

The Acumoxa Treatment of Shoulder Impingement Syndrome

Abstract

This article describes the differential diagnosis and treatment of shoulder impingement syndrome using acupuncture and moxibustion.

Impingement syndrome in the shoulder occurs when the head of the humerus abuts the acromion and coracoacromial ligament and pinches the subacromial bursa, the supraspinatus tendon and/or the tendon of the long head of the biceps brachii. Inflammation and swelling of any or all of these structures as a result of muscle imbalance and improper shoulder biomechanics characterises impingement syndrome (Fig. 1). The patient may complain of pain with raising the arm above the shoulder. The pain is usually located around the anterior or lateral deltoid, in the region of Jianyu L.I.-15 and extra points Naoshang (N-UE-14) and Jianneiling (M-UE-48). The patient will usually report shoulder weakness and difficulty sleeping on the affected side.

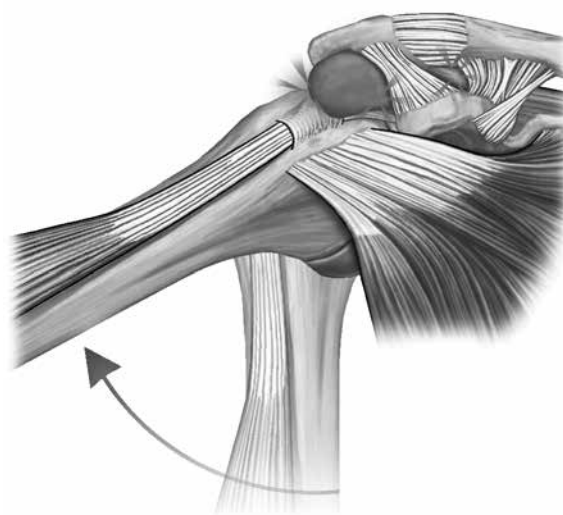


Figure 1: Impingement syndrome can involve the subacromial bursa, the supraspinatus tendon and/or the biceps long head tendon.

When functioning properly, the combined inferior and medial pull from the rotator cuff muscles maintains the humeral head in the shallow glenoid fossa during shoulder movements. An even pull from the rotator muscles keeps the humeral head centred

within a small arc of movement of approximately three millimetres.¹ Any imbalance in the rotator cuff muscles affects how the humeral head is steered into the glenoid fossa, which can eventually result in impingement. When the rotator cuff muscles are imbalanced, it has been shown that the centre of rotation of the humeral head can migrate superiorly up to six millimetres when the arm is raised.²

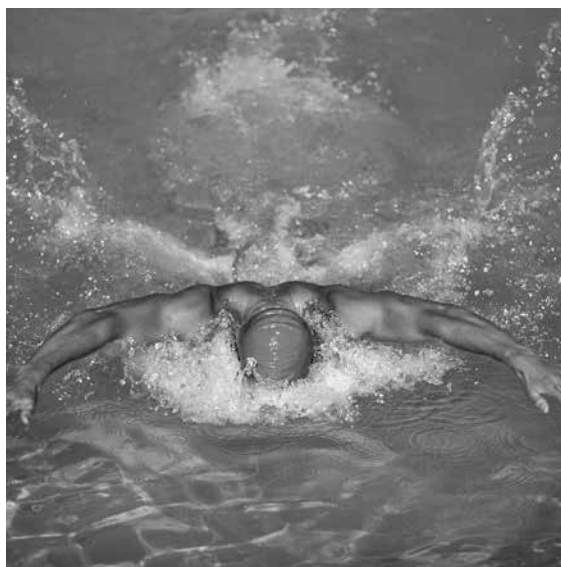


Figure 2: Repetitive overhead movements involving shoulder internal rotation predispose the shoulder joint to impingement.

Muscle imbalance is usually found between the internal and external rotators of the shoulder joint in impingement syndrome, and is typically accompanied by muscle shortening and weakness within the shoulder girdle muscles. Normally, the greater tubercle of the humerus is in very close proximity to the acromion between 60 to 120 degrees of shoulder abduction or flexion. The combination of overhead motion and shoulder internal rotation, such as occurs during a tennis serve or a swimmer's butterfly stroke, is the most likely type of motion to lead to impingement syndrome (Fig. 2). In acute

By: Matt Callison

Keywords:

Acupuncture, shoulder, impingement syndrome, Chinese medicine, supraspinatus, musculoskeletal, pain.

cases of impingement syndrome, the subacromial bursa may become inflamed and/or microtearing of the supraspinatus tendon may occur, both of which lead to pain and swelling. Eventually, muscle imbalance combined with repetitive overhead activities compresses the tissues and results in a fibrotic and thickened subacromial bursa and a weak and degenerating supraspinatus tendon.³ If left untreated, impingement syndrome can progress from simple and reversible inflammation to irreversible rotator cuff tendinopathy and probable rupture.⁴ (Fig. 3) Tearing of the supraspinatus tendon can be a partial tear or complete rupture and this injury occurs most often in older (usually over the age of 40) patients. If untreated, tears of any size in patients with an active lifestyle may lead to chronic pain and weakness.

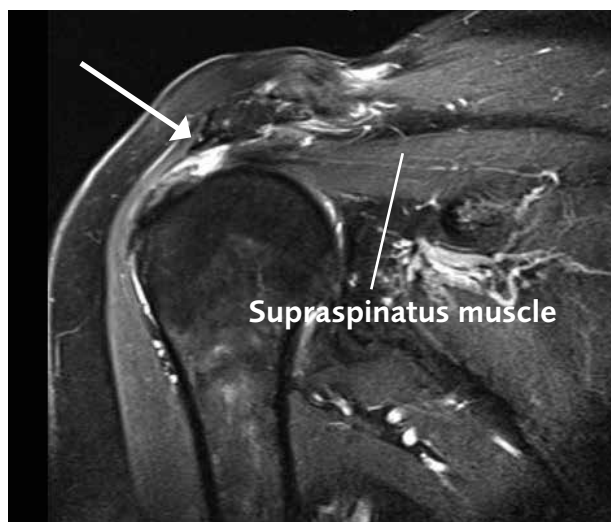


Figure 3: MRI scan; arrow indicates a complete rupture or full thickness tear of the supraspinatus tendon.

In addition to muscle imbalance and repetitive overhead motions, the shape of the acromion itself can predispose the patient to impingement syndrome. The shape of the acromion plays an important role in the amount of room available in the subacromial space. In general, the acromion takes one of three different shapes:⁵

- Type I acromion: The acromial undersurface is flat.
- Type II acromion: The acromial undersurface has a downward curved shape (the most common shape).
- Type III acromion: The acromial undersurface is hooked in shape and it enters and decreases the subacromial space. This shape is the most likely to contribute to supraspinatus tendinopathy and shoulder impingement.

Assessment

- The patient will usually complain of pain with raising the arm above the shoulder. Pain is usually anterior or lateral over the deltoid in the region of Jianyu

L.I.-15, Naoshang (N-UE-14) and Jianneiling (M-UE-48) (Fig. 4).

- The patient will usually report shoulder weakness and difficulty sleeping on the affected side.
- Painful Arc Test: Range of motion is often limited due to the superior translation of the humeral head abutting against the acromion (see Appendix 1).
- Hawkins-Kennedy Test (see Appendix 1).
- Neer's Impingement Test (see Appendix 1).
- Codman Test (see Appendix 1).
- Rotator cuff manual muscle testing (see Appendix 2).
- Postural assessment, especially for scapular protraction and elevation. Assess for upper crossed syndrome (defined as the shortening and lengthening of agonist and antagonist muscle groups found on the anterior and posterior aspects of the upper body; shortened muscles tend to be overactive, whereas the opposing muscles are lengthened and inhibited, and therefore weakened).
- Radiological findings may show bone spurs on the acromion and/or distal clavicle, as well as evidence of a tendon tear.
- Differential diagnosis: The practitioner should differentiate this injury from other causes of anterior shoulder pain, such as bicipital tenosynovitis, supraspinatus tendinopathy, SLAP lesion, subscapularis tendinopathy and coracobrachialis strain.

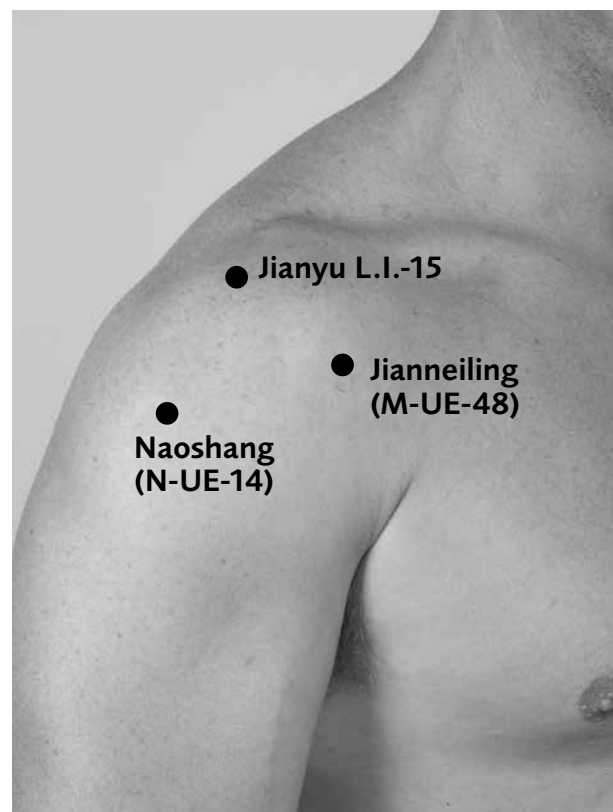


Figure 4: Common triangular region of pain for impingement syndrome.

TCM patterns and treatment principles

The following are some of the TCM patterns that are commonly seen in the local area in shoulder impingement syndrome. The practitioner should always assess the status of the zang fu to determine if there are any underlying organ-related patterns of imbalance. The best clinical results will be obtained when the local injury is treated within the context of these underlying imbalances.

- **Qi and blood deficiency in the channels and collaterals with blood stasis** (jing luo qi xue bu zu xue zhi)

Overuse of the shoulder impairs the circulation of qi and blood in the local channels and collaterals (jing luo), which results in localised qi and blood deficiency and subsequent tissue weakness. Areas of latent blood stagnation result from the repeated traumas and the insufficient flow of qi and blood in the local region. The patient will often describe the pain as sharp, stabbing and fixed in location during activity. The localised qi and blood deficiency may cause symptoms such as muscle spasms, decreased movement, weakness in the shoulder and muscle fatigue. This pattern often results in pain that is worse at night and better during the day.

Treatment principles: Supplement qi and nourish blood in the local channels and collaterals, disperse blood stasis and unblock local obstruction in the channels and collaterals, alleviate pain.

- **Cold-damp painful obstruction** (han shi bi)

Chronic injury weakens the shoulder joint and results in localised qi and blood deficiency that makes the shoulder susceptible to invasion by pathogenic cold-damp. The pain is deep, fixed, worse with cold and better with warmth. The patient may feel heavy sensations or dull, aching pain that is worse with changes in the weather. In severe cases, swelling, oedema and fibrotic changes to the bursa or tendons can occur. In patients over the age of 40, the practitioner should also consider the status of Kidney yang qi. If Kidney yang qi is deficient (shen yang qi xu), the Du Mai (Governing Vessel) and the wei qi will also be weakened and consequently the patient will be even more susceptible to attacks of external pathogenic factors. This type of situation could lead to an advanced painful obstruction syndrome such as tendon or bone bi (jin bi, gu bi).

Treatment principles: Disperse cold, resolve damp, warm the Kidneys, unblock the channels and collaterals, alleviate pain.

- **Liver and Kidney yin deficiency with blood stasis** (gan shen yin xu xue zhi)

The decline of Liver and Kidney yin leads to the gradual deterioration of the bones and tendons, which causes aching, distending and burning pain in the shoulder joint. Long-term overuse of the shoulder in ageing

patients results in structural changes to the tendons and bones and a subsequent lack of circulation of qi and blood in the local area. Deep palpation of the shoulder usually elicits an uncomfortable, sharp and possibly burning pain that reveals the presence of blood stasis in the local area. The patient may also present with difficulty sleeping through the night, light-headedness, irritability, low back and/or knee pain, constipation, a red, dry tongue and a thin and rapid pulse. This pattern will often present with degenerative joint/disc disease, bone spurs, calcification within the tendinous tissues, thinning articular cartilage and a decreased amount of synovial fluid (jin) in the joints. These signs are evidence that the functioning of the zang organ systems have become impaired.

Treatment principles: Nourish the Liver and tonify Kidney yin, disperse blood stasis, unblock obstructions in the channels and collaterals, alleviate pain.

Acupuncture

When treating shoulder impingement syndrome, the practitioner should choose appropriate points from the categories listed below:

Huatuojiaji points

- From the fourth to the sixth cervical vertebrae.

Motor points

The practitioner should needle the supraspinatus motor point and also choose one or two motor points from the antagonist muscle group. Selection is based on maximum tenderness upon palpation.

- **Agonist muscle:** Supraspinatus (Bingfeng SI-12, needled with a perpendicular needle insertion into the supraclavicular fossa, 1-1.5 inches deep).⁶
- **Antagonist muscles:** Teres minor, infraspinatus and subscapularis.
- **Other motor points to consider** are the biceps brachii (long head), upper trapezius, pectorals, serratus anterior and rhomboids.
- **Subscapularis motor point:** To allow adequate access to the subscapularis motor point, have the patient lie supine and abduct their arm as far as comfortably possible, preferably to a minimum of 90 degrees. The shoulder is then externally rotated to a comfortable range and can be supported by a pillow or towel. The practitioner reaches under the patient's scapula and grabs the medial border and pulls the scapula laterally into scapular protraction (abduction) to allow for access to subscapularis (Fig. 5A). The practitioner places the fingertips of their palpating hand into the axilla, inferior and medial to Jiquan HE-1, with the dorsal side of their palpating hand against the ribcage. The fingertips should gently separate the tissue in a



Target tissue needling

• Supraspinatus sinew repair needle technique:

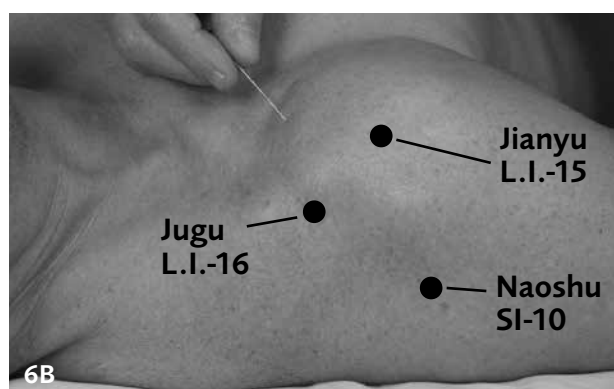
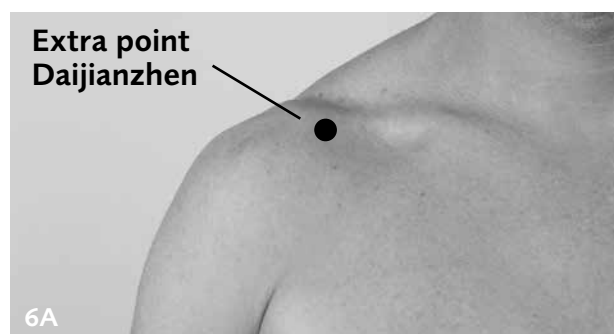
This technique is best used for a partial tear of the supraspinatus tendon. Locate extra point Daijianzhen in the depression directly under the edge of the clavicle, approximately halfway between Yunmen LU-2 and Jianyu L.I.-15 (Fig. 6A). Insert a 1.5-inch/40 millimetre needle from Daijianzhen under the clavicle and in the direction of Naoshu SI-10 (Fig. 6B). The intention is to have the needle directed to the most common location of tendon tears. Once qi is obtained, rotate the needle clockwise and counterclockwise 180 degrees to determine which direction provides the most resistance. Once the direction of most resistance is determined, rotate the needle in that direction until the needle cannot be turned any further due to tissue tightness. The needle sensation should be strong but tolerable for the patient. Leave the needle in place as part of the treatment protocol. After 15 to 20 minutes, the needle should withdraw easily, if not, rotate the needle in the opposite direction until it loosens. The goal of this technique is to wrap the connective and injured tissues together, helping them to bridge for better healing. Due to the amount of torsion placed on the acupuncture



posterior and superior direction, toward the anterior surface of the scapula (Fig. 5B). Palpate with the tip of the middle finger for a tight fibrous band, which when palpated will usually refer sensation down the Heart channel or to the back of the shoulder in the region of Naoshu SI-10. When the practitioner has found the motor point, they should keep the dorsum of their hand and palpating fingers in place while they insert a three-inch / 75 millimetre needle into the point. The needle insertion follows exactly the same angle as the palpating middle finger. The palpating hand is kept in place to protect the ribcage during needle insertion (Figs. 5C-E). Caution is advised: Needle is in close proximity to the pleural cavity and damage to the lung could occur if it is penetrated.

Figures 5A-E: Subscapularis Motor Point Needling. A) The practitioner pulls the scapula laterally. B) The practitioner palpates for the subscapularis motor point. C-E) The needle insertion follows exactly the same angle as the palpating finger. The palpating hand is kept in place on the ribcage to protect the pleural cavity during needle insertion. Note: In image 5E, the palpating hand has been removed so that the reader can see the needle angle. Caution is advised: Needle is in close proximity to the pleural cavity and damage to the lung could occur if it is penetrated.

needle, it is important to use a well-manufactured and high quality stainless steel needle. Note: Based on clinical experience and cadaver dissections, the needle direction described here is accurate, but may need to be slightly modified as individual variances in human structure do occur. For example, in broad-shouldered individuals, the needle angle may need to be directed slightly more laterally.



Figures 6A&B: Supraspinatus sinew (jin) repair needle technique. A) Extra point Daijianzhen. B) Superior view of needle angle from Daijianzhen in the direction of Naoshu SI-10.

Acupuncture point combinations for TCM patterns

- **Qi and blood deficiency in the channels and collaterals with blood stasis**
Quchi L.I.-11, Jugu L.I.-16, Jianyu L.I.-15, Jugu L.I.-16, Tiaokou ST-38, Zusanli ST-36, Geshu BL-17, Pishu BL-20, Sanyinjiao SP-6, Ququan LIV-8, Naoshu SI-10, Tianzong SI-11.
- **Cold-damp painful obstruction**
Houxi SI-3, Shenmai BL-62, Bingfeng SI-12, Fengchi GB-20, Dazhui DU-14, Lieque LU-7, Fengmen BL-12, Biguan ST-31, Fenglong ST-40, Yinlingquan SP-9
- **Liver and Kidney Yin deficiency with blood stasis**
Taichong LIV-3, Ququan LIV-8, Zhaohai KID-6, Lieque LU-7, Dazhu BL-11, Xuanzhong GB-39, Jingmen GB-25, Sanyinjiao SP-6, Ganshu BL-18, Bingfeng SI-12, Jianjing GB-21, Jugu L.I.-16

After identifying the injured channel(s), the practitioner should also consider choosing points that affect the injured

channel via channel correspondences such as internal/external (biao li), midday/midnight (zi wu liu zhu) and the six divisions (liu jing bian zheng).

Moxibustion

- **Qi and blood deficiency in the channels and collaterals with blood stasis**
Direct moxa on Bingfeng SI-12, Jugu L.I.-16 and Jianyu L.I.-15. Pole or direct moxa on Zusanli ST-36, Geshu BL-17, Pishu BL-20, Sanyinjiao SP-6 and Ququan LIV-8.
- **Cold-damp painful obstruction**
Pole moxa over Dazhui DU-14, Bingfeng SI-12, Fengmen BL-12, Feishu BL-13, Fenglong ST-40 and Yinlingquan SP-9. Moxa on the needle at extra point Daijianzhen (Fig. 7).
- **Liver and Kidney yin deficiency with blood stasis**
Pole moxa over Jugu L.I.-16, Ganshu BL-18, Shenshu BL-23, Taixi KID-3 and Taichong LIV-3.



Figure 7: Moxa on the needle at extra point Daijianzhen for cold-damp painful obstruction affecting the shoulder joint

Prognosis

For most cases of shoulder impingement syndrome, the acupuncture and moxibustion protocols provided here will be effective for decreasing pain and increasing range of motion within four to six treatments. Impingement syndrome usually occurs within the context of poor shoulder joint mechanics and muscle imbalance, all of which need to be addressed in order to achieve complete rehabilitation. In many cases, if the practitioner includes

the appropriate strengthening and stretching exercises alongside the acupuncture treatment, impingement syndrome is significantly improved within eight to twelve treatments. It is recommended to initially administer two treatments per week, for three weeks. Repeat this course of treatment two or three times, as long as range of motion and pain are sequentially improving. Range of motion should improve first, with muscle strength increasing after four to six weeks.

For full thickness tears of the supraspinatus tendon, where pain is inhibiting activity, surgery may be needed

to enhance quality of life. Osseous changes such as bone spurring can delay healing for months. A surgical bone debridement may be performed to shave off bone spurs on the underside of the acromion to allow more room for the underlying tendon and soft tissue structures. Depending on the extent of bone removal, full rehabilitation will then take anywhere between eight and 14 weeks. For the most effective long-term results the treatment plan should also include Chinese herbal medicine, a myofascial therapy such as tuina and electrical stimulation (if indicated).

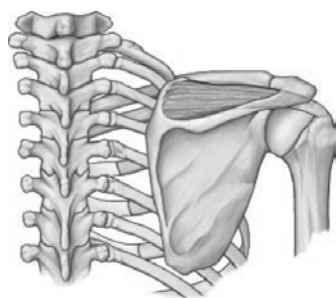
Appendix 1: Manual tests for the rotator cuff muscles

Suprapinatus

Origin: Supraspinous fossa of the scapula (superior aspect).

Insertion: Greater tubercle of the humerus (superior edge).

Action: Shoulder abduction.



1. With the patient in a supine position, place their arm into 25-30° of abduction with slight flexion and elbow extension. The patient's Laogong P-8 and Shaohai HE-3 should face the lateral aspect of their body.
2. The practitioner's driving hand is placed over the distal forearm of the patient covering Waiguan SJ-5. The practitioner holds the opposite anterior superior iliac spine (ASIS) to provide a stable base.
3. The line of drive is into adduction toward Juliao GB-29 (Fig. 8).



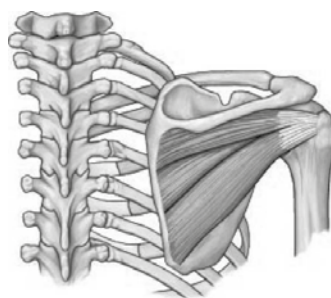
Figure 8: Suprapinatus manual muscle test

Infraspinatus

Origin: Infraspinous fossa of the scapula.

Insertion: Posterior aspect of the greater tubercle of the humerus.

Action: Shoulder external rotation.



1. With the patient in a supine position, abduct their shoulder to 110-120° with shoulder external rotation, so that wrist is 5-10 inches from table. Flex the patient's elbow to 90°.
2. The practitioner should stabilise the elbow at Tianjing SJ-10 to prevent adduction of shoulder. The driving hand is covering Waiguan SJ-5.
3. As the patient resists, the practitioner moves the humerus into internal rotation by pushing on Waiguan SJ-5 (Fig. 9).

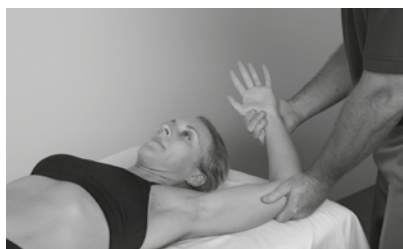


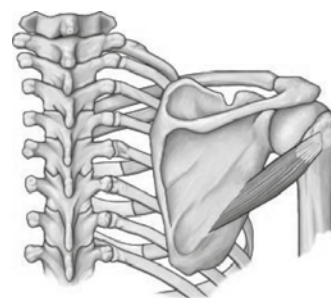
Figure 9: Infraspinatus manual muscle test.

Teres minor

Origin: Medio-lateral edge of dorsal surface of the scapula.

Insertion: Lowest facet of greater tubercle of the humerus.

Action: Shoulder external rotation.



1. With the patient in a supine position, place the elbow into 90° of flexion with full shoulder adduction and 35°-45° of shoulder external rotation.
2. The practitioner's stabilising hand is placed against the patient's elbow to prevent shoulder abduction. The driving hand is held over the distal forearm near Waiguan SJ-5.
3. As the patient resists, the practitioner's line of drive is into shoulder internal rotation (Fig. 10). Note: Watch for elbow flexion or extension as the patient tries to recruit the biceps or triceps.



Figure 10: Teres minor manual muscle test.

Subscapularis

Origin: Subscapular fossa on the anterior surface of the scapula.

Insertion: Anterior aspect of lesser tubercle of the humerus and front of the articular capsule.

Action: Shoulder internal rotation.

1. With the patient in a supine position, abduct their arm to 80-110° and flex the elbow to 90°.
2. The practitioner's stabilising hand is held under the posterior elbow near Tianjing SJ-10. The driving hand is on the distal forearm, covering Daling P-7 (Fig. 11).
3. As the patient resists, the practitioner's line of drive is into shoulder external rotation.



Figure 11: Subscapularis manual muscle test.

Appendix 2: Orthopaedic tests for the shoulder

Painful Arc Test



Figures 12A&B: Painful Arc Test. A) Pain between 60°-120° indicates a positive Painful Arc Test. B) Assisting the scapula while the patient abducts the arm.

This test assesses for impingement of the subacromial bursa and/or supraspinatus tendon between the humeral head and the acromion process.

1. This test may be performed in a seated or standing position. The patient abducts the affected upper extremity through a full range of shoulder abduction.
2. A positive test is for the patient to feel pain in the Jianyu L.I.-15 region between 60-120° of abduction (Fig. 12A). Pain in the Jugu L.I.-16 region during the last 10-20° of abduction may indicate an acromioclavicular joint injury.

3. The practitioner may perform muscle assistance during the Painful Arc Test to determine if the lower trapezius and serratus anterior are unable to upwardly rotate the scapula while raising the arm.
4. The practitioner guides the inferior angle of the scapula laterally and upward to simulate the action of these muscles, as the patient abducts the arm (Fig. 12B). If pain decreases, these muscle motor points should be included in the treatment protocol.

Hawkins-Kennedy Test



Figures 13A&B: Hawkins-Kennedy Test. A) Starting position for Hawkins-Kennedy Test. B) The practitioner internally rotates the humerus so that it abuts the acromion.

This test assesses for supraspinatus tendinopathy and for involvement of the tendon of the long head of the biceps brachii.

1. This test may be performed in a seated or standing position. The practitioner passively flexes the shoulder joint forward and flexes the elbow to 90° (Fig. 13A).
2. The practitioner stabilises the wrist and elbow. The practitioner performs this test by using the patient's elbow and wrist as a lever to internally rotate the glenohumeral joint (Fig. 13B). The practitioner should try and feel resistance of the humerus abutting against the acromion and coracoacromial arch. Pain in the region of Jianyu L.I.-15 generally indicates an inflamed supraspinatus tendon, as the greater tubercle of the humerus compresses the tendon against the acromion and coracoacromial arch. In addition, pain in the anterior shoulder may indicate involvement of the long head of the biceps brachii.

Neer's Impingement Test

This test assesses for supraspinatus tendinopathy, bicipital tenosynovitis and/or subacromial bursitis, all of which may be associated with impingement syndrome. It compresses the subacromial bursa, the supraspinatus tendon and the bicipital tendon attachment into the shoulder between the greater tubercle of the humerus and the acromion and coracoacromial arch.



Figure 14: Proper positioning for the Neer's Impingement Test.

1. The practitioner stands behind the seated patient and applies a downward pressure on the scapula by placing their hand over Jianjing GB-21.

2. With their other hand, the practitioner raises the affected arm into maximum shoulder abduction and internal rotation (Fig. 14). A positive test is pain in the Jianyu L.I.-15 region, especially within the last 10 to 15° of abduction. Pain in the anterior shoulder, especially in the region of the extra point Daijianzhen, indicates probable bicipital long head tenosynovitis.

Codman Test

This test is used to assess the severity of a tear of the supraspinatus tendon.

1. The practitioner places the patient's arm into 90° of abduction (Fig. 15A).
2. The patient is asked to lower the arm slowly to the side of the body (Fig. 15B). A positive test is for the patient to feel severe pain in the region of Jianyu L.I.-15 and/or be unable to lower the arm smoothly, both of which indicate a grade 2 or 3 tear of the supraspinatus tendon.



Figures 15A&B: Codman Test. A) Start position for Codman Test. B) Inability of the patient to maintain the start position indicates a probable grade 3 tear of the supraspinatus tendon.

Acknowledgement

The author would like to thank Adam Schreiber, editor of the soon-to-be-released *Sports Medicine Acupuncture: An Integrated Approach - Combining Sports Medicine and Traditional Chinese Medicine*.

Matt Callison earned his Bachelor of Science Degree in Sports Medicine from San Diego State University in 1985. He worked at the Alvarado Sports Medicine clinic and Scripps Hospital, La Jolla for 8 years. In 1991, Mr. Callison earned his Masters Degree in Traditional Oriental Medicine from Pacific College of Oriental Medicine in San Diego. While he was at Pacific College he created a course on the treatment of orthopaedic disorders, which is still being taught today. Mr. Callison also developed the acupuncture externship for Pacific College, which is located at the University of California San Diego's Sports Medicine RIMAC Center. Based on years of study and clinical experience, Mr. Callison has a unique ability to seamlessly integrate Chinese Medicine and Sports Medicine, and has been teaching internationally for many years, including the Sports Medicine Acupuncture Certification Program. He has published a clinical study on acupuncture for tibial stress syndromes (shin splints), as well as an article on sports-related muscle tension headaches in the *Journal of Chinese Medicine*. Mr. Callison is the creator of the Motor Point and Acupuncture Meridian Chart, as well as the author of four publications including the Motor Point Index and currently in press, *Sports Medicine Acupuncture*. Mr. Callison is well known for his work with professional athletes in the United States and New Zealand.

References

1. Mall, N.A., Lee, A.S., Chahal, J., et al. (2013). "An evidenced-based examination of the epidemiology and outcomes of traumatic rotator cuff tears." *Arthroscopy*, 29(2):366-376
2. Ludewig, P.M. & Braman, J.P., (2011). "Shoulder impingement: Biomechanical considerations in rehabilitation." *Journal of Manual Therapy*, 16(1):33-39.
3. Blair, B., Rokito, A.S., Cuomo, F., et al. (2006). "Efficacy of injections of corticosteroids for subacromial impingement syndrome." *Journal of Bone Joint Surgery*, 78(11):1685-1689.
4. Kibler, W.B. (2008). "The role of the scapula in athletic shoulder function." *American Journal of Sports Medicine*, 26(2):325-337
5. Michener, L.A., McClure, P.W., Karduna, A.R., et al. (2003). "Anatomical and biomechanical mechanisms of subacromial impingement syndrome." *Clinical Biomechanics*, 18(5):369 - 379
6. Callison M. (2007). *Motor Point Index: An Acupuncturist's Guide to Locating and Treating Motor Points*. San Diego, CA: AcuSport Seminar Series