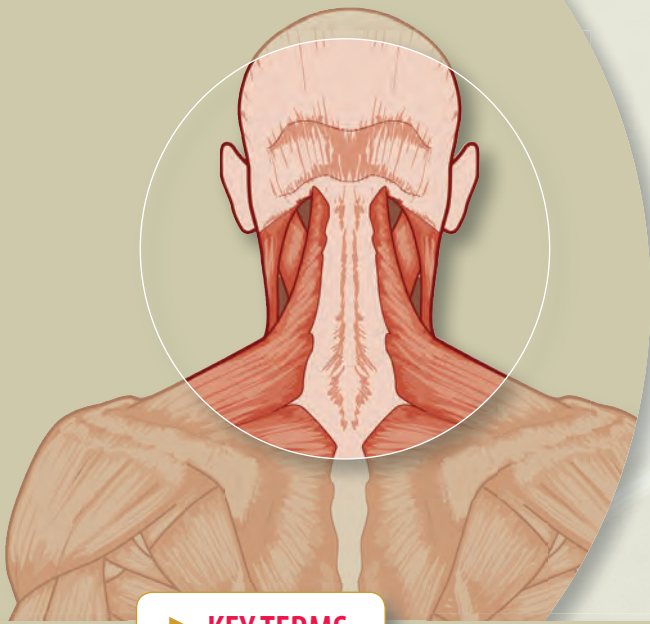




PART II

Muscles and Neuromuscular Therapy Routines by Body Region



HEAD AND NECK 5

► KEY TERMS

Note that common conditions encountered in this region are included among the key terms.

Bilateral: affecting or related to two sides of the body

Bruxism: clenching of the jaw and grinding of the teeth

Dysesthesia: abnormal sensations on the skin, such as numbing, tingling, prickling, burning, or cutting pain

Eagle syndrome: an elongated styloid process of the temporal bone that punctures the sternocleidomastoid muscle and may cause dizziness and pain

Entrapment of the brachial plexus: an endangerment site that lies between anterior and medial scalenes and can become entrapped if the scalene muscles are chronically shortened

Entrapped supraorbital nerve: pressure on the supraorbital nerve caused by a tight frontalis muscle

Forward head posture (protracted head syndrome): poor posture that includes the head being forward in relation to the coronal plane

Glaucoma: disease of the eye characterized by increase in intraocular pressure, which atrophies the optic nerve, causing blindness

Headaches: pain inside the head, including tension headaches, migraines, dome headaches, etc.

Hypoesthesia: dulled sensitivity to touch

Ipsilateral: affecting or related to the same side of the body

Lamina groove: the flattened part of the vertebral arch, which extends between the vertebral spinous processes and the transverse processes

Occlusal imbalance: an uneven bite causing the muscles of the jaw to be in disharmony

Stiff neck: tight cervical muscles that cause pain and/or stiffness

Temporomandibular joint dysfunction (TMJ syndrome): symptoms of pain and discomfort in the temporomandibular joint usually caused by a combination of poor posture along with tight muscles and malocclusion

Tinnitus: a subjective ringing or buzzing sound in the ear

Unilateral: affecting or related to one side of the body only

Whiplash injury: an injury to the cervical vertebrae and adjacent soft tissues produced by a sudden jerking of the head either backward, forward, or to the side with respect to the vertebral column

● OVERVIEW OF THE HEAD AND NECK REGION

In this chapter, we will concern ourselves with the muscles of the head and neck, both anterior and posterior, including

the temporomandibular joint (TMJ) area. Information presented will include trigger points and referrals along with anatomical and treatment considerations. This information will be helpful to you in meeting the goal of normalizing the body's tissue and regaining integrity for the client.

POSTERIOR CERVICAL MUSCLES

The first portion of this chapter presents the muscles of the posterior cervical region in detail. Routines for working these muscles are provided at the end of the chapter for clients in both prone and supine positions.

Rectus Capitis Posterior Major and Minor, Obliquus Capitis Superior and Inferior: The Rock and Tilt Muscles

Three of these short suboccipital muscles connect the first two cervical vertebrae to the occiput, whereas the fourth, the obliquus capitis inferior, connects the upper two cervical vertebrae with each other (Fig. 5-1).

ORIGIN

- Rectus capitis posterior major: spinous process of the axis (C2)
- Rectus capitis posterior minor: tubercle on the posterior arch of the atlas (C1)
- Obliquus capitis superior: transverse process of the atlas (C1)
- Obliquus capitis inferior: spinous process of the axis (C2)

INSERTION

- Rectus capitis posterior major: lateral portion of the inferior nuchal line of the occiput
- Rectus capitis posterior minor: medial half of the inferior nuchal line of the occiput
- Obliquus capitis superior: between the superior and inferior nuchal lines of the occiput
- Obliquus capitis inferior: transverse process of the atlas (C1)

ACTION

- Control movements of nodding, side bending, and rotation of the head (nodding; rocking; looking upward with a rotation: tilting)

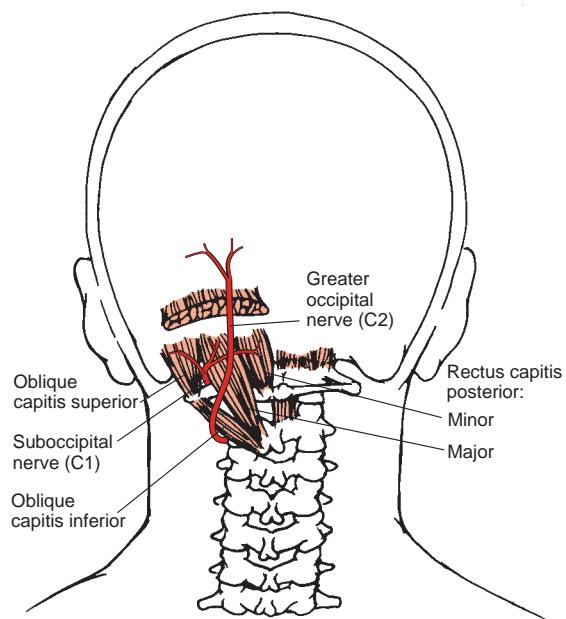
TRIGGER POINTS AND REFERRAL ZONES

These muscles are deeply placed at the upper posterior neck area, just below the skull **bilaterally**. The trigger points are found in the belly of the muscles. The referral sensations will be strongly felt behind, above, and in front of the ear, with quite a bit of spillover extending further in those directions (Fig. 5-2).

It is often difficult to distinguish the difference between referrals from trigger points in these muscles and those from semispinalis. It is rare that the suboccipital muscles develop trigger points without associated involvement of other major posterior cervical muscles.

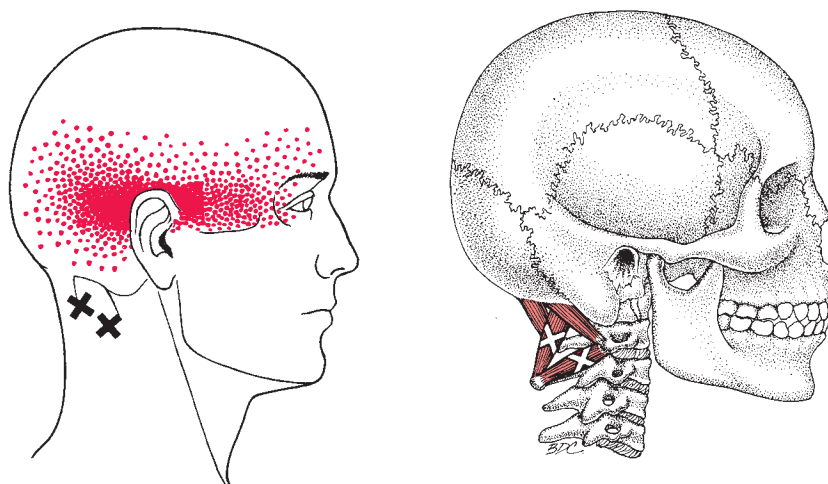
Posterior Suboccipital Muscles

The posterior suboccipital muscles are four pairs of very short and small muscles. They can create severe **headaches**, usually due to mechanical overload on a chronic basis.



- **FIGURE 5-1** Attachment sites for the suboccipitals. Rectus capitis posterior major: spinous process of the axis, lateral portion of the inferior nuchal line of the occiput. Rectus capitis posterior minor: tubercle on the posterior arch of the atlas, medial half of the inferior nuchal line of the occiput. Obliquus capitis superior: transverse process of the atlas, between the superior and inferior nuchal lines of the occiput. Obliquus capitis inferior: spinous process of the axis, transverse process of the atlas. (Reprinted with permission from Oatis CA. *Kinesiology*. Baltimore, MD: Lippincott Williams & Wilkins, 2004.)

Trigger points in these muscles are one of the most common sources of head pain. The pain seems to be inside the head but is difficult to isolate. A person with these trigger points will most likely describe a headache as hurting all inside the head. If questioned further, the client will likely describe pain extending forward **unilaterally** to the occiput, eye, and forehead. The sensation typically does not have clearly definable limits, however. It will not be the straight-through-the-head quality, such as that from the splenius cervicis muscle. These muscles are usually quite tender to the touch, especially considering the depth of tissue one must press through to palpate.



• **FIGURE 5-2** Trigger points and referral zones for the suboccipitals. Notice that Travell and Simons have only noted trigger points on the oblique muscles. The trigger points occur within the belly of each muscle with very strong referral across the lateral head beginning just in front of the ear and completing well behind the ear. There is spillover surrounding the strong referral all the way to the eye and above it in front and to the midline of the posterior head behind. (Reprinted with permission from Simons DG, Travell JG, Simons LS. *Upper Half of Body*. 2nd ed. Baltimore: Lippincott Williams & Wilkins, 1999. *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*; vol 1. p.473, Fig. 17.1.)

Clients experiencing trigger points in these muscles often complain of horrible headaches when their head rests on their pillow at night. The weight of the head presses the pillow against the occiput, placing pressure on these muscles. Such a client might be able to locate the sore spot by palpating the base of the skull. If obliquus capitis inferior is involved, the head may not be able to rotate completely to the rear, as when necessary in trying to back up when driving a car.

TRIGGER POINT ACTIVATION

As these muscles are mostly responsible for moving the head at the top of the spine, they will probably develop trigger points when trying to control flexion, when held in a shortened position maintaining extension looking upward for long periods of time, or when held in a shortened position looking to the side for prolonged periods of time.

Often a person with **forward head posture** will also have the head in hyperextension (chin poking up and out). This accommodates the line of vision for the person. This will likely activate trigger points in the posterior suboccipitals along with other posterior cervical muscles. These muscles are a very common source of posttraumatic headache trigger points.

STRESSORS AND PERPETUATING FACTORS

- Lying on the floor propped up on elbows watching television
- Looking to the side or reading copy from a flat surface while keyboarding when doing computer work
- Sustaining an upward gaze with head tilted up (painting a ceiling or using binoculars)
- Any sustained awkward head position
- Maladjusted eyeglasses or use of trifocals

- Uncorrected nearsightedness
- Lenses with too short a focal length
- A chill or draft to the back of the neck while maintaining the head to the side
- Whiplash injury

PRECAUTIONS

- Avoid working too deeply too quickly
- Initial warming should include the location of the bony landmarks in the area
- Palpation should be gentle: avoid poking or jabbing movements. This is a very sensitive area for most people

MASSAGE THERAPY CONSIDERATIONS

- Be sensitive to the client's pain threshold, yet apply appropriate pressure to allow the tissue to respond correctly
- Treatment of the suboccipital tissues between C1 and the occiput will ensure that the head will be able to move without restriction
- Treatment between C1 and C2 will ensure that the head will be able to rotate fully
- This is a common area for the therapist to overwork using friction and pressure
- An effective technique for warming with the suboccipitals is to use a wave-like motion utilizing fingertips at the base of the skull while resting the head on the palm of the hand (please see the online video for this technique)
- Be sure not to push the atlas forward but to make the direction of pressure upward under the occipital ridge

Levator Scapula: The Stiff Neck Muscle

Interestingly, the scapular attachment of levator scapulae inserts in two layers, with fibers attaching to both the anterior and posterior surfaces of the medial border of the scapulae for most people.¹ Often, there is a bursa between the two layers. There might be another bursa between the attachment of levator scapulae and serratus anterior at the superior angle of the scapulae. These bursas will most likely be very tender (Fig. 5-3).

ORIGIN

- Transverse processes of C1–C4 (C3 and C4 attachments are actually at the posterior tubercles of the transverse processes)

INSERTION

- The vertebral border of the scapulae between the superior angle and the root of the spine of the scapulae

ACTION

- Elevation of the scapula
- Downward rotation of the scapula
- Assists rotation of the neck to the same side when the scapula is fixed
- Assists extension of the neck while helping to control neck flexion

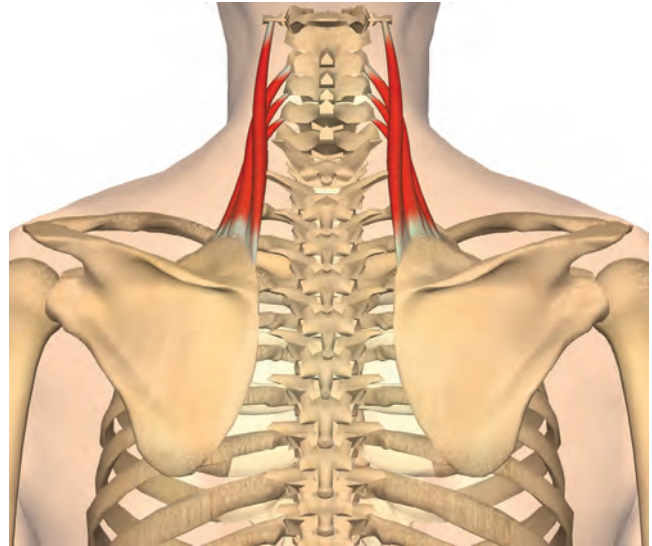
TRIGGER POINTS AND REFERRAL ZONES

Trigger points commonly occur in the belly of this muscle, one in the middle portion and another near the scapular attachment (Fig. 5-4).

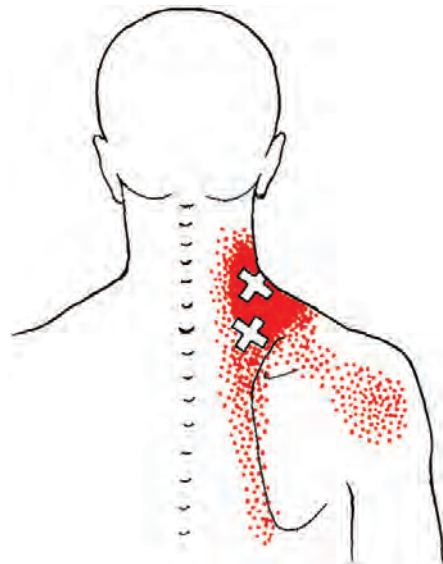
From both of the commonly found trigger points in this muscle, referral sensation projects to the angle of the neck/shoulder (crook of the neck area), with a spillover zone next to the vertebral border of the scapula and across the posterior shoulder.

Referrals from these trigger points are some of the most important causes of neck pain and, at times, shoulder pain. This muscle is often involved in a shoulder girdle issue. In a study done by Sola et al.,² latent trigger points were found in 20% of 200 normal young adults. More trigger points are found here than in any other muscle except for the upper trapezius. In a clinical study of active trigger points,³ the levator scapulae was found to be harboring the most.

When the trigger points are severe, a person will complain of pain at the angle of the neck and/or a painful, **stiff neck**. Symptoms of these trigger points may mimic torticollis. Other clients experiencing these trigger points may have diagnoses of stiff neck syndrome, levator scapulae syndrome, or scapulocostal syndrome, according to Travel and Simons.



• **FIGURE 5-3** Attachment sites for the levator scapula. Transverse processes of C1 to C4, vertebral border of the scapulae between the superior angle and the root of the spine of the scapulae. (Reprinted with permission from *Life Art*, Lippincott Williams & Wilkins.)



• **FIGURE 5-4** Trigger points and referral zones for the levator scapula. The trigger points usually occur within the muscle belly at the angle of the neck and just below with very strong referral around them. There is often spillover down the medial border of the scapulae and across the posterior shoulder. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

With extremely activated trigger points, a person may be unable to turn the head fully to the same side because of pain upon contraction and not fully to the opposite side because of painful increase in muscle tension. To look behind, he or she must turn the body rather than the neck. Pain from the trigger points actually limits neck rotation, and so it is named the “stiff neck” muscle. If active enough, the trigger points will refer extreme pain even when at rest.

TRIGGER POINT ACTIVATION

Postural stress is the main activator here. Trigger points are most likely to develop because of occupational stress or sleeping position. Psychological stress that creates tense, hostile, aggressive posture of the shoulders can also activate trigger points. Activities that keep the levator scapulae in a shortened position can activate latent trigger points. Specific examples of these postures and activities are discussed in the next section.

STRESSORS AND PERPETUATING FACTORS

- Overexertion in sports such as tennis or swimming, particularly when out of shape
- Rotating the head back and forth repeatedly, such as when observing a tennis match at center court
- Keyboarding with the head and neck turned to one side or with the keyboard too high
- Talking for long periods of time to a person sitting to one side
- Carrying a purse on the shoulder by a long strap
- Looking sideways for long periods of time
- Cradling the telephone between the shoulder and the ear
- Using crutches or a cane that are too long
- Tense or aggressive postures, such as occurs when holding one's shoulders up high when driving aggressively
- Sitting in a chair with armrests that are too high
- Sleeping with the head tilting backward or to one side, such as when in an airplane seat or on one's stomach
- Whiplash from any direction
- Asymmetries in the lower part of the body providing an uneven gait

PRECAUTIONS

- When working with a client in the prone position, take care not to mistake the lateral border of trapezius for the levator scapulae
- Be sure to observe the bony landmark of the transverse process of C1 and apply techniques to the lateral aspect of the neck, not at an oblique angle toward the occipital ridge

MASSAGE THERAPY CONSIDERATIONS

- A strain in levator scapulae will restrict range of motion to the opposite side and will be painful upon rotation to the same side
- The attachment on C1 transverse process requires special attention due to its hidden location deep to sternocleidomastoid; this will also treat the splenius cervicis attachment there
- The tendinous attachment at the superior angle of the scapula is often fibrotic and easy to locate. Stand at the head facing the scapula to work on this attachment
- Be sure to use muscle stripping and friction to work on the transverse process attachments
- This muscle should always be examined during any work for the cervical area
- Use of forearm compression into the belly of the muscle at the angle of the neck is a nice way to give a bit of a stretch when completing work here

ANTERIOR CERVICAL MUSCLES

The anterior cervical muscles should be worked with the client in a supine position. As most people have never had their anterior cervical muscles work on, be sure to explain what will be going on during this work and why it is necessary. Especially when a person has had any whiplash injury, the anterior cervical muscles will be involved. Most massage therapists avoid doing this type of work as it frightens them due simply to the area being worked and the fact that to work in this region a therapist must really know their anat-

omy and be able to visualize it. To eliminate risk as you work, be sure to be gentle. Also to be safe with this work, you must be precise with your positioning.

When a person has had a whiplash injury and the only muscles being dealt with are in the posterior neck, pain in that area will actually increase. Because the therapist is giving this person a muscle imbalance by loosening the posterior musculature while leaving the anterior musculature tight, this person may begin to lose the curve of their cervical spine and end up with what is called a “military neck.” This is why it is so important to be able to do this work well.

Sternocleidomastoid: Amazingly Complex

The sternocleidomastoid is a fascinating muscle that should be considered when doing any neck, shoulder, or head work with a client.

ORIGIN

- Manubrium of the sternum
- Medial clavicle (posterior to the sternal attachment)

INSERTION

- Mastoid process of the temporal bone

ACTION

- Rotation to opposite side and tilting upward (unilateral)
- Flexion of head and neck (bilateral)
- Auxiliary muscle for inhalation (bilateral)
- Control of posterior head and neck movements (bilateral)

TRIGGER POINTS AND REFERRAL ZONES

The sternal and clavicular portions of this muscle each have their own referral patterns. Mostly, however, both refer pain to the face and the head, not the neck. The referrals often mimic the symptoms of atypical facial neuralgia or tension headaches. Often dentists recognize these referrals as a component of facial pain complaints.

From the *sternal portion* of this muscle, the referrals usually present as pain. Typically, the trigger points themselves are all along the length of this division, with the referrals being strongly felt at the attachment on the mastoid process and occipital ridge and arcing around the medial, lateral, and superior aspect of the eye and the eyebrow. There may be spillover referral to the top of the head, behind the eye, and to the maxilla and mandible, throat, chin, and sternal attachment.

There may be symptoms of the eye such as excessive lacrimation, reddening of the conjunctiva, or visual disturbances such as blurred vision or a dimming sensation. There



• **FIGURE 5-5** Trigger points and referral zones for the sternal head of the sternocleidomastoid. There will most likely be trigger points set into this portion of the muscle along its entire length. There will be strong referral arcing from the temple up and over the eye to the back of the head and into the sternum. There may be spillover to the top of the head, from the ear to the eye and entire maxilla as well as lateral to the strong referral at the sternum. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

may even be sinus congestion present. Occasionally, there may be unilateral deafness occurring without **tinnitus** or a crackling noise (Fig. 5-5).

From the *clavicular portion* of this muscle, the referrals are pain with the actual trigger points all along the length of this division. The referrals will be felt mostly into the frontal area of the head and behind and deep into the ear. Occasionally, there is spillover referral to the cheek and the molar teeth on the same side.



• **FIGURE 5-6** Trigger points and referral zones for the clavicular head of the sternocleidomastoid. As with the sternal head, the trigger points set into the muscle along its entire length. The strong referrals are to the forehead, into the ear, and behind the ear. There may be a bit of spillover surrounding those sites. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

A person may complain of proprioceptive difficulties such as spatial disorientation, dizziness, and/or vertigo. Mechanical stimulation of active trigger points in the clavicular division can refer autonomic phenomena of localized sweating and vasoconstriction to the frontal area of referral (Fig. 5-6).

Interestingly, there usually is no neck pain or stiffness reported from trigger points in sternocleidomastoid. However, there may be complaints of soreness in the anterior neck area, which mimics the symptoms of tender lymph glands. Extreme referrals into the head and face from these trigger points will also resemble a tension headache. It is rare that this person will complain of restricted neck motion.

Mostly complaints will be of vision blurring, dizziness, profuse tearing of the eye, frontal headaches, and nausea.

TRIGGER POINT ACTIVATION

Any posture or activity that activates these trigger points will also perpetuate them if not corrected. Excessive forward head posture will shorten this muscle and activate trigger points there. Also, having the head turned to one side for long periods of time will activate trigger points, along with sleeping on one's back using two or more pillows to keep the head up.

Mechanical overload is a frequent cause of activation, such as when the neck is hyperextended for a prolonged period during an activity. Activation could also be induced accidentally by injuries such as falling on one's head, or whiplash.

A person with a deformity or injury that restricts upper limb movement requiring awkward compensatory neck

positioning will have active trigger points in sternocleidomastoid, as well. Another source would be a structural inadequacy, such as a high hip/low hip, short leg, or small hemipelvis, because these conditions cause functional scoliosis and shoulder girdle tilting. These conditions overload the muscle by making it work hard to maintain a normal head position to level the eyes. Any limping gait can activate trigger points here because the sternocleidomastoid will try to either help the movement and/or maintain equilibrium.

A tight pectoralis major may activate trigger points in sternocleidomastoid by pulling on the clavicle. Also, paradoxical breathing or chronic coughing can overload this muscle.

STRESSORS AND PERPETUATING FACTORS

- Hyperextension of neck, as when painting a ceiling, writing on a blackboard, hanging curtains, or sitting in a front-row seat at a theater with a high stage
- Reading while lying on the back with the book held to the side
- Protracted head, slouched posture
- Forward head posture while driving
- Wearing collars or ties that are too tight
- Drooping shoulders (wearing too heavy of clothing or feeling “down”)

PRECAUTIONS

- When working on the sternocleidomastoid, avoid the carotid artery, which lies medial to the sternal fibers.

MASSAGE THERAPY CONSIDERATIONS

- Rotating the head slightly *toward* the side being worked will slacken the muscle fibers and make it easier to pincer grasp this muscle
- Using a pincer compression is very effective for this problematic muscle
- It may be necessary to use a tissue or paper towel to be able to grasp the muscle securely if lubricated
- Stretching and range of motion exercises may be effectively done by rotating the head without lateral flexion
- Sternocleidomastoid is the most superficial of the three muscles that attach at the mastoid process
- The referral pattern of the sternal division of sternocleidomastoid mimics the classic migraine arc
- Thorough treatment of this thick upper half of the muscle, including the tendon at its attachment at the mastoid process, is extremely important
- Always note the location of the styloid process prior to treatment so as not to intrude onto it

Scalenes: Anterior, Medius, and Posterior: The Entrappers

Scalene muscle trigger points and their associated thoracic outlet entrapment syndrome are often overlooked sources of pain in the shoulder–girdle region and upper limb. Scalene trigger points are among the more difficult to identify and treat effectively but are also the most important of the myofascial trigger points.

All of the scalene muscles are variable in their attachments. The most variable is scalene minimus. This muscle exists in approximately 50% to 75% of people on at least one side of the body.

ORIGIN

- Anterior: transverse processes of C3–C6
- Medius: transverse processes of C2–C7
- Posterior: transverse processes of C5–C7
- Minimus: transverse processes of C6–C7

INSERTION

- Anterior: rib 1
- Medius: rib 1
- Posterior: rib 2
- Minimus: rib 1

ACTION

- Forward flexion of the neck
- Lateral flexion to same side
- Stabilize cervical spine against lateral movement
- Assist in elevating first two ribs for forceful inspiration

TRIGGER POINTS AND REFERRAL ZONES

Mainly the trigger points occur along the bellies of the muscles. With medius, however, the trigger points are usually found in the lower portion of the belly.

Active trigger points in the anterior, medial, or posterior scalenes may refer sensation anteriorly to the chest, laterally to the upper arm, and posteriorly to the medial scapular border and interscapular area. It could be all of this area referred to or any portion of it.

The posterior referral is usually from scalene anterior, especially along the border of the scapula. Anteriorly, there may be referrals into the pectoral region coming from scalene medius or posterior.

Also, referral may be down the front and back of the upper arm, skipping the elbow, and then into the radial side of the forearm, the thumb, and the index finger. This referral usually comes from trigger points in the upper scalene anterior along with medius (Fig. 5-7).

Trigger points from the scalenes are commonly overlooked sources of back, shoulder, and arm pain. As trigger points from

the scalenes rarely refer to the head, they are associated with trigger points that do refer to the head. Travell and Simons quote a study⁴ that shows that more than half of those in the study who had cervicogenic headaches also had associated active scalene trigger points that were contributing to their pain.

Scalene muscles are among the most common sources of back pain. Pain from these trigger points is usually described as being persistent and aching, coming in two finger-like projections over the upper chest area. If on the left side, it may be mistaken for angina pectoris and will most likely be associated with muscular activity.

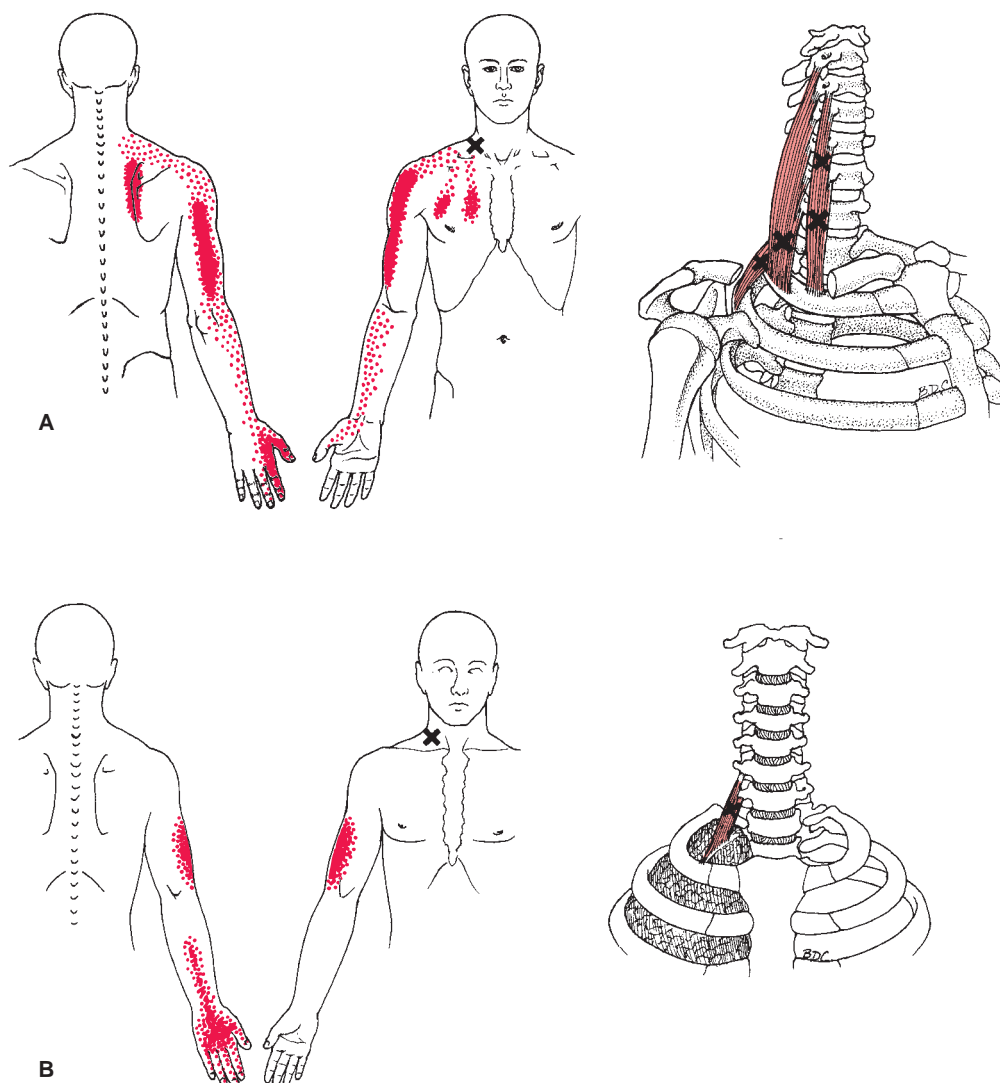
The less common referral into the thumb will usually be described as numbness and may or may not include **hypoesthesia** with or without a thermal sensitivity (usually this will be cold).

TRIGGER POINT ACTIVATION

Often trigger points in the scalene muscles are activated secondary to trigger points in the sternocleidomastoid. This sternocleidomastoid forms a functional unit with the scalenes. Also, a severe stiff neck syndrome from trigger points in levator scapulae will sometimes include trigger points in the scalenes.

STRESSORS AND PERPETUATING FACTORS

- Accidental trauma
- Pulling or lifting heavy items (hauling on ropes when sailing)
- Playing a game of tug-of-war
- Competitive swimming
- Holding awkwardly large objects
- Playing certain musical instruments
- Overuse as with paradoxical breathing
- Coughing hard very often (asthma, bronchitis, etc.)
- Sleeping with the foot of the bed higher than the head of the bed
- A tilted shoulder girdle when standing
- A small hemipelvis when seated
- Loss of an upper limb or surgical removal of a heavy breast
- Scoliosis
- Having to lean awkwardly when seated because of short upper arms not reaching armrests of a chair
- A whiplash-type injury
- Carrying heavy shoulder bags
- Upper chest breathing (asthma, etc.)
- Reading in bed with head tilted forward
- Limping



• **FIGURE 5-7** Trigger points and referral zones for the scalenes. In each of the four portions of this muscle, the trigger points appear within the belly of the muscle. There may be strong referral to the area just medial to the scapulae, down the posterior and lateral forearm, into the posterior hand, and into the chest. There may be spillover across the shoulder both anterior and posterior, down both anterior and posterior areas of the forearm and into the palm, and into the chest above the strong referrals there. (Reprinted with permission from Simons DG, Travell JG, Simons LS. *Upper Half of Body*. 2nd ed. Baltimore: Lippincott Williams & Wilkins, 1999. *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*; vol 1. p. 506, Fig. 20.1.)

PRECAUTIONS

- Avoid direct pressure on the brachial plexus, an endangered site, which lies between anterior and medius

MASSAGE THERAPY CONSIDERATIONS

- Very tight scalenes will cause **entrapment of the brachial plexus**
- When using gliding thumb strokes with the head rotated to the side, avoid direct contact with the clavicle by engaging thumb posteriorly and inferiorly toward the first rib attachment (area of brachial plexus)
- Tightness of scalenes will elevate the first two ribs. Tightness of pectoralis minor will cause the clavicle to

depress. This combination can close the thoracic outlet and cause the brachial plexus to become entrapped, which is thoracic outlet syndrome

- If there is ulnar pain, tingling, numbness, and **dysesthesia** along with hand edema, then the client likely has thoracic outlet syndrome
- Trigger points here may cause symptoms similar to those of carpal tunnel syndrome
- Because the brachial plexus and axillary artery emerge above rib 1 while between the anterior and medial scalene, be careful not to intrude into it. The person will feel an electric-like shock if this happens

Anterior Suboccipitals

The anterior suboccipitals are made up of two muscles, rectus capitis anterior and rectus capitis lateralis. Even though they are relatively difficult to get to, they are palpable and workable.

Rectus Capitis Anterior and Rectus Capitis Lateralis

Although these two muscles are quite short, they can play a major role in head and neck pain, especially when injured. Rectus capitis anterior lies deep to the upper portion of longus capitis.

ORIGIN

- Anterior: anterior transverse process of atlas (C1)
- Lateralis: transverse process of atlas (C1)

INSERTION

- Anterior: occipital bone, anterior to foramen magnum
- Lateralis: jugular process of occipital bone

ACTION

- Anterior: flexes head
- Lateralis: laterally flexes head

TRIGGER POINTS AND REFERRAL ZONES

Actual locations for trigger points as well as specific referral patterns for most of the deeper anterior neck muscles have not been established yet. Most agree, however, that trigger points can refer to the laryngeal area, anterior and posterior neck, and sometimes into the mouth, as well.

A person with trigger points in this area may complain of anterior and neck pain or possibly a lump or tickle in the throat or difficulty with swallowing.

TRIGGER POINT ACTIVATION

As these muscles are mostly responsible for moving the head at the top of the spine, they will probably develop trigger points when trying to control flexion, when held in a shortened position maintaining extension looking upward for long periods of time, or when held in a shortened position looking to the side for prolonged periods of time. Often a person with forward head posture will also have his or her head in hyperextension (chin poking up and out). This accommodates the line of vision for the person. These mus-

cles are a very common source of posttraumatic headache trigger points.

STRESSORS AND PERPETUATING FACTORS

- Lying on the floor propped up on elbows, watching television
- Maladjusted eyeglass frames
- Nearsightedness that goes uncorrected
- Lenses with too short a focal length
- Use of trifocal lenses that require frequent and/or sustained fine adjustment of head position to see properly
- A chill or draft to the back of the neck while maintaining the head to the side
- Whiplash injury
- Sustaining an upward gaze with head tilted up (painting a ceiling or using binoculars)
- Any sustained awkward head position
- Prolonged typing while reading copy from a flat surface or reading to the side

PRECAUTIONS

- Palpate the styloid process to ensure knowledge of its exact location; never press on it as it is quite sharp and could cause trauma to the stylopharyngeus muscle and the glossopharyngeal nerve. Also, the styloid process is small enough to fracture or snap off completely
- Palpation should be gentle; avoid poking or jabbing movements. This is a very sensitive area for most people

MASSAGE THERAPY CONSIDERATIONS

- Be sensitive to the client's pain threshold, yet apply appropriate pressure to allow the tissue to respond correctly
- Unresolved posterior neck pain may result from activated trigger points in these muscles

Longus Capitis and Longus Colli: Military Neck

Longus capitis and longus colli, along with the anterior suboccipitals, are the deepest muscles of the anterior neck. They are responsible for giving a person what is called a military neck or a straight neck when they are chronically contracted. This is a painful situation in which the curve is no longer in the neck, causing the neck to be straight and usually forward.

ORIGIN

- Longus capitis: anterior transverse processes of C3–C6
- Longus colli, vertical fibers: anterior bodies of C1–C3 and C5–C7
- Longus colli, inferior oblique fibers: anterior bodies of T1–T3
- Longus colli, superior oblique fibers: anterior tubercles of transverse processes of C3–C5

INSERTION

- Longus capitis: occipital bone anterior to foramen magnum
- Longus colli, vertical fibers: anterior bodies of C2–C4
- Longus colli, inferior oblique fibers: anterior tubercles of transverse processes of C5–C6
- Longus colli, superior oblique fibers: anterior tubercles of atlas (C1)

ACTION

- Longus capitis: flexes head and neck
- Longus colli: flexes head and neck and assists rotation of the head

TRIGGER POINTS AND REFERRAL ZONES

Specific trigger points and referral areas for most of the deepest anterior neck muscles have not yet been established.

Most believe they can refer to the laryngeal region, anterior neck, and mouth.

A client with trigger points in this region may complain of having difficulty in swallowing, with possible pain in the vicinity of the cricoid cartilage and a sore throat.

TRIGGER POINT ACTIVATION

Mostly these trigger points will be caused by flexion/extension injuries, such as those sustained in automobile injuries or sports injuries, along with a forward head posture. Anyone with a military neck will most likely have several trigger points activated here.

STRESSORS AND PERPETUATING FACTORS

- Whiplash
- Forward head posture

PRECAUTIONS

- Be sure to explain to the client how and where you will be working
- Palpation should be gentle; avoid poking or jabbing movements. This is a very sensitive area for most people

MASSAGE THERAPY CONSIDERATIONS

- Be sensitive to the client's pain threshold, yet apply appropriate pressure to allow the tissue to respond correctly
- Be sure not to move pressure laterally off the transverse processes, as this could cause intrusion onto the carotid artery
- Unresolved posterior neck pain may result from activated trigger points in these muscles

Suprahyoid Muscles

The suprahyoid muscles attach to the hyoid bone from above and continue upward to attach to the mandible, temporal bone, etc. These muscles include the mylohyoid, geniohyoid, and digastric. Related muscles, the infrahyoid muscles, act to stabilize the hyoid bone, so these suprahyoid muscles can move the jaw (Fig. 5-8).

Mylohyoid

This muscle is active in most mouth functions, such as swallowing, chewing, sucking, and blowing.

ORIGIN

- Entire length of the mylohyoid line of the inside surface of the mandible

INSERTION

- Hyoid bone

ACTION

- Opens mouth (lowers mandible)
- Elevates hyoid bone
- Raises floor of mouth and tongue

TRIGGER POINTS AND REFERRAL ZONES

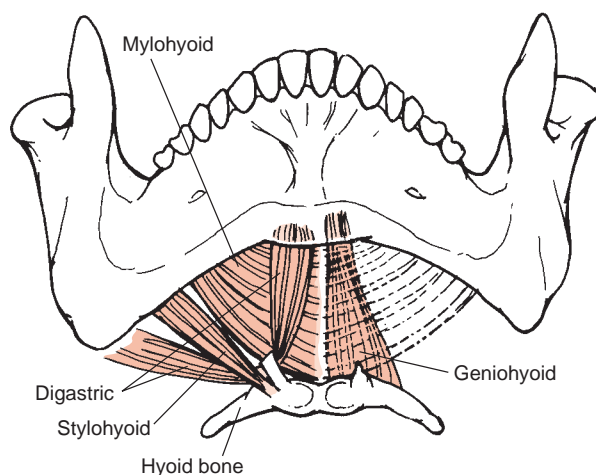
Trigger points have not been officially recorded for this muscle as of yet; however, trigger points most likely set up in the muscle belly. Referrals are likely to occur on the lateral side of the tongue. A client with trigger points in this muscle would likely complain of difficulty when swallowing, along with a painful and restrictive feeling.

TRIGGER POINT ACTIVATION

Trigger points in this muscle can be activated by chronic mouth breathing. Any whiplash-type injury will also activate trigger points here.

STRESSORS AND PERPETUATING FACTORS

- Forward head posture
- Mouth breathing



- **FIGURE 5-8** Attachment sites for the suprahyoids. Mylohyoid: superior aspect of the hyoid bone, entire length of the mylohyoid line of the inside surface of the mandible. Geniohyoid: superior aspect of the hyoid bone, inferior inner surface of the mid-mandible at the symphysis menti. (Reprinted with permission from Oatis CA. *Kinesiology*. Baltimore, MD: Lippincott Williams & Wilkins, 2004.)

PRECAUTIONS

This is inner oral work under the tongue; be sure there are no tissue abnormalities such as a tumor and open sore.

MASSAGE THERAPY CONSIDERATIONS

- Trigger points in any of the anterior throat muscles could refer viscerally into the thyroid gland
- With any whiplash-like accident, always include an examination of this muscle

Geniohyoid

This muscle mainly works synergistically with the digastric muscle.

ORIGIN

- Inferior inner surface of the mid-mandible at the symphysis menti

INSERTION

- Hyoid bone

ACTION

- Retraction and depression of mandible
- Elevates hyoid bone

TRIGGER POINTS AND REFERRAL ZONES

Nothing has been written regarding trigger points and referrals of this muscle as of yet. As with any muscle, it is most likely that a trigger point will setup within the muscle belly. Referrals will most likely be into the mouth area.

TRIGGER POINT ACTIVATION

Trigger points will be activated here because of flexion and extension injuries such as whiplash.

STRESSORS AND PERPETUATING FACTORS

- Forward head posture
- Mouth breathing

PRECAUTIONS

This is inner oral work under the tongue; be sure there are no tissue abnormalities such as a tumor and open sore.

MASSAGE THERAPY CONSIDERATIONS

- Trigger points in any of the anterior throat muscles could refer viscerally into the thyroid gland
- With any whiplash-like accident, always include an examination of this muscle

Digastric: Pseudo-sternocleidomastoid Pain

This is a fascinating muscle in regard to its anatomical attachments. The posterior bellies are united end-to-end by a common tendon that attaches to the hyoid bone through a fibrous loop or sling-like structure.

ORIGIN

- Anterior belly: inferior border of mandible
- Posterior belly: mastoid notch of temporal bone

INSERTION

- Intermediate tendon attached indirectly to hyoid bone by a fibrous loop of fascia

ACTION

- Lowers mandible (opens mouth)
- Moves hyoid bone upward, forward, and backward

TRIGGER POINTS AND REFERRAL ZONES

Trigger points may be found within the belly area of both the anterior and posterior portions of this muscle. Referral from the posterior trigger points is often felt strongly into the side of the jaw and the throat area near the jaw angle, with spillover up into the occiput. From the anterior section, referral is often into the lower front teeth (Fig. 5-9).

Often, a person with trigger points in the posterior portion may not feel pain but instead have problems with swallowing, such as having a lump in the throat or a feeling of something stuck there.

If there is a trigger point in the anterior section, the client will likely experience pain in the lower front teeth. This source of tooth pain is often overlooked.

TRIGGER POINT ACTIVATION

Activation of trigger points in this muscle may be secondary to dysfunction of other anterior neck and throat muscles. However, to activate trigger points here, one must only do things such as clenching and/or grinding and mouth breathing.

Mechanical irritation may occur in this muscle if a person has an elongated styloid process. This is known as “**Eagle syndrome**”; the styloid process presses into the muscle belly and causes some tearing and inflammation. There is typically pain present at the angle of the jaw, with symptoms of dizziness and visual blurring. There may be a decrease in vision, as well.

STRESSORS AND PERPETUATING FACTORS

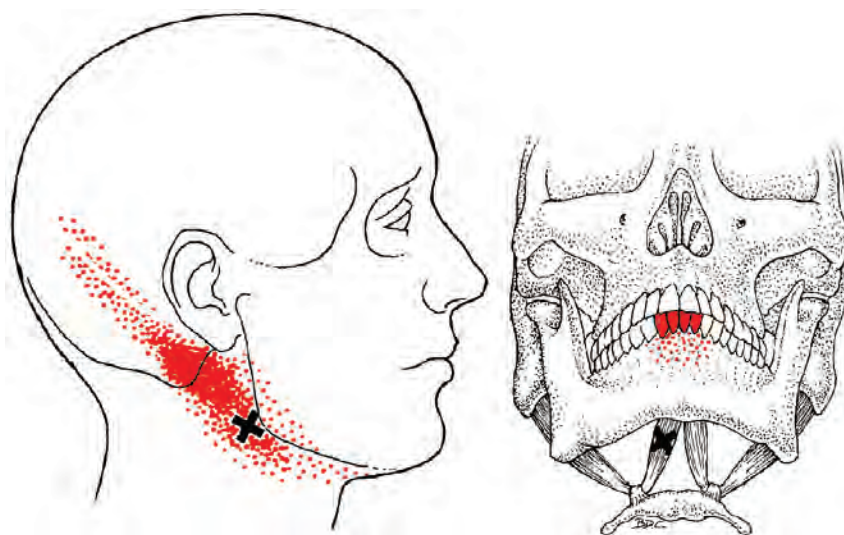
- Overload from **bruxism** and/or mouth breathing
- Eagle syndrome
- Whiplash-type injuries

PRECAUTIONS

- Be sure to locate the styloid process before working on the posterior portion of this muscle and not to press on it as it is small and easily broken

MASSAGE THERAPY CONSIDERATIONS

- Use trigger point pressure to each trigger point found



• **FIGURE 5-9** Trigger points and referral zones for the digastric. The actual trigger points will usually occur in the belly with strong referral into the side of the neck up onto the mastoid and into the lower middle teeth. There may be spillover across the posterior head and into the anterior neck just below the jaw. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

HEAD AND FACE MUSCLES

With the final group of muscles, those of the head and face, we consider face pain, such as that from **TMJ dysfunction**.

Occipitalis: The Scalp Tensor

Travell and Simons state that tenderness in the occipitalis muscle is found in 42% of patients with **ipsilateral** face and head pain associated with myofascial pain/dysfunction syndrome. Ipsilateral means affecting or related to the same side of the body.

This muscle is usually grouped with the frontalis muscle and is called the “occipitofrontalis” or “the epicranius.” For the purposes of splitting the muscles into anterior and posterior categories, this text presents them separately.

ORIGIN

- Occipital bone at the superior nuchal line

INSERTION

- Galea aponeurotica

ACTION

- Draws back scalp
- Assists in raising eyebrows and wrinkling forehead

TRIGGER POINTS AND REFERRAL ZONES

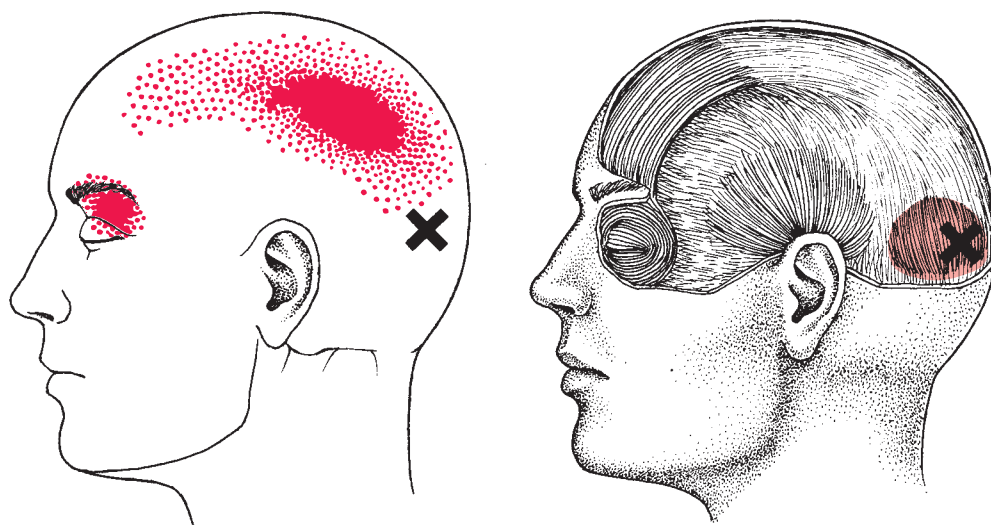
From trigger points in the muscle belly, sensation is referred laterally and anteriorly, diffusely over the back of the head

and through the cranium. There may be intense pain deep in the orbit of the eye and the eyeball itself (Fig. 5-10).

Clients with trigger points in this region often cannot bear the weight of the back of the head on the pillow when trying to sleep because of pain from a trigger point in the muscle belly. They may report that they must lie on their side to get some sleep. Pain from trigger points in this area is a deep aching pain. If the client reports superficial scalp tingling and/or hot prickling, this is most likely due to the greater occipital nerve being entrapped by posterior cervical muscles. If it is trigger point referral the client is experiencing, then moist heat will usually provide relief; if the pain is due to nerve entrapment, most likely the client will not be able to tolerate heat but will enjoy cold applied there.

TRIGGER POINT ACTIVATION

Trigger points are most likely to occur in this muscle when a person has decreased visual acuity and/or **glaucoma**. Glaucoma is a disease of the eye characterized by increase in intraocular pressure, which atrophies the optic nerve, causing blindness. In both of these cases, there is persistent



• **FIGURE 5-10** Trigger points and referral zones for the occipitalis. The trigger point will occur within the muscle belly and refer strongly to the superolateral head and behind the eye with spillover around both. (Reprinted with permission from Simons DG, Travell JG, Simons LS. *Upper Half of Body*. 2nd ed. Baltimore: Lippincott Williams & Wilkins, 1999. *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*; vol 1. p. 428, Fig. 14.1B.)

strong contraction of the forehead and scalp muscles. These trigger points may also be activated as satellites of posterior cervical trigger points that refer sensation to the occipital area.

STRESSORS AND PERPETUATING FACTORS

- Decreased vision
- Trigger points in posterior cervical muscles causing satellites in occipitalis

PRECAUTIONS

- This area may be quite sensitive

MASSAGE THERAPY CONSIDERATIONS

- Teach clients to use trigger point pressure to release trigger points here for themselves
- Be sure to inactivate all key trigger points in the clavicular division of the sternocleidomastoid and all posterior cervical muscles

Frontalis: The Scalp Tensor

This muscle is usually grouped with the occipitalis muscle and is called the “occipitofrontalis” or “the epicranius.” For the purposes of splitting the muscles into anterior and posterior categories, this text presents them separately. Travell and Simons label these two muscles as the “scalp tensors.”

ORIGIN

- Galea aponeurotica

INSERTION

- Fascia of facial muscles and skin above the nose and eyes

ACTION

- Draws scalp back
- Raises eyebrows
- Wrinkles forehead

TRIGGER POINTS AND REFERRAL ZONES

Trigger points occur within the muscle belly and usually refer strongly around the trigger point itself. There may be some feather-like extensions upward on the forehead of spillover referral (Fig. 5-11).

The main complaint of clients with trigger points in this muscle is pain in the forehead.

TRIGGER POINT ACTIVATION

Trigger points here are most likely to be satellites from those set up in the clavicular portion of the sternocleidomastoid. Also, activation could be from work overload; in this case, constant facial expressions showing anxiety, tension, surprise, and distrust. The forehead stays wrinkled with these expressions.

STRESSORS AND PERPETUATING FACTORS

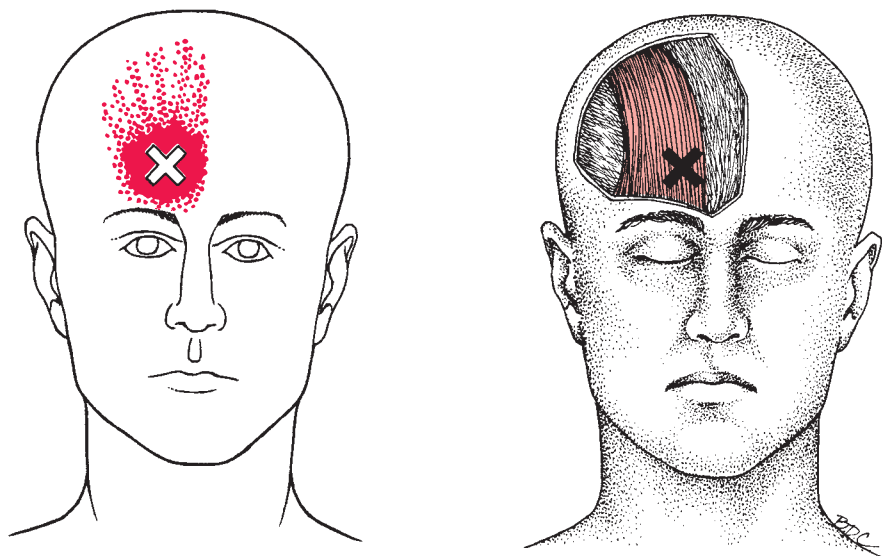
- Longstanding trigger points in the clavicular head of sternocleidomastoid may be forming satellites here
- Chronic frowning or other expressions that include wrinkling the forehead

PRECAUTIONS

- Chronic tension in the belly of frontalis could **entrap the supraorbital nerve**, producing a unilateral frontal headache

MASSAGE THERAPY CONSIDERATIONS

- Work carefully to avoid nerve entrapment



• **FIGURE 5-11** Trigger points and referral zones for the frontalis. The trigger point is within the muscle belly close to the eyebrow with strong referral around itself. There may also be spillover in a feather-like arrangement up higher on the forehead. (Reprinted with permission from Simons DG, Travell JG, Simons LS. *Upper Half of Body*. 2nd ed. Baltimore: Lippincott Williams & Wilkins, 1999. *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*; vol 1. p. 428, Fig. 14.1A.)

Corrugator Supercilii

This tiny muscle of the face can be key in ridding a person of eye headaches (Fig. 5-12).

ORIGIN

- Medial end of superciliary arch of frontal bone above the nasal bone

INSERTION

- Skin above the middle of the supraorbital margin and above the nasal bone

ACTION

- Draws eyebrows medially and inferiorly

TRIGGER POINTS AND REFERRAL ZONES

No specific trigger points or referral zones have been studied here yet. Trigger points are most likely to set up in the more medial portion of the muscle belly while referring sensation to behind the eyes.

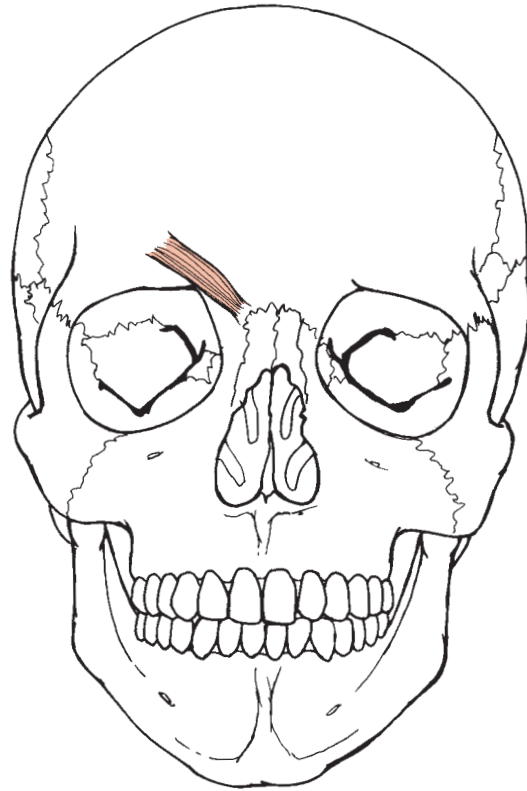
A client with trigger points in this muscle will probably complain of headaches behind the eyes.

TRIGGER POINT ACTIVATION

As with frontalis, trigger points in this muscle will most likely be activated by intense, sustained facial expressions. It will most likely be that intense looking person that has trigger points here. This is a person who mostly wears an expression of concern or anger on their face, pulling their eyebrows together creating a furrow between them. Probably the person who looks surprised will also activate trigger points here.

STRESSORS AND PERPETUATING FACTORS

- Frowning
- Wearing an expression of attention, concern, anger, or surprise, with eyebrows raised and forehead wrinkled
- May be satellites from trigger points in frontalis and the posterior cervical muscles



- **FIGURE 5-12** Attachment sites for the corrugator supercilii. Medial end of the superciliary arch of the frontal bone above the nasal bone, the skin above the middle of the supraorbital margin and above the nasal bone. Note that one end of this muscle does not attach to bone.

PRECAUTIONS

There are no precautions for this muscle.

MASSAGE THERAPY CONSIDERATIONS

- Using a pincer grasp is the only way to effectively work on this muscle

Temporalis: Temporal Headache and Maxillary Toothache

This muscle can be a key player in TMJ dysfunction and is often overlooked by massage therapists as a source of trigger points. It can be so tender that a client cries out when a trigger point is palpated.

ORIGIN

- Temporal bone at its lateral surface

INSERTION

- Coronoid process and ramus of the mandible

ACTION

- Elevates the mandible (closes jaw)
- Retracts the jaw

TRIGGER POINTS AND REFERRAL ZONES

There could be multiple trigger points that set up in the belly of this muscle. Referral areas include all of the upper teeth, with spillover across the maxilla, over the eyebrow, and into the temporal area (Fig. 5-13).

A person with trigger points in this muscle typically complains of head pain and headaches, as well as toothaches or gum pain. Rarely will this person complain of jaw restriction, yet there will be a reduction in its ability to open. There may be complaints of the teeth not meeting correctly, however.

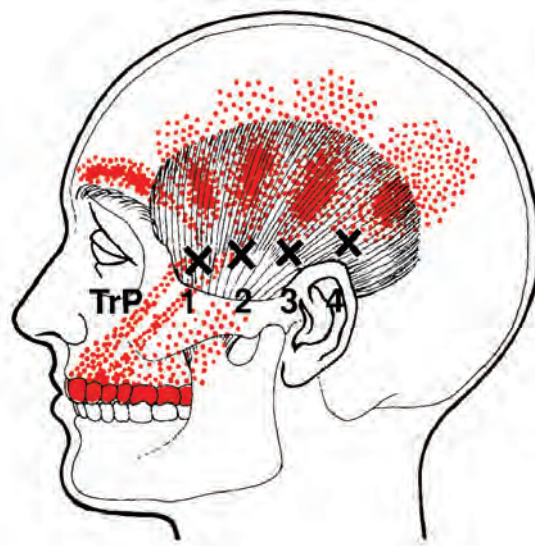
The hypersensitivity in the teeth may present as a reaction to thermal conditions when eating either hot or cold foods.

TRIGGER POINT ACTIVATION

See section “Stressors and Perpetuating Factors.”

STRESSORS AND PERPETUATING FACTORS

- Clenching and grinding of the teeth (bruxism)
- Direct trauma to the muscle, such as getting hit in the side of the head
- Prolonged jaw immobilization, as when at the dentist
- Cervical traction without using an occlusal splint to immobilize the mandible in the fully closed position
- Forward head posture
- Excessive use of the jaw, as when chewing gum



• **FIGURE 5-13** Trigger Points and Referral Zones for the temporalis. Mostly the trigger points occur near or within the large tendinous area above the zygoma and refer strongly into the upper teeth, the eyebrow, and parietal bone with spillover in between all of those points. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

- Chronic infection or inflammation of the TMJ
- Cold drafts over the muscle
- Any overuse of masticatory structures

PRECAUTIONS

- Avoid putting oily fingers in your client's hair when working on this muscle
- The tendon above the zygomatic arch is often fibrotic and quite tender

MASSAGE THERAPY CONSIDERATIONS

- Temporalis is a key player in the function of the TMJ as well as in its dysfunction
- The TMJ is the most often used joint in the body
- When doing cross-fiber friction work here, be aware of the fan-shaped muscle fiber direction
- Work slowly and gently while being very deliberate to alleviate trigger points here

Masseter: The Trismus Muscle

This muscle is usually responsible for a severely restricted jaw opening (Fig. 5-14). Trismus is a tonic contraction of the muscles of mastication.

ORIGIN

- Zygomatic arch and process of the maxilla

INSERTION

- Ramus, angle and neck of the mandible

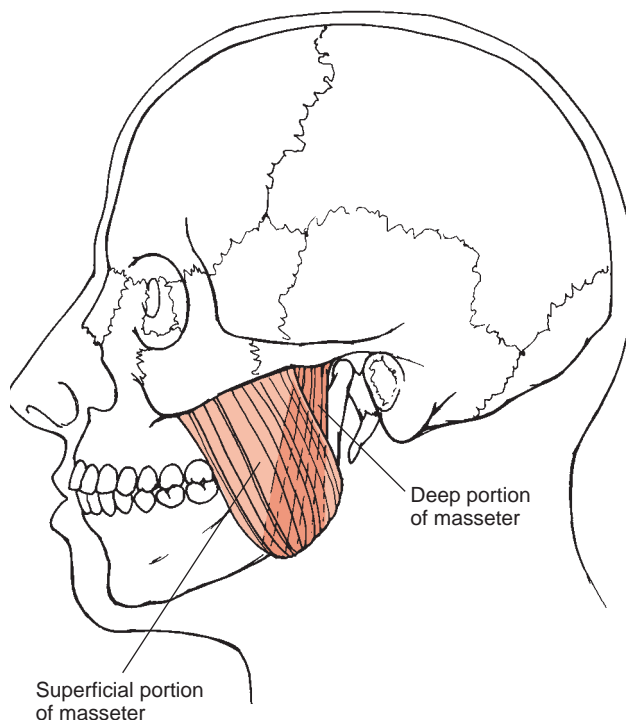
ACTION

- Elevates mandible (close jaw)
- Retrudes mandible

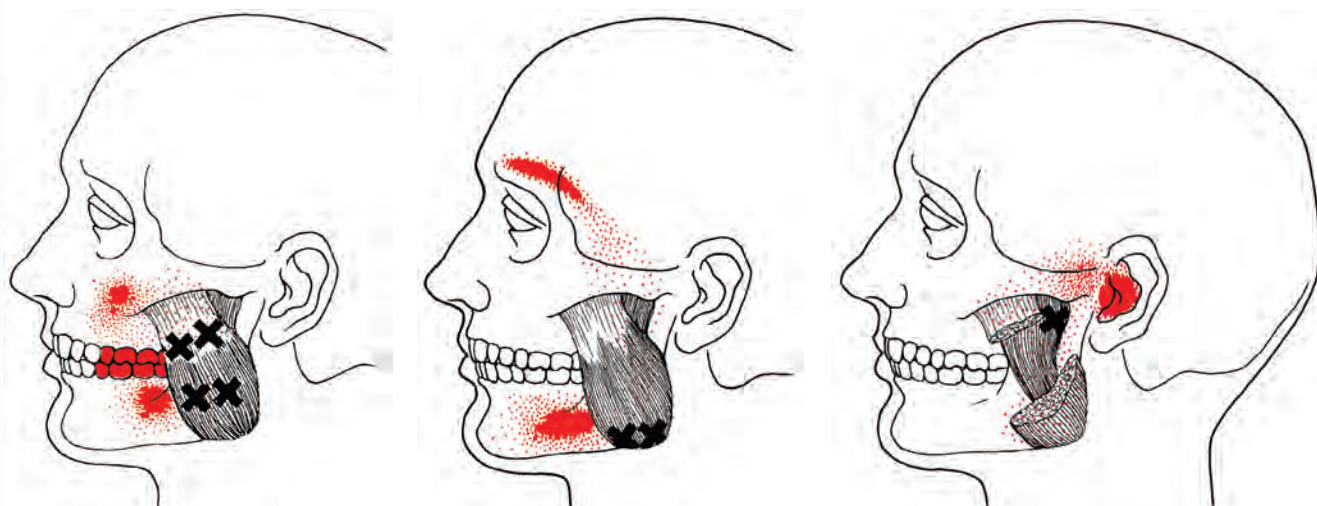
TRIGGER POINTS AND REFERRAL ZONES

Trigger points typically occur anywhere within the belly of both the superficial and deeper layers of this muscle. Referrals often occur into the upper and lower molar teeth, the maxilla and mandible, the inner ear area, and the eyebrow. These are very strong referrals (Fig. 5-15).

The main complaint of a client with trigger points in this muscle is typically pain in the teeth and the jaw area. Often, the client is actually feeling referral sensation into the TMJ itself along with hypertension of this muscle, rather than actual TMJ derangement. Active trigger points often mimic symptoms of dysfunction of the joint. The client also frequently reports significant restriction of the jaw opening.



• **FIGURE 5-14** Attachment sites for the masseter. Zygomatic arch and the process of the maxilla; ramus, angle and neck of the mandible. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)



• **FIGURE 5-15** Trigger points and referral zones for the masseter. There will be trigger points all along the length of the superficial layer with strong referral to the upper and lower molar teeth, into the maxilla and mandible, and the eyebrow. There may be spillover across the maxilla and mandible and into the forehead in front of the ear. In the deeper layer, the trigger points will usually occur up near the zygoma with strong referrals into the ear and spillover surrounding that. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

There may be a unilateral tinnitus associated with trigger points in the upper posterior part of the deep layer. If there is bilateral tinnitus present, it is most likely to be a systemic cause rather than trigger point activity.

TRIGGER POINT ACTIVATION

See section “Stressors and Perpetuating Factors,” below.

STRESSORS AND PERPETUATING FACTORS

- Excessive forward head posture
- Tension and unresolved anger (clenching teeth)
- Bruxism (grinding teeth when at sleep)
- Pipe smoking, chewing gum, nail biting, thumb sucking
- Improperly fitting dentures
- Crushing ice or nuts with the teeth
- An uneven bite (**occlusal imbalance**)

PRECAUTIONS

- When muscle stripping here, avoid pulling the skin of the face downward

MASSAGE THERAPY CONSIDERATIONS

- For its size, the masseter is the strongest muscle in the body. This means that it can hold quite a bit of tension
- Hypertonicity of the masseter is a major factor in the function of the TMJ and its dysfunction, along with craniomandibular pain

The Pterygoid Muscles

This group is made up of the medial and lateral pterygoid muscles. As they are difficult to palpate and work with, many massage therapists choose to skip treatment of them. This is a mistake when a person is reporting head and mouth/jaw pain.

Medial Pterygoid: Ache Inside the Mouth

There is a very small portion of this muscle that may be palpated and worked with, but this work can be essential in alleviating pain in this area for a person (Fig. 5-16).

ORIGIN

- Angle of the mandible

INSERTION

- Lateral pterygoid plate

ACTION

- Elevates the mandible (used bilaterally)
- Laterally deviates mandible to opposite side (used unilaterally)
- Assists protrusion of the mandible

TRIGGER POINTS AND REFERRAL ZONES

Trigger points usually set into the belly of this muscle, with referral sensation sent mainly into the TMJ area and with spillover down the neck of the mandible into the ear and the throat area, as well as inside of the cheek area (Fig. 5-17).

A client with trigger points in this muscle will likely complain of pain that increases when opening the mouth wide, chewing food, or clenching teeth. There may also be a sore throat that makes it hurt to swallow and restriction when opening the jaw.

TRIGGER POINT ACTIVATION

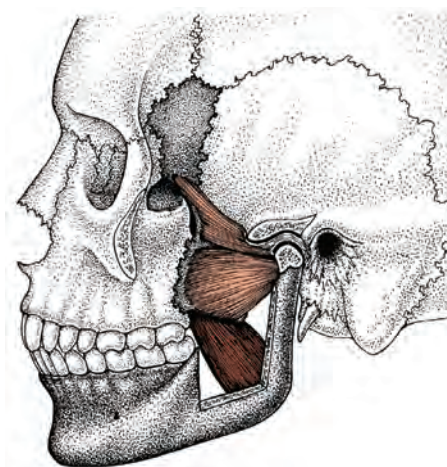
Because a forward head posture places persistent strain on the medial pterygoid, it will also activate trigger points. Trigger points here can be secondary to muscular dysfunction due to trigger points in the lateral pterygoid muscle.

STRESSORS AND PERPETUATING FACTORS

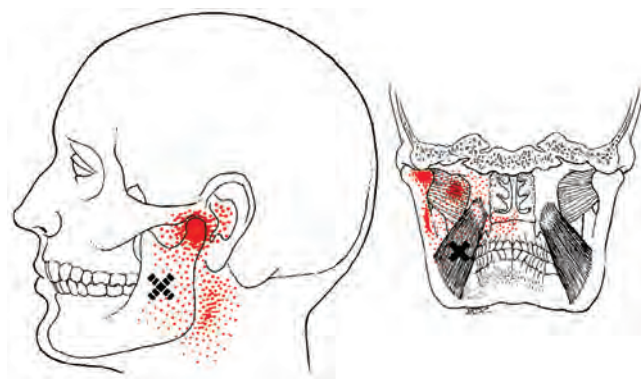
- Thumb sucking beyond infancy
- Excessive gum chewing
- Bruxism
- Jaw clenching
- Anxiety and other emotional tension
- Occlusal imbalance

PRECAUTIONS

- This muscle is usually extremely tender; be gentle



• **FIGURE 5-16** Attachment sites for the medial pterygoid. Angle of the mandible and lateral pterygoid plate. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)



• **FIGURE 5-17** Trigger points and referral zones for the medial pterygoid. The trigger points here can be anywhere within the belly of the muscle with strong referral to the temporomandibular joint and to the inside of the face with spillover into the mandible and lateral neck. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)

MASSAGE THERAPY CONSIDERATIONS

- Trigger points should be inactivated before initiating any prosthodontic treatment

Lateral Pterygoid: TMJ Dysfunction

This muscle is often the key to managing TMJ dysfunction (Fig. 5-18).

ORIGIN

- Superior division: sphenoid bone
- Inferior division: lateral pterygoid plate

INSERTION

- Superior division: neck of the mandible just below the articular disc
- Inferior division: neck of the mandible adjacent to the superior division

ACTION

- Both divisions as a unit: actively controls the return of the condylar head when closing jaw
- Superior division: opens and protrudes jaw
- Inferior division: opens and protrudes jaw, lateral deviation to other side

TRIGGER POINTS AND REFERRAL ZONES

Mostly the trigger points form in the belly of each of the two divisions of this muscle. Referral sensation is felt strongly into the TMJ and the maxilla just below the zygomatic arch (Fig. 5-19).

TRIGGER POINT ACTIVATION

Trigger points could develop as satellites in response to trigger points in neck muscles, especially the sternocleidomastoid. Mechanical overload from various activities can cause trigger points (see section “Stressors and Perpetuating Factors”).

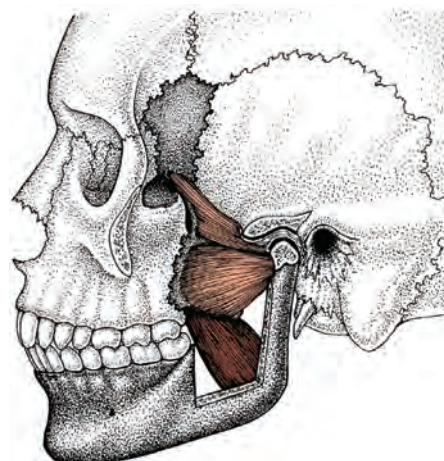
Bruxism can be either the cause or the result of trigger points here due to overuse. It is unclear if a degenerative arthritic change in the TMJ is the result or cause of trigger points here.

STRESSORS AND PERPETUATING FACTORS

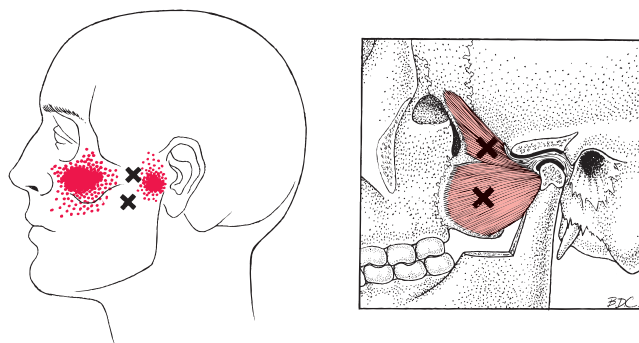
- Occlusal imbalance
- Bruxism
- Gum chewing, nail biting, thumb sucking
- Playing a wind instrument with the mandible fixed in protrusion
- Playing the violin holding the mandible against the instrument

PRECAUTIONS

- This muscle is usually extremely tender; be gentle



• **FIGURE 5-18** Attachment sites for the lateral pterygoid. Superior division: sphenoid bone, medial surface of the neck of the mandible just below the articular disk. Inferior division: lateral pterygoid plate, neck of the mandible adjacent to the superior division. (Reprinted with permission from *Medi Clip*, Lippincott Williams & Wilkins.)



• **FIGURE 5-19** Trigger points and referral zones for the lateral pterygoid. Trigger points will set into the muscle bellies and give strong referral into the temporomandibular joint itself along with strong referral into the maxilla. There may be some spillover around the strong referrals. (Reprinted with permission from Simons DG, Travell JG, Simons LS. *Upper Half of Body*. 2nd ed. Baltimore: Lippincott Williams & Wilkins, 1999. *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*; vol 1. p. 380, Fig. 11.1.)

MASSAGE THERAPY CONSIDERATIONS

- Trigger points should be inactivated before initiating any prosthodontic treatment

Head and Neck Neuromuscular Therapy Routine

For learning purposes this routine will be complete for all muscles in this region and consist of both prone and supine positions. You may pick portions of the routine or use it in its entirety depending upon the specific conditions and injuries the client has. Earlier in the chapter, a list of conditions and injuries has

been provided for the therapist to consider. As with all neuromuscular therapy routines, we work from superficial to deep and as specifically as possible. Note that the video icon indicates routines that are featured in online video clips, on the book's companion Web site.

PRONE ROUTINES

Routines in this section should be performed with the client in prone position, preferably using the face cradle. In these routines, use general loosening and warming techniques of the shoulders and neck, such as petrissage and compression.

Upper Trapezius

Begin with no lubrication. Stand at the side of the table facing the client's head.

1. Perform pincer palpation of trapezius, working from lateral to medial and holding with direct sustained compression. Take a moment to wait for the tissue to relax a bit (Routine 5-1).
2. Using fingertips opposing the thumbs, unroll the upper trapezius using the pincer grasp into the inner fibers just superior to the clavicle. Work from medial to lateral with the client's hand above his or her head on the face cradle for best results.

Note: Apply a small amount of lubrication.

3. Use your inferior hand to traction the client's shoulder inferiorly while effleuraging with your superior hand. This effleurage is to be a gliding squeeze of the bulk of the upper trapezius, applying pressure with the thumbs into the fingertips during the glide (Routine 5-2).

Note: Move to the head of the table and work from a seated position.

4. Perform lengthening strokes using both thumbs together from the base of the neck toward the acromion process unilaterally (Routine 5-3).



• ROUTINE 5-1



• ROUTINE 5-2



• ROUTINE 5-3

Levator Scapula

Sit in a chair at the head of the table.

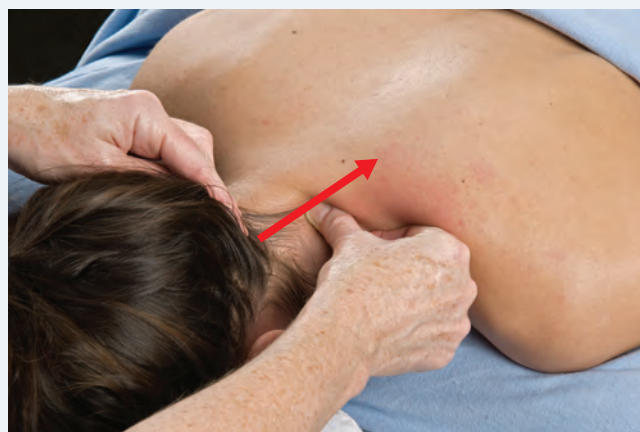
1. At the crook of the neck, isolate the muscle belly with thumb transverse friction and hold with steady pressure (Routine 5-4).
2. Work the insertion on the vertebral border and superior angle of the scapulae. Also, work the anterior surface of the superior angle. Friction and hold with trigger point pressure. You may place the client's hand on his or her back to locate the superior angle (Routine 5-5).
3. Work the muscle using gliding thumb strokes and gentle transverse friction from C1 to the scapulae staying along the posterior aspect of the transverse processes (Routine 5-6).



• ROUTINE 5-4



• ROUTINE 5-5



• ROUTINE 5-6

4. Work the attachments on the posterior transverse processes of C1 to C4 using trigger point pressure. Be gentle, yet specific to the posterolateral aspect here (Routine 5-7).

Note: Stand at the head of the table.

5. Use forearm compression into the muscle belly at the angle of the neck. Then, with the forearm and olecranon, do some lengthening effleurage from upper trapezius through the levator scapula insertion (Routine 5-8).

Posterior Cervical Muscles: Suboccipitals, Occipitalis, Splenius Capitis/Cervicis, Semispinalis Capitis, Multifidi/Rotatores

Sit or stand at the head of the table.

1. Use thumb strokes inferiorly from the occiput to the base of the neck, working the muscles in the **lamina groove** of the neck thoroughly. Be sure to include all portions of the posterior cervical muscles. You may sweep as far lateral as the acromioclavicular joint.

2. Isolate any tight fibers in the lamina groove with transverse friction and trigger point pressure.

Note: Be aware of pressure into this area when the client is using the face cradle. Use the pads of thumbs for comfort to the client.

3. Apply fingertip transverse friction to the occipital ridge at the muscle attachments; isolate the suboccipital muscles with a more specific transverse friction working from lateral to medial. Then, using longitudinal friction, work from medial to lateral. Be gentle, yet thorough. Hold trigger points with trigger point pressure as necessary (Routine 5-9).

4. Move to between C1 and C2 and do the same work as described above.



• ROUTINE 5-7



• ROUTINE 5-8



• ROUTINE 5-9

5. Work occipitalis with friction thoroughly (Routine 5-10).

6. Isolate the nuchal ligament and its muscular attachments using sustained compression and oppositional friction by having the wrists level with the client's neck, using thumbs from both sides at once pushing them toward each other. Hold for release after frictioning the thumbs oppositionally against each other. Begin at the neck/shoulder junction. Once this area has released, move incrementally up the neck until just below the occiput (Routine 5-11).

Note: Step #6 is typically done after working on both sides of the neck.

Middle Trapezius/Rhomboid Area

Stand at the side of the table. Begin with no lubrication.

1. Perform general massage and loosening of middle trapezius, rhomboids, and upper erectors. Use compression, palmer and circular friction, and petrissage.

2. Using pincer compression, isolate tight bands in the middle trapezius. Hold for release.

Note: Lubricate.

3. Perform effleurage to the rhomboids, working deeply and specifically to the fiber depth and direction, from insertion to origin. Stabilize at the inferior angle of the scapulae with the superior hand while thumb stripping superiorly and medially with the inferior hand (Routine 5-12).



• ROUTINE 5-10



• ROUTINE 5-11



• ROUTINE 5-12

Note: Stand at the head of the table.

4. Using both thumbs together, muscle strip the rhomboids again, this time from origin to insertion (Routine 5-13).

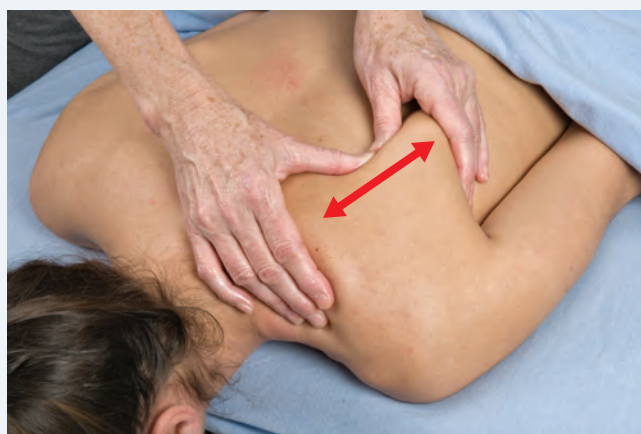
-
5. Friction the rhomboid attachments on the vertebral border of the scapula (Routine 5-14).
-

Note: Stand at the side of the table.

6. Work the muscle attachments on the spinous processes by placing the tip of the T-bar at a 45-degree angle into the lateral aspect of the spinous processes. Work from C7 to T5 using both cross fiber and longitudinal friction (Routine 5-15).



• ROUTINE 5-13



• ROUTINE 5-14



• ROUTINE 5-15

7. Work the attachments of trapezius along the spine of the scapulae using transverse friction. Use the tip of the T-bar at an oblique angle into the superior edge of the spine of the scapulae, then into the inferior edge (Routine 5-16).

Note: You may have to move to the head of the table to work on the superior edge and the side of the table to work on the inferior border.

8. Forearm lengthening to the area. Using the forearm, effleurage slowly down the erectors, and then downward along the medial border of the scapulae.

SUPINE ROUTINES

The routines in this section should be performed with the client in the supine position. Sit at the head of the table. Actively check range of motion of the neck before beginning. Lightly lubricate the upper shoulders and the neck.

For all routines, perform general warming of the posterior neck musculature with emphasis on assessment and preliminary contact and release of major muscle groups such as trapezius, posterior cervical group, and suboccipital group. Include mild stretches, mobilization, and good, thorough isolation and loosening of all musculature.

Posterior Cervical Muscles: Trapezius, Semispinalis Capitis, Multifidi/Rotatores, Splenius Capitis/Cervicis



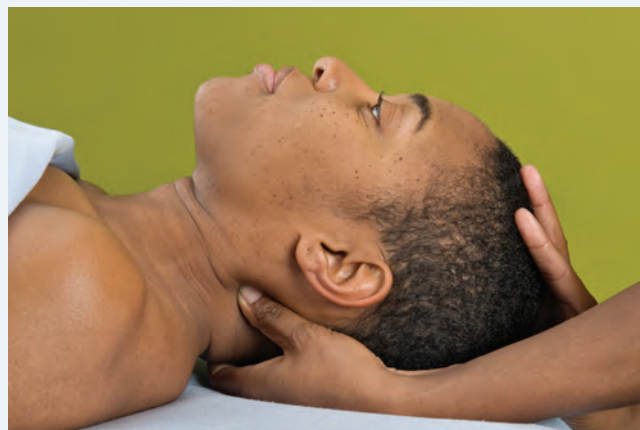
1. Thumb stroke from the occiput to base of the neck, releasing the muscles in the lamina groove area. Begin on one side while stabilizing the client's head with the other hand. Place your thumb adjacent to the spinous process of C1 with fingers cradling the neck. Point the thumb downward toward the base of the neck and proceed with gliding thumb strokes. Begin medially against the spinous processes and move incrementally laterally. Allow a minimum of 10 complete strokes to this area between the spinous and transverse processes. Work superficial to deep incrementally, as well. Allow the thumb to linger on areas of restriction or tenderness as necessary (Routine 5-17).

Note: Allow extension and flexion of the head and the neck to occur, noting the protraction and retraction of the client's chin. It is best to rest the working hand on the table during this movement and remember to keep the thumb straight.

2. Apply transverse friction to tight bands along with ischemic pressure. Use the weight of the client's head and attempt to keep your thumb straight to be able to avoid thumb or wrist strain. The muscles that you are impacting from superficial to deep include the trapezius, splenius capitis/cervicis, semispinalis, multifidi, and rotatores (Routine 5-17).



• ROUTINE 5-16



• ROUTINE 5-17

3. Tight areas can also be isolated with direct thumb pressure and using a positional release method. While engaging tight muscles here, bend the head and the neck into the thumb pressure; hold for release. Proceed into a gentle stretch.

Note: You may also use fingers when your thumb gets tired.

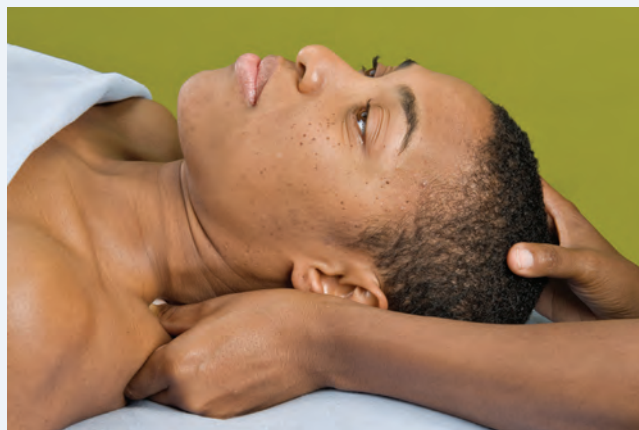
4. To work with the dense tendinous area of splenius capitis and cervicis, place your fingers under the upper trapezius inferior to the neck. Use a thumb anterior to the trapezius and parallel to the transverse processes. Be sure not to press on the posterior scalene. With no pressure applied, rotate the client's head toward the side where the thumb is working, actually placing the head on your working arm, which is lying on the table. This will place the thumb just lateral to the spinous processes and in the pocket that forms on the anterior surface of the trapezius. The thumb is to be pointed at a 45-degree angle across the body, toward the nipple of the opposite breast (Routine 5-18).

5. Apply friction by sweeping in a head to toe direction; then, use trigger point pressure as necessary.

6. When the tissue seems clear, pin the tendons with the thumb while rotating the head in the opposite direction to give a gentle stretch there (Routine 5-19).

Note: Stand at the side of the table.

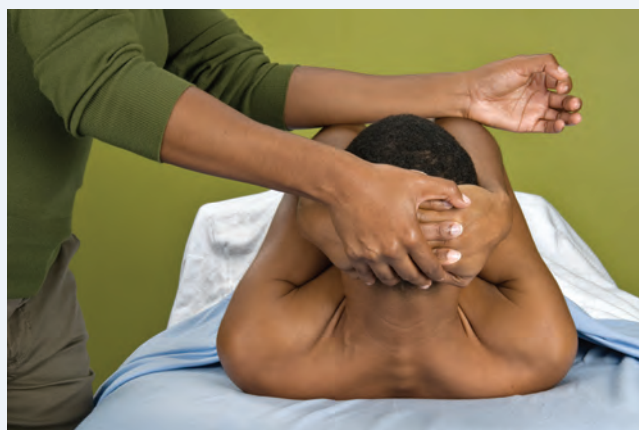
7. Stretch the posterior cervical area by having the client clasp hands behind the head. Flex the client's neck and head by pulling the head up holding the client's hands and then pushing down on both forearms equally (Routine 5-20).



• ROUTINE 5-18



• ROUTINE 5-19



• ROUTINE 5-20

Suboccipitals

Sit at the head of the table. This is a very common area for trigger points. Be sure to warm the muscles thoroughly and be careful with your pressure. Pay attention to tight bands of tissue and referral patterns.

1. Rotate the head away from the side being worked on. Warm the suboccipital area including muscles up to the superior nuchal line. Use circular/transverse friction. Also, release the occipitalis muscle with friction and trigger point pressure.

2. With the head still rotated, position yourself at the corner of the table. Let the client's head rest on the table, stabilizing it with your nonworking hand. Palpate the transverse process of C1, just inferior to the mastoid process (Routine 5-21).

3. Use transverse friction beginning between the occipital ridge and C1 transverse process and moving from lateral to midline. Repeat this same line from medial to lateral using longitudinal friction. Be sure to angle under the occipital ridge to effectively engage the suboccipitals.

4. Repeat this same technique between C1 and C2, working from lateral to midline, and then medial to lateral using both types of frictions.

5. Feel for tight fibers and try to identify the individual suboccipital muscles, using trigger point pressure as necessary.

6. Isolate these muscles with a stretch, placing fingertips on the anterior shoulder in an "X" pattern and allowing the head to rest on your forearms. Lift the head toward the chest while pinning the shoulders to the table (Routine 5-22).



• ROUTINE 5-21



• ROUTINE 5-22

Levator Scapula

1. Isolate the levator scapula using thumb stripping while staying lateral and under the transverse processes. Always work on the posterior aspect of the transverse processes for this, never on the lateral aspect, toward the insertion at the superior angle of the scapulae. Levator lies between the trapezius and scalenes on the posterolateral aspect of the neck. Its insertion is best worked in the prone position.

2. Use transverse friction and trigger point pressure at the origins from C1 to C4 posterior transverse processes.

3. Use fingertips to engage inward under the occipital ridge and provide traction to the skull, both sides at the same time (Routine 5-23).

Note: This is usually done after working both sides of the posterior cervicals. Be sure not to engage the atlas with the points of fingertips. This may project the atlas forward: not a good thing for the client!

Sternocleidomastoid

Lubricate lightly.

1. Warm the muscle by pulling with thumb and finger pressure from the distal attachments toward the mastoid process. Warm both sides at the same time, pulling alternately on each while allowing the head to rock from side to side. This is to be done lightly and should feel very nice to the client. Rotate the head slightly toward the side being worked on to create slack in the muscle belly. Some believe this will also rotate the carotid artery away from pressure applied here (Routine 5-24).

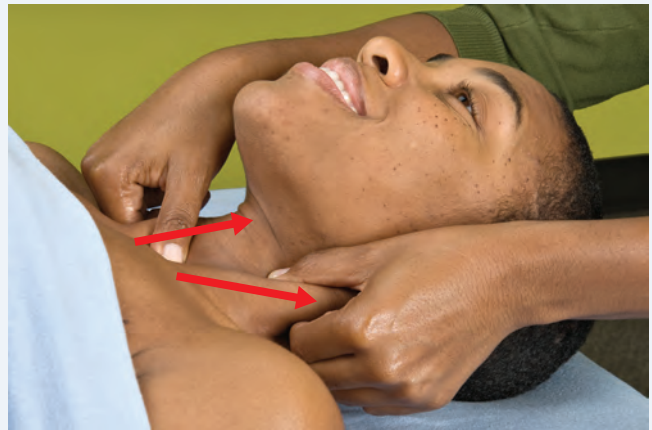
2. Isolate using pincer palpation and hold for myofascial release, working incrementally from the mastoid to the sternum/clavicle. You may have more difficulty grasping the clavicular head, as it is usually tighter. Grasp it between fingers and thumbs just superior to its clavicular attachment and work incrementally up toward the junction of the two heads (Routine 5-25).

3. Rotate the head away from the side being worked. Use transverse and longitudinal friction to the entire mastoid process insertion. This includes the attachments of longissimus capitis and splenius capitis. This is a large area; be sure to be thorough. Bring the head back to a straight position.

4. Friction the clavicular and sternal origin attachments.



• ROUTINE 5-23



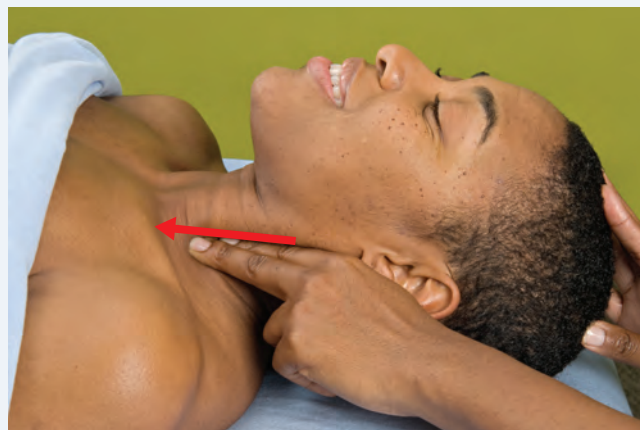
• ROUTINE 5-24



• ROUTINE 5-25

Scalenes

1. Warm and loosen with downward gliding strokes, fingertip friction, and direct pressure. Isolate all three: anterior, middle, and posterior. The anterior scalene is located beneath the sternal portion of the sternocleidomastoid. The middle scalene is lateral to it, whereas the posterior scalene is under the lateral aspect of the clavicle (Routine 5-26).
-
2. Finger strokes downward can easily access attachments behind the clavicle by rotating the head toward the same side while simultaneously applying the finger stroke (Routine 5-27). Stretch into lateral flexion with rotation of the head toward the opposite side while pinning down the attachments on the ribs (Routine 5-28).



• ROUTINE 5-26



• ROUTINE 5-27



• ROUTINE 5-28

3. Use deeper thumb strokes and friction to the bellies and along the vertebral attachments. Use any trigger point pressure necessary along the way. Stretch by using lateral flexion combined with rotation to the opposite side (Routine 5-29).

4. Repeat the technique on the other side. Recheck the range of motion.

Suprahyoids, Anterior Suboccipitals, Longus Capitis, Longus Colli



Stand at the side of the table facing the head.

1. Using your inferior hand, stabilize the hyoid bone. You will be working on the side closest to you. Stabilize the hyoid bone by placing the index finger of your inferior hand on the lateral side of the bone on the opposite side from where you are working (Routine 5-30).

2. Using medial-to-lateral friction with the other index finger, work along the superior aspect of the hyoid bone to affect the suprahyoids at their attachment (Routine 5-30).

3. Using your inferior hand, displace the hyoid bone, esophagus, and trachea away from the side being worked on. You will be working on the side closest to you. This is done easily by using the flat of the length of your thumb, bringing extra skin over first so not to stretch the superficial tissue through which you will be working. Slightly lift the hyoid bone and thyroid cartilage with the thumb first before displacing laterally. This is a flexible tube and will move easily. If you hear a noise, you did not lift enough prior to displacement (Routine 5-31).



• ROUTINE 5-29



• ROUTINE 5-30



• ROUTINE 5-31

- Place the superior index finger midway between the chin and the angle of the jaw, pointing at a 45-degree angle toward the client's nose. Push in as close to the occiput as comfortably possible. Your pressure should be angled toward the client's nose and down toward the table at the same time to affect rectus capitis anterior and the origin of longus capitis (Routine 5-32).

- Using medial-to-lateral sweeps ONLY, approximately 1 inch in width, work the rectus capitis anterior and longus capitis with friction. Now apply trigger point pressure.

- Instruct the client to turn her head slightly toward you while you feel the rectus capitis lateralis contract on the side of your finger. Move your finger to that point (Routine 5-33).

- Apply friction and trigger point pressure.

- Now begin to friction, again from medial to lateral and back, while working in an inferior direction down the anterior neck. Friction to longus colli and longus capitis is to be done from the midline of the neck out to over the transverse processes (Routine 5-34).

- Apply trigger point pressure to any trigger points found along the way (Routine 5-34).

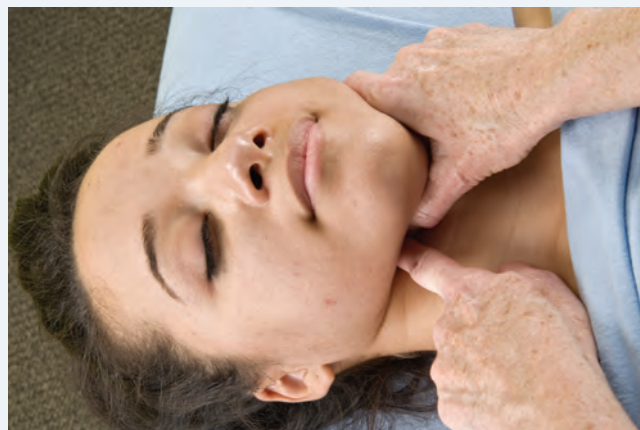
Note: Be careful not to stimulate the cough reflex near the manubrium; also, avoid pressing on any bone spurs or sharp aspects of the transverse processes. If you feel a definite pulse under your finger, move over so you are not pressing on it.

- After working on the other side of the neck, sit at the head of the table and apply an occipital vault and then gentle traction to complete.

Masseter

Stand at the side of the table, facing the head. Place a surgical glove on your inferior hand.

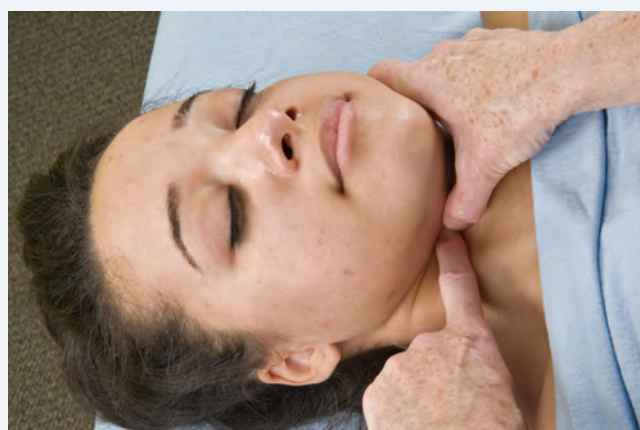
- Check your client's range of motion by seeing how many knuckles she can place between her teeth.



• ROUTINE 5-32



• ROUTINE 5-33



• ROUTINE 5-34

2. Support the outside portion of the masseter with the flat of your superior hand. With the index finger of your inferior hand, muscle strip the medial, or inner aspect, of the masseter, moving from superior by the zygomatic arch to the inferior attachment at the mandible (Routine 5-35).

3. Isolate the deep portion of the masseter by having the client clench her teeth. This should pinch your finger and possibly move it out of the area. Have the client relax her jaw, and then reidentify the muscle fibers and apply a pincer compression using the index finger and thumb of your inferior hand. The thumb will be on the outside of her cheek. Work the entire length of the muscle thoroughly.

4. Now muscle strip along the inferior aspect of the zygomatic arch from anterior to posterior, working the attachment of the masseter there. Use trigger point pressure to any tender areas or trigger points (Routine 5-36).

Medial Pterygoid

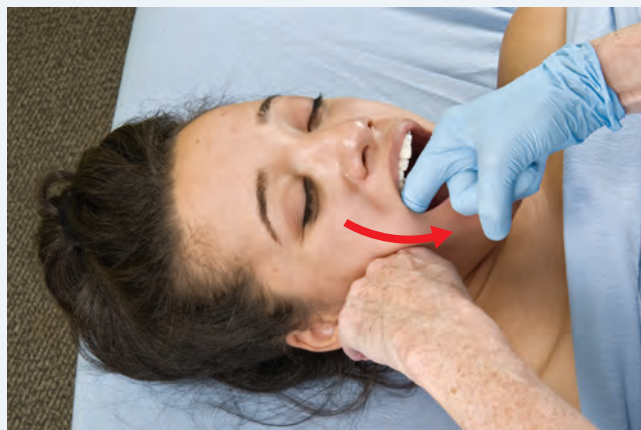
Stand at the side of the table, facing the head. Place a surgical glove on your inferior hand.

1. Ask the client to open her mouth as far as possible. Place your inferior index finger on the medial surface of the upper molars and glide your finger posteriorly until it contacts the medial pterygoid between the upper and lower molars (Routine 5-37).
2. Now glide your finger superiorly on the medial pterygoid until it contacts the medial surface of the lateral pterygoid plate and palatine bone. Press into the origin there for a few seconds and allow for a myofascial release to take place.
3. Now glide your finger down the muscle toward the lower molars (inferiorly and posteriorly) until the medial surface of the mandible and its angle is reached. Repeat this several times, or as much as can be tolerated by your client.

Lateral Pterygoid

Stand at the side of the table, facing the head. Place a surgical glove on your inferior hand.

1. Ask the client to shift her mandible laterally toward you, creating space to palpate the lateral pterygoid.



• ROUTINE 5-35



• ROUTINE 5-36



• ROUTINE 5-37

2. Glide your inferior index finger along the lateral surface of the upper molars as far superiorly and posteriorly as possible. Give some very gentle friction there; it should feel as if there is a tiny pocket at the tip of your finger. After applying friction, press into the muscle to allow for a myofascial release.

Suprahyoid and Infrahyoid Muscles

Stand at the side of the table, facing the head. Place a surgical glove on your inferior hand.

1. Using your inferior index finger, glide on the upper surface of the opposite half of the tongue using a hooking action. Begin as far back on the tongue as you can and glide forward. Attempt to reach the rough ridges on the back of the tongue, and then flex your finger pressing into the superior surface as you pull toward the tip of the tongue. Apply this five to eight times, as tolerated.

2. Now use your same index finger in the same way, but this time to the lateral surface of the opposite side of the tongue. Again, five to eight times, as tolerated.

3. Now use your same index finger again this way, but this time to the inferior surface of the opposite side of the tongue. As above, five to eight times.

4. To treat the mandibular origins of the suprahyoids, support the tissues externally by placing the tips of your fingers (superior hand—the one without the glove) on the midline of the inferior aspect of the mandible from the outside of the mouth (under the chin). Insert your inferior index finger at the midline of the mandible inside the mouth, at the frenulum of the tongue. Use 1-inch wide friction movements, side to side, while compressing the suprahyoid muscles against the tips of your external fingers. Begin at the midline under the tongue and move laterally and posteriorly on the side you are standing. Work incrementally back toward the angle of the mandible, staying on those tissues until they soften. This treats the mandibular attachments of the suprahyoids and both bellies of the digastric (Routine 5-38).

5. Repeat this work on the other side of your client.

6. Have the client recheck the range of motion using knuckles. Can she get more knuckles between her upper and lower teeth?



• ROUTINE 5-38

Case Study 5-1

• Gary: A Client with Posterior Neck Pain, Vertigo, and Tinnitus

Background

Gary had been a client for many years, receiving weekly maintenance sports massage to maintain a high level of health. Gary worked out heavily 6 d/wk with free weights and machines. One day, he showed up for his regularly scheduled massage therapy appointment looking a bit pale and walking slowly and deliberately. When his massage therapist asked about this, Gary stated that 2 days earlier he had woken up very dizzy and felt quite nauseous whenever he moved. He had gone to see his doctor and had been prescribed medication to keep him feeling less dizzy and queasy.

Treatment

The massage therapist explained how there could be trigger points set up in his anterior cervical muscles causing dizziness and that the dizziness could be causing the nausea. He agreed to have neck and upper shoulder work that day, rather than his usual maintenance work.

After loosening his upper and mid trapezius, the therapist spent a few minutes loosening the musculature in the lamina groove of his cervical area with a focus to his posterior suboccipitals. This area was quite tight, giving the impression that he was straining with his neck when he was working out with the machines and weights. Upon questioning him regarding his workout form, he agreed that was probably what he had been doing.

Gary assumed the supine position, and the therapist focused on his anterior cervical muscles. She found referrals of dizziness in the more superficial muscles and was able to clear the trigger points. The tinnitus continued, however. She then

worked specifically with the deeper muscles by displacing the hyoid bone and trachea laterally.

Upon palpation of the more medial fibers at C3 to C5 bilaterally, the therapist found trigger points that Gary described as feeling like an ice pick was being jabbed into his ear. The therapist worked to release these trigger points fairly successfully during this initial session.

Gary felt better, but there was still a bit of ringing in his ears for the next 2 weeks. The anterior neck work was incorporated into his regular maintenance massage for the next two sessions to complete the relief of the tinnitus.

Gary had not been working out for 3 weeks, but went back to it upon complete relief of the tinnitus. Per the therapist's suggestion, he employed a personal trainer for a few weeks to help him use proper body mechanics for his workouts with a focus to how he was holding/using his neck.

Critical Thinking Questions

1. Why would the massage therapist think there could be trigger points causing nausea and tinnitus?
2. Which muscles would you have checked when looking for trigger points into the ear?
3. How could poor body mechanics when working out cause trigger points to set into the anterior cervical muscles?
4. Had there been excessive posterior neck pain as well, would working on the anterior cervical muscles help this, and why?
5. Without the help of a personal trainer, do you think that Gary would have been able to continue his workouts without setting the trigger points back into his neck?

Case Study 5-2

• **Mark:** A Hockey Player with Head and Neck Pain

Background

Mark is a hockey player. He has played hockey since age 6. He has suffered five concussions: the first at age 15 playing hockey in high school and the fifth during his fourth and final year of playing professionally. He now coaches and plays regularly with a professional alumni team.

During his sophomore year in high school, Mark was diagnosed as having several subluxed vertebrae. He was given strengthening exercises to help change that condition. His neck hurt everywhere at that point. He was very consistent about doing the exercises and was able to change his condition in a few months during the summer, so he could continue playing hockey. He then began to regularly work out using machines and free weights for strengthening in general.

At age 49, Mark realized that his posterior neck and head hurt all of the time. He was doing a lot of traveling for business and having to carry a bag full of files along with his carry-on baggage through airports, often running to catch his flight. He felt this was the cause of the neck pain and headaches.

Treatment

Mark began receiving neuromuscular therapy whenever he was at home. Mark's therapist worked with him from his iliac crests up to and on to his occiput and mastoid processes beginning superficially. The therapist also worked with Mark's

anterior cervical muscles in the same manner. As the superficial tissues softened, the therapist began to work layer by layer into the deeper tissues. At each session, Mark's fascia and muscles were regaining integrity regarding pliability and flexibility, and trigger points were fading.

By the third session, Mark was able to report that he was beginning to sleep again, but was still waking up often during the night and still felt pain in his head and neck, but less. By the fifth session, he was no longer waking up during the night and no longer had headaches. By the sixth session Mark reported he no longer felt pain in his neck.

Critical Thinking Questions

1. Why would the therapist work with Mark's lower back muscles when his pain was in his head and neck?
2. Which lower back muscle specifically would be important to work with?
3. Why was it important to work with the more superficial muscles before getting deeper?
4. Which muscles were important to work with on the occiput and mastoid process?
5. Which muscles are usually responsible for headaches?
6. Would it be important to work both the anterior and posterior cervical muscles; why?

► REVIEW QUESTIONS

Short Answer Questions

1. How is soft tissue compromised in a whiplash injury?
2. Describe the condition named torticollis.
3. Which muscle may be entrapping the supraorbital nerve?
4. What causes TMJ syndrome/dysfunction?
5. If one has Eagle syndrome, what symptoms might he experience?

Multiple Choice Questions

6. Which cervical muscles attach to the occipital ridge and/or mastoid process?
 - A. Upper trapezius, rectus capitis posterior major and minor, semispinalis capitis, splenius cervicis
 - B. Sternocleidomastoid, rectus capitis anterior, obliquus capitis superior, upper trapezius
 - C. Obliquus capitis superior and inferior, sternocleidomastoid, splenius capitis
 - D. All of the above
7. At which joint does most of cervical rotation occur?
 - A. C2–C3
 - B. C5–C6
 - C. C6–T1
 - D. None of the above
8. The brachial plexus emerges from between which two muscles?
 - A. Anterior and middle scalenes
 - B. Posterior scalene and pectoralis minor
 - C. Pectoralis major and pectoralis minor
 - D. Middle and posterior scalene
9. Which neck muscles refer sensation to the eye or the forehead?
 - A. Splenius capitis, lower trapezius, levator scapula
 - B. Levator scapula, scalenes, middle trapezius
 - C. Upper trapezius, sternocleidomastoid, suboccipitals
 - D. All of the above
10. Which muscle makes up the majority of the bulk running parallel to the cervical spine?
 - A. Semispinalis capitis
 - B. Levator scapula
 - C. Splenius capitis
 - D. None of the above

True/False

11. The sternal division of sternocleidomastoid is usually tighter than the other.
12. Travell and Simons labeled the splenii muscles “the stiff neck” muscles.
13. Splenius capitis trigger points can produce a “dome headache.”
14. The galea aponeurotica is an attachment site for both the occipitalis and frontalis muscles.
15. Holding a phone to the ear using the shoulder can activate trigger points in the levator scapula muscle.

Matching

- | | | |
|----------------|-----------------|-------------------|
| a. Bilateral | d. Tinnitus | g. Eagle syndrome |
| b. Ipsilateral | e. Hypoesthesia | h. Glaucoma |
| c. Unilateral | f. Dysesthesia | i. Lamina groove |
16. A dulled sensitivity to touch.
 17. A condition that includes having an elongated styloid process causing mechanical irritation to certain muscles.
 18. Related to the same side of the body.
 19. The area that lies between the spinous and transverse processes.
 20. A ringing sound in the ears.

REFERENCES

1. Menachem A, Kaplan O, Dekel S. Levator scapulae syndrome: an anatomic-clinical study. *Bull Hosp Joint Dis.* 1993;53(1):21–24.
2. Sola AE, Rodenberger ML, Gettys BB. Incidence of hypersensitive areas in posterior shoulder muscles. *Am J Phys Med Rehabil.* 1955;34:585–590.
3. Sola AE, Kuitert JH. Myofascial trigger point pain in the neck and shoulder girdle. *Northwest Med.* 1955;54:980–984.
4. Jaeger B. Are “cervicogenic” headaches due to myofascial pain and cervical spine dysfunction? *Cephalalgia.* 1989;9:157–164.

