Adhesive Capsulitis/Frozen Shoulder

Diagnosis/Condition:	Adhesive Capsulitis/Frozen Shoulder
Discipline:	DC, ND
ICD-10 Codes:	M75.00
Origination Date:	1996
Review/Revised Date:	04/2025
Next Review Date:	04/2027

Adhesive capsulitis (aka: frozen shoulder) is a syndrome defined as idiopathic painful restriction of shoulder movement that results in global restriction of the glenohumeral joint. First described in 1875 by French pathologist Duplay, E. A. Codman, an American physician, named the condition "frozen shoulder." An estimated 4.5 million visits to US physicians occur each year with a cost of $3 billion. It causes substantial disability from work and non-work physical activity.[1]

It is not associated with a specific underlying medical condition. The American Academy of Orthopedic Surgeons (AAOS) define the condition as one: "of varying severity characterized by the gradual development of global limitation of active and passive shoulder motion where radiographic findings other than osteopenia are absent." To avoid confusion, the term "adhesive capsulitis" should be used to refer to the primary idiopathic condition and the term "secondary adhesive capsulitis" should be applied to the condition that is associated with, or results from, other pathologic states. Both types involve moderate to severe shoulder pain. The prevalence of frozen shoulder is estimated to be between 2 - 5 percent of the general population, with a peak age of mid-50s and more often affecting women.[2]

Despite over 100 years of treating this condition, its exact nature is uncertain. The definition, diagnosis, pathology, and the best treatment are still largely unclear.[3] The exact pathology is unknown.[4] It is suspected that inflammation occurs initially, followed by the development of adhesions and fibrosis of the synovial lining, which leads to thickening and contraction of the glenohumeral joint capsule and surrounding tissue.

Subjective Findings and History

- Idiopathic (or primary) adhesive capsulitis is often of an abrupt and insidious onset without specific or triggering event. Secondary adhesive capsulitis is associated with diabetes, thyroid disease, COPD, MI, stroke, autoimmune disease, protease inhibitor treatment, or secondary to other shoulder injuries and prolonged immobilization.[5,6]
- Usually over 40 years of age, slightly more common in women, may be related to thoracic kyphosis.

- Pain worse at night, difficulty with ADLs, pain worse with reaching behind and overhead.
- Stages of development:[7]
    - Acute stage (freezing) - moderate to severe pain limiting all shoulder movement, pain interferes with sleep.
    - Middle stage (frozen) - history of acute phase 1-3 months previously, now much less pain but marked stiffness and loss of motion, anterior or lateral brachial pain, constant dull ache becoming pain with movement into restricted range. Most patients present in the middle phase.
    - Final stage (thawing) - very slow increase in ROM with significant residual stiffness.

Objective Findings

- Unilateral, can develop to bilateral.
- Active and passive ROM loss[8]. Usually, abduction and external rotation is diminished.
- Loss of abduction usually substituted by shoulder shrugging or trunk leaning.
- Improved motion following mild reciprocal isometric contractions.
- Full strength of shoulder muscles but may have pain on resisted muscle testing.

Diagnostic Imaging

- Adhesive capsulitis is a clinical diagnosis and diagnostic imaging is usually not necessary. [9,10]
- Imaging such as X-ray, MRI, and ultrasound should be reserved for the evaluation of other sources of shoulder pathology, not to confirm a diagnosis of adhesive capsulitis.

Assessment

- A complete shoulder exam may be limited by pain or stiffness. Pain and ROM (active and passive) should be measured. Glenohumeral joint accessory motion should be assessed to determine translational glide loss.
- Differentiate from "hot" bicipital tendinitis, rotator cuff tear, impingement, posterior dislocation, subacromial conditions, osteoarthritis.
- If symptoms persist after a local anesthetic is injected into the subacromial space, diagnosis is likely frozen shoulder.

Plan

Best therapy is prevention. Avoid prolonged immobilization such as in treatment of shoulder injury or pain. Treatment planning is determined by the stage of the disorder. Studies of common conservative and surgical treatments for adhesive capsulitis are limited by small sample size and/or poor methodological quality.[9,10]

Acute Stage: "Freezing" Stage

Passive care:

- Focus on pain relief, avoid aggressive mobilization or adjustive techniques.
- NSAIDS, topical salicylic acid, CBD cream or oil[11], "icy heat", other topical analgesic creams.
- Curcumin (turmeric) topical and oral.[12,13,14,]
- Bromelain (oral).[15,16]
- Selected homeopathic medicines.
- Homeopathic Traumeel (oral, topical, and injected).[17,18]
- Most patients need more than physiotherapy for pain control.
- Corticosteroid injections are especially effective in this stage, less so in the 2nd and 3rd stages.[19,20]
- Sleep on unaffected side with affected side supported to avoid excessive internal rotation.

Middle Stage: "Frozen" Stage

Passive care:

- Iontophoresis, phonophoresis, ultrasound and massage may reduce the likelihood of favorable outcome when emphasized over other treatment options such as joint mobilization and mobility, i.e., mobilization and activities the patient performs to improve joint mobility.[21]
- There is evidence that laser with exercise is more effective than placebo.[22]
- In a small sample, the addition of *high velocity, low amplitude chiropractic manipulative therapy (*HVLA CMT) to home exercise improved outcomes.[23]
- Soft tissue mobilization techniques such as Trigger Point manipulation or *proprioceptive neuromuscular facilitation* (PNF).
- Active assisted protraction, retraction, elevation, depression, and rotation to foster glenohumeral proprioceptive isolation.
- Passive stretching with axial traction in flexion, external rotation, and perhaps adduction; avoid abduction as may cause impingement symptoms.
- Rhythmic stabilization and hold-relax techniques to increase ROM.
- Mobilization is strongly recommended for decreasing pain, increasing ROM and function, however forceful adjusting of the shoulder is apt to cause inflammatory exacerbation.
- Pain relief as needed as indicated in "Freezing" stage treatments.

Active care:

- Therapeutic exercises are strongly recommended for decreasing pain, increasing ROM and function.[24]
- Codman's exercises and mild isometrics to relax associated muscle spasm
- Self-assisted ROM.

Late Stage: "Thawing" Stage

Passive care:

- Mobilization is strongly recommended for decreasing pain, increasing ROM and function.
- Active Release®, Graston Technique® or prolonged fascial release without creating pain helps to release the anterior capsule in the second and third stages.
- These techniques must not be used if they are creating more than an ache.
- The use of prolonged, low intensity stretching at elevated tissue temperature, followed by cooling of the tissue, is beneficial.
- Pain relief as needed as indicated in" Freezing" stage treatments.

Active care:

- Therapeutic exercises are strongly recommended for decreasing pain, increasing ROM and function.[25]
- Codman's and wall-walking exercises.
- Further stretching with self-mobilization with emphasis on inferior glide.
- Work on postural habits to avoid kyphosis and scapular protraction.
- Pulley, broomstick, or "giant" ball exercises for later stages.
- As pain free movement returns gradually introduce strengthening exercises.

All Stages: Consider the Following

Mind-Body Therapies:

- Mirror therapy.[26]

Herbal Medicine (Western):

- Botanical supplementation to reduce inflammation (*Curcuma longa* (turmeric), *Capsicum annuum* (cayenne), *Arnica montana* (arnica)[27],[28], *Ruta graveolens* (rue), *Hypericum perforatum* (St. John's wort[29]), and *Gaultheria procumebens* (wintergreen).
- Topical treatments (e.g., comfrey poultice, hypericum, arnica, wintergreen).

Supplements and Nutrients:

- Nutritional supplementation (Vitamin C, manganese, magnesium,[30,31] calcium,[32] glucosamine sulfate,[33] chondroitin, methylsulfonylmethane, bromelain,[34] and essential fatty acids[35,36]).

Physical Modalities (Western):

- Short wave diathermy.[37]
- A 2022 study found that ultrasound deep heat therapy (UST) as a co-intervention combined with other physical modalities is an effective means of improving the overall pain in patients.[38]
- Deep heat for pain relief and improved ROM.

- Electrotherapy for short-term pain relief.[39]
- Extracorporeal shock wave treatment.[40]
- Low level laser therapy for pain relief and improved function.[41]

Movement and Exercise:

- Patient education[42] and home exercise.
- Continuous Passive Motion for short-term pain relief but not function or ROM.
- Intensive mobilization after hydrodilatation is a promising adjuvant treatment option for patients suffering from a frozen shoulder.

Manual Adjustments/Manipulation:

- Manual joint mobilization[43,44,45]
- Manipulation under anesthesia.[46,47]

Acupuncture (excluding pharmocoacupture):

- Dry needling.
- Acupuncture,[48] especially with therapeutic exercise for pain relief, improved ROM, and function. The combination of acupuncture and physical therapy is more effective than physical therapy alone in managing pain, improving clinical effective rates, and enhancing range of motion.[49]

Injection Therapies:

- Ultrasound guided injections (mixed reviews) (including corticosteroids[50,51,52], hyaluronic acid[53,54] lidocaine).[55]
- 2023 study (n=1139) found platelet rich plasma (PRP) injection may serve as an effective and safe treatment for patients with AC.[56] A 2024 study (n=1024) showed that PRP was more durable and safer than corticosteroids and other control groups in the treatment of frozen shoulder.[57]
- Hydrodistension is of great clinical significance in alleviating pain and improving function.[58]
- Pharmacoacupuncture (PA) may offer potential benefits as an alternative injection therapy.[59]
- Ultrasound guided radiofrequency. [60]

Outcomes Assessment Tools (OATS)

- Numeric, visual analog pain scale for pain.
- Patient specific functional scale for function.
- DASH score (Disability of Arm, Shoulder and Hand score) for disability.

Length of Treatment

- May require up to 2-4 months with decreasing frequency and increasing emphasis on home care as ROM improves. Improvement is characterized by spurts and plateaus.
- Maintain home exercise program for several months after in-office care ends.

Referral Criteria

- Failure to respond after 6-8 weeks, consider referral for corticosteroid injection to potentiate mobilization. Failure to respond at 12 weeks consider surgical consult for capsular release.
- Persistent or disabling pain.

Resources for Clinicians

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Xiao RC, Deangelis JP, Smith CC, Ramappa AJ. Evaluating Nonoperative Treatments for Adhesive Capsulitis. *J Surg Orthop Adv*. 2017;26(4):193-199.

Physiopedia. DASH Outcome Measure. https://www.physiopedia.com/DASH_Outcome_Measure

Resources for Patients

Handout from American Academy of Family Physicians. Free PDF at https://familydoctor.org/condition/adhesive-capsulitis/

Exercises for frozen shoulder. Harvard Health Publishing. https://www.health.harvard.edu/shoulders/stretching-exercises-frozen-shoulder (Accessed 3/20/19)

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