

SIS: A Myotherapist's Viewpoint

Paul McCann, the Association's Immediate Past President and educator presents an 'active' strategy for working with Subacromial Impingement Syndrome (SIS).



Paul McCann

Changing client behaviours around pain and movement can be one of the most challenging areas of clinical work.

If our bodies are made to move, then it makes sense that we incorporate movement into our treatment regimes.

Generally, we provide treatment in two ways – active and passive. Passive treatments are all the many varieties of hands-on techniques and dry needling that you practice daily. Active treatment can come in the form of exercise therapy.

There is a growing body of evidence now suggesting that active treatments are highly effective in the treatment of musculoskeletal disorders. However, providing an exercise program to your client may be easier said than done. Changing client behaviours around pain and movement can be one of the most challenging areas of clinical work. Although, if we can successfully assist our client to move, strengthen and trust their body post injury, we have a high chance of not only providing more effective treatment but also preventing recurring issues.

Movement Impairment Syndromes (MIS), based on the work by Shirley A Sahrman, are common dysfunction patterns where a sustained deviation from ideal joint alignment results in impaired movement.¹ Many of the issues we see in clinics daily are the end result of MISs. A bursa may be inflamed causing pain, but the bursa itself is not the primary cause of the issue. A nerve may become irritated or a tendon sheath adhesed, but something has led to this occurring - the painful tissue is not always the cause of the problem.

For this article I will focus on Sub-acromial Impingement Syndrome (SIS, also referred to as SAIS) and Movement Impairment Syndromes (MISs) that may lead to the condition.

The causes of MISs can include repeated movements with sustained misaligned postures.¹ Repeated movements can cause positive adaptations of the muscular system

in terms of increased strength, which is a good thing. However, these movements performed repeatedly with poor mechanics can lead to movement impairments. Common daily movements can alter the strength and length of muscles and change the activity of synergists and antagonists, leading to impaired movements. This changes the alignment of joints, leading to less than ideal biomechanics and, eventually, soft tissue irritations.¹

In relation to SIS, there are a few MISs that can predispose someone to this condition. These include scapula winging and tilting, superior glide of the humerus and medial rotation of the humerus. The impairment may be scapula based, humeral based, or a combination of both. We also need to assess if the condition is influenced purely from the muscular system, joint or nervous system. It is often a combination of those elements.

Ideally, the medial border of the scapula should be parallel to the spine. Positioned between the second and seventh thoracic vertebrae, the scapula should be sitting flat against the thoracic rib cage and rotated approximately 30° anterior to the frontal plane.¹ Deviations from ideal alignment can include one or a mixture of these factors.

Optimal humeral alignment includes less than one third of the humeral head sitting anterior to the acromion. Ideally, the antecubital crease should be facing anteriorly, with the olecranon facing posteriorly. Both proximal and distal ends of the humerus should be in the same vertical plane when viewed from the side.¹ Both the scapula and humerus may show impaired alignment through any of the cardinal planes and axes of movement.

It is also imperative to include assessment of both the thoracic and cervical spines for any possible involvement with shoulder girdle issues. Hyperkyphotic thoracic spines can

predispose the client to shoulder girdle issues, as can scoliosis and even forward head postures, for example.

Once visual postural examination is completed, physical examination of the scapulohumeral rhythm is helpful. In an ideal world, a full 180° of glenohumeral abduction requires approximately 60° of upward rotation of the scapula and 120° of humeral abduction.¹ It is possible that the scapula may lack abduction or upward rotation. When the client then attempts to abduct their arm, the scapular and therefore the acromion is not sufficiently elevated, limiting the sub-acromial space, preventing full range of humeral abduction. This dysfunctional pattern over time can irritate soft tissues causing pain.

Once visual and movement assessment is complete, muscle length and strength testing is the next part of the puzzle. Your client's MIS will cause an imbalance in the natural synergistic actions of the muscles surrounding their joints.¹ Common impairments leading to SIS include short, stiff or weak lateral rotators of the humerus, preventing enough lateral rotation to prevent the greater tuberosity contacting the acromion.

Further special testing and screening is required to rule out differential diagnoses and the need for medical referral, for possible issues of a visceral or systemic origin.¹ Structural issues such as osteophytic formation or congenital abnormalities of the acromion must also be ruled out.

Brukner & Kahn classify SIS as either external or internal to the glenohumeral joint.¹ External impingement will see the encroachment of bursa or rotator cuff tendons between the humeral head and the acromial arch. With internal impingement we see encroachment of the rotator cuff tendons between the humeral head and the glenoid rim.ⁱⁱ

According to Sahrman, MISs predisposing a client to SIS include scapular downward rotation syndrome, scapular depression, scapular abduction syndrome, scapular winging and tilting syndrome, humeral anterior glide syndrome, humeral superior glide syndrome, and shoulder medial rotation syndrome.¹

Once the dominant impairment syndrome is decided on, passive and active treatment regimens will be focused and more successful. Active treatment is an integral part of rehabilitation from any condition. Here are some example exercises for MISs:

Scapular downward rotation syndrome – clients demonstrate a lack of upward rotation of the scapular. Muscle impairments can include dominance, shortness or stiffness of rhomboids, levator scapulae, latissimus dorsi, pectoralis minor and major. Insufficient activity of scapular upward rotators including serratus anterior and trapezius.¹

Exercises include – prone scapular setting on elbows, to commence strengthening of serratus anterior. Can progress to arm wall slides as SIS symptoms ease. Prone shoulder rotations, to improve the function of rotator cuff.

Scapular depression – insufficient scapula elevation during movement. This impairment includes dominant, short or stiff scapular depressors including latissimus dorsi, lower trapezius and possibly pectoralis major and minor. Insufficient activity of the upper trapezius and serratus anterior may be present.¹ Strengthen serratus anterior as above. Quadruped position with shoulder flexion as tolerated.

Scapular abduction syndrome – scapular is excessively abducted, with dominance of serratus anterior, pectoralis major and insufficient activity of middle trapezius and rhomboids.¹ Commence strengthening with prone thoracic extension, Wide arm rolls on wall and rocking back in quadruped position to stretch serratus anterior.

Scapular winging and tilting syndrome – where winging and tilting occurs during shoulder flexion and extension. Weakness of the serratus anterior, also timing issues between the axioscapular muscles and the scapulohumeral muscles occurs.¹ Serratus anterior strengthening as above. Rhomboid strengthening with seated rows is suitable.

Humeral anterior glide syndrome – excessive anterior glide of the humeral head past the acromion. Possibly associated with laxity of anterior structures and stiffness of

posterior structures of the glenohumeral joint. Weakness present in subscapularis is common, with dominance of pectoralis major, latissimus dorsi and teres major.¹ Commence isometric subscapularis activation, moving to theraband strengthening as required. Rocking back in quadruped position pushing through the arms is required.

Humeral superior glide syndrome – lack of inferior glide during movement. Stiffness may be present in the glenohumeral joint. Also, weakness of the rotator cuff muscles disrupts the normal force coupling of the rotator cuff and deltoid muscles.¹ Strengthen rotator cuff with theraband activities and prone arm rotations. Perform wall slides with downward pressure through scapular to promote ideal movement.

Shoulder medial rotation syndrome – excessive medial rotation of humerus, with dominant medial rotators over external rotators. Commence strengthening of serratus anterior and rhomboids as above.¹ Also include strengthening of lateral rotators which can be done in prone position, or with theraband.

When starting a therapeutic exercise program, begin with education and activation of the Transverse Abdominus (TrA). This is imperative as this provides much needed stability with exercises performed anywhere on the body. Activation is achieved by instructing your client to subtly pull their naval towards their spine. This activates not only the TrA, but also the lumbar multifidus and pelvic floor muscles, providing stability to all movements of the body.

Paul McCann is in the final semester of a Bachelor of Health Science, Myotherapy. He has been a remedial therapist for 25 years and works within a large multi-disciplinary clinic in Adelaide, where he splits his time between lecturing and clinic work. Paul is the Immediate Past President of Massage & Myotherapy Australia and is currently a member of the Independent Standards Council for the Certification Program.

i. Sahrman S. *Diagnosis and Treatment of Movement Impairment Syndromes*. St. Louis, Missouri: Mosby, Inc.; 2002. p. 193-261.

ii. Brukner P, Clarsen B, Cook J, Cools A, Crossley K, Hutchinson M, McCrory P, Bahr R, Khan K, Brukner & Khan's *Clinical Sports Medicine*. 5th ed. Australia: McGraw-Hill; 2018. p. 380-382.