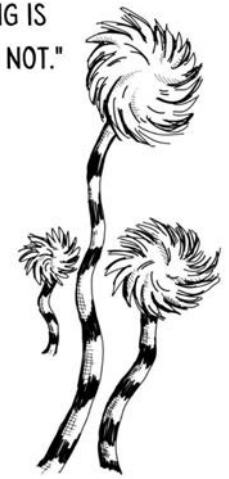
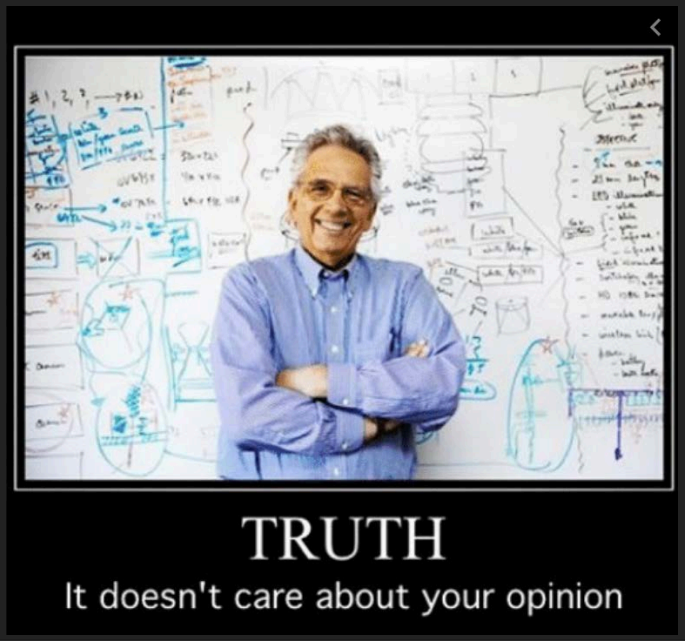
"UNLESS SOMEONE LIKE YOU CARES A WHOLE AWFUL LOT, NOTHING IS GOING TO GET BETTER. IT'S NOT."

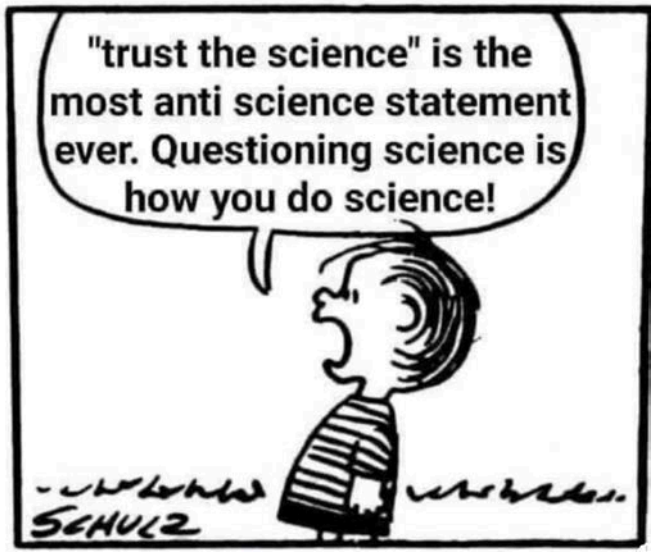
- DR. SEUSS

CHIROUP.COM
Resources for Exceptional Practices



THERE IS A NEW GURU





1998

Do not get into others peoples cars

1998

Do not get into others peoples cars

Do not meet people on the internet

UBER

Creating Value in Healthcare

$$V = \frac{\text{Results}}{\text{Price x Time}}$$

SEPARATE YOURSELF FROM YOUR COMPETITION

Annals of Internal Medicine

"For most patients with acute or subacute low back pain, clinicians and patients should initially select non-pharmacologic treatment with superficial heat, massage, acupuncture, or spinal manipulation."

Qaseem A, Wilt TJ, McLean RM, Forciea MA, for the Clinical Guidelines Committee of the American College of Physicians. Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians. Ann Intern Med. [Epub ahead of print 14 February 2017]

FDA

"Non-pharmacologic therapies, including chiropractic, should be used"

FDA Education Blueprint for Health Care Providers Involved in the Management or Support of Patients with Pain. May 2017. Accessed on May 12, 2017

CDC

"Non-pharmacologic therapy and non-opioid pharmacologic therapy are preferred"

Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain- United States, 2016. MMWR Recomm Rep 2016;65(No. RR-1):1–49.

Joint Commission

"Non-pharmacologic strategies, including chiropractic, have a role"

The Official Newsletter of The Joint Commission. Joint Commission Enhances Pain Assessment and Management Requirements for Accredited Hospitals. July 2017 Volume 37 Number 7. Ahead of print in 2018 Comprehensive Accreditation Manual for Hospitals.

Joint Commission Online. Revision to Pain Management Standards. http:// www.jointcommission.org/assets/1/23/jconline_november_12_14.pdf

37 State Attorney Generals

"Prescribe non-opioid alternatives including chiropractic"

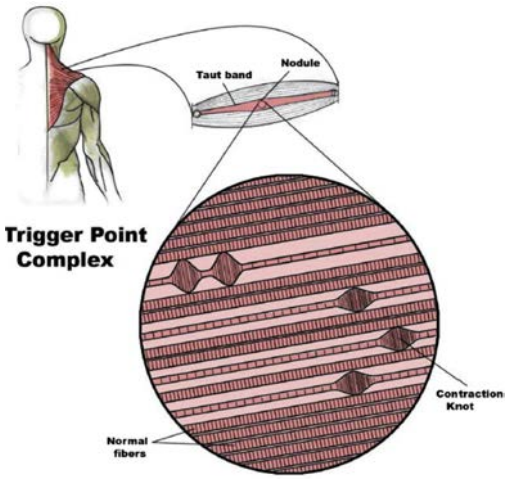
Attorney General Janet Mills Joins 37 States, Territories in Fight against Opioid Incentives. Accessed 9/19/17 from http://www. maine.gov/ag/news/ article. shtml?id=766715

JAMA

"Among patients with acute low back pain, spinal manipulative therapy was associated with improvements in pain and function with only transient minor musculoskeletal harms."

Paige NM, Miake-Lye IM, Booth MS, et al. Association of Spinal Manipulative Therapy With Clinical Benefit and Harm for Acute Low Back Pain; Systematic Review and Meta-analysis. JAMA. 2017;317(14):1451-1460.

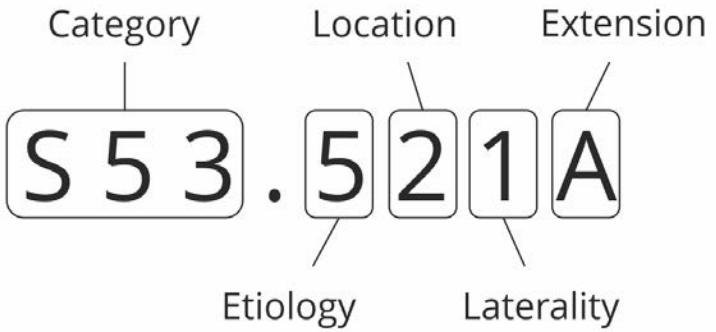
1. Shoulder pain
2. Shoulder pain with weakness upon activity
3. Happens 4x year
4. Worse with overhead lifting activities at their job
5. Worse with sleeping



Clinical Findings

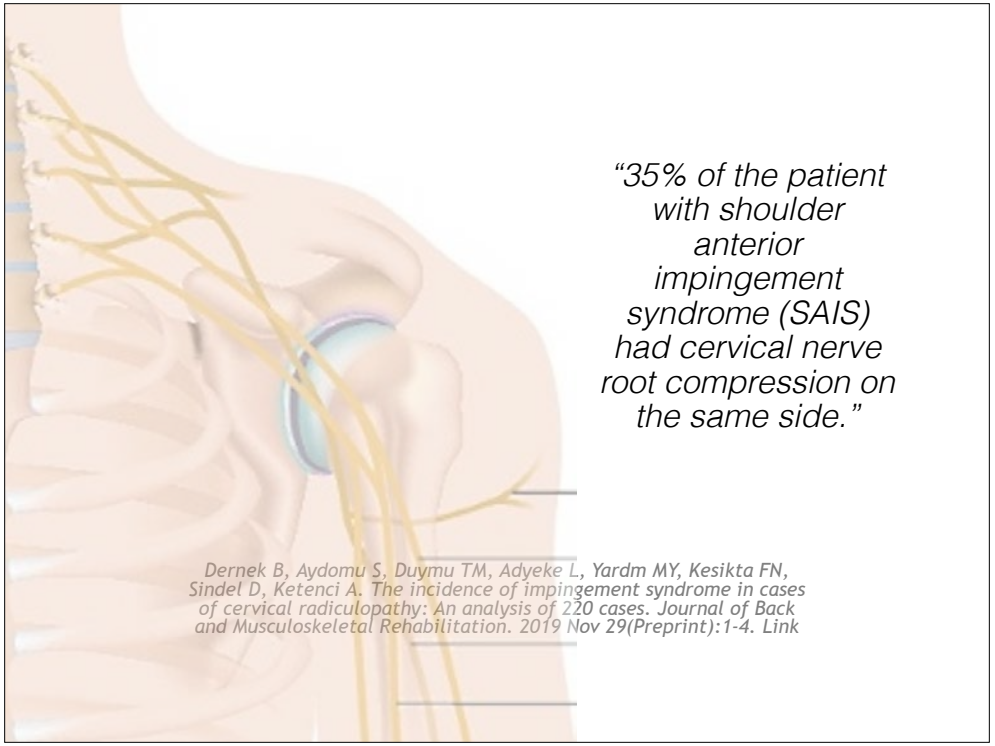
- Tenderness to palpation
- Segmental restriction of the cervical and thoracic spine

ANATOMY OF AN ICD-10 CODE



ICD-10 code for torus fracture of lower right end of right radius, initial encounter for closed fracture

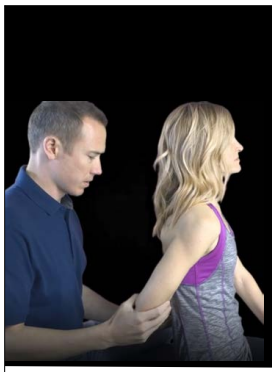
Strain/Sprain



"35% of the patient with shoulder anterior impingement syndrome (SAIS) had cervical nerve root compression on the same side."

Dernek B, Aydomu S, Duymu TM, Adyeke L, Yardm MY, Kesikta FN, Sindel D, Ketenci A. The incidence of impingement syndrome in cases of cervical radiculopathy: An analysis of 220 cases. Journal of Back and Musculoskeletal Rehabilitation. 2019 Nov 29(Preprint):1-4. Link

Supraspinatus Partial/Full Tear



External Rotation Lag Sign

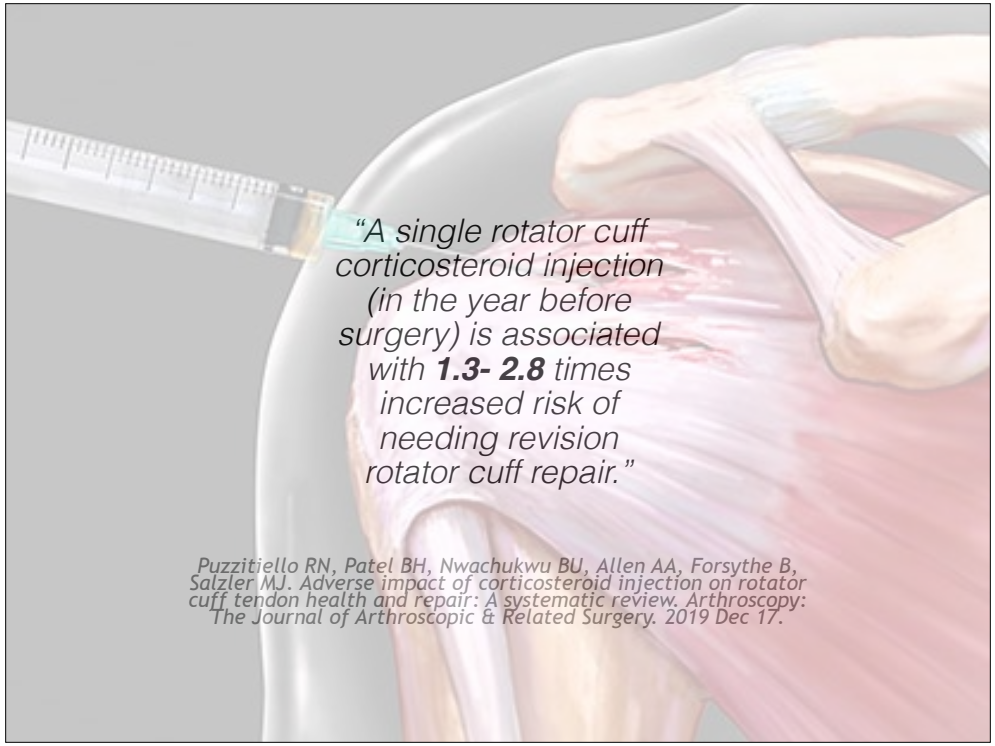
Teres Minor and Infraspinatus

Internal Rotation Lag Sign

Subscapularis

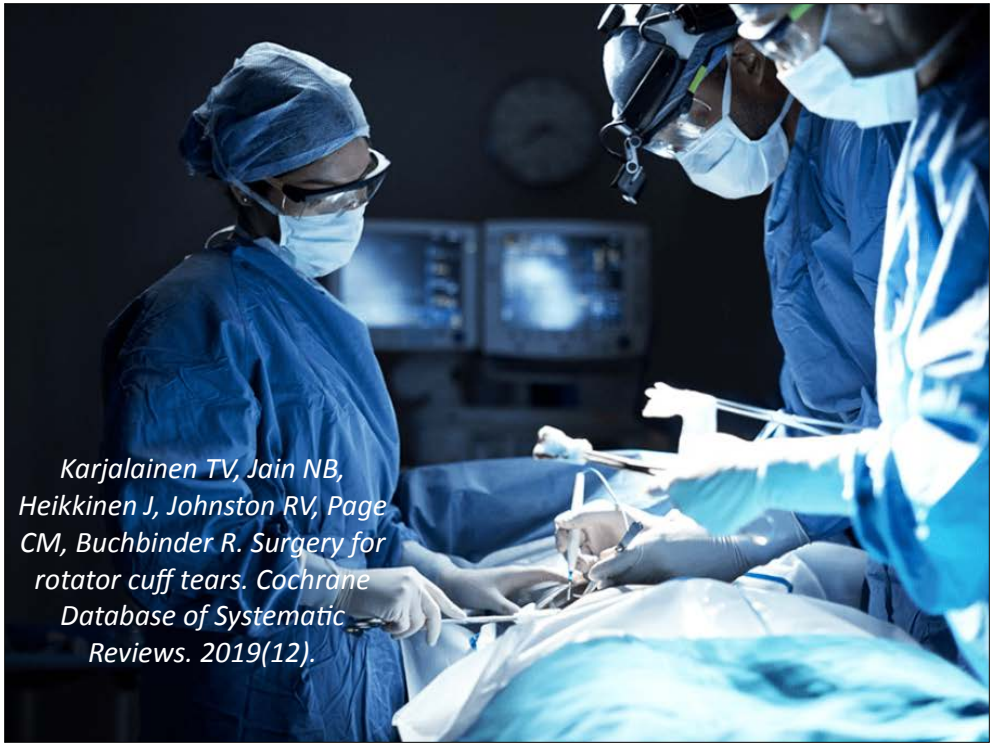
DIME Test

Supraspinatus



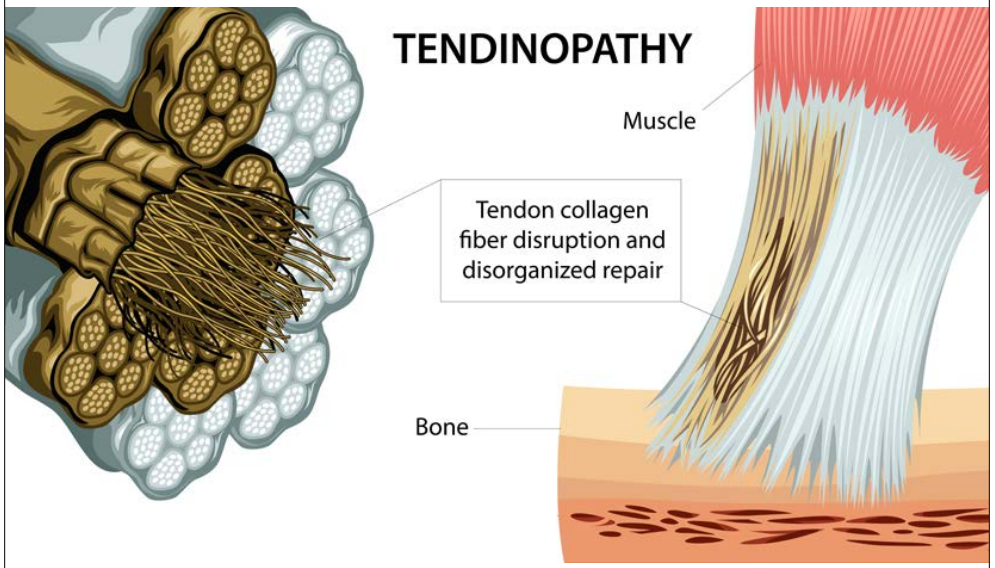
*"A single rotator cuff corticosteroid injection (in the year before surgery) is associated with **1.3- 2.8** times increased risk of needing revision rotator cuff repair."*

Puzzitiello RN, Patel BH, Nwachukwu BU, Allen AA, Forsythe B, Salzler MJ. Adverse impact of corticosteroid injection on rotator cuff tendon health and repair: A systematic review. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2019 Dec 17.



Karjalainen TV, Jain NB, Heikkinen J, Johnston RV, Page CM, Buchbinder R. Surgery for rotator cuff tears. Cochrane Database of Systematic Reviews. 2019(12).

Supraspinatus Tendinosis



Supraspinatus Tendinosis w/ ADL Mofication

Scapular Assistance

1. Strain/Sprain
2. Supraspinatus Partial Tear
3. Supraspinatus Tendinosis
4. Tendinosis

w/ ADL Mofication

1. Strain/Sprain
2. Supraspinatus Partial Tear
3. Supraspinatus Tendinosis
4. Tendinosis

w/ ADL Mofication

1. Strain/Sprain
2. Supraspinatus Partial Tear
3. Supraspinatus Tendinosis
4. Tendinosis

w/ ADL Mofication

1. Strain/Sprain
2. Supraspinatus Partial Tear
3. Supraspinatus Tendinosis
4. Tendinosis
w/ ADL Mofication

1. Strain/Sprain
2. Supraspinatus Partial Tear
3. Supraspinatus Tendinosis
4. Tendinosis
w/ ADL Mofication

DANISH MEDICAL JOURNAL

Original Article

Dan Med J 2021;68(6):A07200496

High incidence of lost workdays in patients with subacromial impingement syndrome

Mikkel Bek Clausen[1, 2], Mathias Fabricius Nielsen[2], Mikas Bjørn Merrild[1], Per Hölmich[2, 3] & Kristian Thorborg[2, 3]

1) School of Physiotherapy, Department of Midwifery, Physiotherapy, Occupational Therapy and Psychomotor Therapy, Faculty of Health, University College Copenhagen , 2) Orthopedic Research Center – Copenhagen (SORC-C), Department of Orthopedic Surgery, Copenhagen University Hospital – Amager-Hvidovre Hospital, 3) Department of Clinical Medicine, University of Copenhagen, Denmark

Dan Med J 2021;68(6):A07200496

sensors

MDPI

Article

Short- and Long-Term Effects of a Scapular-Focused Exercise Protocol for Patients with Shoulder Dysfunctions—A Prospective Cohort

Cristina dos Santos [1,2], Mark A. Jones [3,4] and Ricardo Matias [1,5,*,†]

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2 Escola Superior de Saúde do Alcoitão, 2649-506 Alcabideche, Portugal
3 Allied Health and Human Performance, University of South Australia, Adelaide 5001, Australia; mark.jones@unisa.edu.au
4 International Centre for Allied Health Evidence, University of South Australia, Adelaide 5001, Australia
5 Champalimaud Research and Clinical Centre, Champalimaud Centre for the Unknown, 1400-038 Lisbon, Portugal
* Correspondence: ricardo.matias@neuro.fchampalimaud.org; Tel.: +351-210-480-200 (ext. 4479)
† Current Address: Champalimaud Research, Champalimaud Center for the Unknown, Av. De Brasília, 1400-038 Lisbon, Portugal.

Abstract: Current clinical practice lacks consistent evidence in the management of scapular dyskinesis. This study aims to determine the short- and long-term effects of a scapular-focused exercise protocol facilitated by real-time electromyographic biofeedback (EMGBF) on pain and function, in individuals with rotator cuff related pain syndrome (RCS) and anterior shoulder instability (ASI). One-hundred and eighty-three patients were divided into two groups (n = 117 RCS and n = 66 ASI) and guided through a structured exercise protocol, focusing on scapular dynamic control. Values of pain and function (shoulder pain and disability index (SPADI) questionnaire, complemented by the numeric pain rating scale (NPRS) and disabilities of the arm, shoulder, and hand (DASH) questionnaire) were assessed at the initial, 4-week, and 2-year follow-up and compared within and between. There were significant differences in pain and function improvement between the initial and 4-week assessments. There were no differences in the values of DASH 1st part and SPADI between the 4-week and 2-year follow-up. There were no differences between groups at the baseline and long-term, except for DASH 1st part and SPADI ($p < 0.05$). Only 29 patients (15.8%) had a recurrence episode at follow-up. These results provide valuable information on the positive results of the protocol in the short- and long-term.

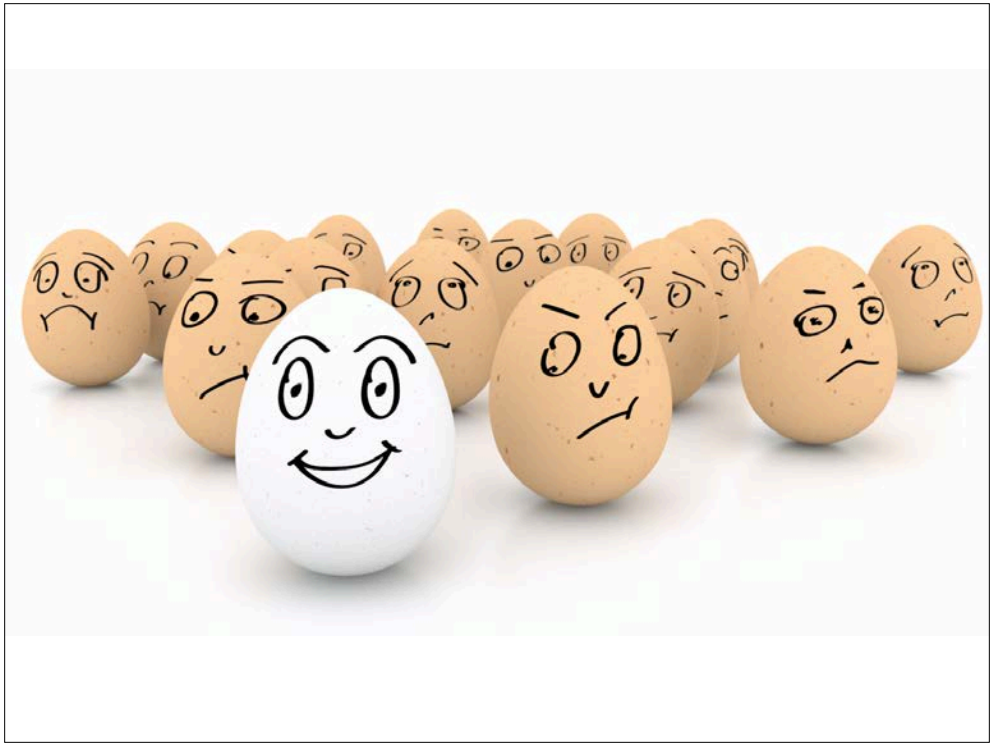
Keywords: scapula neuromuscular activity and control; rotator cuff related pain syndrome; anterior shoulder instability; scapular dyskinesis; electromyographic biofeedback

check for updates

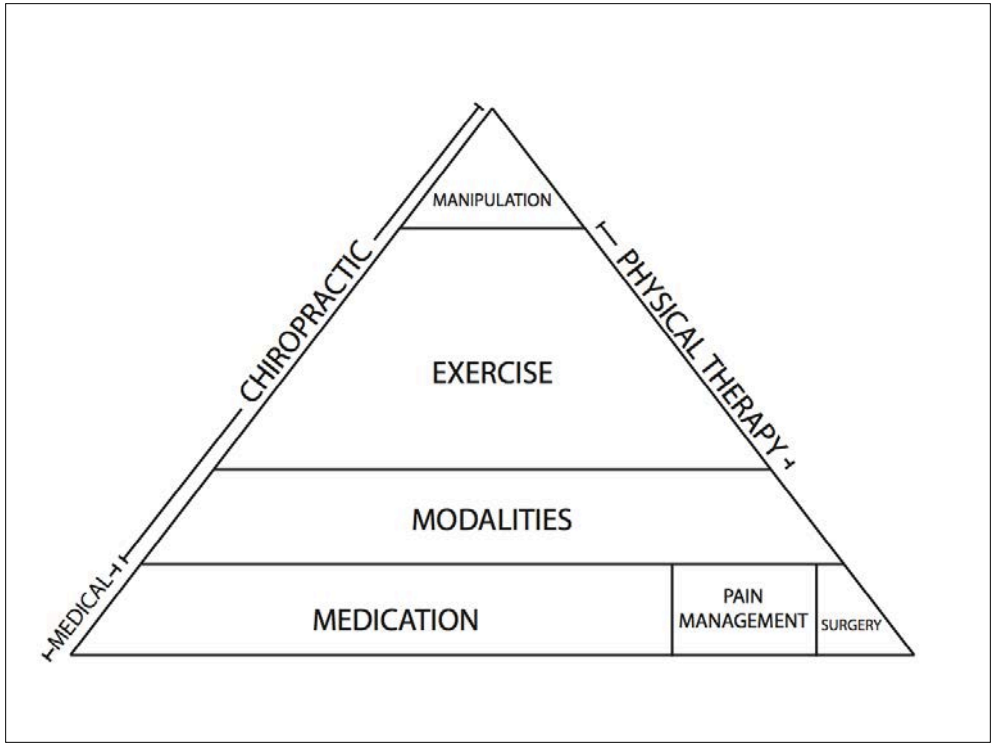
Citation: dos Santos, C.; Jones, M.A.; Matias, R. Short- and Long-Term Effects of a Scapular-Focused Exercise Protocol for Patients with Shoulder Dysfunctions—A Prospective Cohort. *Sensors* **2021**, *21*, 2888. https://doi.org/10.3390/s21082888

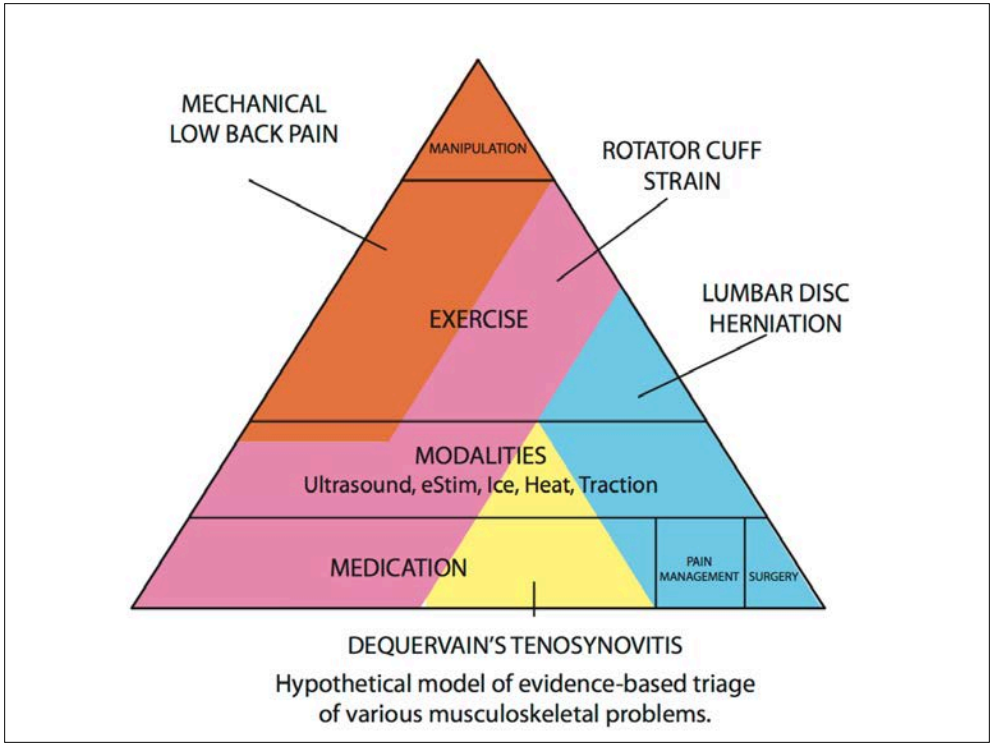
Academic Editor: Maria de Fátima Domingues

Received: 17 February 2021
Accepted: 12 April 2021
Published: 20 April 2021



6-13%



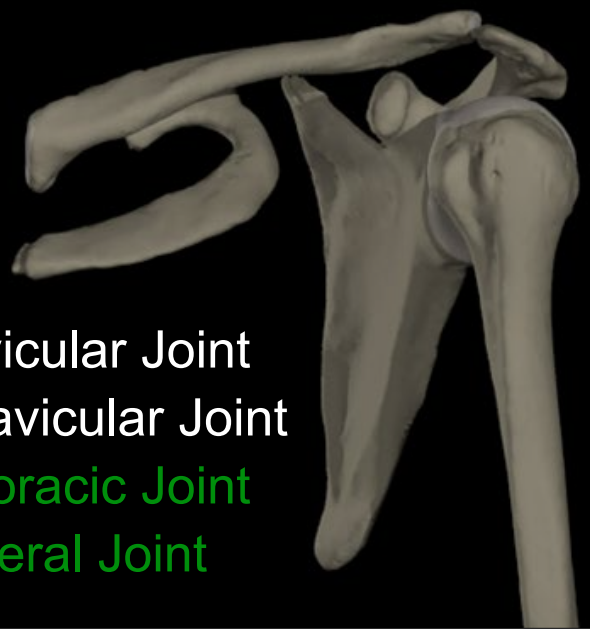


Hypothetical model of evidence-based triage of various musculoskeletal problems.

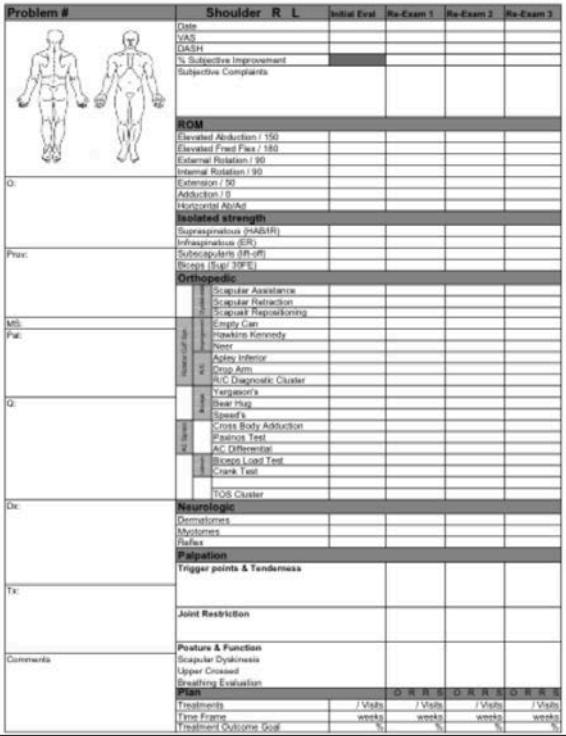
Exceptional Outcomes

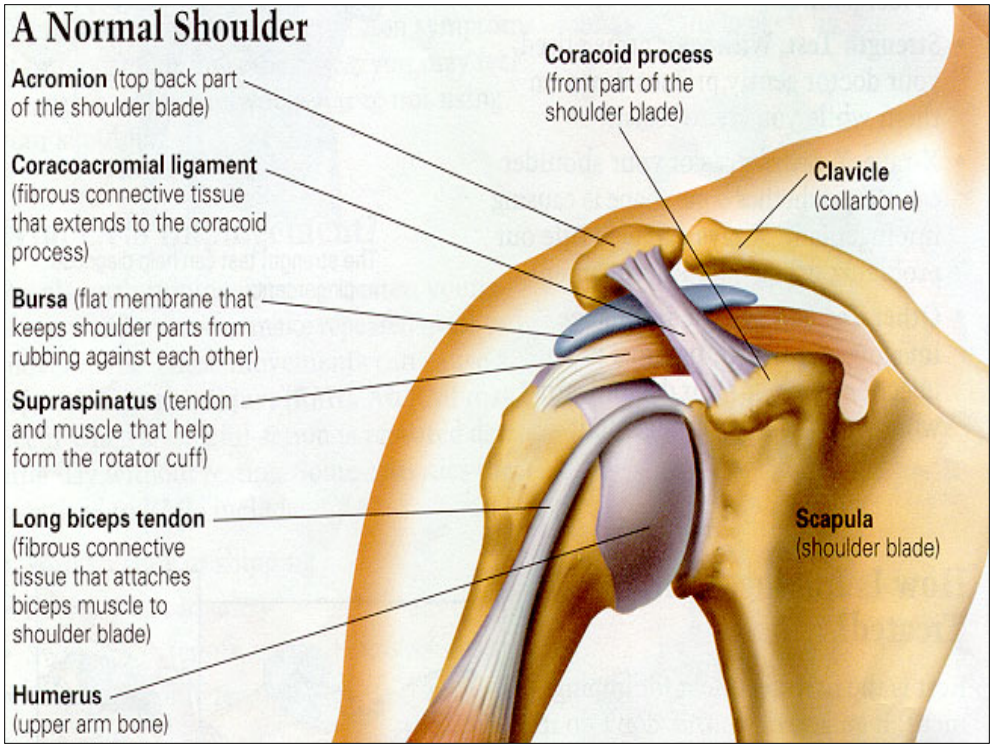
- Accurate Structural Diagnosis
- ID Complicating “Functional” Problems
- Follow “Best Practice” Management
- Active Patient Participation
- Measure and Improve

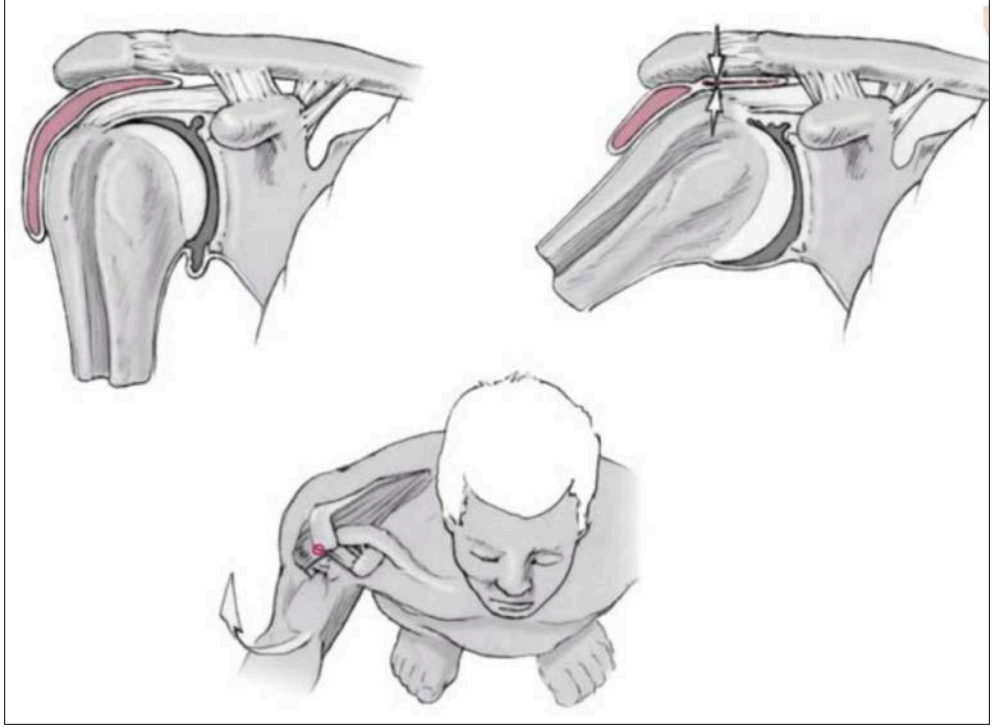
The Shoulder

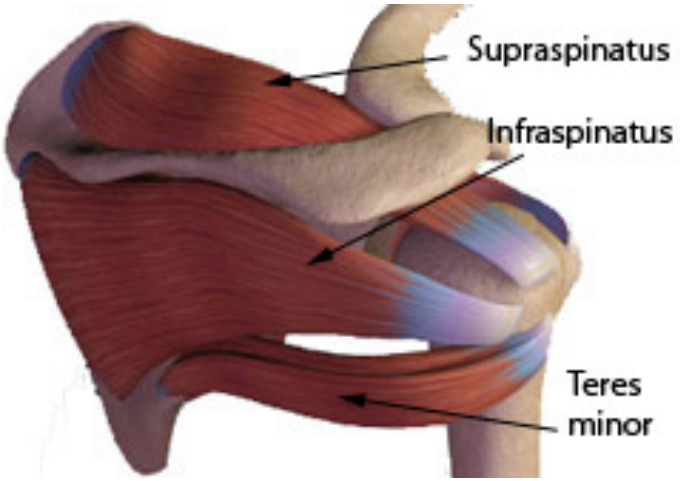


1. Sternoclavicular Joint
2. Acromioclavicular Joint
3. Scapulothoracic Joint
4. Glenohumeral Joint

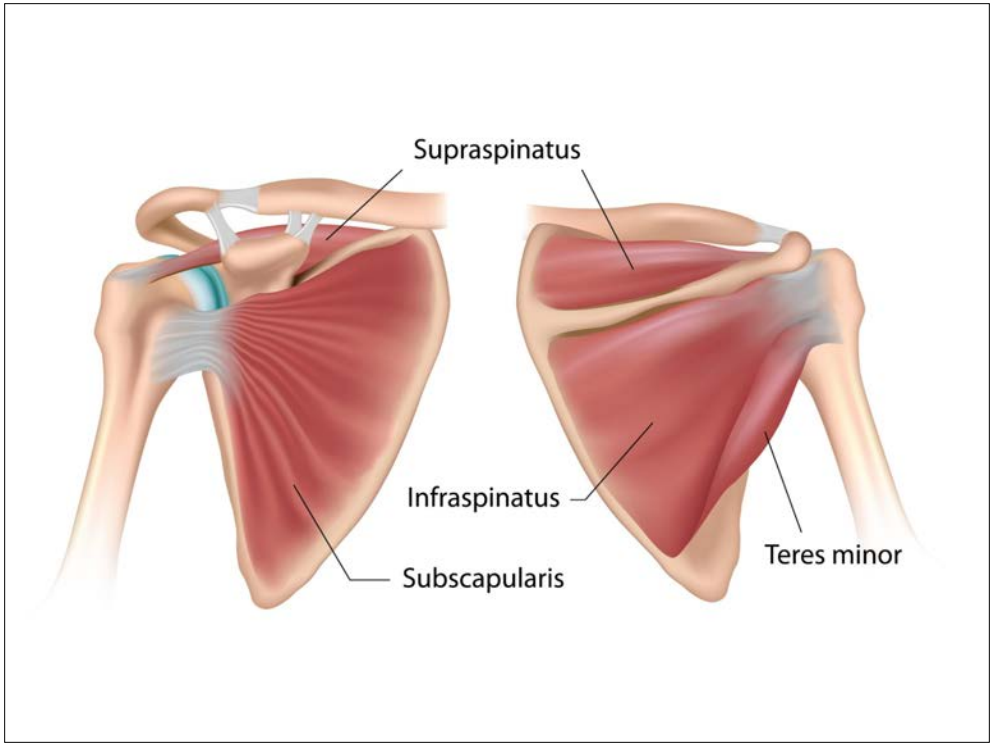


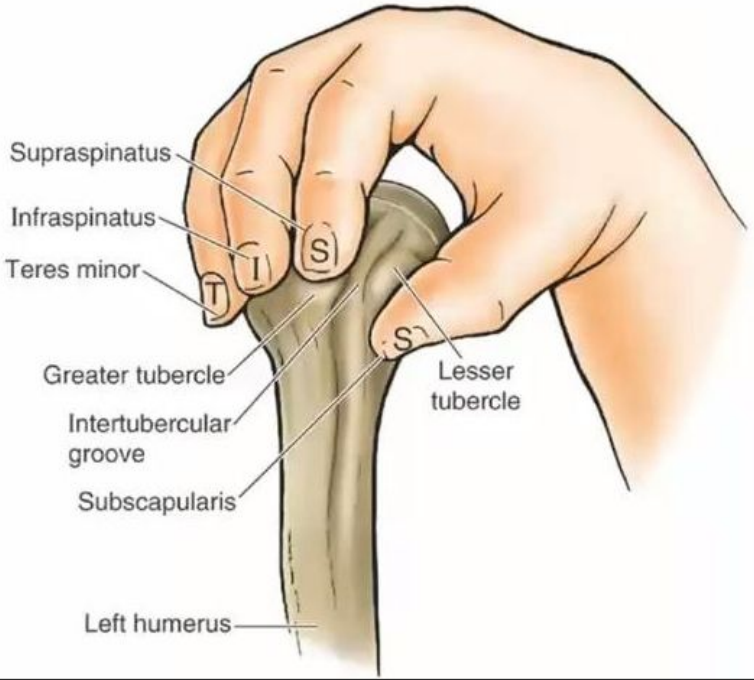




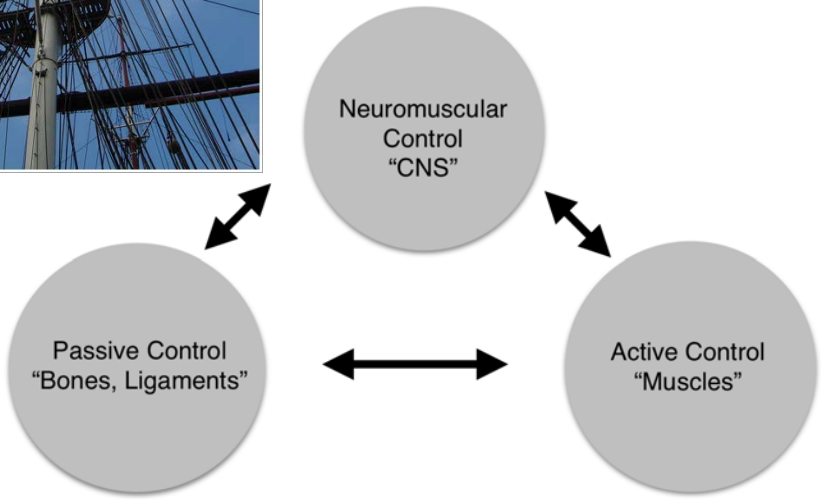


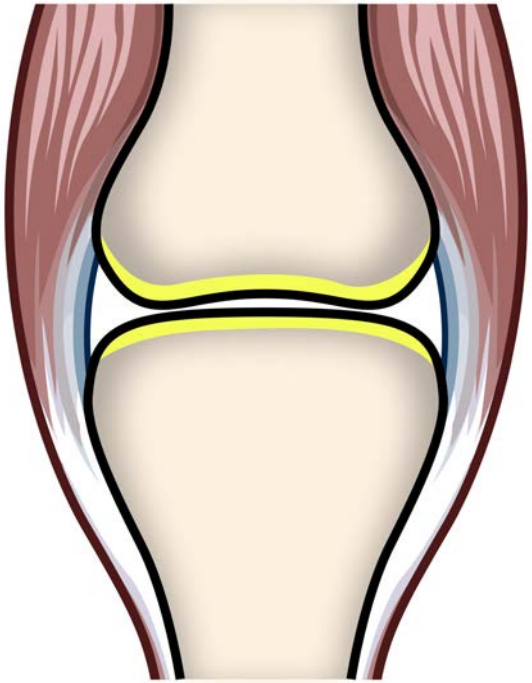
Orthopedic testing can replicate pain or functional deficits give an implicit relevance to patients' symptoms whereas, by contrast, lesions detected by imaging or in open surgery may actually be asymptomatic (MacDonald et al. 2000).

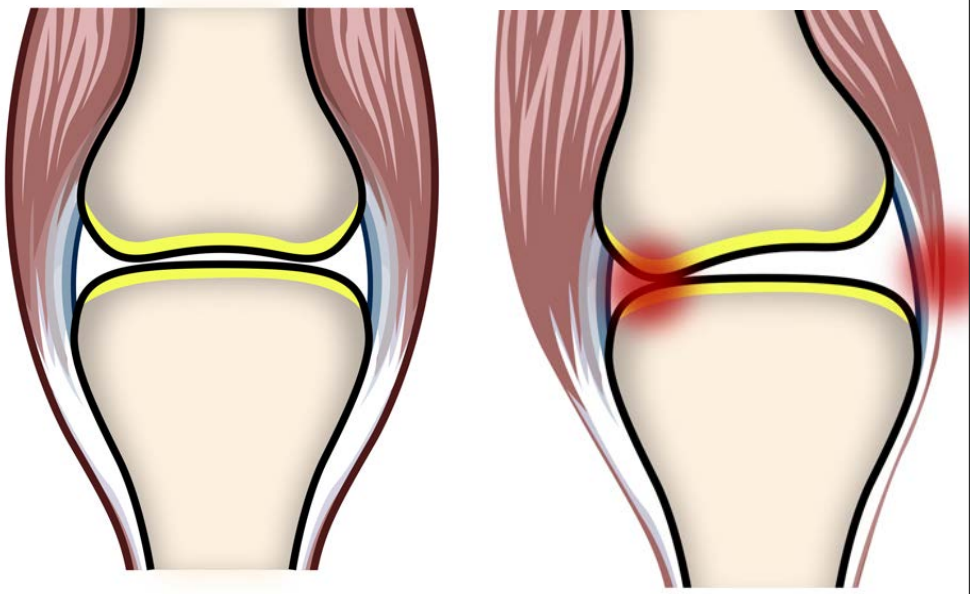


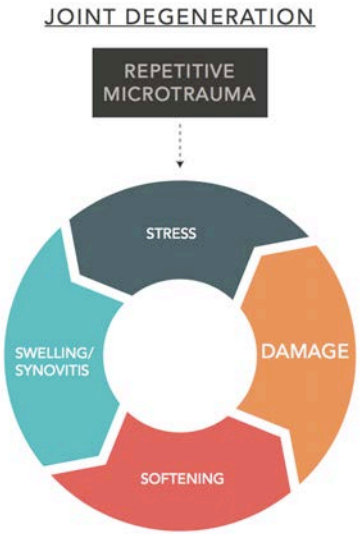


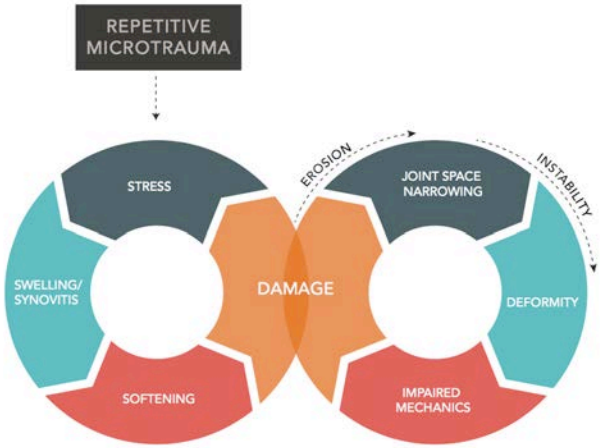
Stability

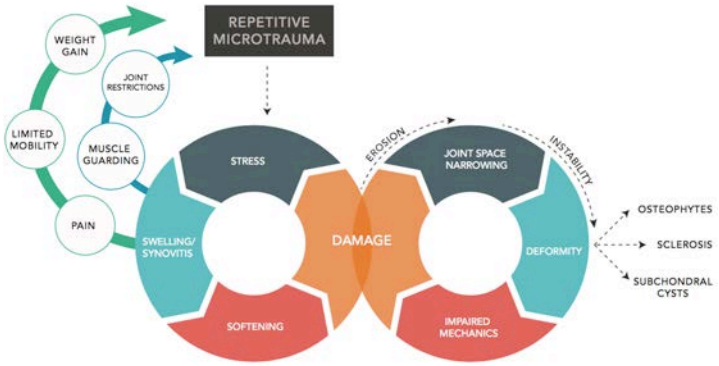

Neuromuscular
Control
“CNS”
Passive Control
“Bones, Ligaments”
Active Control
“Muscles”



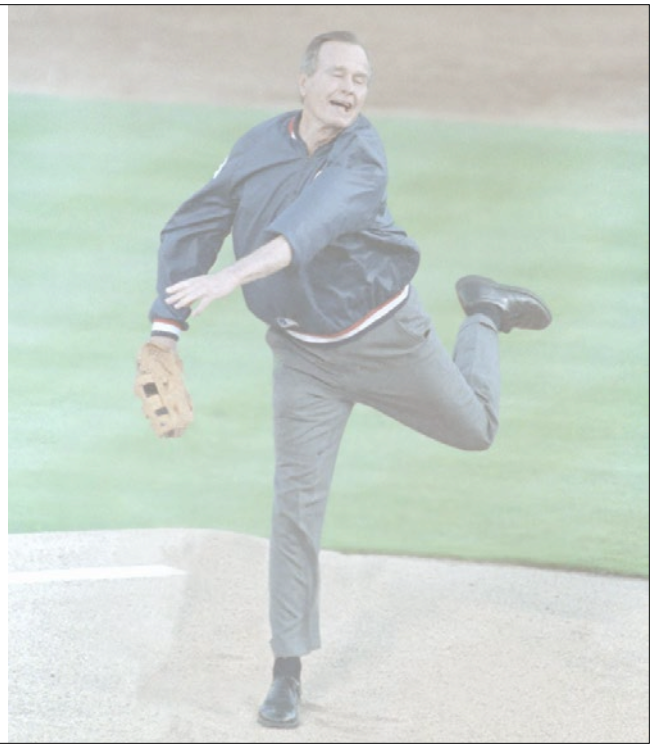



JOINT DEGENERATION
REPETITIVE
MICROTRAUMA
STRESS
DAMAGE
SOFTENING
SWELLING/
SYNOVITIS



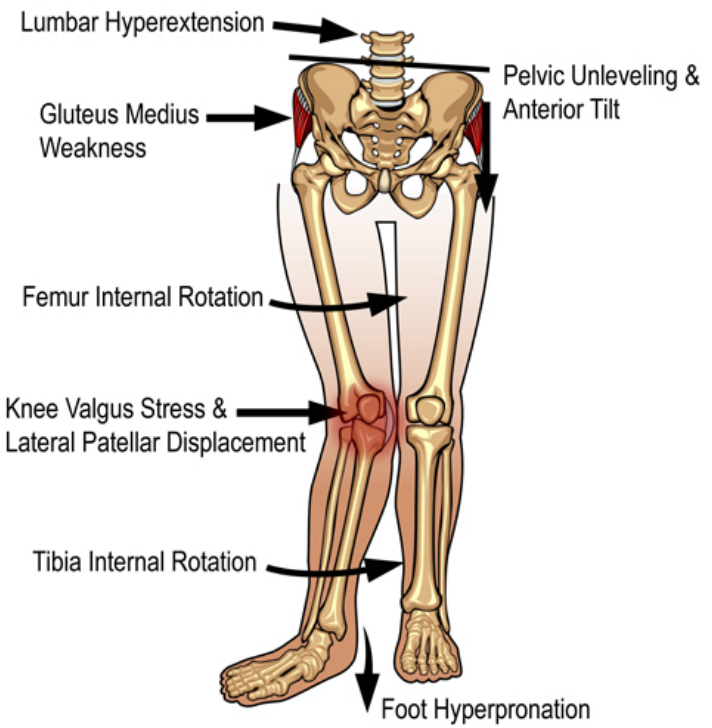


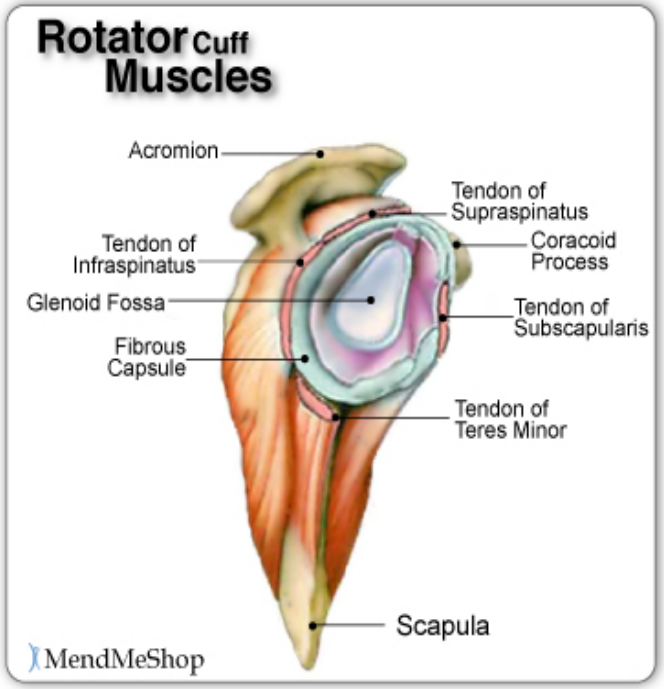
Motor Programs



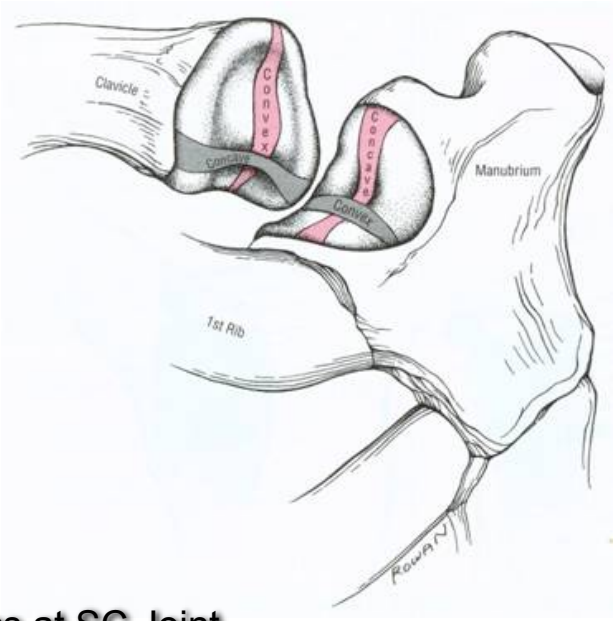
"Pitching to the age-restricted pitch count limit did not result in altered pitching mechanics or muscle activations, and no differences occurred between the 3 pitches (fastball, curveball, and change-up). These results support previous research that indicate the curveball pitch is no more dangerous for youth than the other pitches commonly thrown."

Oliver GD et al. Effects of a Simulated Game on Upper Extremity Pitching Mechanics and Muscle Activations Among Various Pitch Types in Youth Baseball Pitchers. J Pediatr Orthop. 2019 Sep;39(8):387-393.



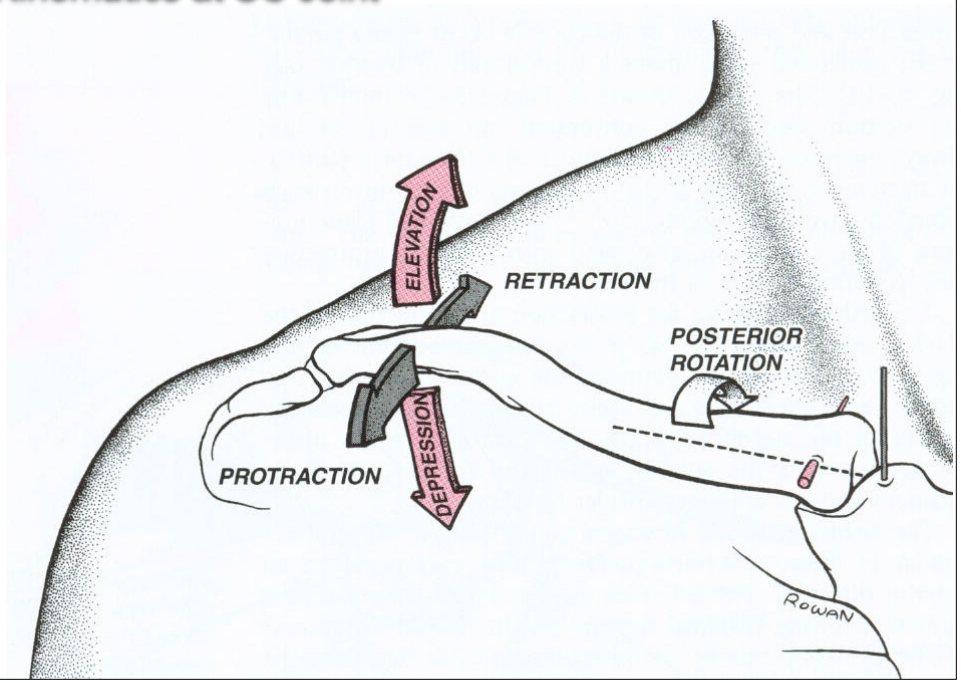


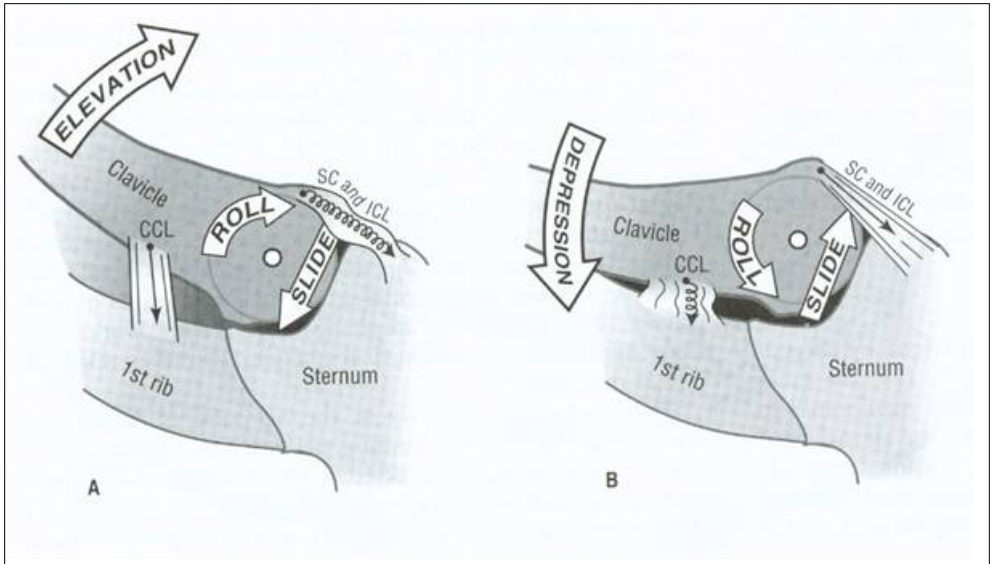
Supraspinatus
Infraspinatus
Teres Minor
Subscapularis



Kinematics at SC Joint

Kinematics at SC Joint

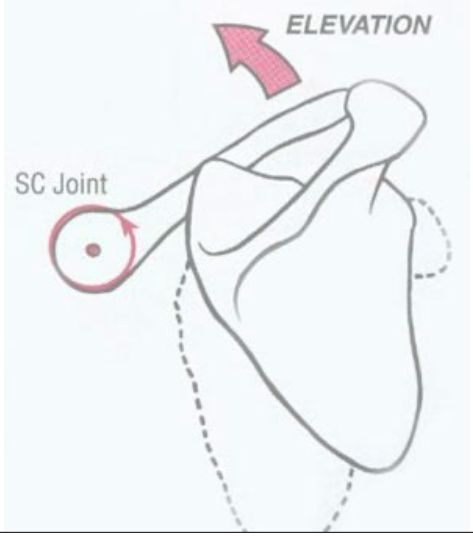




SC Elevation/Depression

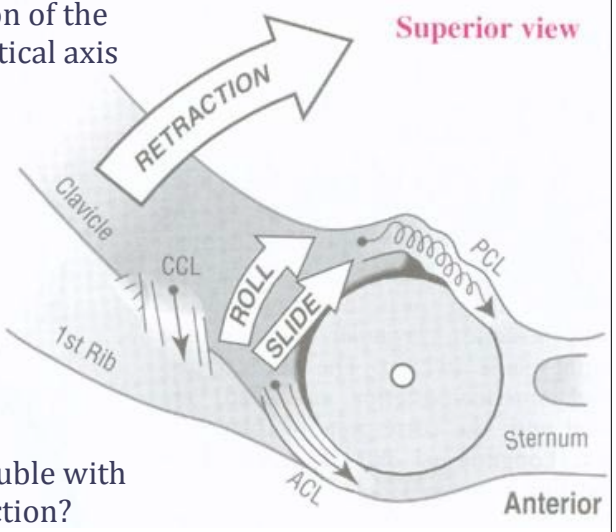
How does SC joint motion affect glenohumeral motion?

What are the effects observed in orthopedic exam?

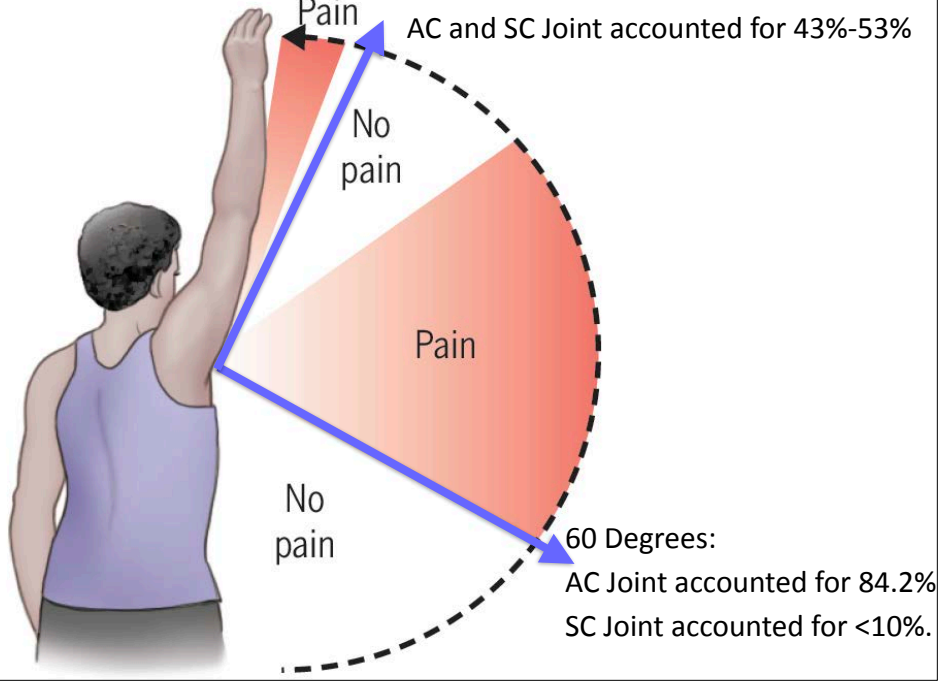


SC Protraction & Retraction

Protraction and retraction of the clavicle occur about a vertical axis of rotation.



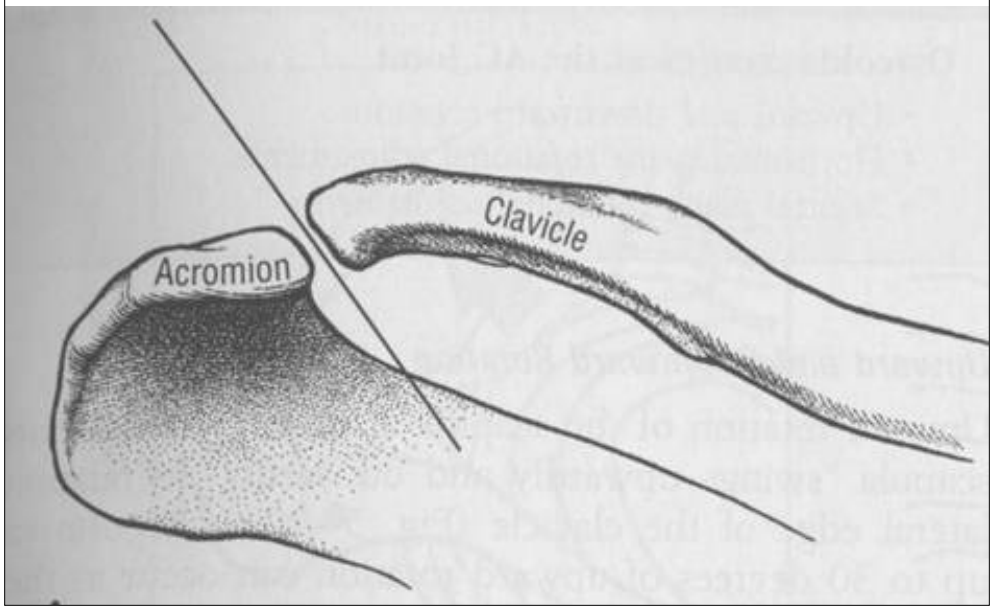
Do most patients have trouble with ***Retraction*** or Protraction?



60-180 Degrees:
AC and SC Joint accounted for 43%-53%

60 Degrees:
AC Joint accounted for 84.2%
SC Joint accounted for <10%.

Kinematics at AC Joint

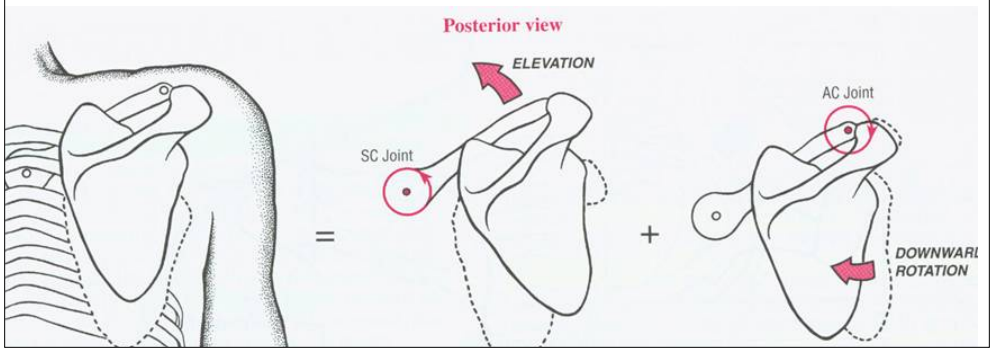


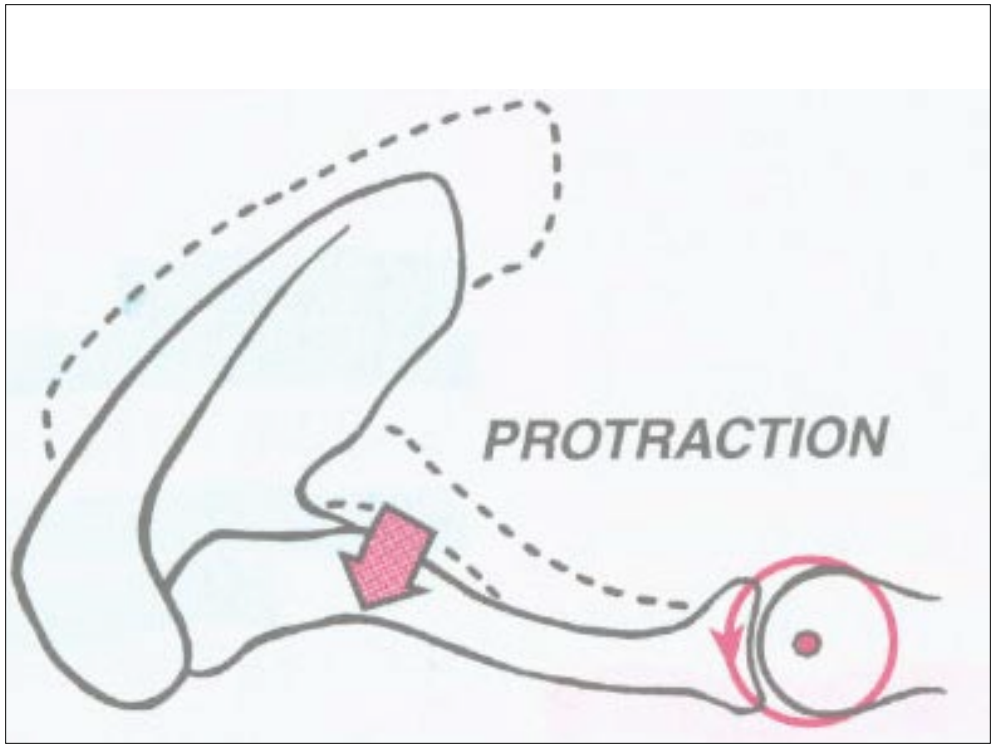
Kinematics at the Scapulothoracic Joint

Elevation/Depression

Protraction/Retraction

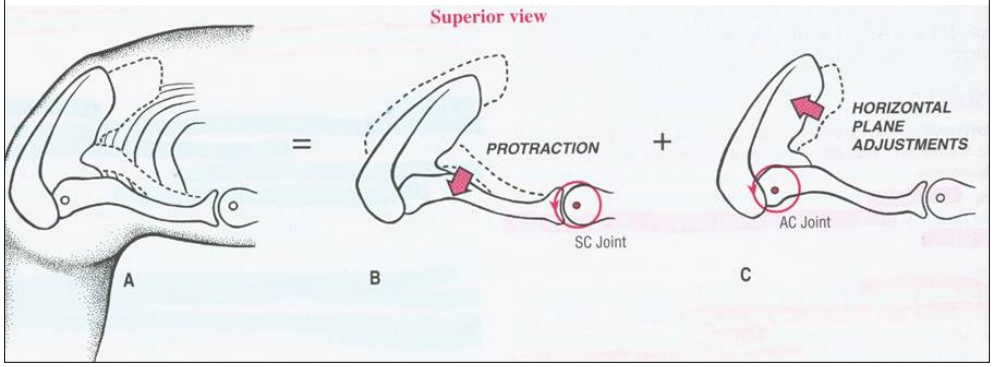
Upward Rotation/Downward Rotation

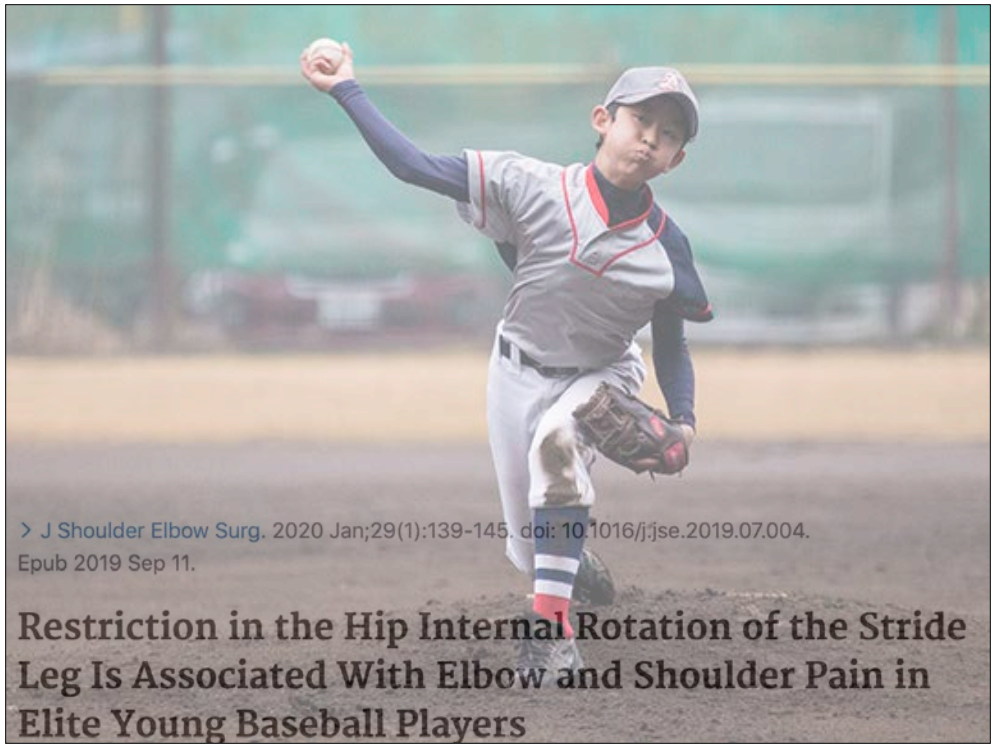




Scapular elevation occurs as a composite of SC and AC joint rotations.

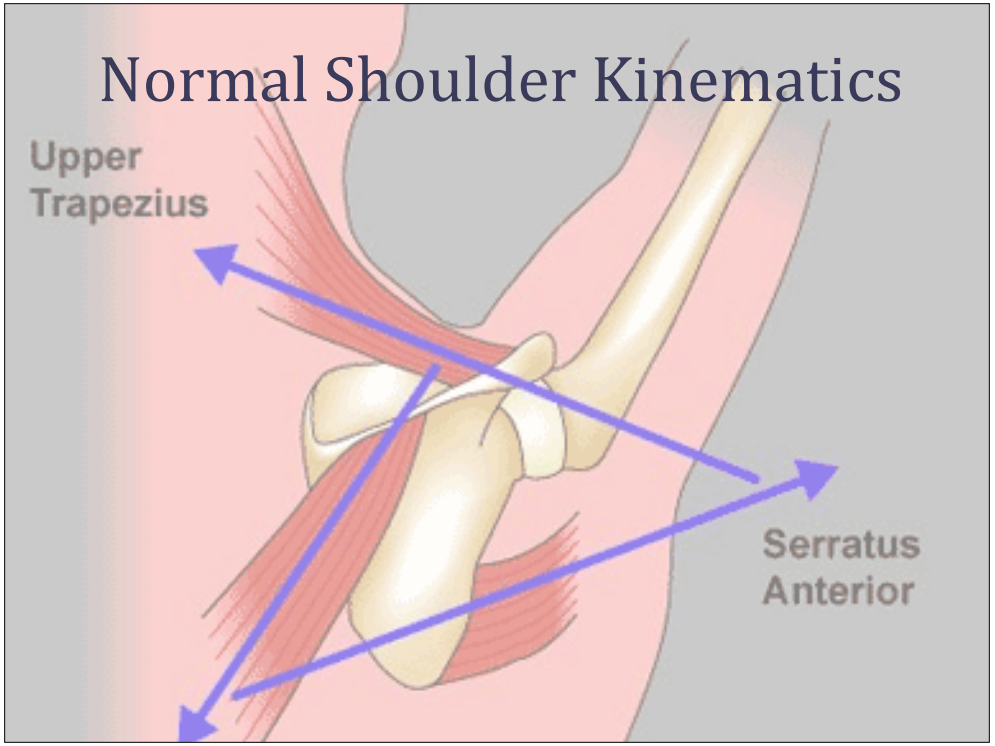
Scapulo-thoracic Rhythm





The Shoulder Dysfunction Continuum

Scapular Dyskinesis
Anterior Impingement Syndrome
Rotator Cuff Tear
Rotator Cuff Rupture



"SICK" Scapula

Scapular malposition

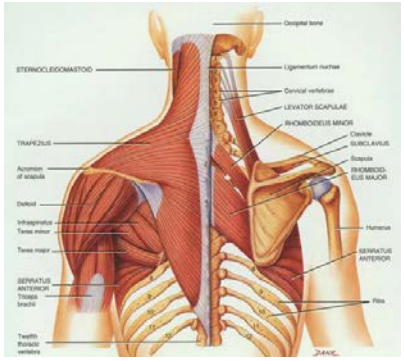
Inferior angle prominence

Coracoid tenderness/malposition

DysKinesis

Scapular Dyskinesis (SD)

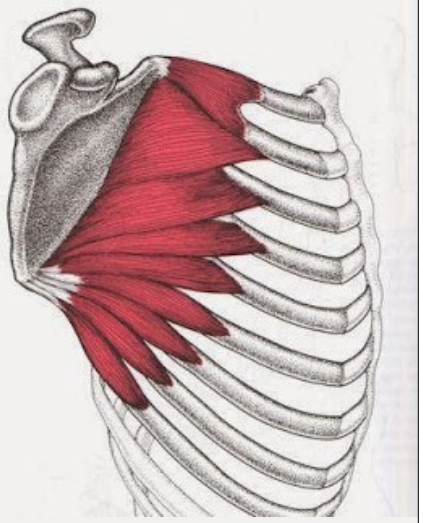
Tightness:
-Pec
-Biceps (short head)



Weakness:
-Lower trapezius
-Serratus anterior

Hegarty AK, Hsu M, Roy JS, Kardouni JR, Kutch JJ, Michener LA. Evidence for increased neuromuscular drive following spinal manipulation in individuals with subacromial pain syndrome. Clinical Biomechanics. 2021 Sep 21:105485. Link

Thoracic spinal manipulation immediately increases neuromuscular drive. In addition, increased serratus anterior muscle activity, a key muscle for scapular motion, is associated with short-term improvements in shoulder clinical outcomes.



Alternate Causes of SD

Neurologic

- Cervical radiculopathy
- Peripheral neuropathy
- Injury to the spinal accessory nerve, **long thoracic nerve**, or suprascapular nerve

Joint Pathology

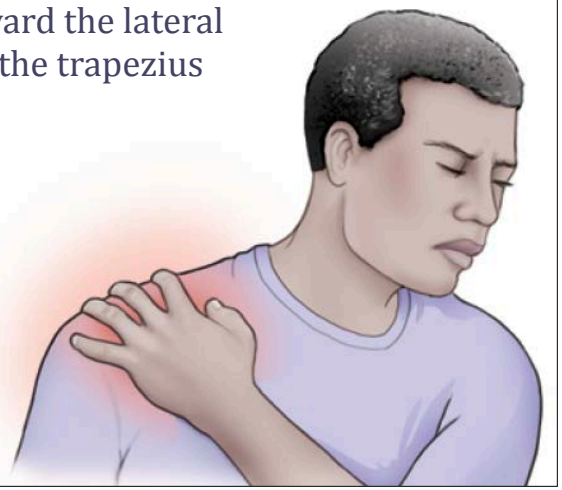
- AC separation
- A/C instability
- A/C arthrosis
- Labral injury
- Glenohumeral internal derangement
- Glenohumeral instability
- Biceps tendinitis
- Prior clavicle or scapula fracture.

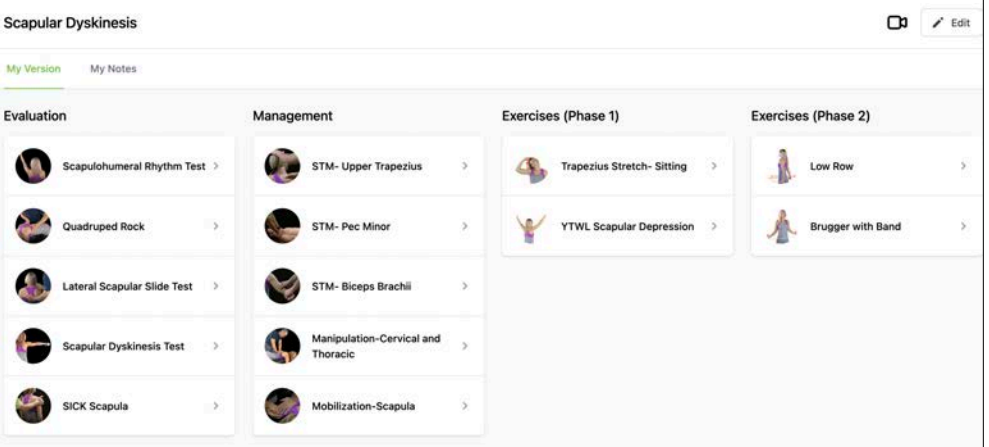
Symptoms??

Anterior or posterosuperior shoulder pain

May radiate inferiorly toward the lateral deltoid or superiorly into the trapezius region

Pain over the coracoid





Evaluation

 Scapulohumeral Rhythm Test >

 Quadruped Rock >

 Lateral Scapular Slide Test >

 Scapular Dyskinesis Test >

 SICK Scapula >

It Takes An Army...Meet ChiroUp's Advisory Board

Tom Hyde D.C., DACBSP

Stephen Perle D.C., ICCSP

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Jess T. Brower, DC, DACRB, Cert. MDT, CCSP

James Lehmann, D.C., FACO

Robert Kuhn, D.C., DACBR, ART®

Scott Bautch, D.C., DACBOH, CCST, CCSP

Howard Chapel D.C., DABCO

Michael Barry, DC, DACBR

Jeffrey Tucker D.C., DACRB

Chocolate Chip Cookies

Here's America's favorite cookie. You'd better bake a double batch because they will disappear in no time. For a wonderfully decadent variation, try the White Chocolate–Macadamia Cookies below.

PREP: 15 MINUTES BAKE: 10 MINUTES PER BATCH
MAKES ABOUT 36 COOKIES

- 1 1/4 cups all-purpose flour
- 1/2 teaspoon baking soda
- 1/2 teaspoon salt
- 1/2 cup butter or margarine (1 stick), softened
- 1/2 cup packed light brown sugar
- 1/4 cup granulated sugar
- 1 large egg
- 1 teaspoon vanilla extract
- 1 package (6 ounces) semisweet chocolate chips (1 cup)
- 1/2 cup walnuts, chopped (optional)

1. Preheat oven to 375°F. In small bowl, combine flour, baking soda, and salt.
2. In large bowl, with mixer at medium speed, beat butter and brown and granulated sugars until light and fluffy. Beat in egg and vanilla until well combined. Reduce speed to low; beat in flour mixture just until blended. With wooden spoon, stir in chocolate chips and walnuts, if using.
3. Drop dough by rounded tablespoons, 2 inches apart, on two ungreased cookie sheets. Bake until golden around edges, 10 to 12 minutes, rotating

SD Static Assessment

Lateral scapular slide test

SD Dynamic Assessment

- Limited IR
- Scapulohumeral rhythm test
- Scapular dyskinesis test.

Scapular DyskinesisTest

Quadruped Rock Test

Management


STM- Upper Trapezius


STM- Pec Minor


STM- Biceps Brachii


Manipulation-Cervical and Thoracic


Mobilization-Scapula

STM- Biceps

STM- Pec Minor

STM- Upper Trapezius

Scapular Mobilization

Exercises (Phase 1)

Trapezius Stretch- Sitting

YTWL Scapular Depression

Exercises (Phase 2)

Low Row

Brugger with Band

Scapular Dyskinesis Phase 1: YTWL Scapular Depression

Stand with your straight arms raised above your head in a "Y" position. Squeeze your shoulder blades together and downward throughout the following sequence of movements. Lower your straightened arms to shoulder level, into a "T" position. Next bend your elbows so that your fingers are pointing straight up while slightly lowering your elbows to make a "W". Finally, while keeping your elbows bent 90 degrees, lower your arms to your sides so that your elbows are touching your ribs to form an "L" on each side and squeeze. Hold each position for 1-2 seconds and repeat 3 sets of 10 repetitions, twice per day or as directed

YTWL Scapular Depression

Stand with your straight arms raised above your head in a "Y" position. Squeeze your shoulder blades together and downward throughout the following sequence of movements. Lower your straightened arms to shoulder level, into a "T" position. Next bend your elbows so that your fingers are pointing straight up while slightly lowering your elbows to make a "W". Finally, while keeping your elbows bent 90 degrees, lower your arms to your sides so that your elbows are touching your ribs to form an "L" on each side and squeeze. Hold each position for 1-2 seconds and repeat 3 sets of 10 repetitions, twice per day or as directed

Trapezuis Stretch

Place your right arm behind your back and grasp your right wrist with your left hand. Laterally flex your neck to move your left ear toward your left shoulder as you pull your right arm. Against the resistance of your left hand, attempt to shrug your right shoulder for seven seconds. Relax and stretch your right arm downward as you bend your neck further toward the left. “Lock in” to this new position and perform three contract/ relax cycles on each side twice per day or as directed.

Corner Pec Stretch

Begin standing, facing a corner with your palms on the walls above head level. Step toward the corner and “lean in” to stretch your chest muscles. Against the resistance of the wall, attempt to push your hands into the wall and toward each other for 7 seconds. Relax and “lean in” to increase the stretch. Lock into this new position and repeat 3 contract/ relax cycles, twice per day or as directed.

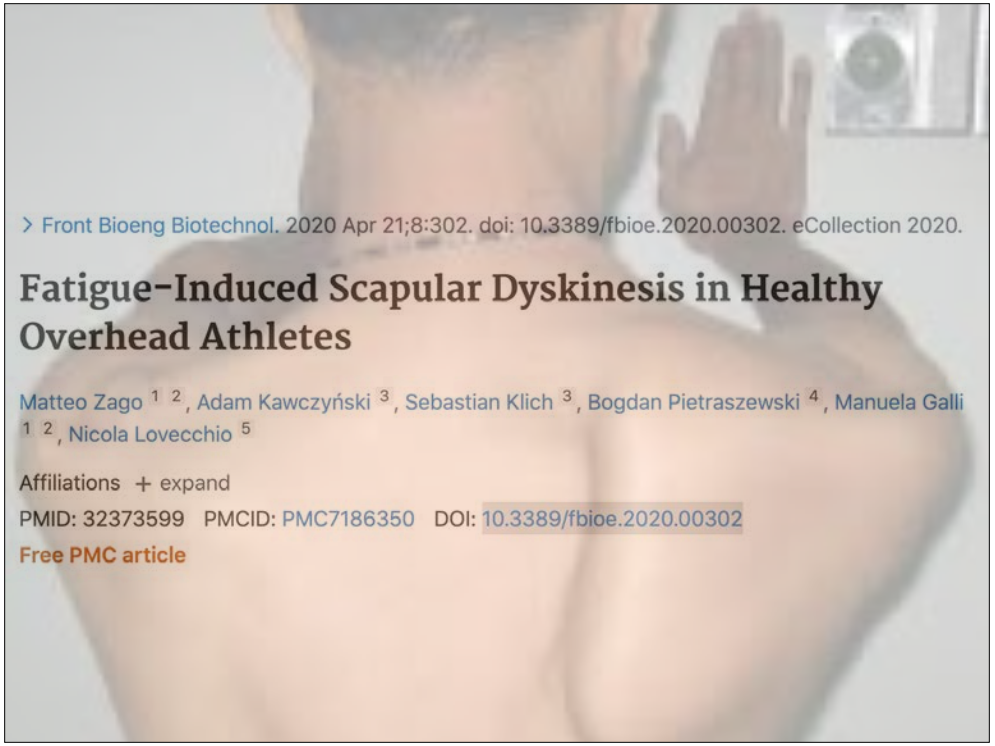
Low Row

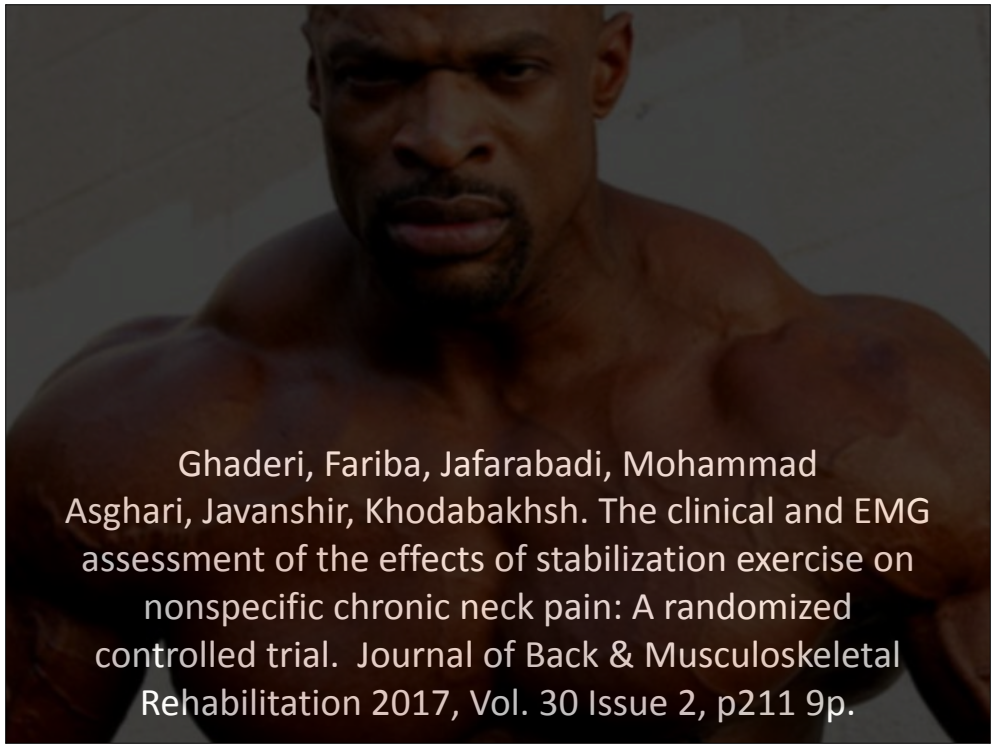
Attach the center of an elastic exercise band to a doorknob or other sturdy object in front of you. Grasp one end of the band in each hand and with straight arms at your side, stretch the band backwards. Keep your palms facing backward and arms pointed straight down throughout the exercise. Return to neutral and repeat 3 sets of 10 repetitions daily, or as directed.

Brugger w/Band

Begin sitting or standing with an elastic exercise band wrapped and secured around your palms. Begin with your arms at your side, elbows bent, forearm's pointing forward. Move your hands apart from each other to maximally stretch the band while simultaneously rotating your palms out, straightening your arms, and pinching your shoulder blades together as your hands move behind your hips. Return to the start position and repeat 3 sets of 10 repetitions daily, or as directed.

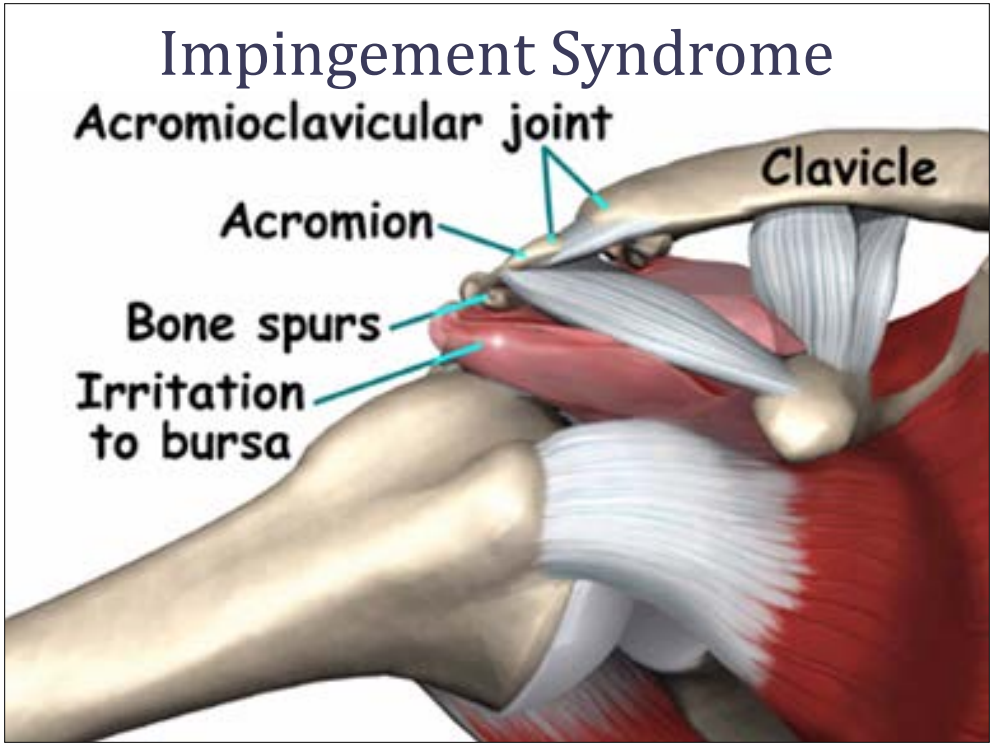
Golz A, Mica MC, Salazar D, Pellegrini A, Tonino P. Comparison of Scapular Mechanics After Activity With and Without a Targeted Compression Garment. J Surg Orthop Adv. 2019 Spring;28(1):18-23.



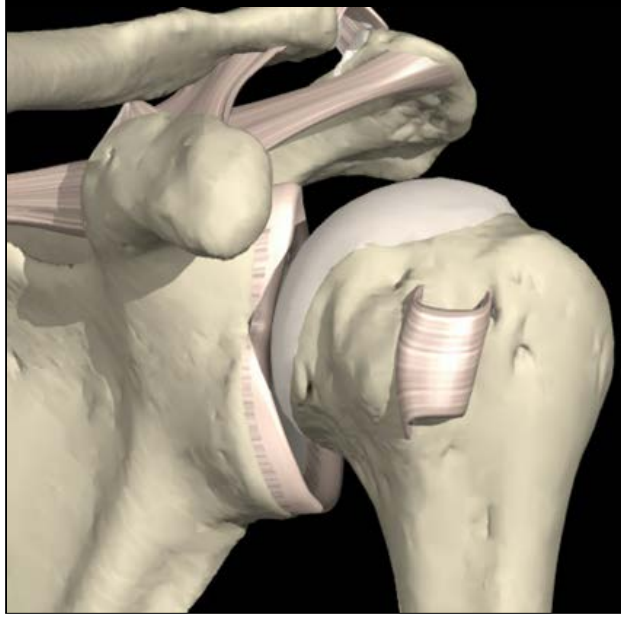


Ghaderi, Fariba, Jafarabadi, Mohammad Asghari, Javanshir, Khodabakhsh. The clinical and EMG assessment of the effects of stabilization exercise on nonspecific chronic neck pain: A randomized controlled trial. Journal of Back & Musculoskeletal Rehabilitation 2017, Vol. 30 Issue 2, p211 9p.

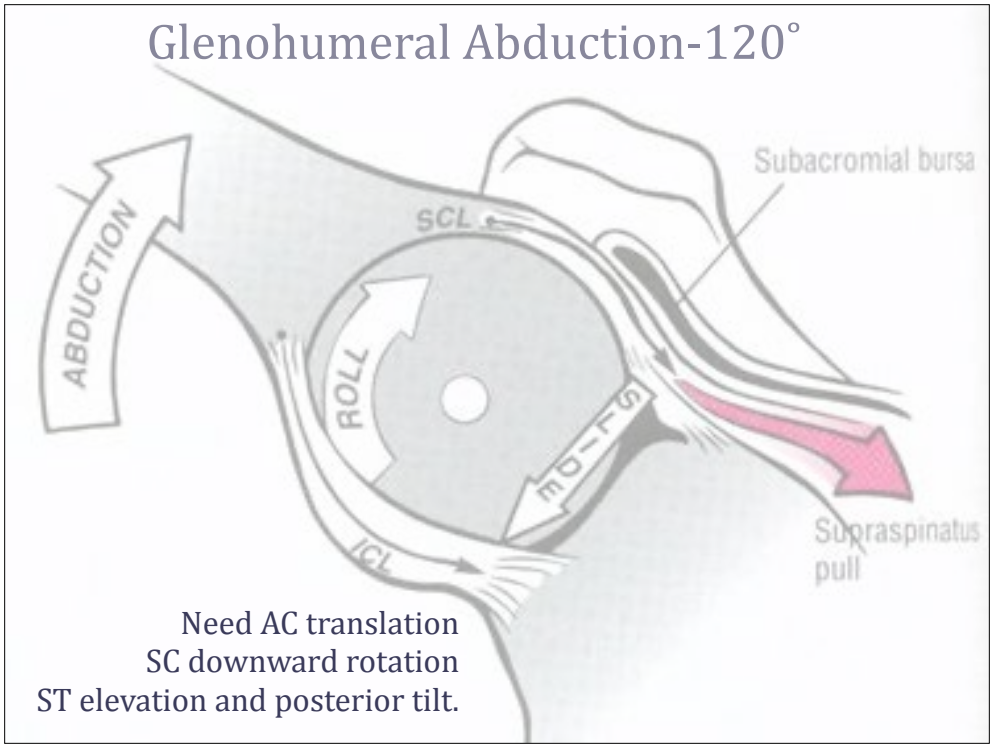
Impingement Syndrome



Kinematics at the GH Joint

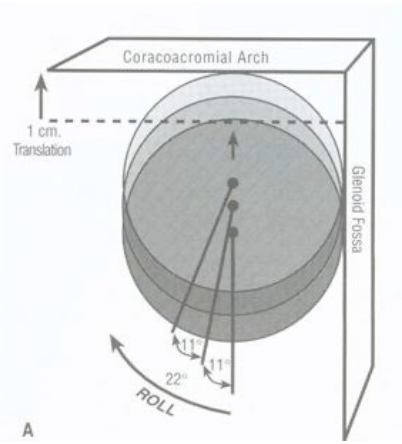


Glenohumeral Abduction-120°

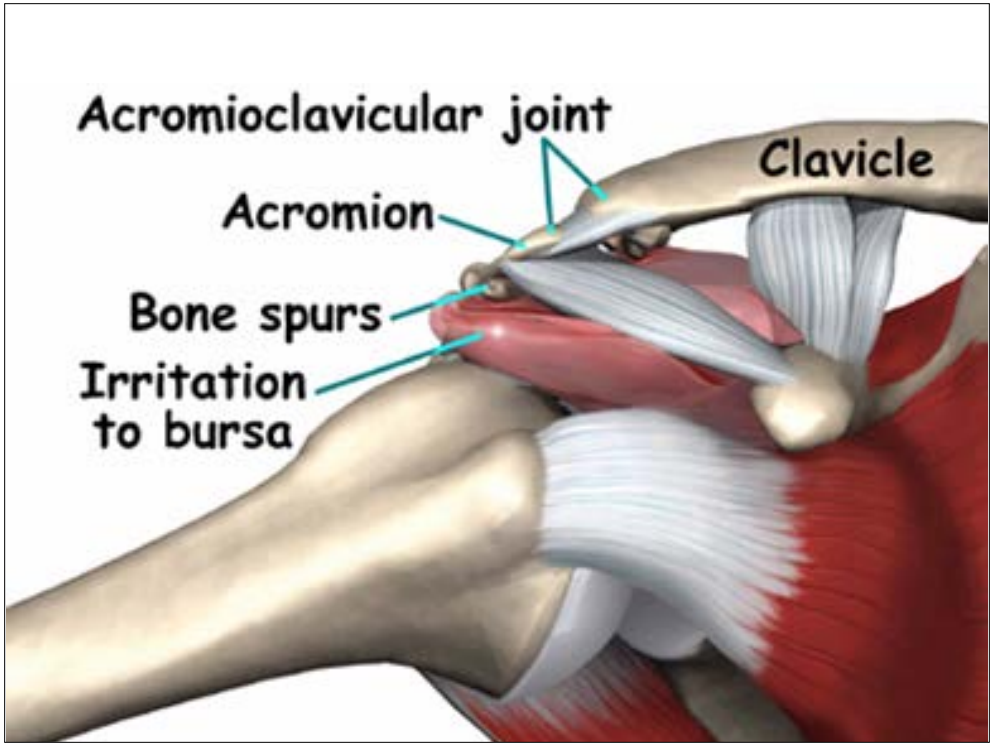


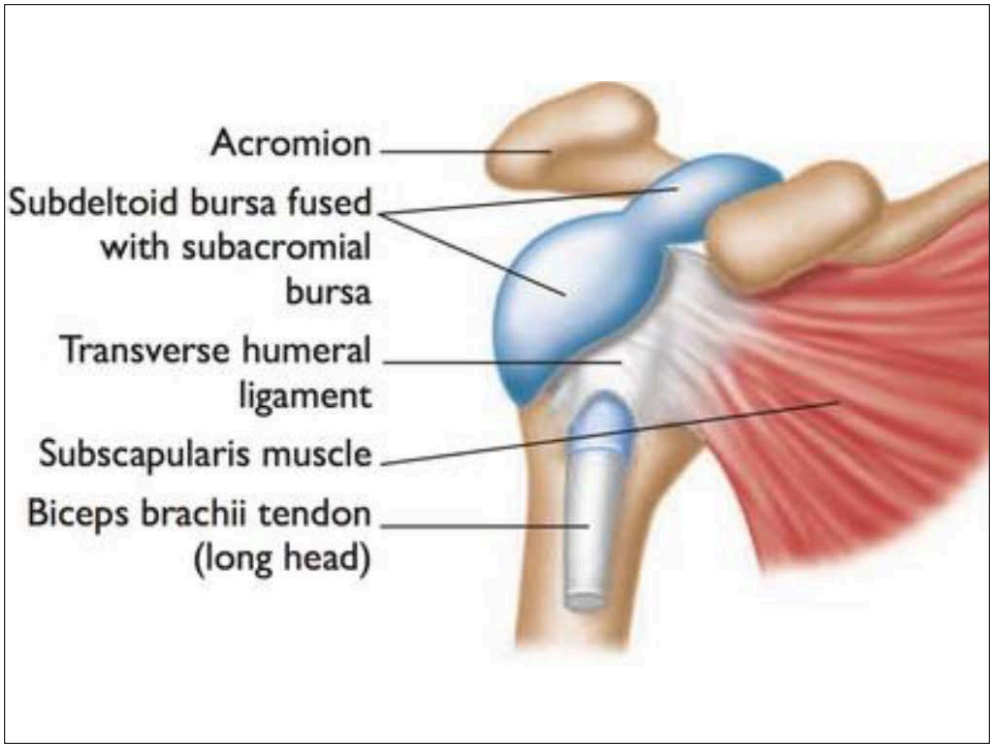
Need AC translation
SC downward rotation
ST elevation and posterior tilt.

Importance of Roll & Slide Arthokinematics



An adult-sized humeral head that is rolling up a glenoid fossa without a concurrent inferior slide would translate through the 10mm coracoacromial space after only 22° of abduction.

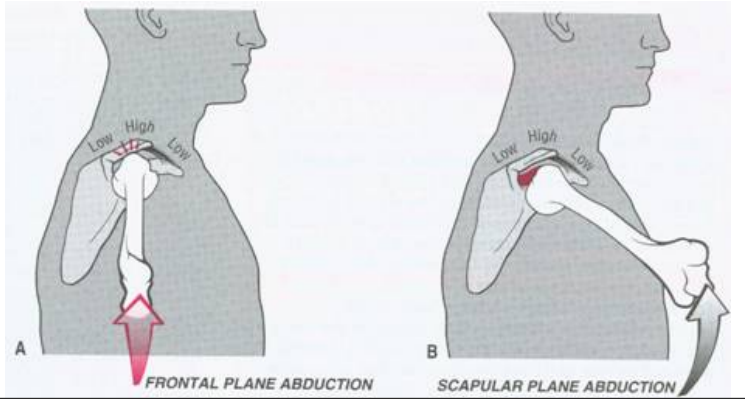




Scapular vs. Frontal Plane Abduction

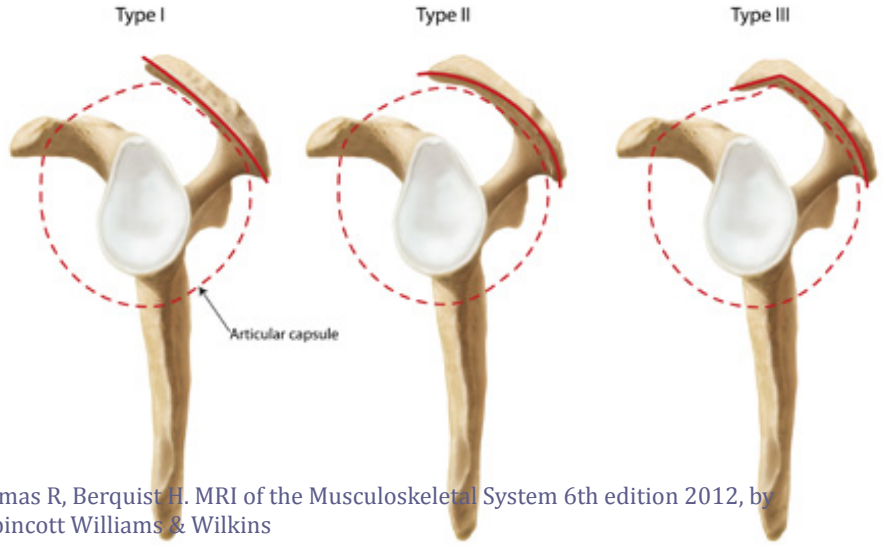
35° anterior to the frontal plane is generally a more functional and natural movement.

Internal Rotation of the arm decreases Subacromial space due to the greater tubercle of the humerus.



Acromion Morphology

20% Flat" (type I)
55% "Curved" (type II)
25% "Beaked" (type III)



Thomas R, Berquist H. MRI of the Musculoskeletal System 6th edition 2012, by Lippincott Williams & Wilkins

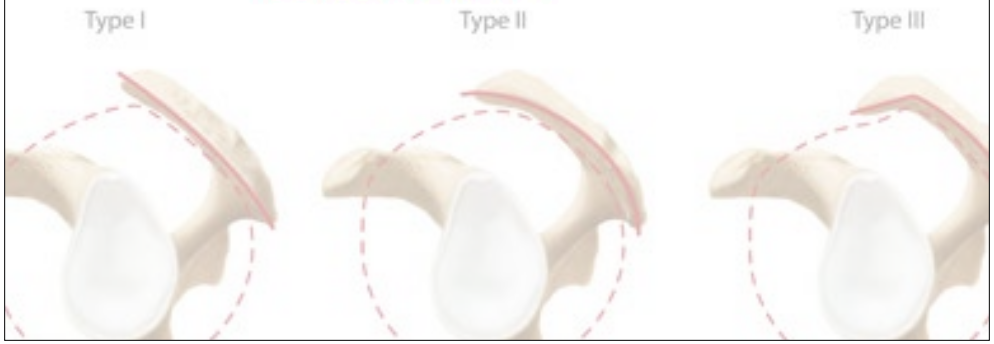
› Surg Radiol Anat. 2020 May 16. doi: 10.1007/s00276-020-02497-5. Online ahead of print.

Anatomical Variations of the Acromial and Coracoid Process: Clinical Relevance

Uriel Alfaro-Gomez [1], Luis Donaldo Fuentes-Ramirez [1], Karla Ivonne Chavez-Blanco [2], Jose Felix Vilchez-Cavazos [3], Matthew J Zdilla [4 5 6], Rodrigo E Elizondo-Omana [1], Jesus Dante Guerra-Leal [2], Guillermo Elizondo-Riojas [2], Ricardo Pinales-Razo [2], Santos Guzman-Lopez [1], Alejandro Quiroga-Garza [7]

Affiliations + expand

PMID: 32418123 DOI: 10.1007/s00276-020-02497-5



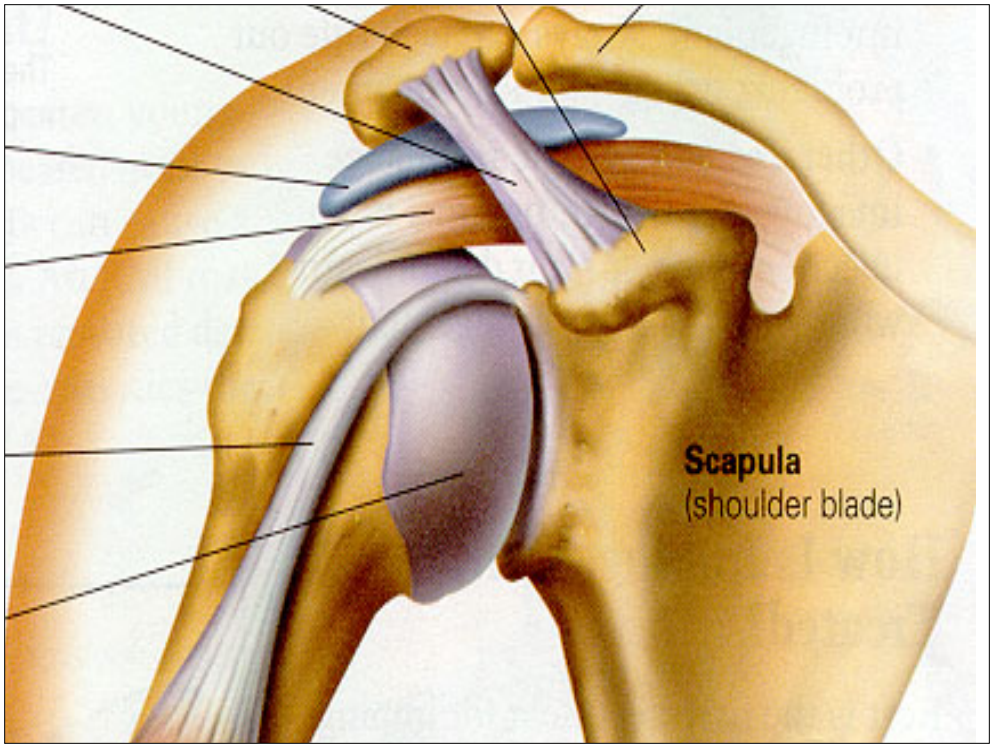
› J Shoulder Elbow Surg. 2020 May 13;S1058-2746(20)30219-6. doi: 10.1016/j.jse.2019.12.035. Online ahead of print.

Acromial Morphology Is Not Associated With Rotator Cuff Tearing or Repair Healing

Peter N Chalmers [1], Lindsay Beck [2], Matt Miller [2], Jun Kawakami [2], Alex G Dukas [2], Robert T Burks [2], Patrick E Greis [2], Robert Z Tashjian [2]

Affiliations + expand

PMID: 32417045 DOI: 10.1016/j.jse.2019.12.035



SAIS
Sport/ Occupation Risks

swimming
baseball
volleyball
weightlifting
tennis
rowing
archery

carpenters
electricians
painters
wall paper hangers
cleaning windows
washing/ waxing cars

Neer Stages

- Stage I
  - younger patients
  - acute but reversible pain, swelling and hemorrhage
- Stage II
  - middle age patients who have suffered with SAIS for months or years
  - tendonitis and permanent fibrosis
- Stage III
  - prolonged irritation that has caused significant tendon degeneration
  - irreversible mechanical disruption of the rotator cuff tendon

SAIS Symptoms

- Sharp pain during overhead activity or while reaching behind the back to fasten a bra or close a zipper.
- May develop a constant ache that is present at rest.
- Nighttime pain is common, often disrupting sleep. Sleeping on the affected side may exacerbate pain

SAIS Clinical Evaluation

SYMPTOMS

Limited & "Painful" ROM

Forced passive horizontal adduction/ Cross body stretch

"Painful Arc" (60-120 abduction)

CLINICAL TESTS

Hawkins-Kennedy test

Neer test

Empty can test

FUNCTIONAL TESTS

Scapular assistance test

Evaluation

- Neer Test
- Hawkins- Kennedy Test
- Empty Can Test
- Scapular Assistance Test
- R/C Isolated Strength Test Cluster
- Modified Scapular Retraction Test
- Scapular Repositioning Test

Management

- STM- Supraspinatus
- STM- Infraspinatus
- STM- Teres Minor
- STM- Subscapularis
- Manipulation-Cervical and Thoracic
- Mobilization- GH Joint

Exercises (Phase 1)

- Codman Pendulum
- YTWL Scapular Depression
- Glenohumeral Internal Rotation
- Corner Pectoral Stretch

Exercises (Phase 2)

- Low Row
- Brugger with Band

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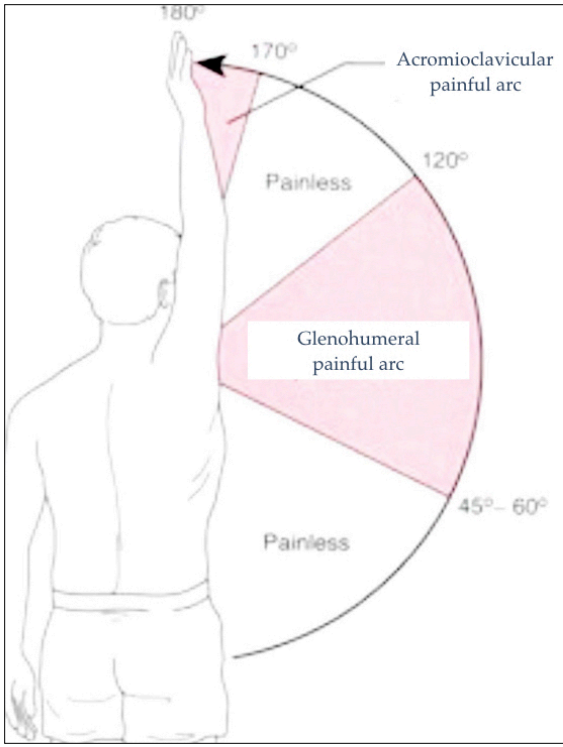
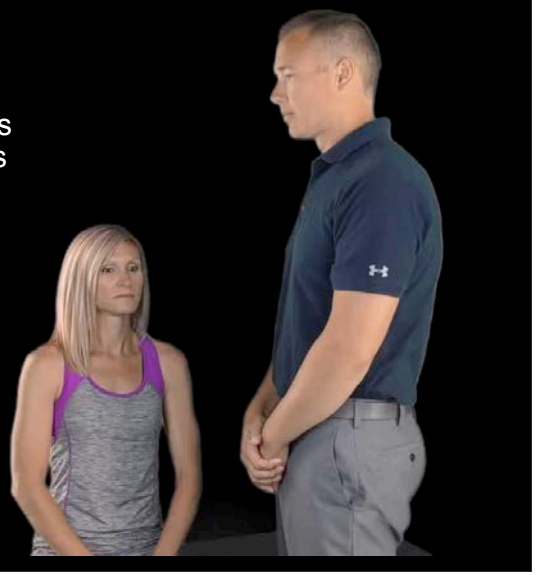


Painful Arc

The patient reports pain between 60-120 degrees of active shoulder abduction. Pain decreases above 120 degrees. This test suggests shoulder impingement.

Hawkins- Kennedy

Seated patient's arm placed into 90 degrees of forward flexion with 90 degrees of elbow flexion. Clinician stands in front and stabilizes patients scapula with one hand while gradually rotating patients arm downward, into internal rotation. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.

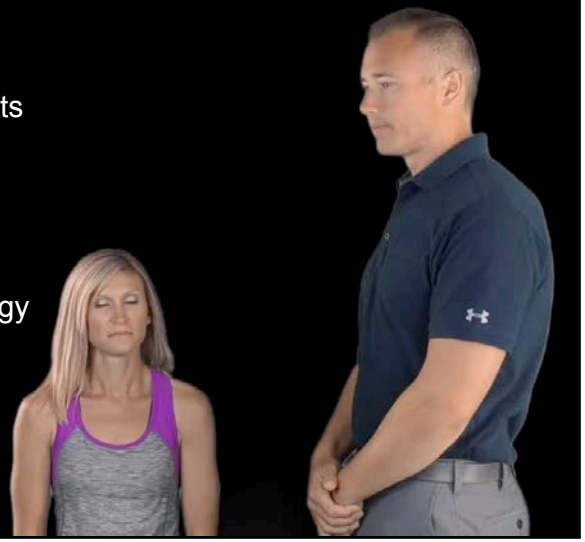


Neer Test

Clinician stands behind patient, stabilizes the scapula with one hand and grasps the patients elbow with the other hand, moving their straightened arm into forward flexion until pain is reported. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.

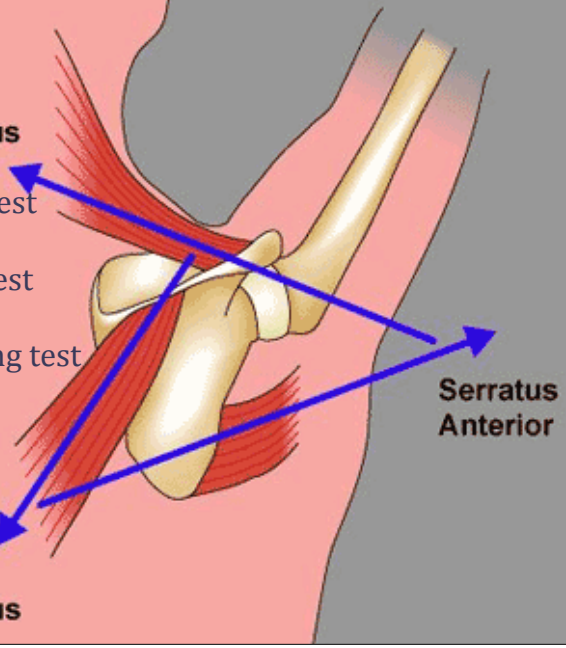
Empty Can

Aka Jobe Test Patients straight arm placed at 90 degrees of elevation and 45 degrees anterior to the scapular plane. Patient points thumb down (as to empty a can). Clinician stabilizes scapula and provides downward pressure on the patients outstretched arm. Pain or weakness signifies possible rotator cuff pathology involving the supraspinatus.

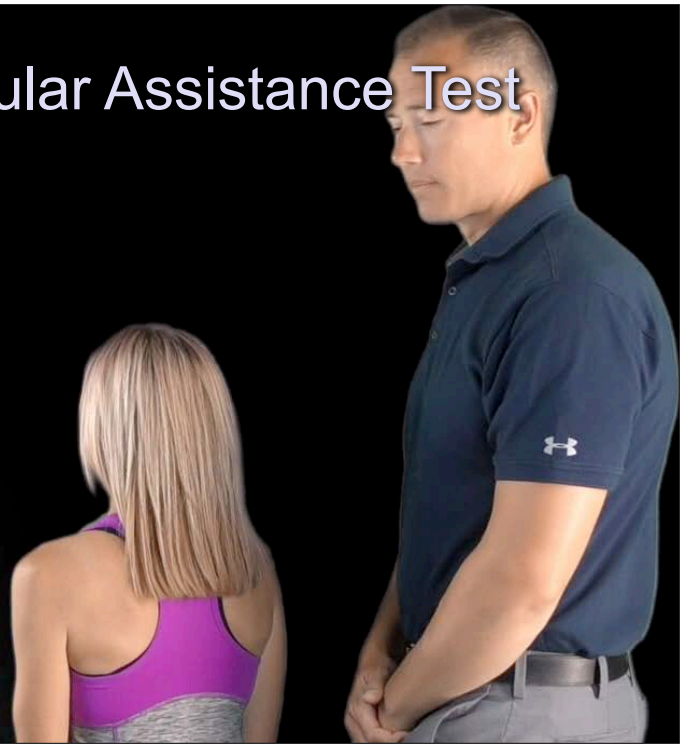


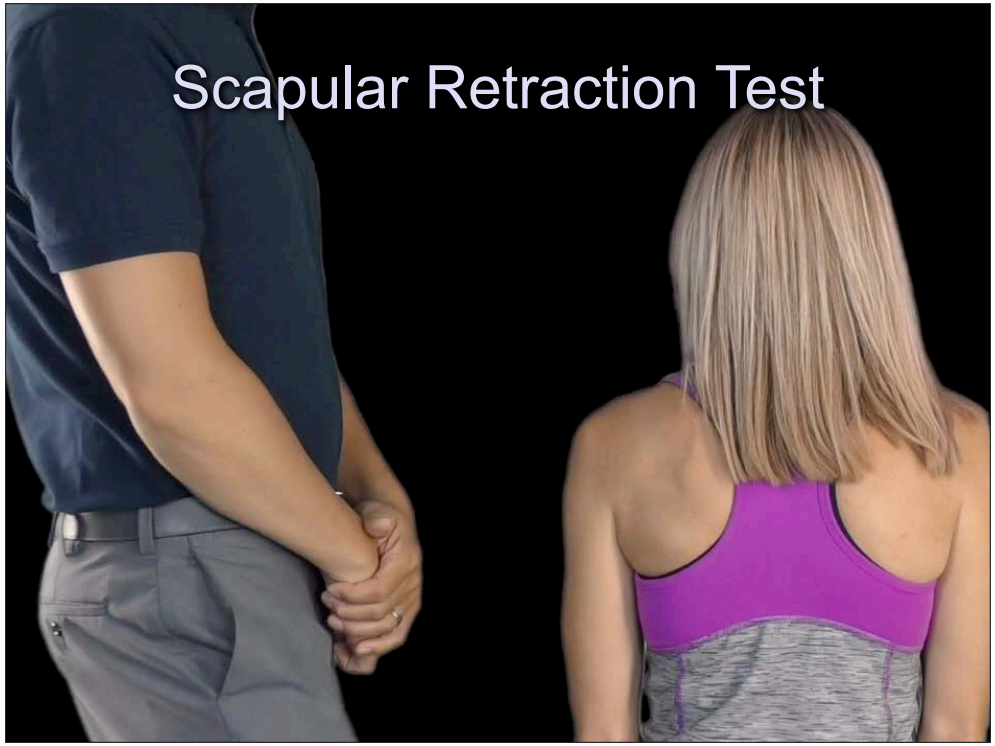
SAIS Functional Maneuvers

1. Scapular assistance test
3. Scapular retraction test
5. Scapular repositioning test



Scapular Assistance Test





Management

- STM- Supraspinatus
- STM- Infraspinatus
- STM- Teres Minor
- STM- Subscapularis
- Manipulation-Cervical and Thoracic
- Mobilization- GH Joint

Premier Rehab LTD
back in action.

9/22/2017

Dr. Justin Rittenhouse
1 Over There
Highland, IL 62249

RE: Initial visit summary for Jane Sample

Dear Dr. Justin Rittenhouse:

Your patient, Jane Sample, presented to my office on 9/22/2017 with cervical spine related symptoms. Here is a brief summary of their initial visit.

The history & physical revealed findings consistent with a diagnosis of Cervical Segmental Joint Restriction.

My treatment recommendations include joint manipulation, therapy modalities, myofascial release and therapeutic exercise.

The patient will be treated 3 times per week for 2 weeks at which point I would expect in excess of 75% improvement.

I will provide you with updates on the progress of your patient. If you would like any additional information, please do not hesitate to contact my office. Once again, thank you for allowing me to participate in the care of your patient.

Sincerely,

Brandon Steele

STM- Infraspinatus

STM- Subscapularis

STM- Supraspinatus

STM- Teres Minor

STM- Mobilization GH Joint

Exercises (Phase 1)

- Codman Pendulum
- YTWL Scapular Depression
- Glenohumeral Internal Rotation
- Corner Pectoral Stretch

Exercises (Phase 2)

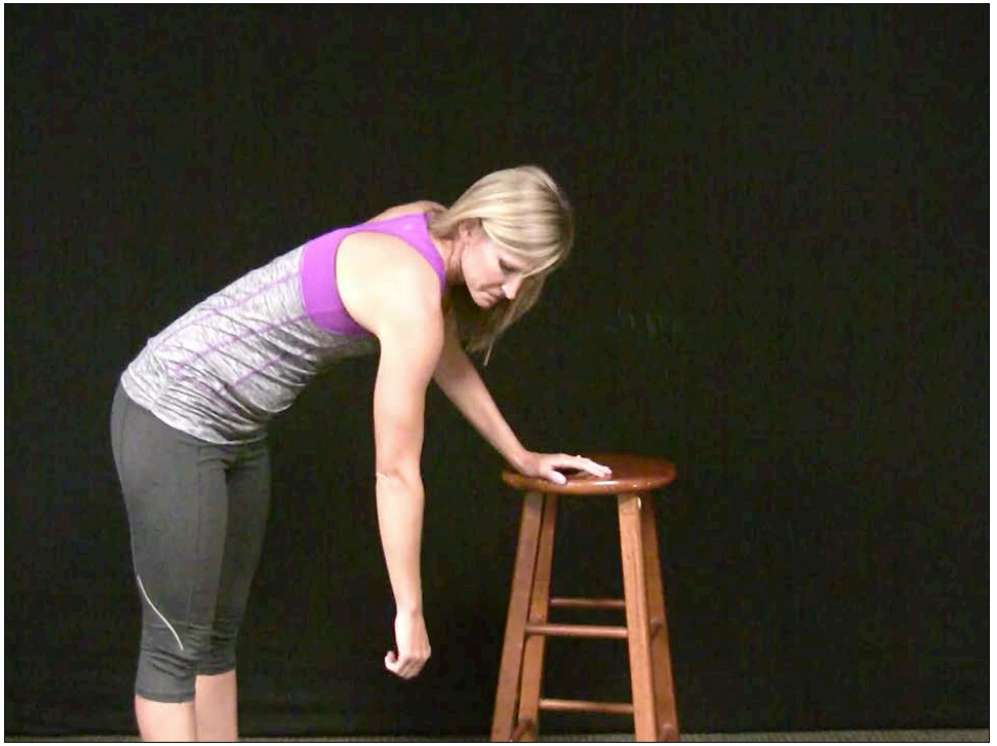
- Low Row
- Brugger with Band

Anterior Impingement Phase 1: Glenohumeral Internal Rotation

Begin sitting with good posture. Place the affected arm behind your back and reach towards your opposite hip. Using the unaffected arm, gently pull the wrist of your affected arm further toward your opposite hip. A stretch should be felt in the affected shoulder. Pull gently to the point of tightness ten times. Each pull should be slow and stopped if you feel a sharp pain. This stretch should be performed for ten repetitions, once per hour or as directed.

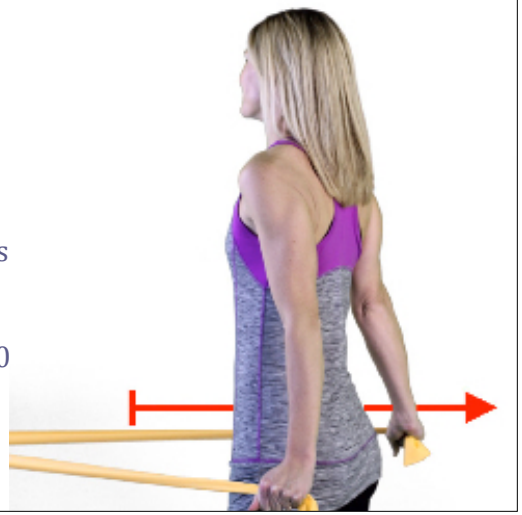
Anterior Impingement Phase 1: Codman Pendulum

Lean over a table using the uninvolved arm for support as shown. Allow the involved arm to hang freely. Use your torso to swing your involved arm in a clock-wise circle for 50 repetitions. Repeat in a counter-clockwise circle for 50 repetitions. Perform 50 repetitions in each direction twice per day or as directed.



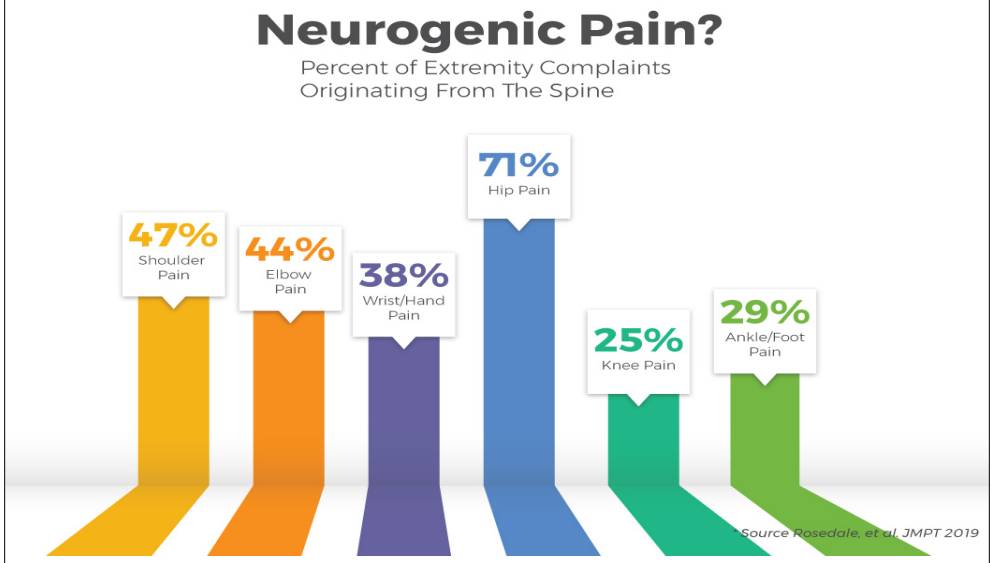
Anterior Impingement Phase 1: Low Row

Attach the center of an elastic exercise band to a doorknob or other sturdy object in front of you. Grasp one end of the band in each hand and with straight arms at your side, stretch the band backwards. Keep your palms facing backward and arms pointed straight down throughout the exercise. Return to neutral and repeat 3 sets of 10 repetitions daily, or as directed.



Anterior Impingement Phase1: Brugger with Band

Begin sitting or standing with an elastic exercise band wrapped and secured around your palms. Begin with your arms at your side, elbows bent, forearm's pointing forward. Move your hands apart from each other to maximally stretch the band while simultaneously rotating your palms out, straightening your arms, and pinching your shoulder blades together as your hands move behind your hips. Return to the start position and repeat 3 sets of 10 repetitions daily, or as directed.

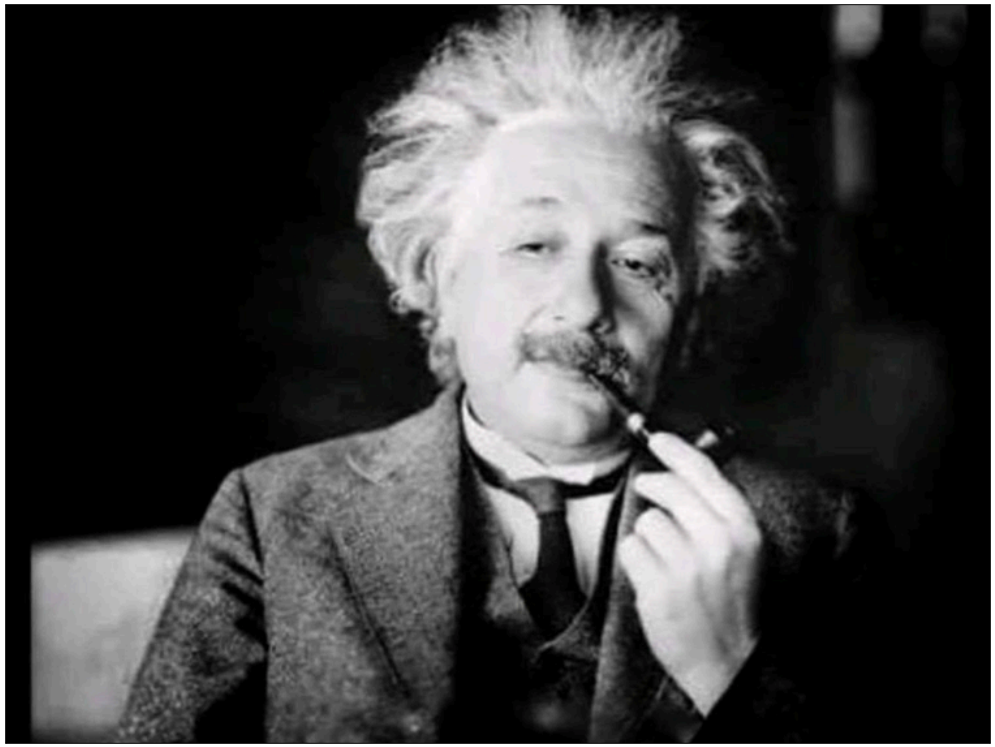


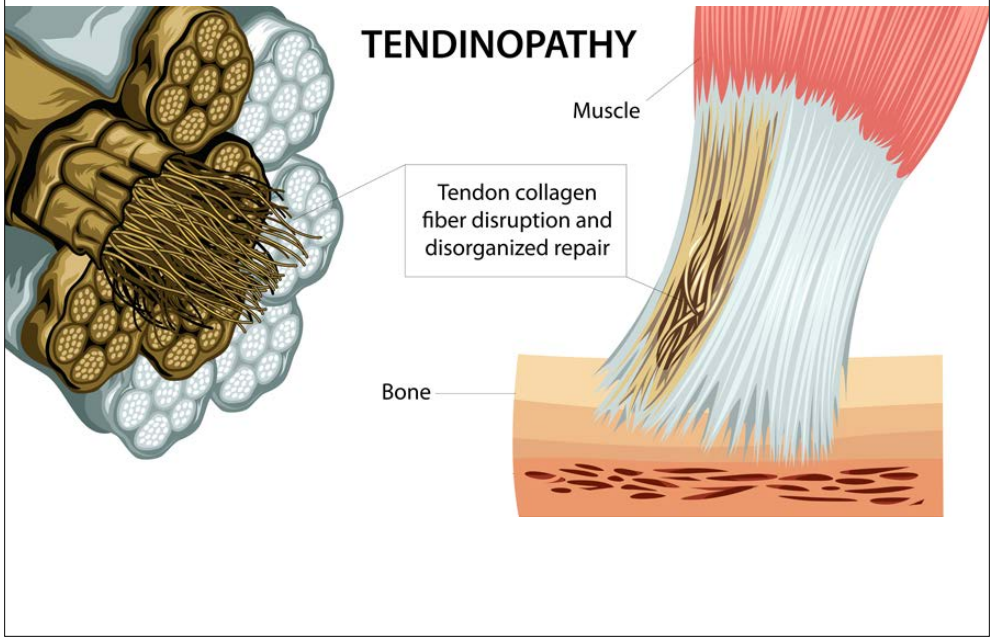
An RCT of 80 shoulder impingement patients evaluated the effectiveness of adding nerve mobilization to standard therapy. The study found that patients receiving nerve mobilization had a nearly two-point greater VAS improvement (lower mean pain score 2.15 vs. 4.90).

Akhtar M, Karimi H, Gilani SA, Ahmad A, Raza A. The effectiveness of routine physiotherapy with and without neuromobilization on pain and functional disability in patients with shoulder impingement syndrome; a randomized control clinical trial. BMC Musculoskeletal Disorders. 2020 Dec;21(1):1-9. Link

"IT'S A TORN ROTATOR CUFF-- YOU CAN FORGET ABOUT THROWING THUNDERBOLTS FOR AWHILE..."

Rotator Cuff Pathology





Hypertrophic effects of concentric versus eccentric muscle actions: A systematic review and meta-analysis.

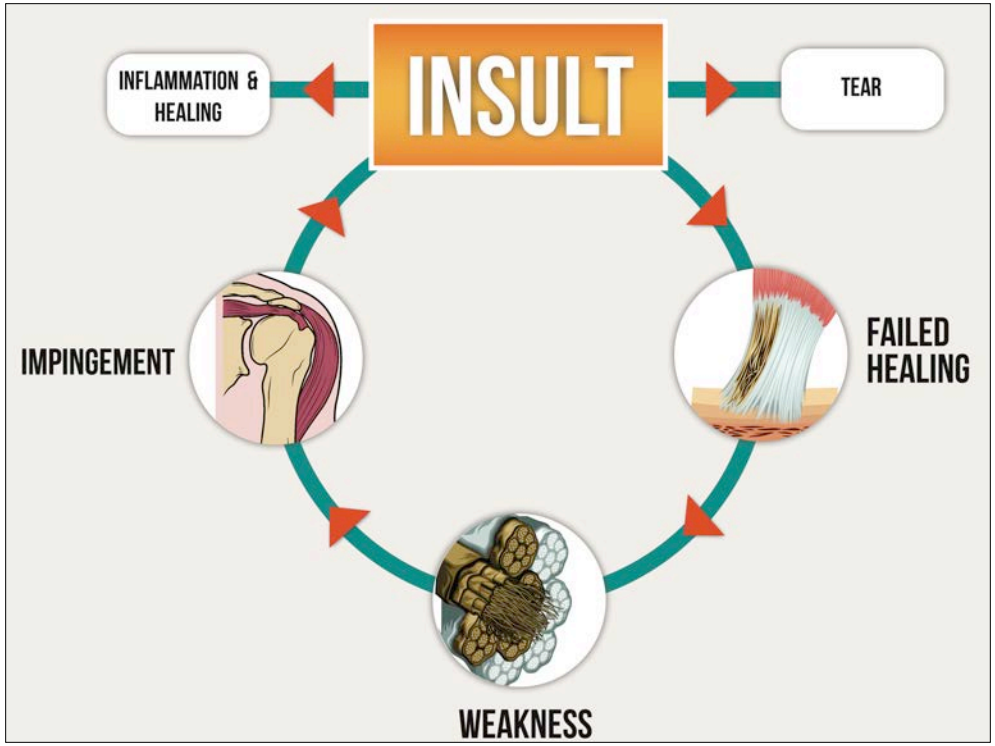
J Strength Cond Res. 2017 May 5

Schoenfeld BJ1, Ogborn D, Vigotsky AD, Franchi M, Krieger JW.

J Back Musculoskelet Rehabil. 2017 Apr 14. doi: 10.3233/BMR-150337. [Epub ahead of print]

Muscle function and size in the lumbar spine before and after a four week exercise intervention.

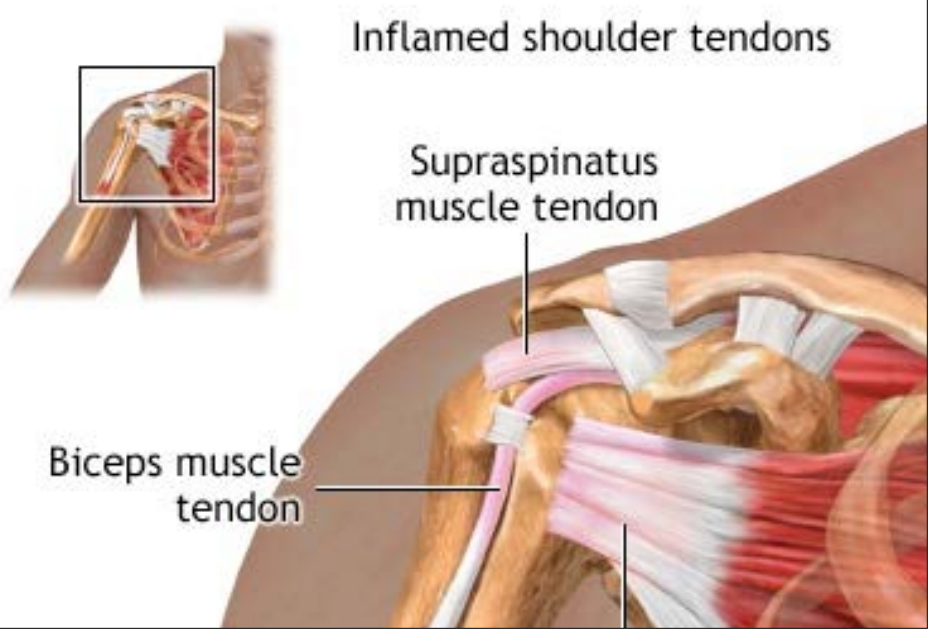
Fulford J1, Juroskova V2, Meakin JR3, Barker AR



RC Predisposing Factors

- Dyskinesis/ Impingement
- Obesity
- Hypercholesterolemia
- Genetics
- History of corticosteroid Injections
- Smoking
- Hypovascularity

Codman's Critical Zone



RC Tear Presentation

Acute

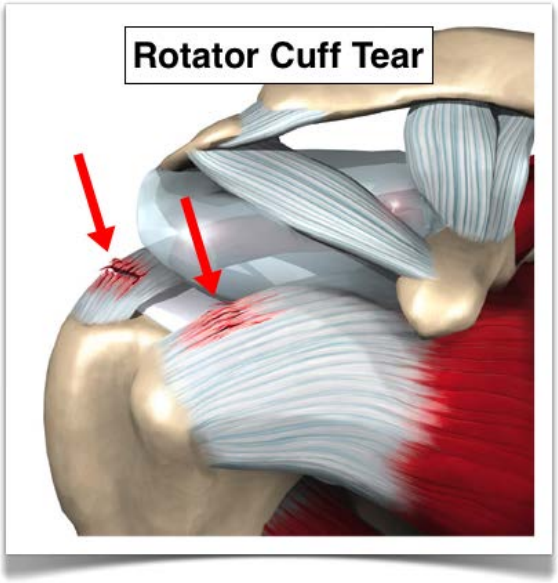
- "Tearing" or "snapping" feeling
- Severe pain and weakness

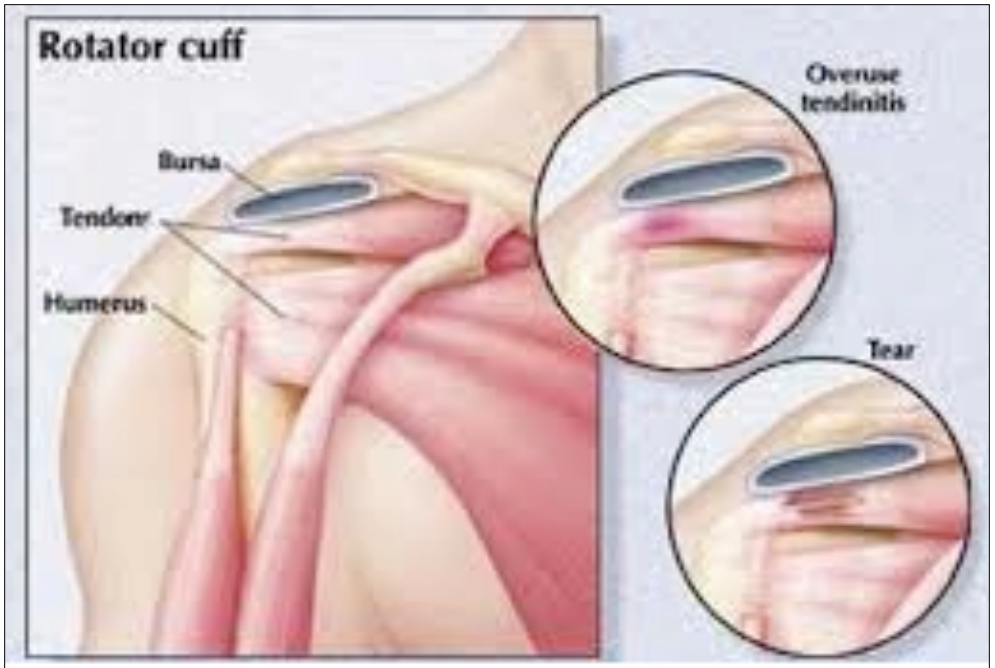
Chronic

- Older patient
- Silent/ slow onset pain and weakness
- Variable symptoms
- Crepitus

RC Tear Presentation

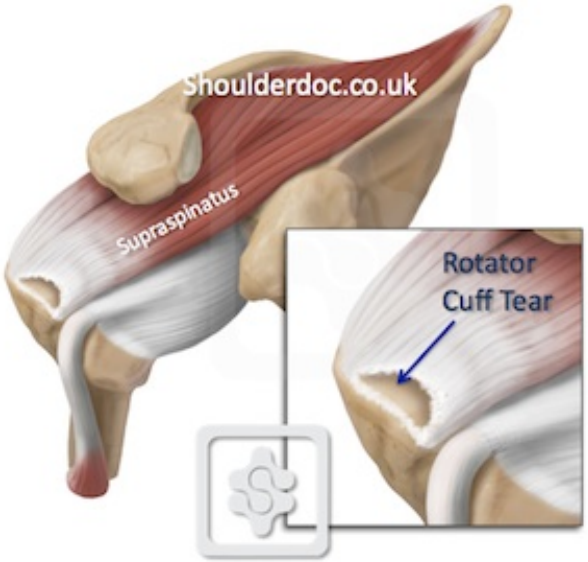
1. Anterolateral shoulder pain
2. Provoked by overhead activity
3. Worse at night



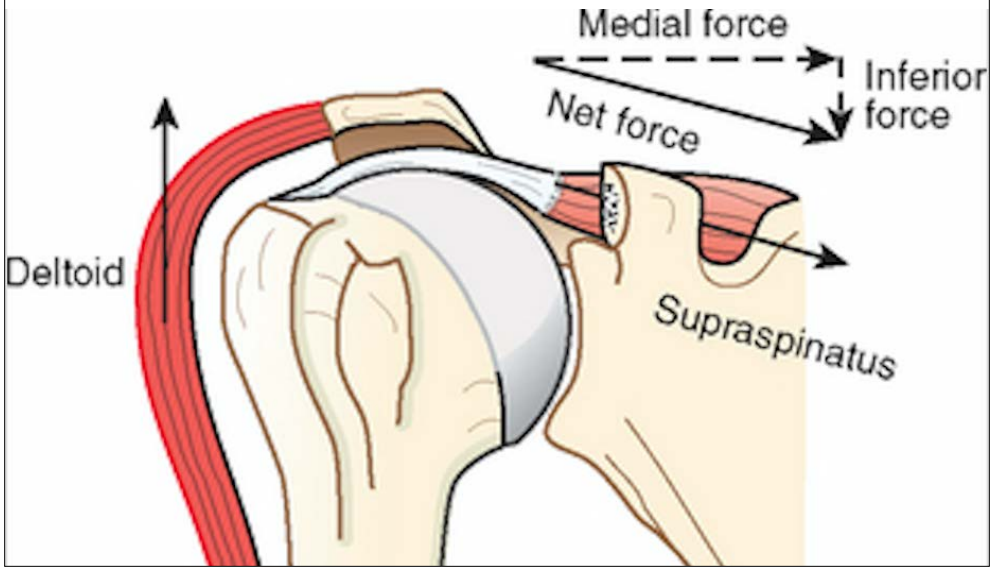


Partial Tear

Full Thickness Tear



Tension vs. Compression



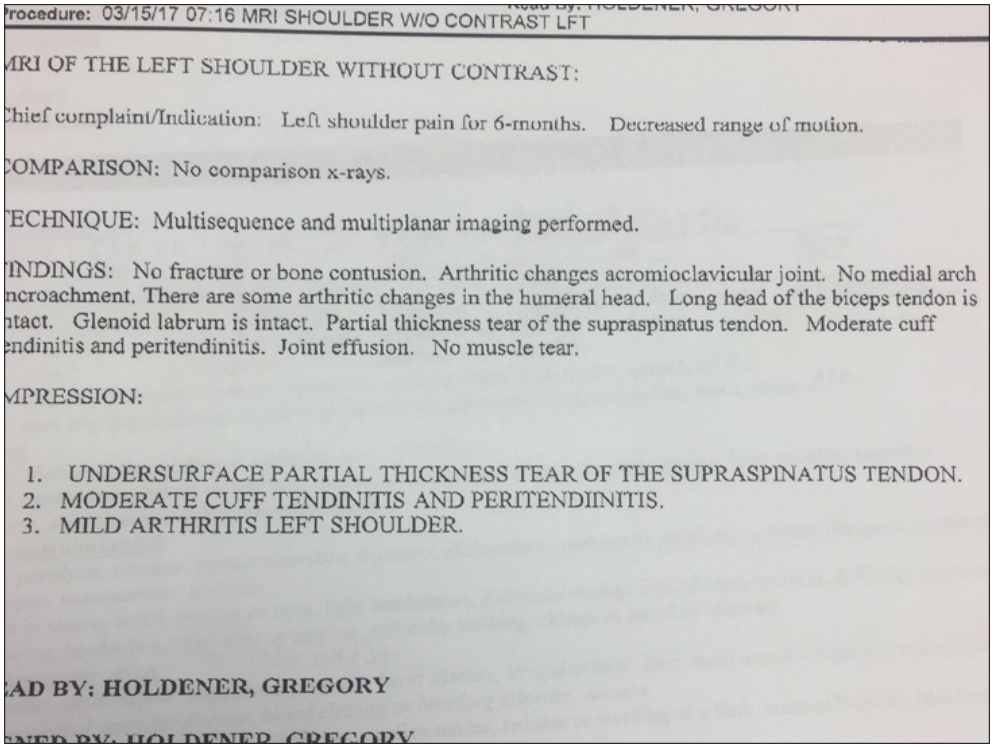
Tendon…

-itis

- Acute
- Stretch/ strain overload
- Inflammation
- Anti-inflammatory Tx

-opathy, -osis

- Chronic
- Compressive overload
- Ischemic
- Failed Inflammation
- Pro-inflammatory Tx



Procedure: 03/15/17 07:16 MRI SHOULDER W/O CONTRAST LFT

MRI OF THE LEFT SHOULDER WITHOUT CONTRAST:

Chief complaint/Indication: Left shoulder pain for 6-months. Decreased range of motion.

COMPARISON: No comparison x-rays.

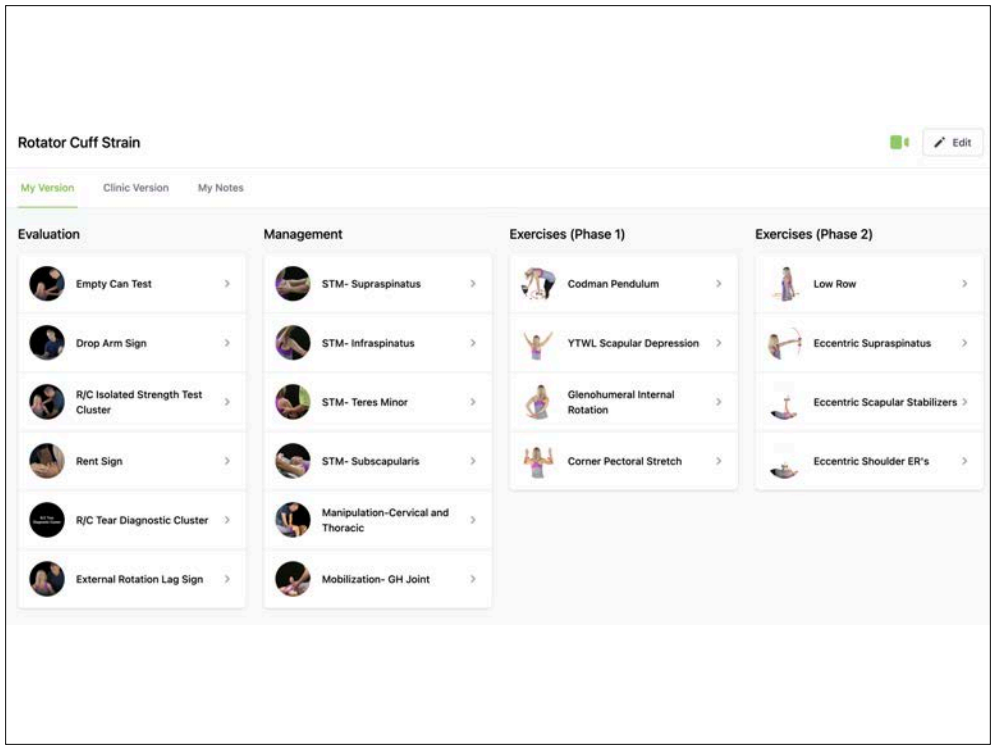
TECHNIQUE: Multisequence and multiplanar imaging performed.

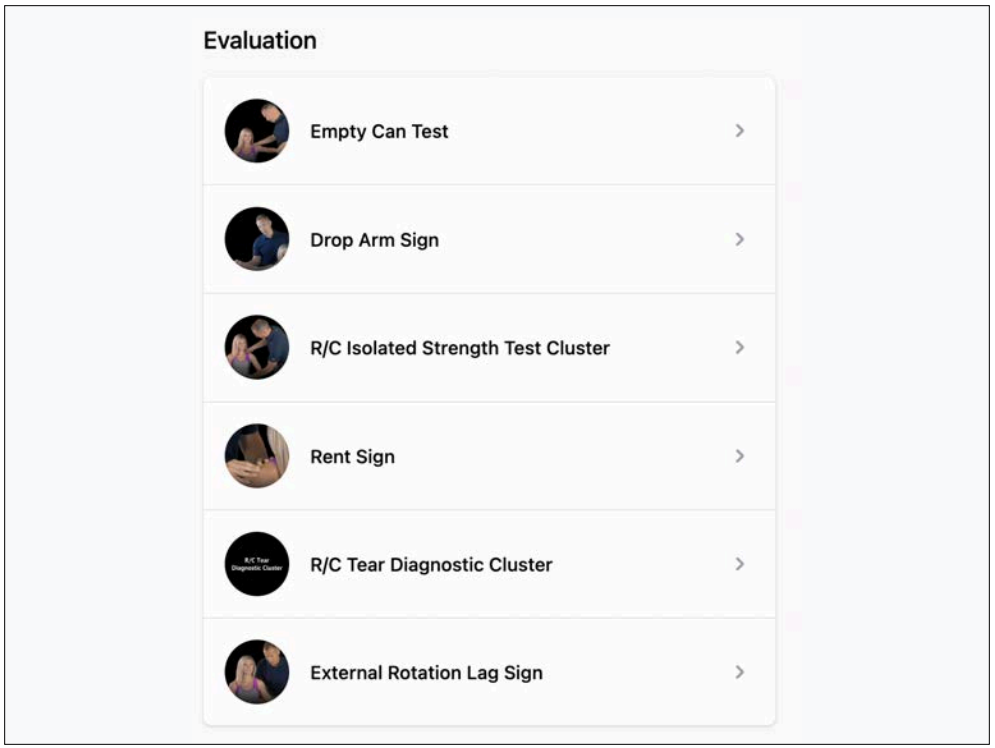
FINDINGS: No fracture or bone contusion. Arthritic changes acromioclavicular joint. No medial arch encroachment. There are some arthritic changes in the humeral head. Long head of the biceps tendon is intact. Glenoid labrum is intact. Partial thickness tear of the supraspinatus tendon. Moderate cuff tendinitis and peritendinitis. Joint effusion. No muscle tear.

IMPRESSION:

1. UNDERSURFACE PARTIAL THICKNESS TEAR OF THE SUPRASPINATUS TENDON.
2. MODERATE CUFF TENDINITIS AND PERITENDIINITIS.
3. MILD ARTHRITIS LEFT SHOULDER.

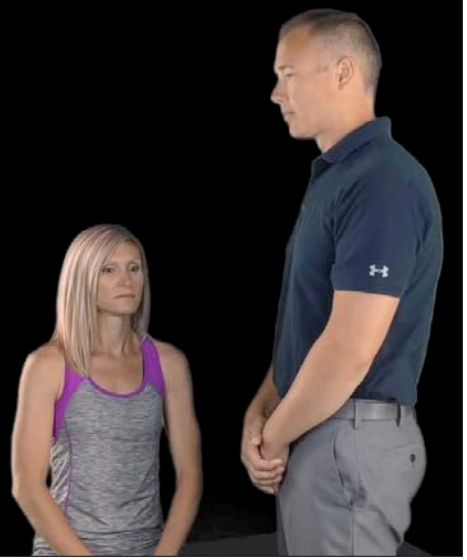
READ BY: HOLDENER, GREGORY





Hawkins- Kennedy

Seated patient's arm placed into 90 degrees of forward flexion with 90 degrees of elbow flexion. Clinician stands in front and stabilizes patients scapula with one hand while gradually rotating patients arm downward, into internal rotation. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.



Neer Test

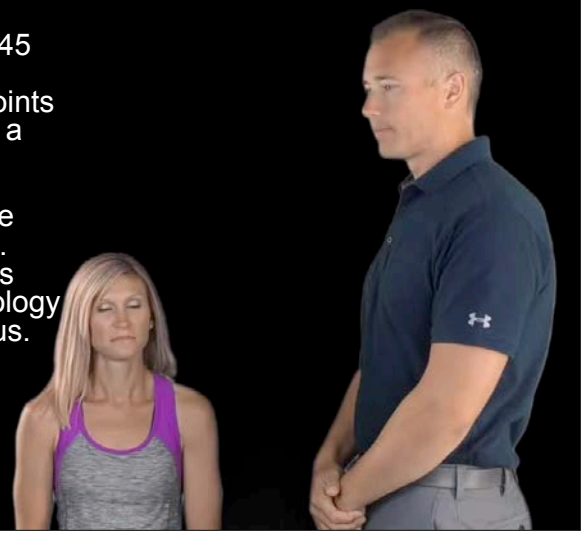
Clinician stands behind patient, stabilizes the scapula with one hand and grasps the patients elbow with the other hand, moving their straightened arm into forward flexion until pain is reported. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.

RC Isolated Strength Assessment

- Supraspinatus (Elevation)
  - Empty can/ Jobe test
  - Full can
- Infraspinatus & Teres Minor (ER)
  - Hornblower's Sign/ Patte Test
- Subscapularis (IR)
  - Lift off test
  - Bear Hug test
  - Belly Press test

Empty Can

Aka Jobe Test Patients straight arm placed at 90 degrees of elevation and 45 degrees anterior to the scapular plane. Patient points thumb down (as to empty a can). Clinician stabilizes scapula and provides downward pressure on the patients outstretched arm. Pain or weakness signifies possible rotator cuff pathology involving the supraspinatus.

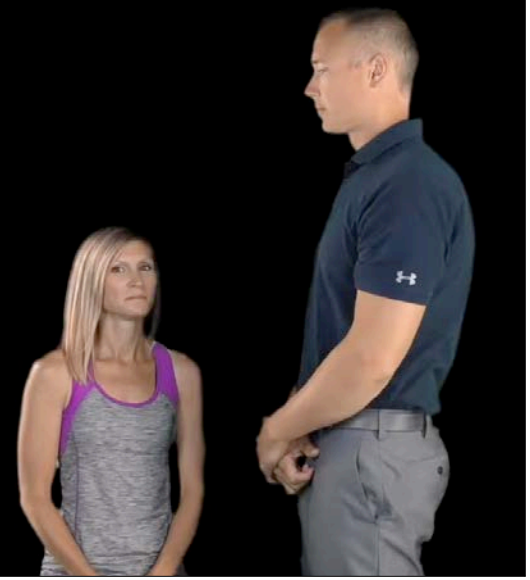


Full Can (Supraspinatus)

The patient is seated or standing with the arm outstretched in the scapular plane, thumb up. The clinician applies a downward force to the patients arm. Pain or weakness signifies possible rotator cuff pathology involving the supraspinatus.

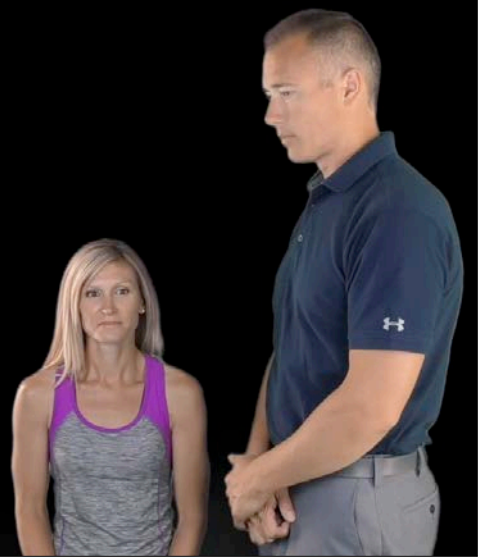
Horn Blowers Sign (Infraspinatus/ Teres Minor)

Aka Patte Test. The patient's elbow is bent to 90 degrees so that their forearm is pointing upward, as though they are holding a horn. The clinician stabilizes the elbow with one hand and attempts to rotate the patient's arm internally while the patient resists with an external rotation counterforce. Pain or weakness is suggestive of teres minor involvement.



Belly Press Test (Subscapularis)

Aka Napoleon test. The standing patient places their hand on their abdomen and aligns their forearm on a frontal plane (i.e. Napoleon style). The clinician attempts to lift the patient's hand/arm away from their abdomen while the patient resists. Pain or weakness suggests subscapularis involvement.



Bear Hug Test (Subscapularis)

The patient places the affected hand, palm down on the unaffected shoulder. The clinician attempts to lift the patient's hand upward, off of their shoulder while the patient resists. Pain or weakness is suggestive of subscapularis muscle involvement.

Lift Off Test (Subscapularis)

The patient is seated or standing and places their hand behind their back, palm facing outward. The clinician applies resistance as the patient attempts to press their hand away from their back against that resistance. Pain or weakness suggests involvement of the subscapularis muscle.

Rent Sign

Drop Arm Test

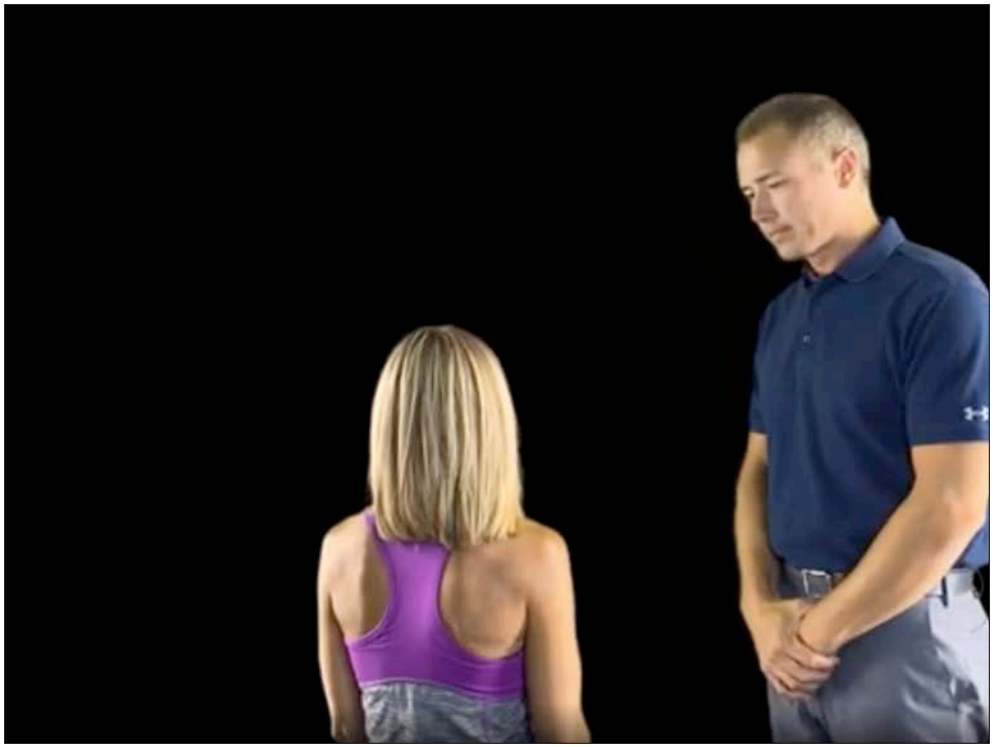
The clinician abducts the patients straightened arm to 90 degrees and asks the patient to hold that position as the clinician removes their support. A positive is noted when the arm can be passively abducted by the clinician without pain, but when support of the arm is removed and the deltoid contracts suddenly, pain causes the patient to hunch the shoulder and quickly lower the arm. The drop arm sign is seen when there is pathology or a full-thickness tear of the supraspinatus tendon.

Pain or weakness during DIME testing in the coronal or scapular plane demonstrates 93-100% sensitivity for full thickness rotator cuff tear.

Abraham PF, Nazal MR, Varady NH, Gillinov SM, Quinlan NJ, Alpaugh K, Martin SD. The New Dynamic Isokinetic Manipulation Examination (DIME) is a Highly-Sensitive Secondary Screening Tool for Supraspinatus Full-Thickness Tears. Journal of Shoulder and Elbow Surgery. 2020 Jul 7.

Dynamic Isokinetic Manipulation Examination (DIME)

Begin by asking the patient to straighten and internally rotate their arm, then elevate it into full horizontal abduction in the coronal plane (straight out to the side then up). The clinician grasps the patient's wrist then forcefully adducts the patients arm back to their thigh in a smooth 5-second arc as the patient maximally resists. The same maneuvers are repeated in the scapular plane (45 degrees forward). Pain or weakness during DIME testing in the coronal or scapular plane demonstrates very high sensitivity for full thickness rotator cuff tear. The DIME test should be compared bilaterally, starting with the asymptomatic side.



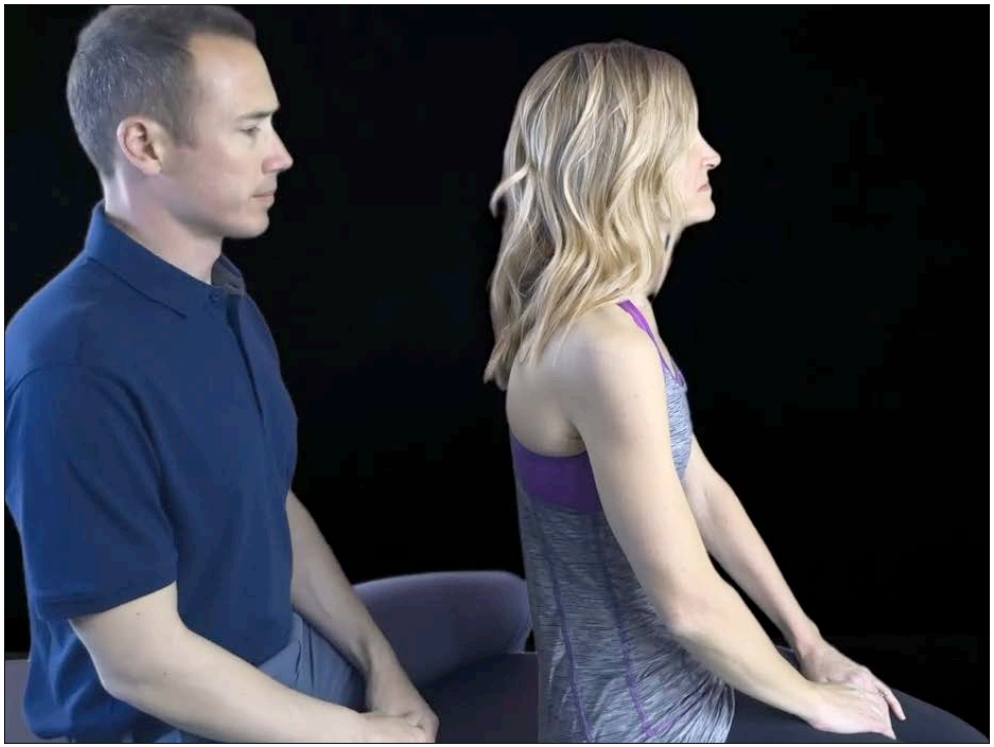
If the tear is isolated to the supraspinatus tendon and no capsular restrictions are present, normal function of the glenohumeral joint may be possible during scapular plane abduction.”

DIME TEST

Mattar LT, et al Journal of Shoulder and Elbow Surgery. 2022 Jan 26. Link

Internal Rotation Lag Sign

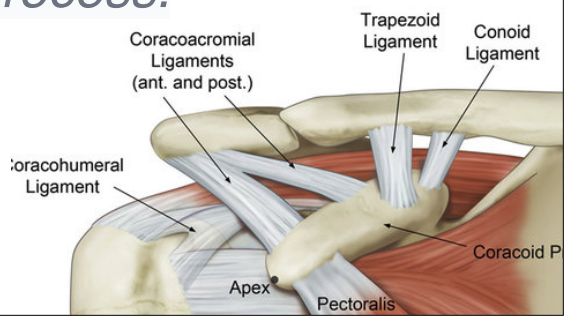
The internal rotation lag sign, AKA modified lift-off test, begins with the patient seated in front of the clinician, holding their arm in maximal internal rotation with the dorsum of their hand resting on their back. The clinician passively extends the patient's arm 20 degrees while supporting their wrist and elbow with one hand on each. The clinician maintains support at the elbow and asks the patient to hold the extended arm position as support is removed from the wrist. Inability to maintain an internally rotated position of the arm suggests full thickness tear of the subscapularis tendon.



Corocoid Morphology Related to Subscapularis Tears

Journal of Shoulder and Elbow Surgery

There is a significant association between articular side subscapularis tear and the morphology of a coracoid process.

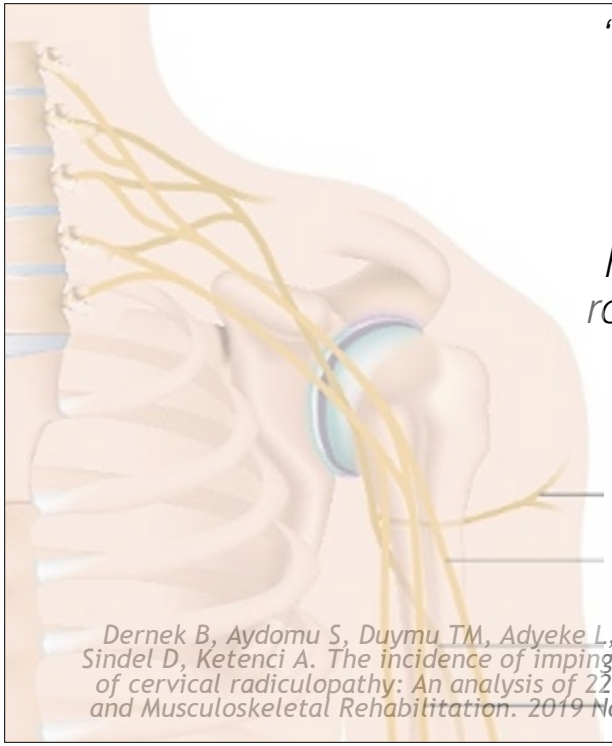


Kawamata J, Suenaga N, Oizumi N, Hisada Y. Morphology of the coracoid process as a predictor of articular side tear at the upper border of the subscapularis. Journal of Shoulder and Elbow Surgery. 2022 Jan 31. Link

R/C Tear Diagnostic Cluster

Murel and Walton demonstrated a 98% probability of full thickness rotator cuff tear in patients exhibiting at least three of the following four findings:

- Age over 60
- Supraspintaus weakness (Empty Can Test)
- Weakness in resisted external rotation
- Positive signs of impingement (Neer, Hawkins)



"35% of the patient with shoulder anterior impingement syndrome (SAIS) had cervical nerve root compression on the same side."

Dernek B, Aydomu S, Duymu TM, Adyeke L, Yardm MY, Kesikta FN, Sindel D, Ketenci A. The incidence of impingement syndrome in cases of cervical radiculopathy: An analysis of 220 cases. Journal of Back and Musculoskeletal Rehabilitation. 2019 Nov 29(Preprint):1-4. Link

Arm Squeeze Test

The clinician stands behind the patient and uses both hands to clasp and squeeze the middle third of the upper arm with enough force to create moderate compression of the underlying muscle. Reproduction of arm pain (rated at least VAS 3 on a 0-10 scale) during compression suggests a cervical origin. The rationale is that compression provokes a response from the relatively superficial peripheral nerves (musculocutaneous, radial, ulnar and median) that arise from hypersensitized lower cervical nerve roots (C5-T1). The Arm Squeeze test shows high sensitivity (97%), specificity (>91%) and inter/ intraobserver reliability for differentiation of shoulder vs. radicular pain.

43.5% of extremity pain originates from the (asymptomatic) spine.

Shoulder pain – 47%
Elbow pain – 44%
Wrist/Hand pain – 38%
Hip pain – 71%
Knee – 25%
Ankle/Foot – 29%

Rosedale R, Rastogi R, Kidd J, Lynch G, Supp G, Robbins SM. A study exploring the prevalence of Extremity Pain of Spinal Source (EXPOSS). Journal of Manual & Manipulative Therapy. 2019 Sep 4:1-9.

"Over 90.2% of [rotator cuff] patients had premature MRI. The use of MRI before a trial of conservative management in patients with:
atraumatic shoulder pain
minimal to no strength deficits on physical examination, and
suspected cuff tendinopathy other than full-thickness tears
provides negative value in the management of these patients, at both the individual and population level."

Cortes A, Quinlan NJ, Nazal MR, Upadhyaya S, Alpaugh K, Martin SD. A value-based care analysis of magnetic resonance imaging in patients with suspected rotator cuff tendinopathy and the implicated role of conservative management. Journal of shoulder and elbow surgery. 2019 Nov 1;28(11):2153-60.

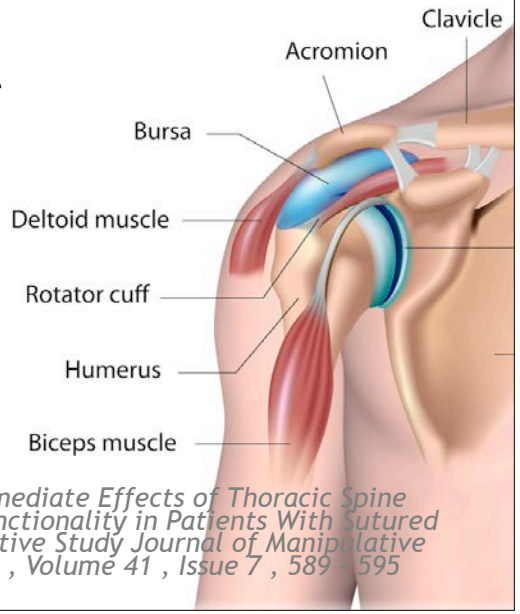
"The use of MRI before a trial of conservative management in patients with atraumatic shoulder pain, minimal to no strength deficits on physical examination, and suspected cuff tendinopathy other than full-thickness tears provides negative value"

Cortes A et al. A value-based care analysis of magnetic resonance imaging in patients with suspected rotator cuff tendinopathy and the implicated role of conservative management. J Shoulder Elbow Surg. 2019 Jul 4. pii: S1058-2746(19)30247-2.

"Individuals with shoulder impingement had a greater thoracic kyphosis and less extension ROM than healthy controls. These results suggest that clinicians could consider addressing the thoracic spine in patients with shoulder impingement."

Hunter DJ, Rivett DA, McKiernan S, Smith L,, Snodgrass SJ. Relationship Between Shoulder Impingement Syndrome and Thoracic Posture. Phys Ther. 2019 Dec 11. pii: pzz182. doi: 10.1093/ptj/pzz182.

"Active shoulder flexion and abduction mobility increase after manipulation of thoracic spine in (rotator cuff) patients. Subacromial space increases significantly after manipulation."



Belón-Perez, Pedro et al. Immediate Effects of Thoracic Spine Manipulation Upon Shoulder Functionality in Patients With Sutured Rotator Cuff Repair: A Prospective Study Journal of Manipulative & Physiological Therapeutics , Volume 41 , Issue 7 , 589 - 595

*"A single rotator cuff corticosteroid injection (in the year before surgery) is associated with **1.3- 2.8** times increased risk of needing revision rotator cuff repair."*

Puzzitiello RN, Patel BH, Nwachukwu BU, Allen AA, Forsythe B, Salzler MJ. Adverse impact of corticosteroid injection on rotator cuff tendon health and repair: A systematic review. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2019 Dec 17.

Management

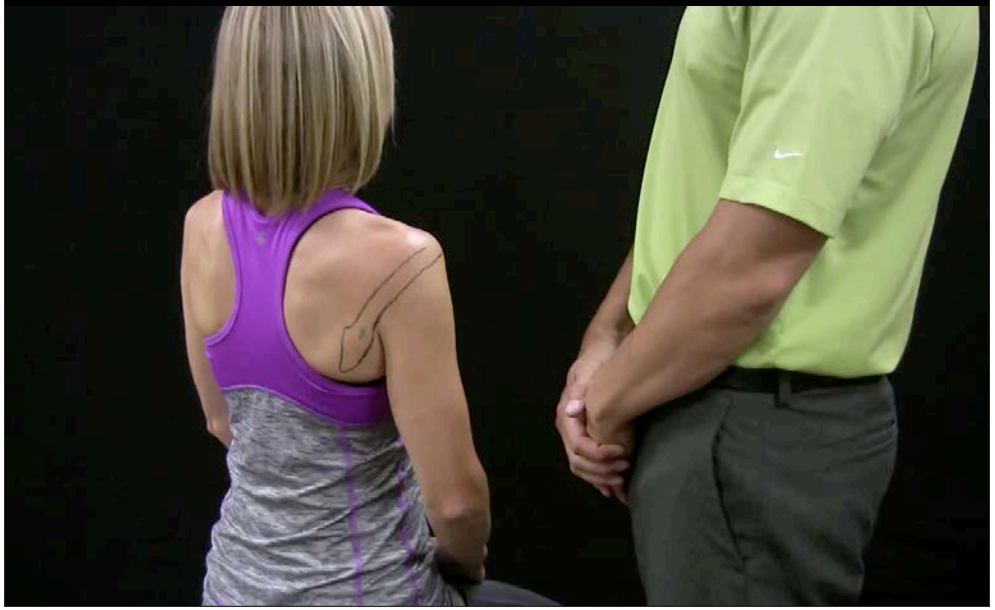
- STM- Supraspinatus
- STM- Infraspinatus
- STM- Teres Minor
- STM- Subscapularis
- Manipulation-Cervical and Thoracic
- Mobilization- GH Joint

STM- Infraspinatus

STM- Subscapularis

STM- Supraspinatus

STM- Teres Minor



Mobilization GH Joint

Exercises (Phase 1)

- Codman Pendulum
- YTWL Scapular Depression
- Glenohumeral Internal Rotation
- Corner Pectoral Stretch

Exercises (Phase 2)

- Low Row
- Eccentric Supraspinatus
- Eccentric Scapular Stabilizers
- Eccentric Shoulder ER's

Rotator Cuff Syndrome Phase 2: Eccentric Strengthening of the Scapular Stabilizers

Rotator Cuff Syndrome Phase 2: Eccentric Strengthening of the Teres Minor and Infraspinatus

Rotator Cuff Syndrome Phase 2: Eccentric Strengthening of the Supraspinatus

TIPS FOR HEALTHY SLEEP

CHOOSING THE RIGHT BED & PILLOW

The age and quality of your mattress have a major impact on how you feel. A worn-out mattress can certainly contribute to back and neck problems. Most experts agree that traditional mattresses should be replaced every 5-8 years. Since you spend about one third of your life in bed, choosing the right mattress is critical. Unfortunately, mattress selection is a highly individual process as there is no single "best" mattress.

The following tips will help you make an informed decision:

- ✓ Choose a medium to firm model. Mattresses that are either too soft or excessively hard can aggravate back pain.
- ✓ Keep the pillow-top relatively thin. An excessively plush topper is the equivalent of placing a cheap mattress on top of a good one.
- ✓ Always replace the box spring foundation when you replace the mattress.
- ✓ Select a pillow that will hold your head in a neutral position while sleeping on your side or back.
- ✓ Avoid excessively thick or multiple pillows.
- ✓ Choose a fiberfill or feather/down pillow as these are usually better than foam.

PubMed

Format: Abstract

Full text links

PMC Free Full text

JB JS Open Access. 2018 Feb 9;3(1):e0043. doi: 10.2106/JBJS.OA.17.00043. eCollection 2018 Mar 29.

The Effect of Rotator Cuff Repair on Natural History: A Systematic Review of Intermediate to Long-Term Outcomes.

Chalmers PN[1], Ross H[1], Granger E[1], Presson AP[1], Zhang C[1], Tashjian RZ[1].

Author information

Abstract

BACKGROUND: **Rotator cuff** disease can have a progressive natural history of increasing tear size and worsening function. It remains unknown whether **rotator cuff** repair alters this natural history.

METHODS: A systematic review of the intermediate to long-term (minimum 5-year) results of operative **rotator cuff** repair and no repair of **rotator cuff injuries** was performed to compare (1) patient-based outcomes, (2) future surgical intervention, (3) future tear progression or recurrence, and (4) tear size. The no-repair group included both conservative treatment and surgical treatment without repair. After the application of selection criteria, 29 studies with 1,583 patients remained. Meta-regression was conducted to adjust for baseline age, sex, tear size, and duration of follow-up.

RESULTS: Comparison of the repair and no-repair groups revealed no significant differences in terms of age ($p = 0.36$), sex ($p = 0.88$), study level of evidence ($p = 0.86$), or Coleman methodology score ($p = 0.8$). The duration of follow-up was significantly longer for the no-repair group ($p = 0.004$), whereas baseline tear size was significantly larger in the repair group ($p = 0.014$). The percentage of patients requiring additional surgery was significantly higher in the no-repair group after adjustment for age, sex, duration of follow-up, and tear size (9.5% higher in estimated means between groups [95% confidence interval, 2.1% to 17%]; $p = 0.012$). The likelihood of a recurrent defect (repair group) or extension of the prior tear (no-repair group) was not different between groups after adjustment for age, sex, duration of follow-up, and tear size ($p = 0.4$). There were no differences between the repair and no-repair groups in terms of the Constant score after adjustment for age, sex, duration of follow-up, and tear size ($p = 0.31$). The final tear size was significantly larger in the no-repair group than the repair group (967 mm^2 higher in estimated means between groups [95% confidence interval, 771 to 1,164 mm^2]; $p < 0.001$).

CONCLUSIONS: At intermediate to long-term follow-up, **rotator cuff** repair was associated with decreased final tear size and decreased need for future surgery after adjusting for age, sex, duration of follow-up, and tear size. The likelihood of a recurrent defect after **rotator cuff** repair did

Nocturnal Shoulder Pain

1. Severity of nocturnal pain and shoulder disability positively correlated.
2. Presence of subscapularis tendinosis appears to be a predictor of nocturnal pain severity.
3. Patients with positive Neer test may experience more nocturnal pain.

Mengi A, Guler MA. Nocturnal pain in patients with rotator cuff syndrome: A prospective study. Musculoskeletal Science and Practice. 2022 Feb 22:102536. Link

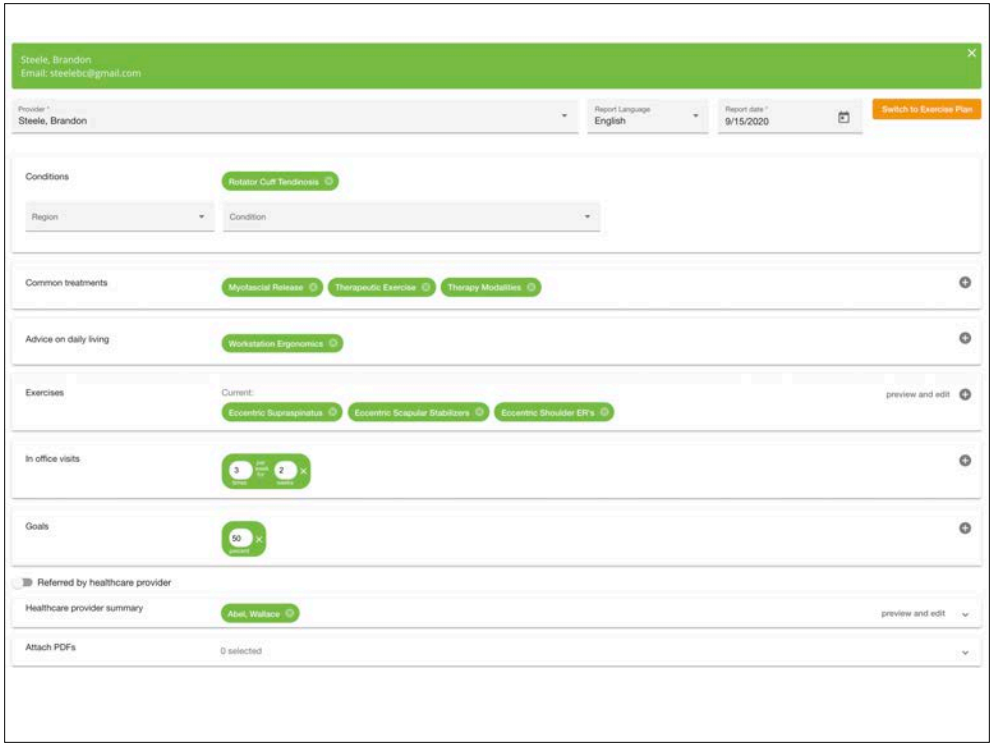
What matters most to a person seeking specialty care for shoulder pain are:

Feeling that they are getting effective care and not being dismissed

Maintaining meaningful activity and life roles

Replacing despair and frustration with hope and progress

Ulack C, Suarez J, Brown L, Ring D, Wallace S, Teisberg E. What are People That Seek Care for Rotator Cuff Tendinopathy Experiencing in Their Daily Life?. Journal of Patient Experience. 2022 Jan;9:23743735211069811. Link



Premier Rehab LTD
back in action.

Chart Copy
Patient Name: Brandon Steele
Prescribed on: 09/15/2020
Provider: Dr. Brandon Steele

Diagnosis: **Rotator Cuff Tendinosis**

Current Exercises

Eccentric Supraspinatus - Begin standing, holding a weight with your arm outstretched at a 45 degree angle in front of you at shoulder level. Your thumb should be pointing down. Slowly lower the weight to your thigh at a count of 4 seconds. Use your "good" arm to remove the weight from your hand and return the weight back to your "affected" hand in the starting position. Repeat 3 sets of 10 repetitions daily, or as directed.

Eccentric Scapular Stabilizers - Begin in a side lying position holding a weight, with your arm outstretched toward the ceiling. Slowly lower the weight to the floor at a count of 4 seconds. Carefully return your arm to the starting position by keeping it close to your body. Perform as directed.

Eccentric Shoulder ER's- Begin in a side lying position holding a weight with your arm on your rib cage, elbow bent to 90 degrees, forearm pointing straight up. While keeping your arm on your ribs, slowly lower the weight toward the floor at a count of 4 seconds. Use your "good" arm to remove the weight from your hand and return the weight back to your "affected" hand in the starting position. Repeat 3 sets of 10 repetitions daily, or as directed.

Premier Rehab LTD
back in action.

09/15/2020

Dr. Wallace Abel
311 W. Lincoln St
Belleville, Illinois 62220
(618) 234-5650

RE: Initial visit summary for Brandon Steele

Dear Dr. Abel,

Your patient, Brandon Steele, presented to my office on 09/15/2020 with shoulder related symptoms. Here is a brief summary of their initial visit.

The history & physical revealed findings consistent with a diagnosis of Rotator Cuff Tendinosis.

My treatment recommendations include Myofascial Release, Therapeutic Exercise and Therapy Modalities.

The patient will be treated 3 times per week for 2 weeks. Upon completion of this plan, I would expect in excess of 50% improvement.

I will provide you with updates on the progress of your patient. If you would like any additional information, please do not hesitate to contact my office. Once again, thank you for allowing me to participate in the care of your patient.

Sincerely,

Brandon Steele, FACO

PremierRehab LTD

ABOUT YOUR CONDITION
BRANDON STEELE
09/15/2020

WHAT'S WRONG?

Rotator Cuff Strain

The term "Rotator cuff" describes a group of four small muscles that hold your shoulder in its shallow socket while larger muscles move it. Strains and injuries to the rotator cuff are the most common cause of shoulder problems, accounting for 4.5 million doctor visits per year. Injuries are classified by the amount of damage as "partial tears", "full thickness tears" or "ruptures". A "partial tear" means that one side of your tendon has been partially frayed. A "full thickness tear", sometimes called a "complete tear", describes a hole or slit in your tendon, much like what would be created by running a knife length-wise down a rope. A "rupture" is the most serious injury and means that your tendon has been torn into two pieces.

Less than 10% of rotator cuff tears are the result of an acute injury like falling, pushing, pulling, throwing or lifting. The vast majority of injuries are the result of repetitive strains over a long period of time. One of the most common reasons that patients develop a rotator cuff tear is something called "impingement". Impingement basically means that the area where your rotator cuff tendon lives has become too crowded and the rotator cuff tendon is being pinched each time you raise your arm. Those who perform repeated overhead activities are at greatest risk for impingement and rotator cuff tendon problems. This includes athletes who play baseball, volleyball, tennis, rowing, weight lifting, swimming and archery, and jobs that include carpentry, painting, wall paper hanging, cleaning windows and washing/waxing cars. Other known risk factors for rotator cuff problems include smoking, obesity, high cholesterol and prior cortisone injection.

Patients who have suffered an acute rotator cuff injury often report a "tearing" or "snapping" sensation accompanied by severe pain and weakness. Most chronic strains begin silently with symptoms becoming more evident as the tear progresses. Pain is often localized to the front and outside of your shoulder but can sometimes radiate down your arm. Symptoms are usually aggravated by overhead activity and may progress to the point that you have difficulty raising your arm overhead. Pain is often worse at night, especially when you lie on the affected shoulder. Be sure to tell us if you suffer from significant neck pain, shortness of breath, chest pain or chest pressure.

Young patients who have suffered an acute tear or rupture may require surgery, while most others will benefit from conservative treatments, like the type provided in this office. Be sure to avoid painful overhead activity or carrying heavy objects. Try not to sleep on your irritated side, especially with your arm stretched overhead. You may benefit by sleeping on your unaffected side with a pillow between your arm and trunk. Smokers should consider a program to help them quit, and overweight patients will recover quicker if they begin a diet and exercise program. Performing your home exercises is especially important.

2 WAYS TO VIEW YOUR EXERCISES

ONLINE

OR NAVIGATE TO
www.HealthCom.io

LOGIN:
bsteele5
TEMPORARY PASSWORD:
(your current password)

DOWNLOAD
OUR HEALTHCOM APP

Download on the App Store

GET IT ON Google Play

Current Exercises

Eccentric Supraspinatus

Perform 3 sets of 10 reps, 1 time per day.

Begin standing, holding a weight with your arm outstretched at a 45 degree angle in front of you at shoulder level. Your thumb should be pointing down. Slowly lower the weight to your thigh at a count of 4 seconds. Use your "good" arm to remove the weight from your hand and return the weight back to your "affected" hand in the starting position. Repeat 3 sets of 10 repetitions daily, or as directed.

Eccentric Scapular Stabilizers

Perform 3 sets of 10 reps, 1 time per day.

Begin in a side lying position holding a weight, with your arm outstretched toward the ceiling. Slowly lower the weight to the floor at a count of 4 seconds. Carefully return your arm to the starting position by keeping it close to your body. Perform as directed.

PremierRehab EXERCISES ADVICE CONDITIONS CLINIC SETTINGS

Exercises

Current

- Eccentric Shoulder ER's
- Eccentric Scapular Stabilizers
- Eccentric Supraspinatus
- Eccentric Achilles Strengthening
- Standing Soleus Stretch
- Standing Gastroc Stretch

Upcoming

- Vele's
- Semi-Stiff Dead Lift

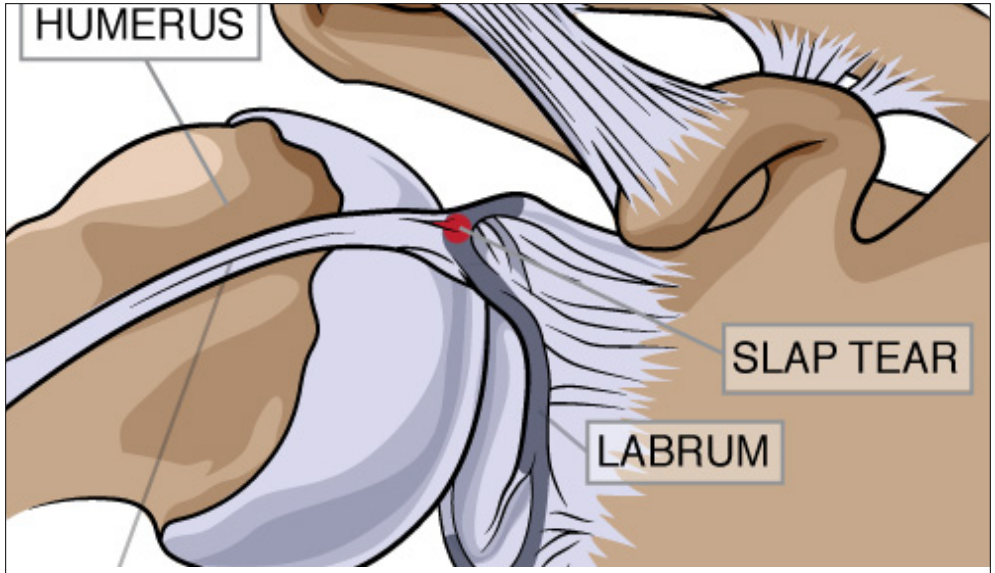
NOTIFY DR STEELE EXERCISES ARE COMPLETED

Eccentric Shoulder ER's 3 sets of 10 reps, 1 times per day

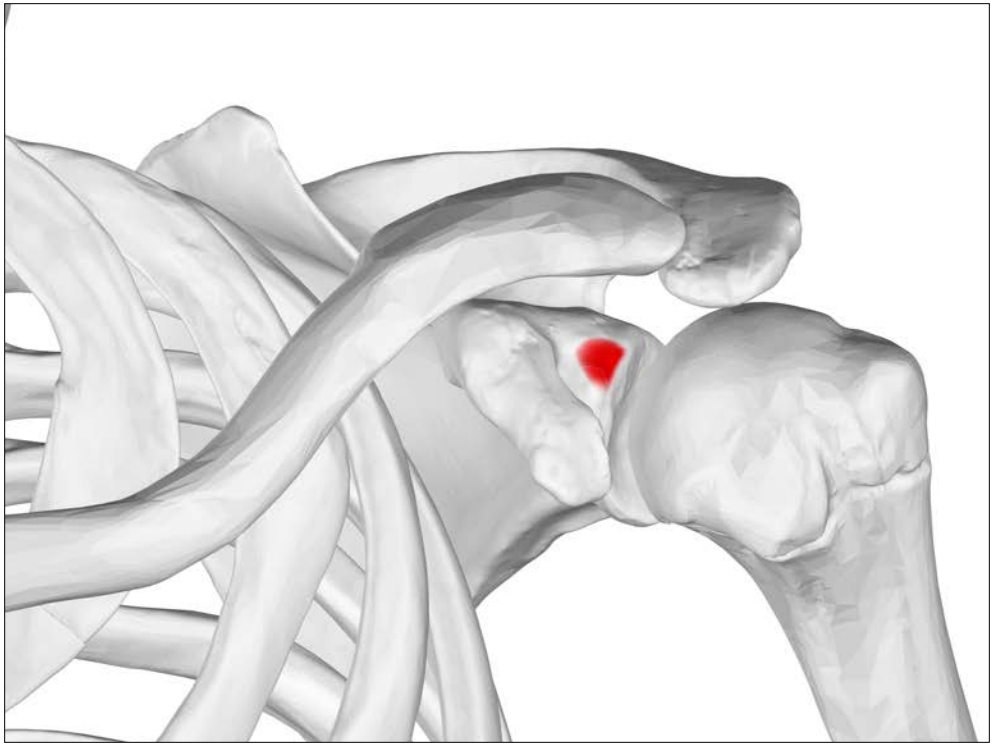
Begin in a side lying position holding a weight with your arm on your rib cage, elbow bent to 90 degrees, forearm pointing straight up. While keeping your arm on your ribs, slowly lower the weight toward the floor at a count of 4 seconds. Use your "good" arm to remove the weight from your hand and return the weight back to your "affected" hand in the starting position. Repeat 3 sets of 10 repetitions daily, or as directed.

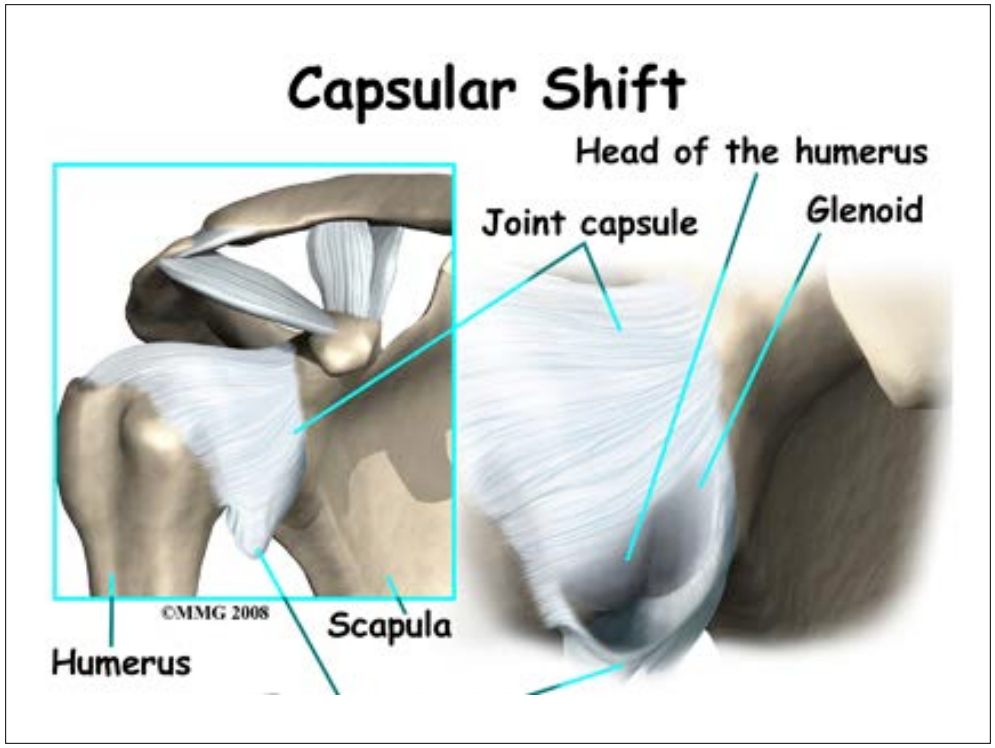
NEXT

Labral Pathology

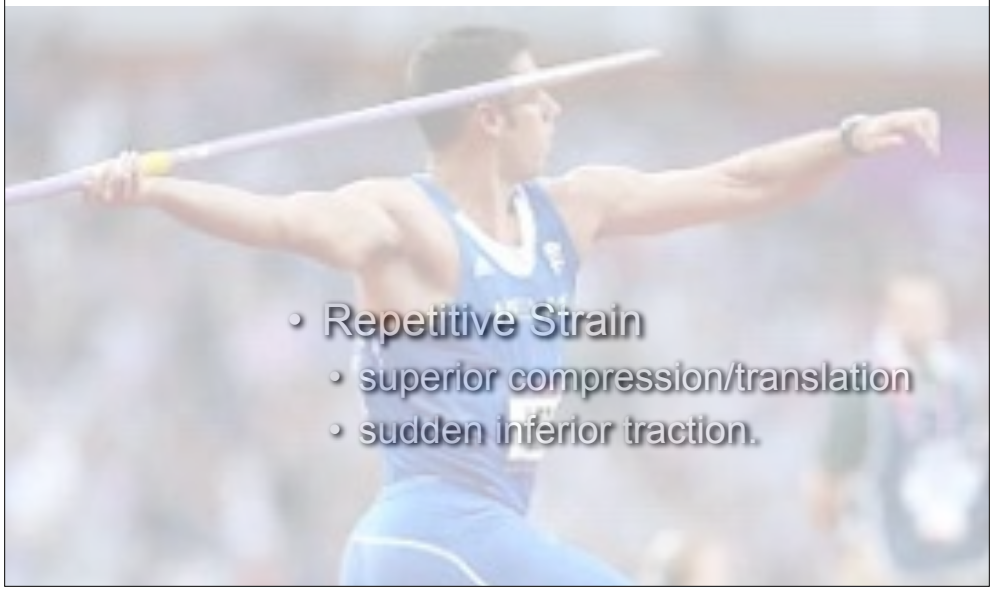


Anatomy





Etiology



Etiology

Most Often—Traumatic

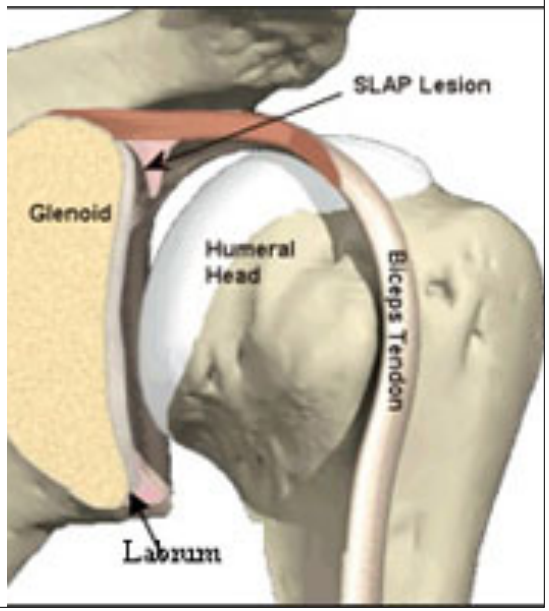
Fall onto an outstretched arm with the shoulder abducted and/or flexed forward.

Symptoms

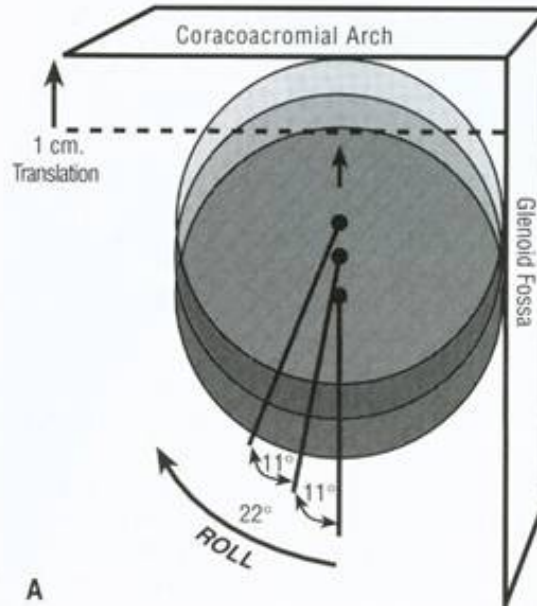
- Symptomatic patients often describe a deep, vague, non-specific shoulder pain that is provoked by overhead and cross-body activity.
- Weakness and stiffness often accompany the disorder. Discomfort may limit athletic performance, particularly in overhead athletes who may complain of a "dead arm."
- Complaints of popping, clicking, grinding or catching are common.
- Patients with more advanced lesions are likely to report symptoms associated with instability; i.e. (pinching, slipping, apprehension or "looseness"- especially during overhead activity)

Function of the Biceps Tendon

Compressive force to stabilize the shoulder

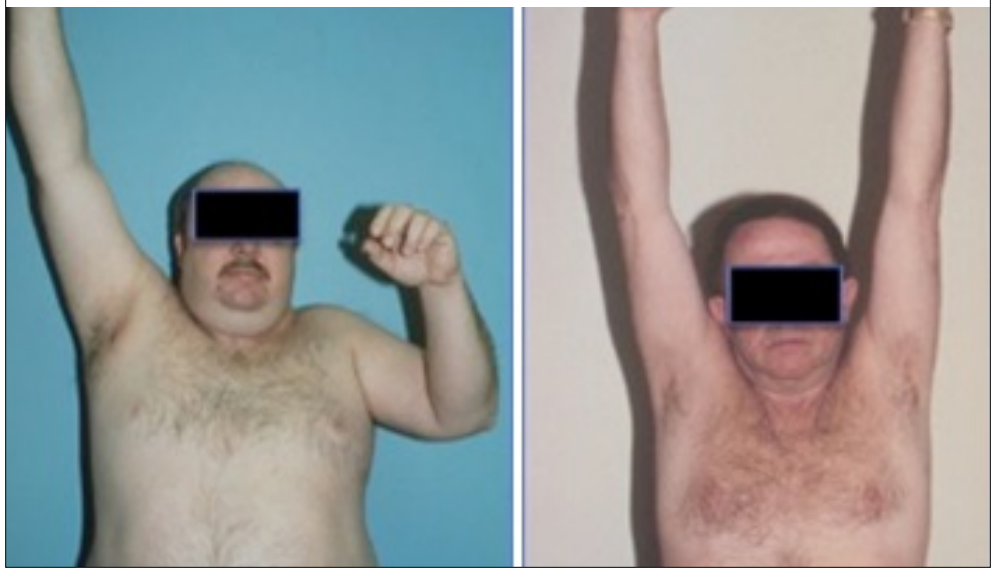


Function of Biceps Tendon?



A: Depress the humeral head.

28% Of SLAP Tears Are Isolated Problems



Snyder Classification Type 1

Type 1 injuries involve fraying or degeneration of the margins of the glenoid labrum without detachment or biceps tendon avulsion.

Snyder Classification Type 2

Type 2 injuries progress to involve detachment of the glenoid labrum from the bony rim, creating a less stable biceps anchor that may be lifted during muscular contraction.

Snyder Classification Type 3

Type 3 lesions have progressed to allow a “bucket handle” displacement of the superior labrum into the glenohumeral joint. The labrum maintains its attachment to the glenoid rim and biceps tendon.

Snyder Classification Type 4

Type 4 lesions include the aforementioned dysfunction plus at least partial rupture of the long head of the biceps tendon.

Original Research

Prevalence of MRI Shoulder Abnormalities in Asymptomatic Professional and Collegiate Ice Hockey Athletes

Brittney Hacken,* MD, Cayce Onks,*† MD, Donald Flemming,‡ MD, Timothy Mosher,‡ MD, Matthew Silvis,*† MD, Kevin Black,* MD, Dan Stuck,§ EMT, and Aman Dhawan,*|| MD

Investigation performed at Penn State Milton S. Hershey Medical Center, Hershey, Pennsylvania, USA

Background: The literature demonstrates a high prevalence of asymptomatic knee and hip findings on magnetic resonance imaging (MRI) in athletes. Baseball pitchers are shown to have a high prevalence of asymptomatic shoulder MRI findings, but the incidence of asymptomatic shoulder MRI findings has not been systematically evaluated in nonthrowing contact athletes.

Purpose/Hypothesis: The purpose of this study was to determine the prevalence of shoulder abnormalities in asymptomatic professional and collegiate hockey players. We hypothesized that, similar to overhead throwing athletes, ice hockey players will have a high prevalence of asymptomatic MRI findings, including labral, acromioclavicular (AC), and rotator cuff pathology on MRI.

Study Design: Cross-sectional study; Level of evidence, 4.

Methods: A total of 25 asymptomatic collegiate and professional hockey players (50 shoulders) with no history of missed games or practice because of shoulder injury, pain, or dysfunction underwent bilateral shoulder noncontrast 3.0-T MRI. MRIs were read blinded by 2 board-certified radiologists at 2 separate time points, 3 months apart, to determine the prevalence of abnormalities of the joint fluid, bone marrow, rotator cuff tendon, biceps tendon, labrum, AC joint, and glenohumeral joint. Interrater and intrareader reliability was determined, and regression analysis was performed to identify the prevalence and relationship to stick-hand dominance.

Results: Labral abnormalities were seen in 25% of the shoulders. AC joint abnormalities and rotator cuff findings were noted in 8% and 6% of shoulders, respectively. One shoulder was noted to have a biceps tendon abnormality, and 1 shoulder demonstrated glenohumeral joint chondral findings. Interrater reliability coefficients were 0.619 for labral abnormalities. Intrareader reliability kappa coefficients were 0.493 and 0.718 for both readers, respectively, for labral abnormalities. Regression analysis was performed and revealed that the overall shoulder pathology was more common in the nondominant stick hand (top stick hand) (coefficient −0.731; $P = .021$).

Conclusion: Professional and collegiate ice hockey players had an overall prevalence of labral abnormalities in 25% of their shoulders, with findings more often found in the nondominant stick hand. Rotator cuff abnormalities were uncommon in ice hockey players. These findings differ significantly from published reports examining professional baseball players and other overhead sports athletes.

Evaluation

SLAP Lesion

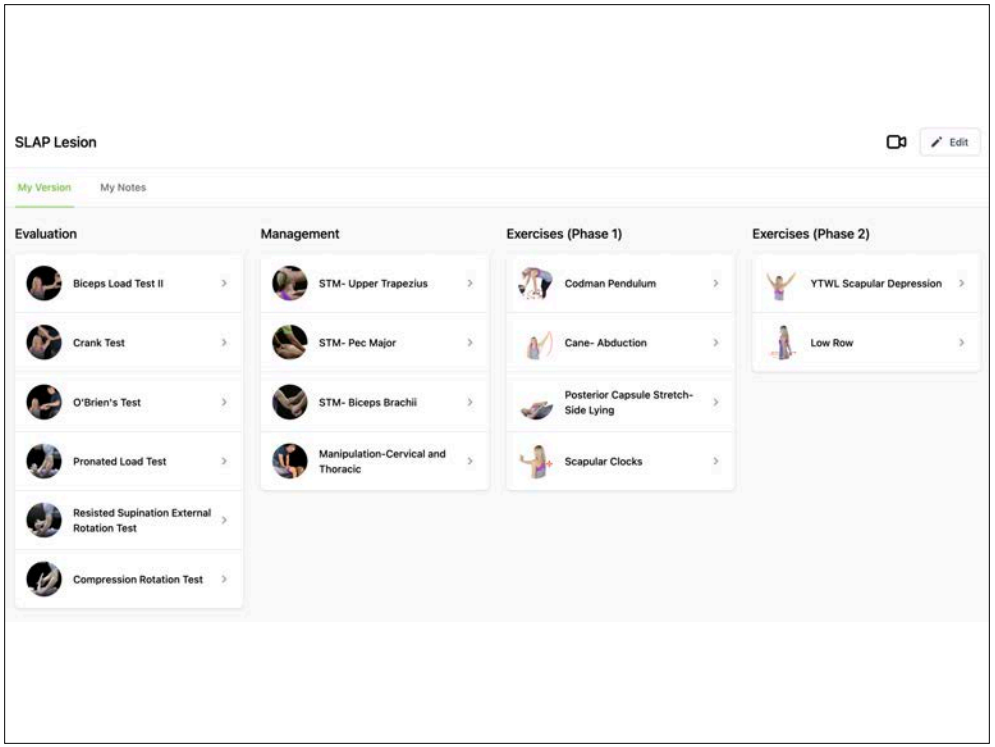
Evaluation

Management

Exercises

Phase I

Phase II



Biceps Load Test II

The patient's shoulder is abducted to 120 degrees and externally rotated. The clinician stabilizes the patient's arm while passively externally rotating until end range or patient apprehension. The patient then attempts to flex their elbow against the clinician's resistance. An increase in pain suggests a SLAP lesion, while a decrease in apprehension or pain makes a SLAP lesion unlikely.

Compression Rotation Test

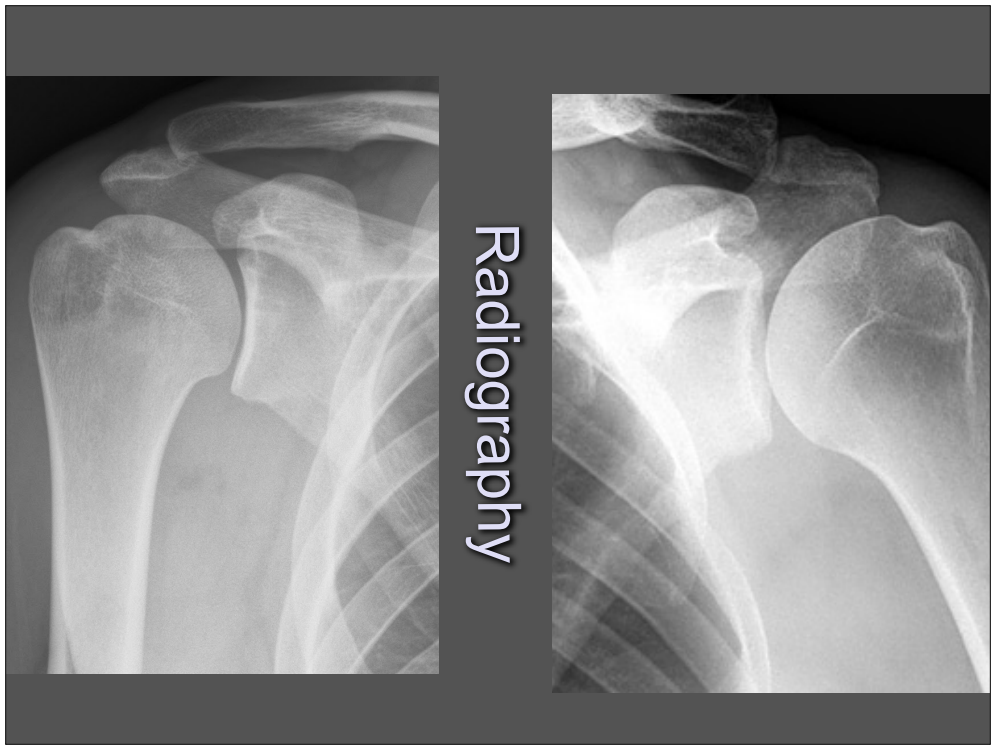
The test is performed on a supine patient with their shoulder in 90 degrees abduction and 90 degrees elbow flexion while the examiner grasps the elbow and applies a compressive force into the glenohumeral joint as the shoulder is rotated internally and externally in an attempt to trap the labrum within the joint. The presence of an uncomfortable "clunk" suggests labral tear.

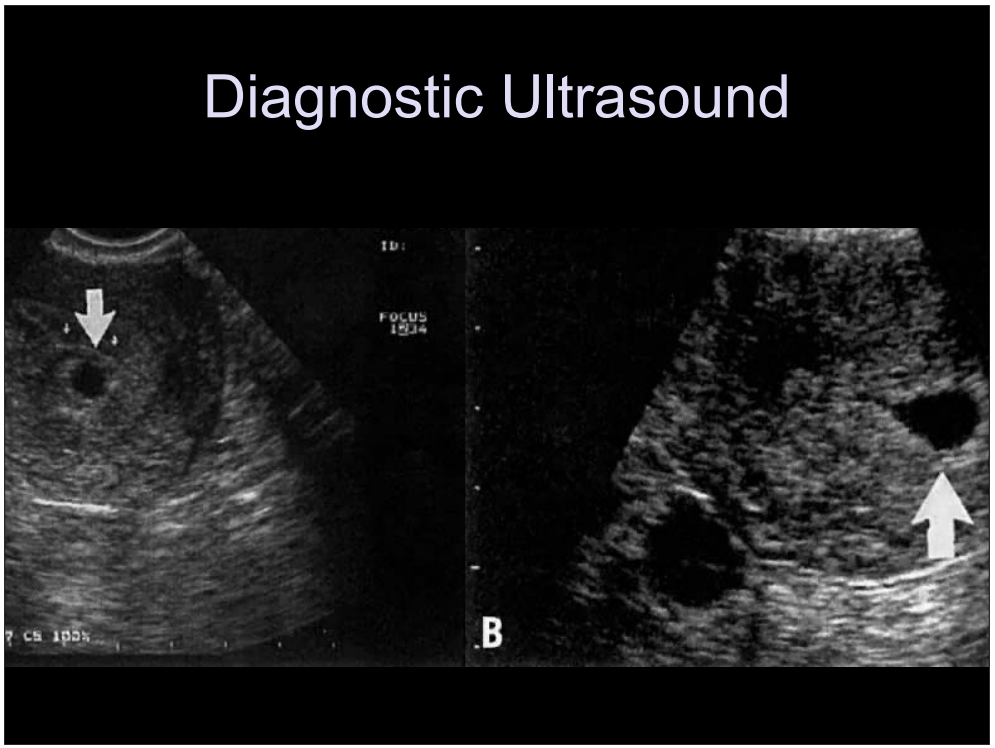
Crank Test

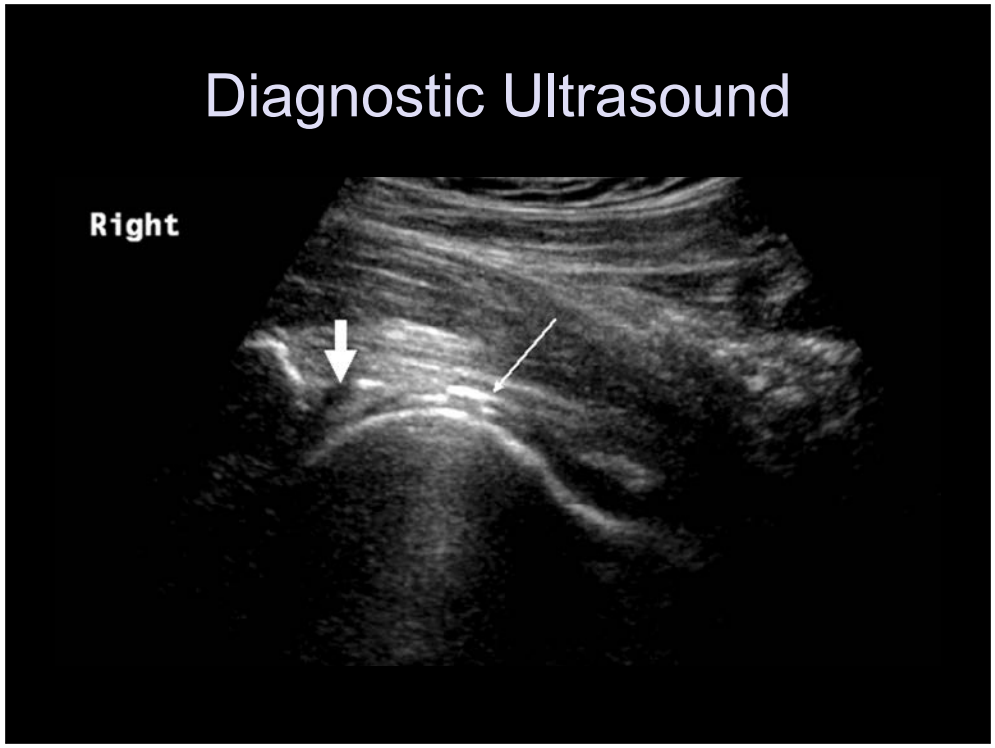
The seated or supine patient elevates their arm to 160 degrees in a scapular plane. The clinician stabilizes the shoulder with one hand and grasps the patient's flexed elbow with the other. The clinician compresses the patient's elbow to apply an axial load to the shoulder while performing passive internal and external rotation. Pain or catching suggests glenoid labrum involvement (tear). (The Compression Rotation Test is similar except it is performed at 90 degrees of elevation.)

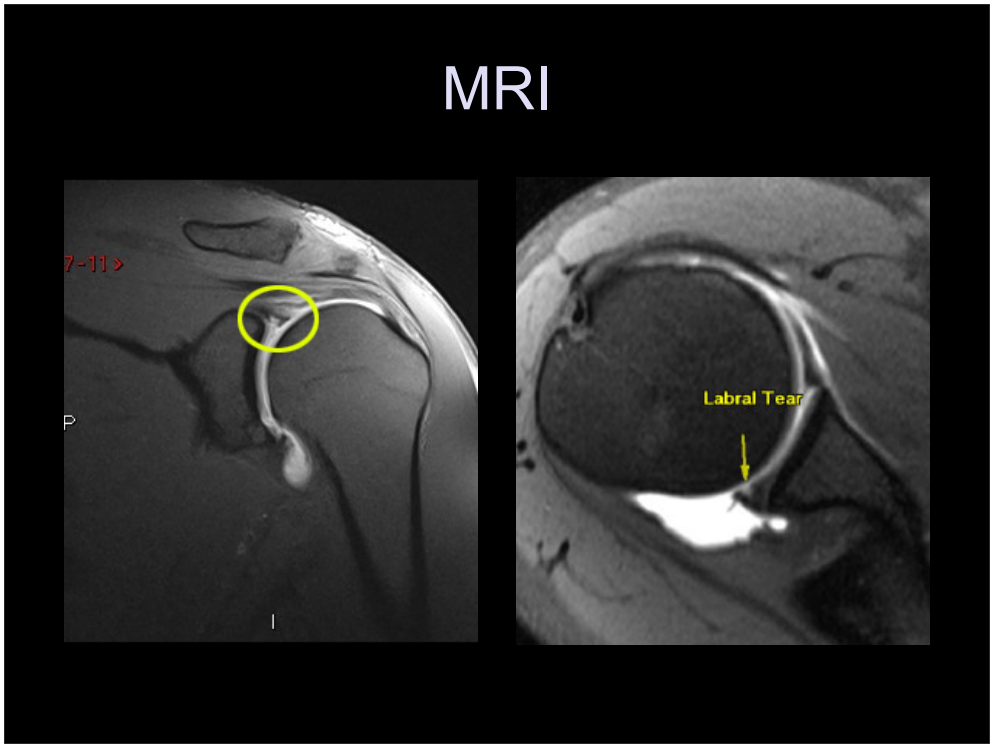
Potential differential diagnostic considerations include A/C joint degeneration, strain or pathology, biceps tendinopathy, cervical radiculopathy, brachial plexus injury, fracture, Bankart lesion, dislocation, glenohumeral degeneration, instability, and most commonly, rotator cuff pathology.

DIFFERENTIAL DX


Radiography


Diagnostic Ultrasound
B


Diagnostic Ultrasound
Right


MRI
Labral Tear

Do the results really matter?

Factors associated with failure of non-surgical management include

1. Older Age
2. Participation in Overhead Sports
3. Traumatic Injury
4. Positive Compression Rotation Test
5. Concomitant Rotator Cuff Injury
6. Longer Baseball Career
7. Longer Symptomatic Period
8. Presence of a Bennett Spur

Steinmetz RG, Guth JJ, Matava MJ, Brophy RH, Smith MV. Return to Play Following Non-Surgical Management of Superior Labrum Anterior-Posterior Tears: A Systematic Review. Journal of Shoulder and Elbow Surgery. 2022 Jan 19. Link

Treatment

Management

STM- Upper Trapezius

STM- Pec Major

STM- Biceps Brachii

Manipulation-Cervical and Thoracic

STM- Biceps

The biceps brachii muscle originates on the coracoid process (medial short head) and humeral head (lateral long head) and attaches to the radial tuberosity. The actions of the muscle include elbow flexion, forearm supination and shoulder flexion (long head only), Trigger points commonly develop in distal muscle bellies. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. IASTM is an alternate means of stripping the muscle. Movement stripping may be performed by contacting the muscle trigger points and applying pressure while passively moving the muscle from a shortened to lengthened state. Contract/ relax stretching is performed by tensioning the muscle, then asking the patient to horizontally abduct and supinate their arm against resistance, followed by increased stretch.

STM Pec Minor

The pectoralis minor muscle originates on ribs 3-5 and attaches to the coracoid process. The actions of the muscle include scapular depression and rotation. Trigger points commonly develop in the muscle belly. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. Movement stripping may be performed by contacting the trigger points and applying pressure while passively moving the muscle from a shortened to lengthened state.

STM- Upper Traps

The upper trapezuis muscle originates on the external occipital protuberance and medial nuchal ligament of the cervical and thoracic spinous processes and inserts on the spine of the scapula and lateral 1/3rd of the clavicle. The action of the muscle includes elevation and retraction of the scapula. Trigger points commonly develop near the scapular insertion. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. IASTM is an alternate means of stripping the muscle. Movement stripping may be performed by contacting the trigger point and applying pressure while passively moving the muscle from a shortened to lengthened state. Contract/ relax stretching is performed by tensioning the muscle, then asking the patient to laterally flex their head against resistance, followed by increased stretch.

Exercises (Phase 1)


Codman Pendulum


Cane- Abduction


Posterior Capsule Stretch- Side Lying


Scapular Clocks

Exercises (Phase 2)


YTWL Scapular Depression


Low Row

Cane Flexion

Stand holding a cane in both hands with your arms hanging down in front of your thighs, palms facing your thighs. While keeping your elbows straight, slowly raise your arms in front of your body, overhead in a pain-free range of motion. Your “good arm” may need to help the involved side. Return to the start position and repeat three sets of 10 repetitions twice per day or as directed.

Codman Pendulum

Lean over a table using the uninvolved arm for support as shown. If directed, you may hold a light weight in your hand to increase traction. Allow the involved arm to hang freely. Use your torso to swing your involved arm in a clock-wise circle for 50 repetitions. Repeat in a counter-clockwise circle for 50 repetitions. Perform 50 repetitions in each direction twice per day or as directed.

Scapular Clock

Place your unaffected palm behind your head. Extend your affected arm directly sideways and place your palm on the wall at shoulder level. Begin with your fingers pointing upward, unless otherwise directed. Imagine that your shoulder blade is a clock and rhythmically elevate and depress your shoulder blade between 12 and 6 o’clock. Repeat 10 times. Next, move between 3 & 9 o’clock by rhythmically pinching your shoulder blade toward your spine, then moving it away. Repeat 10 times. Next, combine these movements to move your shoulder blade in a clockwise fashion, then counterclockwise 10 times each. Repeat twice per day or as directed.

Posterior Capsule Stretch Side Lying

Begin lying on your affected side with your elbow bent at 90 degrees. Stabilize your wrist on the affected side with your opposite hand. Attempt to gently push your wrist into the stabilizing hand for 7 seconds. Do not let the arm move during contraction. Relax and slowly let the affected arm drop towards the table until it cannot go any further. Repeat contract and relax stretching for 10 repetitions twice per day or as directed.

Surgery

Immediate surgical consultation is warranted in cases of suprascapular nerve compression from an associated paralabral cyst.

Cost-Benefit

- The literature fails to demonstrate success for surgically repairing type 2 SLAP lesions with co-existent rotator cuff tears in older patients (greater than 50).
- Surgeons may elect to perform debridement, suturing, or excision based upon the type of lesion.
- Surgical intervention should address concurrent shoulder pathology; i.e. rotator cuff lesions, degeneration, instability, etc.
- 4-6 month post-operative rehab.

Post Surgical Rehab

Dodson CC, Altchek DW. SLAP Lesions: An Update on Recognition and Treatment. JOSPT February 2009, Volume 39 Number 2

Thoracic Outlet Syndrome

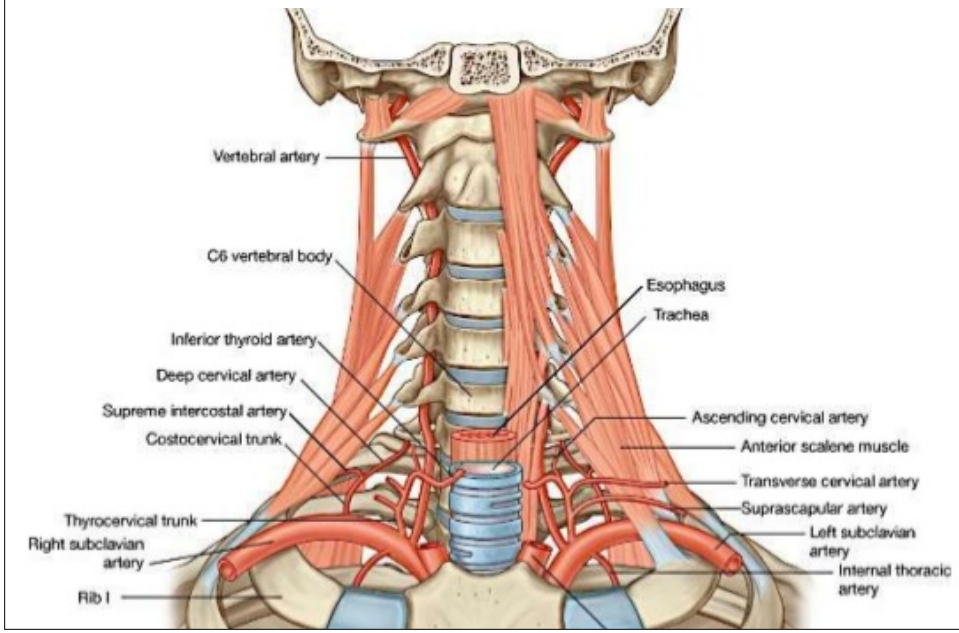
Thoracic Outlet Syndrome

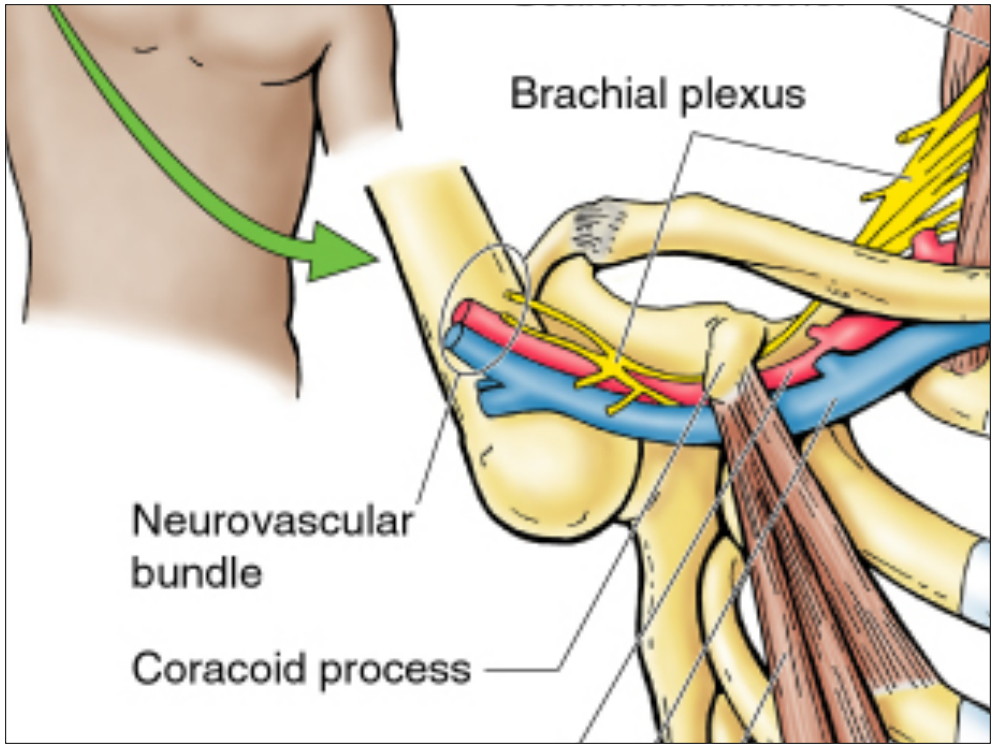
Edit

My Version | My Notes

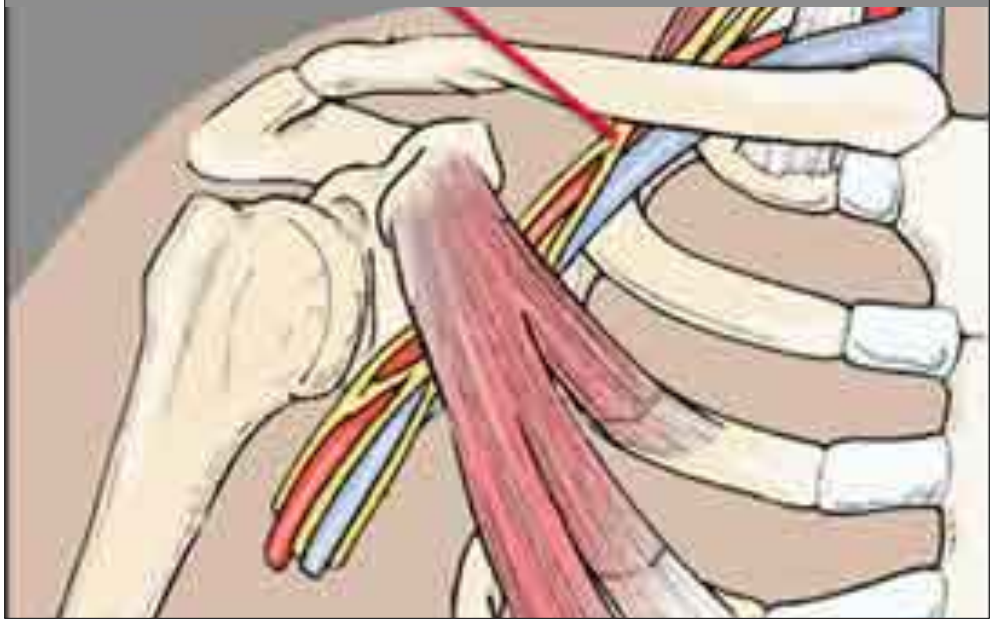
Evaluation	Management	Exercises (Phase 1)	Exercises (Phase 2)
Brachial Plexus Compression Test	STM- Scalenes	Cervical Retractions	Resisted Shoulder Retraction
Wrights Hyperabduction Test	STM- Pec Minor	Ulnar Nerve Floss	
Costoclavicular Test	Manipulation-Cervical and Thoracic	Scalene Stretch	
Cyriax Release Test	Manipulation-First Rib	Corner Pectoral Stretch	
	Nerve Floss- Ulnar		

Arterial TOS

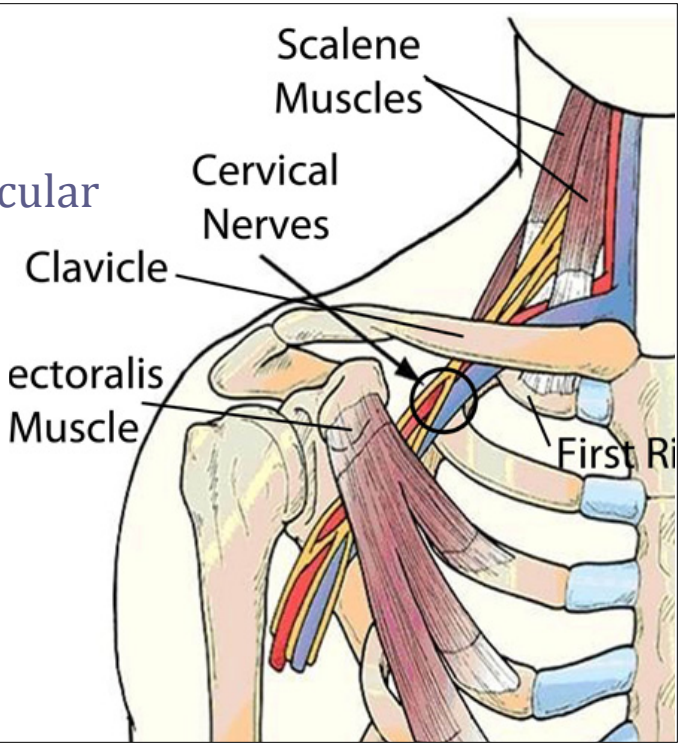


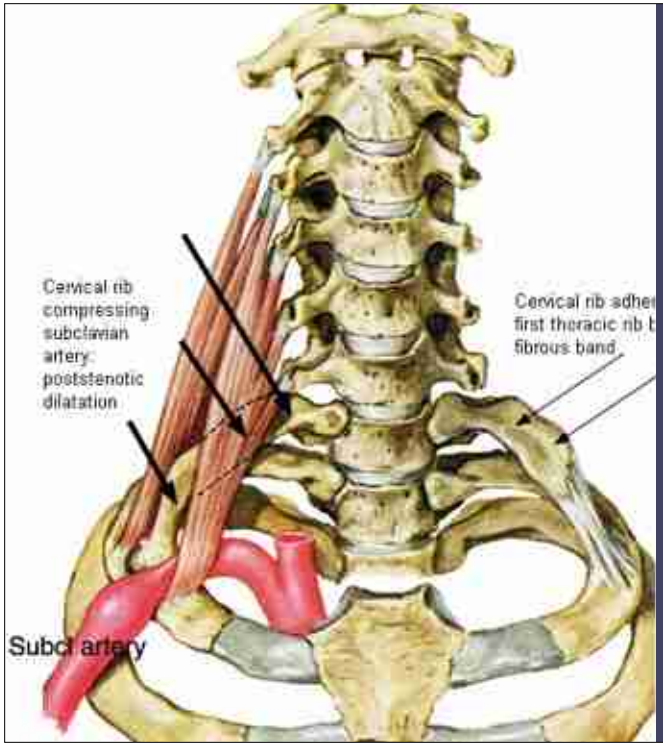


The Other 95%



1.) Scalene
2.) Pectoral
3.) Costoclavicular



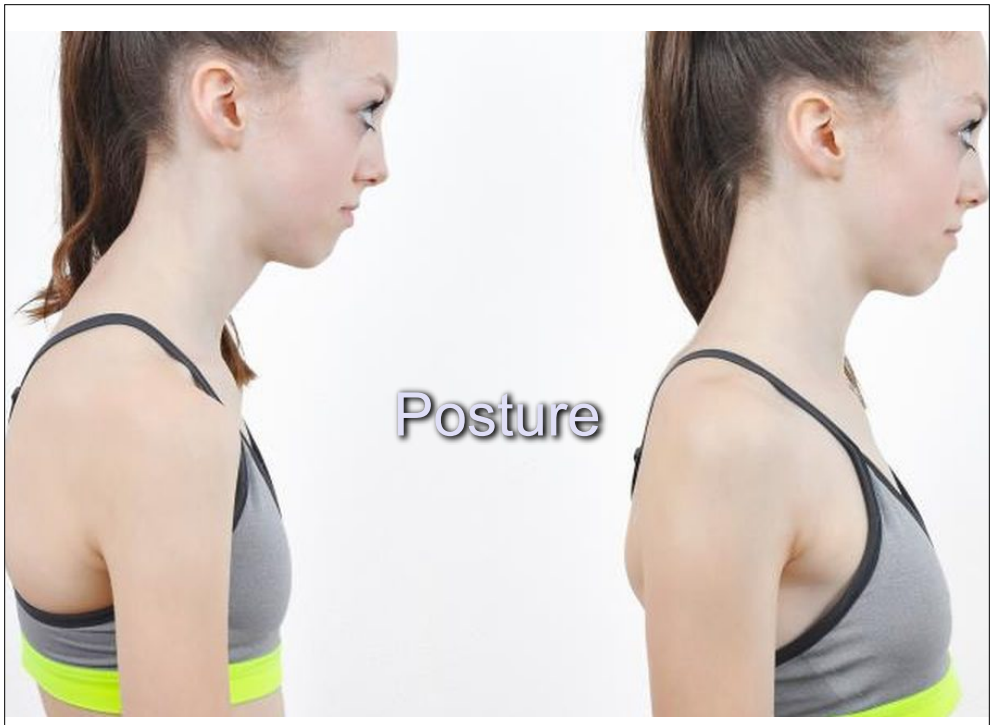


Cervical Rib??

<1% of the population

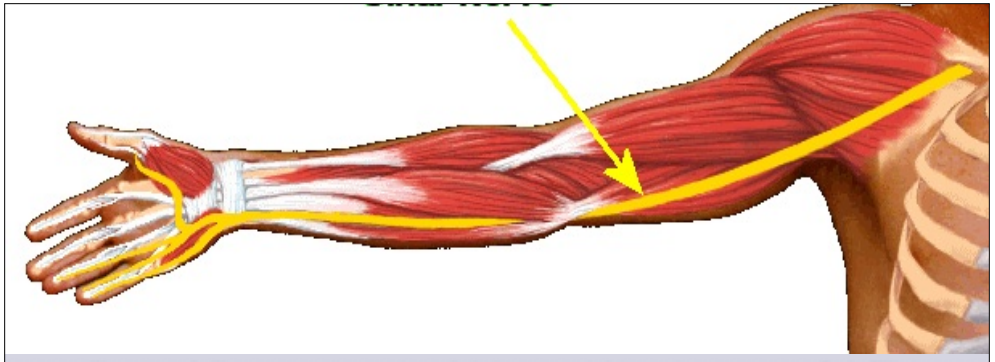
Bilateral in 80%

Injury

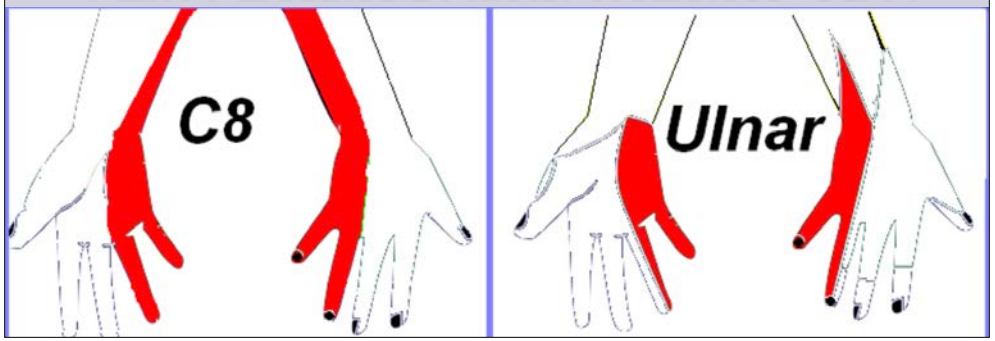


Etiology

- Ages of 20-60, with a peak incidence in the fourth decade
- More common in women with some estimates as high as 9:1.
- The shape of the chest, including traction from pendulous breasts is thought to promote "shoulder drooping" and ongoing downward pressure on the shoulder which further close the thoracic outlet.



Pain / Paresthesia / Motor Weakness C8/T1



diagnostics

MDPI

Article

Hand Strength Deficit in Patients with Neurogenic Thoracic Outlet Syndrome

Alban Fouasson-Chailloux [1,2,3,4,*], Pauline Daley [1,2], Pierre Menu [1,2,3,4], Bastien Louguet [2,3], Guillaume Gadbled [5], Yves Bouju [6], Pierre Abraham [7,8,9] and Marc Dauty [1,2,3,4]

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check for updates

Citation: Fouasson-Chailloux, A.; Daley, P.; Menu, P.; Louguet, B.; Gadbled, G.; Bouju, Y.; Abraham, P.; Dauty, M. Hand Strength Deficit in Patients with Neurogenic Thoracic Outlet Syndrome. *Diagnostics* **2021**, *11*, 874. https://doi.org/10.3390/diagnostics11050874

Academic Editor: Fabio Manfredini

Received: 26 April 2021
Accepted: 11 May 2021
Published: 13 May 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Abstract: Neurogenic thoracic outlet syndrome (NTOS) is a chronic painful and disabling condition. Patients complain about upper-limb paresthesia or weakness. Weakness has been considered one of the diagnostic criteria of NTOS, but objective comparisons to healthy controls are lacking. We compared the grip and the key pinch strengths between NTOS patients and healthy controls. Grip strength was evaluated with a hydraulic hand dynamometer and the key pinch with a pinch gauge. All the patients with NTOS completed a QuickDASH. We included prospectively 85 patients with NTOS, 73% female and 27% male. The mean age was 40.4 ± 9.6. They were compared to 85 healthy subjects, 77.6% female and 22.4% male. Concerning the grip, symptomatic hands of NTOS patients had significantly 30% less strength compared to control hands ($p \leq 0.001$), and 19% less strength compared to asymptomatic hands ($p = 0.03$). Concerning the key pinch, symptomatic hands of patients with NTOS had significantly 19.5% less strength compared to control hands ($p \leq 0.001$). Grip and key pinch strengths had a significant correlation with the QuickDASH ($r = -0.515$ and $r = -0.403$, respectively; $p \leq 0.001$). Patients with NTOS presented an objective hand strength deficit compared to healthy controls. This deficit was significantly correlated to the upper-limb disability. These findings confirm the interest of hand strength evaluation in the diagnostic process of patients with NTOS.

Keywords: thoracic outlet syndrome; neurogenic; strength; grip; key pinch

Evaluation

Thoracic Outlet Syndrome

Evaluation


Brachial Plexus...


Wrights Hyperab...


Costoclavicular.


Cyriax Release...

Medicine (Baltimore). 2019 Mar;98(11):e14778. doi: 10.1097/MD.0000000000014778.

Arterial thoracic outlet syndrome caused by cervical ribs-an unusual case report.

Jiang S[1], Shen H[1], Tan WQ[2], Lu H[1].

Author information

Abstract

RATIONALE: Cervical ribs are rare conditions, occurring in 0.05% to 3.0% of the population. This manuscript reports a case of arterial thoracic outlet syndrome (ATOS) associated with this congenital anomaly.

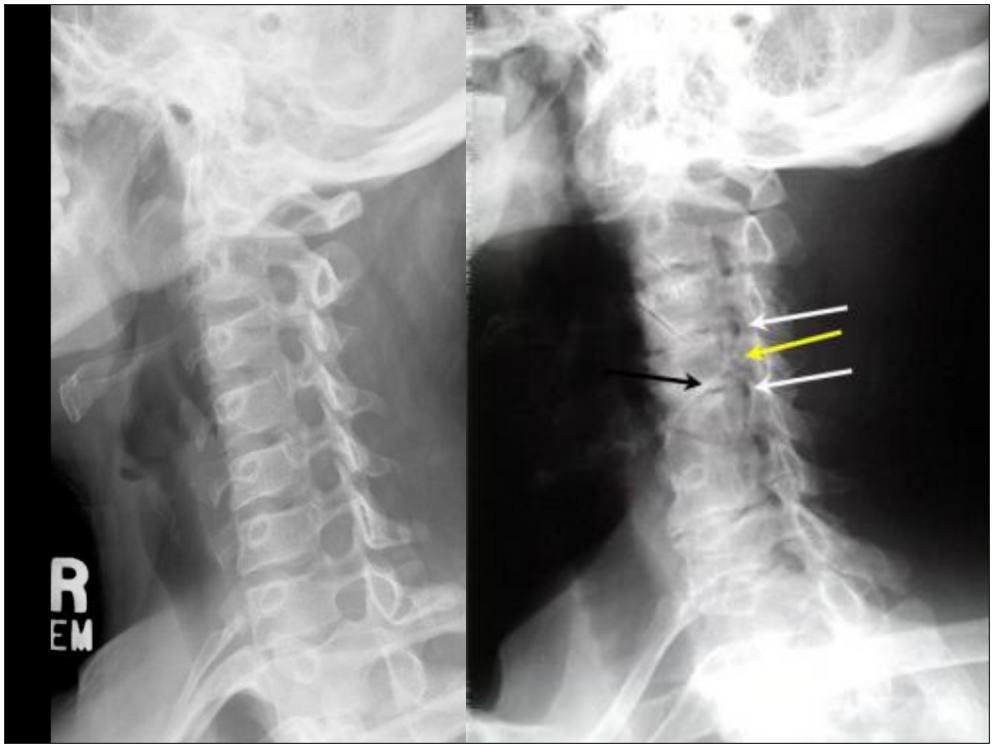
PATIENT CONCERNS: We report a 32-year-old female worker presenting pain in her left upper-extremity for 7 months. Her left hand became paler and cold when the temperature decreased, and the symptoms could not be eased through rest, physiotherapy and drugs medication.

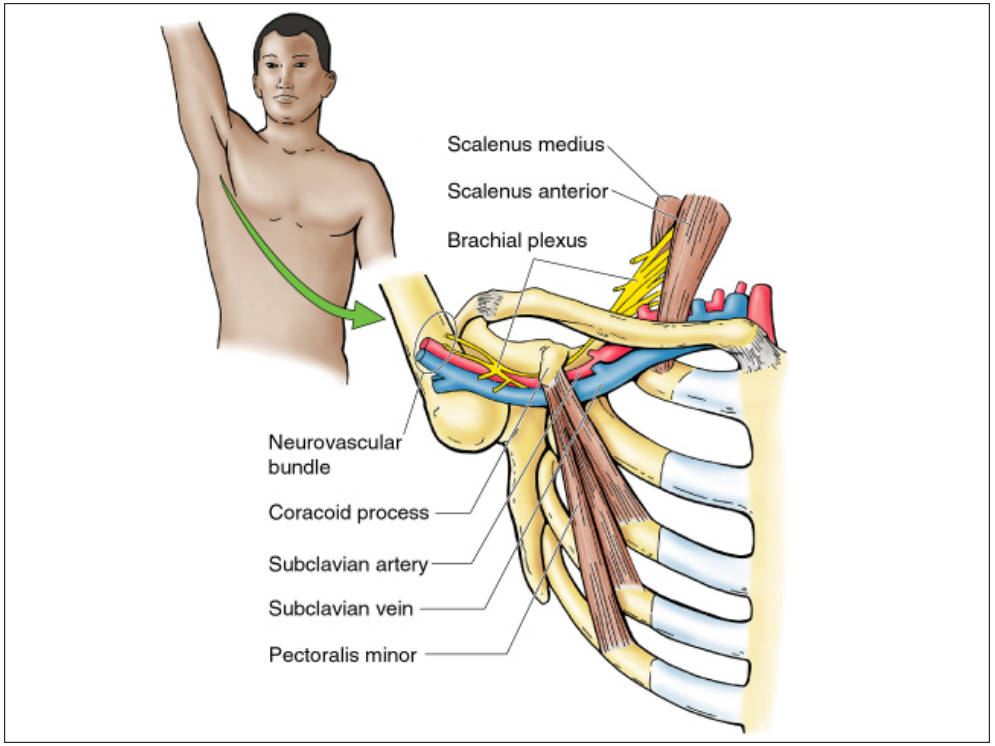
DIAGNOSES: Compression of left subclavian artery with axillary and brachial arteries thrombosis was confirmed by duplex ultrasound and computed tomography angiography. ATOS caused by cervical ribs was confirmed by medical history, physical examination, and imaging.

INTERVENTIONS: The patients underwent acute thrombolysis and balloon angioplasty.

OUTCOMES: Symptoms of pain and weakness disappeared after surgery. The patient had not experienced any apparent symptom recurrence at 1-year follow-up.

LESSONS: Successful treatment of ATOS depends upon urgent assessment, accurate identification of causative factors and compression site and early diagnosis before the event of arterial thrombosis. The surgery combined with anticoagulation treatment can improve the treatment outcome of ATOS.





Brachial Plexus Compression Test

Positive when deeper palpation of the supraclavicular fossa elicits distal symptoms. Positive in up to 68% of TOS patients. aka Morley test

Roos (EAST) Test

From a seated, “hands up” position, the patient repeatedly open and close hands with arms up. Test is positive for any form of TOS when symptoms are reproduced or the patient is unable to maintain this action for 3 minutes. aka Elevated Abduction Stress Test (EAST).

Cyriax Release Test

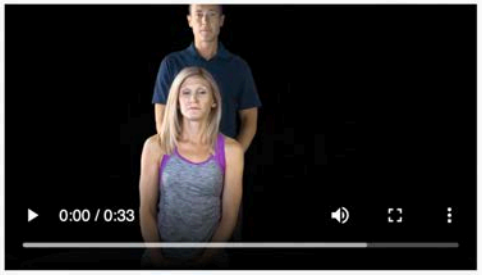
Edit

Regions

C, T

Description

The clinician stands behind the seated patient and grasps beneath both forearms, holding the elbows at 80 degrees of flexion with the forearms and wrists neutral. The clinician leans the patient's trunk posteriorly then passively elevates their shoulder girdles. This position is held for up to 3 minutes. A positive result includes either symptom reproduction or paresthesia secondary to a neurovascular release phenomenon.



Wright's Test

The clinician monitors the patients radial pulse while the seated patients arm is taken into in hyperabduction and external rotation. A positive test results in diminution of pulse intensity and reproduction of distal symptoms. Reproduction of TOS complaints implicates pectoral involvement. aka stress hyperabduction test.

Adson's Test

The clinician monitors the patients radial pulse while the seated patient rotates their head toward side to be tested, and performs cervical extension and shoulder external rotation with extension while patient takes a deep breath. A positive test results in diminution of pulse intensity and reproduction of distal symptoms. A positive test is suggestive of TOS from scalene involvement.

Costoclavicular Test

- Clinician monitors radial pulse while the patient is seated with shoulder in extension, chest in exaggerated military posture. This maneuver is believed to compress the costoclavicular space. A positive test results in diminution of pulse intensity and reproduction of distal symptoms.

Ulnar Nerve Tension Test

The patient begins in a supine position with their arm at their side. The clinician flexes the patient's elbow to 90 degrees and extends their wrist. The clinician then pronates the patients extended wrist and further flexes the elbow so that the patient's finger tips are touching their shoulder. Next, the clinician (may need to switch hands) stabilizes the top of the supine patients shoulder and fingers with one hand, while the other hand externally rotates the patient's arm (wrist crease moves from pointing up, to pointing sideways). Finally the patient's shoulder is abducted. If complaints are reproduced, the clinician may have the patient ipsilaterally flex their neck to remove nerve tension (helping to differentiate between nerve irritation vs (non-neural) irritation of neighboring soft tissues.

Differential

In addition to the aforementioned vascular pathology, considerations for the differential diagnosis of TOS include: cervical radiculopathy, peripheral nerve entrapment, carpal tunnel syndrome, cubital tunnel syndrome, lateral or medial epicondylitis, complex regional pain syndrome, pancoast tumor with possible Horners syndrome (ptosis, miosis, anhidrosis), Raynauds disease, brachial plexus trauma, subclavian steal (brain ischemia post arm use), and somatovisceral referral from esophageal or cardiac pathology.

Management

STM- Scalenes

STM- Pec Minor

Nerve Floss- Ul...

Ulnar Nerve Floss

The ulnar nerve provides sensation to the medial forearm and 4th/5th digits. Adhesions along the course of the nerve may develop secondary to any traumatic or inflammatory process. "Nerve flossing" may help release adhesions and restore normal neurodynamics. Ulnar nerve flossing is performed by laying supine with the shoulder elevated and elbow extended. The patient is asked to slowly depress the shoulder and internally rotate their arm with fingers and wrist in extension. The arm is externally rotated and passively stretched into elbow flexion. The shoulder is then abducted and flexed. Flossing motions should not create or intensify any radicular complaints. The flossing pattern should be repeated 10 times, from the starting position to the end position. The patients may benefit by continuing self-flossing exercises at home.

Exercises

Phase I


Cervical Retrac...


Ulnar Nerve Flo...


Scalene Stretch

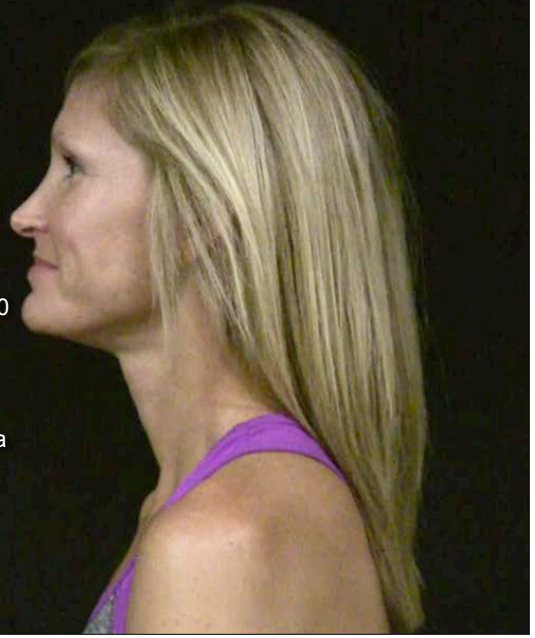

Corner Pectoral...

Phase II


Resisted Should...

Cervical Retractions

Sit or stand looking forward with good posture. Tuck your chin to create a double chin. Hold this position for 3-5 seconds. Return to the starting position. Focus your vision on a spot on the wall to avoid neck flexion or extension. To progress, place a finger on your chin, and apply backwards pressure at end range. Imagine that your head is on drawer slides. Keep your mouth closed. Perform 1 set of 10 repetitions 3-10 times per day. Alternately, this exercise may be performed standing with your back against a wall. Your buttocks and shoulder blades should be in contact with the wall. Tuck your chin to make a “double chin” until the base of your skull contacts the wall, relax and repeat as directed.

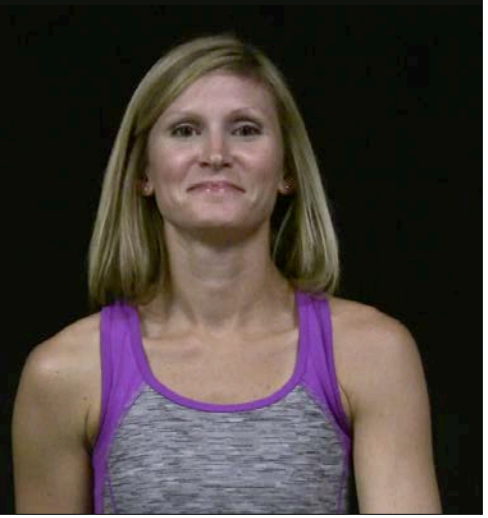


Ulnar Nerve Floss

Hold your arm in front of you with your elbow, wrist, and fingers straight as though you are getting ready to shake hands. Touch the tips of your thumb and first finger together to make a ring. Slowly flex your elbow until your hand reaches your face. The ring position should be maintained and your forefinger should be just beneath your eye socket. Slowly raise your elbow to flip the ring up into a “monacle” around your eye. Lower your arm back to the starting position and repeat 10 repetitions three times per day or as directed.

Scalene Stretch

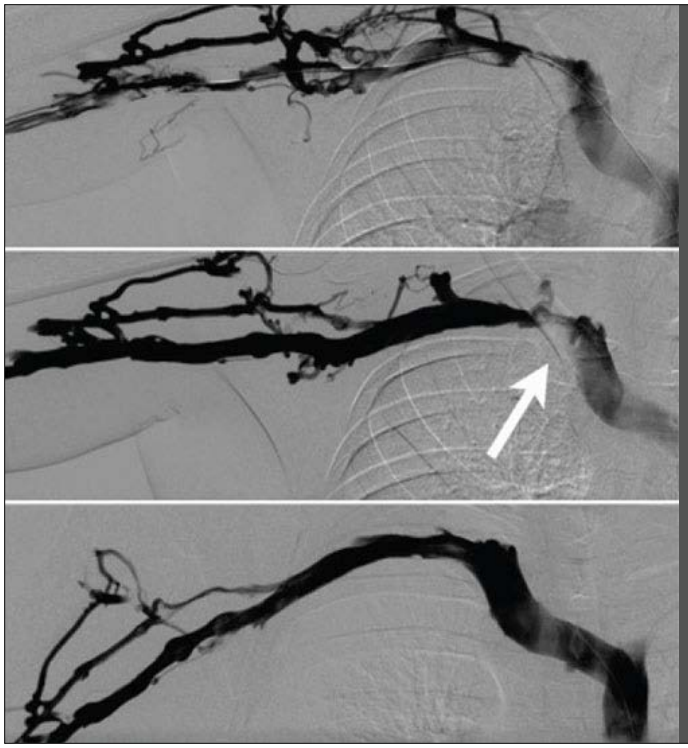
While sitting or standing, reach down with your right arm, grasping your thigh or the bottom of a chair for stability. While looking straight ahead, place your left hand on top of your head, and gently pull your head sideways toward the left. Against the resistance of your hand, attempt to laterally flex your right ear toward your right shoulder for seven seconds. Relax and stretch further toward the left. “Lock in” to each new position, and do not allow any slack. Repeat three contract/relax cycles on each side twice per day or as directed.



Corner Pectoral Stretch

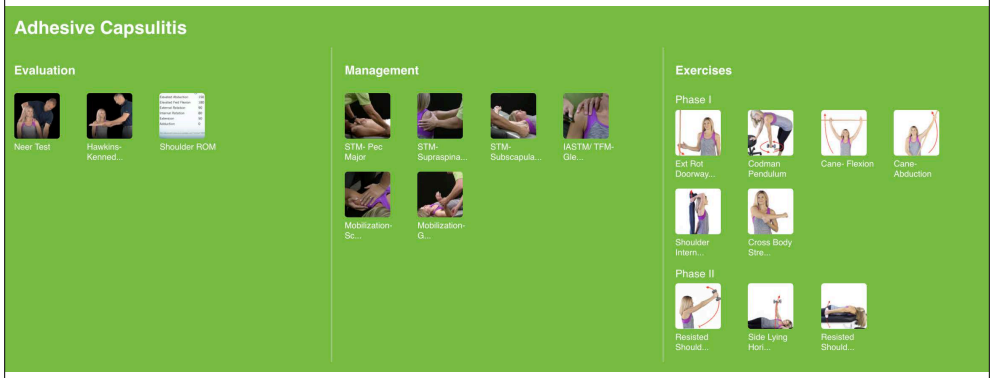
Begin standing, facing a corner with your palms on the walls above head level. Step toward the corner and “lean in” to stretch your chest muscles. Against the resistance of the wall, attempt to push your hands into the wall and toward each other for 7 seconds. Relax and “lean in” to increase the stretch. Lock into this new position and repeat 3 contract/ relax cycles, twice per day or as directed.

Are you attacking all possible causes of compression on the brachial plexus.



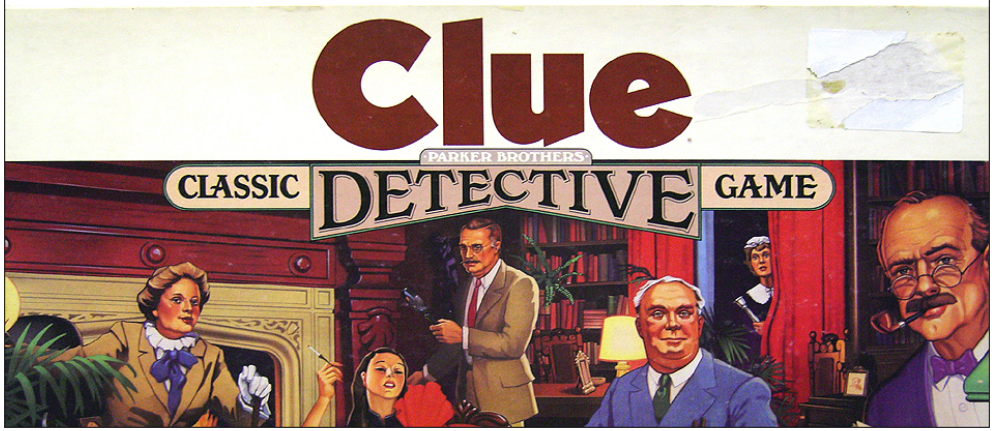
Surgery

Adhesive Capsulitis



Primary Adhesive Capsulitis

Patients with "primary" adhesive capsulitis are unable to identify the genesis of their condition.



Secondary Adhesive Capsulitis

Follows a period of restricted shoulder motion

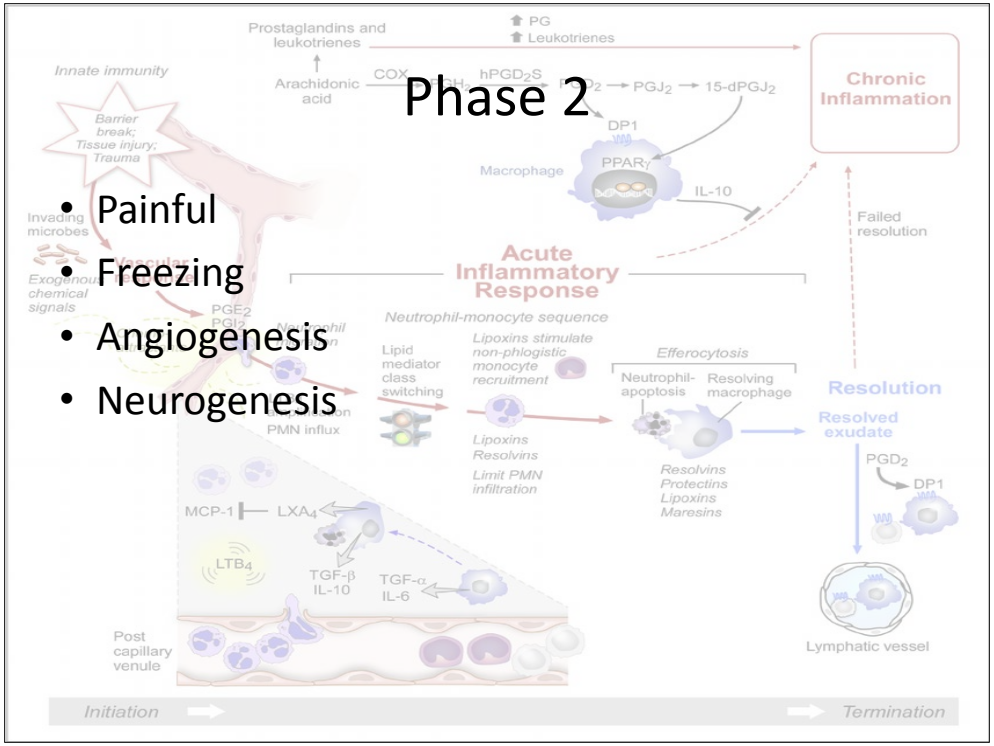
- Rotator cuff pathology
- Trauma
- Surgery

Phase 1

Pre-Cursor Phase

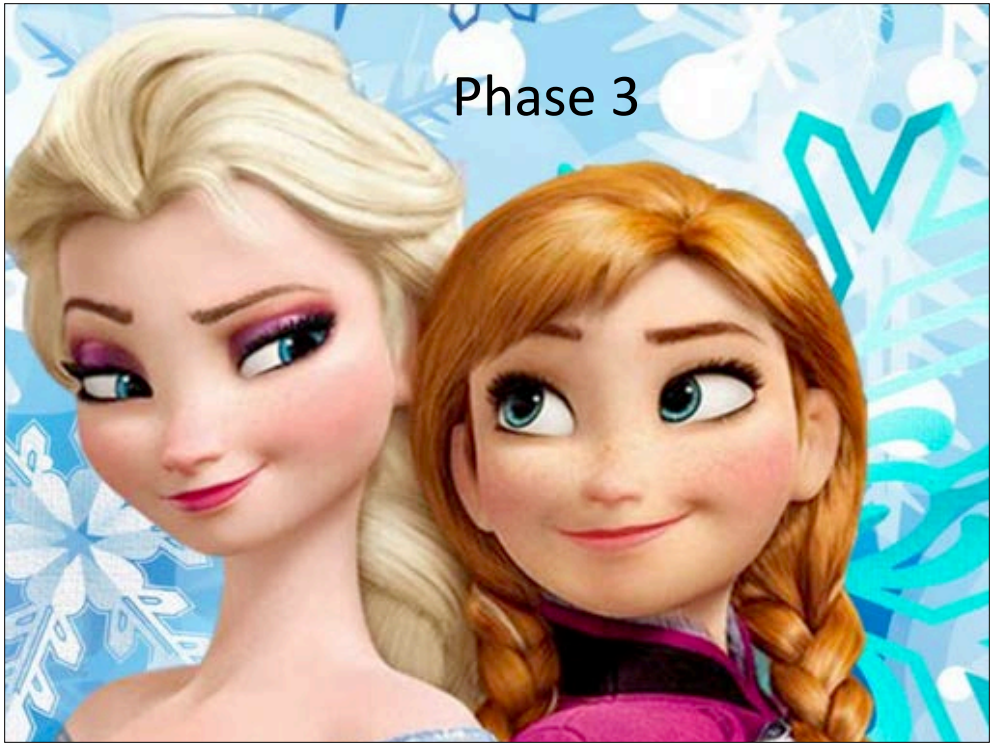
- Internal Rotation—SAIS, Supra, TM, Infra
- External Rotation—Capsule and Subscapularis
  - At 0 degrees: subscapularis
  - >45 degrees: capsule

Phase 2



- Painful
- Freezing
- Angiogenesis
- Neurogenesis

Phase 3



Phase 4

"Thawing"

Associated with progressively decreasing pain and stiffness.

Incidence

2-5% population

10-20% Type 1 Diabetes

36% Type 2 Diabetes

Thyroid Disease

Incidence

Peak Incidence 40-65 yro

Females

Greater risk if prior episode in contralateral arm

Symptoms

- Sleep disturbances are common.
- Functional range of motion deficits limit reaching overhead, behind the back, or to the side.
- Difficulty grooming and dressing.
- Symptoms have generally progressed or plateaued for at least one month prior to presentation.

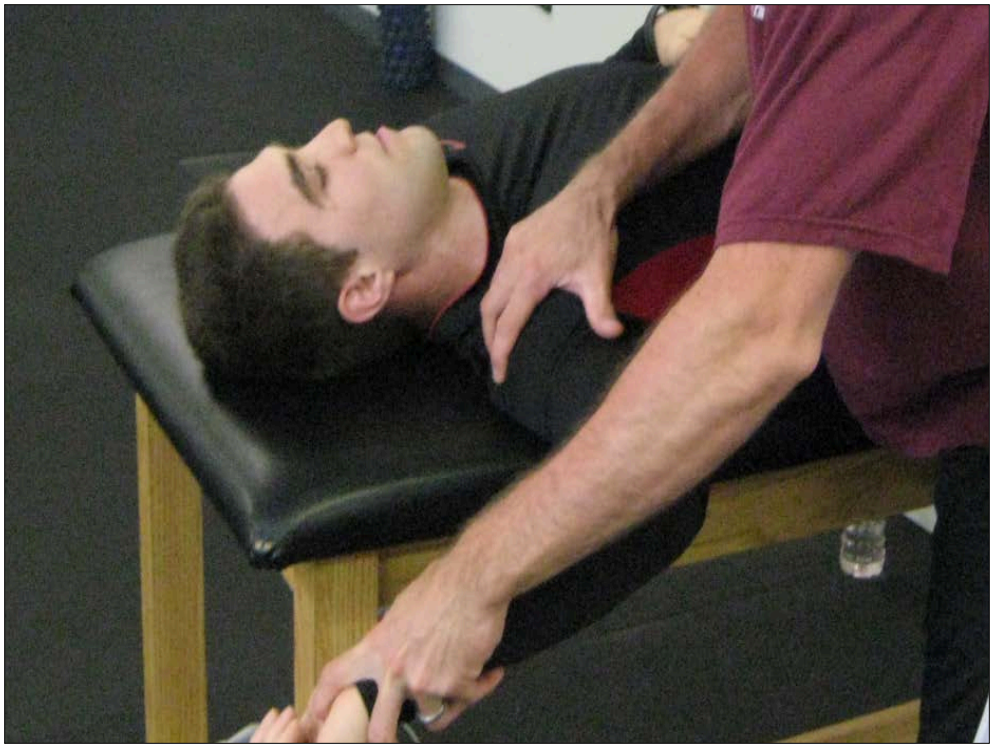
Adhesive Capsulitis

Evaluation

Neer Test

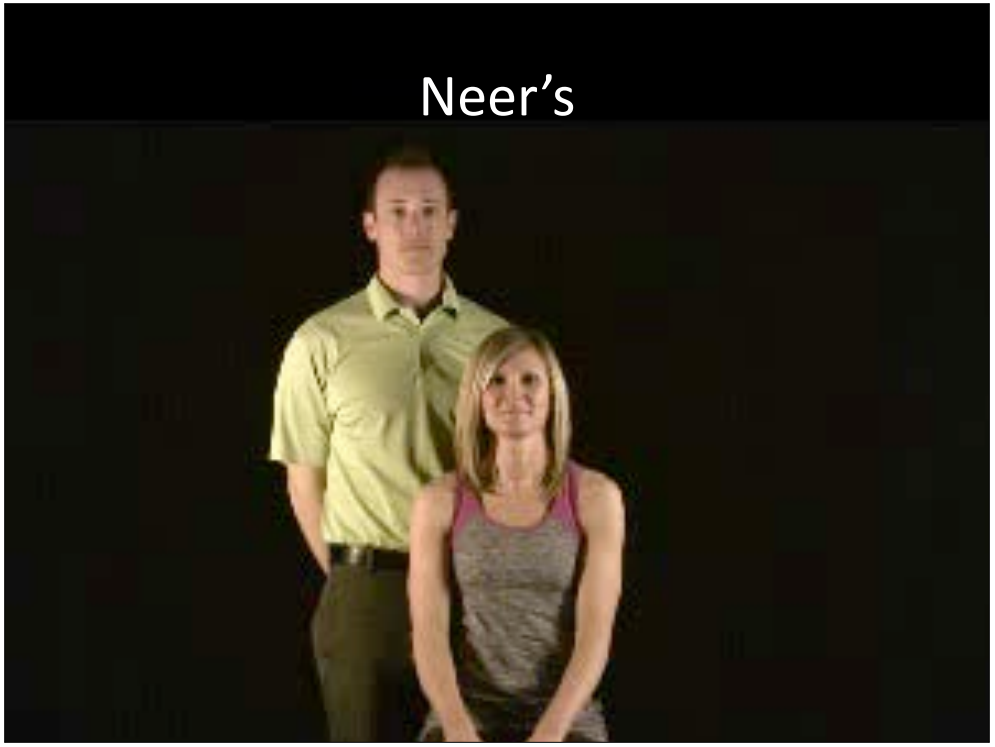
Hawkins-Kenned...

Shoulder ROM

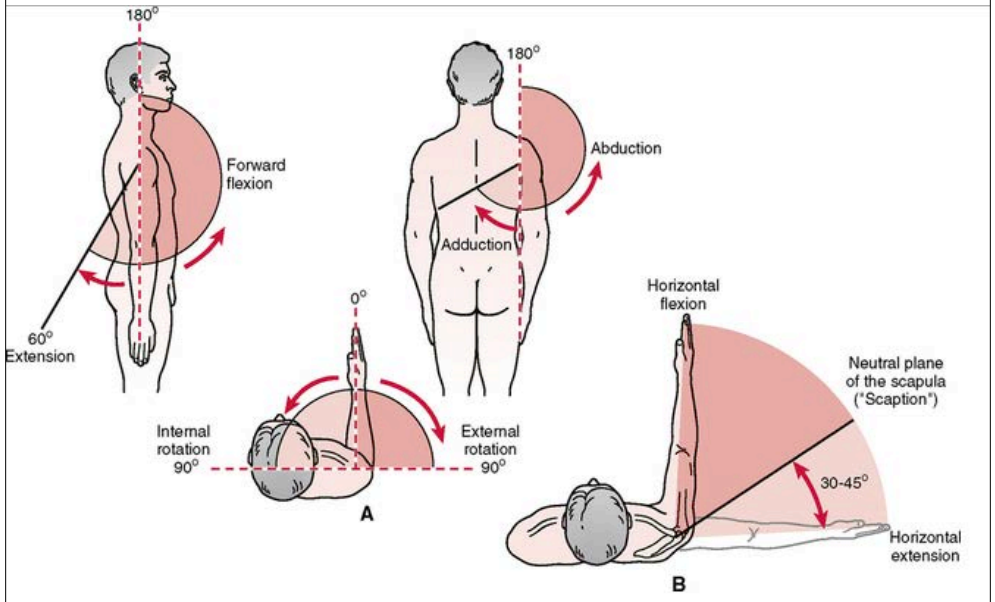


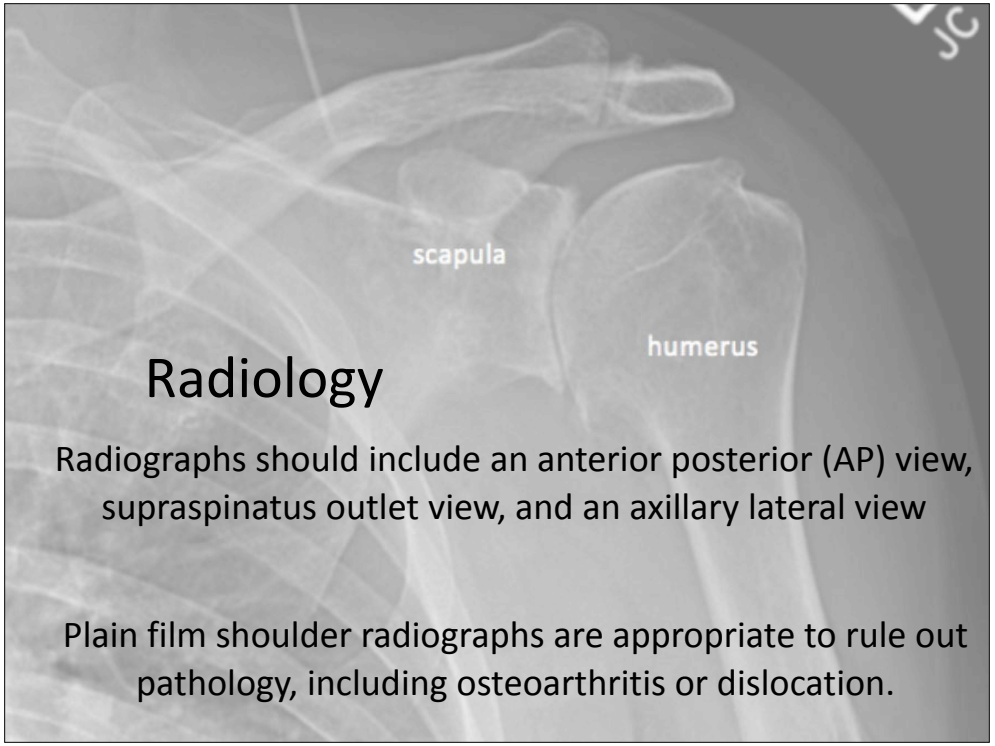
Hawkin’s Kennedy

Neer’s



Shoulder ROM

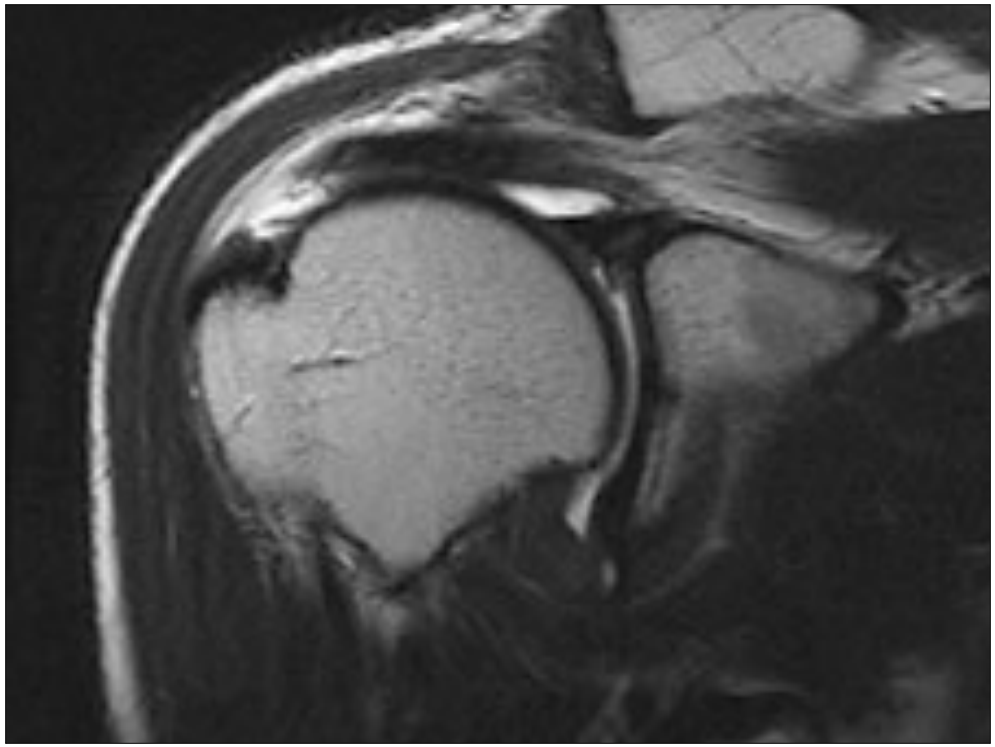


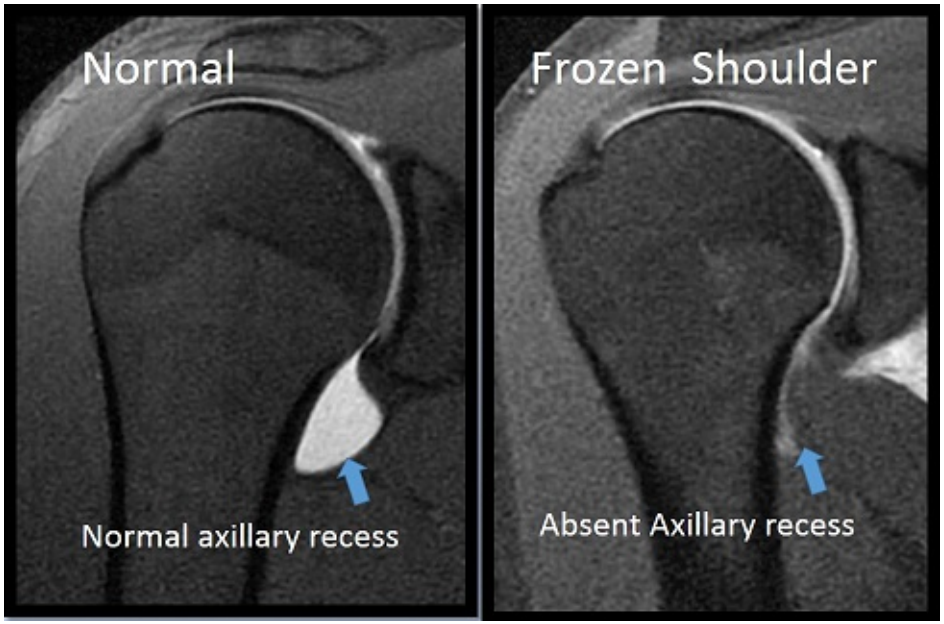


Radiology

Radiographs should include an anterior posterior (AP) view, supraspinatus outlet view, and an axillary lateral view

Plain film shoulder radiographs are appropriate to rule out pathology, including osteoarthritis or dislocation.





What Else Can Cause Shoulder Pain and Restriction to ROM

fracture, infection, neoplasm, calcific tendinits, bursitis, ***cervical radiculopathy***, fibromyalgia, shoulder impingement, rotator cuff pathology, osteoarthritis, systemic arthropathy, sprain/ strain, and referred scleratogenous pain- particularly from the cardiac or digestive systems.

Management


STM- Pec Major


STM- Supraspina...


STM- Subscapula...


IASTM/ TFM- Gle...


Mobilization- Sc...

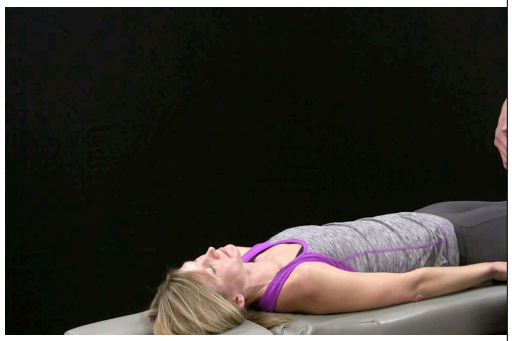

Mobilization- G...

IASTM- GlenoHumeral Capsule

The glenohumeral capsule and ligaments connect the humeral head to the scapular glenoid. IASTM/ TFM may be utilized over the ligaments as a means of releasing adhesions and improving blood flow. Position the patient to best expose the affected ligament. The ligament may be worked along the orientation of the fibers and in a cross friction (strumming) fashion to stimulate a healing response of injured or disorganized tissue. Areas of scar tissue or abnormal tissue density should be worked for 1-3 minutes.

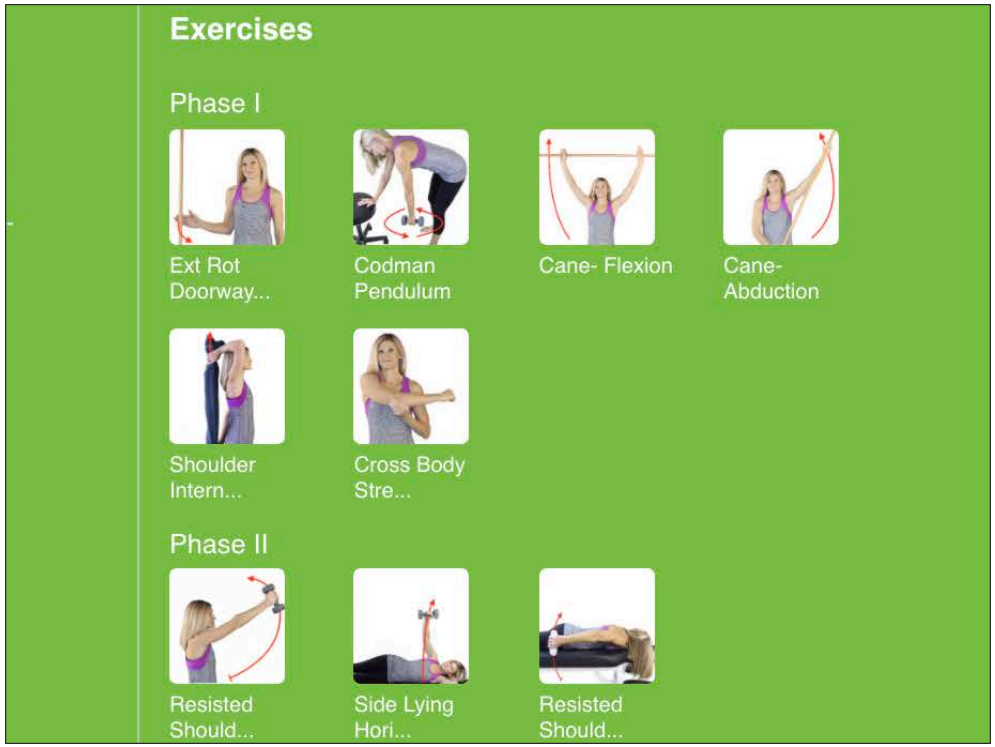
GH Mobilization

Anterior, posterior, and inferior glide mobilizations performed at the end range of abduction



Mobilization Scapula

The patient is prone. The clinician supports the patients abducted and relaxed arm and stabilizes the shoulder. Scapular mobilization is performed by grasping the patient's scapula and progressively moving it superiorally, inferiorally, and laterally, to include movements of rotation and distraction from the thorax.



External Rotation Stretch

Stand at the edge of a doorway or near a wall. Begin with your arms at your side and your elbows bent at 90 degrees. Place the affected hand/wrist on the doorframe or wall and slowly turn away until you feel a gentle stretch. Against the resistance of the doorframe, rotate your arm towards your body for seven seconds. Relax and slowly rotate your body away from the doorframe to increase the stretch. Keep your elbow tucked into your side throughout this exercise. Perform three contract/relax cycles on each side twice per day or as directed.

Abduction w/ Cane

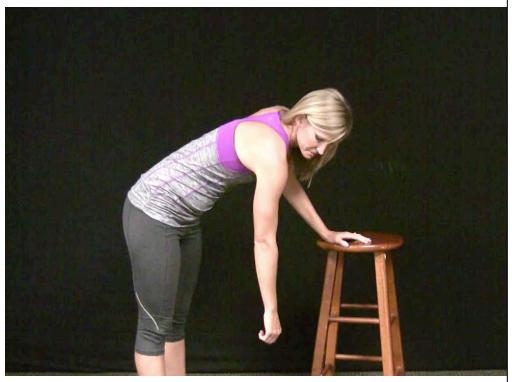
Begin standing holding a cane in front of your hips with your arms at your sides. Your involved arm should be grasping the cane palm out, and the uninvolved arm grasping the cane palm facing your thigh. Keeping your elbows straight, use the uninvolved arm to slowly push the involved side away from your body and upward as far as is comfortable. Return to the starting position and perform three sets of 10 repetitions twice per day or as directed.

Flexion w/ Cane

Stand holding a cane in both hands with your arms hanging down in front of your thighs, palms facing your thighs. While keeping your elbows straight, slowly raise your arms in front of your body, overhead in a pain-free range of motion. Your "good arm" may need to help the involved side. Return to the start position and repeat three sets of 10 repetitions twice per day or as directed.

Codman Pendulum

Lean over a table using the uninvolved arm for support as shown. If directed, you may hold a light weight in your hand to increase traction. Allow the involved arm to hang freely. Use your torso to swing your involved arm in a clock-wise circle for 50 repetitions. Repeat in a counter-clockwise circle for 50 repetitions. Perform 50 repetitions in each direction twice per day or as directed.



Shoulder Internal Rotation

While standing, place your involved arm behind your back at waist level. Place your uninvolved hand behind your head and grasp a towel between your hands. Leading with your top arm, pull the towel up until you feel a stretch in your involved shoulder. Gradually increase the stretch over the period of one minute. Perform this stretch twice per day. *This stretch may alternately be performed as a contract/relax stretch by gently pulling downward on the towel with your involved arm against the steady resistance of your other arm for seven seconds. Relax and gently pull the towel upward with your top arm to increase the stretch in your shoulder. "Lock in" to each new position and repeat three contract/relax cycles twice per day or as directed.

Cross Body Stretch

While sitting or standing, bring your involved arm across the front of your upper chest as shown in the picture. Hold the affected elbow with your uninvolved arm and gently pull across your chest until a stretch is felt in the back of your shoulder. Relax and stretch the arm further across your body. Repeat three stretches, twice per day or as directed.

Lateral Epicondylopathy

Article

PanAfrican Medical Journal

Research

Profil épidémiologique des épicondylites latérales en milieu de rééducation

Mouna Sghir, Takieddine Elhersi, Anouer Abdallah, Aymen Haj Salah, Nadia El Khemiri, Nabil Dammak, Wassia Kessomtini

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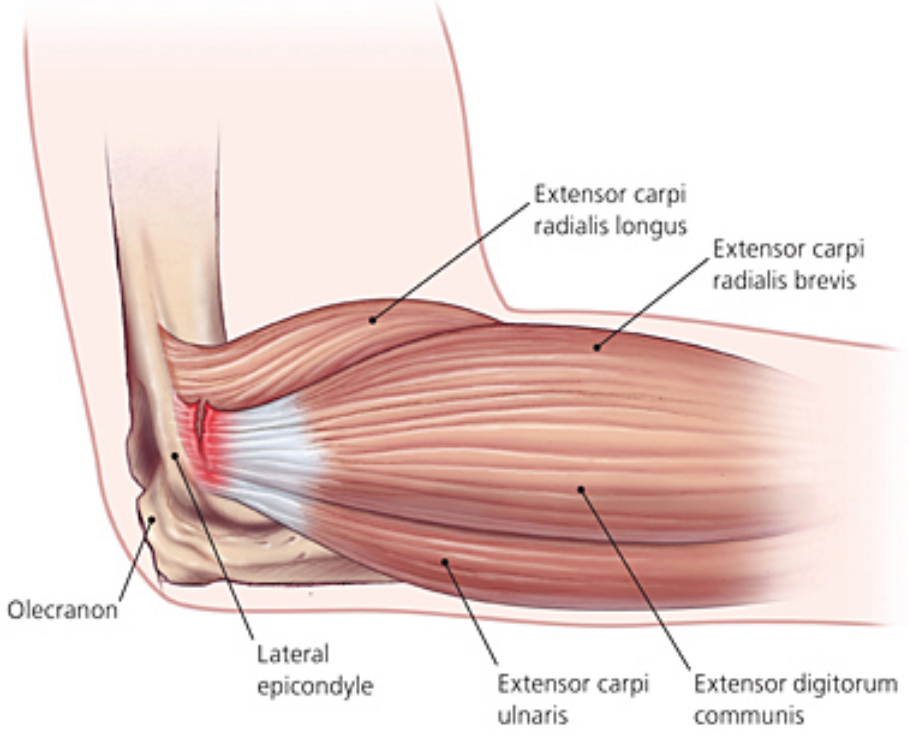
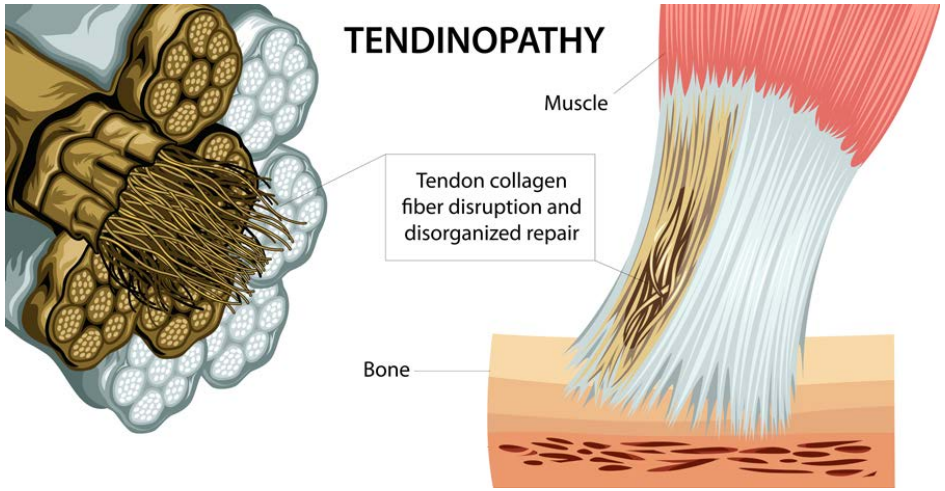
Received: 26 Dec 2019 - **Accepted:** 23 Jun 2020 - **Published:** 11 Aug 2020

Keywords: Epicondylite latérale, épidémiologie, rééducation fonctionnelle

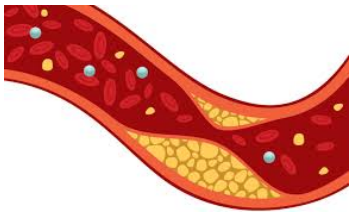
Lateral epicondylitis is a common cause of elbow pain. Its management in physical medicine is based on medical treatment and appropriate functional rehabilitation. However no therapeutic option seems clearly superior to the other.



- Affects between 1 and 3% of the population each year.
- Occurs predominantly in the fourth or fifth decade
- Affects men and women equally.
- Strikes the dominant arm in 75% of cases.
- Average of 12 weeks disability in up to 30% of those workers affected



"The present findings suggest a potential association between high total cholesterol levels and lateral epicondylopathy."



Lee SH, Gong HS, Kim S, Kim J, Baek GH. Is There a Relation Between Lateral Epicondylitis and Total Cholesterol Levels?. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2019 May 1;35(5):1379-84.

"Obesity is associated with a higher risk of tendinopathy, tendon tear and rupture, and complications after tendon surgery than non-obesity."

Medial epicondylitis: odds ratio (OR) 1.9
Achilles tendinopathy: OR 3.81
Patellar tendinopathy: OR 1.10
Plantar fasciitis: OR 2.97
Rotator cuff tendinopathy: OR 1.25
Rotator cuff tear: OR 2.35

Macchi M, Spezia M, Elli S, Schiaffini G, Chisari E. Obesity Increases the Risk of Tendinopathy, Tendon Tear and Rupture, and Postoperative Complications: A Systematic Review of Clinical Studies. A Publication of The Association of Bone and Joint Surgeons® | CORR®. 2020 Apr 14.

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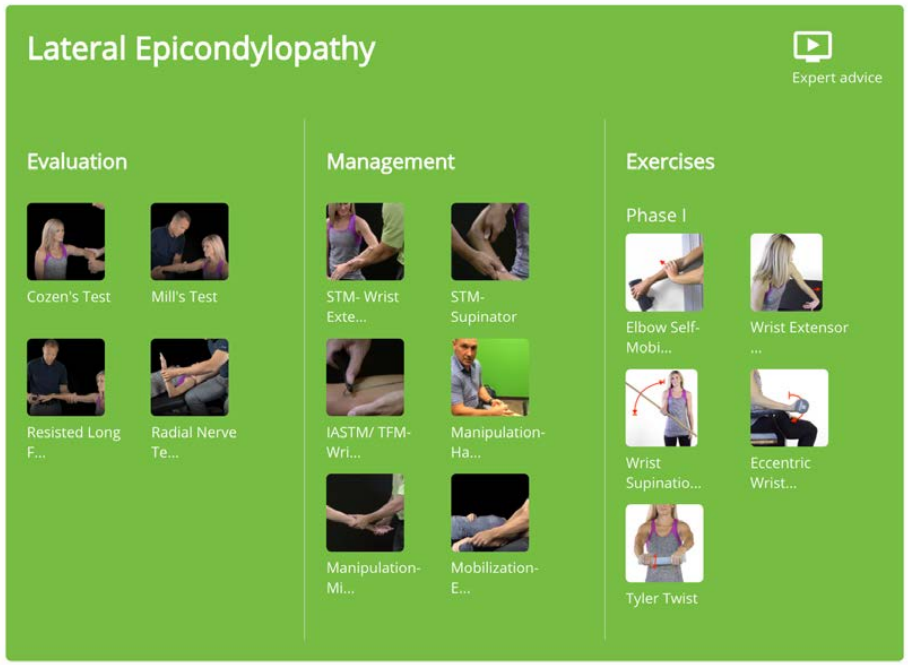
Symptoms

- Begin **insidiously** following overuse-type activity
- **Localized pain** over the lateral aspect of the elbow
- Provoked by activities that involve gripping and/or **wrist extension**.
- Pain may vary from mild to sharp severe pain
- Rest may provide relief



Problem #	Elbow R L	Initial Eval	Re-Exam 1	Re-Exam 2	Re-Exam 3
	Date				
	VAS				
	DASH				
	% Subjective Improvement				
	Subjective Complaints				
	ROM				
	Flexion / 160				
	Extension / 0				
	Pronation / 90				
	Supination / 90				
	Wrist Flexion / 90				
	Wrist Extension (elb flex) / 70				
	Wrist Extension (elb ext) / 70				
	Orthopedic				
Med. Epi	Golfer's Elbow Test				
Lateral Epi	Cozen's Test				
	Mill's Test				
Radial Tunnel	Resisted Long Finger Extension				
	Radial Nerve Test				
	Resisted F-oarm Compression				
	Radial Tunnel Compression				
Cubital Tunnel	Ulnar Nerve Test				
	Tinel's Sign				
Pronator Teres	Median Nerve Test				
	Pronator Compression Test				
	Pronator Teres Syndrome Test				
	Regional Eval				
	Cervical				
	Shoulder				
	Neurologic				
	Dermatomes				
	Myotomes				
	Reflex				
	Mensuration				
	Palpation				
	Trigger Points & Tenderness				
	Joint Restriction				
	Posture & Function ☐ Upper Crossed Syndrome ☐ Scapular Dyskinesis ☐ Breathing Evaluation				
	Plan	O R R S	O R R S	O R R S	O R R S
	Treatments	/ Visits	/ Visits	/ Visits	/ Visits
	Time Frame	weeks	weeks	weeks	weeks
	Treatment Outcome Goal	%	%	%	%

Q:

PT:

PJ:

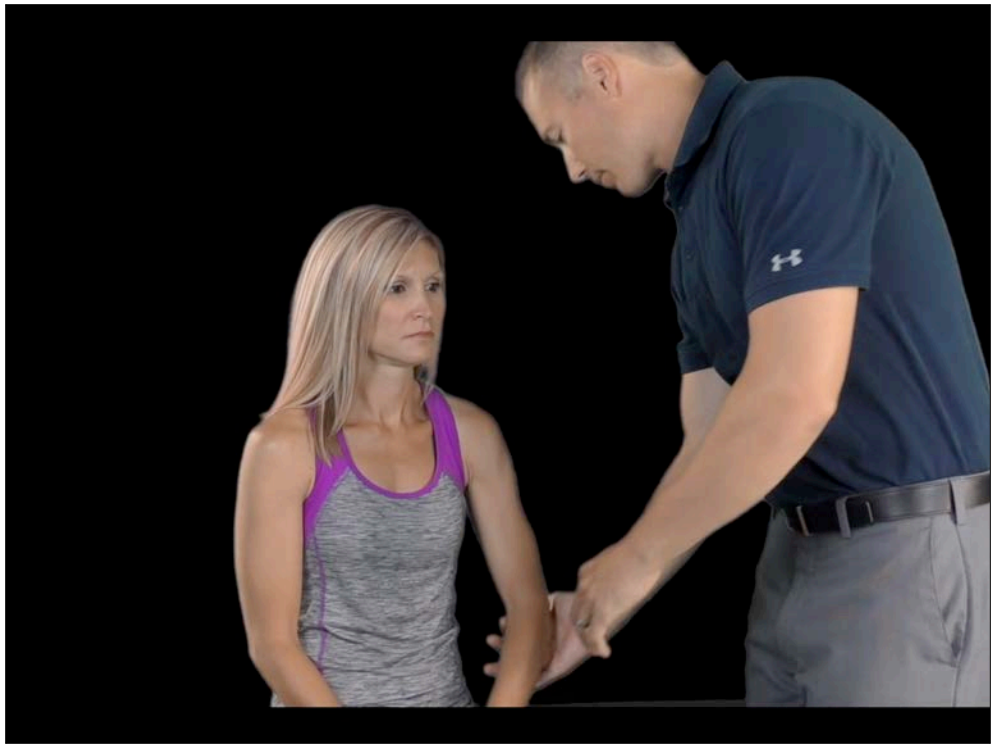
Q:

Dx:

Comments:

Cozens Test

The seated patient partially extends their arm, with their wrist pronated and slightly radially deviated, fingers closed into a fist. The clinician stabilizes the elbow with one hand while the patient extends their wrist against resistance. Reproduction of symptoms suggests lateral epicondyle involvement.

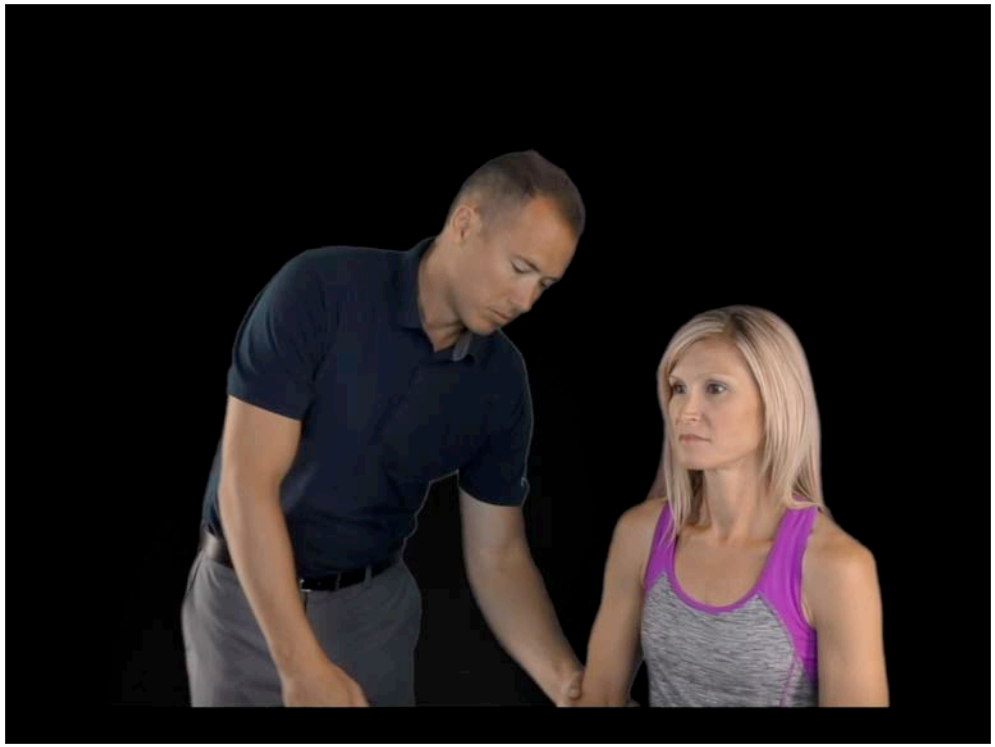


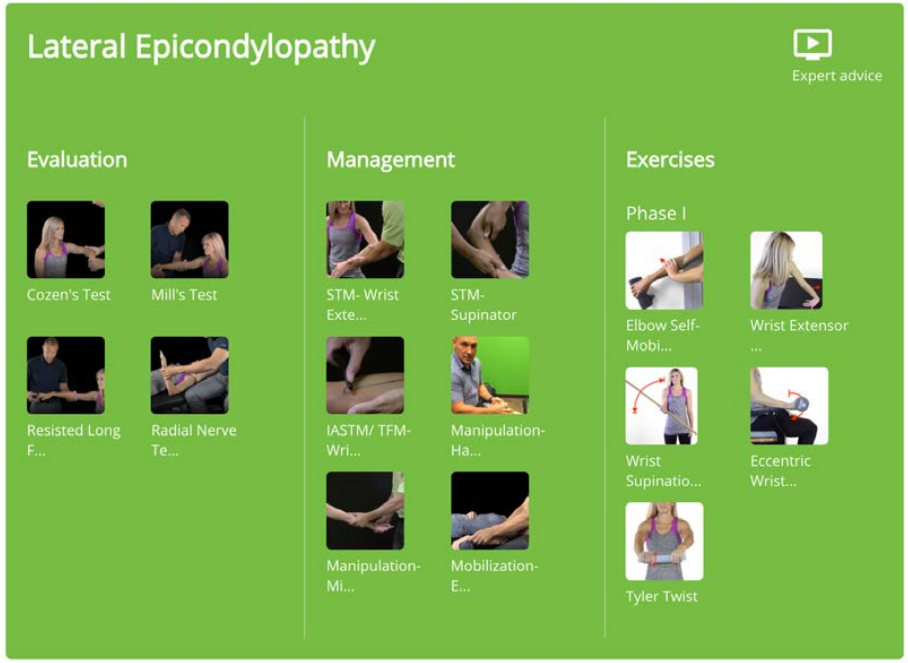
Mills Test

The patient is seated with their arm fully extended. The clinician passively flexes the wrist and applies radial deviation to fully stretch the wrist extensors. Reproduction of pain suggests wrist extensor or lateral epicondyle involvement.

Resisted Middle Finger Extension

With the patient's forearm and fingers extended, the examiner resists middle finger extension. Reproduction of radial nerve pain during this test suggests compression of the radial nerve by the extensor carpi radialis brevis. This test may also be positive in lateral epicondylitis but radial tunnel irritation is the likely diagnosis when this test is more painful than passively flexing the fingers and wrist of an extended elbow. aka Middle Finger Sign.





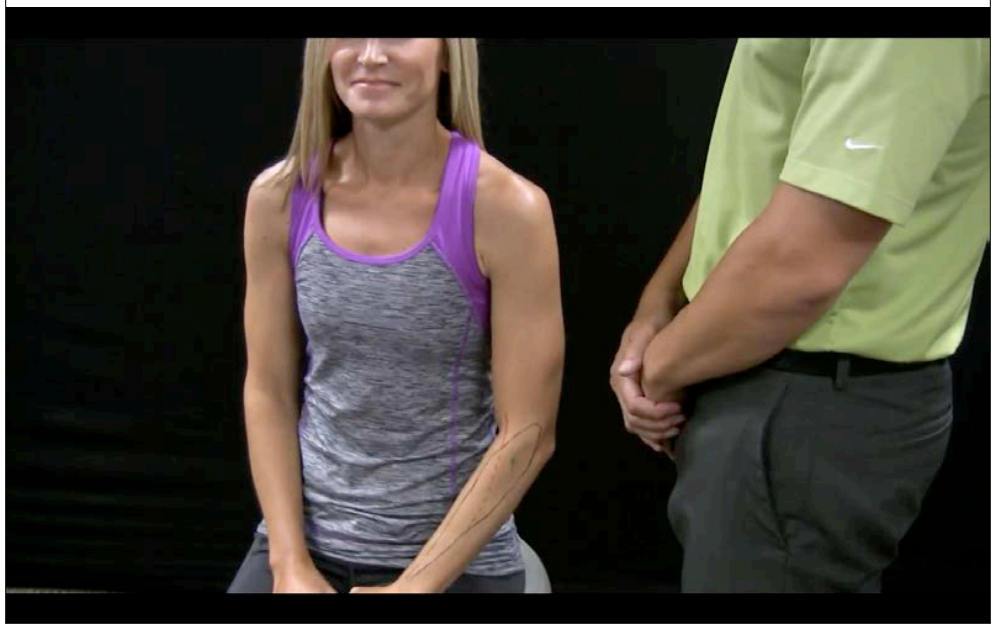
"Shockwave therapy significantly reduced the pain that accompanies tendinopathies and improves functionality and quality of life. It might be first choice because of its effectiveness and safety."

Dedes V, Stergioulas A, Kipreos G, Dede AM, Mitseas A, Panoutsopoulos GI. Effectiveness and Safety of Shockwave Therapy in Tendinopathies. Mater Sociomed. 2018 Jun;30(2):131-146. doi: 10.5455/msm.2018.30.141-146.

IASTM- Wrist Extensors

STM - Supinator

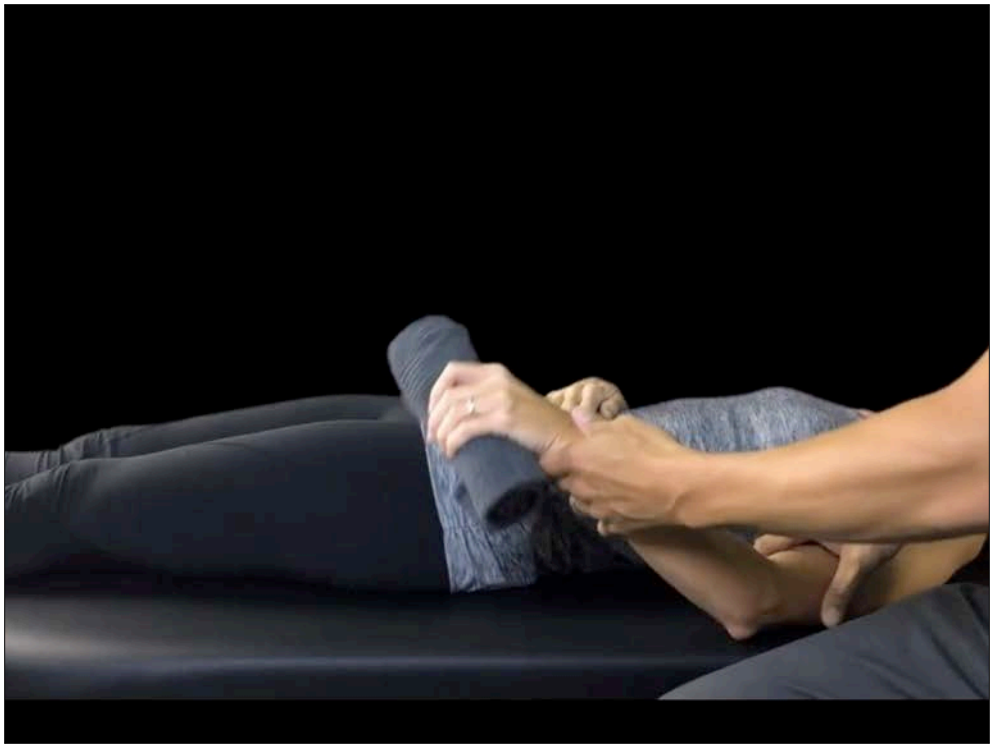
STM – Wrist Extensors



Manipulation – Mill's Radial Head

Mobilization with Movement

Begin with the patient in a supine position, loosely gripping a rolled towel in the affected hand. Their triceps should be contacting the edge of the table, forearm extending off the edge in a pronated position. The clinician places one hand under the patient's arm near the elbow, while grasping the top of the patient's proximal forearm with the other. The clinician applies a downward mobilization from a slightly relaxed/ flexed position into full extension. At terminal extension, the patient squeezes the towel with moderate force. Mobilization should be pain-free, if not, reposition the patient's arm by allowing slight supination. Relax and repeat 3 sets of 6 mobilizations.



"The surgical excision of the degenerative portion of the extensor carpi radialis brevis (ECRB) offers no additional benefit over and above placebo surgery for the management of chronic tennis elbow."

Kroslak M, Murrell GA. Surgical treatment of lateral epicondylitis: a prospective, randomized, double-blinded, placebo-controlled clinical trial. The American journal of sports medicine. 2018 Apr;46(5):1106-13.

"Pitching to the age-restricted pitch count limit did not result in altered pitching mechanics or muscle activations, and no differences occurred between the 3 pitches (fastball, curveball, and change-up). These results support previous research that indicate the curveball pitch is no more dangerous for youth than the other pitches commonly thrown."

Oliver GD et al. Effects of a Simulated Game on Upper Extremity Pitching Mechanics and Muscle Activations Among Various Pitch Types in Youth Baseball Pitchers. J Pediatr Orthop. 2019 Sep;39(8):387-393.

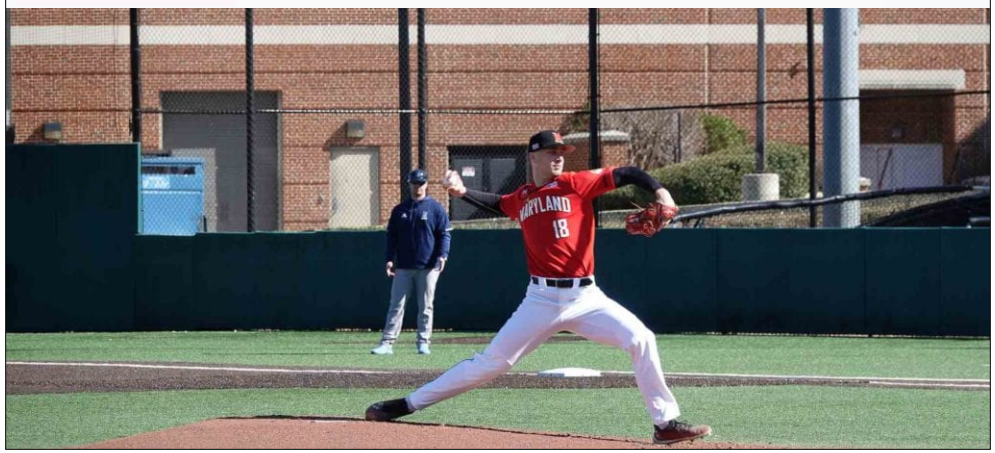
Preventing Youth Throwing Injuries

A new study of 195 youth baseball pitchers (mean age range 8-12 years) found three factors that correlated with injury rates:

- *Hip external rotation on the dominant side*
- *Hip internal rotation on the non-dominant side*
- *Ankle plantar flexion on the non-dominant side*

Incidentally, *"The shoulder ROM and strength in the injured and non-injured groups did not differ to a statistically significant extent."*

Editors note: This study serves as a reminder to assess the entire kinetic chain in all patients, particularly athletes. Subscribers can use the ChiroUp Healthy Throwing infographic to help educate young throwers on preventing throwing injuries.



"The counterforce brace provides significant reduction in the frequency and severity of pain in the short term (2-12 weeks), as well as overall elbow function at 26 weeks."

Kroslak M et al. Counterforce bracing of lateral epicondylitis: a prospective, randomized, double-blinded, placebo-controlled clinical trial. J Shoulder Elbow Surg. 2019 Feb;28(2):288-295.

"Using wrist joint splinting for a short duration is effective for improving pain intensity…[and] may also be effective for improving wrist ROM and grip strength in the treatment of patients with lateral epicondylitis."

Kachanathu SJ, Alenazi AM, Hafez AR, Algarni AD, Alsubiheen AM. Comparison of the effects of short-duration wrist joint splinting combined with physical therapy and physical therapy alone on the management of patients with lateral epicondylitis. European journal of physical and rehabilitation medicine. 2019 Aug;55(4):488-93.

"A thoracic costovertebral T5 mobilization shows an immediate positive effect on pain-free grip and sympathetic activity in patients with lateral epicondylalgia."

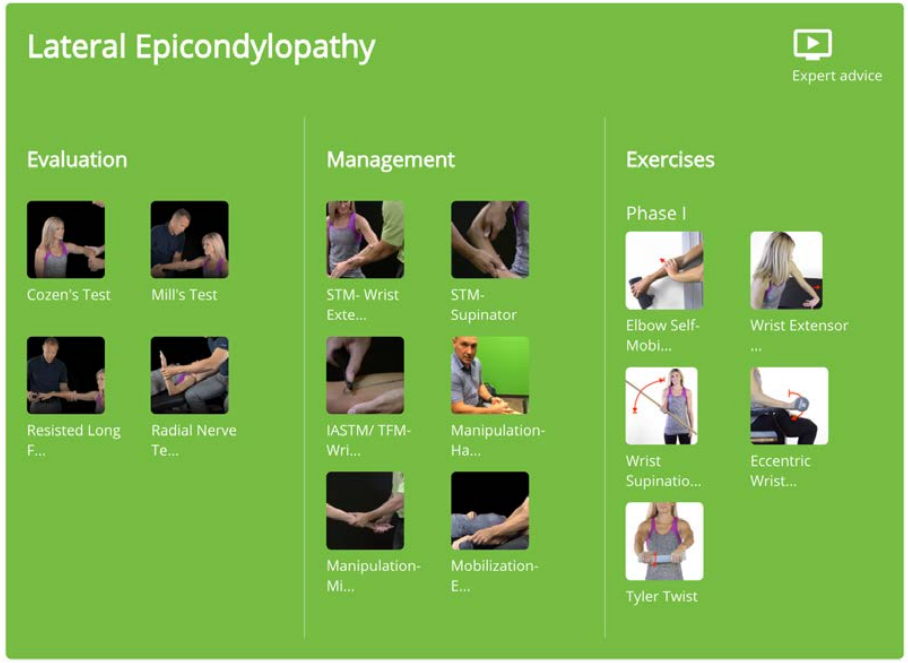
Zunke P, Auffarth A, Hitzl W, Moursy M. The effect of manual therapy to the thoracic spine on pain-free grip and sympathetic activity in patients with lateral epicondylalgia humeri. A randomized, sample sized planned, placebo-controlled, patient-blinded monocentric trial. BMC Musculoskeletal Disorders. 2020 Dec;21(1):1-1.

Dextrose Prolotherapy is superior to active controls at 12 weeks for decreasing pain intensity and functioning for Lateral Epicondylitis.

Plasma Rich Protein injection was not superior to saline for relieving pain and joint functionality in chronic lateral epicondylitis.

Zhu M, et al. Archives of Physical Medicine and Rehabilitation. 2022 Feb 28. Link

Simental-Mendia M, et al Clinical rheumatology. 2020 Aug;39(8):2255-65. Link



"This study determined that elbow extension, forearm pronation, and wrist flexion was the most effective eccentric stretching for the ECRB"

Joong-Bae Seo, MD, Sung-Hyun Yoon, MD, Joon-Yeul Lee, MD, Jun-Kyom Kim, MD, Jae-Sung Yoo, MD What Is the Most Effective Eccentric Stretching Position in Lateral Elbow Tendinopathy? Clinics in Orthopedic Surgery2018;10:47-54 https://doi.org/10.4055/cios.2018.10.1.47

Wrist Extensor Stretch - Table

Begin standing near a table with your arm dropped and elbow straight. Flex your wrist so that your fingers are pointing away from your thigh with your palm upward. (Butler's tip position) Place your hand and wrist flat on the table and gently lean your shoulder over the top of your hand until you feel a stretch. Against the resistance of the table, attempt to extend your wrist straight for seven seconds. Relax and lean further over the top of your hand to increase the stretch. "Lock in" to this new position and repeat three contract/relax cycles twice per day or as directed. To increase the stretch, make a fist.

Wrist Supination/Pronation

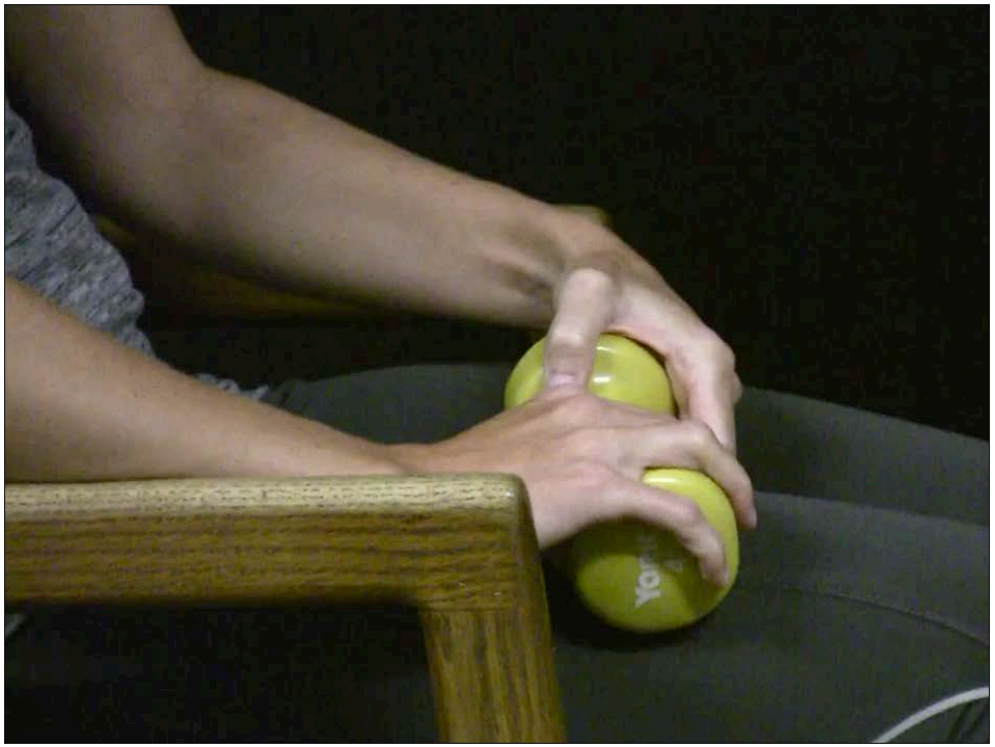
While standing with your arm outstretched in front of your abdomen, hold a weight or broomstick and rotate your hand from palm up to palm down 30 times daily or as directed.

"A treatment program using eccentric strengthening of adequate intensity and duration seemed to be most effective for treating lateral elbow tendinopathy."

Chen Z, Baker NA. Effectiveness of eccentric strengthening in the treatment of lateral elbow tendinopathy: A systematic review with meta-analysis [published online ahead of print, 2020 Apr 10]. J Hand Ther. 2020;S0894-1130(20)30027-2.

Eccentric Wrist Extensors

Begin sitting with your forearm on a table or armrest with your hand off the edge, palm down as shown. Begin with your hand in the extended/up position. Grasp a weight with your hand and slowly lower at a count of four seconds. Release the weight and use your healthy arm to reset to the starting position. Repeat three sets of 10 repetitions twice per day or as directed. This exercise may alternately be performed with an elastic band stretched between your hand and foot.



"Soft tissue calcification is likely iatrogenic complication of steroid injection for lateral epicondylitis patients."

Park HB et al. Association of steroid injection with soft-tissue calcification in lateral epicondylitis. J Shoulder Elbow Surg. 2019 Feb;28(2):304-309.

> J Am Acad Orthop Surg Glob Res Rev. 2021 Sep 10;5(9).
doi: 10.5435/JAAOSGlobal-D-21-00186.

Trends in Corticosteroid Injections for Treatment of Lateral Epicondylitis: An Analysis of 80,169 Patients

John Q Sun [1], Quinn A Stillson, Jason A Strelzow, Lewis L Shi

Affiliations + expand

PMID: 34506365 DOI: 10.5435/JAAOSGlobal-D-21-00186

Abstract

Introduction: Corticosteroid (CS) injections are a frequently used treatment modality for lateral epicondylitis (LE) despite an increasing number of studies suggesting their lack of efficacy. The objective of this study was to review the annual utilization of CS injections for treatment of LE, as well as that of other nonsurgical treatments and surgical treatments, to understand how recent publications have affected the practice of physicians in treating LE.

Methods: Patients with LE from 2010 to 2017 were identified within a national insurance database and grouped by treatment modalities of CS injections, physical therapy, bracing treatment, and surgery. Epidemiologic and demographic data were reported using descriptive statistics. The number of patients receiving each treatment and the number of CS injections per patient were quantified for each year, and annual trends were analyzed using logistic regression.

Results: Among 80,169 qualifying patients, 16,476 received CS injections, 12,180 received physical therapy, 1,874 received bracing treatment, and 2,650 underwent surgery, with patients receiving multiple modalities being members of each respective group. We found a significant decrease in the proportion of patients with LE receiving CS injections from 23.3% in 2010 to 18.8% in 2017 ($R2 = 0.956$, $P < 0.001$). Interestingly, the number of CS injections per patient increased during this period from 1.33 to 1.83 ($R2 = 0.843$, $P = 0.001$). No notable changes in utilization trends for other modalities were found.

Discussion: Overall, our data support a decline in the use of CS injection as a treatment modality for LE from 2010 to 2017. Although correlational, this trend may reflect the increasing body of published evidence demonstrating the ineffectiveness of CS injections for the treatment of LE. In addition, the increasing number of injections per patient among those who received injections contrasts with the overall decrease in steroid utilization among all patients. Further study is needed to fully understand the mechanisms behind these trends.

Clinical Pearls

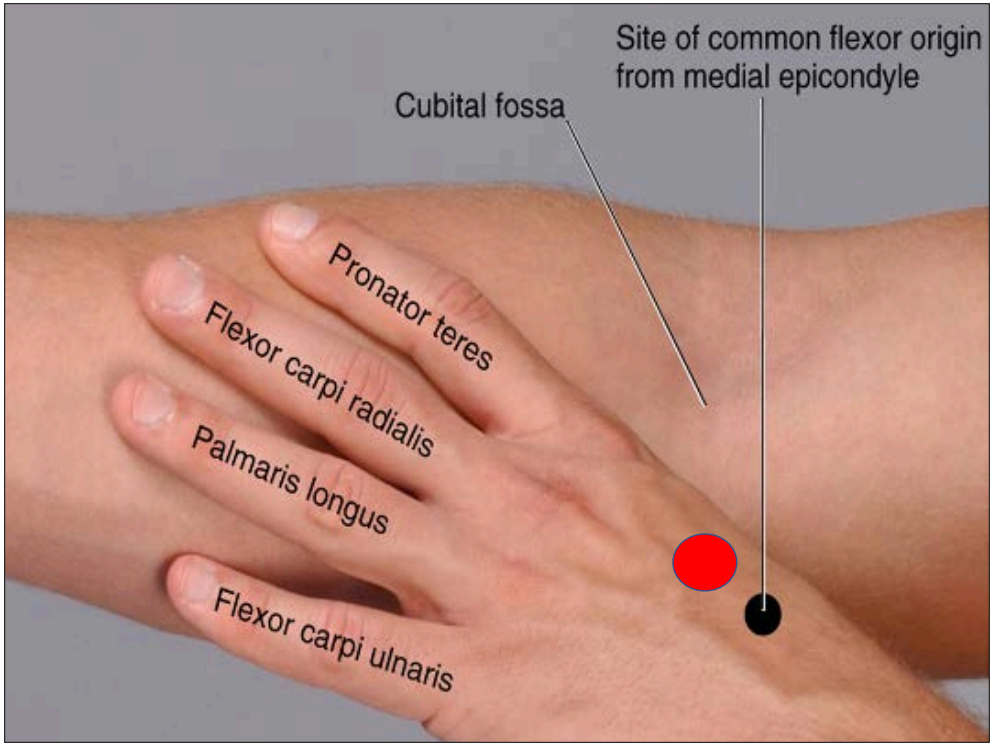
- LE is primarily a **degenerative** condition (tendinopathy)rather than a chronic inflammatory process (tendinitis).
  * Patients may require **3-4 months for full recovery**.
- * 10% of patients with LE have **co-existent Radial Tunnel Syndrome**- counterforce braces are contraindicated in this population.

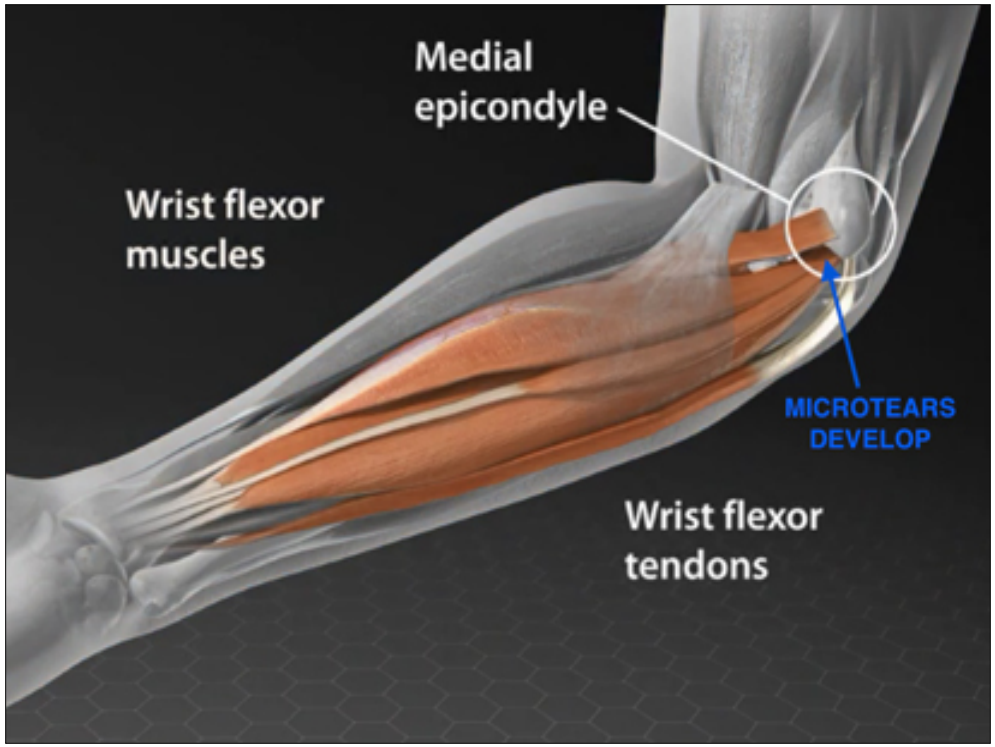
Medial Epicondylopathy

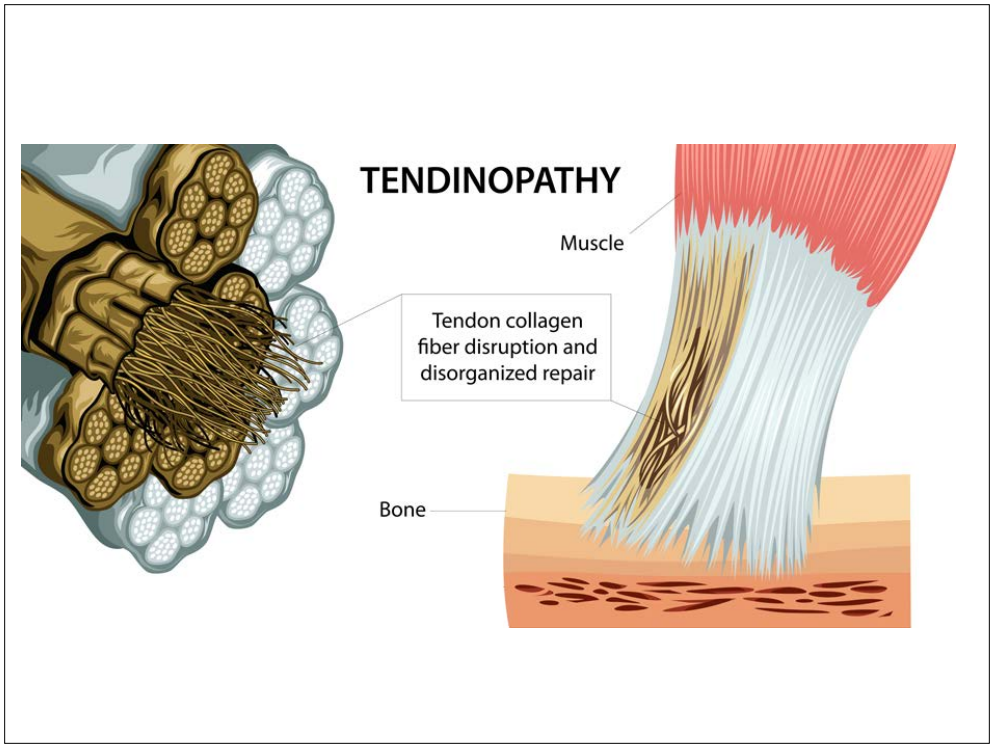
Brandon Steele

Medial Epicondylopathy

- 3-10 times **less common** than lateral epicondylopathy
- Most prevalent 40-60 y/o
- Affects men and women fairly equally
- **Dominant arm** in 75% - 82% of cases







- Throwing
- Racquet sports
- Bowling
- Archery
- Weight lifting
- Carpentry

90-95% of sufferers are not athletes

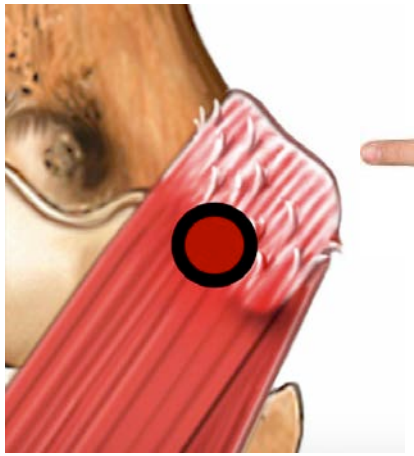
Risk Factors

- Poor conditioning
- Inadequate warm up
- Improper technique
- Improperly-sized racquet grip
- Excessively tightened racquet strings
- Old or wet balls
- Weakness
- Inflexibility
- Smoking
- Obesity
- Type II diabetes

Symptoms

- Insidious onset **dull aching**
- **Exacerbation with use**
- **Grip weakness**
- ADL limitations - shaking hands, grasping objects, and opening jars
- Local swelling

Clinical Findings



- Tenderness to palpation

- Pain on resisted forearm pronation or wrist flexion

Medial Epicondylopathy

Evaluation


Tinel's Sign


Golfer's Elbow ...


Ulnar Nerve Tes...

Management


STM- Pronator T...


STM- Wrist Flex...


IASTM/ TFM- Wri...


Manipulation- Ce...


Mobilization- E...

Exercises

Phase I


Wrist Flexor St...


Wrist Flexor St...


Pronator Teres ...

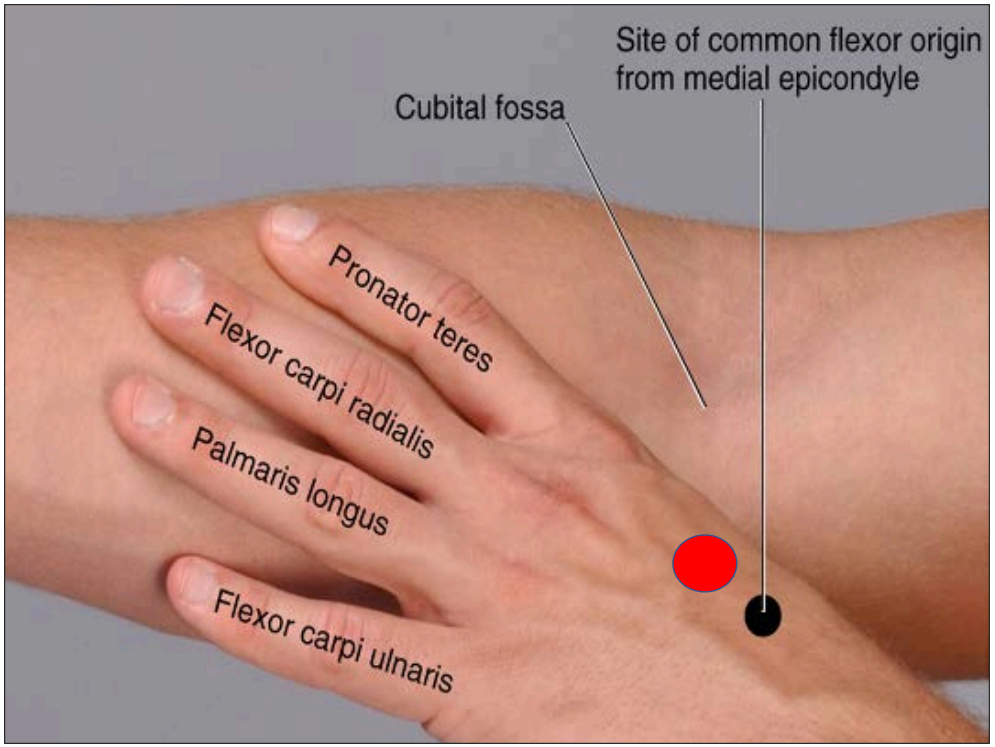

Reverse Tyler T...

Phase II


Eccentric Wrist...

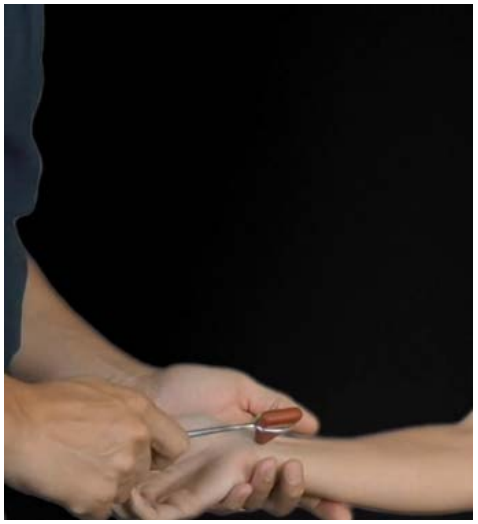
Golfer's Elbow Test

The test is performed on a seated patient with their palms resting on their knees. The clinician grasps the patient's hand and elbow and **simultaneously supinates the hand while extending the wrist and elbow**. Reproduction of pain suggests medial epicondyle involvement.

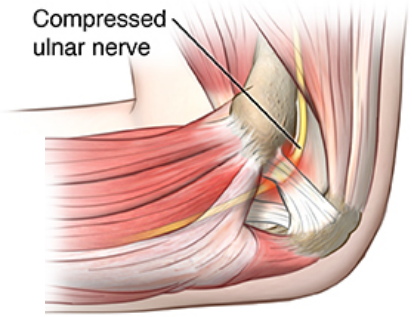


Tinel's Sign

The clinician taps the skin over a peripheral nerve with a reflex hammer. Reproduction of neurologic complaints suggests irritation. Commonly used in the diagnosis of peripheral neuropathies involving the median, radial, ulnar, peroneal or posterior tibial nerves.



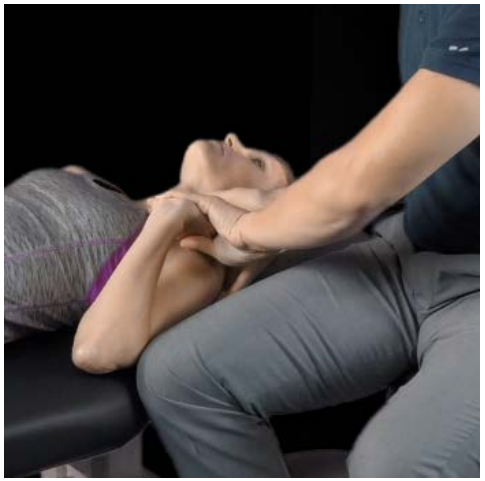
DDx: Cubital Tunnel Syndrome (20%)

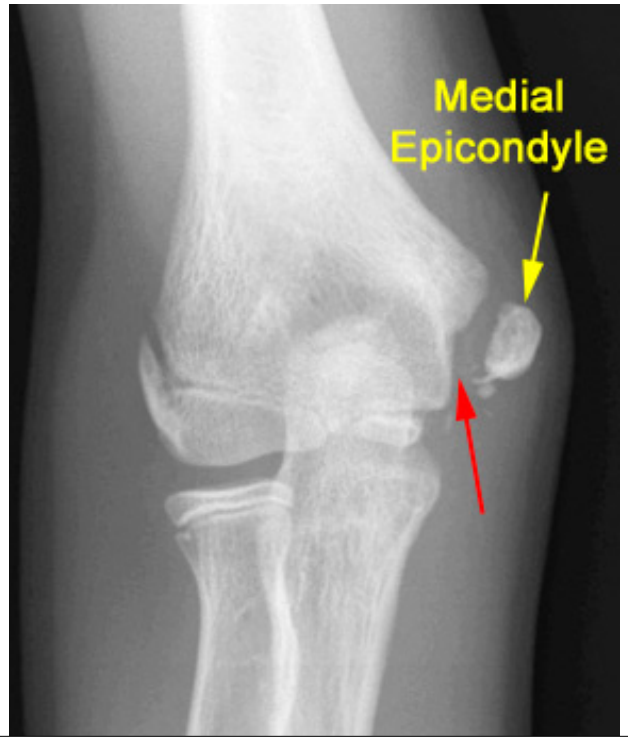


- Paresthesia to the 4th or 5th digit
- Nocturnal symptoms
- Positive Tinel's sign
- Elbow flexion test

Ulnar Nerve Tension Test

The patient begins in a supine position with their arm at their side. The clinician flexes the patient's elbow to 90 degrees and extends their wrist. The clinician then pronates the patients extended wrist and further flexes the elbow so that the patient's finger tips are touching their shoulder. Next, the clinician (may need to switch hands) stabilizes the top of the supine patients shoulder and fingers with one hand, while the other hand externally rotates the patient's arm (wrist crease moves from pointing up, to pointing sideways). Finally the patient's shoulder is abducted. If complaints are reproduced, the clinician may have the patient ipsilaterally flex their neck to remove nerve tension (helping to differentiate between nerve irritation vs (non-neural) irritation of neighboring soft tissues.





Medial Epicondylopathy

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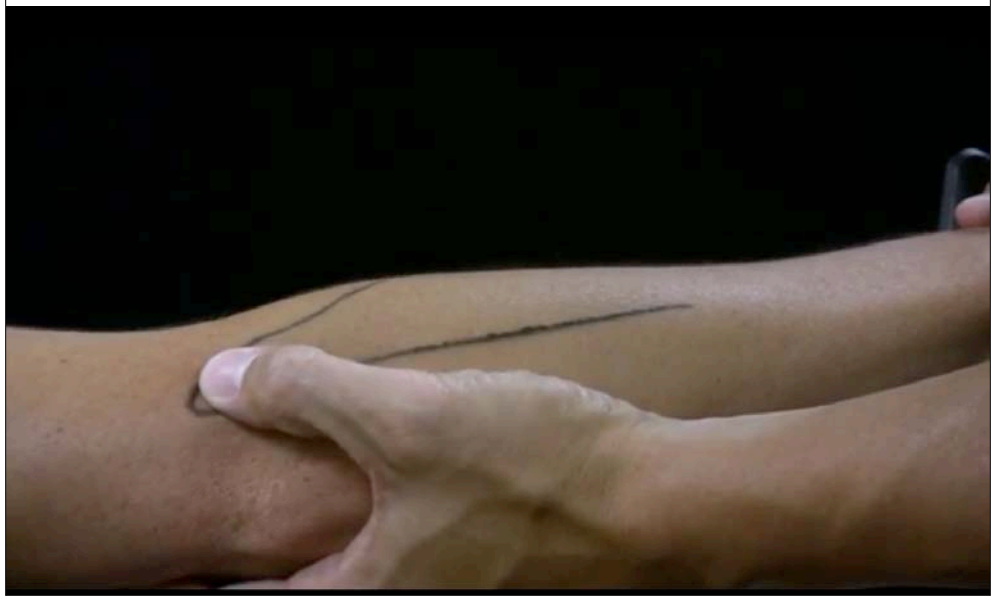
Reverse Tyler T...

Phase II


Eccentric Wrist...

IASTM/TFM – Wrist Flexor Tendon



STM – Pronator Teres

"Conservative, non-surgical management is the most appropriate treatment for medial epicondylopathy."

Ciccotti M C, Schwaetz M A, Ciccotti M G. Diagnosis and treatment of medial epicondylitis of the elbow. Clin Sports Med 2004. 23693–705.705

Treatment

- Modalities including ESWT, and laser
- Soft tissue manipulation
- Stretching, and myofascial release
- IASTM to release adhesions within the common flexor tendon
- Mobilization or manipulation of the cervical spine, elbow, wrist, and shoulder.
- Dry needling
- Eccentric rehabilitation

Medial Epicondylopathy

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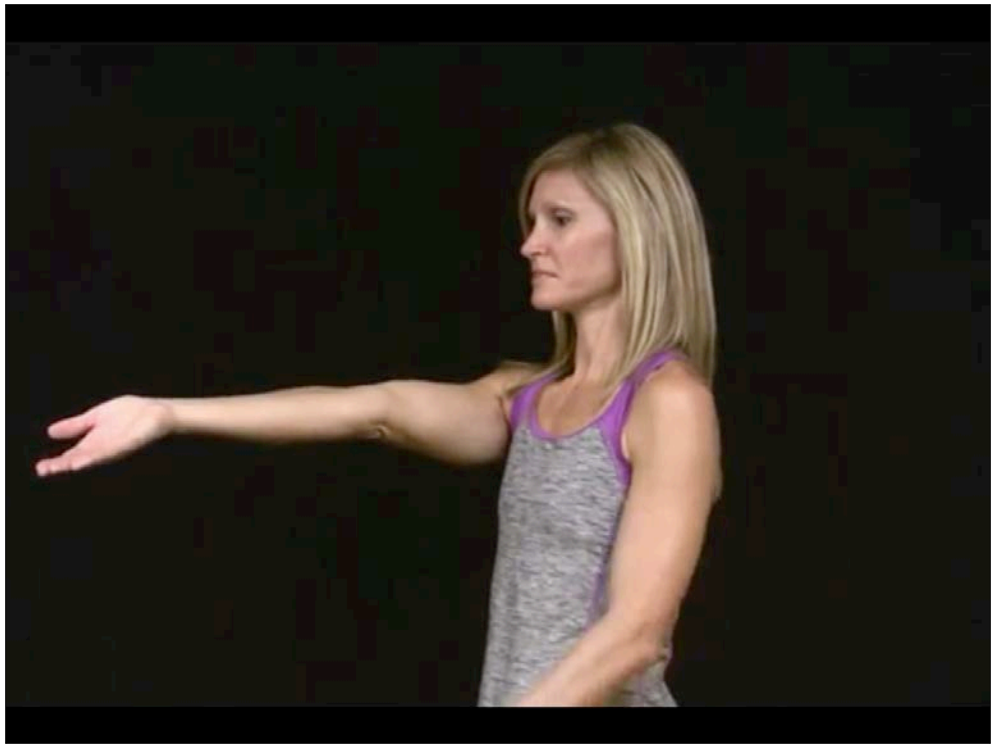


Wrist Flexor Stretch

Straighten your arm in front of you with your hand at chest level, palm up. Keep your elbow locked and use your opposite hand to grasp your fingers and gently pull down on your fingers until you feel a stretch in your forearm. Keep your elbow straight throughout the exercise. Against the resistance of your opposite hand, contract your wrist and fingers upward for seven seconds. Relax and increase the stretch on your wrist and forearm by pulling downward and backward on your fingers. “Lock in” to the new position and repeat three contract/ relax cycles twice per day or as directed.

Wrist Flexor Stretch – Table

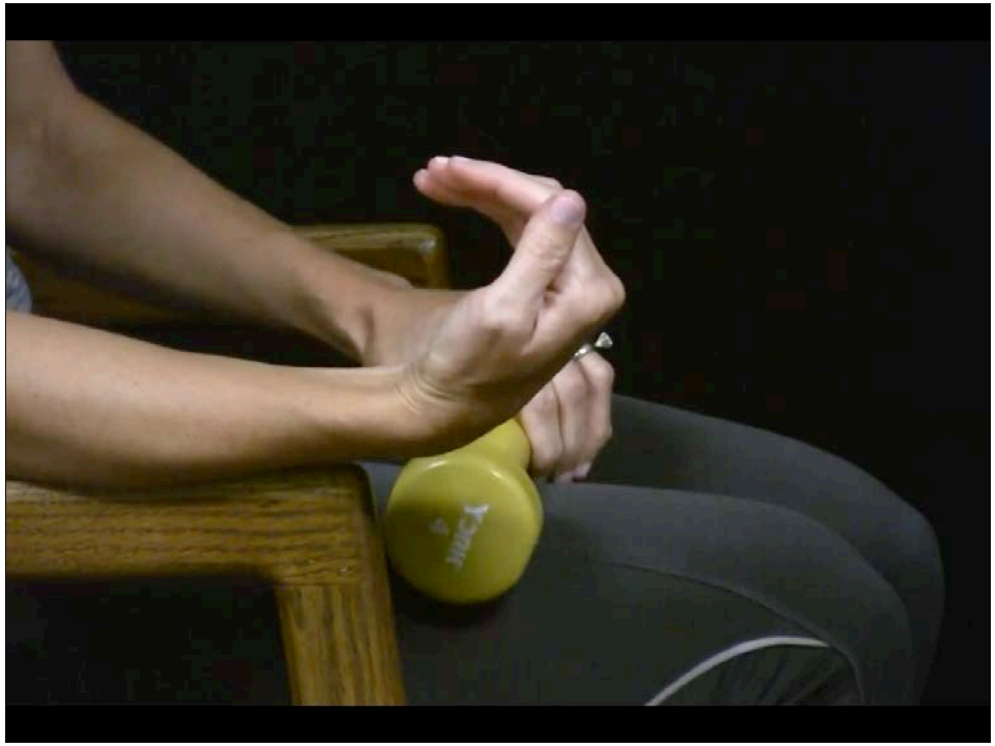
Begin standing with your palms flat on a table in front of you. Your fingers should be pointed toward your legs. Keep the heel of your hand on the table and gently lean back until you feel a stretch in your forearm. Against the resistance of the table or floor, attempt to flex your wrist forward for seven seconds. Relax and slowly lean backward to increase the stretch in your forearms. “Lock in” to each new position and repeat three contract/ relax cycles twice per day or as directed. Keep your entire palm and fingers flat on the table or floor throughout the exercise. Alternately, this exercise may be performed on all fours.

Pronator Teres Stretch

Begin with your elbow bent 90 degrees touching the front of your abdomen with your forearm pointing straight forward. Your palm should be facing up. With your opposite hand, apply a torque to rotate your involved hand outward (thumb moving down.) Gently straighten your elbow to increase tension. Against your own resistance, attempt to rotate your involved hand inward (palm down) for seven seconds. Relax and increase the stretch, locking into each new position. Perform three contract/relax cycles twice per day or as directed.

Eccentric Wrist Flexors

Begin sitting with your forearm on a table or armrest with your hand off the edge, palm up as shown. Begin with your wrist in the flexed/up position. Grasp a weight with your hand and slowly lower at a count of four seconds. Release the weight and use your healthy arm to reset to the starting position. Repeat three sets of 10 repetitions twice per day or as directed. This exercise may alternately be performed with an elastic band stretched between your hand and foot.



Home Care

- Selective rest
- Activity modification
- Counter-force bracing
- Cock-up wrist splint
- Ice & NSAIDs ???

Recalcitrant

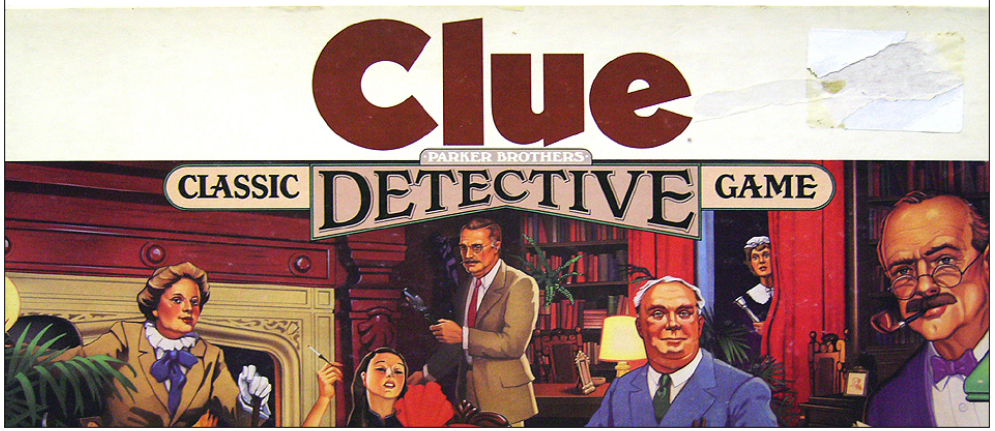
- 25% of unmanaged patients will continue to experience symptoms for over one year
- 19% of patients continue to experience symptoms after three years
- 5-26% of patients experience r**ecurrent** episodes
- 40% suffer **prolonged discomfort**

"Yup, it's definitely a case of frozen shoulder."

Adhesive Capsulitis

Primary Adhesive Capsulitis

Patients with "primary" adhesive capsulitis are unable to identify the genesis of their condition.



Secondary Adhesive Capsulitis

Follows a period of restricted shoulder motion

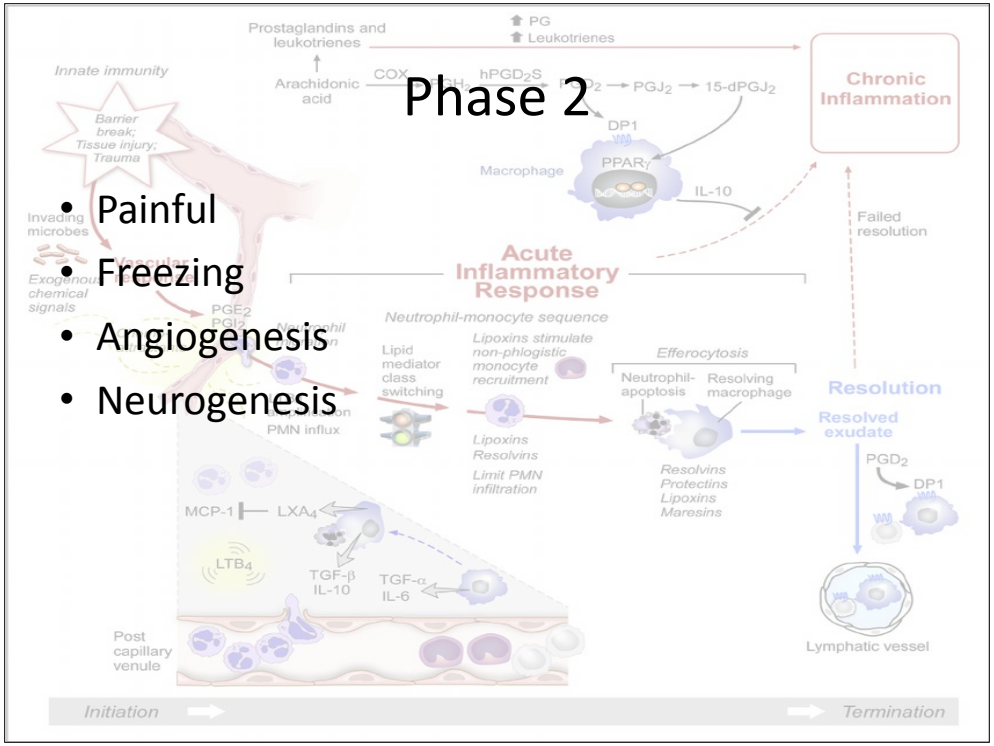
- Rotator cuff pathology
- Trauma
- Surgery

Phase 1

Pre-Cursor Phase

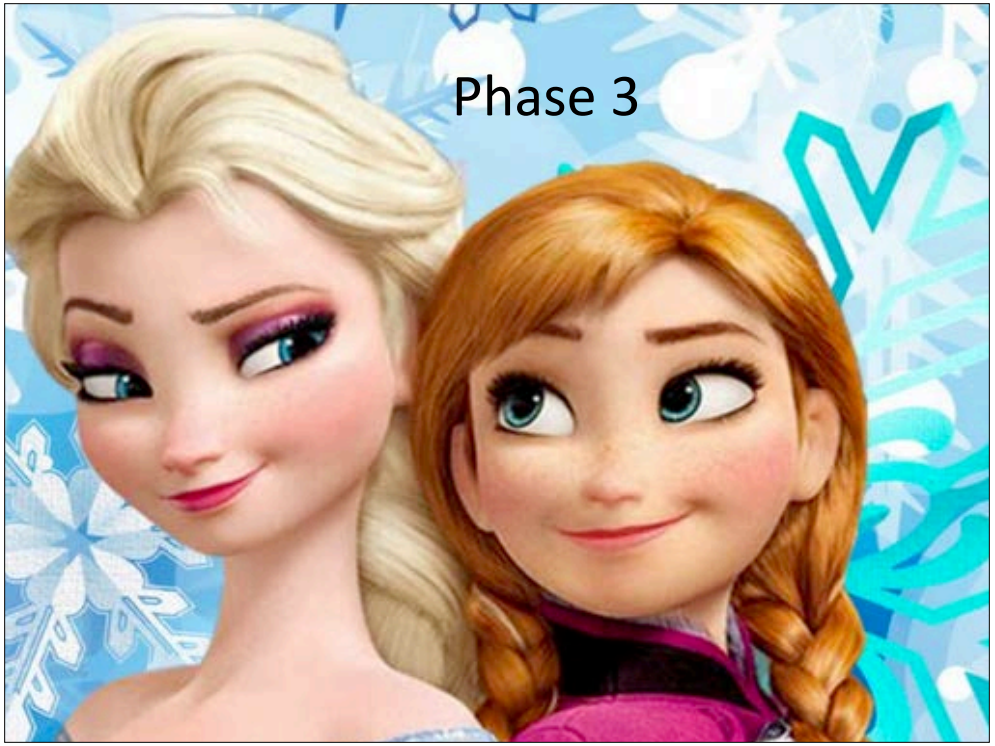
- Internal Rotation—SAIS, Supra, TM, Infra
- External Rotation—Capsule and Subscapularis
  - At 0 degrees: subscapularis
  - >45 degrees: capsule

Phase 2



- Painful
- Freezing
- Angiogenesis
- Neurogenesis

Phase 3



Phase 4

"Thawing"

Associated with progressively decreasing pain and stiffness.

Incidence

2-5% population

10-20% Type 1 Diabetes

36% Type 2 Diabetes

Thyroid Disease

Incidence

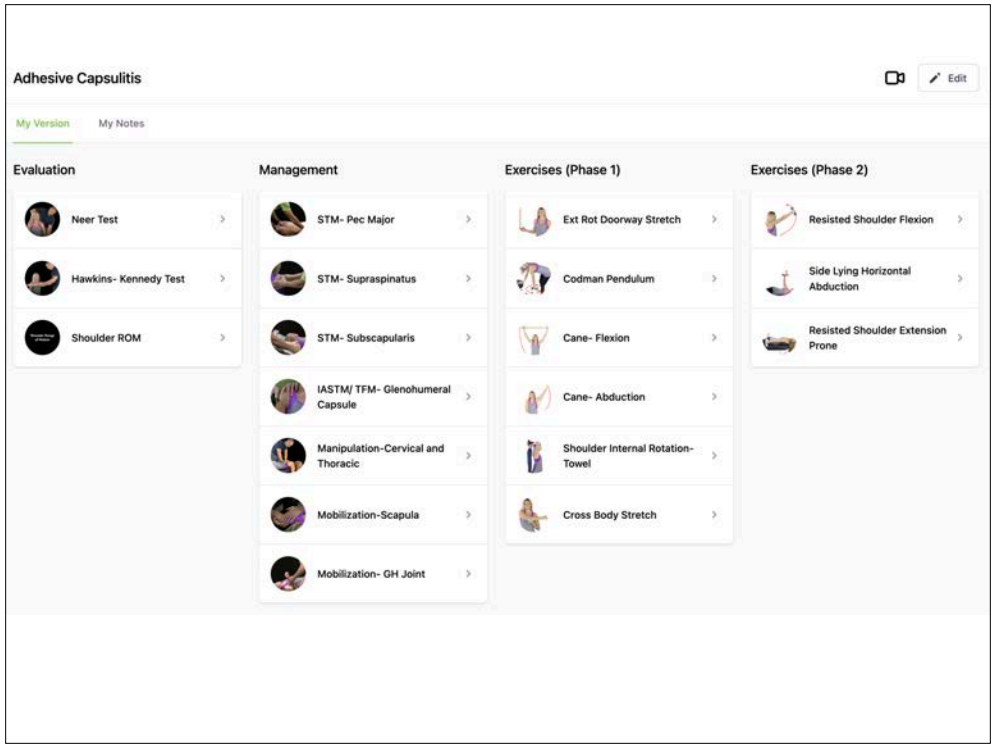
Peak Incidence 40-65 yro

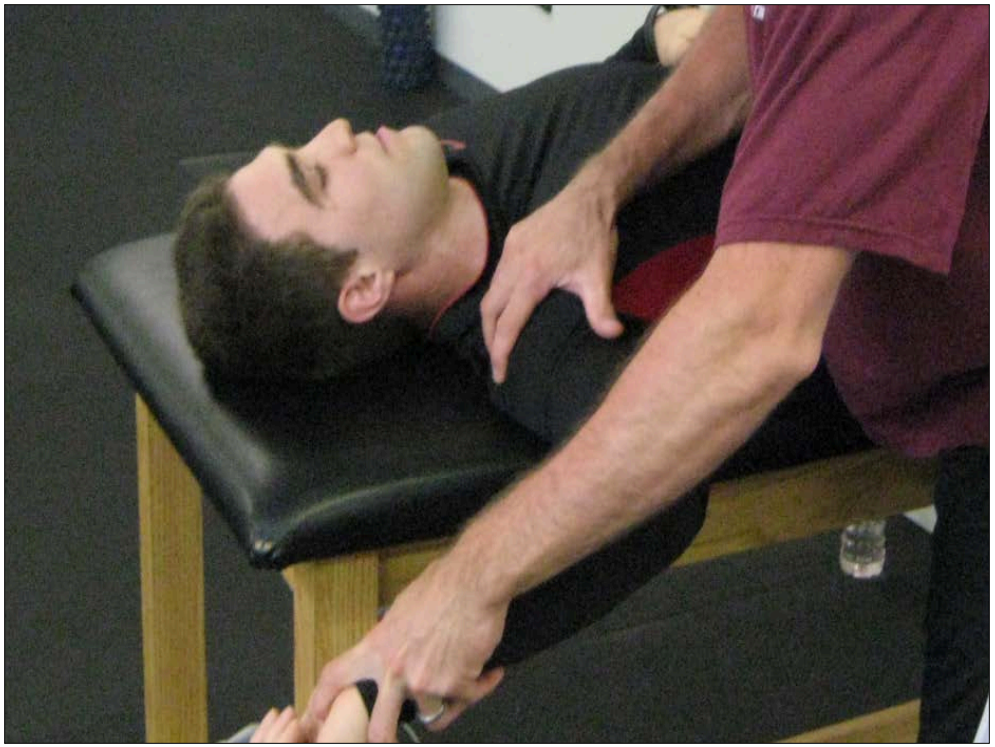
Females

Greater risk if prior episode in contralateral arm

Symptoms

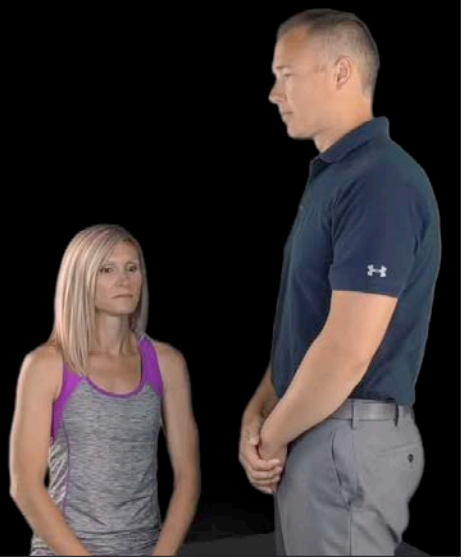
- Sleep disturbances are common.
- Functional range of motion deficits limit reaching overhead, behind the back, or to the side.
- Difficulty grooming and dressing.
- Symptoms have generally progressed or plateaued for at least one month prior to presentation.





Hawkins- Kennedy

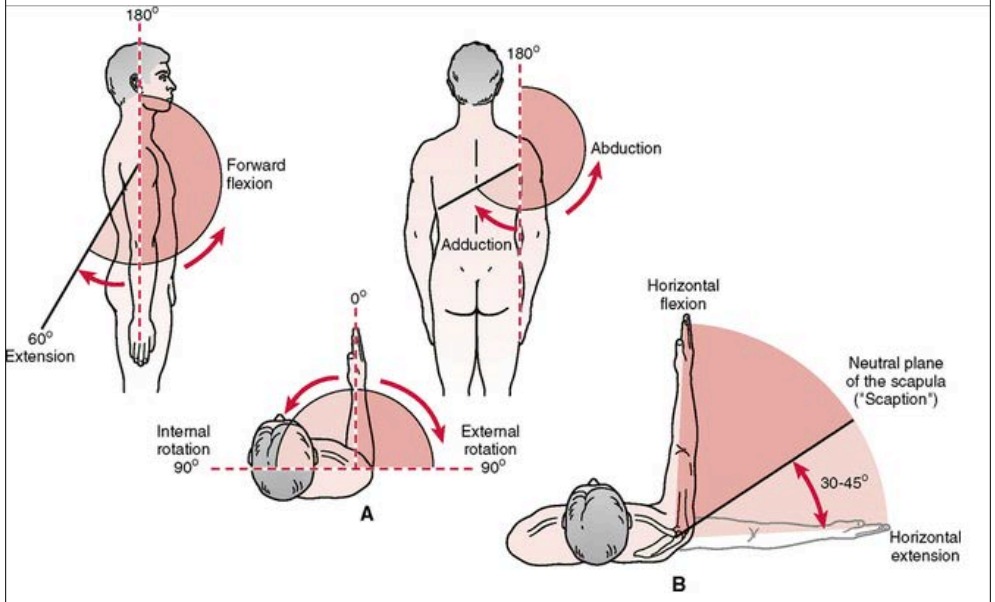
Seated patient's arm placed into 90 degrees of forward flexion with 90 degrees of elbow flexion. Clinician stands in front and stabilizes patients scapula with one hand while gradually rotating patients arm downward, into internal rotation. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.

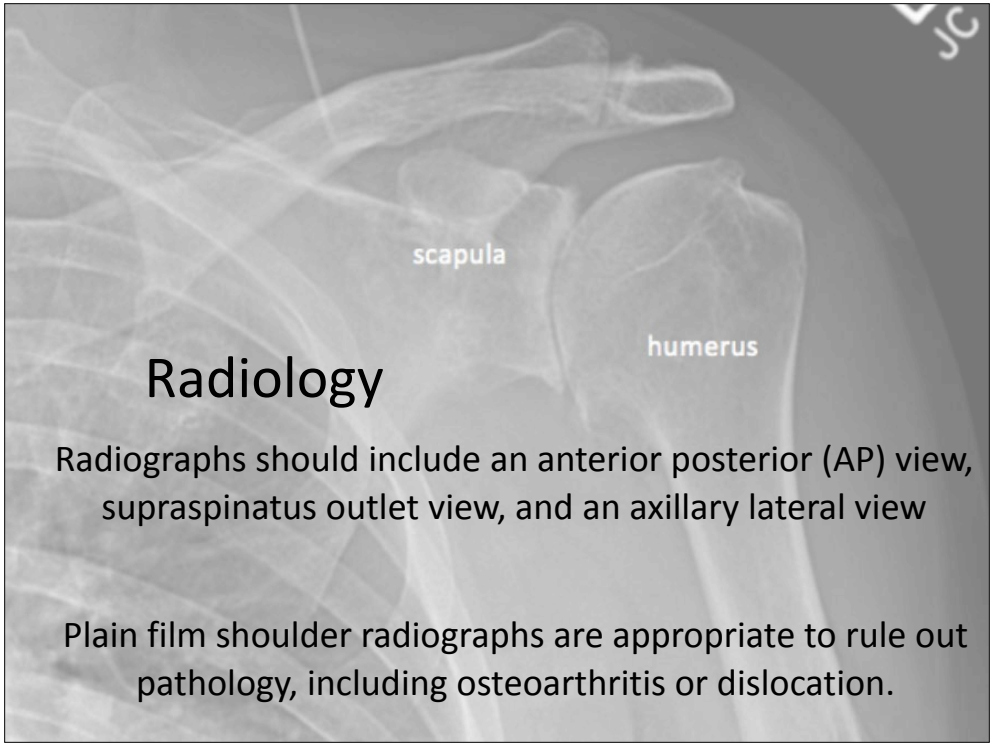


Neer Test

Clinician stands behind patient, stabilizes the scapula with one hand and grasps the patients elbow with the other hand, moving their straightened arm into forward flexion until pain is reported. Used to assess for impingement as well as the integrity of the rotator cuff tendons and glenoid labrum.

Shoulder ROM

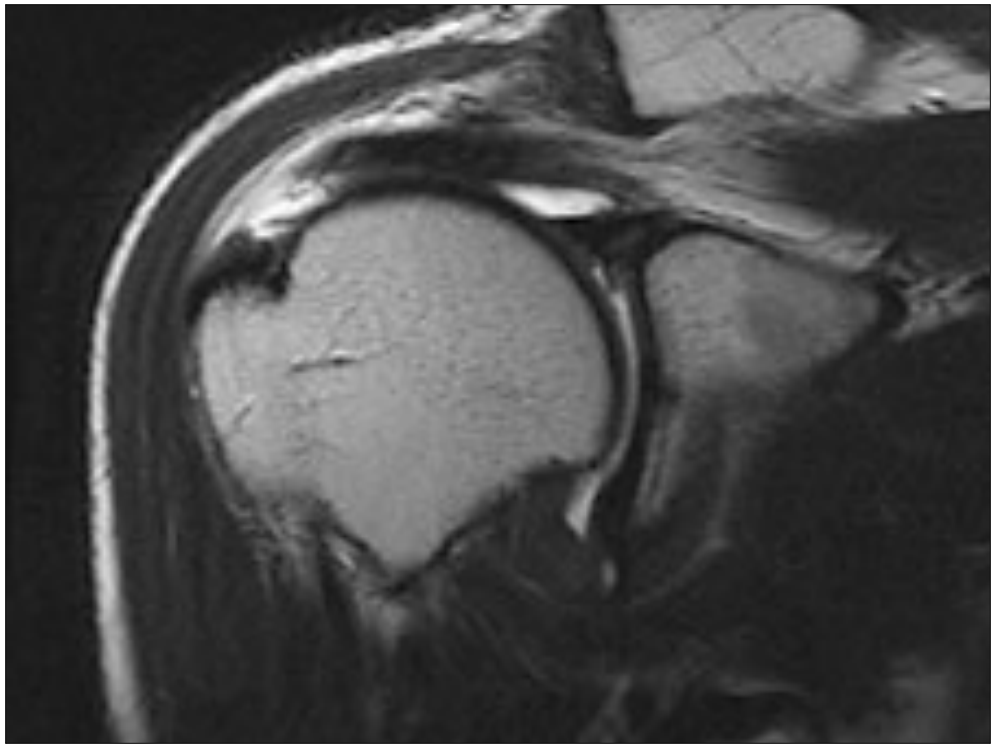


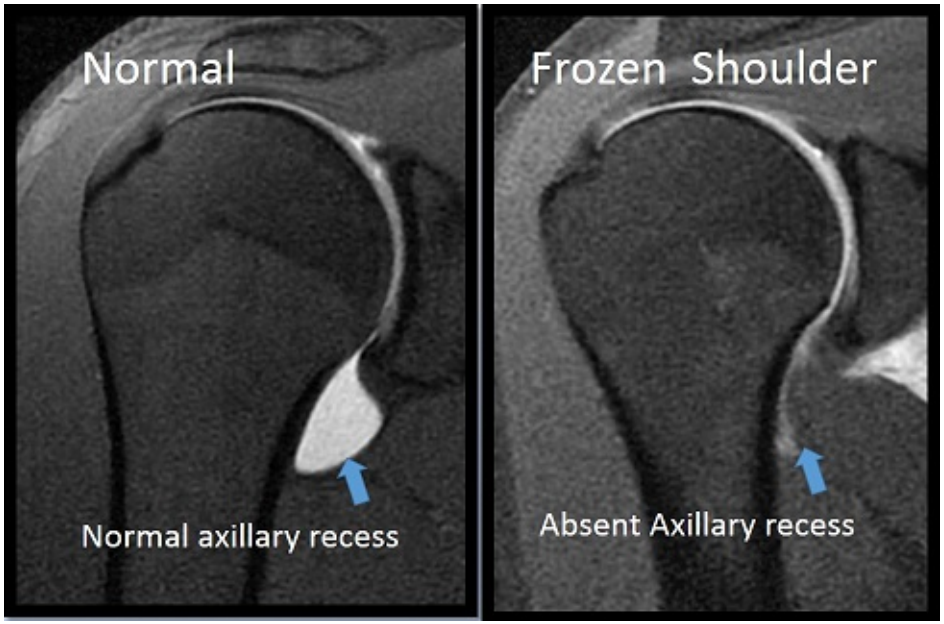


Radiology

Radiographs should include an anterior posterior (AP) view, supraspinatus outlet view, and an axillary lateral view

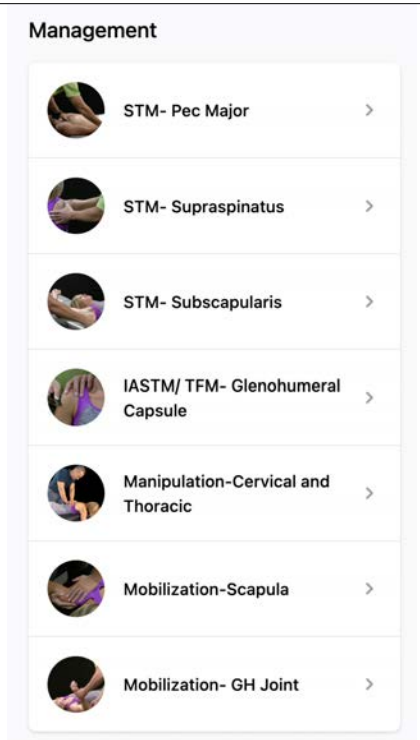
Plain film shoulder radiographs are appropriate to rule out pathology, including osteoarthritis or dislocation.





What Else Can Cause Shoulder Pain and Restriction to ROM

fracture, infection, neoplasm, calcific tendinits, bursitis, ***cervical radiculopathy***, fibromyalgia, shoulder impingement, rotator cuff pathology, osteoarthritis, systemic arthropathy, sprain/ strain, and referred scleratogenous pain- particularly from the cardiac or digestive systems.

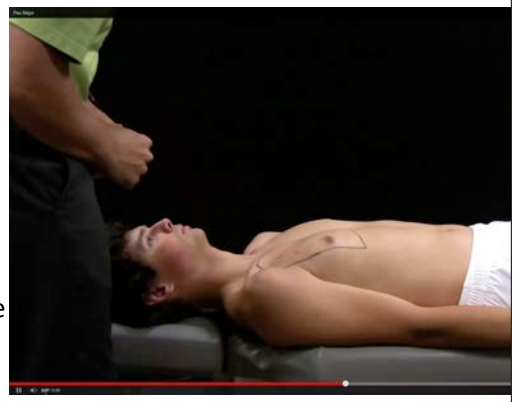


IASTM- GlenoHumeral Capsule

The glenohumeral capsule and ligaments connect the humeral head to the scapular glenoid. IASTM/ TFM may be utilized over the ligaments as a means of releasing adhesions and improving blood flow. Position the patient to best expose the affected ligament. The ligament may be worked along the orientation of the fibers and in a cross friction (strumming) fashion to stimulate a healing response of injured or disorganized tissue. Areas of scar tissue or abnormal tissue density should be worked for 1-3 minutes.

STM- Pec Major

The pectoralis minor muscle originates on ribs 3-5 and attaches to the coracoid process. The actions of the muscle include scapular depression and rotation. Trigger points commonly develop in the muscle belly. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. Movement stripping may be performed by contacting the trigger points and applying pressure while passively moving the muscle from a shortened to lengthened state.



STM- Subscapularis

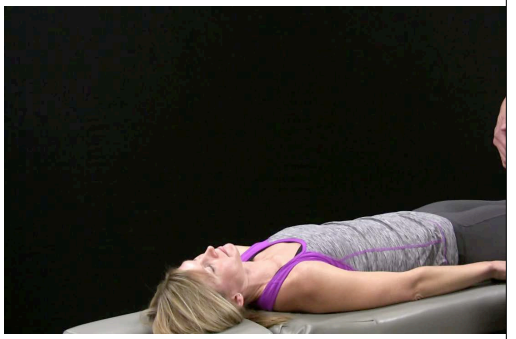
The subscapularis muscle originates on the undersurface of the scapula and attaches to the lesser tubercle of the humerus. The actions of the muscle include shoulder internal rotation and glenohumeral stabilization. Trigger points commonly develop in muscle belly. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. Movement stripping may be performed by contacting the muscle trigger points and applying pressure while passively abducting the humerus. Clinicians should recognize the presence of sensitive neurovascular structures in this region and be judicious when performing STM.

STM- Supraspinatus

The supraspinatus muscle originates on the supraspinous process of the scapula and attaches to the greater tubercle of the humerus. The actions of the muscle include shoulder abduction and glenohumeral stabilization. Trigger points commonly develop in muscle belly. Soft tissue manipulation includes ischemic compression of trigger points and myofascial stripping parallel to the muscle fibers. IASTM is an alternate means of stripping the muscle. Movement stripping may be performed by contacting the muscle distally and applying pressure while passively moving the muscle from a shortened to lengthened state by having the patient reach behind their back.

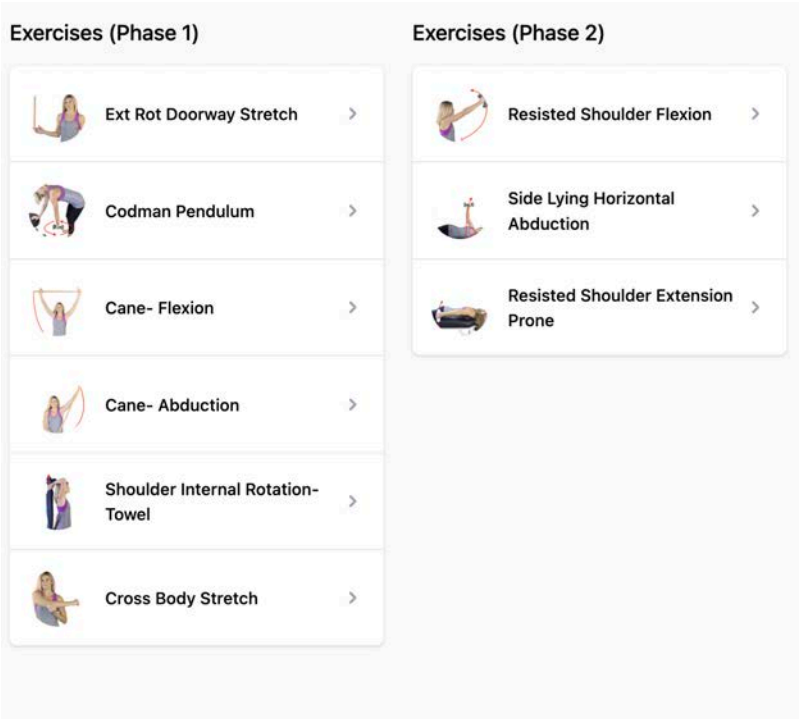
GH Mobilization

Anterior, posterior, and inferior glide mobilizations performed at the end range of abduction



Mobilization Scapula

The patient is prone. The clinician supports the patients abducted and relaxed arm and stabilizes the shoulder. Scapular mobilization is performed by grasping the patient's scapula and progressively moving it superiorally, inferiorally, and laterally, to include movements of rotation and distraction from the thorax.



External Rotation Stretch

Stand at the edge of a doorway or near a wall. Begin with your arms at your side and your elbows bent at 90 degrees. Place the affected hand/wrist on the doorframe or wall and slowly turn away until you feel a gentle stretch. Against the resistance of the doorframe, rotate your arm towards your body for seven seconds. Relax and slowly rotate your body away from the doorframe to increase the stretch. Keep your elbow tucked into your side throughout this exercise. Perform three contract/relax cycles on each side twice per day or as directed.

Abduction w/ Cane

Begin standing holding a cane in front of your hips with your arms at your sides. Your involved arm should be grasping the cane palm out, and the uninvolved arm grasping the cane palm facing your thigh. Keeping your elbows straight, use the uninvolved arm to slowly push the involved side away from your body and upward as far as is comfortable. Return to the starting position and perform three sets of 10 repetitions twice per day or as directed.

Flexion w/ Cane

Stand holding a cane in both hands with your arms hanging down in front of your thighs, palms facing your thighs. While keeping your elbows straight, slowly raise your arms in front of your body, overhead in a pain-free range of motion. Your “good arm” may need to help the involved side. Return to the start position and repeat three sets of 10 repetitions twice per day or as directed.

Codman Pendulum

Lean over a table using the uninvolved arm for support as shown. If directed, you may hold a light weight in your hand to increase traction. Allow the involved arm to hang freely. Use your torso to swing your involved arm in a clock-wise circle for 50 repetitions. Repeat in a counter-clockwise circle for 50 repetitions. Perform 50 repetitions in each direction twice per day or as directed.

Shoulder Internal Rotation

While standing, place your involved arm behind your back at waist level. Place your uninvolved hand behind your head and grasp a towel between your hands. Leading with your top arm, pull the towel up until you feel a stretch in your involved shoulder. Gradually increase the stretch over the period of one minute. Perform this stretch twice per day. *This stretch may alternately be performed as a contract/relax stretch by gently pulling downward on the towel with your involved arm against the steady resistance of your other arm for seven seconds. Relax and gently pull the towel upward with your top arm to increase the stretch in your shoulder. “Lock in” to each new position and repeat three contract/relax cycles twice per day or as directed.

Cross Body Stretch

While sitting or standing, bring your involved arm across the front of your upper chest as shown in the picture. Hold the affected elbow with your uninvolved arm and gently pull across your chest until a stretch is felt in the back of your shoulder. Relax and stretch the arm further across your body. Repeat three stretches, twice per day or as directed.

Lateral Elbow Pain

Article

PanAfrican Medical Journal

Research

Profil épidémiologique des épicondylites latérales en milieu de rééducation

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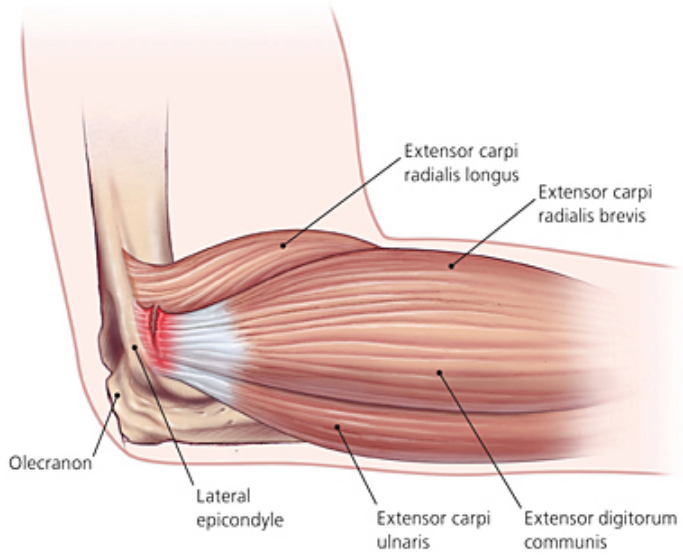
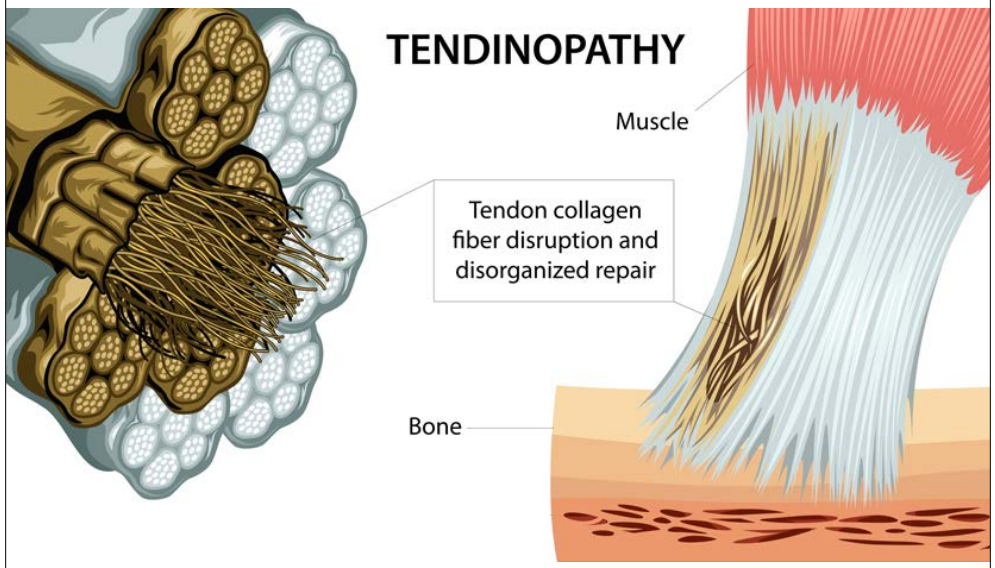
Received: 26 Dec 2019 - **Accepted:** 23 Jun 2020 - **Published:** 11 Aug 2020

Keywords: Epicondylite latérale, épidémiologie, rééducation fonctionnelle

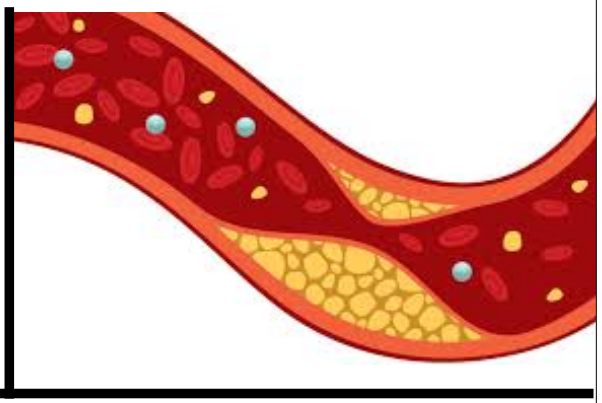
Lateral epicondylitis is a common cause of elbow pain. Its management in physical medicine is based on medical treatment and appropriate functional rehabilitation. However no therapeutic option seems clearly superior to the other.



- Affects between 1 and 3% of the population each year.
- Occurs predominantly in the fourth or fifth decade
- Affects men and women equally.
- Strikes the dominant arm in 75% of cases.
- Average of 12 weeks disability in up to 30% of those workers affected



"The present findings suggest a potential association between high total cholesterol levels and lateral epicondylopathy."



Lee SH, Gong HS, Kim S, Kim J, Baek GH. Is There a Relation Between Lateral Epicondylitis and Total Cholesterol Levels?. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2019 May 1;35(5):1379-84.

"Obesity is associated with a higher risk of tendinopathy, tendon tear and rupture, and complications after tendon surgery than non-obesity."

Medial epicondylitis: odds ratio (OR) 1.9
Achilles tendinopathy: OR 3.81
Patellar tendinopathy: OR 1.10
Plantar fasciitis: OR 2.97
Rotator cuff tendinopathy: OR 1.25
Rotator cuff tear: OR 2.35

Macchi M, Spezia M, Elli S, Schiaffini G, Chisari E. Obesity Increases the Risk of Tendinopathy, Tendon Tear and Rupture, and Postoperative Complications: A Systematic Review of Clinical Studies. A Publication of The Association of Bone and Joint Surgeons®| CORR®. 2020 Apr 14.

*13

Symptoms

- Begin **insidiously** following overuse-type activity
- **Localized pain** over the lateral aspect of the elbow
- Provoked by activities that involve gripping and/or **wrist extension**.
- Pain may vary from mild to sharp severe pain
- Rest may provide relief

Lateral Epicondylopathy

Expert advice

Evaluation


Cozen's Test


Mill's Test


Resisted Long F...


Radial Nerve Te...

Management


STM- Wrist Exte...


STM- Supinator


IASTM/ TFM- Wri...


Manipulation- Ha...


Manipulation- Mi...


Mobilization- E...

Exercises

Phase I


Elbow Self-Mobi...


Wrist Extensor ...


Wrist Supinatio...


Eccentric Wrist...


Tyler Twist

Problem #	Elbow R L	Initial Eval	Re-Exam 1	Re-Exam 2	Re-Exam 3
	Date				
	VAS				
	DASH				
	% Subjective Improvement				
	Subjective Complaints				
	ROM				
	Flexion / 160				
	Extension / 0				
	Pronation / 90				
	Supination / 90				
	Wrist Flexion / 90				
	Wrist Extension (elb flex) / 70				
	Wrist Extension (elb ext) / 70				
	Orthopedic				
Med. Epi.	Golfer's Elbow Test				
Lateral Epi.	Cozen's Test				
	Mill's Test				
Radial Compr.	Resisted Long Finger Extension				
	Radial Nerve Test				
	Resisted Forarm Compression				
	Radial Tunnel Compression				
Ulnar	Ulnar Nerve Test				
	Tinel's Sign				
Pronator Teres	Median Nerve Test				
	Pronator Compression Test				
	Pronator Teres Syndrome Test				
	Regional Eval				
	Cervical				
	Shoulder				
	Neurologic				
	Dermatomes				
	Myotomes				
	Reflex				
	Mensuration				
	Palpation				
	Trigger Points & Tenderness				
	Joint Restriction				
	Posture & Function				
	☐ Upper Crossed Syndrome				
	☐ Scapular Dyskinesis				
	☐ Breathing Evaluation				
	Plan		Q R R S	Q R R S	Q R R S
	Treatments	/ Visits	/ Visits	/ Visits	/ Visits
	Time Frame	weeks	weeks	weeks	weeks
	Treatment Outcome Goal	%	%	%	%

O:

PT:

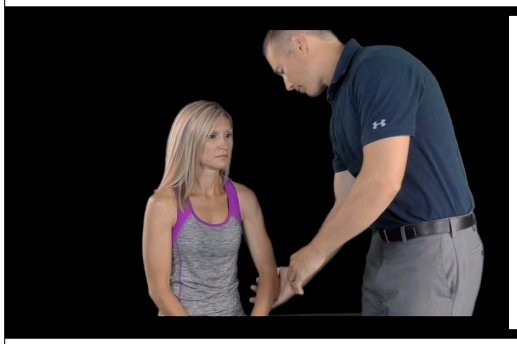
pt:

Q:

Dx:

Comments:

Cozens Test

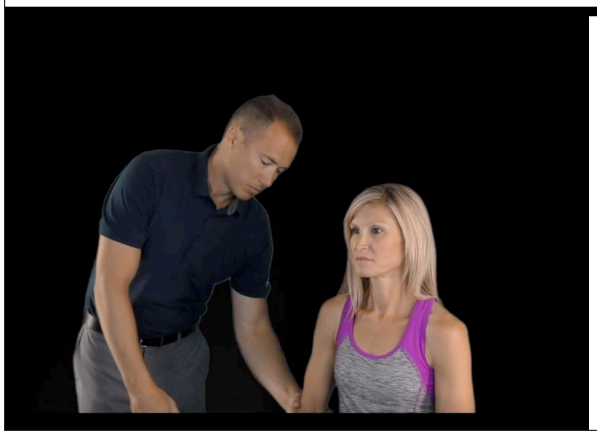


The seated patient partially extends their arm, with their wrist pronated and slightly radially deviated, fingers closed into a fist. The clinician stabilizes the elbow with one hand while the patient extends their wrist against resistance. Reproduction of symptoms suggests lateral epicondyle involvement.

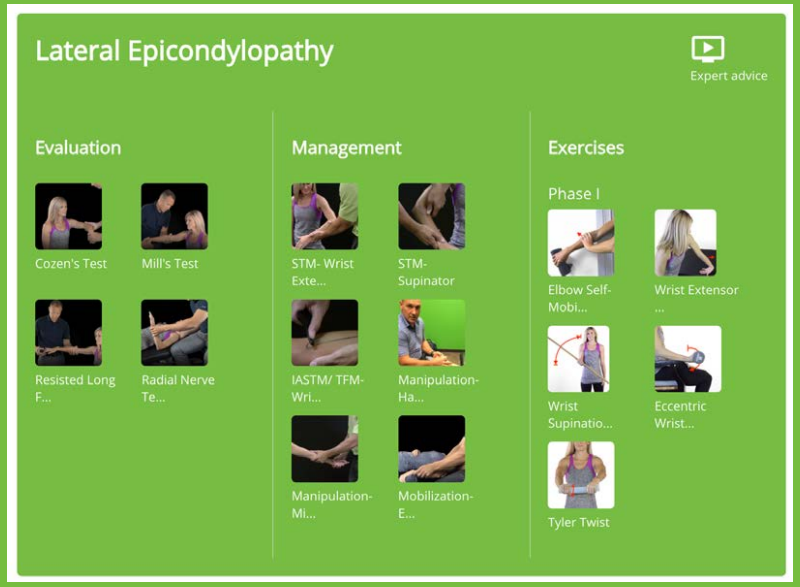
Mills Test

The patient is seated with their arm fully extended. The clinician passively flexes the wrist and applies radial deviation to fully stretch the wrist extensors. Reproduction of pain suggests wrist extensor or lateral epicondyle involvement.

Resisted Middle Finger Extension

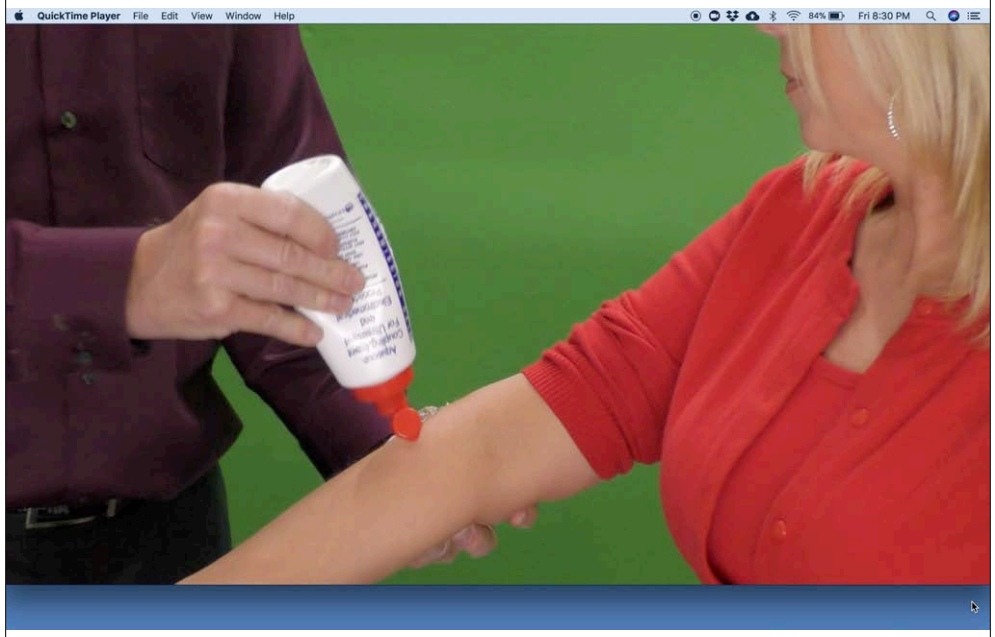


With the patient's forearm and fingers extended, the examiner resists middle finger extension. Reproduction of radial nerve pain during this test suggests compression of the radial nerve by the extensor carpi radialis brevis. This test may also be positive in lateral epicondylitis but radial tunnel irritation is the likely diagnosis when this test is more painful than passively flexing the fingers and wrist of an extended elbow. aka Middle Finger Sign.



"Shockwave therapy significantly reduced the pain that accompanies tendinopathies and improves functionality and quality of life. It might be first choice because of its effectiveness and safety."

Dedes V, Stergioulas A, Kipreos G, Dede AM, Mitseas A, Panoutsopoulos GI. Effectiveness and Safety of Shockwave Therapy in Tendinopathies. Mater Sociomed. 2018 Jun;30(2):131-146. doi: 10.5455/msm.2018.30.141-146.



IASTM- Wrist Extensors

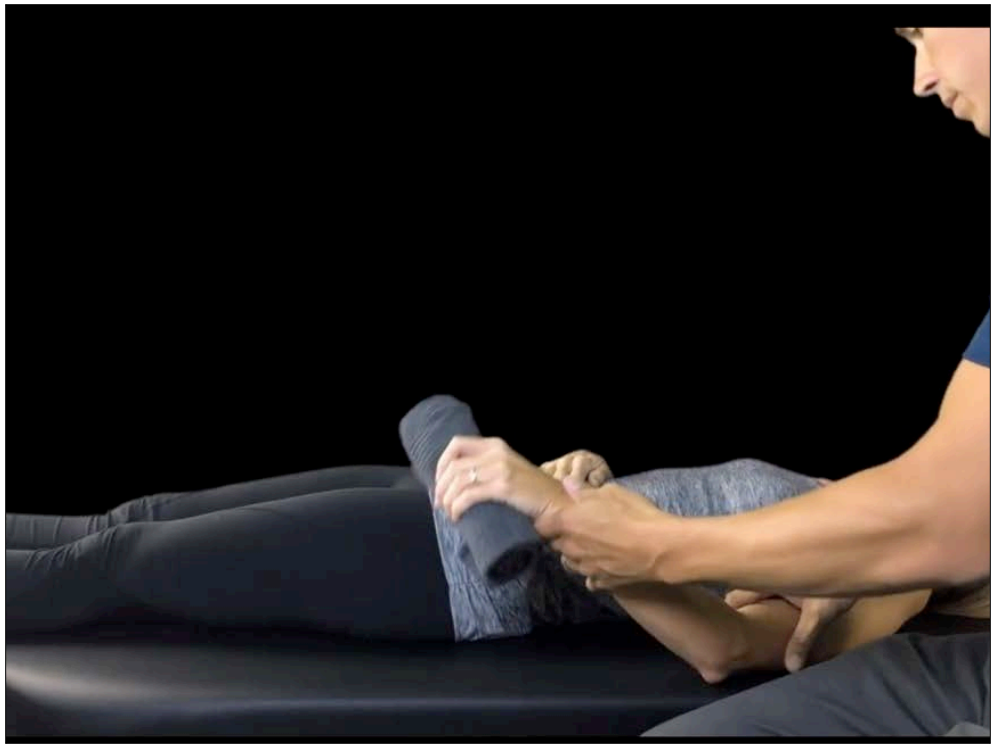
STM - Supinator

STM – Wrist Extensors

Manipulation – Mill's Radial Head

Mobilization with Movement

Begin with the patient in a supine position, loosely gripping a rolled towel in the affected hand. Their triceps should be contacting the edge of the table, forearm extending off the edge in a pronated position. The clinician places one hand under the patient's arm near the elbow, while grasping the top of the patient's proximal forearm with the other. The clinician applies a downward mobilization from a slightly relaxed/ flexed position into full extension. At terminal



"The surgical excision of the degenerative portion of the extensor carpi radialis brevis (ECRB) offers no additional benefit over and above placebo surgery for the management of chronic tennis elbow."

Kroslak M, Murrell GA. Surgical treatment of lateral epicondylitis: a prospective, randomized, double-blinded, placebo-controlled clinical trial. The American journal of sports medicine. 2018 Apr;46(5):1106-13.

"Pitching to the age-restricted pitch count limit did not result in altered pitching mechanics or muscle activations, and no differences occurred between the 3 pitches (fastball, curveball, and change-up). These results support previous research that indicate the curveball pitch is no more dangerous for youth than the other pitches commonly thrown."

Oliver GD et al. Effects of a Simulated Game on Upper Extremity Pitching Mechanics and Muscle Activations Among Various Pitch Types in Youth Baseball Pitchers. J Pediatr Orthop. 2019 Sep;39(8):387-393.

04/15/2021

Preventing Youth Throwing Injuries

A new study of 195 youth baseball pitchers (mean age range 8-12 years) found three factors that correlated with injury rates:

- *Hip external rotation on the dominant side*
- *Hip internal rotation on the non-dominant side*
- *Ankle plantar flexion on the non-dominant side*

Incidentally, *"The shoulder ROM and strength in the injured and non-injured groups did not differ to a statistically significant extent."*

Editors note: This study serves as a reminder to assess the entire kinetic chain in all patients, particularly athletes. Subscribers can use the ChiroUp Healthy Throwing young throwers on preventing throwing injuries.

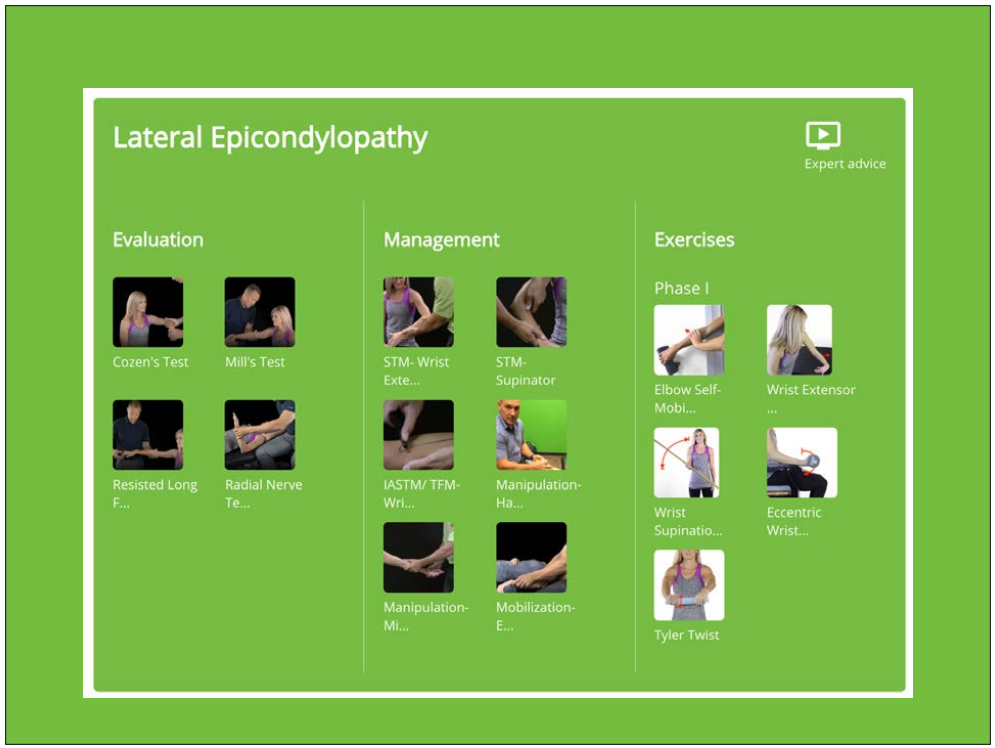
Hamano N, Shitara H, Tajika T, Ichinose T, Sasaki T, Kuboi T, Shimoyama D, Kamiyama M, Miyamoto R, Endo F, Nakase K. Relationship between the Lower Limb Functio Injuries in Elementary School Baseball Pitchers. Progress in Rehabilitation Medicine. 2021;6:20210015. Link

"The counterforce brace provides significant reduction in the frequency and severity of pain in the short term (2-12 weeks), as well as overall elbow function at 26 weeks."

Kroslak M et al. Counterforce bracing of lateral epicondylitis: a prospective, randomized, double-blinded, placebo-controlled clinical trial. J Shoulder Elbow Surg. 2019 Feb;28(2):288-295.

"Using wrist joint splinting for a short duration is effective for improving pain intensity… [and] may also be effective for improving wrist ROM and grip strength in the treatment of patients with lateral epicondylitis."

Kachanathu SJ, Alenazi AM, Hafez AR, Algarni AD, Alsubiheen AM. Comparison of the effects of short-duration wrist joint splinting combined with physical therapy and physical therapy alone on the management of patients with lateral epicondylitis. European journal of physical and rehabilitation medicine. 2019 Aug;55(4):488-93.

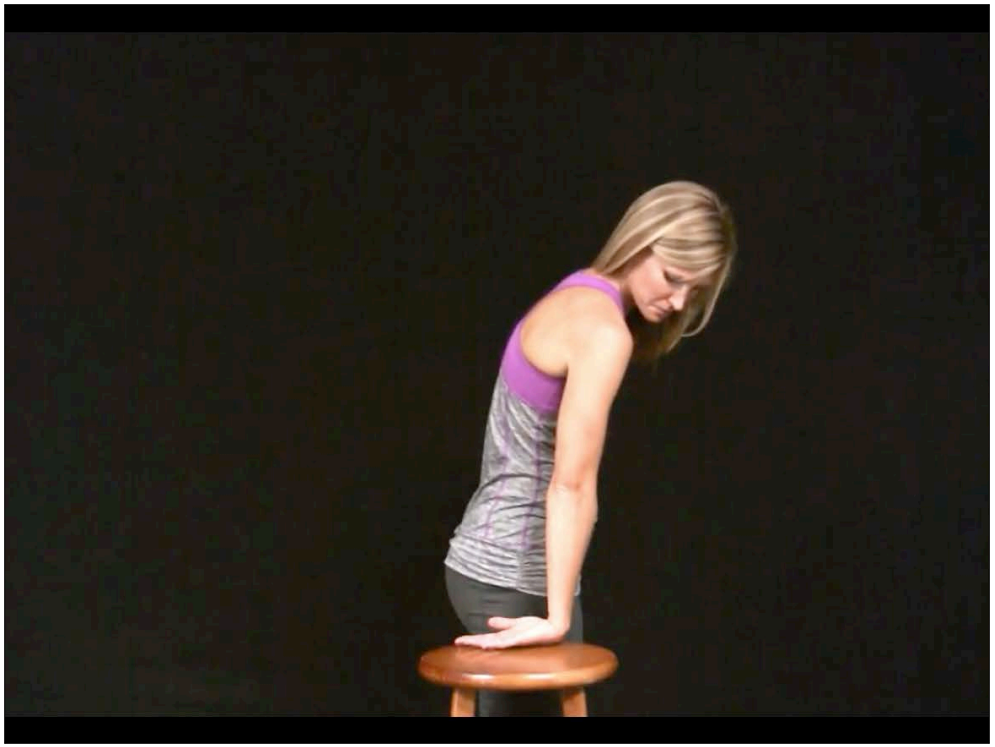


"This study determined that elbow extension, forearm pronation, and wrist flexion was the most effective eccentric stretching for the ECRB"

Joong-Bae Seo, MD, Sung-Hyun Yoon, MD, Joon-Yeul Lee, MD, Jun-Kyom Kim, MD, Jae-Sung Yoo, MD What Is the Most Effective Eccentric Stretching Position in Lateral Elbow Tendinopathy? Clinics in Orthopedic Surgery2018;10:47-54 https://doi.org/10.4055/cios.2018.10.1.47

Wrist Extensor Stretch - Table

Begin standing near a table with your arm dropped and elbow straight. Flex your wrist so that your fingers are pointing away from your thigh with your palm upward. (Butler's tip position) Place your hand and wrist flat on the table and gently lean your shoulder over the top of your hand until you feel a stretch. Against the resistance of the table, attempt to extend your wrist straight for seven seconds. Relax and lean further over the top of your hand to increase the stretch. "Lock in" to this new position and repeat three contract/relax cycles twice per day or as directed. To increase the stretch, make a fist.



Wrist Supination/Pronation

While standing with your arm outstretched in front of your abdomen, hold a weight or broomstick and rotate your hand from palm up to palm down 30 times daily or as directed.

"A treatment program using eccentric strengthening of adequate intensity and duration seemed to be most effective for treating lateral elbow tendinopathy."

Chen Z, Baker NA. Effectiveness of eccentric strengthening in the treatment of lateral elbow tendinopathy: A systematic review with meta-analysis [published online ahead of print, 2020 Apr 10]. J Hand Ther. 2020;S0894-1130(20)30027-2.

Eccentric Wrist Extensors

Begin sitting with your forearm on a table or armrest with your hand off the edge, palm down as shown. Begin with your hand in the extended/up position. Grasp a weight with your hand and slowly lower at a count of four seconds. Release the weight and use your healthy arm to reset to the starting position. Repeat three sets of 10 repetitions twice per day or as directed. This exercise may alternately be performed with an elastic band stretched between your hand and foot.

"Soft tissue calcification is likely iatrogenic complication of steroid injection for lateral epicondylitis patients."

Park HB et al. Association of steroid injection with soft-tissue calcification in lateral epicondylitis. J Shoulder Elbow Surg. 2019 Feb;28(2):304-309.

> J Am Acad Orthop Surg Glob Res Rev. 2021 Sep 10;5(9).
doi: 10.5435/JAAOSGlobal-D-21-00186.

Trends in Corticosteroid Injections for Treatment of Lateral Epicondylitis: An Analysis of 80,169 Patients

John Q Sun [1], Quinn A Stillson, Jason A Strelzow, Lewis L Shi

Affiliations + expand

PMID: 34506365 DOI: 10.5435/JAAOSGlobal-D-21-00186

Abstract

Introduction: Corticosteroid (CS) injections are a frequently used treatment modality for lateral epicondylitis (LE) despite an increasing number of studies suggesting their lack of efficacy. The objective of this study was to review the annual utilization of CS injections for treatment of LE, as well as that of other nonsurgical treatments and surgical treatments, to understand how recent publications have affected the practice of physicians in treating LE.

Methods: Patients with LE from 2010 to 2017 were identified within a national insurance database and grouped by treatment modalities of CS injections, physical therapy, bracing treatment, and surgery. Epidemiologic and demographic data were reported using descriptive statistics. The number of patients receiving each treatment and the number of CS injections per patient were quantified for each year, and annual trends were analyzed using logistic regression.

Results: Among 80,169 qualifying patients, 16,476 received CS injections, 12,180 received physical therapy, 1,874 received bracing treatment, and 2,650 underwent surgery, with patients receiving multiple modalities being members of each respective group. We found a significant decrease in the proportion of patients with LE receiving CS injections from 23.3% in 2010 to 18.8% in 2017 ($R2 = 0.956$, $P < 0.001$). Interestingly, the number of CS injections per patient increased during this period from 1.33 to 1.83 ($R2 = 0.843$, $P = 0.001$). No notable changes in utilization trends for other modalities were found.

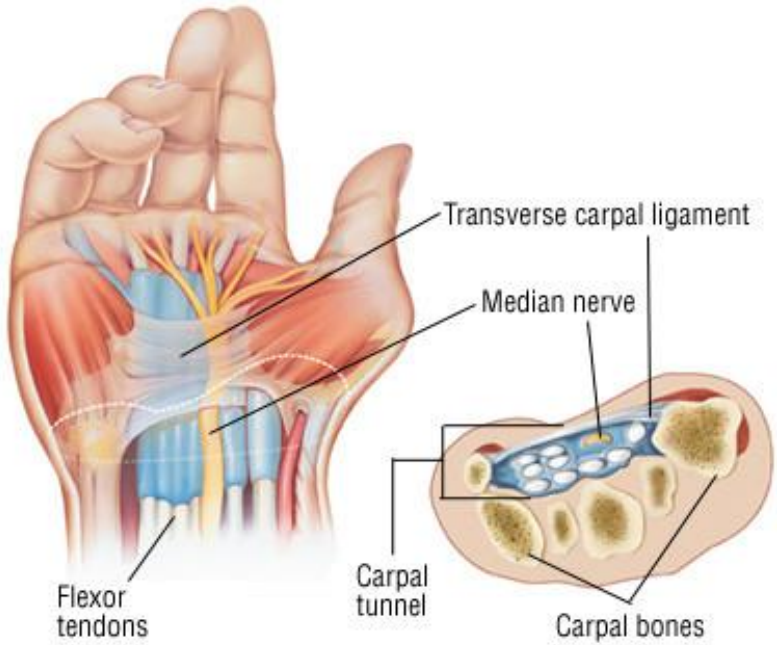
Discussion: Overall, our data support a decline in the use of CS injection as a treatment modality for LE from 2010 to 2017. Although correlational, this trend may reflect the increasing body of published evidence demonstrating the ineffectiveness of CS injections for the treatment of LE. In addition, the increasing number of injections per patient among those who received injections contrasts with the overall decrease in steroid utilization among all patients. Further study is needed to fully understand the mechanisms behind these trends.

Clinical Pearls

- LE is primarily a **degenerative** condition (tendinopathy)rather than a chronic inflammatory process (tendinitis).
  * Patients may require **3-4 months for full recovery**.
- * 10% of patients with LE have **co-existent Radial Tunnel Syndrome**- counterforce braces are contraindicated in this population.

Carpal Tunnel Syndrome

Carpal Tunnel Syndrome



- Affects **3-5%** of the general population
- More common in **dominant** hand
- **Female** to male ratio of at least 2 or 3:1
- Adults age **45-60**
- **White** adults are affected 2-3 times more commonly than black adults

Hosseini-Farid M, Schrier VJ, Starlinger J, Zhao C, Amadio PC. Carpal tunnel syndrome treatment and the subsequent alterations in tendon and connective tissue dynamics. Clinical Biomechanics. 2021 Jul 24:105440. Link

Carpal tunnel syndrome patients demonstrate diminished motion of the median nerve and fibrotic changes in the subsynovial connective tissue within the carpal tunnel.

"Up to 20% of carpal tunnel syndrome CTS patients demonstrate cutaneous findings involving the affected digits."

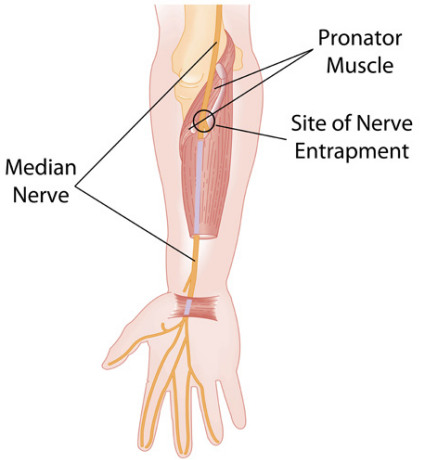
Egger A, Tosti A. Carpal Tunnel Syndrome and Associated Nail Changes: Review and Examples from the Author's Practice. Journal of the American Academy of Dermatology. 2020 Mar 19.

Sensitivity

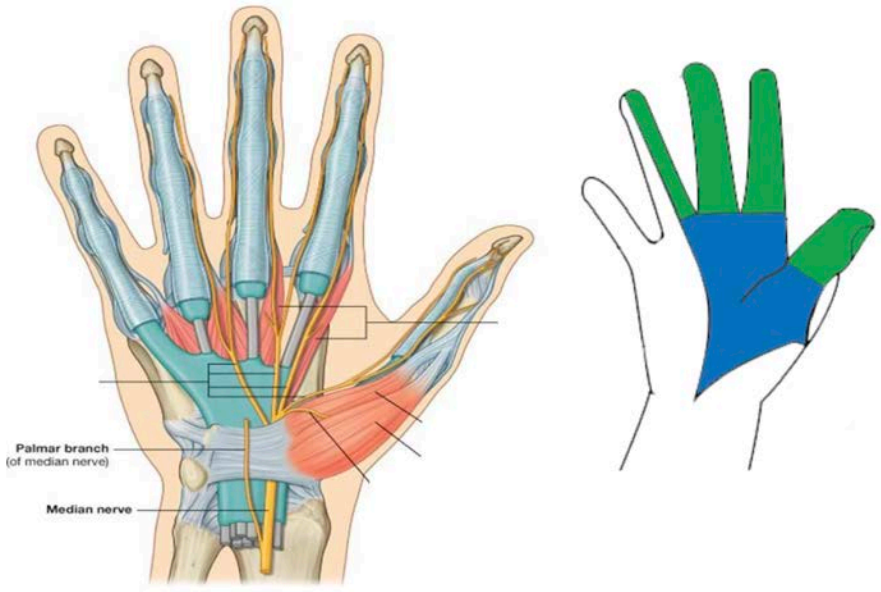
- Paresthesia in a median nerve distribution with nocturnal awakening - **77.4%**
- Phalen sign - **52.8%**
- Hoffman-Tinel sign - **37.7%**

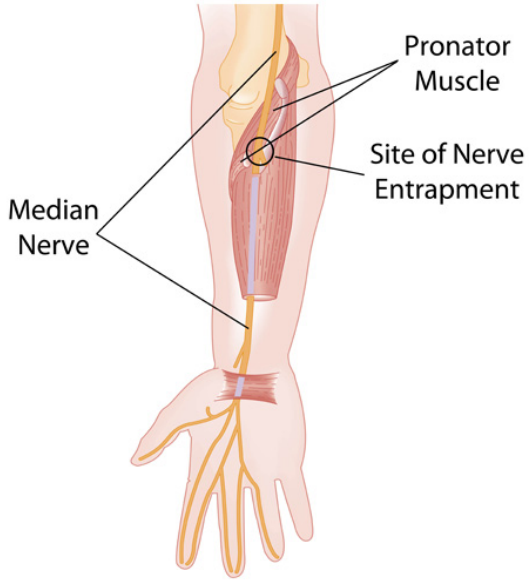
Hegmann KT et al. Median Nerve Symptoms, Signs, and Electrodiagnostic Abnormalities Among Working Adults. J Am Acad Orthop Surgery. 2018 Jul 19.

"A total of 174 extremities in 146 (CTS) patients were included in the study. Pronator syndrome was diagnosed in 22 extremities (12%)."

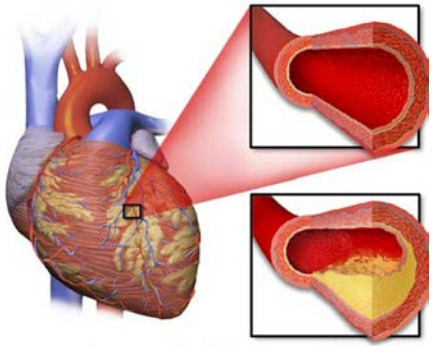


Özdemir A, Acar MA, Güleç A, Durgut F, Cebeci H. Clinical, Radiological, and Electrodiagnostic Diagnosis of Pronator Syndrome Concurrent With Carpal Tunnel Syndrome. The Journal of Hand Surgery. 2020 Jul 22.





"A significant positive correlation was observed between CAD and a previous diagnosis of carpal tunnel syndrome."



Chang YC, Chiang JH, Lay IS, Lee YC. Increased Risk of Coronary Artery Disease in People with a Previous Diagnosis of Carpal Tunnel Syndrome: A Nationwide Retrospective Population-Based Case-Control Study. Biomed Res Int. 2019;2019:3171925. Published 2019 Mar 3.

"Intraneural blood flow velocity is dependent on median nerve function and wrist posture such that patients with mild CTS are more susceptible to the effects of non-neutral wrist postures. This study stresses the importance of limiting exposure to non-neutral wrist postures in patients with early signs of the condition."

Zuniga AF, Ghavanini AA, Israelian G, Keir PJ. Blood flow velocity but not tendon mechanics relates to nerve function in carpal tunnel syndrome patients. Journal of the Neurological Sciences. 2020 Jan 21:116694.

"A wrist splint has short-term effectiveness in treating symptoms of carpal tunnel syndrome but may not be more effective than other conservative therapies."

Sprouse RA et al. Braces and Splints for Common Musculoskeletal Conditions. Am Fam Physician. 2018 Nov 15;98(10):570-576.

"Manual therapy, including desensitization maneuvers of the central nervous system, has been found to be equally effective but less costly (i.e., more cost-effective) than surgery for women with CTS."

Fernandez-De-Las-Penas C, Ortega-Santiago R, Díaz HF, Salom-Moreno J, Cleland JA, Pareja JA, Arias-Buría JL. Cost-Effectiveness Evaluation of Manual Physical Therapy Versus Surgery for Carpal Tunnel Syndrome: Evidence From a Randomized Clinical Trial. journal of orthopaedic & sports physical therapy. 2019 Feb;49(2):55-63.

Fernández-de-Las-Peñas C, Arias-Buría JL, Cleland JA, Pareja JA, Plaza-Manzano G, Ortega-Santiago R. Manual Therapy Versus Surgery for Carpal Tunnel Syndrome: 4-Year Follow-up From a Randomized Controlled Trial. Physical Therapy. 2020 Aug 6.

"The use of manual therapy based on neurodynamic techniques maintains the beneficial effects 6 months after therapy in CTS patients." (With regards to pain reduction, symptom severity, and strength improvement)

Wolny T, Linek P. Long-term patient observation after conservative treatment of carpal tunnel syndrome: a summary of two randomised controlled trials. Peer J. 2019 Nov 8;7:e8012.

Median Nerve Floss

Begin with your elbow, wrist, and fingers bent with your hand at chest level, palm up. Your head should be leaning toward the side of the arm that you are flossing. As you simultaneously move your head toward the opposite shoulder, also move your arm down across the fron of your chest out to the side of your hip. As your wrist and fingers move into extension, follow your hands motion with your eyes. Return to the start position and repeat three sets of 10 repetitions twice per day or as directed.

Median Nerve Glide

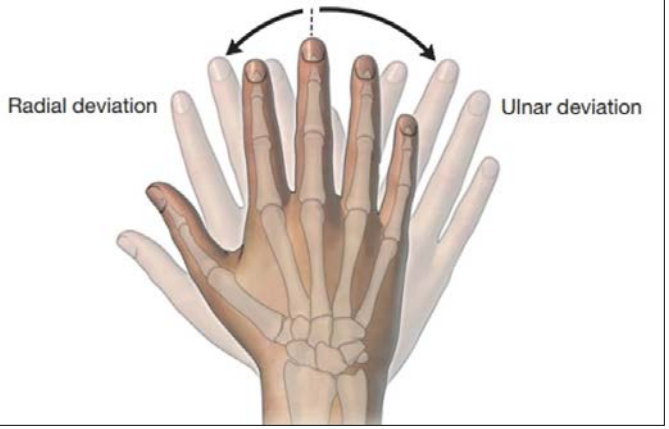
Begin by making a **fist**. First, flex your fist **downward**, then bring your wrist **back to a neutral** position. **Straighten your fingers** and thumb so that all five tips are pointing forward. Bend your wrist back/up as to make a "**stop**" motion and move your **thumb away from your palm**. **Turn your wrist palm up**. Use your opposite hand to **pull your thumb further away** from your palm. Perform 20 repetitions twice per day or as directed.

"Myofascial stretching of the carpal ligament showed statistically significant improvements…in numbness, tingling, pinch strength, and symptom severity."

Shem K, Wong J, Dirlikov B. Effective self-stretching of carpal ligament for the treatment of carpal tunnel syndrome: A double-blinded randomized controlled study. Journal of Hand Therapy. 2020 May 1.

For the treatment and prevention of carpal tunnel syndrome, results suggest that attention should be given to slight radial-ulnar deviation postures (<10°), while slight flexion-extension postures (<20°) are of lesser consequence to carpal tunnel volume.

Anderson DA, Agur AM, Oliver ML, Gordon KD. Effects of slight flexion-extension and radial-ulnar deviation postures on carpal tunnel volume. Clinical Biomechanics. 2022 Jan 12:105575. Link



"For both symptom relief and function improvement, manual acupuncture is superior to ibuprofen."

Wu IX, Lam VC, Ho RS, Cheung WK, Sit RW, Chou LW, Zhang Y, Leung TH, Chung VC. Acupuncture and related interventions for carpal tunnel syndrome: systematic review. Clinical rehabilitation. 2019 Sep 26:0269215519877511.

"We found no clinically significant benefit from ultrasound treatment for CTS"

Jothi KP, Bland JD. Ultrasound Therapy Adds No Benefit to Splinting in Carpal Tunnel Syndrome. Muscle & nerve. 2019 Jul 30.

"Focused extracorporeal shock wave therapy is an effective and noninvasive treatment method for mild to moderate carpal tunnel syndrome."

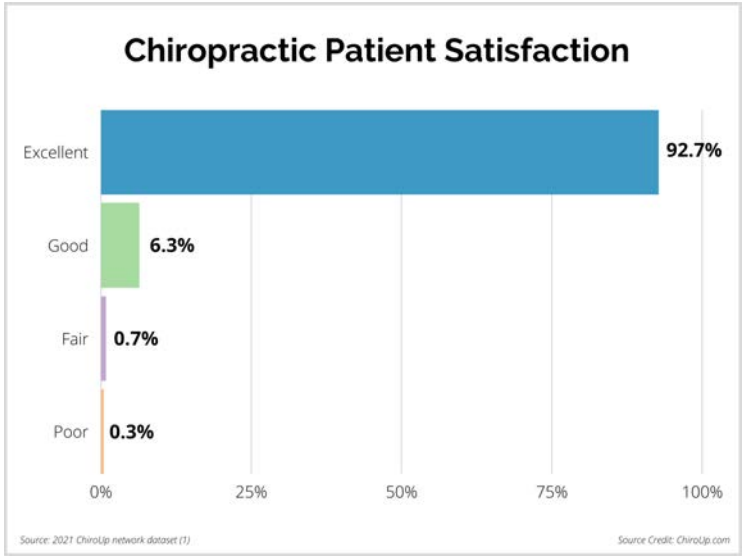
Gesslbauer C, Mickel M, Schuhfried O, Huber D, Keilani M, Crevenna R. Effectiveness of focused extracorporeal shock wave therapy in the treatment of carpal tunnel syndrome. Wiener klinische Wochenschrift. 2020 Dec 22:1-0

Our findings indicate that obesity and Type 2 Diabetes are independent risk factors of CTS.

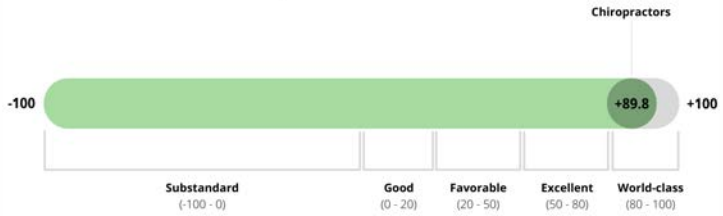
Mi J, Liu Z. Obesity, Type 2 Diabetes, and the Risk of Carpal Tunnel Syndrome: A Two-Sample Mendelian Randomization Study. Frontiers in Genetics. 2021;12. Link

Opinion is really the lowest form of human knowledge. It requires no accountability, no understanding. The highest form of knowledge... is empathy, for it requires us to suspend our egos and live in another's world. It requires profound purpose larger than the self kind of understanding.

Bill Bullard



Overall Net Promoter Score for Chiropractors (NPS)



Source: 2021 ChiroUp network dataset (1)

Source Credit: ChiroUp.com

PremierRehab

ABOUT YOUR CONDITION
EMMIE STEELE
10/05/2021

WHAT'S WRONG?

Carpal Tunnel Syndrome

The eight bones of your wrist form a U-shaped channel that houses several tendons and your Median nerve. This channel is called the Carpal tunnel. Your median nerve is responsible for sensation on the palm side of your first 3 ½ fingers. Compression or irritation of this nerve as it travels through the carpal tunnel causes the condition known as "Carpal tunnel syndrome". Carpal tunnel syndrome is the most common nerve entrapment, affecting 3-5% of the general population. Females are affected two or three times more frequently than males. Carpal tunnel syndrome most often affects adults age 45-60.

Carpal tunnel syndrome can be brought on by prolonged wrist flexion and/or repetitive wrist movements like supermarket scanning, keyboard use, carpentry, or assembly line work. Exposure to vibration or cold may also aggravate the condition. Carpal tunnel syndrome is more common in your dominant hand but frequently affects both hands. Some risk factors for developing carpal tunnel syndrome include diabetes, thyroid disease, rheumatoid arthritis, alcoholism, kidney disease, and being short or overweight. Fluid retention during pregnancy is a common cause of carpal tunnel symptoms.

Symptoms of carpal tunnel syndrome include numbness, tingling, or discomfort on the palm side of your thumb, index, middle finger, and half of your ring finger. The discomfort can sometimes extend towards your elbow. The symptoms usually begin as nighttime discomfort or waking up with numb hands but can progress to a constant annoyance. Your symptoms are likely aggravated by gripping activities like reading the paper, driving, or painting. Early on, your symptoms may be relieved by "shaking your hands out". You may sometimes feel as though your hands are tight or swollen. In more severe cases, hand weakness can develop.

Compression of your median nerve in the carpal tunnel is often accompanied by compression at a second or third site as well. Researchers call this "double crush syndrome." Common "double crush" partners for carpal tunnel syndrome involve the spine or muscles in your neck, shoulder, and forearm.

To help resolve your condition, you should avoid activities that involve repetitive wrist flexion, i.e. pushups. Grasping the handlebars on your bicycle will likely irritate your condition. Our office may prescribe a special splint that holds your wrist in a neutral or slightly extended position that will help with your nighttime symptoms.

If left untreated, carpal tunnel syndrome can result in permanent nerve damage. The American Academy of Neurology recommends conservative treatment, like the type provided in our office, before considering surgical alternatives.

Joint Manipulation

Your provider has found joints in your body that are not moving freely. This can cause tightness and discomfort and can accelerate unwanted degeneration i.e. arthritis. Your provider will apply a gentle force with their hands, or with handheld instruments, in order to restore motion to any "restricted" joints. Sometimes a specialized table will be used to assist with these safe and effective "adjustments". Joint manipulation improves flexibility, relieves pain, and helps maintain healthy joints.

Myofascial Release

Overworked muscles often become tight and develop knots or "trigger points". Chronic tightness produces inflammation and swelling that ultimately leads to the formation of "adhesions" between tissues. Your provider will apply pressure with their hands, or with specialized tools, in order to release muscle tightness and soft-tissue adhesions. This will help to improve your circulation, relieve pain and restore flexibility.

Therapeutic Exercise

Muscle tightness or weakness causes discomfort and alters normal joint function, leading to additional problems. Your chiropractor will target tight or weak muscles with specific therapeutic stretching and strengthening to help increase tissue flexibility, build strength, and ease the pain. Healthy, strong, and flexible muscles may help prevent re-injury.

TREATMENT GOALS AND OUTCOME MEASURES

Your treatment will be most effective when scheduled at a rate of 3 times per week for 2 weeks. After this initial course of treatment we will reassess to make sure that you have met your initial treatment goal of at least 50 % overall improvement. We will determine the need for any additional care after your reassessment.

THINGS YOU CAN DO TO HELP YOURSELF

Your everyday activities, habits, and postures can have a dramatic impact on your body. The following advice will help you minimize stress while improving your comfort and health:

2 WAYS TO VIEW YOUR EXERCISES

ONLINE

OR NAVIGATE TO
www.HealthCom.io

LOGIN:
esteele2
TEMPORARY PASSWORD:
(your current password)

DOWNLOAD
OUR HEALTHCOM APP

Download on the App Store

GET IT ON Google Play

Current Exercises

Median Nerve Floss

Perform 3 sets of 10 reps, 2 times per day.

Begin with your elbow, wrist, and fingers bent with your hand at chest level, palm up. Your head should be tilting away from the arm that you are flossing. As you simultaneously move your head toward the opposite shoulder, also move your arm down across the front of your chest out to the side of your hip. As your wrist and fingers move into extension, follow your hands motion with your eyes. Return to the start position. Perform as directed.

Median Nerve Glide

Perform 1 set of 20 reps, 2 times per day.

Begin by making a fist. First, flex your fist downward, then bring your wrist back to a neutral position. Straighten your fingers and thumb so that all five tips are pointing forward. Bend your wrist backlup as to make a "stop" motion and move your thumb away from your palm. Turn your wrist palm up. Use your opposite hand to pull your thumb further away from your palm. Perform 20 repetitions twice per day or as directed.