

Applying Soft Tissue Release

The three chapters in part III provide detailed information about how to apply STR to various muscles of the body. In chapter 6 you will learn how to apply STR to these muscles of the trunk: rhomboids, pectorals, levator scapulae, upper fibres of the trapezius, erector spinae and scalenes. Chapter 7 focuses on these muscles of the lower limbs: hamstrings, calf, foot, quadriceps, tibialis anterior, fibulari (peroneals), gluteals, iliotibial band (ITB) and iliacus. Chapter 8 provides examples of how to apply STR to these muscles of the upper limbs: triceps, biceps brachii, shoulder adductors, infraspinatus, and wrist and finger flexors and extensors.

Each chapter begins with an overview in the form of a table enabling you to quickly identify the muscles contained in that chapter and which forms of STR can be used for them.

Within each chapter are illustrations of each of the muscles showing common sites of trigger points, with text describing where they refer pain, how to locate them and what perpetuates these points. Where available, references relating to the deactivation of trigger points are provided. Photographs showing start and end positions are provided along with detailed step-by-step guidelines, plus the advantages and disadvantages of each stretch. For most of the muscles there are descriptions and photographs of how STR can be applied in these treatment positions: prone, supine, side lying, seated or standing. The chapters include plenty of helpful tips and some Client Talk boxes, with examples of how some of the stretches have been used in real-life situations. As usual, chapters end with Quick Questions with which to test yourself. Use these chapters in any order to help you master all three types of STR.

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Soft Tissue Release for the Trunk

This chapter outlines how to apply soft tissue release to the trunk. You will find comparisons between applying passive, active-assisted and active STR to each of the major muscle groups of the trunk. You will also find illustrations showing key trigger points in each muscle. As with chapters 3, 4 and 5, this chapter includes a table providing an overview of the techniques for each muscle; in this case, it shows whether the technique illustrated is passive, active-assisted or active (table 6.1).

Table 6.1 Types of STR Used on Trunk Muscles

Muscle	Passive	Active-assisted	Active
Rhomboids	✓	–	✓
Pectorals	✓	✓	✓
Levator scapulae	–	✓	–
Upper trapezius	–	✓	✓
Erector spinae (spinalis)	–	✓	–
Scalenes	–	✓	✓

- *Passive STR*: It is useful to apply STR passively to the rhomboids and pectorals. However, when working with tissues of the neck, active-assisted STR is a more appropriate method of application. Active-assisted STR puts the client in charge of his or her own neck movements and therefore the degree of stretch received.

- *Active-assisted STR*: This technique is a useful method of safely stretching the pectorals, levator scapulae, upper trapezius, erector spinae and scalenes. It may be used on the rhomboids, but with the client in the prone position, these muscles are quickly fatigued. Applying active-assisted STR to the rhomboids also makes it difficult for the therapist to firmly lock the tissues, which are relatively small and shorten when concentrically contracted. For these reasons, illustrations of active-assisted STR to the rhomboids have not been included here.

- *Active STR*: Whilst trunk muscles are often included in an overall stretching routine, these muscles are generally not stretched using active STR, because it is fairly difficult to lock the tissues correctly without causing strain to other body parts.

The following section provides detailed instructions for applying passive, active-assisted or active STR to many of the muscles of the trunk, including tips that may help you apply these techniques. Advantages and disadvantages of each application are also included.

Trigger Points in the Rhomboids

Trigger points in the rhomboid muscles (figure 6.1) cause pain in the rhomboid area but can also cause symptoms in the region of the supraspinatus. The best way to palpate rhomboid muscles to locate trigger points is with the shoulder flexed and the scapula protracted. The application of STR to the rhomboid muscles lends itself well to the identification of trigger points as, whether STR is performed with the client prone (passive STR), seated (active-assisted STR), or standing (active STR), the scapula can be protracted. You can find trigger points throughout the rhomboid muscles between the medial border of the scapula and the spine. In many people, the rhomboids are lengthened and weak, so whilst STR *can* be applied to them, it is important to ask yourself whether it *should* be applied to them. Before you begin, note whether your client has a kyphotic posture, the posture associated with protraction of the scapulae with stretched and weak rhomboids. If you are not sure how to assess the client's posture, refer to a text such as *Postural Assessment* (Johnson, 2012).

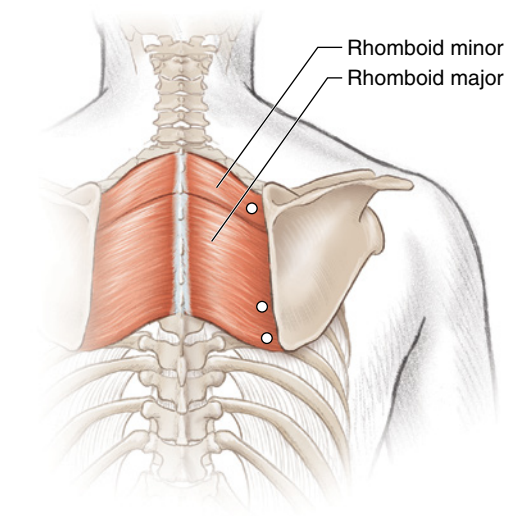


Figure 6.1 Trigger points in the rhomboid muscles.

When treating a client with a typical thoracic curve, you may apply STR to trigger points by following any of the methods (passive, active-assisted or active). Locate the trigger points and, whilst maintaining your lock, stretch the tissues. Clients with active trigger points in the rhomboid muscles often also have active points in the upper fibres of trapezius too, so to be fully effective it is important to deactivate those trigger points. If your client has a kyphotic posture, then trigger points can be deactivated through gentle pressure, but avoid overstretching the muscles afterwards. Instead, encourage your client to engage in a programme for strengthening the rhomboids and the lower fibres of trapezius.

Tewari et al. (2017) report how they deactivated two trigger points in the left rhomboids and left erector spinae of a person with Ehlers-Danlos syndrome (a form of hypermobility) who had chronic upper-back pain. They injected the triggers with lignocaine, and they prescribed the application of heat and 10 minutes of deep massage twice a day. Seven days later, the subject reported a 60 to 80 percent relief from pain, which had been measured using a visual analogue scale (VAS).

Botha (2017) compared ischaemic compression with the use of a foam roller for the deactivation of trigger points in the rhomboid muscle; 30 participants were randomly split into either the compression or foam roller group. Six treatments were delivered over a period of 6 weeks, and both subjective (questionnaire and VAS)

and objective (pressure algometer) measurements were taken. Botha concluded that both treatments were equally effective at reducing trigger points with neither being superior.

Passive STR for Rhomboids: Prone

Step 1: Position your client in the prone position on a treatment couch so that he or she is able to flex at the shoulder. To do so you will need to position your client so that the arm can hang off the couch. A safe approach is to have the client lie at an angle on the couch, feet positioned at the corner opposite to the arm you are working on. With your client in this position, shorten the rhomboids by passively retracting the scapula, holding the client's arm just above the elbow (figure 6.2a). It does not matter whether the client rests the head to the left or to the right, as long as he or she is comfortable.



Figure 6.2 Lifting the arm (a) passively retracts the scapula, bringing it closer to the spine (b).

Step 2: Whilst holding the client's arm to keep the rhomboids passively shortened, gently lock the tissues, directing your pressure towards the spine (figure 6.3). As you can see from figure 6.2b, the ribs curve outward. It is therefore important to direct your pressure towards the spine rather than perpendicularly, because pressing into the ribs would be uncomfortable for the client.



Figure 6.3 Directing pressure towards the spine.

Step 3: Whilst maintaining your lock and still pressing gently towards the spine, gently lower your client's arm into flexion (figure 6.4a). Notice how the scapula protracts around the rib cage (figure 6.4b), stretching the rhomboids.



Figure 6.4 Passively flexing the arm (a) protracts the scapula around the rib cage (b).

Relatively speaking, the rhomboids are a small group of muscles and cannot be worked in lines running between their insertion point as some other muscles can. Change the position of your lock to any point on the rhomboids as you repeat the procedure. To deactivate trigger points here, use your thumb or fingers to gently depress the trigger prior to the stretch.

TIP You may need to practise repositioning your client to ensure flexion at the shoulder. If the client is not correctly positioned, this technique may cause pressure on the brachial plexus in the armpit, which could be uncomfortable, sometimes causing temporary numbness or tingling in the fingers that lasts until the client is repositioned.

If you find using your fist uncomfortable for your wrist, try using your forearm for the lock. This area is bony, so use elbows with caution.

Whilst it is possible to use active-assisted STR with your client in this position, it is a little tricky; the client needs to retract and protract his or her own scapula, which can be tiring. Also, you need to take care where you stand so as to be out of the way of the client's moving arm. Standing at the head of the couch, rather than to the side, is one solution. From this position you can use reinforced fingers to lock the tissues.

CLIENT TALK

Active-assisted STR to the rhomboids in prone was particularly useful when treating a female rower with large musculature. By combining this technique with lots of oil massage, it was possible to get good leverage on the client's muscles and I used my elbow to localise the stretch to specific areas of tightness. However, it was necessary to work through a facecloth, because it was quite difficult to get a firm enough lock on the skin alone.

Advantages

- You have considerable leverage and will be able to fix the muscles well.
- Working with the scapula protracted means you can access the rhomboids well and this is especially useful when treating trigger points.

Disadvantages

- If the client is not correctly positioned, this technique may cause uncomfortable pressure on the brachial plexus in the armpit.
- Use of inappropriate posture when lifting and lowering the client's arm could cause you to hurt your back.
- This technique cannot easily be incorporated into an oil massage because it requires the client to be positioned diagonally on the treatment couch, which would mean moving the client several times during treatment.
- With good leverage, some therapists accidentally press too hard; it is especially uncomfortable when working over ribs.
- Unless your client is engaged in regular physical activity, it may be unlikely he or she needs the rhomboids stretched. Many clients have kyphotic postures, with protracted shoulders. When the shoulders are protracted, the rhomboids are lengthened. Do you need to stretch them further?

Passive STR for Rhomboids: Seated

Step 1: With your client comfortably seated, gently hold his or her arm to passively retract the scapula, shortening the rhomboids. Take up the slack in the skin, directing your pressure towards the spine (figure 6.5a). You may need to practise different handholds, sometimes supporting the client's forearm on yours, in order to help him or her relax and give you the weight of the arm. With the scapula retracted, you have little space to position your lock (figure 6.5b), so you may need several attempts before both you and your client are comfortable.



Figure 6.5 Taking up slack in the skin (*a*) as the scapula is passively retracted, moving it closer to the spine and shortening the rhomboids (*b*).

Step 2: Whilst maintaining your lock, take the arm into flexion, which passively protracts the scapula (figure 6.6).



Figure 6.6 Passively protracting the scapula.

If you wish to use STR to deactivate trigger points in the rhomboids, it is easiest to palpate the muscles whilst the scapula is protracted. To facilitate this position, ask your client to hug him- or herself, freeing up both of your hands to locate the trigger points. You can then return to performing passive STR as described.

TIP One way to make this process easier for yourself is to apply a little oil to the area and then ask your client to put on an old T-shirt. Apply STR through the T-shirt, which will help facilitate your lock.

Advantages

- In this position, you have less leverage and are therefore less likely to apply too much pressure. As a result, it is a good method of working with clients who are especially sensitive to pressure.
- It is also helpful when working with clients who cannot lie in the prone position.

Disadvantages

- Locking the tissues using your thumb risks injury to the joint in the thumb. This risk can be lessened by restricting the use of the technique and using only light pressure.
- It is difficult to perform passive STR on clients with long or heavy limbs.
- Some clients find it difficult to relax during passive STR and will always tense their limbs.
- When the client is sitting, the muscles of the posterior trunk are not as relaxed as in prone.

It is possible to use active-assisted STR to the rhomboids with your client seated. However, to do so you need to stand directly behind the client in order to be out of the way of the arm as he or she horizontally flexes and extends the shoulder. Standing directly behind the client in this way makes it difficult to press the soft tissues over the rhomboids towards the spine, which is necessary in order to take up slack at the start of the technique.

Active STR for Rhomboids: Standing

Step 1: Stand with your back close to a wall. Place a ball on a rope or another kind of small, hard ball, between your upper back and the wall, over the area of the rhomboids (figure 6.7). If using this method to teach clients how to use active STR, be certain to advise them that they should avoid pressure to the spine. The dorsal scapular nerve runs parallel to the medial border of the scapula, so you should avoid deep pressure here.

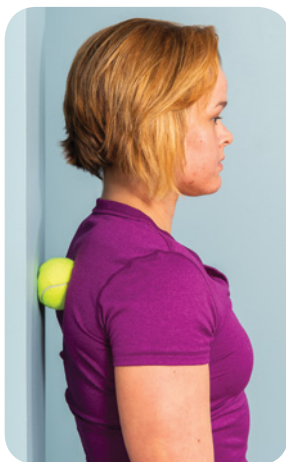


Figure 6.7 Positioning a ball between the rhomboids and a wall.

Step 2: Start with your arm by your side. Reposition the ball if necessary to get it into the correct place over the rhomboids. When you are happy that the ball is in the correct position, horizontally flex your shoulder, and protract the scapula (figure 6.8).



Figure 6.8 Protracting the scapula to stretch the rhomboids.

Advantage

- Active STR can be practised anywhere there is a wall. Therefore, it is likely to be effective for deactivating trigger points as it can be performed frequently.

Disadvantages

- Repeating active STR too many times, or pressing too deeply, can cause soreness.
- The technique is not suitable for anyone with osteoporosis or for whom pressure to the posterior rib cage might cause problems.

CLIENT TALK

I taught a client how to actively use STR to treat his rhomboid muscles. They were tight and sore due to his job, which involved carrying long planks of wood from where they were delivered by crane, to where they needed to be sawn for furniture making. To carry the wood the client balanced it on his shoulder, one plank at a time, using one arm in front of him and one behind him to support the plank. Imagine you are carrying wood in this way, and notice how you need to retract the scapula of the arm that you take behind you. Providing the client with this technique meant he could use it daily to alleviate pain.

Trigger Points in the Pectorals

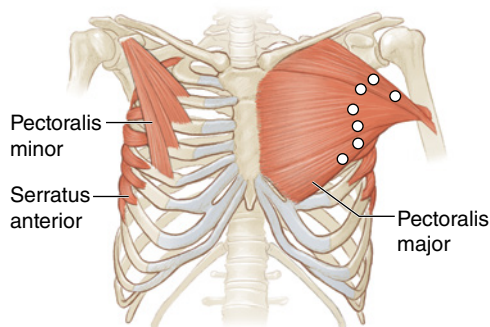


Figure 6.9 Trigger points in pectoralis major and pectoralis minor.

Trigger points develop throughout pectoralis major. Shown in figure 6.9 are those in the clavicular, sternal and lateral portions of the muscle. The clavicular portion refers pain locally to that part of the muscle as well as to the anterior deltoid. The sternal portion refers pain to the anterior chest on that side, as well as down the arm on that side, especially to the medial epicondyle. When severe, pain can radiate to the little and ring finger on that side also. Finally, the lateral portion has trigger points located in the front aspect of the axilla and can cause breast sensitivity or pain.

Trigger points found in the upper and lower portions of pectoralis minor refer pain to the anterior deltoid primarily, the chest and the anteromedial side of the arm. Trigger points in pectoralis minor increase the tonicity of this muscle and cause protrusion of the inferior angle of the scapula due to pulling of the muscle on the coracoid process, which tilts the scapula anteriorly. Tension in this muscle also causes the scapula to rotate and is a major cause of scapulothoracic dysfunction, affecting movement of the shoulder and impairing performance in sporting populations.

Shortening of pectoralis major, if prolonged, can aggravate trigger points. This muscle is shortened in clients with round-shouldered posture. Weakness in the rhomboids and the middle and lower fibres of trapezius is common in such a posture, causing trigger points to develop in those muscles also due to stretch weakness. Pain due to trigger points in pectoralis major reduces motion at the shoulder. Trigger points in pectoralis minor may be established and perpetuated by trigger points in the scalenes, poor posture, and, being muscles of respiration, by dysfunctional breathing such as forced or prolonged inspiratory effort.

To palpate trigger points in pectoralis major, position your client supine with the arm abducted to around 90 degrees. With the flat of your fingertips, work along the fibres of the muscle, starting with the clavicular portion and changing direction to match the change in direction of fibres. Trigger points in the lateral portion are easier to palpate if you gently pinch the front of the axilla between your finger and thumb. Palpation of trigger points in pectoralis minor is best achieved by passively

shortening pectoralis major. Do so by abducting the client's arm whilst they rest in the supine position, and place a pillow or rolled up towel beneath it. Then, you can locate trigger points in the upper part of pectoralis minor by first identifying the coracoid process and feeling for the muscle attachment. You can identify lower triggers by gently squeezing the pectoralis major muscle between your finger and thumb, your thumb over pectoralis major. Active elevation of the shoulder in this position will cause pectoralis to become tensioned, making it easier to identify.

Research into the use of trigger point deactivation in pectoralis major has focused on clinical outcomes following mastectomy. Shin et al. (2014) examined the effectiveness of ultrasound-guided needling to trigger points in pectoralis major and infraspinatus in 19 post-mastectomy patients who each had shoulder pain and restricted movement of the shoulder on the surgical side. Additionally, all participants were instructed to stretch 20 times during the day, although which stretch was performed is not stated. VAS scores and shoulder range of movement improved immediately after the first injection and 3 months after the last injection compared to baseline measurements. In a case report, Cummings (2003) provides a detailed and interesting description of a patient who presented at the British Medical Acupuncture Society's London teaching clinic with a 5-month history of arm pain radiating down the ulnar side of the forearm, right to the fourth and fifth digits. A discrete area of tenderness was identified in the lateral portion of pectoralis major, which the author took to be a trigger point; however, the author notes that symptoms could be derived from both this and neuropathic pain from surgical damage to the intercostobrachial nerve. Some pain was resolved immediately after the first session of needling, and as all symptoms were resolved 2 weeks later; no further acupuncture was performed. Again, a home stretching programme was advised.

Use the STR techniques provided in this section to learn how to apply STR to most clients, especially for those with round-shouldered postures. If you want to use STR to treat trigger points, you will need to use a finger to locate and compress the point. For clients who report shoulder or arm pain following mastectomy where you have identified an active trigger, consider using gentle ischaemic compression, or gentle compression with mild stretch as is achieved with STR.

Passive STR for Pectoralis Major: Supine

Step 1: With your client in supine, take his or her arm into horizontal flexion and fix the tissues with a soft fist, directing your pressure towards the sternum rather than into the underlying ribs (figure 6.10). You may want to explain to your client where you are going to position your fist for the lock, because some clients may find it invasive.

TIP If you find it tricky to apply your lock, cushion the lock by working through a facecloth folded into fourths. Applying a little massage medium first will help the cloth grip the skin and facilitate the taking up of slack.

PECTORALIS MAJOR AND MINOR



Figure 6.10 Passively taking the arm into horizontal flexion, shortening the pectoralis major muscle.

Step 2: Whilst maintaining your lock, gently take your client's arm from horizontal flexion into a more neutral position (figure 6.11).



Figure 6.11 Passively extending the shoulder whilst maintaining the soft lock.

As you can see from figures 6.10 and 6.11, the movement is small, requiring only a subtle change in arm position for the client to experience this stretch. When treating a female client, you will need to focus on the upper fibres of pectoralis major and avoid working through breast tissue. When treating male clients, you may work over a greater part of the muscle.

TIP Avoid pressing downward into the ribs. If your fists are too large for the small area on which you need to work, try using the pads of your fingers and gently reinforce one hand over the other.

Some clients do not feel the stretch immediately. In this case, you must practise the technique by applying your pressure from various angles and stretching the tissues by moving the client's arm in varying degrees of abduction. However, clients with kyphotic postures may feel the stretch immediately because they have shortened pectorals.

Advantage

- This technique is relatively easy to incorporate into a holistic massage treatment.

Disadvantages

- It takes practice to direct pressure towards the sternum rather than downward into the ribs.
- Your hands may be too large to use your fists, especially if the client has a small frame. In this case, use your fingers but exercise care because there will be an increased likelihood of pressing into the ribs.
- It takes practice to know at which angle to abduct the arm, and the angle needed to facilitate the stretch varies considerably between clients.
- This stretch cannot be applied easily to clients with large breasts.
- It can be difficult finding the correct method of supporting the upper limb when working with larger clients.
- Clients with large and well-developed pectorals are unlikely to feel passive STR to the pectorals; a considerably stronger lock is required to fix the tissues of these clients.

Active-Assisted STR for Pectoralis Major: Supine

Step 1: Ask your client to move his or her arm across the body, which actively shortens the pectoralis major. Using soft fists, lock the muscle and direct your pressure towards the sternum (figure 6.12).

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Figure 6.12 Active shortening of pectoralis major as the therapist gently locks the tissues.

Step 2: Whilst maintaining your lock, ask your client to move the arm so that he or she can feel the stretch in the pectorals. The client will need to move the arm from horizontal flexion into a more neutral position (figure 6.13).

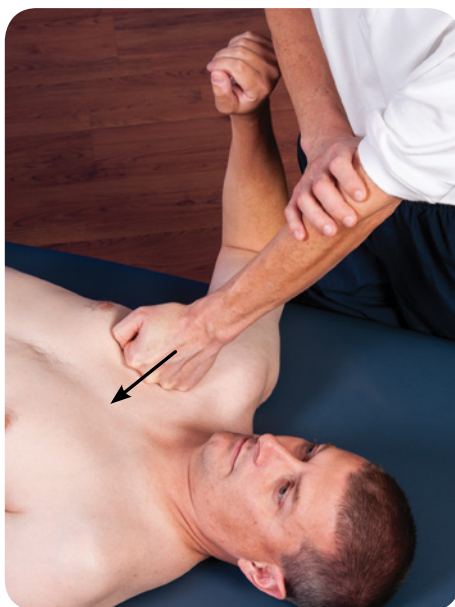


Figure 6.13 Active movement of the arm to lengthen and stretch pectoralis major.

Step 3: Release, and repeat steps 1 and 2 three times on each side of the body.

As with passive STR for pectoralis major, if you wish to deactivate trigger points in this muscle you will need to create your lock using a finger.

Advantages

- The client will be able to locate the precise position where he or she feels the stretch.
- You can reinforce the lock using two soft fists or reinforced fingers.

Disadvantage

- It can be tricky at first to find the best place to stand as the client moves his or her arm in search of the stretch. However, once the client finds the position, the treatment can proceed without disruption.

Active STR for Pectorals: Seated or Standing

Step 1: With your arm by your side, seated or standing, gently draw the skin and soft tissues of your chest towards your sternum (figure 6.14). It can be difficult to lock tissues through clothing, slightly easier without clothing, and easiest of all if you apply a little massage medium and then lock the tissues through a cloth or an old T-shirt.



Figure 6.14 Locking the tissues of the chest for active STR.

PECTORALIS MAJOR AND MINOR

Step 2: Maintaining your lock, gently abduct and extend your arm, producing a stretch (figure 6.15). Practise changing to the position of your arm to discover where you best feel the stretch.



Figure 6.15 Actively abducting and extending the arm to stretch the tissues in active STR.

To deactivate trigger points in the lateral portion of the pectoralis muscle, gently pinch the front of your armpit, palpating until you locate a trigger point. Maintain your grip, then abduct and extend your arm. To deactivate trigger points in the rest of the muscle, gently roll a firm ball over the muscle until you locate a trigger point. Hold the ball in place as you abduct and extend your arm. For example, to treat a trigger in the left pectoralis muscle, press the ball gently over the point using your right hand as you move your left arm to create the stretch.

Trigger Points in the Levator Scapulae

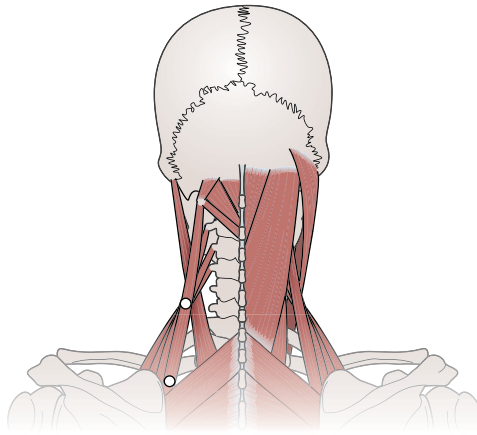


Figure 6.16 Trigger points in the levator scapulae.

Trigger points found in the levator scapulae (figure 6.16) produce pain locally and down the medial border of the scapula as well as to the back of the shoulder. When active, these trigger points can limit rotation of the neck and cause feelings of neck stiffness. Many factors perpetuate these points, including carrying a bag on one shoulder, retaining a static posture with the head turned slightly to one side, using a walking aid that is too high and which causes the user to walk with the shoulder elevated, as well as repetitive overhead actions of the arm. Trigger points in the levator scapulae are relatively easy to identify. The easiest point to identify is the inferior of the two, which is found close to the insertion of the muscle on the superior angle of the scapula. The more superior point can be found at the point where the levator scapulae can be palpated independent of the anterior border of the upper fibres of the trapezius.

TIP To make palpation of these triggers easier, work with the upper fibres of the trapezius in a passively shortened position. For example, if palpating your client in a seated position, support his or her arm on a table; if working with the client in a prone position, place a small towel beneath the shoulder on that side; when palpating in the side-lying position, position the uppermost arm in such a way as to reduce depression of the shoulder. The upper trigger point can also be palpated when the client is supine and the trapezius is relaxed.

In a randomized clinical trial, De Meulemeester et al. (2017) compared trigger point dry needling with manual pressure for the deactivation of trigger points in 42 female office workers who each did a minimum of 20 hours of computer work per week and who each had myofascial neck or shoulder pain. Baseline measurements were taken using a numerical rating scale, the Neck Disability Index

LEVATOR SCAPULAE

(NDI), pressure pain thresholds and muscle characteristics. Six trigger points were identified for treatment, including those in the levator scapulae, and participants were treated once a week for four weeks. At the end of the study, no significant differences existed between the groups; both resulted in a significant improvement in NDI scores. Significant improvements also occurred in the other outcomes of pain, muscle elasticity and stiffness.

The active-assisted method of applying STR described in this section is an ideal way to help deactivate trigger points in the levator scapulae. For best effect, you will most likely need to deactivate trigger points in the scalenes and posterior cervical muscles, as these too restrict movement and can inhibit full release of the levator scapulae.

Applying STR to the levator scapulae is particularly useful when treating clients with a stiff neck or shoulder problems. It is safe to use on the neck area because the stretch is performed actively, within the client's comfort level, making it unlikely that the tissues would ever be overstretched.

Active-Assisted STR for Levator Scapulae: Seated

Step 1: Locate the levator scapulae by gently palpating up the medial border of the scapula to the insertion point of the muscle on this bone (figure 6.17a). Note that you will be close to, if not on a trigger point in this region (figure 6.17b), so press gently as it can be tender.



Figure 6.17 Identifying the levator scapulae by palpating up the medial border of the scapula (a) to the superior angle (b).

Step 2: Lock the muscle (figure 6.18). The levator scapulae is a strap-like muscle and is often hypertonic (extremely tight), yet long in people with forward-head postures and those who are prone to weakness.



Figure 6.18 Gently locking the levator scapulae using an elbow.

Step 3: Whilst maintaining your lock, ask your client to rotate the head to about 45 degrees and then lower the chin to look to the floor (figure 6.19). Repeat the movement three times and then apply the same stretch to the opposite side of the body.



Figure 6.19 The client performs the stretch by flexing and rotating the head away from the therapist.

TIP This muscle is so hypertonic in many clients that they cannot tolerate a stretch at all; simply locking the muscle provides some relief for their tension. If you find this to be the case, use gentle ischaemic compression to reduce the trigger points, address trigger points in the scalenes and erector spinae, and then return to the levator scapulae.

CLIENT TALK

I taught two telephonists how to perform active-assisted STR. They used it gently in treating each other, taking turns throughout the day, in order to alleviate tension in each other's neck muscles.

Advantages

- When you work in this position, you have easy access to the muscle and good leverage.
- There is little danger that soft tissues of the neck will be overstretched, because the client is in charge of the stretch. Provided that the client is reminded to stretch only within a comfortable, pain-free range, this technique should always be a safe way to use STR to stretch this muscle.

Disadvantages

- This muscle is so hypertonic in many clients that they cannot tolerate a stretch.
- For the stretch to be really effective, it is essential to show the client specifically where to move the head once you have locked the tissues; otherwise, there is a tendency for them to flex the neck without also rotating it, and this lessens the effectiveness of the stretch.
- Make sure that for each new lock, the client's neck is in neutral, with the head facing forward. If you place your lock when the neck is in slight flexion, it lessens the effectiveness of the stretch.

Trigger Points in the Upper Trapezius

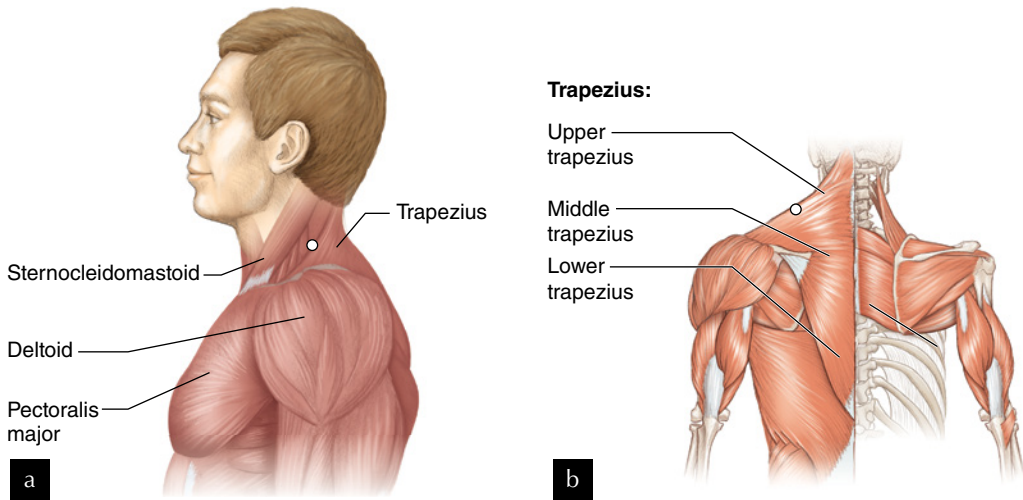


Figure 6.20 Trigger points in the upper trapezius; side view (a) and back view (b).

Trigger points are found in the upper, middle and lower fibres of the trapezius. In this section you will discover how you can utilise STR to help deactivate those in the upper fibres. In the side view (figure 6.20a) you can see the trigger point that refers pain to the side of the neck, head, eye and jaw. This trigger is located around midway in the anterior fibres of the muscle and contributes to symptoms associated with tension headache. It is more likely when trigger points are in suboccipital temporal and the sternocleidomastoid muscles, so all muscles should be treated for trigger points when attempting to reduce headache that is of muscular origin. Trigger points in the upper fibres of the trapezius (see figure 6.20) can develop from carrying a heavy bag on one shoulder; a rucksack; tight bra straps pressing into the muscle; trauma such as whiplash associated disorders (WAD); lower limb discrepancy, which causes lateral curvature of the spine; and uneven shoulder height resulting in overactivity of the upper fibres on one side to maintain head position. Sitting with one arm passively raised, as is common when some people drive and rest an arm on an open window side of the car door, and repetitive overarm movement from sports or hobbies both contribute to the perpetuation of active trigger points. Conversely, tension from prolonged lack of support when using the arms can also aggravate triggers.

You can locate the trigger points in the upper fibres of the trapezius by gently pinching the upper fibres between your finger and thumb and exploring them to find the tender point. Passive elevation of the arm can make this task easier, as can palpation of the client in a supine position. Try this technique on your own muscle: sit with your right arm supported on the arm rest of a chair or table and your right shoulder slightly elevated. Using the forefinger and thumb of your left hand, gently pinch the upper portion of your right trapezius, rolling it beneath your forefinger until you locate the point.

Moraska et al. (2017) examined the responsiveness of trigger points to single and multiple trigger point release massages to the upper trapezius muscle in 62 people with tension-type headache. Participants were randomly assigned to one of these three groups: a wait list where no treatment was prescribed, a sham ultrasound group, or a group receiving ischaemic compression of trigger points bilaterally in the upper trapezius and suboccipital. Treatment was provided twice-weekly for 6 weeks and lasted 45 minutes and in the massage group trapezius was treated by gripping the muscle between the thumb and finger whilst the participant was supine. Using an algometer, pressure pain threshold was measured at baseline and after the first and twelfth treatments. They found that the pressure pain threshold increased after both the first and twelfth treatment in the massage group only.

In a study of 45 volunteers, Taleb, Youssef and Saleh (2016) explored the effectiveness of manual versus algometer pressure release techniques in active trigger points in the upper trapezius. The pressure pain threshold and active side bending of the head were assessed at baseline and after treatment. Results revealed that participants who had received trigger point release with the algometer had a significant increase in the side-bending range, which the authors suggest may be due to the consistency of pressure delivered when using the device.

Active-Assisted STR for Upper Trapezius: Seated

Step 1: With your client sitting, lock the upper fibres of the trapezius (figure 6.21).



Figure 6.21 Locking the upper fibres of the trapezius using the forearm.

Step 2: Whilst maintaining your lock, ask your client to laterally flex the neck until feeling a comfortable stretch (figure 6.22).



Figure 6.22 Active lateral flexion of the neck to bring about the stretch.

Step 3: Repeat the action three times, then repeat the same stretch on the opposite side of the body.

Advantages

- When you work in this position, you have easy access to the muscle and good leverage.
- There is little danger that soft tissues of the neck will be overstretched, because the client is in charge of the stretch. Provided that the client is reminded to stretch only within a comfortable, pain-free range, this technique should always be a safe way to use STR to stretch this muscle.
- With practice, and by working with the client, you will be able to alter the direction of pressure to localize the stretch to different fibres in the upper trapezius.

Disadvantage

- It is easy to press into bony structures, such as the clavicle and acromion process.

Active-Assisted STR for Upper Trapezius: Supine

Using active-assisted STR with the client in the supine position is a good way to deactivate trigger points in the upper fibres of trapezius.

Step 1: With your client in the supine position, palpate for trigger points. If treating trigger points in the anterior fibres, gently lock the tissues using your thumb or a massage tool (figure 6.23). To treat the posterior trigger in the upper trapezius, use a firm ball, getting feedback from your client to ensure that it is positioned in the correct place (figure 6.24).



Figure 6.23 Using a massage tool to gently depress a trigger point in the upper, anterior fibres of the trapezius.



Figure 6.24 Using a ball to depress a trigger point in the posterior, upper fibres of the trapezius.

Step 2: With your thumb, tool or ball in place, maintain gentle pressure as you ask your client to slowly turn his or her head away from that side. For example, in the photographs shown in figures 6.23 and 6.24, the client would turn the head to the left. Lateral flexion of the head to that side also helps, but some clients find it difficult.

Advantage

- It is an effective way to deactivate trigger points in the upper fibres of the trapezius, as the muscle is relaxed when working with a client in the supine position.

Disadvantages

- It can be more difficult for some clients to actively perform lateral neck flexion.
- It can be more difficult to massage the area following the application of STR.
- It is not suitable for people with osteoporosis who should not receive deep pressure to specific points on the body.

Active STR for Upper Trapezius: Seated or Standing

Step 1: Sitting or standing, gently hook into the upper fibres of the trapezius using the end of a curved-handled umbrella (figure 6.25).

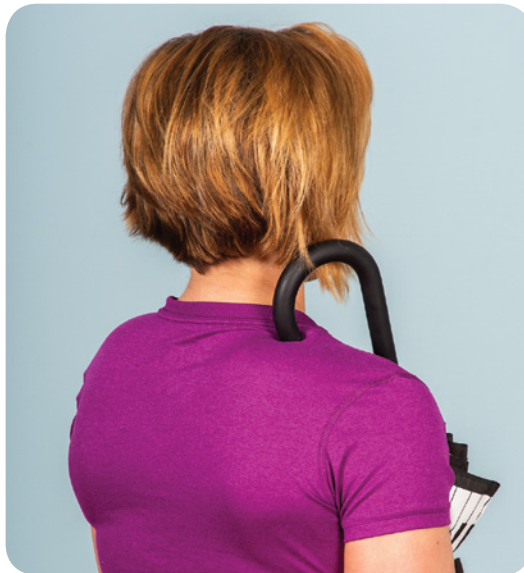


Figure 6.25 Using the curved handle of an umbrella to depress the upper fibres of the trapezius.

Step 2: Whilst maintaining the lock, either turn your head to the opposite side or laterally flex your head (figure 6.26). For example, when locking the fibres of the upper trapezius in the right shoulder, turn your head to the left or take your left ear toward your left shoulder.

UPPER TRAPEZIUS



Figure 6.26 Laterally flexing the neck to bring about a stretch.

Whilst the upper fibres of the trapezius can be grasped in a pincer-type grip with the arm elevated instead of using an umbrella handle, STR in this position does not effectively stretch the tissues of the trapezius as pressure tends to come from the thumb that you are using to lock the fibres, and it is therefore more effective at treating the scalenes. Try this exercise for yourself: Sitting with your right arm elevated, use the finger and thumb of your left hand to gently pinch the upper fibres of your right trapezius. Maintaining your lock, turn your head to the left. Notice how you can feel more pressure from your thumb than you can from your forefinger—a stretch in the tissues on the front of your neck on the right side. Because your thumb is pressing into the very anterior aspect of trapezius, onto scalenes, it is a less effective method of active STR for the upper fibres of trapezius but a good way of stretching scalenes. Some people use a tennis ball to apply the lock, but it can be difficult to get into the right place to effectively lock the tissues of the upper fibres; although it can be helpful when locking the middle and lower fibres, should you want to apply STR there.

TIP Practise active STR using one or both hands to depress the umbrella handle into the muscle in order to determine which is best. If you are applying STR to your right trapezius and depress the muscle using the umbrella in your left hand only, the advantage you have is that the muscle is relaxed but the disadvantage is that you are able to apply less pressure than when using both hands on the umbrella. When you use both hands to depress the upper fibres of the trapezius using the umbrella handle, you have more pressure and, additionally, the lower fibres of the trapezius contract as they depress the scapula. Activating the lower fibres in this way decreases tone in the upper fibres, which can be advantageous in bringing about a stretch and in deactivating trigger points.

Advantage

- Active STR to the upper fibres of the trapezius can be performed anywhere and with equipment as simple as an umbrella.

Disadvantage

- Where the upper fibres are hypertrophied it can be difficult to maintain a lock, as the umbrella hook slips off the muscle.

Active STR for Upper Trapezius: Supine

You can use active STR to treat the trigger point on the posterior of the upper fibres of the trapezius by resting on your back. Place a ball over the trigger point and turn your head to one side, as described in figure 6.24.

Advantage

- The muscle is relaxed, permitting easier access to the posterior portion of the upper fibres of the trapezius.

Disadvantages

- It can be difficult to access the anterior portion of the upper fibres of the trapezius.
- The weight of the shoulders on the ball can be uncomfortable for some people.
- It is not suitable for people with osteoporosis who should not receive deep pressure to specific points on the body.

Trigger Points in the Semispinalis Capitis

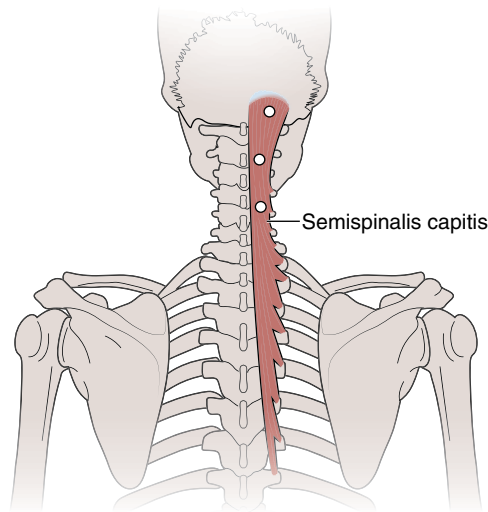


Figure 6.27 Trigger points in the semispinalis capitis.

Trigger points can be found throughout the neck and thoracic extensor muscles. In their paper on trigger point injections for headache disorders, Robbins et al. (2014) provide guidelines for the reduction of trigger points in the semispinalis capitis and other neck extensors through injection. In addition, Fernandes-de-las-Peñas, Layton and Dommerholt (2015) have described the process for dry needling trigger points in the thoracic spine for the purposes of treating thoracic spine pain. For example, figure 6.27 shows some triggers in the spinalis muscle, located 1 to 2 centimetres (0.4-0.8 in.) lateral to the midline and referring pain to the temples, back of the head and base of the skull, radiating to the region of the posterior trapezius and up to the medial border of the scapula. They can be palpated either when the head is slightly flexed, tensioning the muscle slightly, or when the head is supported in a side-lying position and the muscles are relaxed. To locate the thoracic multifidus, place your finger immediately adjacent to the spinous processes of the spine, in the 'dip', and search for raised areas that refer pain when pressed. Trigger points in the longissimus thoracis muscle require palpation of the 'hump' of muscle running parallel to each side of the spine. Trigger points in the cervical extensors are perpetuated by postural stress or trauma to the head. Postures that might aggravate these triggers are slumped and forward-head postures, or where the head is held in an extended position for prolonged periods of time.

STR cannot easily be applied to trigger points in the posterior neck region, because to lock tissues here causes the neck to be pushed forward. Similarly, in the middle and lower regions of the thorax, the torso is pushed forward. In both cases this forward push causes the client to move away from you, making it difficult to secure the lock prior to a stretch. However, working in the upper portion of the torso, just inferior to the C7 vertebra does work and provides a nice stretch to the tissues of the posterior neck.

Active-Assisted STR for Erector Spinae: Seated

Step 1: With your client sitting, lock the tissues in the mid-thoracic area. In the photograph (figure 6.28), the therapist has chosen to use his knuckles.



Figure 6.28 Locking the erector spinae tissues using the knuckles.

Step 2: Whilst maintaining your lock, ask your client to flex his or her neck (figure 6.29).



Figure 6.29 Active neck flexion brings about the stretch.

ERECTOR SPINAE (UPPER)

Step 3: Release and repeat, placing your lock slightly superior to the first one. Repeat as you work superiorly towards the neck. If you are performing STR correctly, your client will feel an increasing stretch as you move up the erector spinae.

Advantages

- Clients usually find this stretch to be comfortable.
- It can be performed with the client in a sitting position.

Disadvantages

- It is difficult to get a good lock on these tissues. As shown in figure 6.29, locking presses the client forward. It takes practice for the client to learn to remain upright, perhaps pressing back against your hands.
- It is easy to overuse your fingers or thumbs.

TIP Applying a small amount of massage medium and then working through a small towel or old T-shirt makes it easier to create a lock.

Trigger Points in the Scalenes

Trigger points in the scalenes (figure 6.30) refer pain to the chest, both the front and back of the shoulder, the medial border of the scapula, the front and back of the arm and the hand. They are most easily palpated using fingertip pressure as the client rests in the supine position. Although these muscles do not refer pain to the head, Florencio et al. (2015) found reduced pressure pain thresholds over trigger points in 30 women with migraine compared to 30 women without migraine, in not only those muscles known to refer pain to the head (suboccipitals, sternocleidomastoid and trapezius) but also in the scalenes and levator scapulae muscles. This finding lead the authors to recommend that neck musculature should be examined and treated in patients with headache.

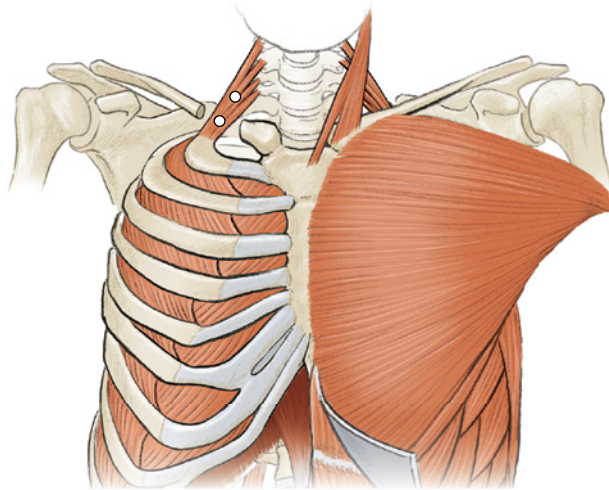


Figure 6.30 Trigger points in the scalenes.

Simons, Travell and Simons (1999) provide a long list of factors that activate and perpetuate trigger points in the scalene muscles. These factors include trauma, the actions of pulling and lifting as when hauling ropes, overuse of respiratory muscles, hard coughing, idiopathic scoliosis, playing some kinds of musical instruments and handling and riding horses.

Postulating that restriction of inspiration by respiratory muscles could impair function, Lee et al. (2016) carried out a study to examine the effect of stretching the scalenes, as they attach to the ribs and are therefore classes of muscles of respiration. They assigned 20 asymptomatic 20-year-old females into two groups, one used as a control group and one whose members carried out stretching of the scalene muscles. The slow vital capacity of each participant was measured before and after stretching using a digital spirometer. The stretching group followed a protocol in which they stretched anterior, middle and posterior scalene muscles, with the assistance of a practitioner, for a total of 15 minutes. Both inspiratory and expiratory volumes increased in the group who performed the stretching, leading the authors

to conclude that stretching scalene muscles improved pulmonary function. It seems feasible that combining trigger point deactivation and stretching could have the same kind of benefit, and STR to the scalenes is one way to apply it.

Active-Assisted STR for Scalenes: Seated

Step 1: With your client sitting, gently lock the scalenes using your fingers (figure 6.31).



Figure 6.31 Gently locking the scalenes using a finger.

Step 2: Ask your client to rotate the head away from you until he or she feels a comfortable stretch in the tissues (figure 6.32).



Figure 6.32 Active rotation of the neck brings about the stretch.

Step 3: Repeat the stretch three times on both the left and right sides.

Advantage

- When you work in this position, there is little danger that soft tissues of the neck will be overstretched, because the client is in charge of the stretch. Provided that the client is reminded to stretch only within a comfortable, pain-free range, it should always be a safe way to use STR to stretch this muscle.

Disadvantage

- It takes practice to fix the scalenes whilst avoiding the vascular structures of the neck.

Active-Assisted STR for Scalenes: Supine

Step 1: With your client in the supine position, gently palpate the scalenes and use your finger to create a gentle lock (figure 6.33).



Figure 6.33 Gently locking the scalenes with a client in the supine position.

Step 2: Ask your client to turn the head away from you as you maintain your pressure (figure 6.34).



Figure 6.34 Active rotation of the neck brings about the stretch.

Advantages

- This is a particularly effective way of locating scalenes, as the neck muscles are relaxed.
- The technique lends itself to deactivation of trigger points that can be identified more easily in this position than when the client is seated.

Disadvantage

- As with application of active-assisted STR, when a client is seated, it takes practice to fix the scalenes whilst avoiding the vascular structures of the neck.

Active STR for Scalenes: Seated

Step 1: Sitting, standing or lying, use your right hand to gently palpate the scalenes on the left side of your neck. When certain you are on a muscle and not a vascular structure, apply gentle pressure using a finger (figure 6.35).

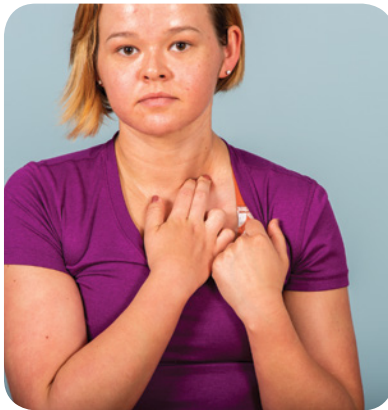


Figure 6.35 Gently locking the scalenes.

Step 2: Maintaining the gentle pressure, slowly turn your head to the right, stretching the soft tissues (figure 6.36).

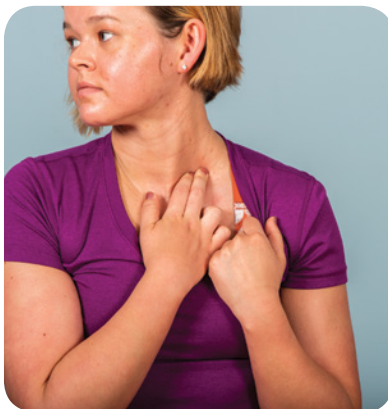


Figure 6.36 Stretching the scalenes whilst maintaining a gentle lock.

Step 3: Repeat the stretch on the other side, using your left hand to lock the right scalene muscles and then turning your head to the left.

Advantages

- It is a useful method of stretching the soft tissues of the anterior neck.
- It may be useful for the deactivation of trigger points in clients who feel uncomfortable when a therapist applies pressure to the neck.

Disadvantage

- Clients need to be taught not to press into blood vessels. However, it is unlikely that anyone would maintain pressure on a vessel as a pulse can easily be felt here.

Quick Questions

1. When a therapist applies passive STR to the rhomboids, why does the client need to have his or her arm positioned off the couch?
2. When applying active-assisted STR to the pectorals, how might you dissipate the pressure of your lock?
3. Why is active-assisted STR to the levator scapulae a relatively safe method of stretching neck tissues?
4. When applying active-assisted STR to the upper fibres of the trapezius, which bony structures should you be aware of?
5. When active-assisted STR is applied to the erector spinae, does the client flex or extend once you have locked the tissues?

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Soft Tissue Release for the Lower Limbs

This chapter outlines how to apply soft tissue release to the lower limbs. You will find comparisons between applying passive, active-assisted and active STR to each of the major muscle groups of the lower body. Table 7.1 shows which versions of STR are presented in this chapter. The chapter also includes illustrations and information about trigger points found in each of the muscles.

Table 7.1 Types of STR Used on Muscles of the Lower Limbs

Muscle	Passive	Active-assisted	Active
Hamstrings	✓	✓	✓
Calf	✓	✓	✓
Foot	–	✓	✓
Quadriceps	–	✓	✓
Tibialis anterior	–	✓	–
Peroneals (Fibulari)	–	✓	–
Gluteals	✓	✓	✓
Iliotibial band (ITB)	–	✓	–
Iliacus	–	✓	–

- *Passive STR:* Passive STR is excellent for treating the hamstrings, calf and gluteal muscles. Technically, passive STR can be applied to the foot, tibialis anterior, peroneals (fibulari), quadriceps, ITB and iliacus. However, doing so is either quite difficult or requires the therapist to adopt an awkward posture. Therefore, illustrations of passive STR to these muscles have not been included.

- *Active-assisted STR*: As you can see from table 7.1, you are able to apply active-assisted STR to all muscles of the lower limbs. However, that does not mean that you should use this technique for all muscles. Practise the technique to discover the muscles for which you find active-assisted STR easiest to apply.
- *Active STR*: It is possible to apply active STR to the hamstrings, calf, foot, quadriceps and gluteals by using a tennis ball. Active STR to the tibialis anterior, peroneals (fibulari) and iliacus is possible but difficult, so illustrations of this technique have not been included for these muscles.

The following sections provide detailed instructions for applying passive, active-assisted or active STR to many of the muscles of the lower limbs, including tips to help you along the way, and variations in treatment position where it is possible.

Trigger Points in the Hamstrings

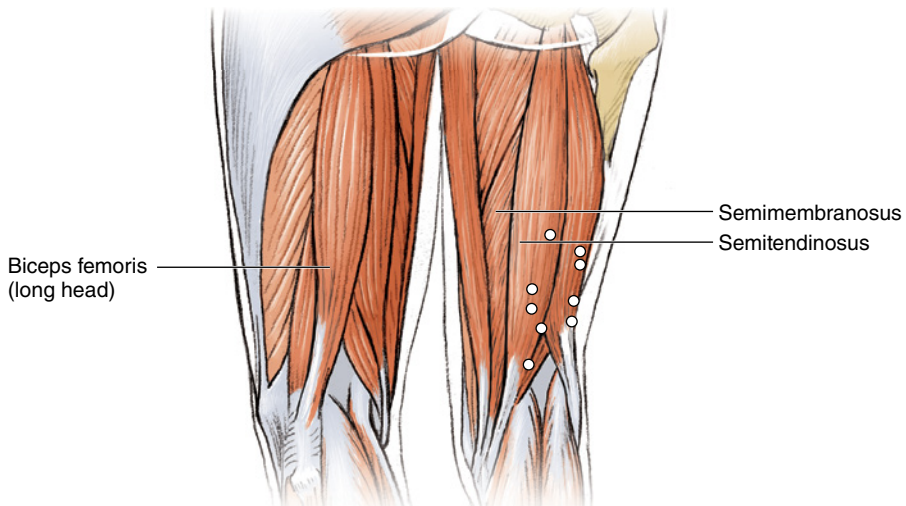


Figure 7.1 Trigger points in the hamstrings.

Trigger points are found in the middle-to-lower portions of all three hamstring muscles—semimembranosus, semitendinosus and biceps femoris (see figure 7.1). Triggers here refer pain primarily to the back of the knee and proximal part of the posterior thigh and are perpetuated by activities such as sitting for prolonged periods of time with the knees flexed, as when driving or working at a desk, or when immobilized in bed or a wheelchair following injury or illness. Prolonged pressure to the back of the thigh is another perpetuating factor. You can palpate trigger points in this muscle group with your client in the prone, side-lying and even supine position, in each case with the knee flexed.

Using a group of 30 physically active males with tight hamstrings and at least one trigger point, Trampas et al. (2010) compared the effects of trigger point release combined with stretching with stretching alone and a control group. They took knee range of movement, stretch perception, pressure pain threshold and pain subjectivity measures (using the VAS scale) pre- and post- intervention. Non-painful cross-fibre friction massage was used over the trigger points in the trigger point plus stretch group. Both groups showed improvements in post-treatment measures compared to the control group who received no intervention; and the group who received trigger point massage as well as stretching showed a significant improvement in outcomes compared to the group who only received stretching.

TIP Pain radiating down the back of the thigh is not necessarily sciatica and can be an indication of trigger points in hamstrings.

Passive STR for Hamstrings: Prone

Step 1: With your client in the prone position, passively shorten these muscles by flexing the client's knee. Lock the muscle close to its origin at the ischium (figure 7.2) using your thumb or soft fist. Each time you lock the fibres in this stretch, direct your pressure towards the ischium rather than perpendicularly. When locking with a fist, make sure you keep the wrist in alignment; do not press through a flexed or extended wrist. If using your thumb to lock the tissues, take care to only press lightly as overuse may be damaging to your thumbs.



Figure 7.2 Locking the hamstrings as close to the ischium as possible.

TIP It's a good idea to explain to the client where the lock is going to be before beginning the treatment. Some clients may consider locking under the buttock in this way to be invasive. In figure 7.2, the therapist has chosen to place the first lock distal to the ischium, on the upper part of the thigh.

Step 2: Whilst maintaining your lock, gently stretch the muscle by extending the knee (figure 7.3). Many clients do not feel much stretch at this point.



Figure 7.3 Stretching the hamstrings whilst maintaining a lock.

Step 3: Again with the knee passively flexed, choose a new, slightly more distal lock, perhaps in the midline of the thigh (figure 7.4).



Figure 7.4 Creating a more distal lock on the hamstrings.

Step 4: Whilst maintaining your lock, stretch the tissues by passively extending the knee (figure 7.5).



Figure 7.5 Stretching the hamstrings.

Step 5: Work down the length of the hamstrings from proximal to distal insertions, repeating this procedure. Avoid pressing into the popliteal space behind the knee. If you are performing the technique correctly, your client will experience an increasing sensation of stretch as you work towards the hamstring tendons. If your client does not feel the stretch, you will need to do active-assisted STR.

TIP You can use STR to help assess the pliability of the hamstring muscles. Notice the resistance you feel as you work from proximal to distal on these muscles. Can you sense which muscles are tightest—the biceps femoris (laterally) or the semimembranosus and semitendinosus (medially)?

If you wish to use STR to help deactivate trigger points, use your thumb to apply gentle pressure to a trigger, repeating the procedure over the trigger rather than to other parts of the muscle. Only when the trigger has dissipated should you move to another area. Following STR for trigger point release, instruct your client to perform hamstring stretches to maintain length in the muscle fibres.

Advantages

- Many clients report having tight hamstrings. This technique is helpful for assessing the pliability of hamstring muscles and identifying which muscles are tightest.
- Passive STR to the hamstrings may be incorporated into an overall massage treatment for the lower limbs with the client in the prone position.
- It is easy to use your thumb to gently lock trigger points you have located in the middle and lower portions of the muscles and to use passive STR to deactivate them.

Disadvantages

- The hamstrings are strong, powerful muscles that require a firm lock to fix the tissues. Using a fist to lock the tissues is one method of locking, but it is not as powerful as using a forearm (as in active-assisted STR).
- Elbows may be used to lock the tissues, but due to the length of the lever in this case, using the elbow makes passive flexion and extension of the knee difficult and may compromise your posture as you lean forward to lock the tissues.

Active-Assisted STR for Hamstrings: Prone

Step 1: Whilst your client is in a prone position, ask him or her to flex the knee. Using the side of your forearm or your elbow, lock the hamstrings close to the ischium (figure 7.6). Direct your pressure towards the buttock to take up some of the slack in soft tissues before the stretch.



Figure 7.6 Locking the hamstrings close to the ischium using an elbow.

Step 2: Whilst maintaining your lock, ask your client to lower the leg back to the couch (figure 7.7). Release your lock.



Figure 7.7 Stretching the hamstrings as the client lowers the leg to the couch.

Step 3: Choose a new lock, more distal to the first. Repeat the lock-and-stretch motion, working in lines down the posterior thigh from the ischium to the hamstring tendons. Avoid pressing into the popliteal space behind the knee.

TIP The knee does not need to be fully flexed at the start of the technique, or fully extended afterwards. Indeed, when working with a client with severe tightness on the posterior of the knee, full extension may not be desirable nor possible initially.

Advantages

- This method allows you to lock using the side of your forearm or your elbow and thus provides a stronger fix to soft tissues than when using a fist.
- Active-assisted STR to the hamstrings is particularly useful as part of the rehabilitation process after surgery to the knee or immobilization of the knee joint, by increasing knee range of motion and hamstring strength. Hamstrings contract concentrically each time the client actively flexes his or her knee; they contract eccentrically as the client lowers his or her knee, thus helping to maintain strength in these muscles.
- When the technique is used after knee replacement surgery, it may help increase both knee flexion and extension, because the client works within his or her pain-free range and is likely to increase range at the knee in a way that is safer than post-operative passive stretching.

Disadvantages

- Constant active flexion of the knee may cause the client's hamstrings to cramp.
- Leaning over to lock tissues could hurt your back so take care to guard your posture. Take a wide stance and ensure that your upper-body weight is supported by the client or treatment couch. With practice, this is easy.
- Use of the side of the forearm or elbow makes accessing trigger points in the medial aspect of the thigh tricky.

TIP Working on the leg closest to you (figure 7.8) is often easier than stretching across the body to the opposite leg. Using the right arm when treating the left leg (or left arm when treating the right leg) can also make application easier.



Figure 7.8 Applying STR to the leg closest to the therapist.

CLIENT TALK

Active-assisted STR has been great for treating a dancer who is flexible but nevertheless reports tightness in her muscles. The straight-leg raise test was not an appropriate method of testing hamstring tension in this client, who can easily position her chest on her thighs before and after treatment. Client feedback was therefore used to identify specific areas of tightness and work on and around those areas, sometimes with oil and sometimes without.

TIP Using the point of your elbow creates a more specific lock and can be a useful alternative to thumbs when using STR to deactivate trigger points which you have first identified with finger palpation (figure 7.9). However, it is more difficult to use the elbow in this way as you reach the distal end of the muscles, where a thumb lock is better.



Figure 7.9 Using the point of the elbow to create a lock.

TIP An alternative position for treating trigger points in the hamstrings is to work with your client supine, his or her hip and knee flexed to 90 degrees. In this position you can grasp the distal point of the client's thigh above the knee, using your thumbs to press into the trigger points in this area. Maintaining pressure on the trigger, ask your client to slowly extend the knee until it is straight. Following trigger point release, your client is already in a suitable treatment position for passive hamstring stretch.

Active STR for Hamstrings: Supine

Step 1: Lie in the supine position, shorten the muscle by flexing your knee, and place a tennis ball over part of your hamstring muscles (figure 7.10).



Figure 7.10 Applying a ball to the hamstrings.

Step 2: Whilst holding the tennis ball, gently extend your knee (figure 7.11).



Figure 7.11 Stretching the hamstrings using a tennis ball.

HAMSTRINGS

Place your first lock (using the ball) near the ischium and gradually work down towards your knee with subsequent locks. Because the hamstrings are a large muscle group, you will need to work all over them to fully benefit from the stretches. Sometimes it is best to work systematically, perhaps starting with the biceps femoris on the lateral side of the thigh, proximal to distal (ischium to knee). When you feel you have worked this section enough, move your locks to a more medial position so that you are over the semimembranosus and the semitendinosus; continue to work this area in the same way. To use the technique to deactivate trigger points in hamstrings, palpate the muscle until you locate a trigger, place the ball over it, and repeat the STR on that same spot several times until the trigger dissipates.

Advantages

- It is easy to use active STR to deactivate trigger points in the hamstrings when resting supine.
- Elevating the leg helps blood and lymph drainage and could be a useful part of active recovery following exercise.

Disadvantage

- If you have large, strong hamstrings, it may be difficult to apply the necessary amount of pressure to lock the tissues with the ball in this position.

Active STR for Hamstrings: Seated

Step 1: With the knee bent as is usual when seated, place a ball beneath your thigh whilst sitting so that it is between you and the chair (figure 7.12).



Figure 7.12 Starting position for active STR for the hamstrings.

Step 2: Extend your knee (figure 7.13).



Figure 7.13 Extending the knee to bring about a stretch in active STR for the hamstrings.

Advantages

- Sitting STR is useful for treating hamstrings during the day if you have a desk job.
- Applying STR in a seated position is less effortful than when lying, as it does not require the ball to be held in place with the hands.
- It is relatively easy to use active STR to deactivate trigger points when sitting.

Disadvantage

- Active STR to the hamstrings when sitting places considerably more pressure on your hamstrings than when supine, and it could be painful.

Trigger Points in the Calf

Figure 7.14 shows trigger points in the medial and lateral portions of the gastrocnemius muscle. The medial triggers refer pain to the instep and medial aspect of the posterior knee primarily, radiating on the medial aspect of the calf, whilst the lateral triggers refer pain locally and to the lateral inferior knee region. These triggers are aggravated by forceful plantar flexion of the ankle as might occur when going *en pointe* in ballet or when walking up a steep hill. They are also perpetuated by compression of the calf, as when wearing tight socks or sitting with the legs outstretched, the calves resting on a footstool. Prolonged passive plantar flexion is also likely to aggravate triggers, as occurs when sleeping or wearing high heels.

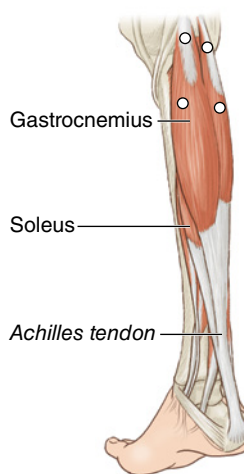


Figure 7.14 Trigger points in the calf.

Trigger points in the calf can be located with your client resting prone, their feet off the edge of the treatment couch (figure 7.15) or as they kneel on a chair, their feet off the edge of the chair, or with the client in the side-lying position.

Grieve, Barnett, et al. (2013) examined myofascial trigger point therapy for the triceps surae in 10 participants with calf pain. Baseline measurements were taken before and after each treatment; they were pressure pain threshold, presence of trigger points, ankle dorsiflexion range of movement, lower extremity functional scale and a verbal numerical rating scale. A therapist found trigger points in the gastrocnemius and soleus muscles using a thumb, then passively stretched the calf. Participants were also advised to self-treat their trigger points using a tennis ball or foam roller at least once a day, followed by active stretching of the calf. Thirteen active triggers had been identified at baseline across the 10 participants, and they were reduced to zero following intervention. However, the 31 latent trigger points which had been identified across the participants were only reduced to 30. Both ankle dorsiflexion for gastrocnemius and soleus improved post treatment, as did the pressure pain scores for all participants.

Grieve, Cranston, et al. (2013) also explored deactivation of latent triggers in the triceps surae of 22 recreational runners. Participants ran at least twice a week and had at least one latent trigger point in either the gastrocnemius or soleus. All had restricted ankle dorsiflexion. Trigger point release was performed with thumb pressure for 10 minutes followed by a 10-second stretch each of the gastrocnemius and soleus muscles. The control group received no intervention, but both groups had ankle dorsiflexion measures using a goniometer pre- and post-test. Ankle dorsiflexion increased in both groups but was greater in the intervention group. In the intervention group the increase was statistically significant compared to

baseline measurements for both soleus and gastrocnemius, leading the authors to conclude that myofascial trigger point release provided an immediate improvement in ankle dorsiflexion.

TIP If a client complains of waking at night with a cramp in the calf, consider the presence of trigger points in the gastrocnemius.

Passive STR for the Calf Using Thumbs: Prone

Step 1: Position your client in prone with the feet off the end of the treatment couch (figure 7.15).



Figure 7.15 Positioning your client on the couch.

Step 2: Check for clips on the edge of the treatment couch that may press into the client's foot. Make sure the client can dorsiflex at the ankle. One way to do so is to gently push the ankle into dorsiflexion (figure 7.16).



Figure 7.16 Passively dorsiflexing the ankle.

TIP Practise positioning your thigh on various aspects of your client's foot, either medially or laterally. Find the position that provides the client with the greatest stretch. When you apply this technique, you will need to provide passive dorsiflexion of the ankle to at least 90 degrees. Notice that to do so, you need to angle the client's foot so as to stretch the calf muscle, not simply press on the foot, thereby pushing the client up the treatment table.

Usually, it is best to shorten a muscle slightly before performing STR. The calf is an exception to this rule, because the foot and ankle naturally fall into plantar flexion, where the muscles are already in neutral, neither stretched nor contracted.

Step 3: Whilst standing at the end of the couch, lock the calf using reinforced thumbs, just distal to the knee joint, perhaps in the centre of the calf. Each time you lock the fibres in this stretch, direct your pressure towards the knee rather than perpendicularly (figure 7.17).



Figure 7.17 Locking the calf using thumbs.

To demonstrate passive STR to the calf, the therapist in figure 7.17 has used reinforced thumbs. This approach is useful in working through the following steps until you get the hang of passive STR. It is also a good way to treat trigger points in the upper part of the gastrocnemius (figure 7.14). However, it is essential for all therapists to protect their own limbs, and overuse of the thumbs should be avoided. Because they are plantar flexors, calf muscles are exceptionally strong, and it may be necessary to use a particularly firm lock when treating them. Although it may be tempting to press harder with your thumbs, you should avoid doing it.

Step 4: Whilst maintaining your lock, use your thigh to dorsiflex the client's ankle (figure 7.18).



Figure 7.18 Stretching the calf passively by dorsiflexing the ankle using the thigh.

Step 5: Once you have dorsiflexed the ankle, release your lock, remove your thigh and move to a new locking position distal to your first lock (figure 7.19).



Figure 7.19 Locking tissues in the midline of the calf.

Step 6: Dorsiflex the ankle once again (figure 7.20).



Figure 7.20 Passively dorsiflexing the ankle to bring about a stretch whilst maintaining a lock.

Step 7: Once you have dorsiflexed the ankle, release the lock and your thigh. Then, place a new, more distal lock (figure 7.21).



Figure 7.21 Creating a final, distal lock on the calf.

Step 8: Once again, passively dorsiflex the ankle (figure 7.22).



Figure 7.22 Passively stretching the calf whilst maintaining a distal lock.

Step 9: Work down the length of the muscle proximally to the junction of the muscle with its Achilles tendon. Repeat this action along the same line of the calf up to three times.

TIP The gastrocnemius, the most superficial calf muscle, is a bipennate muscle; it has two bellies. Once you have performed STR down the centre of the muscle, move to the lateral or medial aspect of the calf, following the same steps. Working on the lateral and medial sides of the calf will help you to identify trigger points here. Notice that many clients have a palpable band of tension running down their lateral calf. Could this band be thickened fascia between the lateral and posterior compartments of the leg?

It does not matter whether you start STR in the centre of the calf or to the lateral or medial side. Usually, STR applied approximately three times to one group of muscle fibres is adequate to help stretch these fibres and increase range of motion at a joint.

Advantages

- Using the thigh to dorsiflex the client's ankle can provide a pleasant stretch in addition to that provided by the STR.
- This stretch may be incorporated into an overall massage treatment for the lower limbs with the client in the prone position.
- It is easy to palpate for trigger points in the calf and use STR to help deactivate them.

Disadvantages

- It is easy to overwork the thumbs.
- Clients with large, bulky muscles will not necessarily feel the stretch, because the lock will need to be firmer than the thumbs can safely apply.

Passive STR for the Calf Using Fists: Prone

The only difference between applying passive STR to the calf using fists instead of thumbs is in the method of locking. With your client in the prone position, follow steps 1 and 2 of passive STR to check that the ankle can be safely and comfortably dorsiflexed (figure 7.17).

Step 1: Instead of using thumbs, make a gentle fist to create the lock (figure 7.23).



Figure 7.23 Using fists to lock the calf.

Step 2: Whilst maintaining your lock, gently dorsiflex the ankle (Figure 7.24).



Figure 7.24 Using your thigh to passively dorsiflex the ankle and bring about a stretch whilst maintaining fist lock on the calf.

Advantage

- Using fists is a good alternative to save overuse of the therapist's thumbs.

Disadvantages

- It can be difficult to form a lock. Applying a massage medium and then working through a facecloth or small towel is helpful.
- This method cannot be used to treat trigger points.

Passive STR for the Calf Using Fists to Glide: Prone With Knee Extension

Step 1: Check that the ankle can be dorsiflexed (figure 7.17). Apply a small amount of massage medium such as oil or wax.

Step 2: As you dorsiflex the ankle, use your fist to apply pressure as you glide from the ankle to the top of the calf, reducing pressure when you reach the knee (figure 7.25).



Figure 7.25 Applying gliding STR on the calf using fists.

Advantage

- It can be a soothing form of STR for clients with large, bulky muscles where you find it difficult to maintain a lock, or on those clients with tender calves for whom a specific lock is uncomfortable.

Disadvantages

- Although it is soothing to receive following deactivation using other methods, this method of STR cannot be used to deactivate trigger points.
- It requires a little practice to perform dorsiflexion whilst simultaneously gliding up the calf.

Passive STR for the Calf Using Forearms to Glide: Prone With Knee Flexion

Step 1: Rest your client's ankle on your thigh as they lie in the prone position, and place your hand on his or her toes (figure 7.26).



Figure 7.26 Placing the hands on the toes in preparation to glide up the calf.

Step 2: Using your forearm, glide from the ankle to the knee as you passively dorsiflex the ankle (figure 7.27).



Figure 7.27 Passively dorsiflexing the ankle whilst gliding up the calf with the forearm.

Advantages

- Passive flexion of the knee helps relax the calf muscle.
- This method can also aid blood and lymph flow toward the knee.

Disadvantages

- Not all therapists find this treatment position comfortable.
- It can take practice to become proficient in passive dorsiflexion of the ankle with simultaneous gliding.

Active-Assisted STR for the Calf Using the Elbow: Prone

Step 1: With your client positioned as shown in figure 7.28, lock the calf muscle using your elbow. Place your first lock just inferior to the knee joint, taking care not to press into the popliteal space at the back of the knee. Notice that the muscle naturally falls into a neutral position with the client prone and therefore does not need to be actively shortened.



Figure 7.28 Gently locking the calf using the elbow.

Step 2: Whilst maintaining your lock, ask your client to pull up the toes, thus dorsiflexing the foot and ankle (figure 7.29). Once the client has done so, remove your lock and move to a new position.



Figure 7.29 Active contraction of the tibialis anterior brings about the stretch.

Step 3: Repeat the action. Work down the calf towards the ankle, stopping when you reach the Achilles tendon. Repeat in lines from the proximal to the distal ends of the muscle.

Because constant dorsiflexion fatigues the tibialis anterior muscle, limit the time you spend on active-assisted STR to the calf.

TIP For an alternative to using your elbow, use your thumbs (figure 7.30). For a broader lock, use your forearm (figure 7.31).



Figure 7.30 Using thumbs to lock the tissues at the start of active-assisted STR to the calf.



Figure 7.31 Using the forearm to lock the tissues at the start of active-assisted STR to the calf.

Whichever lock you use, make sure you transfer your weight to the client or to the couch: unsupported flexion of the trunk can cause backache.

Advantages

- This method enables you to apply a firm lock.
- Not having to stand at the foot of the treatment couch means that you can focus the lock in a variety of ways.
- The client is likely to dorsiflex to a greater extent than would be produced through passive STR to the calf and may therefore experience a greater stretch.
- Using the thumb or elbow is an effective method of deactivating trigger points.
- When used with permission from medical personnel, it is a great technique to incorporate as part of the rehabilitation process after Achilles tendon surgery. The client is unlikely to dorsiflex beyond his or her pain-free range and is therefore less likely to damage tissues through overstretching.

Disadvantages

- Constant dorsiflexion will eventually fatigue the tibialis anterior muscle.
- Leaning forward to lock using a forearm or elbow increases the possibility of injuring your lumbar spine. Make sure you transfer your weight to the client or to the couch.

Active-Assisted STR for the Calf Using Grip Lock: Prone

Step 1: Passively flex the client's knee, and grasp the calf (figure 7.32).



Figure 7.32 Using a grip lock on the calf.

Step 2: Whilst in this position, ask your client to plantar flex and dorsiflex the foot and ankle as you maintain the lock. Take care not to grip the muscle too hard.

Advantages

- The client does not need to position the feet off the edge of the treatment couch.
- Passive flexion of the knee facilitates slackening of the calf muscle, which permits a deeper lock and a different stretch sensation for the client.

Disadvantages

- It can be difficult to apply the lock along the length of the muscle. However, it may be possible to move a little either proximally or distally, depending on the shape and bulk of the calf.
- This method cannot be used to deactivate trigger points, as the lock is too broad.

Active STR for the Calf: Supine

Step 1: Resting with your legs outstretched, place your calf on a ball (figure 7.33). To shorten the calf, you would normally plantar flex. However, you will find that your ankle falls naturally into plantar flexion in this position.



Figure 7.33 Positioning a ball to perform active STR for the calf.

Step 2: Gently dorsiflex your ankle (figure 7.34).



Figure 7.34 Dorsiflexing the ankle in active STR for the calf.

TIP For a broader, less specific lock, an alternative is to place your leg on a cylinder, such as a can, and apply the stretch.

Advantages

- This technique is useful for overcoming cramping in an acute situation.
- It is a good technique for actively addressing trigger points in the posterior part of the calf.

Disadvantages

- Depending on how well-developed your muscles are, keeping your leg on the ball in this position can be tricky.
- This technique places considerable pressure on the calf muscles and may not be tolerable for all clients.

Trigger Points in the Foot

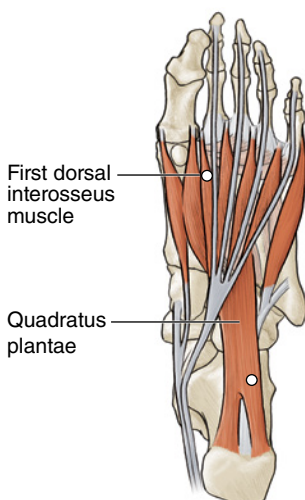


Figure 7.35 Trigger points in the foot.

There are multiple trigger points in all of the muscle layers throughout the dorsal and plantar aspects of the foot. Figure 7.35 illustrates common triggers found in the deep, quadratus plantae muscle, which refers pain to the plantar aspect of the heel, and the first dorsal interosseous muscle, which refers pain locally on the dorsal and plantar aspects of the foot. Figures 7.36 and 7.38 show how these might be treated using a massage tool. These triggers can be perpetuated by trauma to the foot or by keeping the foot immobilized, as might be common following injury, or by tight fitting shoes. To palpate for any of the triggers in the feet, work slowly and in a systematic manner over the sole of the foot. Using the sit-and-reach and active knee extension tests pre- and post-treatment, researchers Patel, Vyas and Sheth (2016) examined the effect of self-treatment of trigger points in the sole of the foot in a group of 30 participants randomly assigned either a treatment or no-treatment group. All participants lacked 25 degrees of knee extension before the intervention, which was carried out over a period of four weeks. Participants were instructed to roll a tennis ball beneath the foot between the metatarsal heads and the heel, potentially releasing more than one trigger point, for a maximum of two minutes per foot, for one session only. Results showed that both the intervention and control group had significantly improved active knee extension scores, but there was no change in the sit-and-reach test scores. The authors concluded that a single session of self-release of the plantar fascia was beneficial in improving hamstring length but made no difference to lumbopelvic flexibility. They attributed the increase of hamstring flexibility in the control group to a training effect. That is, 'creep' of the soft tissues due to having taken three readings of the knee extension test.

Keep in mind that heel pain may derive from trigger points elsewhere, such as the calf, and some studies support the use of trigger point therapy to reduce heel pain. For example, Renan-Ordine (2011) carried out a randomised control trial of 60 participants with heel pain in which participants either self-released triggers in their calf muscles and also stretched the calf, or just stretched the calf. Outcomes were superior in the group who self-released triggers.

Active-Assisted STR for the Foot Using a Tool: Prone and Supine

Step 1: Position your client prone, with his or her feet off the couch and the ankle in a neutral position. Apply a gentle lock using a massage tool (figure 7.36).



Figure 7.36 Using a massage tool to gently lock tissues on the sole of the foot when the client is in the prone position.

Step 2: Ask your client to pull up his or her toes, thus dorsiflexing the ankle and extending the toes (figure 7.37). Work over the sole of each foot for a few minutes only.



Figure 7.37 Actively dorsiflexing the ankle brings about the stretch.

You can also perform the technique with your client in the supine position (figure 7.38).



Figure 7.38 Applying active-assisted STR to the sole of the foot with the client in the supine position.

TIP Whether using active-assisted STR in the prone or supine position, asking your client to extend the toes whilst also dorsiflexing the ankle increases this stretch. However, as most clients will not know what ‘extend’ means, you may need to ask them to ‘pull up your toes even further’ if they have not automatically done it.

Advantages

- Using a tool protects your thumbs.
- This technique may be incorporated into an overall massage treatment for the lower limbs with the client in the prone position.
- It is a useful way of addressing trigger points in the sole of the foot.

Disadvantages

- Not all clients like the sensation of the massage tool.
- Great care must be taken to avoid making too firm a lock.
- It can be difficult to get leverage here.

CLIENT TALK

A client trying to lose weight by walking to work started to experience foot pain when he changed from wearing training shoes to noncushioned flat-soled shoes. Having ruled out any serious pathology, the client received a foot and calf massage. He enjoyed the application of pressure to the soles of his feet, which was applied using a massage tool through a piece of tissue in order to get a secure lock.

Active STR for the Foot: Seated

Step 1: Whilst sitting down, place your foot on a tennis ball or spikey therapy ball with your ankle in neutral (figure 7.39). Notice that in this instance you do not need to shorten the soft tissues. To do so, you would need to flex your toes, and many people find this action causes cramping.



Figure 7.39 Resting the foot on a spikey ball to apply active STR.

Step 2: Gently extend your toes, dorsiflexing your ankle (figure 7.40).



Figure 7.40 Dorsiflexing the ankle and extending the toes to bring about a stretch when using a ball for active STR of the sole of the foot.

Step 3: Work over the sole, moving the ball to discover which aspects of the fascia are tight and would benefit most from the stretch.

TIP When working the plantar surface of the foot, it is also useful to treat the calf, because some of the calf muscles, such as flexor hallucis longus, extend down into the toes. Stretching the calf may help ease foot pain in some cases.

Advantages

- It is a useful way of addressing trigger points in the sole of the foot.
- Active STR for the sole of the foot is helpful for those clients who find active-assisted STR ticklish.
- Applying STR to the sole of the foot stimulates circulation and has been reported to help alleviate pain in people suffering from plantar fasciitis.
- This active stretch is a quick fix for clients who have been standing for long periods.
- It helps alleviate cramps in the foot muscles.
- It can help ease tension in the foot after prolonged walking or after running.
- The massage tool is easily portable.

Disadvantage

- Standing on the ball or overusing the technique can result in damage to the tissues.

CLIENT TALK

A client serving in the military police was experiencing plantar fasciitis in his right foot. He wanted to find a way to stimulate recovery because he had already had the condition in his other foot and found it debilitating. He was anxious that active-assisted STR might be painful and preferred to carry out his own STR, which he did successfully, using a golf ball instead of a spikey ball, over a period of weeks. Deep massage to the calf was used in helping alleviate tension in the connecting fascia, the aim of which was to take pressure off the calcaneus and perhaps also off the plantar fascia.

Trigger Points in the Quadriceps

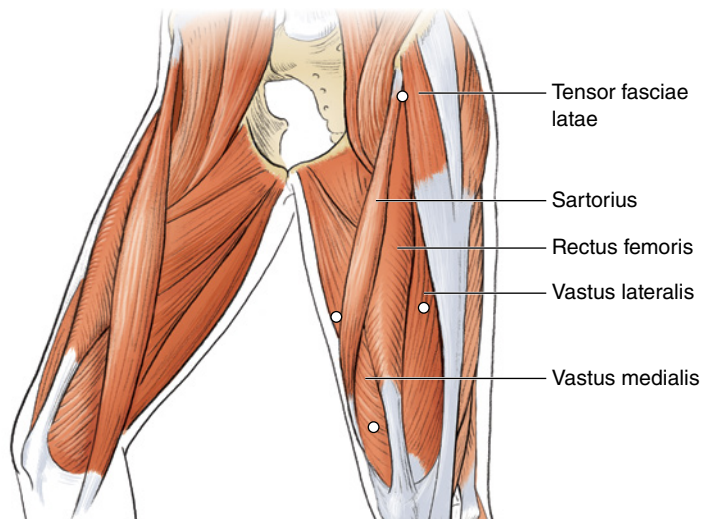


Figure 7.41 Trigger points in the quadriceps.

Four common trigger points are found in the quadriceps. The trigger point at the proximal attachment of the rectus femoris is close to the anterior superior iliac spine (figure 7.41) and refers pain into the knee. To identify the rectus femoris, palpate the area as you get your client to perform isometric knee extension in a manner that does not engage the hip. The rectus femoris will contract, and you will be able to palpate it for this trigger.

Two trigger points in the vastus medialis (figure 7.41) refer pain to the medial thigh and knee. To palpate for these trigger points, either stand facing the side of the couch with the client in the supine position and gently glide your fingers from the adductors through to the vastus medialis, or begin at the knee and palpate from the knee to the hip.

Trigger points exist in the proximal, distal and middle portions of the vastus lateralis, one of which is shown in figure 7.41. For more information on trigger points in this area, see the section on the iliotibial band (ITB).

There are trigger points in the vastus intermedialis (not shown in figure 7.41), and they refer pain over the anterolateral portion of the thigh.

The trigger points in the quadriceps are aggravated by trigger points in the hamstrings, and they may not resolve unless the hamstrings are first addressed. Tight hamstrings can prevent full knee extension, meaning that the muscle is unnecessarily strained during weight bearing. They are perpetuated by immobilization of the thigh, as is common following injury.

Espí-López et al. (2017) recruited 60 people with patellofemoral pain to compare the effectiveness of adding dry needling into trigger points to manual therapy and exercise. For 3 weeks, half the group received manual therapy and exercise and half the group received the same manual therapy, exercise plus dry needling

into trigger points into the vastus medialis and vastus lateralis muscles. Outcome measures used were the Knee Injury and Osteoarthritis Outcome Score, the Knee Society Score, The International Knee Documentation Committee Subjective Knee Evaluation Form, and the numeric pain rating scale. Measures were taken at baseline, 15 days post-treatment and 3 months later. Both groups showed moderate-to-large improvements in all scores, no significant differences existed between the two groups, leading the authors to conclude that adding dry needling to trigger points to a manual therapy and exercise intervention did not result in improved outcomes for patients with knee pain and disability.

Active-Assisted STR for Quadriceps: Seated

Step 1: With your client sitting, lock the proximal portion of the quadriceps with the client's knee in active extension, directing your pressure towards the hip (figure 7.42).



Figure 7.42 Locking the quadriceps using the soft side of the elbow.

Step 2: Maintain your lock as your client flexes the knee (figure 7.43).



Figure 7.43 Active flexion of the knee as the therapist maintains the lock brings about a stretch in the quadriceps.

Step 3: Once the knee is flexed, release your lock and repeat, placing a new lock slightly more distal to the first. Work your way down the quadriceps from hip to knee.

Notice that the knee does not need to be fully flexed for the client to feel a stretch in the tissues. Practise locking the vastus lateralis and rectus femoris to locate areas of tension.

This stretch is particularly good for clients who have anterior knee pain aggravated by tight quadriceps. Work slowly and carefully as you approach the distal end of the quadriceps; it increases the stretch and thus places greater pressure on the patella.

TIP Although you can also perform this stretch using your left arm to lock the client's right quadriceps, both you and the client may find this position slightly invasive.

Advantages

- You will be able to achieve a strong, broad lock on these powerful muscles.
- You can use this method to deactivate trigger points in the thigh when they have been identified through palpation and the lock is created using the point of the elbow. In such cases, remember that your client will need to perform a quadriceps stretch following treatment to help maintain length in the muscle fibres.

Disadvantages

- Both you and the client may find this position slightly invasive.
- It is easy to compromise your posture. Therefore, to prevent unsupported forward flexion of the lumbar spine, use a wide stance.

Active STR for Quadriceps With a Tennis Ball

Step 1: Lie facedown on a mat, and position a tennis ball beneath your thigh with your knee in extension (figure 7.44).

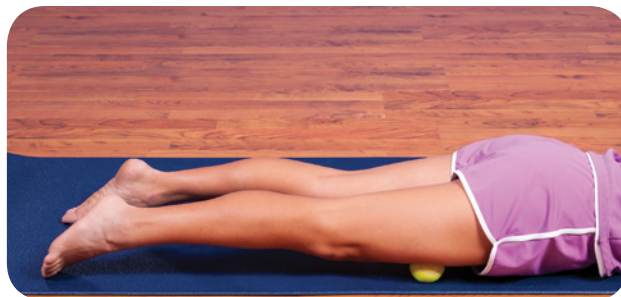


Figure 7.44 Positioning a ball at the start of active STR for the quadriceps.

QUADRICEPS

Step 2: Flex your knee (figure 7.45).

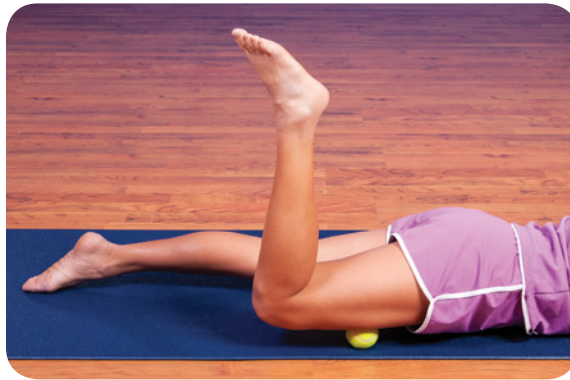


Figure 7.45 Active knee flexion brings about the stretch.

Practise positioning the ball against various parts of your thigh, and notice where you most feel the stretch. Position the ball first near your hip; with subsequent locks, work towards your knee. To help identify trigger points, use the ball and work systematically down the length of the muscles in this group. When you find a trigger, use STR to help deactivate it.

Advantages

- This method is useful if you find that a general stretching programme for your quadriceps is not targeting specific tissues. For example, by positioning the ball to the lateral side of your thigh, you are more likely to access the vastus lateralis.
- It is a good method for targeting trigger points in the rectus femoris and the middle portion of the thigh muscle.

Disadvantages

- Not everyone will feel comfortable in this treatment position.
- This technique may be uncomfortable for some people because the leg's entire weight is on the tennis ball. An alternative method is to use a massage tool to lock into your own thigh whilst sitting with your leg in extension.
- It can be difficult to treat trigger points in the vastus medialis using this method.

To apply STR actively to your quadriceps whilst sitting in a chair or on the edge of a massage couch, simply extend the knee and fix your quadriceps by pressing a ball into the tissues of your thigh. Maintain your lock as you gently flex your knee. Repeat this action several times on different parts of this muscle group. Accessing trigger points in the vastus medialis can be easier when seated.

Trigger Points in the Tibialis Anterior

A trigger point is found in the upper third of the muscle (figure 7.46) and refers pain to the dorsal aspect of the big toe and the front of the ankle. The point is easy to identify, just lateral to the ridge of the tibia. Trigger points in the tibialis anterior are likely activated by trauma to the ankle or foot.

Active-Assisted STR for Tibialis Anterior: Side Lying

For this stretch you will lock your client's tibialis anterior muscle. Sometimes you can position the client in supine. However, in figure 7.47, the therapist has positioned the client in side lying with her leg supported on a bolster in order to allow better access to the muscle. Notice that the therapist is supporting himself with his left hand on the treatment couch to avoid strain to his lower back.

Step 1: Locate the tibialis anterior by asking your client to pull up the toes. Whilst the client's ankle is in dorsiflexion, lock the muscle (figure 7.47). The tibialis anterior is a strap-like muscle, and the therapist in this photograph has chosen to lock it gently using his elbow, directing his pressure towards the knee.

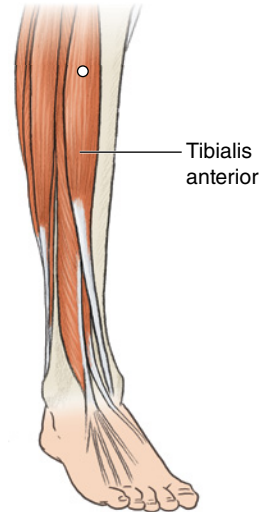


Figure 7.46 Trigger points in the tibialis anterior.



Figure 7.47 Using the elbow to gently lock the tibialis anterior with a client in the side-lying position.

TIBIALIS ANTERIOR

Step 2: Whilst maintaining your lock, ask your client to point the toes (figure 7.48).



Figure 7.48 Active plantar flexion brings about a stretch in the tibialis anterior.

Step 3: Once the client has pointed the toes, release your lock and choose a new position, slightly more distal, for your second lock. With the ankle in dorsiflexion, lock in and repeat, working proximally to distally as long as the client feels the stretch and it is comfortable.

TIP The tibialis anterior becomes tendinous fairly quickly, so it is not necessary to work all the way down the length of the muscle to the ankle; to do so may be uncomfortable for the client because this muscle lies over the tibia.

Advantages

- It is relatively difficult to apply passive or active STR to this muscle group, so active-assisted STR is a useful alternative.
- Once you feel confident locating the muscle with the client in this position, you may incorporate active-assisted STR into a massage routine with the client in supine.
- It is an effective technique for deactivating trigger points in the tibialis anterior.

Disadvantages

- This method may compromise your thumbs.
- If you use your elbow to lock the tissues, excessive pressure may damage tissues.

Active-Assisted STR for Tibialis Anterior: Gliding in Prone

Step 1: With your client in the prone position, apply a small amount of massage medium such as oil or wax to the front of the leg.

Step 2: Starting at the ankle, gently glide your fist along the length of the tibialis anterior muscle as your client actively dorsiflexes and plantar flexes the ankle (figure 7.49).



Figure 7.49 Using gliding STR on the tibialis anterior.

Advantage

- Treating the tibialis anterior in the prone position means that you can easily incorporate the technique into a regular massage routine.

Disadvantages

- You have very little leverage on the muscle in this position, so the stretch created is mild, which may not suit all clients.
- Gliding STR is not used to treat trigger points, as they require a specific lock to be held.

CLIENT TALK

Active-assisted STR to the tibialis anterior was combined with an oil treatment for a client with shin splints. In an attempt to give up smoking, the client had taken up running; thinking he could train hard and fast, he had been running every day for 3 weeks until his activity was limited by anterior shin pain. Stress fractures were ruled out, and STR was included in a gentle massage routine twice a week for 3 weeks. After a period of rest, the client was able to return to a gentler running programme.

Trigger Points in the Peroneals (Fibulari)

Trigger points in the peroneal (fibulari) muscles refer pain to the lateral malleolus, the anterolateral aspect of the ankle and sometimes to the heel (figure 7.50). You can easily locate them by palpating the lateral side of the leg with your client in a side-lying position. Take care when palpating the proximal end of the muscle, as the common peroneal nerve courses around the head of the fibula here and pressure to the nerve causes a tingling sensation.

Immobilisation of the ankle for any reason may perpetuate triggers, and clients with triggers may report frequent ankle sprains or feeling that the ankle is unstable. Other perpetuating factors include leg length discrepancy, flatfootedness, wearing high heels and prolonged plantar flexion.

In a randomised controlled trial, Rossi et al. (2017) examined whether spinal and peripheral dry needling were any better than peripheral dry needling for people with a history of lateral ankle sprain. Twenty participants with a history of ankle sprain were randomly assigned one of two groups. One group received dry needling into trigger points in the multifidi and fibulari; the other group received dry needling to fibulari alone. Measurements were taken at baseline, immediately following the intervention and 6 or 7 days later. Measurements included the Foot and Ankle Disability Index, the Cumberland Ankle Instability Tool, unilateral strength, balance and hop test performance, and pain measured on the VAS scale. There was no significant difference between the groups at the end of the study, leading the authors to conclude that dry needling of multifidus in addition to dry needling of trigger points in fibularis muscles did not result in short-term improvements over and above dry needling trigger points in fibularis muscles alone.

Active-Assisted STR for Peroneals (Fibulari): Side Lying

Step 1: With your client in the side-lying position, ask him or her to evert the foot; demonstrate what you mean. Lock the muscle, which is now in a shortened position, directing your pressure towards the knee (figure 7.51). For demonstration purposes, the therapist in the photo has chosen to use reinforced thumbs to lock the muscle. Alternatively, you can use your elbow, using caution to prevent bruising the tissue against the fibula.

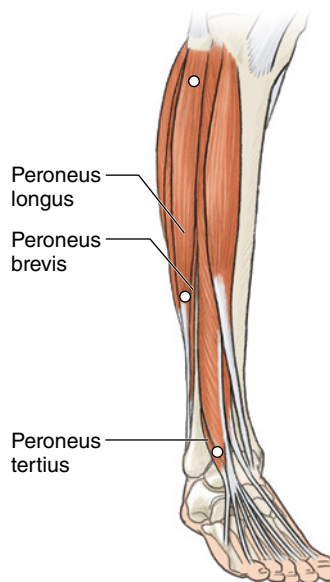


Figure 7.50 Trigger points in the peroneals (fibulari).



Figure 7.51 Using the thumbs to lock the peroneal (fibulari) muscles.

Step 2: Whilst maintaining your lock, ask the client to invert the foot. You may want to show the client how to do this motion first and, rather than use the term 'inversion,' ask him or her to 'turn the sole of the foot inwards' (figure 7.52).



Figure 7.52 Active inversion of the ankle produces a stretch in the peroneals (fibulari) whilst the therapist maintains a gentle lock.

Step 3: Work in a single line down the muscle, from proximal to distal, as long as the client feels the stretch and remains comfortable.

TIP Clients with flatfoot have particularly tight peroneals and may benefit from stretching these muscles.

PERONEALS (FIBULARI)

Advantage

- Active-assisted STR works best, because it is relatively more difficult to apply passive or active STR to this muscle group.

Disadvantages

- This technique may compromise your thumbs if overused.
- When using your elbow to lock the tissues, excess pressure can damage tissue.

Trigger Points in the Gluteals

Trigger points are found throughout all three gluteal muscles. Some are illustrated in figure 7.53. They are found in gluteus maximus, close to the lateral border of the sacrum; in gluteus medius, running inferior to the iliac crest and in the gluteus minimus muscle. The gluteus maximus trigger refers pain along the sacroiliac joint and into the base of the

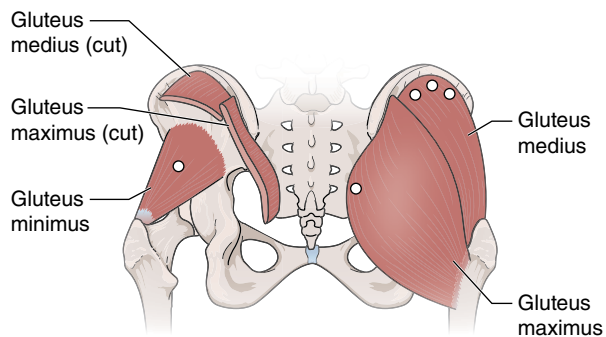


Figure 7.53 Trigger points in the gluteals.

buttock on that side. It is easy to identify when your client is in a side-lying position. The gluteus maximus is associated with trigger points in the hamstrings and lumbar erector spinae, which are perpetuated by prolonged sitting and activities that require hip and spine extension such as repeated lifting of a heavy object.

The trigger points shown in gluteus medius refer pain to the sacrum, sacroiliac joint and ipsilateral (same-side) buttock. Palpate for these triggers with your client in either the side-lying or the prone position, sliding your fingers inferiorly off the iliac crest. Perhaps more than the other two gluteal muscles, trigger points in gluteus medius are perpetuated by gait abnormalities as might be caused by leg-length discrepancy or Morton's foot (second toe longer than the big toe). They are also aggravated by prolonged sitting and prolonged hip flexion.

Trigger points are found throughout the upper portion of gluteus minimus and refer pain to the buttock and lateral thigh and leg on that side. To palpate these trigger points, position your client supine, locate the tensor fasciae latae, and work your fingers posteriorly into the gluteus minimus. It is a deep muscle, and you are unlikely to be able to identify specific triggers easily but may be able to reproduce mild tenderness on applying pressure here. Trigger points in the gluteals are aggravated by prolonged immobility, either sitting or standing, and they are associated with trigger points in the quadratus lumborum muscle.

With all treatment, it is important to measure your effectiveness. Chapter 2 provided examples of various tests, such as the straight-leg raise test, which is one method of testing range of movement at the hip, notably length of the hip extensor muscles. Huguenin et al. (2005) examined the effect of dry needling trigger points in the gluteal muscles on the straight-leg raise test as well as internal rotation of the hip. They randomly assigned 59 male runners to a group that received dry needling to trigger points in the gluteal muscles or a group that received placebo needling to triggers. Triggers were reported in the majority of participants to be in the 'upper outer buttock quadrant' (p.87) and were pierced by the dry needle in one group, but in the placebo group the needle only touched the skin without piercing it. The straight-leg raise test and internal rotation of the hip were measured at baseline, immediately after intervention as well as 24 and 72 hours after intervention by

taking digital photographs of the test positions. VAS scores were also recorded. There was no significant change in VAS scores or gluteal pain after running, but both groups showed significant improvement in reported hamstring tightness, hamstring pain and gluteal tightness after running. The authors commented that the results could indicate one of these three things: (1) The postulated restriction in range of movement measured by the straight-leg raise and internal rotation tests may not be associated with symptoms, (2) dry needling had no effect on muscle length in these muscles, or (3) the outcome measures used are not appropriate to measure change resulting from dry needling of trigger points.

Passive STR for Gluteals: Prone

Step 1: With your client in the prone position, grasp the ankle of the leg closest to you and flex the knee. Gently lock the tissues using your elbow, first or thumb. In figure 7.54, the therapist has chosen to use the elbow to lock fibres of gluteus medius.



Figure 7.54 Gently locking the gluteals with an elbow.

Step 2: Maintaining your lock, rotate the femur by passively moving the ankle towards you or away from you, experimenting to determine where your client feels the stretch most (figure 7.55).



Figure 7.55 Passively rotating the femur whilst locking the tissues of the buttock brings about a stretch.

Advantages

- This method is an easy way to incorporate passive STR into a massage routine.
- It is also an excellent way to address trigger points in gluteals.

Disadvantages

- Pressing into the tissues too firmly using an elbow can cause damage to tissues.
- When using STR in this manner, it is difficult to access trigger points in gluteus minimus, as it lies towards the front of the hip.

Active-Assisted STR for Gluteals: Side Lying

Step 1: With your client in the side-lying position, the hip in neutral, use your forearm (close to the elbow) to lock the gluteals, directing your pressure towards the sacrum (figure 7.56).



Figure 7.56 Locking the gluteals close to the sacrum with the hip in a neutral position.

Step 2: Whilst maintaining your lock, ask your client to flex the hip, perhaps by asking him or her to take the knee to the chest (figure 7.57).



Figure 7.57 Active hip flexion brings about the stretch in the gluteals as the therapist maintains a passive lock on the tissues.

Step 3: Repeat this action for a few minutes, varying the position of your lock and working on the area that feels most beneficial for the client.

TIP It is quite challenging to apply active-assisted STR to the gluteals, and it takes practice to focus your lock in the correct spot on the muscles. With practice, however, you will discover a small area that, when locked, provides for the greatest degree of stretch.

Advantages

- Active-assisted STR to the gluteals in the side-lying position is helpful when working with a client who is unable to rest in the prone position.
- With experimentation it is possible to locate the fibres of the gluteus minimus, which are more difficult to access when using STR in the prone position. However, you may find that you need to lower your treatment couch to make working in this position more comfortable for you.
- With practice you will be able to identify triggers in the gluteus maximus and use STR in this position to deactivate them.

Disadvantage

- When you first begin, it is challenging to keep your client balanced in the side-lying position whilst you focus your lock in the correct spot on the muscles.

Active STR for Gluteals: Standing

Step 1: Stand with your back to a wall, and place a ball between your buttock on one side and the wall (figure 7.58).



Figure 7.58 Positioning a ball at the start of active STR for the gluteals.

Step 2: Slowly flex your hip, bringing your knee to your chest (figure 7.59).



Figure 7.59 Active hip flexion brings about a stretch in the gluteal muscles.

TIP To stretch the gluteus medius and minimus, change your position so that your back is turned away from the wall or you are standing almost with the side of your body to the wall as you not only flex but adduct your hip. Notice how medial rotation of the hip can bring about a stretch in some parts of the gluteals once you have locked them using a ball.

Advantage

- Active STR to the gluteals is a good way to address trigger points in these muscles.

Disadvantage

- This technique requires you to stand on one leg as the hip is flexed, and this position can be a problem for people with poor balance.

Trigger Points in the Vastus Lateralis

The iliotibial band (ITB) is a thickening of the fascia covering the lateral side of the thigh and overlying the vastus lateralis (figure 7.60). Tender spots here are likely to be triggers in this muscle, and they refer pain throughout the side of the thigh from the hip to the knee. Palpate for these triggers with your client in the supine position, turned slightly away from you so that the lateral part of the thigh closest to you is raised off the couch a little. These trigger points are difficult to identify due to the thick fascial covering.

Pavkovich (2015) noted improvements in the Lower Extremity Functional Scale and Quadruple Visual Analogue Scale for four trigger points in the vastus lateralis, as well as those in the gluteus maximus, gluteus medius, piriformis and the greater trochanter area in a recreational walker with chronic lateral hip and thigh pain. Trigger points were treated with dry needling twice a week for 8 weeks. The patient reported a significant improvement in quality of life in terms of being able to sleep on the affected side, walk farther without pain and stand for extended periods. The author notes that strength in the lower limb improved and postulated that the improvement was a result of the participant having less pain and an improved gait posture.

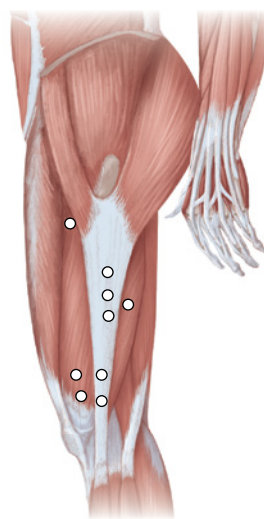


Figure 7.60 Trigger points in the vastus lateralis.

Active-Assisted STR for Vastus Lateralis: Side Lying

Step 1: With your client in the side-lying position, check that he or she can flex the knee comfortably; if not, place a small towel or sponge between the client's knee and the edge of the couch. With the knee extended, direct your pressure towards the hip as you gently lock the tissues with soft fists (figure 7.61).



Figure 7.61 Gently locking the ITB with soft fists at the start of active-assisted STR.

ILIOTIBIAL BAND (ITB)/VASTUS LATERALIS

Step 2: Maintain your lock as your client slowly flexes the knee (figure 7.62).



Figure 7.62 Active knee flexion brings about a stretch in the tissues of the ITB.

Step 3: Select a different lock position that is more proximal than your first, and repeat the procedure.

TIP As for active-assisted gliding STR to the calf and tibialis anterior, you can modify this technique to the gliding form of STR too. Simply begin by applying a little massage medium, and place your lock just above the knee, gliding from the knee to the hip as your client actively flexes and extends the knee.

Advantage

- Active STR to the lateral thigh is a good way to address trigger points in the vastus medialis but only when fingers or thumbs are used to apply the lock.
- The technique can easily be modified into a gliding STR.

Disadvantage

- The side-lying position is not comfortable for all clients. Therefore, you must take care to protect the side of the knee resting against the couch.

Trigger Points in the Iliacus

A trigger point in the iliacus is located high in the muscle, just inferior to the iliac crest on the anterior of the ilium. It refers pain down the upper part of the anterior thigh. Palpate for it with your client in the side-lying position, hooking your fingers gently over the crest and pressing them towards you (figure 7.64). Prolonged hip flexion aggravates this trigger which is associated with triggers in the psoas and quadratus lumborum muscles. Ferguson (2014) provides examples of three case studies of clients with idiopathic scoliosis, describing how trigger points in muscles, including iliacus, affect and are affected by spine shape.

Oh et al. (2016) describe how an inflatable ball was used to deactivate triggers in a range of muscles, including the iliacus, in a group of elderly patients with chronic low-back pain. All participants had trigger points in the gluteus maximus, gluteus medius, iliopsoas and quadratus lumborum on at least one side that had persisted for more than 2 months. The iliopsoas was treated actively with the patient in the prone position; the hip on the affected side was abducted to around 45 degrees, and the knee was flexed to 90 degrees. Significant changes were found in VAS scores, pressure pain sensitivity and lumbar flexion.

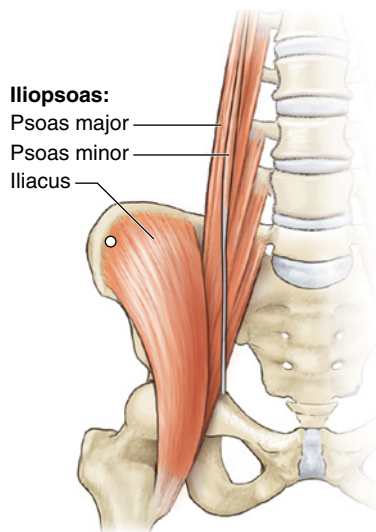


Figure 7.63 Trigger points in iliacus.

Active-Assisted STR for Iliacus: Side Lying

This is an excellent stretch for clients with tight hip flexors. Show your client where you intend to place your hands, and be sure to get client approval before performing this stretch.

Step 1: With your client in the side-lying position and the hip flexed, lock into the iliacus on the anterior surface of the ilium (figure 7.64).



Figure 7.64 Locking the iliacus with a client in the side-lying position.

Step 2: Whilst maintaining your lock, ask your client to straighten the leg, which extends the hip (figure 7.65).



Figure 7.65 Active hip extension stretches the iliacus as the lock is maintained by the therapist.

The area to be worked is small, so the lock may be repeated in the same place or a centimetre to one side. Usually, performing the stretch three times this way will provide some relief from tension in the hip area.

If the client requires a greater degree of stretch, rather than pressing more firmly with your fingers, have your client extend his or her hip at the end of the movement. One way to explain this action is to ask the client to ‘press into my fingers’ when you get to the end of the movement.

TIP This area can be ticklish. An alternative is to ask the client to place his or her own hand on the area and then you press over it. Alternatively, dissipate your pressure by working through a facecloth folded into fourths.

Advantages

- Active-assisted STR works best because it is extremely difficult to apply STR actively or passively to this area.
- The abdominal contents fall away in side lying position, so having the client in this position is relatively safer than working with a client in supine.

Disadvantages

- This technique requires a fairly strong grip.
- The area may be ticklish.
- Some clients may find the technique invasive.

CLIENT TALK

An office cleaner came for treatment for lower-back pain. Tests revealed very tight hip flexors. The client frequently worked on her knees, in almost full hip flexion, causing shortening of her hip flexors and strain on her lumbar spine. After explaining the STR procedure using a miniature skeleton, STR was applied through her clothing twice a week over a period of 4 weeks to treat the iliacus. I also advised the client how to do active hip stretches.

Quick Questions

1. When performing STR to the hamstrings, which structure should you avoid locking into?
2. When performing passive STR to the calf, why do you use your thigh to dorsiflex the client's ankle?
3. Should you stand on a ball when performing active STR to the sole of your foot?
4. What sort of client might especially feel the stretch of STR to his or her peroneal muscles?
5. In which position do you treat iliacus—prone, supine or side lying?

Soft Tissue Release for the Upper Limbs

This chapter explains how to apply soft tissue release to the upper limbs. You will find comparisons between applying passive, active-assisted and active STR to each of the major muscle groups of the upper body. Notice, however, that not all three versions of STR can be applied to all muscle groups (see table 8.1).

Table 8.1 Types of STR Used on Muscles of the Upper Limbs

Muscle	Passive	Active-assisted	Active
Triceps	✓	✓	✓
Biceps brachii	✓	✓	✓
Shoulder adductors	✓	–	–
Infraspinatus	–	✓	–
Wrist and finger extensors	✓	✓	✓
Wrist and finger flexors	✓	✓	✓

- *Passive STR*: STR may be used passively on all muscles of the upper limbs with the exception of the infraspinatus, as passively rotating the entire upper limb medially whilst maintaining a lock is almost impossible.
- *Active-assisted STR*: Active-assisted STR works well on all of the muscles of the upper limb with the exception of the shoulder adductors, where it is difficult for the therapist to stand in a position to maintain a lock without getting in the way of the client's arm.
- *Active STR*: All the muscles of the upper limbs may be stretched using active STR, although this chapter has not shown active STR for the shoulder abductors or the infraspinatus.

The following sections provide detailed instructions for applying passive, active-assisted or active STR to many of the muscles of the upper limbs, including tips that may help you apply the techniques.

Trigger Points in the Triceps

Trigger points can be found throughout the triceps (see figure 8.1), including in the lateral and long heads of the muscle. The lateral trigger point refers pain to the posterior arm, sometimes radiating into the back of the forearm and fourth and fifth digits. The long head refers pain primarily to the shoulder and elbow, radiating along the posterior arm and forearm. Trigger points in this muscle are perpetuated through repeated or prolonged elbow extension. One way to palpate for these trigger points is with the client in the prone position, his or her shoulder abducted and elbow flexed, and the forearm resting over the edge of the couch. Explore the muscle with your fingertips, working consistently from the distal to the proximal ends.

Nielsen (1981) provided a good description of how trigger points were treated in the upper limb of a 59-year-old dentist with shoulder pain, beginning with the triceps. The subject was a keen racquetball player and had pain radiating down his arm into his hand. Nielsen examined each of the muscles of the shoulder, including teres major and latissimus dorsi. All muscles in which trigger points had been identified were treated by the spray-and-stretch technique in which cold spray is first applied to the muscle, which is subsequently stretched.

TIP If your client experiences a tingling sensation when you palpate for trigger points in triceps, this is the result of gentle pressure to the radial nerve. Tingling will resolve as soon as you reduce your pressure or palpate a different part of the muscle.

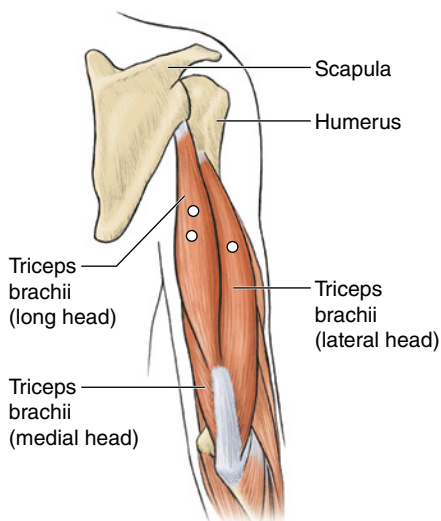


Figure 8.1 Trigger points in the lateral and long heads of the triceps.

Passive STR for Triceps: Prone, Grip Lock

Step 1: Position your client in prone, and make sure he or she is able to flex at the elbow. Passively extend your client's elbow to shorten the muscle. Place your lock close to the origin, directing your pressure towards the shoulder (figure 8.2).



Figure 8.2 Using a broad grip to lock the triceps muscle.

Step 2: Whilst maintaining your lock, gently flex the elbow (figure 8.3).



Figure 8.3 Passively stretching the triceps.

Step 3: Release your lock, extend the elbow and set a new fixing point more distal to the first. Repeat the action, working your way from the shoulder towards the distal end of the humerus. Your client should experience a greater stretch as you work towards the elbow.

Advantages

- This stretch is easy to apply, because the triceps do not need a very firm lock to stretch the tissues.
- By using a more specific lock, you can localize the stretch to particular tissues and especially to trigger points.
- Because you can use this technique with your client in the prone position, it is a relatively easy stretch to incorporate into a holistic massage.

Disadvantage

- It may be necessary to move your client to ensure his or her arm is fully supported on the treatment couch.

Active-Assisted STR for Triceps: Prone, Thumb Lock

Step 1: With your client positioned prone, create a lock on the triceps (figure 8.4).



Figure 8.4 Locking the triceps.

Step 2: Ask your client to bend the elbow (figure 8.5).



Figure 8.5 Active flexion of the elbow brings about the stretch in the triceps.

Advantage

- Active-assisted STR permits the therapist to lock specific points on the muscle, including trigger points, using a reinforced thumb if necessary.

Disadvantage

- Repeated elbow extension to bring the arm back to the start position can fatigue the muscle, and in this treatment position the elbow is extending against gravity.

TIP If using STR to deactivate trigger points in the triceps, remember to instruct the client to perform triceps stretches after the treatment. The elbow cannot flex fully when the arm is resting against the couch, which is the case with this treatment position.

Active STR for Triceps: Seated or Standing

Step 1: Extend your arm, and grip your triceps muscle (figure 8.6).



Figure 8.6 Gripping the triceps muscle.

Step 2: Whilst maintaining your grip, gently flex your elbow (figure 8.7).



Figure 8.7 Active flexion of the elbow brings about the stretch in the triceps as a grip lock is maintained.

Some people do not feel the stretch in the triceps. However, most people will certainly feel it after activities involving prolonged or repeated elbow extension, such as when playing tennis or resting on the left hand whilst polishing with the right hand. Massage therapists who perform repetitive elbow extension when applying effleurage should practise active STR to the triceps between treating clients.

Advantages

- This stretch is easy to apply.
- Although applying a small lock actively can be tricky, a tennis ball placed between the triceps and a table can be utilised to target specific tissues or trigger points.

Disadvantage

- When you direct your pressure towards the shoulder, you take up slack in the tissues and get a better stretch. However, when working the triceps, it is difficult to direct your pressure towards the shoulder; as a result, applying the stretch actively is not as effective as when it is applied passively.

Trigger Points in the Biceps Brachii

Trigger points occur in both the long and short heads of the biceps brachii (see figure 8.8). They refer pain primarily to the front of the arm, proximally to the shoulder and distally to the elbow. They are perpetuated by repeated or prolonged use of the biceps as when flexing the elbow, lowering a weight against resistance or supinating the forearm, such as carrying heavy shopping bags, repeated loading or unloading of heavy items and fixing in screws using a manual screwdriver. Sometimes palpation for these points is easier when the elbow is passively flexed slightly. Begin at the distal end of the muscle, and work towards the shoulder, using your fingertips to explore the muscle fibres.

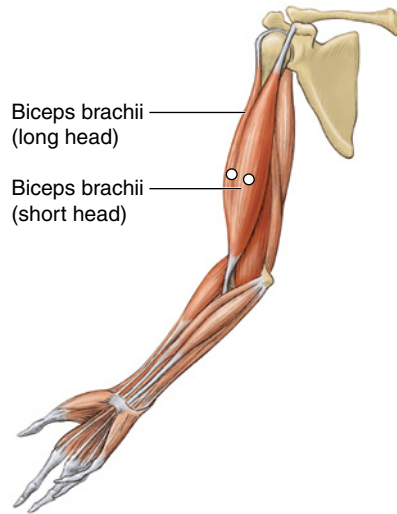


Figure 8.8 Trigger points in the biceps brachii.

Passive STR for Biceps Brachii: Supine

Step 1: With your client in supine and the elbow passively flexed, lock in gently to the biceps brachii, taking up slack in the skin as you direct your pressure towards the armpit (figure 8.9).



Figure 8.9 Locking the biceps brachii using the thumb.

BICEPS BRACHII

Step 2: Gently extend the elbow whilst maintaining your lock (figure 8.10).



Figure 8.10 Passively extending the elbow whilst maintaining a lock brings about a stretch in the biceps brachii.

Step 3: Work from the proximal end of the muscle near the shoulder joint towards the elbow. Avoid pressure into the cubital fossa at the anterior of the elbow.

TIP When stretching out the biceps after using STR to deactivate trigger points, remember to pronate the forearm in addition to extending the elbow, because the biceps brachii is a forearm supinator.

Advantages

- This form of STR is easy to apply, because the biceps brachii does not usually require a firm lock.
- Because you can use this technique with your client in supine, it is a relatively easy stretch to incorporate into a holistic massage.

Disadvantage

- It may be difficult to fix large, bulky biceps due to their cylindrical shape.

Passive STR for Biceps Brachii: Supine, Gliding

Step 1: To modify passive STR to make it a gliding STR, begin by applying a small amount of massage medium to the biceps.

Step 2: Passively flex the elbow a little, and place a soft fist at the distal end of the arm. As you glide your fist from the elbow to the shoulder, simultaneously extend the elbow (figure 8.11).



Figure 8.11 Passive gliding STR to the biceps brachii.

Advantage

- This massage is soothing to receive and can be helpful in stretching out tissues after locks have been placed to specific areas of the muscle.

Disadvantage

- Gliding STR cannot be used to deactivate specific trigger points.

Active-Assisted STR for Biceps Brachii: Supine

Step 1: With your client supine, ask him or her to flex the elbow. Then lock the tissues at the proximal end of the muscle (figure 8.12).



Figure 8.12 Locking the proximal end of the biceps brachii.

BICEPS BRACHII

Step 2: Maintain your lock as your client actively extends the elbow (figure 8.13).



Figure 8.13 Active elbow extension brings about a stretch in the biceps brachii as the therapist maintains a lock on the muscle.

Step 3: Repeat the technique, each time using a new lock slightly more distal to the first.

Advantage

- Active-assisted STR facilitates locking of specific areas of the muscle, including trigger points, with greater pressure, should that be required.

Disadvantage

- Not all clients wish to be engaged with their treatment in this way when STR is incorporated into a massage, in which case passive STR to the biceps is more appropriate.

Active STR for Biceps Brachii: Seated or Standing

Step 1: With your arm in flexion, gently grip your biceps muscle (figure 8.14).



Figure 8.14 Actively gripping the biceps brachii.

Step 2: Gently extend your elbow whilst maintaining your grip (figure 8.15).



Figure 8.15 Active elbow extension whilst maintaining gripping the muscle brings about the stretch in the biceps brachii.

Applying STR to the biceps brachii feels good after any activity involving prolonged or repetitive elbow flexion, such as rowing, digging or carrying.

Advantage

- This stretch is easy to apply.

Disadvantages

- It is difficult to apply a small lock actively. Therefore, it is challenging to localize the stretch to specific tissues, including trigger points, unless a small ball is held over the point.
- It is difficult to direct your pressure towards the shoulder and take up slack in the tissues to get a better stretch.

Trigger Points in the Shoulder Adductors

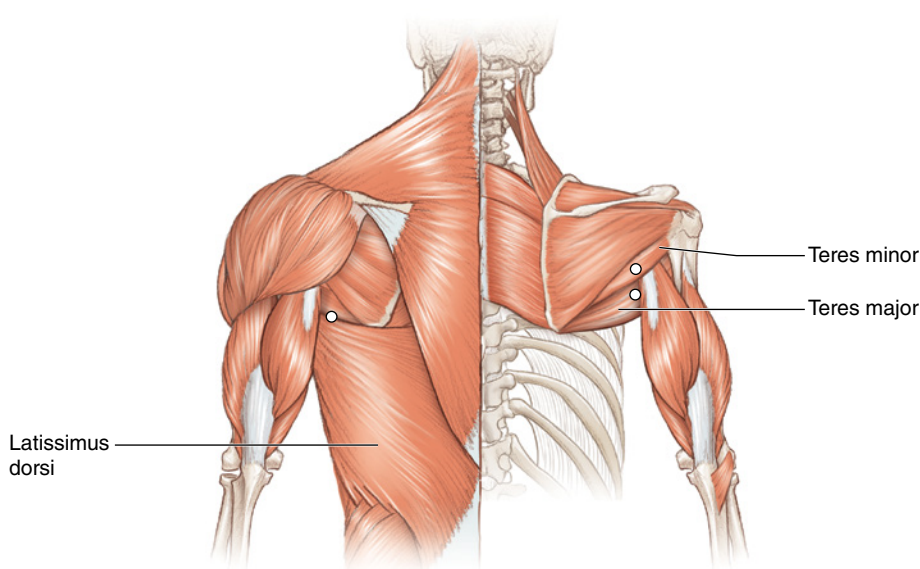


Figure 8.16 Trigger points in teres major, latissimus dorsi, and teres minor.

The shoulder adductors include teres major, teres minor and latissimus dorsi posteriorly (see figure 8.16), all of which can develop trigger points, although some points are found more frequently than others. Trigger points in teres major and teres minor refer pain to the posterior deltoid whilst a trigger in the axillary portion of latissimus dorsi refers pain to the inferior angle of the scapula and down the entire upper limb posteriorly and anteriorly. Repeated adduction of the arm perpetuates trigger points in these muscles, which can be palpated with your client resting in either the prone or supine position, the arm passively abducted to around 90 degrees. If you are palpating the posterior axilla with your client supine, gently pinch the muscles between your finger and thumb; if you are working with your client prone, use your thumb to work along the lateral aspect of the scapula, identifying trigger points as you go.

Passive STR for Shoulder Adductors: Prone

Step 1: With your client resting in the prone position, his or her arm abducted to around 90 degrees, lock the tissues. The armpit can be sensitive to localized pressure, so the therapist pictured in figure 8.17 has chosen to lock the tissues using the palm and to apply gentle traction, which helps take up slack in the skin.



Figure 8.17 Locking the posterior shoulder adductors using the palm whilst applying gentle traction.

Step 2: Maintaining your lock, passively abduct the arm (figure 8.18). Notice how it feels for the client when you add gentle traction at the shoulder joint, but avoid tractioning the joint in clients who are hypermobile or who have a history of shoulder subluxation or dislocation.



Figure 8.18 Passive abduction of the arm whilst maintaining a lock; traction brings about a stretch in the posterior shoulder adductors.

Advantages

- This stretch is easy to perform and relatively comfortable for most people to receive.
- You can use thumbs to lock specific trigger points and thus help deactivate them.

Disadvantage

- This area of the body is particularly sensitive, and specific locks using the thumb can be uncomfortable for some clients.

SHOULDER ADDUCTORS

Passive STR for Shoulder Adductors: Side Lying

Step 1: With your client in a side-lying position, grasp the arm with one hand, passively abduct it to around 110 degrees and, using your forearm or elbow, gently lock the shoulder adductors.

Step 2: Maintaining your lock with your forearm or elbow, passively abduct the client's arm (figures 8.19 and 8.20).



Figure 8.19 Passively stretching the adductors whilst maintaining a gentle lock using a forearm.



Figure 8.20 Passively stretching the adductors whilst maintaining a gentle lock using an elbow.

Trigger Points in the Infraspinatus

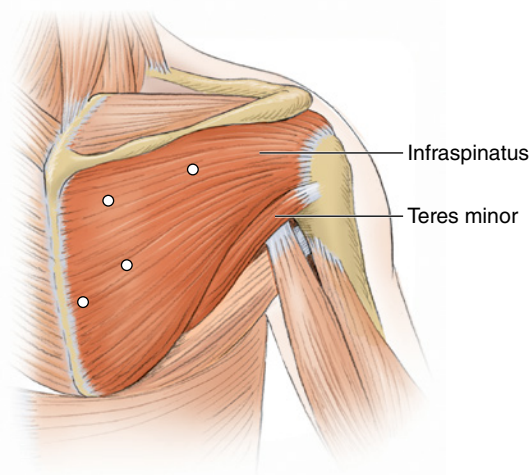


Figure 8.21 Trigger points in the infraspinatus.

Trigger points are found throughout this muscle (see figure 8.21). They refer pain to the front of the shoulder and medial border of the scapula, which can radiate down the anterolateral aspect of the arm. Palpate for these trigger points with your client in the prone position, his or her arms resting by the sides of the body. Trigger points here develop from sudden overload rather than overuse.

Hidalgo-Lozano et al. (2010) explored the relationship between trigger points and pressure pain hyperalgesia in 12 patients with unilateral shoulder impingement, 42 percent of whom had trigger points in the infraspinatus. Participants were asked to rate their pain on a numerical pain rating scale and to draw the location of their pain on a body map diagram. The pressure pain threshold over different trigger points was measured and compared to that of a control group of patients who did not have shoulder impingement. Significant differences were found between the two groups. For example, the patients had a variety of active and latent trigger points, whereas the control group only had latent trigger points and the patient group had a significantly lower pressure pain threshold. In the patient group, the intensity of pain correlated to the number of trigger points; the greater the number of trigger points, the greater the level of reported pain.

Active-Assisted STR for Infraspinatus: Prone

Step 1: Begin with your client resting prone, his or her arms by the sides of the body and externally rotated. The easiest way to achieve this position is to ask your client to turn the palms over so that they are resting on the treatment couch, as most clients rest with the dorsum of their hand on the couch when in the prone position. Apply your lock to the infraspinatus using your thumb (figure 8.22).

INFRASPINATUS



Figure 8.22 Locking the infraspinatus as the client rests with the arm externally rotated.

Step 2: Whilst maintaining your lock, ask your client to return to the position in which the back of the hand is against the couch (figure 8.23).



Figure 8.23 As the client internally rotates the arm whilst the therapist maintains a lock, the infraspinatus is stretched.

Advantage

- This method is effective for deactivating trigger points in the infraspinatus.

Disadvantage

- It can be difficult to maintain your lock on the infraspinatus as the client internally rotates the arm.

Trigger Points in the Wrist and Finger Extensors

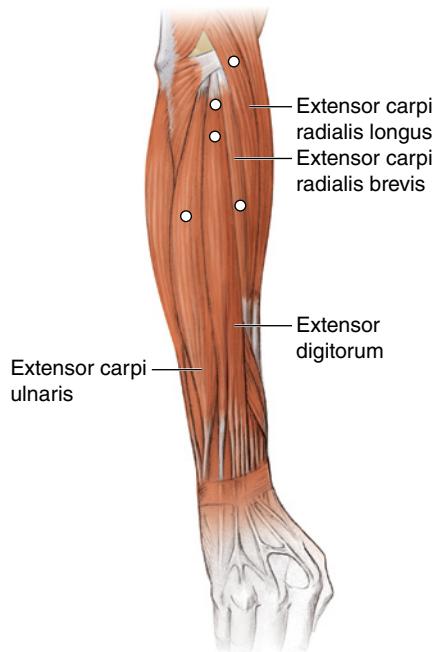


Figure 8.24 Trigger points in the wrist and finger extensors.

Figure 8.24 illustrates trigger points found in the extensor carpi ulnaris, extensor carpi radialis longus, extensor carpi radialis brevis and extensor digitorum. The extensor carpi ulnaris refers pain to the ulnar side of the wrist, the extensor carpi radialis longus refers pain to the lateral epicondyle and sometimes to the radial side of the dorsum of the hand, and the extensor carpi radialis brevis refers pain to the dorsum of the wrist and hand. The extensor digitorum refers pain to the dorsum of the middle and ring fingers as well as to the lateral epicondyle. Locate trigger points by gently rubbing your finger across the muscle fibres. You are likely to feel multiple taught bands of tissue. These trigger points are aggravated by prolonged gripping, as when carrying shopping bags. Triggers in the extensor carpi ulnaris are aggravated by holding the wrist in ulnar deviation, as might occur when using a computer mouse. Simons, Travell and Simons (1999) note that trigger points in the scalenes can result in satellite trigger points developing in the extensor carpi radialis and extensor carpi ulnaris. Trigger points in the extensor digitorum are perpetuated by repetitive movements, such as typing or playing the piano.

González-Iglesias et al. (2011) researched the effect of multi-modal treatment on nine rock climbers diagnosed with lateral epicondylitis. All completed a Patient-Rated Tennis Elbow Evaluation and their pain pressure thresholds were tested at baseline, after the third visit and 2 months later. Pressure to the extensor carpi radialis brevis replicated symptoms, so treatments included dry needling of trigger points to that muscle as well as manipulation of the cervical spine and wrist, mobilization of the elbow and taping. There was an improvement in all outcomes at both the final visit and the 2-month follow-up.

Passive STR for Wrist and Finger Extensors: Supine

Step 1: Gently extend your client's wrist. Lock into the bellies of the wrist and finger extensors on the lateral aspect of the forearm, directing your pressure toward the elbow (figure 8.25).



Figure 8.25 Locking the wrist extensors using a thumb.

Step 2: Whilst maintaining your lock, gently flex the wrist (figure 8.26). You can achieve a greater stretch by passively extending the elbow and flexing the fingers. It is difficult to do whilst maintaining a lock but can be achieved if you abduct your client's arm slightly when you extend the elbow so that the hand is off the treatment couch, thus facilitating flexion of the wrist and fingers. You will have to change the way you are holding the hand so that you can passively bring your clients fingers into a fist.



Figure 8.26 Passive flexion of the wrist whilst maintaining a lock brings about a stretch in the wrist extensors.

Step 3: Repeat the technique, each time selecting a lock more distal than the one previously used, as you work down the forearm from elbow to wrist.

TIP The muscles of the forearm are tightly bound in fascia, so to determine in which muscle you have located a trigger point, it is necessary to carry out active movement tests in order to identify a specific muscle. For example, the extensor carpi ulnaris extends the wrist and brings about ulnar deviation of the wrist, and asking your client to perform ulnar deviation once you have identified a trigger on the lateral side of the forearm is a relatively easy way to identify this muscle; the extensor carpi radialis extends the wrist and brings about radial deviation, so asking your client to perform radial deviation when palpating the medial side of the forearm is needed.

CLIENT TALK

Passive STR to the wrist and finger extensors was used in conjunction with a full upper-limb massage for a client recovering from lateral epicondylitis (tennis elbow) from playing tennis. The client was shown how to perform active STR in between treatment sessions, along with self-massage. She was advised not to apply active STR before playing tennis, because to do so might decrease her grip strength.

Advantages

- Because you can use this technique when your client is supine, this stretch is relatively easy to incorporate into a holistic massage.
- Little pressure is required to lock the tissues.
- It is easy to use this technique to help deactivate trigger points.

Disadvantages

- Getting the correct handhold so that you can flex and extend the wrist can be tricky when first learning the technique.
- It can be difficult to get leverage on the muscle bellies with your client in supine.

Passive STR for Wrist and Finger Extensors: Prone, Gliding

Step 1: Position your client prone with his or her shoulder abducted to around 90 degrees, the elbow flexed and the hand off the treatment couch. Check that you can passively flex the client's wrist. Apply a small amount of massage medium to the forearm.

Step 2: Passively extend the wrist. Beginning at the wrist, use your forearm or fist to slowly glide from the wrist to the elbow as you simultaneously flex the wrist (figure 8.27).

WRIST AND FINGER EXTENSORS

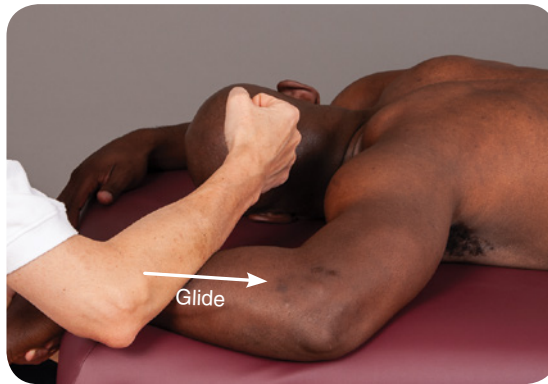


Figure 8.27 Gliding STR to the wrist and finger extensors.

Advantages

- It is a useful way of treating the wrist and finger extensors with a client in the prone position.
- Gliding STR is soothing following deactivation of trigger points.

Disadvantages

- Clients with shoulder problems may find abduction of the shoulder uncomfortable when performed in the prone position.
- Gliding STR cannot be used to deactivate trigger points.

Active-Assisted STR for Wrist and Finger Extensors: Supine

Step 1: Locate the bellies of the wrist and finger extensors by asking your client to extend his or her wrist. Lock the tissues using both thumbs, directing your pressure towards the elbow (figure 8.28).



Figure 8.28 Locking the tissues of the wrist and finger extensors as the client actively extends the wrist.

WRIST AND FINGER EXTENSORS

Step 2: Whilst maintaining your lock, ask your client to flex the wrist (figure 8.29). Extending the elbow and flexing the fingers brings about a greater stretch.



Figure 8.29 Active wrist flexion whilst the therapist maintains the lock brings about an even stretch in the wrist and finger extensors.

Step 3: Repeat the lock over the lateral aspect of the elbow where the muscle bellies are located.

TIP This stretch is beneficial for the treatment of conditions such as lateral epicondylitis and for clients who perform repeated wrist extension, such as tennis players. However, the technique requires active wrist extension, so repeating the technique too many times within one treatment session may fatigue those muscles.

Advantages

- You are able to apply slightly more pressure using reinforced thumbs.
- Applying active-assisted STR is useful when working with clients who do not feel the stretch when it is performed passively.
- It is easy to use this technique to help deactivate trigger points.

Disadvantage

- It can be difficult to get leverage on the muscle bellies with your client in the supine position.

Active-Assisted STR for Wrist and Finger Extensors: Seated

Step 1: Position your client seated with the arm to be treated resting on a treatment couch and the hand off the couch. Check that the wrist can be flexed. Apply your lock at the proximal part of the muscle, using either your fist, forearm or thumbs, directing your pressure toward the elbow (figure 8.30).



Figure 8.30 Applying a lock to the wrist and finger extensors with a client seated.

Step 2: Maintaining your lock, ask your client to flex the wrist (figure 8.31).



Figure 8.31 Active wrist flexion whilst the therapist maintains a lock brings about a stretch in the wrist and finger extensors.

TIP Look at the passive and active-assisted gliding techniques described in this chapter. Note that you could modify seated STR to make it gliding STR.

Advantages

- It is easy to get leverage on the wrist and finger extensors when treating them with your client seated.
- It is easy to use this technique to help deactivate trigger points.

Disadvantage

- STR used in this way is not incorporated into a massage routine.

Active-Assisted STR for Wrist and Finger Extensors: Gliding

Step 1: Position your client prone, with the shoulder abducted to around 90 degrees, the elbow flexed and the hand off the treatment couch. Check that your client can actively flex the wrist. Apply a small amount of massage medium to the forearm.

Step 2: Ask your client to extend his or her wrist. Beginning at the wrist, use your forearm or fist to slowly glide from the wrist to the elbow as your client flexes the wrist (figure 8.32).



Figure 8.32 Gliding along the wrist and finger extensors as the client actively flexes the wrist.

Advantages

- It is a useful way of incorporating STR into a prone massage routine.
- Because the therapist has good leverage, it is a useful treatment position for addressing tension in the finger extensors.

Disadvantages

- Repeated active wrist extension against gravity can fatigue this muscle group.
- Gliding STR is not used to deactivate trigger points.

WRIST AND FINGER EXTENSORS

Active STR for Wrist and Finger Extensors: Seated or Standing

Step 1: Locate the bellies of your wrist and finger extensors. These muscles are on the lateral posterior side of your forearm. Gently lock into the tissues with your wrist in extension, directing pressure toward your elbow if possible (figure 8.33).



Figure 8.33 Actively locking the wrist and finger extensors.

Step 2: Whilst maintaining your lock, gently flex your wrist (figure 8.34).



Figure 8.34 Maintaining a lock whilst flexing the wrist actively stretches the wrist and finger extensors.

Step 3: Work all over the extensors from proximal (near the elbow) to distal (near the wrist).

TIP Active STR is especially useful for people who spend a lot of time typing, anyone with tennis elbow and after activities involving gripping, such as carrying heavy bags, as it can easily be performed anywhere, at any time of day. It is great for massage therapists to use on their own forearms between treating clients.

Advantages

- It is a relatively easy stretch to apply.
- It can be used to deactivate trigger points.

Disadvantages

- It can be difficult to direct pressure both into the muscle and toward the elbow.
- It is easy to put excess pressure on the thumbs.

Active STR for Wrist and Finger Extensors: Gliding, Using a Roller

Step 1: Sit or stand with your forearm resting on a table, your palm turned upwards. Place a small roller beneath your forearm, beginning at the wrist, and apply gentle pressure using your other hand (figure 8.35).



Figure 8.35 The start position for active STR to the wrist and finger extensors using a roller.

Step 2: As you roll your forearm over the roller from wrist to elbow, slowly flex your wrist (figure 8.36).



Figure 8.36 Flexion of the wrist whilst rolling from wrist to elbow brings about the stretch in the wrist and finger extensors.

TIP To use the roller to help deactivate trigger points, simply rest the part of your forearm with the trigger point over the roller, then flex your wrist.

WRIST AND FINGER EXTENSORS

Advantages

- This stretch does not require any special or expensive equipment. Rollers are inexpensive, and you can use alternatives such as a can of food.
- You can use the roller to deactivate trigger points.
- It is an especially good method for addressing tension in the finger extensors.

Disadvantages

- It can take time to figure out which height works best for the treatment couch.
- It is often necessary to stand rather than to sit.

Trigger Points in the Wrist and Finger Flexors

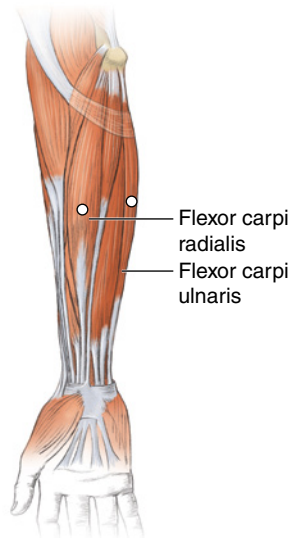


Figure 8.37 Trigger points in the wrist and finger flexors.

Figure 8.37 illustrates two of the trigger points found in the wrist and finger flexors, the flexor carpi radialis and flexor carpi ulnaris, which refer pain to the middle and ulnar side of the wrist, respectively. Trigger points can be found in the flexor digitorum (not shown in the figure), and they refer pain to the dorsum of the middle, ring and little fingers. As with the wrist and finger extensor muscles, trigger points in the flexor groups are perpetuated by forced or prolonged gripping.

TIP To identify the muscle in which you have a trigger point, active wrist and finger movements are required. To identify the flexor carpi ulnaris, ask your client to bring about ulnar deviation; to identify the flexor carpi radialis, the client needs to bring about radial deviation; to identify the finger flexors, he or she needs to flex the fingers or bring about wrist flexion as you palpate the middle of the forearm.

Passive STR for Wrist and Finger Flexors: Supine

Step 1: Passively flex your client's wrist, and gently lock into the common flexor origin (figure 8.38). Holding the hand in such a way as to keep the fingers straight will facilitate this stretch.



Figure 8.38 Locking into the wrist and finger flexors.

Step 2: Gently extend the client's wrist whilst maintaining your lock, preventing the fingers from flexing if possible (figure 8.39). Note that a great stretch is achieved if you also extend the elbow.



Figure 8.39 Passive extension of the wrist whilst locking the tissues brings about the stretch.

Step 3: Work down the forearm from proximal (elbow) to distal (wrist).

TIP You may find that it is better to work close to the origin of this muscle group, which quickly becomes tendinous in the forearm. Pressure into the anterior forearm is uncomfortable for some clients.

Advantages

- Because you can use this technique when your client is in the supine position, it is a relatively easy stretch to incorporate into a holistic massage.
- This technique can be used to deactivate trigger points.

Disadvantages

- Getting the correct handhold so that you can flex and extend the wrist can be tricky when first learning the technique.
- To fully stretch the wrist and finger flexors, it is best that the fingers as well as the wrist be extended (see figure 8.39), but it can be a difficult manoeuvre when you are using one hand.

Active-Assisted STR for Wrist and Finger Flexors: Supine

Step 1: Identify the muscles by asking the client to flex the wrist. Lock the tissues over the muscle bellies, directing your pressure towards the elbow (figure 8.40).



Figure 8.40 Locking the wrist and finger flexors.

Step 2: Whilst maintaining your lock, ask your client to extend the wrist (figure 8.41). Active extension of the elbow increases the stretch but can make it tricky to maintain your lock.



Figure 8.41 Active wrist extension brings about the stretch in the wrist and finger flexors.

Step 3: Repeat this lock-and-stretch, lock-and-stretch sequence over the muscle bellies.

Advantages

- You can apply slightly more pressure using reinforced thumbs.
- This technique is useful when working with clients who do not feel the stretch when it is performed passively.
- You can use the technique to deactivate trigger points.

Disadvantage

- It can be difficult to get leverage on the muscle bellies with your client in the supine position.

Active STR for Wrist and Finger Flexors: Seated or Standing

Step 1: Identify the bellies of your wrist and finger flexors. To do so, palpate your forearm on the anterior surface as you flex your wrist and fingers. You will discover the muscles on the middle and medial aspect of the forearm. With your wrist in flexion, gently lock into this area, gently pulling the tissues towards the elbow (figure 8.42).



Figure 8.42 Locking the wrist and finger flexors close to the elbow.

WRIST AND FINGER FLEXORS

Step 2: Whilst maintaining your lock, gently extend your wrist (figure 8.43).



Figure 8.43 Active wrist extension whilst maintaining a lock brings about a stretch in the wrist and finger flexors.

Step 3: Work your way from the elbow to the wrist.

TIP You may need to lessen your pressure as you work distally. The forearm becomes stringy with tendons and contains many neural and vascular structures that may be compressed on the anterior surface.

This stretch is great for people who type all day who are constantly flexing their fingers, and for drivers who, in gripping the steering wheel, are constantly working these muscles. It is also great for golfers and may alleviate the discomfort of golfer's elbow. Massage therapists who use their hands for applying petrissage should practise active STR to their wrist flexors between treating clients.

Advantages

- This stretch is relatively easy to apply.
- It is great for massage therapists to use on their own forearms between treating clients.

Disadvantage

- It is easy to place excess pressure on the thumb.

CLIENT TALK

I frequently apply STR to my own wrist flexors if I have had to carry heavy shopping bags or treatment couches. I also used it whilst writing this book when taking breaks from typing.

Quick Questions

1. When are you particularly likely to feel STR in the triceps?
2. In which position is the client when receiving passive STR to the triceps?
3. When performing active STR to the wrist extensors, do you start with your wrist in extension or flexion?
4. When performing active-assisted STR to the wrist flexors, do you lock in near the elbow or near the wrist?
5. Give examples of three clients who might benefit from STR to the wrist flexors.

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