needs looking at more urgently.

In more depth

This section goes a step further than you need for your own treatment decisions. It is here because frozen shoulder is one of the conditions where what patients get told and what the research actually shows have drifted apart, and some people would rather see the reasoning than be asked to take it on trust.

WHAT IS ACTUALLY GOING WRONG IN THE JOINT

The capsule is a sleeve of collagen around the joint. In frozen shoulder it becomes inflamed and then **fibrotic** – cells called **fibroblasts** multiply and lay down dense new collagen, and some of them convert into **myofibroblasts**, which can actively contract. That is the key difference from ordinary scarring: the tissue does not just thicken, it pulls tight. The joint volume can drop from a normal 10–15 mL to 3–4 mL.

The same cell behaviour occurs in **Dupuytren's disease** in the hand, which is why the two conditions turn up in the same people, and why one shoulder surgeon has argued the condition should simply be renamed a *contracture* of the shoulder rather than a “capsulitis” [1]. Despite the old name “adhesive capsulitis”, surgeons looking inside the joint find no adhesions at all.

WHY THE “THREE STAGES” STORY IS ON SHAKIER GROUND THAN IT SOUNDS

You will read everywhere that frozen shoulder passes through freezing, frozen and thawing phases. That model was proposed in 1975. When researchers went back and traced where it came from, they found the author had **mixed up the references** for two different earlier papers, and – more importantly – that his patients had their arms rested in slings for up to **nine months**. A shoulder immobilised that long becomes stiff, and loosens once you let it move. The “stages” may partly describe the treatment rather than the disease.

A systematic review that set out to test the model could find no evidence for it, and found the opposite of what it predicts: most improvement happens **early and then slows**, rather than building to a late thawing [2]. Nor can clinicians reliably agree which stage a given shoulder is in – the people who wrote the standard definition admitted in print that the data to confirm it “are not available”.

THE RECOVERY STATISTIC, AND WHY IT HAS TWO VERY DIFFERENT ANSWERS

The often-quoted figure is that **94%** of people recover without treatment. That comes from a real study, but it counts only the patients who went untreated *and* came back for follow-up. Most of the original group either chose treatment or dropped out. Counting everyone, the same data gives roughly **26%** [3]. “Recovered” also meant within 10 degrees of the other shoulder – and in some of those patients the other shoulder had been frozen too.

The largest long-term follow-up found **41%** still had symptoms an average of four years on, and – the part worth knowing – that improvement largely **stops** after about three years rather than continuing indefinitely [4].

IT IS A WHOLE-BODY CONDITION, NOT JUST A SHOULDER ONE

A large genetic study found five regions of DNA associated with frozen shoulder and, using a technique that can separate cause from coincidence, showed that **type 1 diabetes genuinely causes it** rather than merely accompanying it. Being overweight did not – once diabetes was accounted for, the weight association disappeared. That points to blood sugar rather than mechanical load as the driver [5].

WHAT THE PHYSIOTHERAPY EVIDENCE ACTUALLY SAYS

This is the part most worth knowing if you are having, or delivering, physiotherapy. A Cochrane review pooled **32 trials and 1,836 people** [6]. Three findings stand out.

Against a steroid injection, hands-on physiotherapy comes off worse early on. In the head-to-head trial, six weeks of passive mobilisation and supervised exercise produced **26 points less** pain improvement and **25 points less** function improvement at seven weeks than a single injection. Judged on whether people felt much improved or recovered, it was **46% for physiotherapy against 77% for the injection** – roughly one extra person helped for every four injected instead. By six to twelve months the gap had closed and the difference no longer mattered.

How hard you push, how often, and which technique is used appear not to matter. A 100-patient trial compared firm **end-of-range** mobilisation against gentle **pain-free** mobilisation and found no significant difference on *any* of seventeen outcomes at six or twelve months – pain, night pain, function, every plane of movement, quality of life. A 120-patient trial varying the *frequency* of end-range mobilisation (more than twice weekly, weekly, less than weekly) found differences in abduction of under eight degrees, all statistically indistinguishable from zero. Head-to-head comparisons of technique – anterior versus posterior glide, PNF versus conventional exercise, dumbbells versus bare-handed – were almost all non-significant. Reassuringly, there was also **no sign that working at end range does harm**.

The biggest structural gap: no trial has ever compared manual therapy plus exercise against no treatment at all. So while we can say physiotherapy is not clearly better than an injection, and that the details of how it is delivered do not seem to change much, nobody has actually shown how much of the improvement would have happened anyway.

Two useful caveats. The one genuinely high-quality trial in the review looked at physiotherapy *after* a joint distension, and found it made no difference to pain, function or quality of life – but it did improve how many

people rated themselves recovered, and added about **13 degrees** of abduction at six weeks, which had faded by six months. And in the big UK trial, the physiotherapy arm was *described* as including hands-on stretching into the stiff range, yet its own records show manual mobilisation was used in only **11–27%** of patients and supervised stretching in a single one. What was actually delivered – and performed as well as surgery at a year – was education, an injection, gentle supervised movement and a home programme.

HOW LONG UNTIL IT FEELS BETTER, AND DOES THE TYPE OF RELEASE MATTER

Timing. After a release, the median patient crosses the “this is a real improvement” threshold at about **one month**, and the “my shoulder is acceptable to me” threshold at about **four months** [14]. Time off work runs to a median of **eight weeks**, though the spread is wide – a quarter are back by four weeks, three quarters by thirteen [15].

Manipulation gets movement back faster. That is the honest trade-off against the durability advantage above: manipulation restores range sooner, and release does not really catch up until around the six-month mark, after which the two are indistinguishable on every pooled measure. One small comparison even found manipulation alone finished with the *best* external rotation [16].

How much capsule to divide is a genuine question, and the answer is “less than you might think”. A review pooling **18 studies, 629 patients and 811 shoulders** compared three techniques: releasing the front and underside of the capsule only, adding the back of it, or going the whole way round. Its conclusion was that **less extensive releases gave better function and pain scores**, that adding a posterior release buys early internal rotation which does not last (though it does give a lasting flexion gain), and that a full **360-degree release “may not provide any further benefit”**. Complication rates did not differ between the three [17]. Two randomised trials of the posterior extension found the same pattern – faster early recovery, no difference by six months. So a bigger operation is not automatically a better one.

Doing both together is not the answer. In the only three-way comparison, adding a manipulation to a release produced the *highest* rate of losing external rotation – **18%, against 7% for manipulation alone and 2% for release alone** [16].

WHAT THE BIGGEST TREATMENT TRIAL ACTUALLY FOUND

A UK trial randomised just over 500 people to structured physiotherapy with an injection, manipulation under anaesthetic, or keyhole surgery. At one year all three landed **within a few points of each other** – less than the difference a patient would notice [7]. That is genuinely useful news: it means the choice can be made on what suits you and your circumstances, rather than one option being plainly better.

Where the three do differ is in **how often people need something else afterwards**. In that trial, further treatment was needed by **4% after a release, 7% after a manipulation and 15% after physiotherapy** [7]. Manipulation came out best on cost per unit of benefit; release cost the most and generated most of the trial’s serious complications, though those were rare in absolute terms.

MANIPULATION OR RELEASE – THE RECURRENCE QUESTION

This is where the two operations genuinely separate, and it is the reason a surgeon may steer you towards a release even though the headline outcome scores look the same.

CQ HAND + UPPER LIMB

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A **manipulation** stretches the capsule until it tears, and the tear does not always go where you would choose. In the largest series – **792 shoulders followed for 17 years** – a second manipulation was needed in **17.8%**, and in people with type 1 diabetes that rose to **37.9%** [9]. The longest follow-up, at an average of 13 years, found **19.2%** had needed a repeat manipulation and **31.3%** described a recurrence at some point [10]. Two things soften that: nearly all recurrences happen in the **first year** (after five years the rate is under 2%), and a repeat manipulation works about as well as the first [9][10].

A **release** divides the capsule deliberately, under vision. Reoperation is markedly less common: a series followed for a mean of five years reported **no reoperations in 32 patients**, with a single recurrence in someone who did not complete their rehabilitation [11]. The meta-analysis pooling eight studies and 768 patients found no significant difference between the two operations for pain, function or movement, but did note the manipulation group needed more additional injections, concluding that over a longer follow-up **“the MUA group may experience more recurrences”** [8].

Two honest caveats. First, the big manipulation-recurrence studies largely come from **one surgeon’s practice**, so they are not independent confirmations of each other. Second, release is not a full restoration either: one series measuring against the patient’s own opposite shoulder found people sitting at about **77–79% of the good side** two to six years later [12], and in a cohort that excluded diabetics, while almost everyone improved by a meaningful amount, **11–22% still did not consider their shoulder acceptable at six months** [13].

So the honest summary is this: for getting the shoulder moving and comfortable, the two are about equivalent, and manipulation is the cheaper way there. For *staying* that way, the evidence favours release. That difference matters most if you have diabetes, if the shoulder is very stiff, or if you have already had a manipulation that did not hold.

REFERENCES

1. Bunker T. Time for a new name for frozen shoulder — contracture of the shoulder. *Shoulder Elbow*. 2009;1(1):4-9.
2. Wong CK, Levine WN, Deo K, Kesting RS, Mercer EA, Schram GA, et al. Natural history of frozen shoulder: fact or fiction? A systematic review. *Physiotherapy*. 2017;103(1):40-7.
3. 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;470(4):1133-43.
4. Hand C, Clipsham K, Rees JL, Carr AJ. Long-term outcome of frozen shoulder. *J Shoulder Elbow Surg*. 2008;17(2):231-6.
5. Green HD, Jones A, Evans JP, Wood AR, Beaumont RN, Tyrrell J, et al. A genome-wide association study identifies 5 loci associated with frozen shoulder and implicates diabetes as a causal risk factor. *PLoS Genet*. 2021;17(6):e1009577.
6. Page MJ, Green S, Kramer S, Johnston RV, McBain B, Chau M, et al. Manual therapy and exercise for adhesive capsulitis (frozen shoulder). *Cochrane Database Syst Rev*. 2014;2014(8):CD011275.
7. Brealey S, Northgraves M, Kottam L, Keding A, Corbacho B, Goodchild L, et al. Surgical treatments compared with early structured physiotherapy in secondary care for adults with primary frozen shoulder: the UK FROST three-arm RCT. *Health Technol Assess*. 2020;24(71):1-162.
8. Zhao Y, Yang T, Feng C, Li L, Pang L, Zhao S. Arthroscopic capsular release versus manipulation under anesthesia for refractory frozen shoulder: a systematic review with meta-analysis. *Orthop Surg*. 2024;16(7):1517-29.
9. Woods DA, Loganathan K. Recurrence of frozen shoulder after manipulation under anaesthetic (MUA). *Bone Joint J*. 2017;99-B(6):812-7.
10. Fairclough A, Waters C, Davies T, Ali A, Woods D. Long-term recurrence of frozen shoulder after manipulation under anaesthesia. *Shoulder Elbow*. 2023;15(2):173-80.
11. Ranalletta M, Rossi LA, Zaidenberg EE, Bertona A, Tanoura I, Maignon GD, et al. Midterm outcomes after arthroscopic anteroinferior capsular release for the treatment of idiopathic adhesive capsulitis. *Arthroscopy*. 2017;33(3):503-8.

12. Mardani-Kivi M, Hashemi-Motlagh K, Darabipour Z. Arthroscopic capsular release of frozen shoulder: mid-term results. *Clin Shoulder Elb*. 2021;24(3):172-7.
13. Pasqualini I, Tanoira I, Hurley ET, Ranalletta M, Rossi LA. Arthroscopic capsular release achieves clinically significant outcomes in patients with adhesive capsulitis. *Arthroscopy*. 2024;40(4):1081-8.
14. Pasqualini I, Rossi LA, Oyem PC, Tanoira I, Ranalletta M. Time required to achieve clinically significant outcomes after arthroscopic capsular release. *Orthop J Sports Med*. 2024;12(11):23259671241275653.
15. Sedlinsch A, Berndt T, Rühmann O, Lerch S. Convalescence after arthroscopic capsular release in frozen shoulder. *J Orthop*. 2020;20:374-9.
16. Schoch B, Huttman D, Syed UA, et al. Surgical treatment of adhesive capsulitis: a comparison of manipulation, capsular release and both. *Cureus*. 2020;12(7):e9032.
17. Sivasubramanian H, Chua CXK, Lim SY, Manohara R, Ng ZWD, Prem Kumar V, et al. Arthroscopic capsular release to treat idiopathic frozen shoulder: how much release is needed? *Orthop Traumatol Surg Res*. 2021;107(1):102766.
18. Bunker T. Time for a new name for frozen shoulder — contracture of the shoulder. *Shoulder Elbow*. 2009;1(1):4-9.
19. Wong CK, Levine WN, Deo K, Kesting RS, Mercer EA, Schram GA, et al. Natural history of frozen shoulder: fact or fiction? A systematic review. *Physiotherapy*. 2017;103(1):40-7.
20. 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;470(4):1133-43.
21. Hand C, Clipsham K, Rees JL, Carr AJ. Long-term outcome of frozen shoulder. *J Shoulder Elbow Surg*. 2008;17(2):231-6.
22. Green HD, Jones A, Evans JP, Wood AR, Beaumont RN, Tyrrell J, et al. A genome-wide association study identifies 5 loci associated with frozen shoulder and implicates diabetes as a causal risk factor. *PLoS Genet*. 2021;17(6):e1009577.
23. Page MJ, Green S, Kramer S, Johnston RV, McBain B, Chau M, et al. Manual therapy and exercise for adhesive capsulitis (frozen shoulder). *Cochrane Database Syst Rev*. 2014;2014(8):CD011275.
24. Brealey S, Northgraves M, Kottam L, Keding A, Corbacho B, Goodchild L, et al. Surgical treatments compared with early structured physiotherapy in secondary care for adults with primary frozen shoulder: the UK FROST three-arm RCT. *Health Technol Assess*. 2020;24(71):1-162.
25. Zhao Y, Yang T, Feng C, Li L, Pang L, Zhao S. Arthroscopic capsular release versus manipulation under anesthesia for refractory frozen shoulder: a systematic review with meta-analysis. *Orthop Surg*. 2024;16(7):1517-29.
26. Woods DA, Loganathan K. Recurrence of frozen shoulder after manipulation under anaesthetic (MUA). *Bone Joint J*. 2017;99-B(6):812-7.
27. Fairclough A, Waters C, Davies T, Ali A, Woods D. Long-term recurrence of frozen shoulder after manipulation under anaesthesia. *Shoulder Elbow*. 2023;15(2):173-80.
28. Ranalletta M, Rossi LA, Zaidenberg EE, Bertona A, Tanoira I, Maignon GD, et al. Midterm outcomes after arthroscopic anteroinferior capsular release for the treatment of idiopathic adhesive capsulitis. *Arthroscopy*. 2017;33(3):503-8.
29. Mardani-Kivi M, Hashemi-Motlagh K, Darabipour Z. Arthroscopic capsular release of frozen shoulder: mid-term results. *Clin Shoulder Elb*. 2021;24(3):172-7.
30. Pasqualini I, Tanoira I, Hurley ET, Ranalletta M, Rossi LA. Arthroscopic capsular release achieves clinically significant outcomes in patients with adhesive capsulitis. *Arthroscopy*. 2024;40(4):1081-8.
31. Pasqualini I, Rossi LA, Oyem PC, Tanoira I, Ranalletta M. Time required to achieve clinically significant outcomes after arthroscopic capsular release. *Orthop J Sports Med*. 2024;12(11):23259671241275653.
32. Sedlinsch A, Berndt T, Rühmann O, Lerch S. Convalescence after arthroscopic capsular release in frozen shoulder. *J Orthop*. 2020;20:374-9.
33. Schoch B, Huttman D, Syed UA, et al. Surgical treatment of adhesive capsulitis: a comparison of manipulation, capsular release and both. *Cureus*. 2020;12(7):e9032.
34. Sivasubramanian H, Chua CXK, Lim SY, Manohara R, Ng ZWD, Prem Kumar V, et al. Arthroscopic capsular release to treat idiopathic frozen shoulder: how much release is needed? *Orthop Traumatol Surg Res*. 2021;107(1):102766.