

Treating Trigger Points Home Study Course

1 CE Hour

Text, Examination, and Course Guide

Presented by the:

Center for Massage Therapy Continuing Education

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Instructions for the Treating Trigger Points home study course

Thank you for investing in the Treating Trigger Points home study course, a 1 CE hour course designed to further your knowledge in the principles and practice of treating clients with signs and symptoms myofascial trigger points. This guide will contain all of the instructions you will need to complete this course. This is a 1 CE hour course, so that means it should take you approximately 1 hour to read the text and complete the multiple choice exam and course evaluation.

The following are steps to follow in completing this course:

- 1. Read and review the exam and text in this file. The exam is provided for review before testing online and is the same as the online exam.**
- 2. When you are ready to test online, access the online examination by logging in to your account at <https://www.massagetherapyceu.com/login.php>.**
- 3. Complete your examination and print your certificate. The exam is open book and there is no time limit for completion.**

You must pass the exam with a 70% or better to pass this home study course. You are allowed to access and take the exam up to 3 times if needed. There is no time limit when taking the exam. Feel free to review the text while taking the test. This course uses the text *Myofascial Trigger Points, an excerpt from Condition-Specific Massage*, by Celia Bucci. All of the answers can be found in the text. It is advised to answer the exam questions in the study guide before testing online. That way, when you are testing you do not have to go back and forth through the online exam.

If you have any questions please feel free to contact us at 866-784-5940, 712-490-8245, or info@massagetherapyceu.com. Most state boards require that you keep your “proof of completion” certificates for at least four years in case of audit. Thank you for taking our Treating Trigger Points home study course.

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It is the responsibility of the practitioner to determine the appropriateness of the techniques presented in terms within the scope of practice. This information is in no way meant to diagnose or treat medical conditions. Written medical opinions are always the best way to resolve any questions regarding contra-indications to or advanced treatment of myofascial trigger points.

Treating Trigger Points Exam

1. What is a myofascial trigger point?
 - a. A spot in a joint capsule that shows evidence of an excessive, prolonged response to stimuli
 - b. A spot in skeletal tissue that shows evidence of an excessive, prolonged response to stimuli
 - c. A spot in a skeletal muscle that shows evidence of an acute injury in response to an injury
 - d. A spot in a skeletal muscle that shows evidence of an excessive, prolonged response to stimuli
2. Which of the following is a primary contributing factor to the development of trigger points?
 - a. Mechanical overload of a muscle, whether by acute incident or repetitive misuse
 - b. Congenital factors such as single gene defects or chromosomal disorders
 - c. Environmental factors such as nutrient deficiencies
 - d. Pregnancy
3. In which of the following stages of injury is a trigger point best treated?
 - a. Acute stage
 - b. Grade 3 sprain
 - c. Grade 3 strain
 - d. Subacute or chronic
4. Resisted range of motion (ROM) tests are used to assess:
 - a. The full ROM of the joint
 - b. The strength of the affected muscle
 - c. The client's pain-free range of motion for a joint
 - d. For restrictions and scar tissue
5. Place the muscle in a _____ position when palpating for trigger points.
 - a. Fully stretched and abnormally lengthened
 - b. Fully contracted and comfortably shortened
 - c. Fully relaxed and comfortably lengthened
 - d. Fully relaxed and comfortably shortened
6. All of the following are methods for treating trigger points EXCEPT:
 - a. Vapocoolant spray
 - b. Moist heat
 - c. Shortening
 - d. Muscle energy techniques
7. When palpating a taut band for a trigger point, which of the following is a good general rule?
 - a. Take 6 seconds to palpate 1 inch of muscle
 - b. Take 4 seconds to palpate 1 inch of muscle
 - c. Take 3 seconds to palpate 1 inch of muscle
 - d. Take 2 seconds to palpate 1 inch of muscle

8. If you hold the compression for 10–20 seconds and the trigger point does not release, what is the best next step?
 - a. Follow with lengthening strokes and Swedish techniques to the surrounding area but do not return to the area to apply another round of compression
 - b. Follow with lengthening strokes and Swedish techniques to the surrounding area and then return to the area, applying a few short rounds of compression followed by lengthening
 - c. Refer the client to their primary care physician
 - d. Continue to hold the compression for up to 5 minutes and wait for it to release, then apply a slow, passive stretch

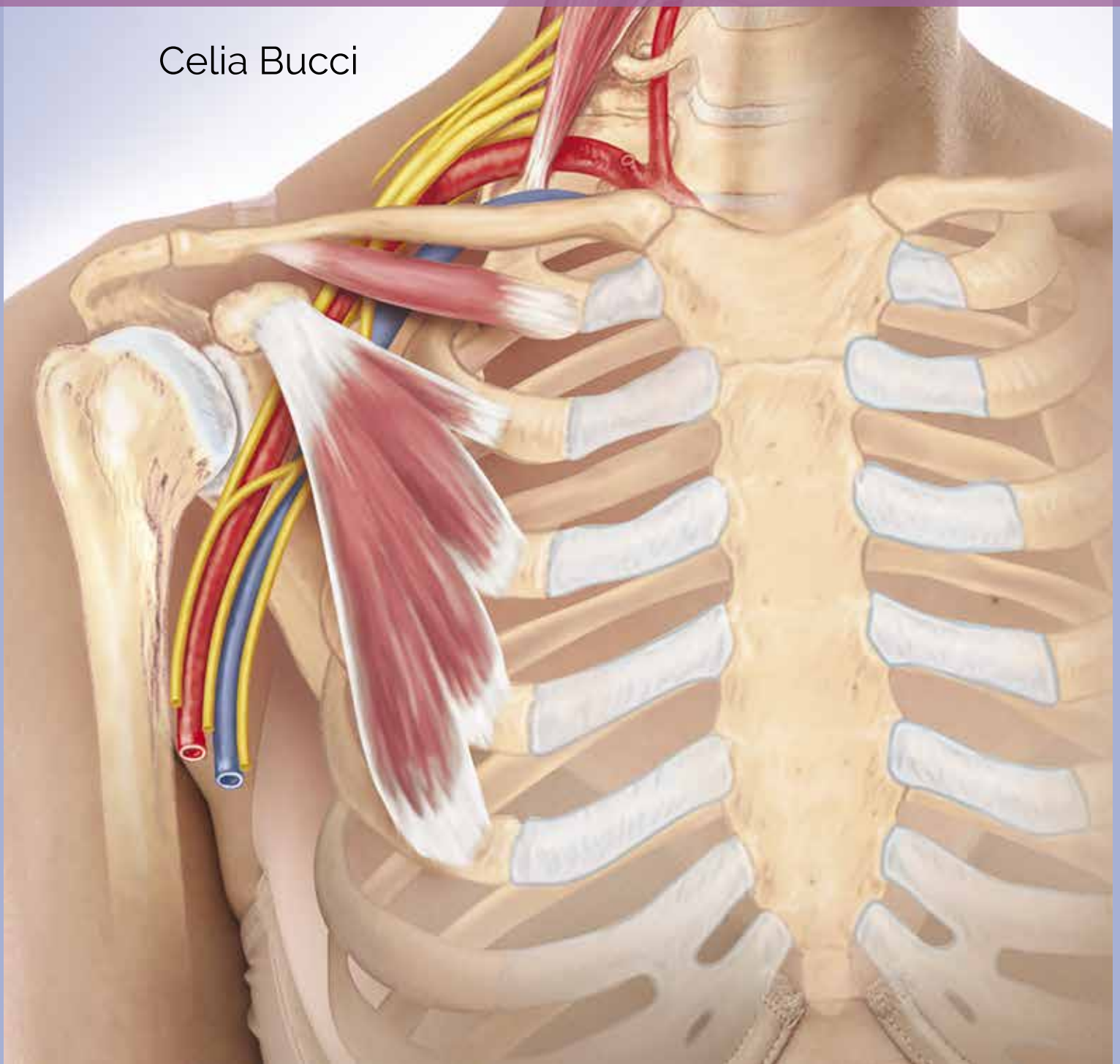
9. All of the following are self-care activities you can instruct your client to perform EXCEPT:
 - a. Encourage the client not to take regular breaks from stationary postures or repetitive actions
 - b. Demonstrate gentle self-massage of the muscles containing trigger points to keep adhesions and hypertonicity at bay between treatments
 - c. Instruct the client to follow self-massage and moist heat with a full passive stretch
 - d. Demonstrate all strengthening exercises and stretches to your client and have him or her perform these in your presence before leaving to ensure that he or she is performing them correctly and will not harm himself or herself when practicing alone

This completes the Treating Trigger Points exam. Proceed to the next page to view the text.

Condition Specific Massage Therapy

SECOND EDITION

Celia Bucci



Chapter 3:

Myofascial Trigger Points

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Myofascial Trigger Points

Understanding Myofascial Trigger Points

There has been much recent research into myofascial trigger points. While this research continues to investigate theories about them, to date, there is no single agreed-upon explanation for the pathophysiology of trigger points and no universally accepted diagnostic criteria. *Myofascial Pain and Dysfunction: The Trigger Point Manual* by Simons and Travell (1999) is a seminal resource for the study of trigger points and is a primary source of information in this book. This chapter presents an overview of myofascial trigger points, their contribution to chronic pain, and the role massage therapy can play in relieving the symptoms they cause. Many continuing education offerings focus on the finer details of trigger point therapy for those interested in advanced training.

Trigger points may be found in epithelial tissue, connective tissue, nerves and muscles. Trigger points in muscles and fascia are called myofascial trigger points, and these will be the focus of this chapter. The term *trigger point* is used throughout this text to refer to myofascial trigger points.

A myofascial trigger point is a spot in a skeletal muscle that shows evidence of an excessive, prolonged response to stimuli. The spot is palpated as a nodule within a taut band of muscle fibers (Fig. 1). Trigger points refer pain to a location distant from the nodule in predictable patterns. When chronic pain is not relieved by manual manipulation of the symptomatic area, it is possible that the pain is referred from a trigger point in another area. For example, a trigger point in gluteus medius often refers pain down the lateral leg and calf (Fig. 2). Trigger points can also cause other referred reactions including spasm; dilation or contraction of blood vessels; or secretion of fluids, such as tears or saliva, and can cause the referred inhibition of another muscle.

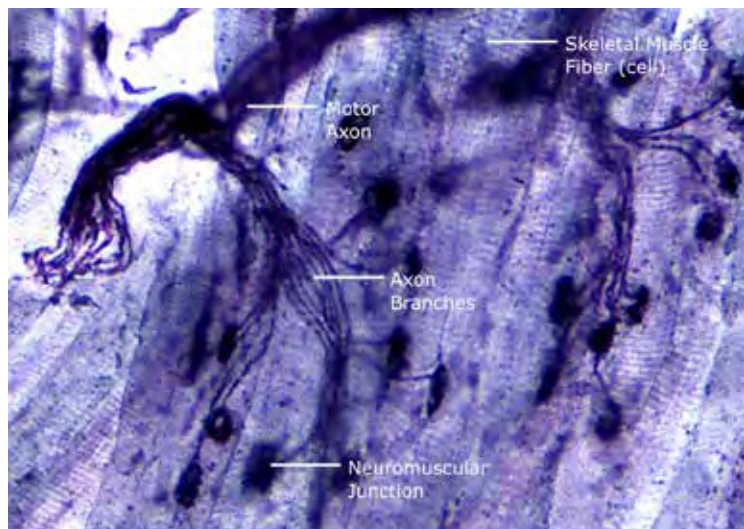


Figure 3-1 Myofascial trigger point. A myofascial trigger point is a hyperirritable spot in a skeletal muscle palpated as a nodule within a taut band of muscle fibers.



Figure 3-2 Referred pain. Trigger points refer pain into areas distant from the nodule.

Figure 3-3 Neuromuscular junction.
Nerves meet the muscle at the motor endplate to form a neuromuscular junction.



Trigger points are frequently found at the neuromuscular junction. The neuromuscular junction is the site of synaptic contact between the motor neuron and muscle fibers, where an action potential spreads from nerve to muscle to initiate a contraction (Fig. 3). In most human muscles, the neuromuscular junction occurs in the middle of the muscle fiber. At the neuromuscular junction, a synapse depends on the presence of the neurotransmitter acetylcholine (ACh), which is released locally to activate only those fibers recruited to produce a contraction. In a normal muscle contraction, the production, use, and breakdown of ACh happens quickly, limiting the duration of the contraction as well as the energy required for this process. The contracted muscle fibers are quickly released and are ready to respond to another action potential.

Circumstances including injuries, overuse, misuse, or systemic conditions can cause dysfunction at the neuromuscular junction, which results in a sustained contraction of the affected muscle fibers, creating the contraction knot we call a trigger point. The sustained contraction initiates a cycle that perpetuates the contraction through a number of actions that may occur in variable order:

- Metabolic demand is increased because the sustained contraction requires energy.
- The contraction knot reduces circulation and the supply of oxygen and nutrients needed to meet the metabolic demand while promoting the accumulation of metabolic waste products that disturb local nociceptors and cause pain.
- Reduced circulation and increased metabolic demand depletes adenosine triphosphate (ATP) locally, which prevents the inhibition of ACh release and impairs the function of the pump that returns calcium to the sarcoplasmic reticulum.
- The continual imbalance of calcium, ACh, and ATP sustains the contraction.
- The sustained contraction shortens muscle fibers and reduces their action potential, both of which affect the function of the muscle as a whole.

Studies suggest that a trigger point is actually a mass containing many dysfunctional motor endplates. Biopsies from cadavers have revealed that the diameter of the shortened muscle fibers containing trigger points is considerably greater than the diameter of healthy muscle fibers. This makes the knot feel bigger and denser than the healthy tissue around it. A taut band may occur because the contraction pulls fibers toward the knot, leaving them taut on either side of the knot (Fig. 4). The degree of dysfunction and irritability in the trigger point influences the intensity of pain more than the size of the muscle does. Active trigger points in small, minor muscles are just as likely to cause severe pain as trigger points in big, major muscles.

Trigger points are categorized as active, latent, or satellite. An *active trigger point* causes symptoms with normal activities of daily living and at rest. The referred sensation elicited by compressing an active trigger

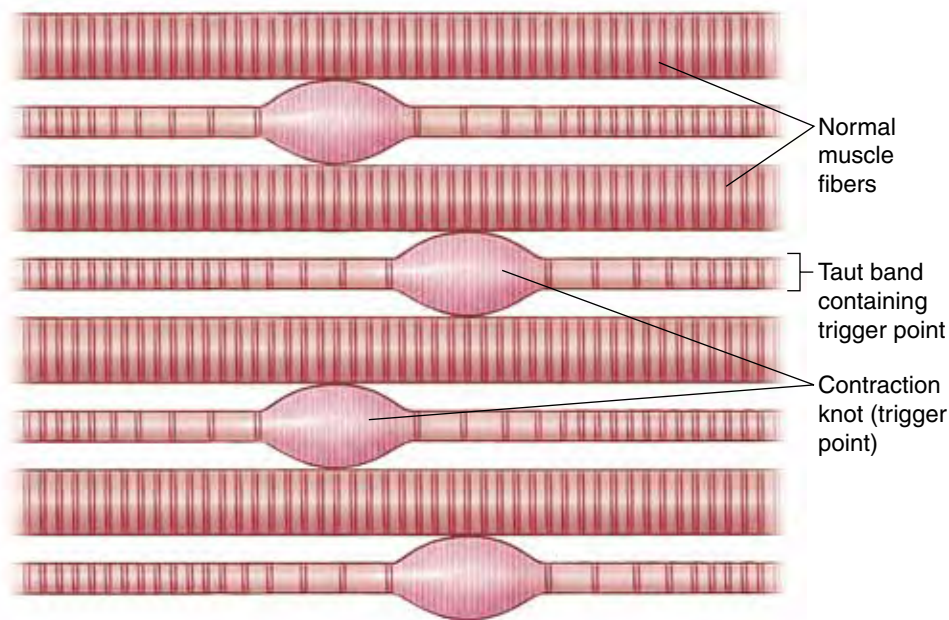


Figure 3-4 Taut band of muscle. Note how the contraction knot increases tension on either side of the knot, pulling the affected fibers taut and making them thinner.

point will likely replicate the client’s pain during daily life (i.e., the client will be familiar with this sensation). A *latent trigger point* is painful only on compression. While it is also found within a taut band of muscle and produces referred sensation that is characteristic for that trigger point, a latent trigger point does not cause pain during activities of daily living or rest, and the referral elicited by compression may not be familiar to the client. A latent trigger point can become active with overuse or other irritating factors. A *satellite trigger point* is one that develops within the referral area of an active trigger point, in an overloaded synergist, or in the antagonist of the muscle containing a trigger point. Satellite trigger points are often deactivated when the primary trigger point that induced it is deactivated.

COMMON SIGNS AND SYMPTOMS

Clients with trigger points often initially report pain in a general area. For example, a trigger point in the scalenes may refer pain around the medial aspect of the scapula, which the client will often call neck or shoulder pain. Trigger points rarely produce sharp or easily localized pain unless the point is directly compressed. Symptoms such as numbness, tingling, or prickling are sometimes reported. Compression of a trigger point causes predictable, referred pain or tenderness in an area either surrounding or distant from the trigger point. Active trigger points produce pain with activity, while at rest, and when compressed. The pain may be felt at the site of the trigger point or in its referral zone. Reducing the factors that contribute to an active trigger point can cause it to become latent, but it can become active again when improper use of the affected muscle or involvement of another factor aggravates it. Referred pain can become chronic unless the active trigger point is deactivated. Chronic, painful trigger points can disturb sleep. Lack of sleep can consequently increase sensitivity to pain, exacerbating symptoms. A break in this cycle is necessary to relieve the chronic condition.

It may be difficult for the client to relax a muscle containing a trigger point. Muscle tension, hypertonicity, and spasm may develop in muscles containing active or latent trigger points. This may cause the client to perform actions clumsily. Affected muscles may be short and tense, may fatigue quickly, and may not lengthen fully without pain. Pain may be worse with passive lengthening than with an active contraction because the client will limit active motions to avoid pain. Limiting the function of the prime mover containing a trigger point can lead to overloading of its synergists and antagonists, which may

in turn cause trigger points to develop in those muscles. Reflex inhibition caused by trigger points may lead to weakness in muscles that show no sign of atrophy. Clients may be less aware of the dysfunction caused by trigger points than they are of pain.

Referred autonomic phenomena including dilation or constriction of blood vessels, changes in local temperature, sweating, goose bumps, and production of tears or saliva may be caused by trigger points. Proprioceptive irregularities including dizziness, ringing in the ears, and problems maintaining balance may also result from trigger points in some muscles. Strumming a taut band at the site of a trigger point may shorten the affected fibers, eliciting a local twitch response. This twitch response, which feels like a quick flutter of the muscle fibers, is often used as a diagnostic criterion for assessing trigger points.

POSSIBLE CAUSES AND CONTRIBUTING FACTORS

Mechanical overload of a muscle, whether by acute incident or repetitive misuse, is a primary contributing factor to the development of trigger points. Active trigger points in muscles that are held in a shortened position will cause pain in the area of the trigger point or its referral zone. Latent trigger points in muscles that are regularly held in a shortened position may become active. Muscle contraction, particularly from the shortened position or against resistance, aggravates trigger points.

Muscles that are shortened due to postural imbalance are prone to developing trigger points. Postures that hold affected muscles in a shortened position, such as during sleep, sitting at a desk or in a car, or holding other inactive postures, may exacerbate pain. Actively lengthening a muscle containing a trigger point shortens its antagonist. Performing this stretch too quickly or forcefully can activate a trigger point in the antagonist. People who exercise their muscles daily are less likely to develop trigger points than those who are generally sedentary but occasionally participate in short bouts of intense activity.

Chilling a muscle, whether directly when using an ice pack or indirectly, such as when sitting near an air conditioning vent, may activate a trigger point. Compression of muscles by external forces, such as the strap of a bag or a utility belt, may contribute to the development or activation of trigger points. Nerve compression may encourage the development of trigger points in the muscles it innervates. Pathologies including organ insufficiency and inflammatory conditions such as arthritis can activate trigger points. Trauma, fatigue, and physical or emotional stress can also activate and perpetuate the symptoms of trigger points.

Conditions that affect metabolic, endocrine, or chemical homeostasis including thyroid conditions, diabetes, gout, and clinical depression can be perpetuating factors. Deficiency in vitamins or minerals including B, C, folic acid, magnesium, calcium, and iron can contribute to or delay the healing process of trigger points. Chronic bacterial or viral infections and some allergies may lead to chronic trigger points. Regular exposure to toxic chemicals, such as those in environmental pollution and pesticides, or heavy metals, such as mercury, may also play a role.

Most of the conditions described in this book will likely involve trigger points because the postures or traumas that contribute to these conditions can also contribute to the development of trigger points. Deactivating trigger points that contribute to these conditions is often necessary to fully resolve the signs and symptoms associated with them.

Because trigger points can occur in any muscle and are perpetuated by factors that include chronic infections and visceral disease, they can contribute to and be confused with many other conditions throughout the body. For example, pain in the pectoral area may result from a trigger point but can also be a symptom of cardiac disease, while trigger points in the abdominal muscles can mimic as well as contribute to digestive distress. Travell and Simons suggest that trigger points may contribute to a wide variety of chronic conditions to a much greater degree than is currently recognized by health care professionals. Table 1 lists some of the general conditions commonly confused with or contributing to trigger points. Because it may be difficult to distinguish pain referred by a trigger point from pain that results from a more serious condition, it is particularly important to

Table 3-1: Differentiating Conditions Commonly Confused with or Contributing to Trigger Points

CONDITION	TYPICAL SIGNS & SYMPTOMS	TESTING	MASSAGE THERAPY
Myofascial pain syndrome	<p>Persistent muscle aches or pain</p> <p>Muscle or joint stiffness</p> <p>Muscle tension</p> <p>Trigger points</p> <p>Pain interrupts sleep</p>	<p>Physical exam</p> <p>Palpate for trigger points</p> <p>Referred pain or twitch response</p> <p>Other tests may be performed to rule out other sources of pain</p>	<p>Massage therapy is indicated.</p>
Fibromyalgia	<p>Constant, dull, widespread aching or pain</p> <p>Tender points</p> <p>Fatigue</p> <p>Sleep disturbances</p> <p>Signs and symptoms of possible coexisting conditions including chronic fatigue syndrome, depression, headaches, irritable bowel syndrome, and post-traumatic stress disorder</p>	<p>Physical exam</p> <p>Pain lasting at least 3 months</p> <p>11 of 18 points positive for tenderness</p> <p>Blood tests to rule out other conditions</p>	<p>Massage is indicated. It is important to distinguish the tender points of fibromyalgia from trigger points that refer pain elsewhere. Fibromyalgia is often exacerbated by deep pressure and may require a soft touch.</p>
Angina Pectoris	<p>Chest pain</p> <p>Pain in arms, neck, jaw, shoulder, or back</p> <p>Nausea</p> <p>Fatigue</p> <p>Shortness of breath</p> <p>Anxiety</p> <p>Sweating</p>	<p>Physical exam</p> <p>Risk factors</p> <p>Blood test</p> <p>Electrocardiogram</p> <p>Stress test</p> <p>Chest x-ray</p> <p>Echocardiogram</p> <p>CT scan</p>	<p>Trigger points in pectoralis major may mimic some symptoms of angina pectoris. If the client presents with risk factors or the symptoms listed here, refer them to a health care provider prior to treatment. When risk factors are present, massage is indicated only if cleared by a primary health care provider and if the client is able to perform normal activities of daily living.</p>
Migraine	<p>Episodic or chronic</p> <p>Moderate or severe</p> <p>Often unilateral</p> <p>Pulsating or throbbing</p> <p>Aggravated by physical activity</p> <p>Aura, nausea, vomiting, sensitivity to light and sound</p>	<p>Diagnosed by signs and symptoms, familial history, and response to treatment</p> <p>MRI or CT to rule out other causes</p> <p>EEG to rule out seizures</p>	<p>Trigger points in SCM, temporalis, and the posterior cervical muscles may mimic the symptoms of migraines.</p> <p>Massage may not be appropriate during a migraine but may reduce intensity and frequency when performed regularly between headaches.</p>
Tension headache	<p>Dull, aching, vice-like pain</p> <p>Pain in neck and shoulders</p> <p>Scalp tenderness</p> <p>Loss of appetite</p> <p>Fatigue</p> <p>Insomnia</p> <p>Mood changes</p> <p>Trouble concentrating</p>	<p>Often self-assessed</p> <p>Physical exam</p> <p>Blood tests, CT, or MRI to rule out other conditions</p>	<p>Massage is indicated. See Ch. 5. Trigger points in the SCM, muscles of mastication, posterior cervical muscles, suboccipitals, and upper trapezius may contribute to tension headaches.</p>

Table 3-1: Differentiating Conditions Commonly Confused with or Contributing to Trigger Points (continued)

CONDITION	TYPICAL SIGNS & SYMPTOMS	TESTING	MASSAGE THERAPY
Dysmenorrhea (severe menstrual cramps)	Throbbing or cramping in low abdomen Pain radiating to back and thighs Nausea Dizziness	Assessed only when cramps are severe enough to disrupt activities of daily living, suggesting other contributing factors Ultrasound CT or MRI Laparoscopy	Trigger points in the lower rectus abdominis can mimic the pain of dysmenorrhea. It is best to wait until the menstrual cycle is over and swelling and tenderness in the abdomen have subsided before assessing and treating trigger points.
Earache and tinnitus	Ear pain Ringing in ears Hearing loss Fever Irritability	Physical exam of ear, mastoid, nose, and throat	Pain in or around the ear and mastoid may indicate infection. Massage is contraindicated until infection is resolved. Trigger points in the deep masseter can cause earache or tinnitus. Trigger points in the lateral pterygoid and SCM may also cause tinnitus.
Temporomandibular joint disorder (TMJD)	Pain in the jaw, face, ears, or neck Stiffness in jaw Difficulty chewing Reduced ROM Locking of jaw Clicking in jaw Uneven bite Headaches	Physical exam X-ray of teeth CT scan of bones MRI of joint's disc	Massage therapy is indicated for TMJD. Advanced training is necessary. Some states have restrictions against working intra-orally. Trigger points in the masseter or lateral pterygoid may cause TMJD pain.
Infant colic	Predictable bouts of crying Inconsolable crying Changes in posture including flexed hip, clenched fists, and tense abdominal muscles	Physical exam Diagnostic test to rule out other causes	Massage is indicated to relieve the symptoms of colic. Training in infant massage is advised. Trigger points in the abdominal muscles may contribute to the pain of colic.
Spasm/cramp (contracture)	Sudden, often sharp pain in affected voluntary muscle Palpable and often visible mass of hypertonic muscle tissue	Often self-assessed X-ray or MRI may be used to assess extent of damage	Massage is indicated. Discuss with health care provider if repeated spasm may be related to an underlying condition or side effects of medication.
Bursitis	Pain, especially with activity or palpation Heat, redness, swelling, or tenderness	Physical exam ROM tests X-ray or MRI if conservative treatment is not successful	Massage is systemically contraindicated if bursitis is due to infection and is locally contraindicated in the acute stage to avoid increased swelling. In the subacute stage, massage to structures surrounding the joint is indicated.
Diabetes	Frequent urination, frequent thirst, increased appetite, fatigue, nausea	Physical exam Fasting blood sugar test	Massage is indicated when tissues are not compromised, and circulation and nerve conduction are healthy.
Gout	Redness, heat, and swelling Sudden, intense pain—often at night—that diminishes gradually over a couple of weeks	Physical exam Blood and urine uric acid concentration tests Synovial fluid test	Massage is contraindicated during acute attacks. Gout may indicate other systemic conditions. Work with the health care team.

understand the client's health history, precipitating events, and other possible causes for pain before initiating treatment. Consult your pathology book for more detailed information. If you are unsure and the client's signs and symptoms resemble those of a more serious condition, particularly if the client has other risk factors, refer them to a health care provider for a medical assessment.

CONTRAINDICATIONS AND SPECIAL CONSIDERATIONS

First, it is essential to understand the cause of the client's pain. Because trigger points refer pain and other autonomic symptoms that may also result from serious conditions, refer the client to their health care provider if symptoms are severe or significantly reduce activities of daily living. These are a few general cautions:

- **Infection.** Trigger point pain can be associated with or may mimic pain related to local or systemic infections. Massage is systemically contraindicated until the infection is resolved.
- **Acute injury.** Do not treat trigger points local to an acute injury such as a strain or sprain. Trigger point therapy may be too aggressive for recently injured tissues. Wait until the subacute or chronic stage, when the tissues become more stable.
- **Producing symptoms.** Compressing a trigger point will produce local or referred pain. Take care to keep the level of pain within the client's tolerance. Explain the process of treatment before beginning so that the client is aware and prepared to experience this pain during treatment. Knowing what to expect may keep the client from tensing up. Instructing the client to breathe through the technique may help reduce pain.
- **Kick-back pain.** Treating a taut band or trigger point too vigorously may cause the client to experience symptoms within hours or days following treatment. Work slowly, one layer at a time, to prepare the deeper tissues for treatment. Avoid treating one area too intensely, and avoid treating several trigger points in the same area in one session. Always follow frictions and compressions with a full, passive stretch within the client's tolerance. Heat may also help to release the trigger point and reduce the possibility of kick-back pain.
- **Hypermobile joints and overstretched muscles.** It is best not to fully stretch a muscle that crosses a hypermobile joint or one that is already overstretched. When treating a trigger point in these circumstances, use a localized pin and stretch or muscle stripping to lengthen only the affected fibers.
- **Treatment duration and pressure.** If the client is elderly, has a degenerative disease, or has been diagnosed with a condition that diminishes their activities of daily living, you may need to adjust your pressure as well as the treatment duration. Frequent half-hour sessions may suit the client better.
- **Friction.** Do not use deep frictions if the health of the underlying tissues is at risk for rupture. Allow time for scarring and tissue regeneration to avoid re-injury. Do not use deep frictions if the client is taking antiinflammatory medication or anticoagulants. Friction initiates an inflammatory process, which may interfere with the intended action of antiinflammatory medication. Recommend that the client refrain from taking such medication for several hours before treatment if their health care provider agrees. Because anticoagulants reduce clotting, avoid techniques such as friction that may cause tearing and bleeding.

MASSAGE THERAPY RESEARCH

What follows is just a small sampling of the research describing the effects of massage therapy techniques commonly used for the treatment of trigger points. Trigger points have been studied in great detail by practitioners in fields ranging from massage therapy, physical therapy, and chiropractic care to anesthesia, cardiology, and neurology. Each of the condition chapters from this book includes references to research in which trigger point therapy is central to the outcomes described.

For the studies described here, the pressure pain threshold (PPT) represents the least amount of pressure that causes the subject to perceive pain, which is measured using an external instrument called an algometer. The visual analog scale (VAS) represents the results of a questionnaire answered by each subject.

The study “Effectiveness of a Home Program of Ischemic Pressure Followed by Sustained Stretch for Treatment of Myofascial Trigger Points” (Hanten et al., 2000) tested the possibility that a home care program designed, demonstrated, and monitored by a trained practitioner could help alleviate the pain associated with trigger points. Forty subjects diagnosed with one or more trigger points in the neck or upper back were randomly divided into two groups. One group was instructed to apply gradually increasing pressure to their trigger point using a Thera Cane[®] until they felt release, followed by a 30–60 second stretch, at least twice a day for 5 days. The control group was assigned a 5-day home program of active ROM exercises to be performed 10 times each, at least twice a day, for 5 days. Both groups were instructed not to perform any treatment on days 6 and 7. PPT and VAS were reported before treatment and on the third day after treatment. Subjects also reported the duration of their pain over a 24-hour period. The subjects performing compressions reported greater improvement in PPT and VAS. Functionality was not studied in this trial. The authors concluded that a home program of compression and stretching, occasionally monitored by a trained clinician, reduces pain and the number of visits to a clinic, although it is not clear whether this provides any improvement in function.

In 2006, Fernández-de-las-Peñas et al. published “The Immediate Effect of Ischemic Compression Technique and Transverse Friction Massage on Tenderness of Active and Latent Myofascial Trigger Points: A Pilot Study.” Forty subjects with neck pain for at least 2 consecutive weeks, who had received a diagnosis of either latent or active trigger points in the upper trapezius, were randomly divided into two groups. Subjects in Group A received a single treatment in which the therapist applied gradually increasing pressure to the trigger point in the lengthened upper trapezius fibers until the subject felt pressure and pain. This amount of pressure was maintained until the subject reported a 50% decrease in pain. The pressure was then increased until the subject felt pain again, and the process was repeated for 90 seconds. The subjects in Group B received 3 minutes of continuous transverse friction to the relaxed upper trapezius fibers, applied slowly, using pressure that approached the PPT. Both PPT and VAS were assessed before treatment and 2 minutes after treatment. In both groups, there was a significant improvement in the PPT and VAS. There was no remarkable difference in outcomes between the two groups, nor was there any remarkable difference in results after treatment for a latent trigger point versus an active trigger point. The authors noted that positive results are obtained when the therapist applies only enough pressure to feel an increase in tissue resistance, and that there may be no clear reason to use pressure that causes pain or ischemia. They suggested that while ischemic compression and friction reduce pain resulting from trigger points, further study is needed to determine whether the amount of pressure applied to a trigger point during treatment affects the results.

In 2009, Ibáñez-García et al. published a comparative study titled “Changes in Masseter Muscle Trigger Points Following Strain-Counterstrain or Neuro-muscular technique.” Seventy-one subjects, aged 20 to 65 years, who had received a diagnosis of latent trigger points in the masseter muscle, were divided into three groups. Group A was treated with neuromuscular therapy. The therapist used the thumb to apply six to eight muscle stripping strokes to the masseter. Each stroke lasted 4–5 seconds. Group B was treated with strain-counterstrain. The therapist located the trigger point in the masseter muscle, then applied gradually increasing pressure until the subject felt pain. The subject’s position was then changed until pain was reduced by approximately 75%, and the new position was held for 90 seconds. The subject was then passively moved into the neutral position. Group C, the control group, received neither treatment nor a sham procedure. Each participant lay supine in a neutral position for 5 minutes and was assessed after treatment. Each group participated in one session per week for 3 consecutive weeks. PPT, VAS, and ROM for active opening of the mouth were measured prior to and 1 week after treatment. Both the neuromuscular and strain-counterstrain groups showed significant improvement compared to the control group. Differences between the neuromuscular and strain-counterstrain groups were insignificant. The authors noted limitations in their study, which reported only the immediate effects of treatment. Studies analyzing long-term effects are needed. In addition, while the subjects had received a diagnosis of masseter trigger points, all were asymptomatic and their results may

be different from subjects who are presenting with pain. However, latent trigger points are clinically relevant and can become active. Finally, because the control group received no treatment, the study cannot rule out a placebo effect in the other groups that showed improvement. The authors recommend a trial that includes a sham technique to validate the improvements shown with neuromuscular therapy and strain-counterstrain.

Working With The Client

CLIENT ASSESSMENT

Assessment begins at your first contact with a client. In some cases, this may be on the telephone when an appointment is requested. Ask in advance if the client is seeking treatment for specific pain so that you can prepare yourself. Table 2 lists questions that may aid your assessment.

Table 3-2: Health History

QUESTIONS FOR THE CLIENT	IMPORTANCE FOR THE TREATMENT PLAN
When did the symptoms begin?	Onset of symptoms may help you determine whether trigger points are the result of a recent injury or recent episode of misuse or if the condition is chronic or recurrent.
Did you receive an injury or surgery to this area?	An explanation of prior injury to the area may help you determine the contributing factors. Surgery and resulting scar tissue may increase the risk of developing trigger points.
Do you have a history of chronic infection, metabolic disorders, or other chronic health conditions?	Chronic health conditions may be a contributing factor in the client's pain or may be a predisposing factor in the development of trigger points.
Have you seen a health care provider for this condition? What was the diagnosis? What tests were performed?	Medical tests may reveal the condition contributing to trigger points. If no tests were performed to make a diagnosis, use the tests described in this text for your assessment. If your assessment is inconsistent with a diagnosis, ask the client to discuss your findings with their health care provider or ask for permission to contact the provider directly.
Where do you feel symptoms?	The pain reported by a client may either indicate the site of the trigger point or its referral zone or may result from restricted ROM because a muscle crossing the joint contains a trigger point.
Describe what your symptoms feel like.	Active trigger points usually cause steady, aching pain that is somewhat diffuse. Trigger points rarely produce sharp, pinpointed pain. Remember that clients are not likely to realize that a spot in one part of the body can refer symptoms to another part of the body, so it is important for you to make that connection.
Describe your posture during sleep, work, or other activities of daily living.	Holding a muscle in a shortened position may contribute to trigger points.
Do any movements make your symptoms worse or better?	This may help you locate weakness in structures producing such movements. Resisted activity or activities that lengthen the muscle containing a trigger point are likely to increase symptoms. Adding slack or reducing tension in the muscle may decrease symptoms.
Are you taking any prescribed or over-the-counter medications or any herbal or other supplements?	Medications of all types may contribute to symptoms or have contraindications or cautions.

Table 3-2: Health History (continued)

QUESTIONS FOR THE CLIENT	IMPORTANCE FOR THE TREATMENT PLAN
Have you had a corticosteroid or analgesic injection in the past 2 weeks? Where?	Local massage is contraindicated. A history of repeated corticosteroid injections may affect the integrity of muscle and tendons, increasing the risk of injury. Use caution when applying pressure or cross-fiber strokes. Analgesics reduce sensation and may cause the client to allow you to work too aggressively.
Have you taken a pain reliever or muscle relaxant within the past 4 hours?	The client may not be able to judge your pressure and may allow you to work too aggressively.
Have you taken anti-inflammatory medication such as NSAIDs (e.g., aspirin or ibuprofen) within the past 4 hours?	Deep friction causes inflammation and should not be performed if the client has recently taken an anti-inflammatory medication. Regular use of anti-inflammatories may also contribute to collagen degeneration.

Postural Assessment

The client's description of the location of their pain will help you to determine which muscles may harbor the trigger point(s) that refer pain to that location. This will also help you to determine which muscles are short, weak, or otherwise inhibited. Allow the client to enter the room ahead of you while you assess their posture and movement. Clients may avoid postures or movements that lengthen or overload a muscle containing a trigger point. Look for imbalances in movement or patterns of compensation that may give additional clues about the location of trigger points. For example, a client with low back or leg pain may have a trigger point that shortens the piriformis, which may cause the client to stand with the hip laterally rotated. A client with shoulder pain may have a trigger point that shortens the scalenes on one side, which could cause the client to hold the head in slight lateral flexion to the same side and slight rotation to the opposite side to avoid lengthening the shortened scalenes. Look for reduced mobility or a favoring of one side. If the lower body is affected, watch as the client walks, climbs steps, sits, and stands from sitting. If the upper body is affected, watch as the client opens the door, takes off their coat, or picks up a pen. Notice if the client rotates the trunk to avoid rotating the head when turning to talk to you. Notice if they are able to perform these activities without assistance or if they avoid lengthening or loading certain muscles.

When assessing standing posture, be sure that the client stands comfortably. If they deliberately try to stand in the anatomic position, you may not get an accurate assessment of their posture in daily life. When trigger points affect the lower body, the client may stand in a position that keeps resistance off the affected muscles. This, in turn, may initiate imbalances in posture from the feet up to the spine. Check for irregularities in the ankles, knees, hips, and low back. When the upper body is affected, the client may hold the joint in a position that keeps the injured muscle from stretching. This may initiate compensating patterns that protect the affected muscle. Look for imbalance in the shoulders and rotations in the arm, forearm, and cervical or thoracic spine. You may not be able to attend to all of the compensating patterns in the early treatments, but may be able to return to them once the primary trigger point(s) are deactivated.

ROM Assessment

ROM assessment may reveal limitations that the client was unaware of. Clients with trigger points are often more conscious of pain than they are of limitations. Because the pain of trigger points is often referred, ROM assessment, particularly against resistance or in a full passive stretch, will help you pinpoint the muscle containing a trigger point that is referring pain. Since it allows the client to control the amount of movement and stay within a pain-free range, only active ROM should be used during the acute stage of injury to prevent undue pain or re-injury.

Active ROM

Compare your assessment of the client's active ROM in the affected joints to the values listed in the Average ROM boxes in each specific condition lesson from this book.

- **Active ROM of the affected joint** may be limited but may not cause pain if the movement is slow and steady, whereas a quick or forceful active contraction of a muscle containing a trigger point will be limited and likely painful. The client may limit movement to the pain-free range.

Passive ROM

Compare the client's P ROM on one side to the other when applicable. Note and compare the end feel for each range.

- **P ROM of the affected joint** may produce no symptoms or restriction when that movement shortens the muscle, but is often restricted and produces pain on a full passive stretch. The location of pain during a full passive stretch of the affected joint may reveal the referral pattern for that trigger point and help to determine the location of the trigger point.

Resisted ROM

Use resisted tests to assess the strength of the affected muscle. Compare the strength of the affected side to the unaffected side when possible.

- **R ROM of the affected joint** may reveal weakness in the affected muscle and will likely produce pain local to the trigger point or in its referral zone. Pain is most likely when the resisted contraction is initiated with the muscle in a shortened position.

Special Tests

Numerous orthopedic tests are specific for trigger points in individual muscles. These specific, named tests largely comprise combinations of compression, passive lengthening, and resisted contractions of the affected muscles. It is important to learn these tests in advanced training that is focused on clinically oriented treatments or research. For now, length and strength assessment, a full passive stretch of the affected muscle, and palpation are sufficient tools for assessing trigger points. Use ROM testing as described above

Palpation Assessment

Place the muscle in a fully relaxed and comfortably lengthened position when palpating for trigger points. If a muscle can be grasped between the fingers, a pincer grip may be a good option for palpating trigger points. For muscles that cannot be gripped, compress the area between your finger and the muscle or bone deep to the affected muscle. When palpating for trigger points, it is essential to work slowly, with full concentration. They can easily be missed when working broadly or quickly. Locate the taut band first. A taut band feels something like a guitar string, pulled tight, that rolls under your finger when you strum across it using pressure. Palpation along the length of the taut band may reveal a nodule—the trigger point. Compression of this nodule causes more local or referred pain than pressure to any other part of the taut band. This spot can be very small—even the size of a pinhead—so it is important to palpate slowly and to stay focused. If the nodule is mobile and does not seem to be embedded in a muscle or fascia, it may be a lipoma. Lipomas are fatty nodules that should not be directly compressed or treated with friction.

Applying direct pressure to the trigger point often elicits pain or other referred sensations. This sensation may occur immediately upon pressure or 10 or more seconds later. If the trigger point is active, this sensation will be familiar to the client, resembling the pain they experience during activities of daily living. Strumming the taut band or applying pressure to the precise trigger point may cause a local twitch response, which feels like a brief flutter of the muscle and is likely due to a spinal reflex. The local twitch response supports an assessment of the presence of a trigger point. The local twitch response may be momentarily painful for the client. It may also reduce tension in the muscle. The tissue surrounding the trigger point may be dense and adhered and have the rough, granular texture of panniculosis.

It is essential to adequately warm the tissues and reduce adhesions and hypertonicity in order to palpate a small or deep trigger point. The area around the affected trigger point may be cool due to ischemia. Repeated rubbing or scratching of the area containing trigger points may cause the skin to become red and itchy, possibly due to overly sensitive mast cells releasing histamine, which causes the blood vessels to dilate upon minor trauma. It is unclear why this condition, called dermographia, occurs or if it is directly related to trigger points.

Some trigger points cause symptoms other than pain or weakness. For example, trigger points in the sternocleidomastoid (SCM) may cause dizziness, ringing in the ears, or the production of tears. Several books, including *Travell and Simons' Trigger Point Manual*, and much continuing education are dedicated to detailed explanations of these individual responses.

CONDITION SPECIFIC MASSAGE

Trigger points often contribute to musculoskeletal injuries or chronic pain conditions. For example, plantar fasciitis may have origins in a trigger point that shortens the gastrocnemius. Trigger points should always be considered when assessing chronic pain conditions. When trigger points contribute to the symptoms of musculoskeletal conditions, the following recommendations are incorporated into treatment to aid healing and reduce the risk of further injury. Releasing the contraction knot of a trigger point, restoring proper circulation through the muscle, and restoring normal muscle length and neuromuscular function are the basic goals of treating trigger points.

Because trigger points can occur in any muscle, the descriptions of techniques here do not specify locations since they are described more fully in later chapters. Use the resources in the following chapters when needed to determine the muscle fibers' direction, joints that have been crossed, tissues that are superficial versus deep, and so on. In some cases, such as with myofascial pain syndrome, trigger points can cause systemic symptoms and significantly reduce the client's activities of daily living. In addition, trigger points may be complicated by other conditions such as infection, metabolic insufficiency, or complex nerve lesions. A complicated case involving trigger points should be supervised by a professional with advanced training or referred to a primary health care provider.

It is essential for the treatment to be as relaxing as possible. Strumming or compressing a trigger point may cause pain at the upper end of the client's tolerance. Explain this to your client, asking them to let you know when your pressure approaches the upper end of their tolerance. Ask the client to breathe deeply during the application of the technique to help relax the muscle and nervous system, which may allow you to use more pressure when necessary. As the trigger point is deactivated, the referral pain will also diminish. Because treatment to the affected muscle can be uncomfortable, it is best to alternate treatment directly to the trigger point with more general treatment, stretches, and joint mobilizations. In addition, treating aggressively or attempting to resolve several trigger points in one session may cause kick-back pain. You may not be able to fully resolve chronic symptoms related to trigger points in one session. Do not try to do so by treating aggressively. Remember that you are working on tissue that is compromised. Ask the client to let you know if any part of your treatment reproduces symptoms, and always work within their tolerance.

There are many methods for treating trigger points including vapocoolant spray, moist heat, stretching, and muscle energy techniques. The following suggestions for treating pain, weakness, and limited ROM caused by trigger points are easily incorporated into the treatments suggested for the specific conditions described in other chapters from this book. The following description is generalized for any affected muscle. Refer to the chapters on specific conditions for images and treatment suggestions pertaining to specific muscles.

Treatment Goals:



Increase circulation



Reduce adhesions



Reduce tone/
tension



Lengthen tissue



Treat trigger points



Passive stretch



Clear area

- The area of pain reported by the client will give you clues about the possible location of an active trigger point. Use the illustrations of trigger point referrals in the following chapters or a more detailed trigger point chart, such as Travell & Simons' Trigger Point Flip Charts, to match the client's complaint with the referral area of a trigger point.
- Positioning and bolstering depends on the area to be treated. The muscle containing a trigger point should be comfortably lengthened, but not stretched.
- If you find edema, apply superficial clearing strokes toward the nearest lymph nodes and, when possible, bolster the area to allow gravity to draw fluid toward the thorax.
- If swelling is minor or absent, apply brief moist heat to the affected area to soften adhesions and increase circulation. If inflammation is present, do not use heat.



- Use your initial warming strokes to increase superficial circulation, soften tissues, and assess the tissues broadly surrounding the suspected trigger point and those that may be compensating. You should be able to initially assess tissues for adhesions, hypertonicity, protective muscle spasm, and tensile stress, all of which will help you to determine how to focus your treatment.



- Before applying emollient, assess and treat fascial restrictions around the affected muscle(s).



- Soften the tissues peripheral to the trigger point, beginning proximally (closest to the trunk). Pay special attention to the affected muscle and its synergists. If the antagonists are accessible, treat these now, or return to this step when the client changes position. Circular kneading and cross-fiber strokes are effective for both softening tissues and reducing adhesions.



- Once the superficial tissues are pliable enough to allow for deeper work, apply friction strokes to reduce the remaining adhesions and apply lengthening strokes to peripheral tissues that are short and tight, beginning proximally. Muscles with fiber direction and actions in common with the injured muscle may have shortened to protect the injured muscle from further injury. If you find taut bands within these peripheral muscles, assess for additional trigger points.



The following steps describe treatment options for trigger points.

- Locate the taut band. It is easiest to find the taut band when the muscle is relaxed in a comfortably lengthened position. Shortening the muscle adds slack, which reduces tension, and makes the taut band more difficult to palpate. Feeling a twitch in the muscle as you palpate is a good indicator that you have found a taut band and possibly a trigger point.

- Begin with slow lengthening strokes along the taut band. Muscle stripping is sometimes sufficient to release a trigger point. If this happens, the taut band may also release and become slack.
- If muscle stripping is sufficient to resolve a trigger point, apply a full stretch to the muscle.
- If lengthening strokes do not release the taut band, slowly palpate along it to find the trigger point. This will be the most tender spot within the taut band. You may feel a nodule. Because a trigger point can be very small and obscured by adhesions and hypertonicity, this step requires slow and deliberate palpation. A good general rule is to take 6 seconds to palpate 1 inch of muscle.
- Once you have found the trigger point, compress it slowly. Your pressure may cause discomfort but should not cause pain. Remind the client to use the pain scale you described at the beginning of treatment to let you know when your pressure approaches a level of pain that keeps them from relaxing. Slow, deep breathing may make the treatment more comfortable and may improve the outcome of trigger point therapy.
- While compressing the trigger point, ask the client to let you know if the level of pain decreases. In addition, ask the client to describe any referred sensations.
- The compression can be held for as little as 10 seconds or as long as 1 minute. As you apply pressure, the fibers may begin to lengthen and become slack. Increase your pressure slightly to take up that slack so that you can maintain direct contact with the nodule. If you feel the resistance in the tissue decrease during compression, increase your pressure slightly until you feel the resistance again. If you feel the nodule move, do your best to follow it. This may require using one hand to stabilize the taut band while the other compresses the trigger point.
- While applying pressure to the trigger point, it may help to change the direction of your pressure slightly by making tiny movements around the nodule. This may give you more direct access to the contracted fibers.
- If you hold the compression for 10–20 seconds and the trigger point does not release, follow with lengthening strokes and Swedish techniques to the surrounding area. You can return to the trigger point, applying a few short rounds of compression followed by lengthening. The client's pain level may reduce with each application.
- If you apply compression for 20–60 seconds and the trigger point does not release, do not apply another round. Prolonged compression is an aggressive form of treatment that causes ischemia, and repeated applications may result in kick-back pain. You can return to this spot in a subsequent session.
- If you did not feel the trigger point or taut band release sufficiently, perform postisometric relaxation to the affected muscle. Assess muscle length and the taut band following postisometric relaxation.



- Follow any of the above methods with a slow, passive stretch of the affected muscle. Ask the client to remain as relaxed as possible. Hold the stretch for 15–30 seconds.

- Heat may be applied directly to a trigger point or taut band that did not fully relax. Heat increases circulation, softens adhesions, and may allow the muscle to lengthen more fully.
- If you were unable to address the antagonists of the injured muscle, reposition the client and address them now.



- Clear the areas treated.

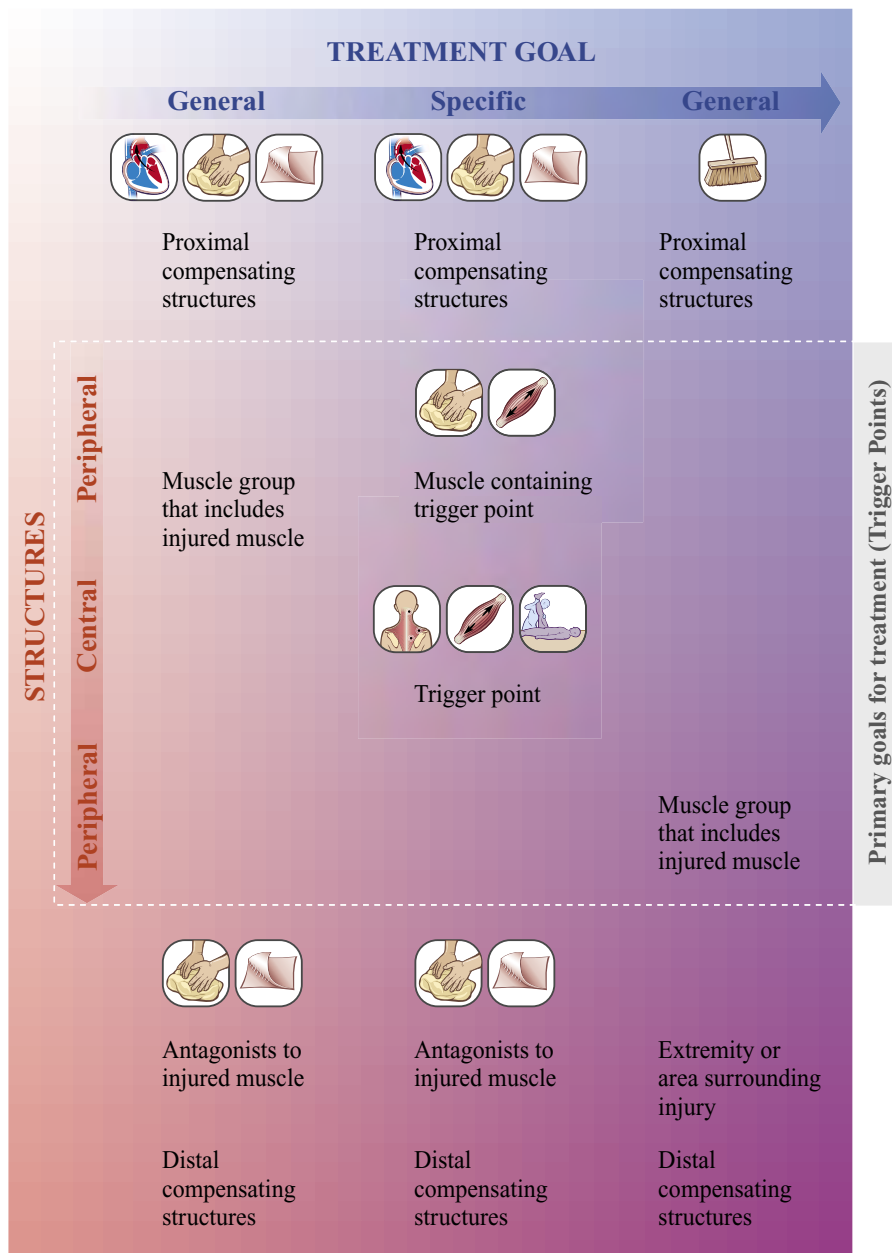


Figure 3-5 Trigger points treatment overview diagram. Follow the general principles from left to right, or top to bottom, when treating trigger points.

CLIENT SELF-CARE

Avoiding further injury is a primary concern when recommending self-care. Reducing or eliminating habitual offending activities and other perpetuating factors is crucial for long-term relief from trigger points. The client must learn to recognize when they are holding the affected muscle in a shortened position and which of their activities of daily living are putting undue stress on muscles that have developed trigger points. You can help clients learn how to modify such activities to avoid overstressing the muscle. In many cases, the most important modification is simply slowing down to avoid the reflex responses that shorten muscles. The following are intended as general recommendations for stretching and strengthening muscles involved in the client's condition. The objective is to create distance between the attachment sites of muscles that have shortened, and to perform repetitions of movements that decrease the distance between the attachments of muscles which have weakened. If you have had no training in remedial exercises and do not feel that you have a functional understanding of stretching and strengthening, refer the client to a professional with training in this area.

Clients often neglect self-care due to time constraints. Encourage them to follow these guidelines:

- Instruct the client to perform self-care throughout the day, such as while talking on the phone, reading e-mail, washing dishes, or watching television instead of setting aside extra time.
- Encourage the client to take regular breaks from stationary postures or repetitive actions. If the client's daily activities include hours of inactivity, suggest moving for at least a few minutes every hour to prevent adhesions and reduced circulation. If the client's daily activities require repetitive actions that contribute to trigger points, suggest resting for at least a few minutes every hour or reducing the offending activity as much as possible.
- Demonstrate gentle self-massage of the muscles containing trigger points to keep adhesions and hypertonicity at bay between treatments. Applying moist heat may also help alleviate symptoms of trigger points. Instruct the client to follow self-massage and moist heat with a full passive stretch.
- Demonstrate all strengthening exercises and stretches to your client and have them perform these in your presence before leaving to ensure that they are performing them correctly and will not harm himself or herself when practicing alone. Stretches should be held for 15–30 seconds and performed frequently throughout the day within the client's limits. The client should not force the stretch or bounce. A stretch should be slow, gentle, and steady, keeping every other joint as relaxed as possible.
- Recommend stretching and strengthening exercises according to your findings in ROM testing and palpation.

Stretching

Maintaining proper length and tone of the affected muscle, its synergists, and its antagonists is essential to resolving trigger points and reducing the risk of further injury. For the contraction knot of a trigger point to be released, the affected fibers must be fully lengthened. Each stretch should be relaxed while reaching the full range possible within the client's tolerance. Stretches should be performed throughout the day, particularly before and after intense activity. Take care to instruct the client to begin slowly, gradually increasing the stretch as symptoms diminish and ROM improves. Stretching an injured muscle too quickly or too deeply may initiate a reflex response, which may result in spasm. In addition, when the affected muscle is lengthened, its antagonists are shortened. If the antagonists are involved in protective splinting, contracting them too quickly or too deeply may also result in spasm.

The results of ROM testing and palpation will determine which muscles have shortened and need to be stretched. In general, stretching occurs when the distance between the attachment sites of the muscle is increased. Refer to Chapters 4 to 11 to find stretches for specific muscles or groups of muscles.

Strengthening

A muscle with trigger points may not function efficiently, which may affect the ROM of the joint it crosses. While it is important to lengthen the affected fibers to eliminate a trigger point and keep it from returning, the client may also need to restore strength to a muscle affected by trigger points. In addition, strengthening the antagonists of muscles harboring trigger points may help keep the affected muscle from reflexive shortening. Strengthening weakened muscles is equally important for restoring proper function to the affected joint. The results of ROM testing and palpation will determine which muscles have weakened and need to be strengthened. In general, active or resisted contractions strengthen muscles. As with stretching, a strengthening program should progress gradually. Pain-free, active ROM is effective for gradually restoring strength to weakened muscles. These exercises should be introduced slowly and increased in intensity only within the client's tolerance. As healing progresses and the risk of re-injury diminishes, add resistance to active ROM. Refer to Chapters 4 to 11 for exercises to strengthen specific muscles or muscle groups.

SUGGESTIONS FOR FURTHER TREATMENT

Treatment duration and frequency can vary widely when trigger points are a contributing factor in the client's condition. New trigger points resulting from a recent injury or newly developed pattern of activity or inactivity may be resolved in a single treatment. An acute trigger point that has been unrecognized or ignored may have become chronic. Chronic trigger points may lead to other factors, such as adhesions, hypertonicity, or weakness, that require more attention. When treating specific conditions such as those described in other chapters, it may be necessary to include assessment and treatment of trigger points in each session. As the client learns new postures and methods for performing pain-free activities, other muscles may respond to these changes. A trigger point treated in the last session may have resolved, while another one may become active.

There should be some improvement with each session. If this is not happening, consider the following possibilities:

- There is too much time between treatments. It is always best to give the newly treated tissues 24–48 hours to adapt, but if too much time passes between treatments in the beginning, the client's activities of daily living may reverse any progress.
- The client is not adjusting their activities of daily living or is not keeping up with self-care. As much as we want to fix the problem, we cannot force a client to make the adjustments we suggest. Explain the importance of their participation in the healing process and encourage the client to follow your recommendations, but be careful not to judge or reprimand a client who does not.
- The condition is advanced or involves other musculoskeletal complications that are beyond your basic training. Refer this client to a massage therapist with advanced training. Continuing to treat a client whose case is beyond your training could hinder their healing and turn the client away from massage therapy altogether.
- The client has an undiagnosed, underlying condition. Discontinue treatment until the client sees a health care provider for medical assessment.

If you are not treating the client in a clinical setting or private practice, you may not be the therapist who takes this client through the full program of healing. Still, if you can bring some relief in just one treatment, it may encourage the client to discuss this change with their primary health care provider and seek manual therapy rather than more aggressive treatment options. If the client agrees to return for regular treatments, the symptoms are likely to change each time, so it is important to perform an assessment before each session.

Professional Growth

Case Study

Todd is a 58-year-old bank executive. He has pain in his left shoulder that was intermittent until about 6 weeks ago, when it became constant. Todd spends many hours working at a computer and talking on the telephone. He stays fit by rock climbing and playing basketball and other sports on the weekends and some evenings. Todd stated that he has been athletic since childhood and has been well trained to warm and stretch his muscles before and after strenuous activity.

SUBJECTIVE

Todd reported feeling pain in his left shoulder that used to come and go but has become fairly constant over the past 6 weeks. He has also noticed that from time to time he feels pain radiating down his arm and into his thumb. When asked if he had any injuries, he replied “No” but quickly added

that he had been in a side-impact car accident approximately 3 years ago. He had been taken to the hospital following the accident, but no injuries were found. Twenty-four hours later, he had told his health care provider that he felt a little stiffness in his neck, although it was not debilitating. His provider prescribed a neck brace, which Todd wore for approximately 3 days until the aching stopped. He has had no manual or physical therapy since the accident. Todd stated, with frustration, that he has been taking ibuprofen nearly every day for the past month, and while this helps him get through the workday, he is concerned that it will cause stomach problems. When asked, Todd stated that his shoulder does not hurt when he is playing basketball, but he has stopped climbing because the symptoms are intense when he bends his head back to look up. He feels the worst pain when he straightens his neck after holding the phone between his left ear and shoulder. He also feels pain when riding his bike. When asked, he described that he leans forward to reach his handlebars with his neck bent back to look forward while riding his bike. When asked, he stated that he feels no numbness, tingling, or weakness in his arm or hand.

OBJECTIVE

Todd appears healthy and vibrant. He had no difficulty turning the doorknob or taking off his coat. I noticed that after filling out his form, he lifted his head very slowly and had a brief, pained expression on his face. I asked if he felt pain at that moment, and he said he did not notice anything.

Postural assessment revealed left lateral flexion of the neck and right rotation of the neck. The left shoulder is elevated. Trunk is slightly flexed toward the left. Rotating the neck to the left produced pain in the shoulder after 3 seconds. Todd stated that he felt like it was about to hurt in his arm too. Extension of the neck produced pain along the levator scapula after 5 seconds. Vertebral artery test was negative for circulation deficiency. Adson's test was negative for compression of neurovascular bundle.

Tissues of the neck, particularly the left anterior neck, are dense and adhered. Crepitus was both felt and heard with superficial cross-fiber strokes. Gentle pincer grip to the left SCM was instantly tender. No referred pain. Trigger points were found in the anterior scalene, approximately 1 inch superior to the clavicle. Pressure on the trigger point produced pain in the shoulder instantly, and into the arm within 5 seconds. Palpation of the area around the scapula and down the arm caused no pain; Todd stated that it felt good. Levator scapula and upper trapezius are hypertonic and tender. No trigger points were found here, although this may be because the tissues are dense and adhered. I will reassess in a follow-up treatment.

It is possible that the side-impact car accident resulted in whiplash that was not properly treated.

ACTION

We began in the supine position. I performed myofascial release from the skull toward the ribs anteriorly, toward the acromion process laterally, and toward the scapula posteriorly. I applied more specific superficial techniques to release fascia surrounding the left SCM and scalenes. The tissue is dense and adhered and may contain minor scar tissue. Crepitus was evident during cross-fiber strokes across scalenes. I applied emollient and general Swedish techniques to the neck and shoulders to warm and lengthen the superficial muscles. I applied pincer grip kneading to the full length of the SCM. This produced pain at level 5 initially. Pain reduced to 1 after three repetitions. With the SCM softened, I accessed the scalenes. I began with three rounds of slow muscle stripping to the full length of the anterior scalene. The client reported pain at a level 5 along the muscle, increasing to level 7 as the stroke approached a nodule in the muscle. No twitch response was felt. After the third round of muscle stripping, the pain remained at level 6 at the most tender spot. I applied direct pressure to the nodule for 10 seconds. The client reported familiar pain referred into the shoulder at level 4 and less so into the arm. I increased the length of the scalenes slightly by laterally flexing the neck toward the right before each round of compressions. By the third round, local pain in the anterior scalene reduced to 4 and referred pain was described as "a shadow of the

pain I felt in the beginning.” I felt what may have been a twitch response, although it was minor and could have been a movement of the muscle related to breathing. I continued muscle stripping to the middle and posterior scalene. I found nothing other than hypertonicity in the middle scalene. The posterior scalene was locally painful at level 4 but produced no referred pain. I applied a full passive stretch to the left scalenes by laterally flexing the neck toward the right with a slight rotation toward the left for 20 seconds.

I performed general deep tissue techniques to neck extensors and pectorals. I then turned the client prone and continued general deep tissue techniques to the upper back. I found taut bands between the scapula and spine. Due to hypertonicity and adhesions, it is unclear whether these are the rhomboid or serratus posterior superior. Deep forced breathing did not help to distinguish between the rhomboid and serratus. I focused on releasing adhesions between the scapula and spine and on reducing hypertonicity in the levator scapulae and upper trapezius.

PLAN

Todd rescheduled for one week from today. I will assess the scalenes, the rhomboid/posterior serratus, the trapezius, and the levator scapula again during the next session.

I demonstrated a gentle massage to the neck to keep adhesions at bay until the next session. I suggested that he do this while lying down so that the neck and shoulder are cradled and the muscles do not need to actively contract. I demonstrated scalene stretches. I recommended that Todd perform a full, slow, gentle rotation of the neck for 20 seconds out of each hour that he sits at his computer, followed by a full stretch to the scalenes. I suggested using a speaker phone or ear buds to avoid holding the phone with his shoulder.

CRITICAL THINKING EXERCISES

1. Your client reports chronic pain in the gluteal area that has not been relieved by massage. You suspect that the pain may be referred by a trigger point in the quadratus lumborum. The area around the quadratus lumborum is dense and adhered, and it is difficult to distinguish the individual muscles in the area. Discuss methods for getting to the small trigger point in a deep muscle obscured by adhesions and hypertonicity. Create a self-care plan and a plan for future treatment.
2. Using books, Web sites, and other sources that describe trigger points in detail, find possible sources for pain in the following areas, keeping in mind that there may be more than one:
 - Around the eye
 - In the upper row of teeth
 - The thumb and index finger
 - The fourth and fifth fingers
 - The elbow
 - Across the iliac crests and sacrum
 - Near the greater trochanter
 - Down the posterior leg
 - At the patella
 - In the arch of the foot

3. Conduct a short literature review to learn about the relationship between trigger points and one or more of the following:
 - Vitamin deficiency
 - Chronic infections
 - Hypothyroidism
 - Hypoglycemia
 - Depression

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