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Introduction

What is Neuromuscular therapy?

Neuromuscular therapy is specific.

By using range-of motion (ROM) tests and other assessment tools, the neuromuscular therapy practitioner is able to pinpoint areas of dysfunction. A practitioner only trained in Swedish massage might simply work generally over an area of complaint, hoping that it will help. The neuromuscular therapy practitioner has a specific knowledge of anatomy and knows exactly where to work.

Neuromuscular therapy is efficient.

By using very slow strokes performed at moderate depth, the muscles and fascia are loosened easily and quickly. The practitioner's joints are aligned while doing these slow strokes, so that the force is transmitted by bone, instead of muscular strength. This makes neuromuscular therapy easier to perform than a massage that requires rubbing techniques.

Neuromuscular therapy uses elbows, fists and knuckles as tools.

Using fingers and thumbs during a massage can put strain on the practitioner's hands. With the use of the elbow, a weak wrist can be completely avoided, while still giving a satisfying massage. Proper joint alignment when using the fist or thumbs allows stress-free massage.

Neuromuscular therapy addresses the source of pain.

Sometimes people will feel pain in locations distant from the source of the pain. These are called referral patterns. For example, clients often experience pain in the anterior shoulder that is actually coming from the infraspinatus muscle on the back. A neuromuscular therapy practitioner is able to see past the confusion caused by referral pain and to find the source of dysfunction.

Neuromuscular therapy is penetrating and effective.

Neuromuscular therapy works through applying the right amount of pressure to the right area. With a good knowledge of anatomy, the neuromuscular therapy practitioner can access muscles that are unknown to other practitioners. Change can be affected with little effort with this skilled approach.

Neuromuscular therapy does not have to be painful.

Pain is the body's signal that it is being traumatized. The old adage of 'no pain, no gain' is not true here. The neuromuscular therapy practitioner looks for areas of tenderness in the body, but never pushes so hard as to elicit pain. It is true that it is important to make contact with the area of dysfunction, and sometimes to 'dig in,' but the client should be able to stay relaxed while receiving.

Introduction

How does Neuromuscular Therapy differ from other modalities?

Neuromuscular therapy is distinguished from other types of bodywork in that it addresses trigger points. Trigger points are irritated tissue that causes the person to feel that pain is coming from somewhere else.

Trigger points can also cause sensations of burning, cold or grabbing. Neuromuscular therapy focuses on relieving trigger points by applying appropriate, static pressure. Correct pressure allows the referral pattern or spot tenderness to diminish in about 30 seconds. When the pain is significantly reduced, the pressure is released.

The neuromuscular therapist is much like a detective, and knows where most muscles have a tendency to refer pain. The videos show the muscles and referral patterns in the beginning of each section. In this manual the referral patterns of each muscle are listed. Included in the manual are three referral charts. These charts are 'backwards' compared to traditional charts. These charts show areas of pain and list the muscles that refer to those areas (instead of showing each muscle and it's referral pattern). This is helpful because people don't say "my Quadratus lumborum is referring into my lower back." Instead people just complain of lower back pain, and it is up to you to know what muscles refer there.

The referral patterns are accurate about 75 percent of the time because our bodies are all a little different. Learn the referral patterns- they are valuable.

When you are performing massage ask your clients if tender areas are referring sensations anywhere else. In this way you can start introducing yourself and your clients to the referral pain phenomena.

Here is a short list of some very common referral patterns that you should know:

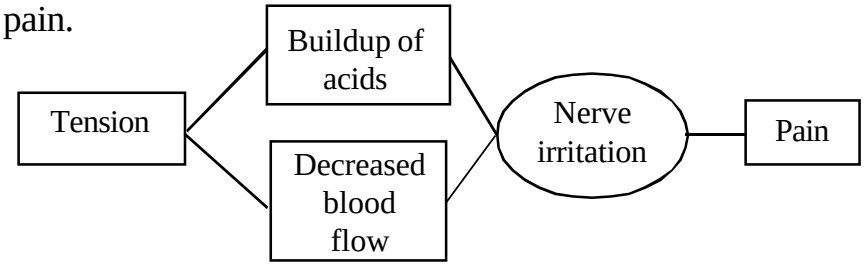
quadratus lumborum	SI joint & the crest of the ilium
gluteus medius	SI joint & sacrum
psoas	anterior thigh and lower back
vastus medialis	anterior and medial knee
gastrocnemius	posterior knee
soleus	calcaneus
subscapularis	posterior shoulder
infraspinatus	anterior and lateral shoulder
levator scapula	neck
sternocliedomastiod	forehead
Suboccipitals	headache
flexor carpi radialis	anterior wrist

Introduction

How does Deep Tissue and Neuromuscular Therapy work?

In order to understand how Deep Tissue and Neuromuscular Therapy works, we first have to understand why we feel pain.

When a muscle becomes tight for too long it becomes inflamed. It becomes inflamed because the tension in the muscle restricts blood flow into the muscle. When there is not enough blood flow into the muscle lactic acids and other types of cellular wastes accumulate in the muscle. This irritates the nerve cells, and causes you to feel pain.



Every muscle in the body has an individual tone setting. This means that some muscles in the body are tighter than others. When we have an injury the muscles around the injury can keep a heightened tone for many years afterwards. We refer to these areas of tightened muscle tissue as the areas where we hold our tension. This tone setting operates even when we're not using our muscles. For example, when we sleep some muscles still retain their tension during the night. These are the muscles that move in an out of pain.

Nerve cells must reach a threshold value in order to send a pain signal. This means that a muscle can be a little bit tight without the nerve cells sending any pain signals. However, if the muscle tightens any more, the nerves will be pushed over their threshold and start sending pain signals.

When we become stressed our sympathetic nervous system slightly tightens all of the muscles in our body. This is why we experience more pain when we are stressed. By increasing the stress we increase muscle tone. The reverse is also true. By decreasing stress we decreased the tone in our muscles. Because stress is often unconscious, we may not notice, or understand, why our muscle pain is coming and going.

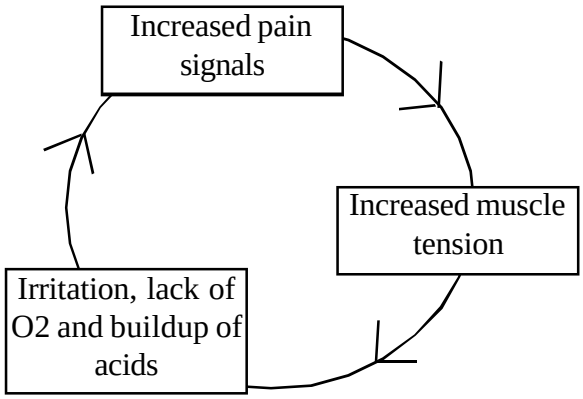
This is commonly called the stress bucket syndrome. The analogy is a bucket full of water. The water represents stress. When you have too much water the bucket starts to overflow and you feel pain. Do something that's relaxing and it allows some of the water in the bucket to drain out. Muscles that are habitually tight can be seen to be buckets that are almost full of water, and just a little stress will cause the overflow that triggers pain.

Effective Neuomuscular Therapy permanently lowers the tone setting in the muscles, helping the client stay out of pain.

Introduction

Pain-spasm-pain cycle

The pain/spasm/pain cycle is at the root of chronic pain. First an injured muscle sends pain signals to the spinal cord. The first reaction to pain is always to tighten up, so the spinal cord sends a message to the muscle making it contract even more. This increased tension squeezes the vessels that bring blood into the muscle. This reduced blood supply means that the muscle runs out of the energy that it needs to relax (as you may remember from A&P, it takes ATP for the muscle cell to relax). A reduced blood supply also means that waste products are not washed away, so acids build up around the muscle tissues, causing increased tissue irritation. These increased pain signals are then sent to the spinal cord and the process continues.



By massaging the muscle we do three things:

1. Manually loosen and lengthen the muscle.
2. Increase the blood flow into the muscle. This can be reflected by the increase of blood flow in the skin, often noticed as a flushing or reddening where we have worked. This is called a durable hyperemia, or a long-lasting flushing of blood.
3. Numb the muscle. This numbing effect occurs in the spinal cord. It is caused by the secretion of enkephalins; chemicals more powerful than morphine. These chemicals block signals in the spinal cord — both sensory nerves sending pain, and motor nerves telling the muscle to tighten. When these chemicals are created the muscle is numbed, and the muscular tension is inhibited.

These three factors all contribute to break the pain/spasm/pain cycle.

Introduction

Cautions & Contraindications

In discussion of cautions and contraindications, we are referring to Neuromuscular therapy. Other forms of massage may be appropriate. Cautions and contraindications are based on common sense; use good judgement and your work will be safe. When in doubt, leave it out, and refer to a trained practitioner, chiropractor or M.D.

Here is a short list of contraindications related to specific situations:

Acute disc injuries can be destabilized by deep massage. This includes:

-slipped discs
-ruptured discs
-herniated discs

A straight leg test can help determine this, along with signs of possible neurological deficit: loss of strength or sensation. After a few weeks, however, it is usually safe and helpful to work on the muscles around the area.

-Any joint or muscle that is acutely inflamed.

This is characterized by being painful, hot, red, visibly swollen or palpably mushy. Rest, ice, compression and elevation are indicated here. Acute, undiagnosed injury or pain is to be especially avoided.

-Initial inflamatory stage (one to three days after an accident.)
-Posttraumatic concussion (they come in disoriented after a fall).
-Area of cancer (energy work is appropriate, not neuromuscular therapy).
-Occluded vertebral or carotid arteries (test with a vertebral artery test).
-Severe colds or flu (energy work is indicated).
-Varicose veins (may damage the tissue).
-Edema (lymphatic drainage is appropriate).
-Skin lesions, cuts, rashes (may tear the skin).

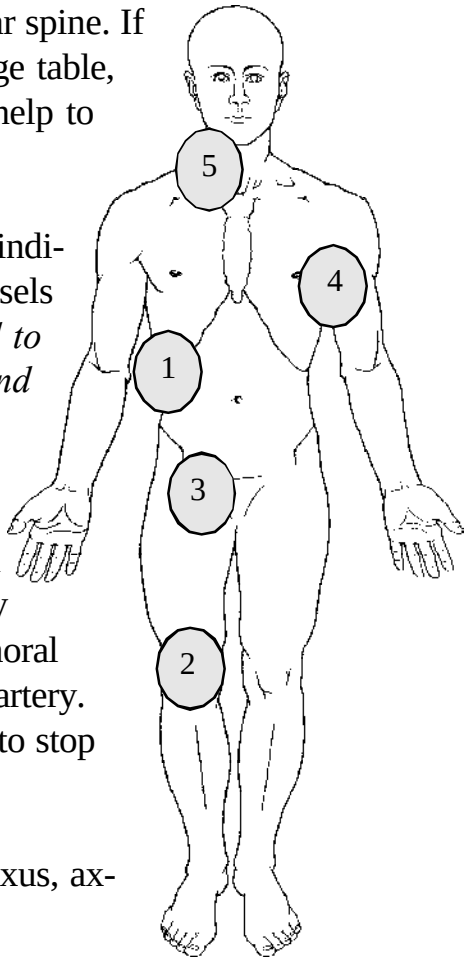
Working with injuries can be tricky. If someone was hurt from your work, you performed the techniques incorrectly, or went too deep. Remember that your clients should not be sore for more than one day.

Introduction

Endangerment zones

Here is a list of body areas that we need to be cautious when working around:

1. The ribs do not support the lower back. Sometimes this area can be sensitive to deep pressure that bends the lumbar spine. If someone has pain on laying face down on the massage table, placing a pillow under their belly or the pelvis will help to relieve stress and make the position comfortable.



2. The popliteal space (the posterior knee) is contraindicated for deep pressure because of the nerves and vessels that course through there. *These are, from superficial to deep, the posterior tibial nerve, the popliteal vein, and the popliteal artery.*

3. The femoral triangle (the space between the inguinal ligament, the sartorius and the adductor longus) is an area of caution because of the femoral nerve, artery and vein. You will know when you are within the femoral triangle when you can feel the pulsing of the femoral artery. Firemen apply pressure to this artery when they need to stop the blood flow out of a severed leg.

4. The deep axilla (armpit), because of the brachioplexus, axillary vein & artery.

5. The carotid artery area in the neck should also be treated gently, because of the chance of initiating a carotid reflex (a slow down of the heartbeat, which reduces blood flow to the brain). Never work both sides of the neck at the same time.

6. The spinous processes can be tender.

Stay within your client's pain tolerance and be alert when working around these areas of caution.

Introduction

Connecting

Along with your technical knowhow, your ability to connect with your clients is your most important skill.

We can connect to our clients by:

-Being present with them.

-Putting aside any distractions and to giving the client your whole focus.

-Listening to their story without interrupting.

-Asking them pertinent questions and listening to the answers.

-Coming to the session with an open heart and mind.

-Being open to what is, rather than your idea of what should be.

-Having an attitude of attentiveness, exploration and possibility.

-Being aware of their breath rate and depth, toe or fist clenching , etc.

Connection means that the client feels heard, understood, touched and seen as a whole human being.

Introduction

Connecting (continued)

The interview

In the interview stage it's important for you to listen to the client and hear what they have to say about their body. Get a sense of the priority of the session. Speak back to them what you heard, so they know that you understood what they said. Make agreements about where you'll work, how long you'll work for, what the goal the session is. Perform any standing evaluations that you need.

Where to start the session

As a general rule, its best to start with the area that is most in need. In this way client will feel taken care of and heard right from the start. Often times massage therapists have a routine that they perform on each person. It is more effective and enjoyable to treat each client uniquely. Practitioners tend to spend more time on the area that they first make contact with.

Verbal connection

During the session verbally check with your client to make sure the pressure is appropriate, that they are warm enough, that they are comfortable. Neuromuscular therapy can be penetrating and involves working on the edge of comfort. Because of this, verbal communication throughout the session is necessary.

Touching

Connect with a client through your touch. Don't be in a hurry. The best way to develop a deep connection with your client, and for both of you to drop into a deep state of relaxation, is to perform slow strokes. I have noticed while teaching massage classes that the students who have difficulty connecting with clients are also the ones that tend to do the strokes the fastest. Take time to feel the client's body with your hands, and use your intuition.

Have your intention be to create space in the body. Rather than vigorously rubbing out tight spots, allow them to melt under your presence and your pressure. This requires gentleness and patience, but brings a sense of sacredness and reverence to the session.

Introduction

Handling emotional release in a session

Neuromuscular therapy can bring to the surface emotions that have been held in the body. This release of emotions is good, and represents a natural healing of the mind and body. It is important that you know how to deal with emotional release delicately. Here are some guidelines for dealing with a client's feelings during a session.

How do you know that an emotional release is occurring? The signs can be obvious, such as crying; or subtle, such as a change in breathing pattern. (Often there may be no overt signs of an emotional release, but the practitioner might begin feeling emotional. It is important for the practitioner to be able to discern what emotions are authentic to his or her self, and what emotions are coming from the client.) If nothing overt is going on, it can be enough just to continue with the massage and allow the client to experience their feelings without any extra interaction from you. If their feelings are intense, then there is a need for greater interaction on the part of the practitioner.

The first step is to acknowledge that something is going on. The client might be feeling embarrassed for crying. By acknowledging that the client is feeling something, the practitioner stays in alignment with the truth, instead of pretending that everything is OK. Suppressed emotions are often suppressed simply because the client is trying to pretend that everything is OK. By recognizing their pain, they begin the healing process.

The second step is to ask your client what they would prefer you do. Letting the client be the guide is the safest and most responsible way to work. When we notice a client visibly crying, we should ask them, "Would you like me to continue massaging, or would you rather I just stop and hold?" Our intention is to allow the client to reach the natural conclusion of the release. Sometimes clients prefer that we continue massaging. When we continue massaging it takes the focus away from the emotions, and can help certain clients feel comfortable amidst their emotions. Sometimes clients would rather that we stop and hold two areas. This lack of movement allows them to deepen into their feelings without any distractions. Unless we are trained counselors; we should not try to counsel our clients.

There is no way to know what each client needs. We can use our intuition, but when we verbally communicate and give the client a choice, we place the responsibility and power in the hands of the client.

Introduction

Handling emotional release (continued)

The third step in handling a client's emotional release is to sense when the client needs encouragement. This requires sensitivity. It is a skill to know when to say, "let it out, it's ok" or "good." Sometimes gentle words spaced at the appropriate time can help someone deepen into their release. Other times it can distract them from their feelings. Use words sparingly and with awareness with what the person seems to need. If they are trying to suppress their feelings because they are embarrassed, some encouragement might be helpful. If their release seems unrestrained, then few or no words might be best.

Generally a positive emotional release should end up freeing or releasing held emotion. Hopefully this is the kind of emotional release we usually encounter with our clients. Sometimes, however, there is a need for containment of emotions. This occurs when the client seems to bring up the same trauma again and again in each session, without any sense of movement. The releases tend to be dramatic, and yet at their core are hollow, and can cause the therapist to feel tired after the session. In these cases the person is not releasing and clearing emotion, but recycling traumas that they are not willing to let go of. They may be stuck in the past. They may need professional counseling. Our job as massage therapists in these cases is to contain the emotions of our clients by bringing them back to the present moment. Ask them to focus on your hands as you massage to help them be more present.

Look for these issues in your client's emotional releases. Deep emotional release that is clear will leave the client and perhaps the therapist peaceful and with an open heart. If the release is less intense, usually client and therapist will feel energized and clear after the session. When emotional release is not clear, and just a recycling, the therapist might feel fatigued after the session.

Boundaries

Therapists with a strong need to please can be tying their client's well-being into their own sense of self worth. A needy massage practitioner only creates co-dependent relationships. Sometimes clients get better, sometimes they don't. Healing is complex and mysterious. Massage is not a cure-all. I am suspicious of practitioners who claim everyone they work on gets better. This kind of bravado points to low self-esteem, and a distorted view of reality. Do your best work, open your heart to your clients, and realize you can only do so much. Healing ultimately comes from within the client.

Introduction

Modalities

Stripping strokes

Stripping strokes involve the application of slow, deep, gliding pressure along the length of the muscle fibers. Stripping strokes release and elongate tightened muscle and fascia, flush the muscles with fresh blood, and erase trigger points (trigger points are hyperirritable muscle tissue that refers pain). Stripping strokes are performed using the elbow, forearm, knuckles and thumb. The elbow and forearm are used for larger muscles, and the knuckles and thumbs are used for detail work and smaller muscles.

Ischemic compression

Ischemia means a lack of blood supply, with associated tissue irritation and congestion. Ischemic compression is used in both Shiatsu and trigger point work. The purpose of ischemic compression is to deliberately increase the blockage of blood to an area so that, upon release, there will be a resurgence of blood. This washes away waste products, supplies necessary oxygen and helps the affected tissue to heal. This increase of blood flow to the area is called a hyperemia.

Sometimes when applying ischemic compression, a client will experience referred pain. With correct pressure, the referral should diminish within 30 seconds.

"To apply ischemic compression to a trigger point, the relaxed muscle is stretched to the verge of discomfort. Initially, a thumb (or strong finger) is pressed directly on the trigger point to create tolerably painful (7 to 8 on a client pain scale of 10), sustained pressure. Treatment is useless if the patient tenses the muscles and so protects the Trigger point from pressure. As the discomfort tends to abate, pressure is gradually increased by adding a thumb or finger from the other hand, as necessary, for reinforcement. This process is continued up to 1 minute. (but usually around 30 seconds) with as much as 20 or 30 pounds of pressure. If Trigger point tenderness persists, the procedure can be repeated, preferably after a hot pack and active range of motion." (Travell, Janet, Myofascial Pain and Dysfunction, The Trigger point manual, v1.) Following treatment it is valuable to gently stretch the area to help the muscle "remember" its full length.

Introduction

Modalities

Deep Transverse (Cyriax) friction:

Developed for the treatment of soft tissue lesions by the British osteopath, Dr. James Cyriax, deep transverse friction effectively reduces fibrosis and encourages the formation of strong, pliable scar tissue at the site of healing injuries. This technique, also known as cross-fiber frictioning, reduces the crystalline roughness that forms between tendons and their sheaths that can result in painful tendonitis. It can also prevent or soften myofascial adhesions.

A deep, non-gliding, oil-less friction stroke, cross-fiber friction is administered with a braced finger or thumb moving across the grain of a muscle, tendon or ligament. The therapist's thumb and the client's skin move as one over the exact site of the lesion with sufficient sweep and duration to create a mechanical effect on the tissue treated. The stroke must be applied directly at the site of the lesion, at right angles to the fibers, and be broad enough to separate the fibers without bouncing over them. The treatment is painful, though always within tolerance, and should be initiated only with the informed consent of the client. It should never be applied during the initial inflammatory stage in an acute injury.

The first treatment should be conservative, lasting one to three minutes only, followed by a day of rest for the treated part. The treatment is resumed on alternate days until the pain abates and full usage is returned, usually within three to ten sessions. Appropriate application of ice following treatment is recommended.

Introduction

Modalities

Ice

Ice permits your body to heal quickly in two ways: it promotes circulation of blood and lymph, and it numbs the pain so that you can move the injured area. Movement is essential for healing in soft tissue injuries, as it allows the newly forming tissues to remain pliable. Application of ice will cause immediate vasoconstriction, thus reducing swelling in the tissues. It also numbs the cutaneous and subcutaneous nerve endings, thus reducing pain. Finally, upon removal, there is a resurgence of blood and lymph to the area, thus helping to cleanse the injury of metabolic debris.

Ice should be applied as soon as possible after an injury, as part of the first aid treatment of rest, ice, compression and elevation (RICE). The injured area should then be chilled in cycles of 10-15 minutes on and 30-90 minutes off. As soon as the ice is removed, when the area is still numb, begin to move the area gently without putting weight on the injury. Moving stimulates proper healing by increasing blood circulation and preventing abnormal scar tissue from forming.

Heat

Heat has been used for pain and injuries for hundreds of years, yet is probably one of the most misunderstood forms of treatment for injuries. Essentially, the application of heat increases blood circulation to the area; thus increasing the supply of food and oxygen needed to repair damaged tissue. This can be helpful in relieving tense and sore muscles, yet is contraindicated in any injury involving inflammation and swelling, or pressure on nerves. For these reasons, *application of heat is not indicated for acute injuries, only chronic injuries.*

Warm baths, heat packs and heating ointments can be helpful adjuncts to treatment of injured tissue, since they are inherently relaxing, but they are rarely effective by themselves, and can be harmful.

Introduction

Modalities

Stretching

People, like animals, feel the need to stretch. Stretching encourages the muscle fibers to maintain their length, thereby preserving a full range of motion. In addition, it allows you to "tune in" to your body, awakening the kinesthetic sense that unifies mind and body.

Many people confuse stretching with warming up, but they are actually separate and distinct activities; you cannot stretch effectively if your body is not already warmed up. Both the fascia surrounding your muscles, as well as the muscles themselves, must have adequate circulation and heat before they will begin to lengthen. Also, remember that the goal is to stretch the muscles, not the tendons or ligaments, as they can become permanently damaged if they are stretched more than a small amount. Pay attention to where you feel the stretch; it should be in the central, meaty part of the muscle, rather than over or near the joints.

There are also two distinctly different reasons for stretching; to relieve accumulated tension within the muscle and to increase the resting length of the muscle. In either case, it's crucial to respect the myotactic reflex (stretch reflex), the signal from the muscle spindles that initiates a protective contraction in response to a stretch that is too rapid or too forceful (this is the reflex that Muscle Energy Technique/ Contract-Relax/PNF helps to reprogram).

The benefits of stretching increase in direct proportion to the amount of time spent with each stretch. Rapid or forceful stretching will initiate the stretch reflex, and is thus less than useless. A "gentle" stretch, held for up to 30 seconds is useful for relieving accumulative tension within the muscle, but will not do much to alter the length of the fibers. If your intention is to increase the resting length of the muscle, the stretch must be maintained for a minimum of one full minute.

A stretch can be either passive or dynamic. Passive stretching, as the name implies, utilizes gravity to provide the effort, and is therefore an inherently relaxing method of working. Dynamic stretches utilize the principle of reciprocal inhibition; when one muscle contracts, the opposing muscle is neurologically inhibited from contracting, and is thus allowed to lengthen.

Remember that stretching should always be pain free. Not all stretches suit all bodies. If a stretch is uncomfortable, try repositioning, or have an alternative stretch available. Never force a stretch; "no pain, no gain" is definitely not operative here.

Introduction

Assessment: Test,Work,Retest

Resistance testing

Use a resistance test in order to evaluate the muscle and tendon unit. Have your client push in a specific direction with 100% of their strength against your resistance for one second. If the muscle or tendon is compromised, the test will illicit pain. By changing the direction of resistance, the therapist can quickly pinpoint the exact sight of the injury. Don't let your client push for more than one second, for fear of straining the muscle too much. When the injury is minor, sometimes the resistance tests will not elicit pain, and in that case, range of motion tests can be used.

Range of motion testing

Range of motion tests assess the integrity of the joint capsule and the ability of the muscles to lengthen. Range of motion tests also can help to reveal postural distortions. To perform a range of motion test, take the client's joints to the end of their range of movement. If the joint has good motion and no pain, all is well.

Minor restriction has a springy feeling when you reach the end of the range. This indicates a muscular cause. The springy feeling is the muscles restricting the movement before the joint capsule and ligaments engage. You can address this by releasing the muscles and rechecking.

An empty feeling through the range with a hard ending indicates that the joint capsule is stopping the motion. If there is pain at the end range, then the capsule and surrounding ligaments are probably inflamed. To address this condition your focus should be to cool down the inflammation by static pressure, ice, and other techniques.

If there is major restriction but no pain, and this restriction has been chronic, the joint capsule has undergone fibrotic changes; meaning that it has toughened up in response to some injury. Use slow deep stretches to loosen the capsule and introduce more motion.

By assessing where the joints are restricted, then releasing those restrictions, we can increase mobility and help the person out of pain.

Increased mobility = Decreased pain

Introduction

Assessment

Retesting

The most effective way to perform massage is to find a motion or resistance that elicits pain when tested, then work on the area that you feel causes that pain for 10 minutes. Retest and see if the pain is easing up. If you are working on the correct area with the correct technique, the pain usually is diminished by 50% or more. If there is no change in pain, you need to try different techniques, or a different location.

Test, work, retest. Do not test for pain, work a whole session, then ask your client afterwards if they feel better. This is a common way to do massage and is very inappropriate when dealing with injuries. When you test, work and retest, you can quickly assess if your intuition, anatomical skill and techniques have been accurate. If the pain is not lessened, then you get to try again.

When you find the right area, you will easily be able to get an 80–100 percent abatement of pain in under 20 minutes. Done correctly, massage is very powerful and these types of results are easy to get.

Test - Work - Retest

Introduction

Application of pressure

Apply pressure at 90 degrees to the body.

In order for our bodywork to be effective, we need to gain access to the deeper tissues of the body. We can do this by applying pressure directly into whatever structure we are working on. Our body is made up of cylinder shapes, which means that to apply pressure directly into the tissue, we should be at a 90 degree angle to the body. If we perform our strokes correctly, we will usually be applying pressure toward the center of the body.

Line up your joints.

The position of our bones determines where the pressure is going. When using the thumb, the phalange bone should always point toward the area that we are working on, with all other proximal joints aligned. When working with the elbow or forearm, the humerus directs the angle of force. By aligning the joints, we allow the bones to do the work of transmitting force, rather than the ligaments and muscles. This keeps the practitioner's body pain-free.

Stand in the right position.

We can only line up our joints if our body is in the correct position in relationship to our client's body. Wherever we choose to work, that part of the body should be facing us, and we should stand in front of it. For example, if we wish to work the quadratus lumborum muscle with the client prone, we should stand at their side. If we want to work on the upper back with the client prone, we should stand at their head. We will avoid injury by standing in the correct position with our joints aligned. By using a wide stance, one leg in front of the other, we can apply pressure that comes from our stance. In this way we can apply deep pressure effortlessly and with joy.

(Some people believe that small women cannot apply very deep pressure. With these techniques I have taught very small women to apply the very deepest of pressure without injury to themselves.)

Introduction

Mechanics of the Forearm

The forearm is one of the most useful tools for performing long, sweeping, general strokes. These have the benefit of being soothing and relaxing as well as being deeply penetrating and effective for clearing the muscle tissue of waste and tension.

Proper alignment of the humerus

When performing the forearm stroke on any part of the body, it is important to make sure that the humerus is in correct alignment. The humerus can move in four different planes; forward and back, medial and lateral. In the forward and back plane of motion, the humerus should not be completely vertical but back just a little bit so when the practitioner leans on the elbow, the forearm will slowly slide forward.

In the medial and lateral plane the practitioner should have the forearm directly above whenever structure they are working. This allows an appropriate transfer of force into the tissue.

Depress the shoulder

Depress your shoulder while doing forearm strokes in order to protect the glenohumeral joint. By depressing the shoulder, the latissimus dorsi pulls the head of the humerus down, taking pressure off the glenohumeral joint.

Other considerations

The wrist should be neutral and the fingers relaxed. The head should be in relative neutral, perhaps looking down a little but not in full flexion with the chin touching the chest. The practitioner should not get too close to their work. The lower back should not be rounded but should be supported. This is achieved by sticking your butt out which, in effect, anteriorly rotates the pelvis and causes the correct curve in the lumbar spine.

Introduction

Mechanics of the Forearm

Support

While applying deep tissue strokes, especially the forearm stroke, it is important that you are stabilized well. Stabilize your position in five places:

1. Two feet firmly on the floor, one knee extended and one knee bent.
2. One side of your hip rests against the table.
3. One hand resting on the table.
4. One elbow connected to the tissue of the body.
5. The fingers of that arm connected to the forearm of the other arm.

In this way, you can regulate your pressure appropriately and apply deep pressure safely. If you need to lighten up, you can place more pressure on the hand that is resting on the table.

Area of contact

In order to gain a good mechanical advantage, apply pressure within three inches of the elbow . This allows you to apply pressure through the bones without much muscular effort. When you want the pressure to be especially deep and intense, you can use your elbow point. Stay on top of whatever structures you are working on in order to transmit force effectively. For this reason, neuromuscular therapy requires a slightly lower table than Swedish massage styles.

Tightening the skin

The skin on your forearm is loose. In order to get an effective depth with your stroke, you need to first tighten the skin on your forearm before you can apply deep pressure. This means starting a little below where you were going to apply your stroke. The first inch or two of the stroke will tighten the skin, then you can apply deep pressure.

Introduction

Stroke mechanics

Knuckle and loose fist

The fists and the knuckles are excellent tools to apply deep pressure. They are more specific and sensitive than the elbow. When applying pressure with the fist, keep the fingers relaxed. In this way, as you apply pressure, your nails will not bite into your palm. Relax your hand, straighten your wrist, and use your knuckles to apply deep pressure. Make sure that as you apply pressure, you're only leaning on and allowing your body weight to push your fists forward. Most strokes done with fists are done pushing away from your body.

Mechanics of the thumb

In applying pressure with the thumb, it is important that the joints are straight so that the force is applied through the bones, rather than through ligaments or muscles. It is difficult, however, to keep the thumb joint well aligned while applying pressure. By bracing the thumb on the index finger, deep pressure can be applied and the joint kept straight. While applying force, it is sometimes necessary to push the thumb into the finger in order to stabilize it.

When performing stripping strokes with the thumb, it is important to brace the fingers and slide with up with the thumbs. When the position becomes uncomfortable, lift up the fingers, move to a new position, and continue the stroke.

Introduction

Stroke Speed

Mechanical component

The intention of stripping strokes is to elongate tight muscles and fascia. By performing these strokes slowly, we are able to penetrate deeply and affect lasting change in the body. Faster strokes are more superficial, while slow strokes can penetrate to the core of the muscle. There also is a direct relationship between pain and speed. The slower the stroke, the less pain will be felt. When clients complain of a painful area, sometimes rather than lightening up, simply slowing down or stopping is enough to ease the discomfort, but will allow a deep release to continue.

Emotional component

A practitioner's strokes will speed up when they feel rushed for time, when they resist connecting with their client, or resist feeling any emotions the session brings up. Slow and rhythmic strokes demand an attitude of patience on the part of the practitioner. In order to perform slow strokes, it takes a willingness to feel and an ability to be intimate in a comfortable and appropriate way. Slow strokes bring you into the moment, demand that you feel your own feelings as well as connect to the receiver. Slow strokes are done from the heart, where consistently fast strokes are done from the head.

Introduction

Depth

Choosing the appropriate depth for each client is of utmost importance. Here are some considerations:

Is this a first time client?

When working on someone the first time, always go lighter. This is a lesson learned only through misjudging appropriate depth, creating bruising and excessive soreness after the session. Take heed, trust the power of massage, and the client's ability to come back and receive another session.

Do they bruise easily?

If they have bruises on their legs from bumping into things, and express that they bruise easily, make your strokes a little broader, and perhaps ice after the session.

Do they have a layer of fatty tissue that you are working through?

Fatty tissue bruises easier than muscle tissue. Respect it and don't try to push though fat layers in order to get to muscles. Work with palm compression and use more generalized strokes to be effective without bruising.

Do they exercise regularly?

If they perform cardiovascular exercise on a regular basis, their tissues will probably be healthy and able to receive deep pressure without excessive soreness or bruising. People who are bodybuilders with great masses of muscle who don't emphasize cardiovascular exercise often have poor tissue health. Don't be surprised if they complain of great soreness with moderate or light pressure. Having big muscles doesn't mean they're healthy muscles.

Have they been receiving massage regularly?

Clients who regularly receive massage generally have more "open" tissue, and will begin relaxing their muscles when they get on the table as part of a conditioned response. The first time receiver is often a little anxious and/or curious, and often retains some tension wondering what will be happening next.

Again, if the client is a first time massage receiver, be careful. We don't want these people to go away bruised or excessively sore. People are much more likely to have a detoxification response from the massage if they have never received massage before.

Introduction

Depth

Always use a pain scale to achieve the appropriate depth. 0 = feather touch, 10 = excruciating pain. Never work above an eight. At 7 and 8 there is soreness, but it feels good at the same time. Tell your client that if they notice that they are starting to tighten up other areas of their body in response to the pressure, to say “lighten up.” The practitioner should also keep a look out for such signs as a tightening of the extremities, curling toes, or tightening fingers. Many times clients may not be aware they are tensing. If you see these cues, advise the client to breath deeply. The client should be able to be at ease throughout the whole massage, and not have to brace against your pressure.

Your clients should not be sore for more than one day. If they are sore for two or more days- you went too deep. When working on trigger points the referral patterns should ease up within 10-30 seconds.

Healthy tissue is not sore to the touch. Sometimes clients want you to go deeper on areas that are not sore. Deep pressure applied without eliciting soreness indicates healthy tissue. Look for areas that the client experiences soreness to the touch. In my experience, everyone who complains of pain has tender areas when palpated. A client with no tender spots is possibly taking muscle relaxants, anti-inflammatory pills, or painkillers (including aspirin type drugs). Be aware of this as you work.

Sometimes people will feel pain in areas that are healthy. If a client tells you they have pain in their middle back, but then say there is no soreness when you work on the area, instead of going deeper and deeper, exhausting yourself and possibly damaging your client, search around the area for sore spots. These may be trigger points that are referring pain. By understanding the referral patterns for trigger points, you can determine where the true cause of pain is.

Ankle

Common Injuries

The most common ankle injuries involve talo-fibular and calcaneo-fibular ligament strain and achilles tendinitis. In evaluating ankle strains, it is important to internally and externally rotate the ankle. This will tell you how loose or tight the ankle joint is.

The ankle joint can respond in two ways to a strain. The ankle ligaments could be stretched, causing the ankle to be unstable and to feel looser than the healthy side. When someone has a loose ankle, they should perform exercises to strengthen the ankle. The main muscles of stabilization of the ankle joint are the peroneus brevis, peroneus longus, and the deep ankle flexor, such as the tibialis posterior. Trigger points in the muscles will also make the muscles weak and unable to support the joint.

The other response is a buildup of scar tissue that causes limited range of motion in the ankle. Ankles that have a restricted range of motion should be loosened by massage, cross-fiber frictioning and stretching.

Assessment

In order to test the ankle the client should be supine. Take both feet in your hands and turn them towards each other (inversion). This can tell you if the ligaments on the outside have been torn or stretched. Notice which foot is restricted. Use slow stretches to release the restriction.

Massage application

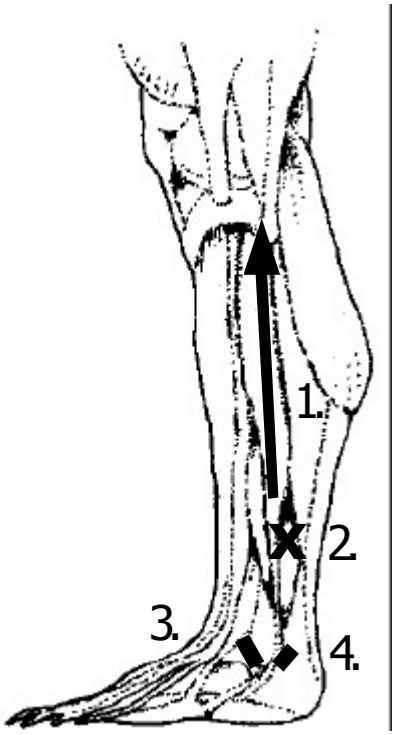
Only work on an ankle injury after the initial inflammatory stage (1-3 days) is over. It is contraindicated to do deep massage over an area that is inflamed or puffy. When there is excessive edema (swelling), the appropriate form of treatment is manual lymphatic drainage.

Working on ankle injuries consists of frictioning the ligaments, releasing the muscles, and suggesting that the client perform ankle strengthening exercises at home.

Ankle

Everters & Sprains

peroneus brevis, peroneus longus, calcaneo-fibular ligament, talo-fibular ligament



Client prone:

Externally rotate the leg, placing that ankle across the opposite leg.

1. Use your elbow to glide up the peroneus longus and brevis.
2. Apply static pressure with your thumbs over the peroneus brevis.
3. Cross fiber friction the talo-fibular ligament, just anterior to the latereral maleolus.
4. Cross fiber friction the calcaneo-fibular ligament, just inferior to the lateral maleolus.

Reposition the client's leg to neutral

5. Standing at the base of the table, glide up the foot flexors muscles just posterior to the tibia.

Referral Pattern

peroneus longus: lateral ankle
peroneus brevis: lateral ankle

Cautions & Comments

Only work on these ligaments after the initial inflammatory stage (one to three days), when the swelling has gone down. Don't stretch ligaments that are already too loose.

Test

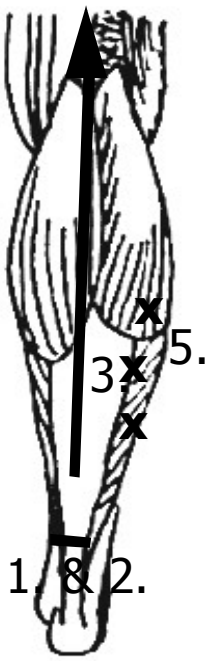
Client is face up.
To test the muscles grasp your clients metatarsals with both hands and ask them to forcefully evert their foot against your resistance. If there is pain, then the muscles are involved.

To test the ligaments, passively invert the foot, stretching the outside. If there is pain here, then this indicates that the ligaments are inflamed.
<u>These tests are not shown in the video.</u>

Ankle

Plantar Flexors

soleus, gastrocnemius, achilles tendon



Client prone:

1. Put the tendon on a stretch by placing the foot against your belly, then use your thumbs to friction the sides of the Achilles' tendon.
2. Release the foot from your belly and use one thumb to push the tendon aside. Rotate your other hand in order to cross fiber the anterior part of the Achilles' tendon.
3. Forearm glide up the leg. **Place no pressure on the posterior knee.**
4. Use your thumbs to split the heads of the gastrocnemius.
5. Apply static thumb pressure on the lateral edge of the soleus.
6. Stretch the soleus by flexing the knee and placing the foot on your chest, or use your hands, or elbow. Then dorsi-flex the ankle.

Referral Pattern

soleus: The lowest point refers into the calcaneus. Just below the heads of the gastrocnemius, a spot refers to the lower back, and should be checked on runners with lower back pain

gastrocnemius: One point on the medial head of this muscle can refer into the bottom of the foot, but most others refer into the posterior knee and leg

Cautions & Comments

When you are splitting the heads of the gastrocnemius, sometimes the client will experience burning as adhesions are separated.

Be careful near the popliteal space where the nerve and vessels are near the surface.

Knee

Internal support

anterior & posterior cruciate ligaments

Client supine:

Bend the knee and sit on the foot.

1. To relieve pull on the anterior cruciate ligament, push the tibia posterior and hold this position for two to three minutes. This should feel good to the client and offer almost immediate relief.
2. To release the posterior cruciate ligament, pull the tibia forward by grasping around the gastrocnemius and steadily pulling anterior for two to three minutes.

Referral Pattern

anterior & posterior cruciate ligaments: deep inside the knee

Cautions & Comments

These techniques are simply ways of relieving pull on the ligaments. Rest and medical help are an important next step.

Test

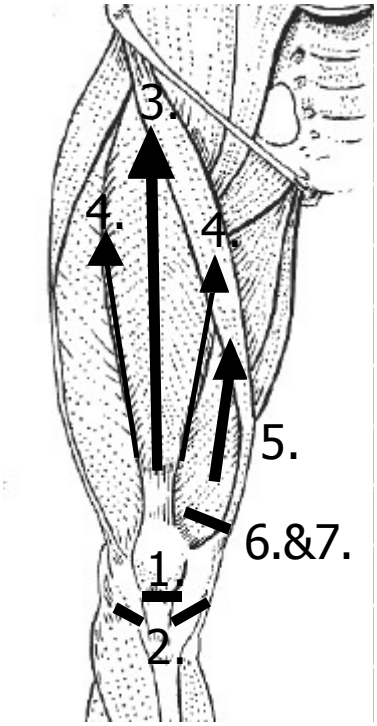
Client supine.

Posterior cruciate; bend the knee and sit on the foot. Now place your palms on the tibia near the knee and forcefully shear it posterior.

Anterior cruciate ligament; cross your fingers under the calf and forcefully pull towards yourself.

Knee Extensors

vastus medialis, vastus lateralis, vastus intermedius, rectus femoris, infrapatellar ligament and coronary ligament



Client supine:

1. Infrapatellar ligament; Stabilize the patella with one hand. Perform cross-fiber thumb strokes where the ligament meets the bone for one to three minutes.
2. Coronary ligament; Bend the knee and use your thumbs to press down on tibial plateau on both sides of the infra-patellar ligament. Friction horizontally for one to three minutes.
3. Glide up the rectus femoris with your forearm.
4. Use your thumb to push aside the rectus femoris, glide up over the vastus intermedius.
5. Glide up the vastus medialis.
6. Friction the vastus medialis at its most distal point.
7. Apply static pressure and search for trigger points.
8. Stretch with the client prone by fully flexing the knee.

Referral Pattern

vastus medialis: anterior/medial knee
vastus lateralis: side of the thigh
vastus intermedius: anterior thigh
rectus femoris: anterior knee

Just remember that the rectus femoris and vastus medialis refer into the anterior knee. These should be your prime muscular concern with anterior knee pain.

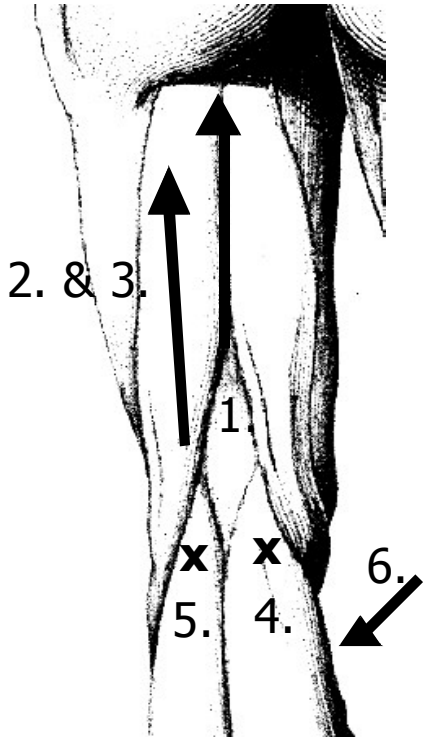
Cautions & Comments

People who experience pain when squatting may have inflamed tendons, ligaments or muscles. Be aware that the anterior and posterior cruciate ligaments can also cause pain that feels as though it is on the anterior knee. Always test those ligaments first.

Knee

Flexors

popliteus, gastrocnemius, biceps femoris, semi-membranosis, and semi-tendonosus.



Client prone:

1. Forearm glide up the posterior leg. **Put no pressure on the popliteal space**.
2. Forearm glide over the biceps femoris.
3. Use your thumbs to glide up the second head of the biceps femoris.
4. Bend the knee and rest the ankle on your thigh. Apply static thumb pressure over the medial head of the gastrocnemius. **If you feel a strong pulse, move inferior or more medial to avoid applying direct pressure on the blood vessels.**
5. Apply static pressure on the lateral head of the gastrocnemius. This area is usually less tender than the medial trigger point.
6. Use your thumb to apply static pressure to the posterior tibia over the popliteus.
7. Client supine. Stretch by flexing the hip and knee, then slowly extending the knee. Stabilize the client's leg by placing one hand above the knee, and the other on the plantar surface.

Referral Pattern

biceps femoris: the posterior knee
gastrocnemius: posterior knee
popliteus: posterior knee
semi group: hip

Test

Flex the hip to 90 degrees, then straighten the leg. With normal range the knee should approach a straight leg.

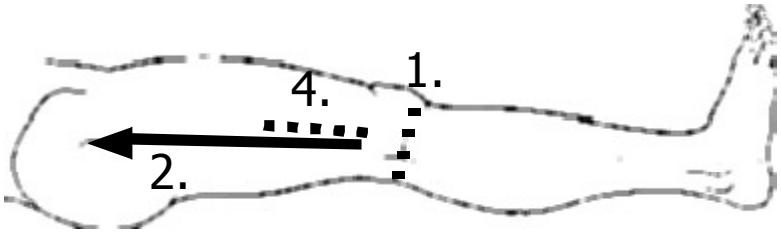
Cautions & Comments

As you work the heads of the gastrocnemius you are next to the popliteal vessels, so be cautious and avoid any frictioning. If you feel a strong pulse right under your fingers, move inferior or lateral. The medial head of the gastrocnemius is usually more tender.

Knee

Lateral

iliotibial band, vastus lateralis, lateral collateral ligament



Client supine:

1. Find the joint space at the knee and follow it posteriorly until you feel a strap crossing the joint space (the lateral collateral ligament). Apply friction here anterior to posterior for one to three minutes.
2. Position yourself on your knees, so that your upper body is level to the table. Use your forearm to glide up the vastus lateralis.
3. Alternately, you can position your client in side posture and use your forearm to glide up the vastus lateralis.
4. Friction the distal two thirds of the iliotibial band with your thumbs.

Referral Pattern

vastus lateralis: lateral knee and thigh

Test

Use one hand to stabilize the lower leg and use your other hand to forcefully pull the knee towards yourself.

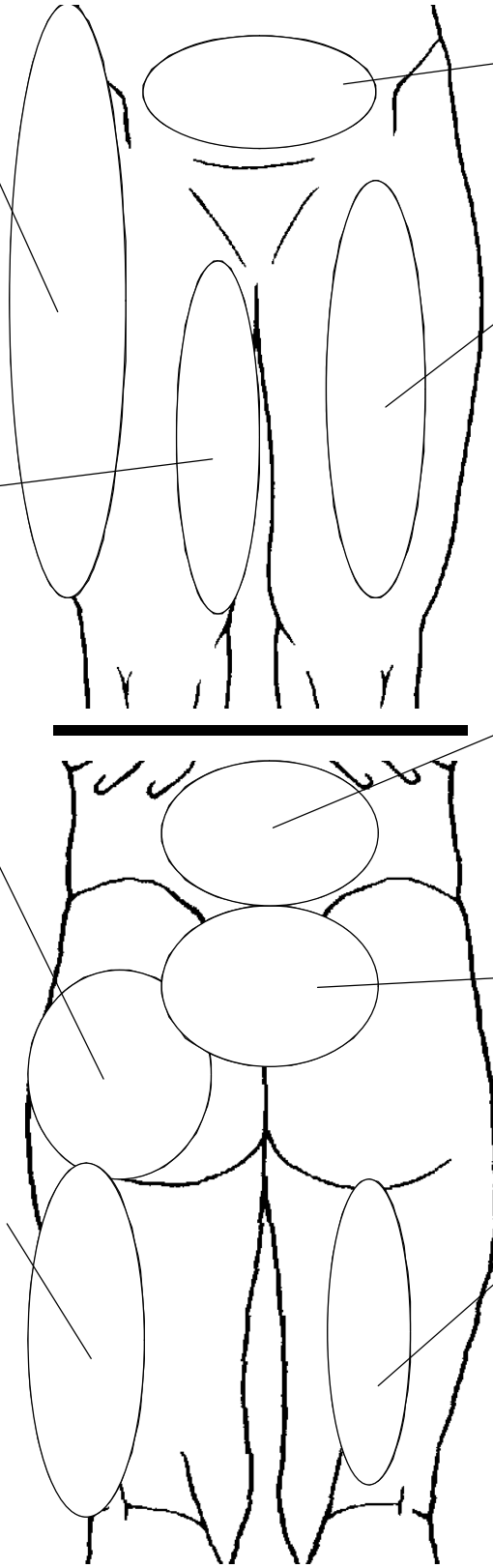
Hip Introduction

The hips are the foundation of our lower bodies. They are the bowl that carries our deepest selves, our organs. The hips are balanced upon each femur, and then support the spine where the lumbar vertebrae meet the sacrum. The shape of the hip bones create an arch, with the top being the sacrum, and the sides coming down onto the femurs. This arched structure allows the hips to transfer the weight of the body to the femur bones.

There are four groups of muscles around the hips. These are the adductors (on the inside), the abductors (on the lateral hip), the flexors (on the anterior side) and the extensors (on the posterior aspect). These muscles control the movements of the hips. When we think about movement of the hips, there are two possibilities. The first possibility is that someone is placing their weight on one leg, so the opposite hip joint is able move between the femur and ilium. This happens when someone takes a step. The other possibility is that both feet are planted on the ground, becoming the foundation, and the hips move in relation to both femurs but affect the curve of the lumbar vertebrae. There are two major hip/back movements that we can evaluate, (1.) anterior rotation (tilting forward and an increase in lordosis) and (2.) posterior rotation (tilting back and an increase in kyphosis, or flat back).

With each distortion, there will be a diagonal pattern of tension through the body. For example, with posterior rotation, the hamstrings and rectus abdominis will be tight. In an anterior rotation, the rectus femoris and iliopsoas on the front and the back erectors on the back will be tight. When the movement of the hips is exaggerated one way or another, it can result in lower back pain.

Hip
Referral Pattern



Gluteus minimus
Vastus lateralis
Piriformis
Quadratus lumborum
Tensor fasciae latae
Vastus intermedius
Gluteus maximus
Rectus femoris

Rectus abdominis
External oblique
Iliocostalis
Multifidi
Quadratus lumborum

Adductors
Iliopsoas
Vastus intermedius
Rectus femoris

Pectineus
Vastus medialis
Gracilis
Adductor magnus

Gluteus medius
Multifidi
Iliopsoas
Longissimus
Rectus abdominis
Iliocostalis

Gluteus medius
Quadratus lumborum
Gluteus maximus
Iliocostalis lumborum
Longissimus thoracis
Semitendinosus
Semimembranosus
Piriformis
Gluteus minimus
Rectus abdominis

Gluteus medius
Quadratus lumborum
Gluteus maximus
Multifidi
Rectus abdominis
Soleus

Gluteus minimus
Vastus lateralis
Piriformis
Quadratus lumborum
Tensor fasciae late
Gluteus maximus

Gluteus Minimus
Hamstrings
Piriformis
Obturator internus

Hip

Anterior & Posterior Rotation

Check for the tilt of the hips by measuring from the side the relationship between the ASIS (anterior superior iliac spine) and the PSIS (posterior superior iliac spine). When your client is standing, place a finger under the ASIS and under the PSIS, compare which is higher or lower. The ASIS should be equal (on men) or one-half inch inferior to the PSIS (on women).

Compare the right and left hips. If they are not relatively similar, or both distorted in the same way, this may put stress on the SI joint, causing pain.

Posterior Rotation excessive lumbar kyphosis.	
Both ASIS are superior to the PSIS.	Tight muscles: hamstrings, gluteus maxi-mus and rectus abdominus

Anterior Rotation excessive lumbar lordosis	
Both ASIS are inferior more than ½” The most common distortion.	Tight muscles: iliopsoas, rectus femoris and back erectors

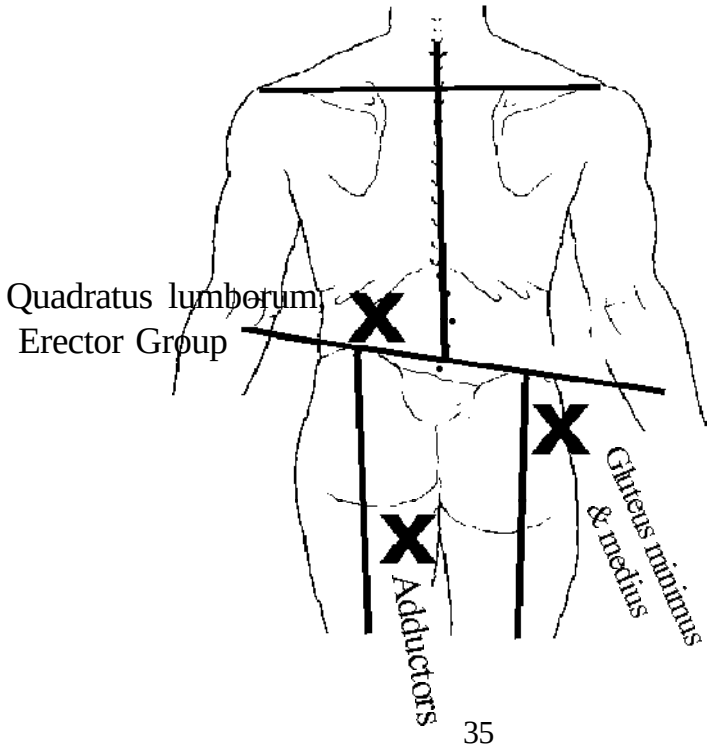
Hip

High/Low Ilium

You can evaluate the relationship of the ilium by placing your fingertips on top of the ilium while the client is standing. Note which side is higher. Be careful that your fingertips are in the same place on either side, or your measurement my be off. Always look for obvious difference. If you can't tell which side is higher, the client is probably balanced.

The relationship between a high/low hip and an anterior/posteriorly rotated pelvis can be complex. The more common dysfunction is a high/low hip, so always start by trying to balance this first. Then recheck to see if the hips have shifted. If they have not, then work on a different set of muscles to balance the anterior/ posterior tilt. If the hip alignment still does not change, then the person may have an anatomically long or short leg, and no amount of massage will help. The other option is that the pattern is long-term, and will take time to shift.

The image below shows where to work to balance the hips. In this example the right hip is low, the left hip is high. To balance everything, work above the left hip, below the right hip and the adductors on the left side. You work the adductors because when a hip is high, the femur becomes slightly adducted- so releasing the adductors can help the hip to come down. You work the abductors on the opposite side because when a hip is low the femur becomes slightly abducted.



Hip

Piriformis muscle syndrome, sciatic pain

In 85 percent of people, the sciatic nerve exits the greater sciatic foramen just anterior to the piriformis muscle. Spasm in the piriformis muscle can cause compression on the sciatic nerve sending pain, tingling and numbness down the posterior leg. The sciatic nerve can also be compressed at sacral nerve roots and the lumbar nerve roots at L4 and L5 arising from a bulging disc. Often times sciatic pain has its root in a spasm of the piriformis muscle.

We can evaluate the client to discover if the neurological symptoms arise from piriformis constriction by observing three things:

1. In the supine position, does the foot of the affected side lay out in external rotation, indicating tight external rotators?

2. In the prone position, perform the ROM test for the external rotators, by bending the knee to 90 degree and bring the femur into internal rota tion. Is there restriction or pain?

3. Does palpation of the piriformis muscle illicit pain or tenderness?

If these three tests are positive, then there is a strong indication of piriformis muscle involvement.

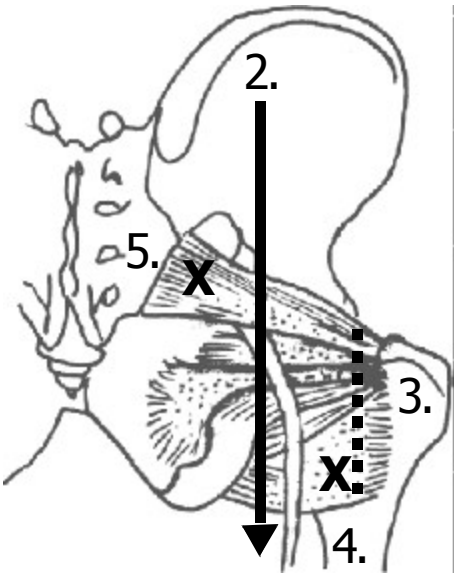
Caution (ischemic compression on nerves)

The normal response to applying ischemic compression to a muscle is an initial period of soreness, often times accompanied by a jump sign. The pain and any referral should diminish slowly over the space of 15-30 seconds. If the pain or referral becomes more intense, this could indicate pressure on a nerve instead of a muscle. Release the pressure immediately if you are pushing on a nerve.

Hip

External Rotators

piriformis, gemellus inferior and superior, obturator internus and externus, quadratus femoris, gluteus maximus



Client prone:

1. Skin roll the gluteal fascia
2. Elbow strip from the iliac crest, inferiorly. Add internal and external rotation of the hip to increase the intensity
3. Thumb friction medial to the greater trochanter
4. Friction the quadratus femoris, then apply static elbow point pressure
5. Apply static thumb pressure to the piriformis

Referral Pattern

All these muscle refer pain around the posterior hip and sacrum

Test

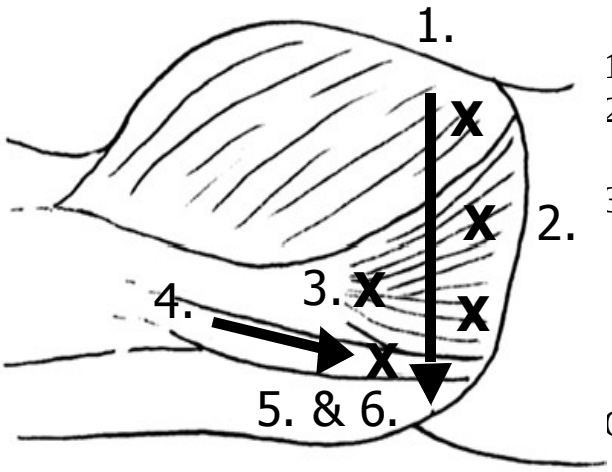
Client face down.
Grasp the ankle and bend the knee to 90 degrees. Then pull the leg toward you (internally rotate, the femur points toward the midline). The leg should rotate 45 degrees out.

Test both sides and compare.

Hip

Internal Rotators & Abductors

gluteus medius, tensor fascia latae, adductors



Client prone:

1. Elbow strip towards the floor
2. Apply static pressure on trigger point areas
3. Bend the knee to 90, grasp the ankle and internally and externally rotate the hip while applying static pressure just superior to the greater trochanter

Client supine:

4. Strip the tensor fascia latae with your thumbs
5. Apply static pressure
6. Apply static pressure while the client internally and externally rotates their leg

Referral Pattern

gluteus medius: Ilium and sacrum
tensor fascia latae: itself and lateral leg

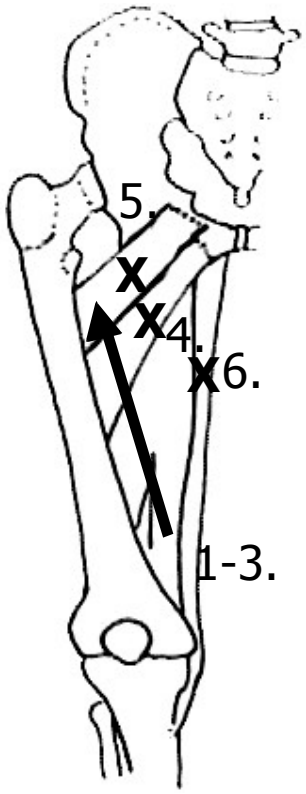
Test

Client face down
Grasp the ankle and bend the knee to 90 degrees. Then push the leg away from you (external rotation – the femur points away from the body). The leg should rotate as far as the other leg.

Hip

Adductors

adductor magnus, adductor longus, adductor brevis, and pectineus



Client supine:

1. Stand on the opposite side of the table, and use your forearm to glide up the adductors
2. Stand on the same side of the table, your thigh under your clients knee, glide up the adductors with your elbow
3. Thumb strip
4. Apply static pressure on the adductor longus
5. Apply static pressure on the pectineus
6. Use pincer palpation on the gracilis muscle
7. Cross-fiber friction the adductor attachments

Referral Pattern

adductor magnus:
inner thigh and urogenital region
adductor longus and brevis:
anterior knee and upper thigh
pectineus: around itself

Cautions and Comments

Be cautious of the femoral artery and lymphatic vessels. Sometimes there is tenderness and stagnation of fluid and energy here. Be aware of boundary issues due to the proximity to the genital area.

Test

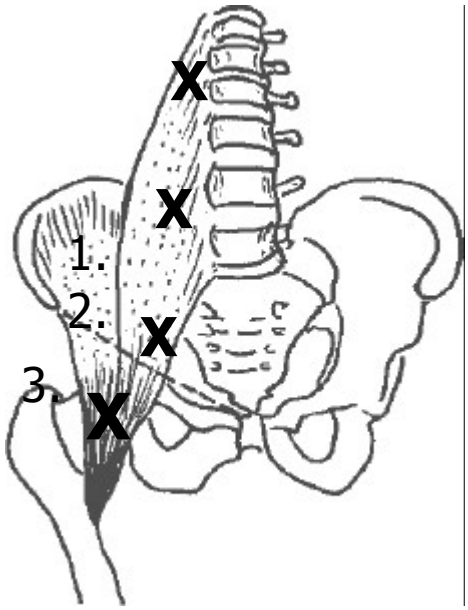
To test the adductor magnus, hold your client's ankle to the table while they forcefully adduct their leg.

To test the adductor longus, brevis and pectineus- have the client flex their knee with their foot next to the opposite knee. Let the leg fall out, then have them adduct against your resistance offered at the knee. (The positioning is the same as the adductor longus stretch on the video.)

Hip

Flexors

psoas, iliacus, rectus femoris



Client supine:

1. Apply static pressure in three spots up the body of the psoas
2. Apply static pressure while the client slides their foot up the table (flexing and extending their hip)
3. Apply static pressure inferior to the inguinal ligament, lateral to the femoral pulse and medial to the sartorius

Referral Pattern

psoas: anterior thigh and lower back

Cautions & Comments

When working next to the inferior attachment of the psoas, be aware of the femoral artery. If you feel a pulse, move laterally.

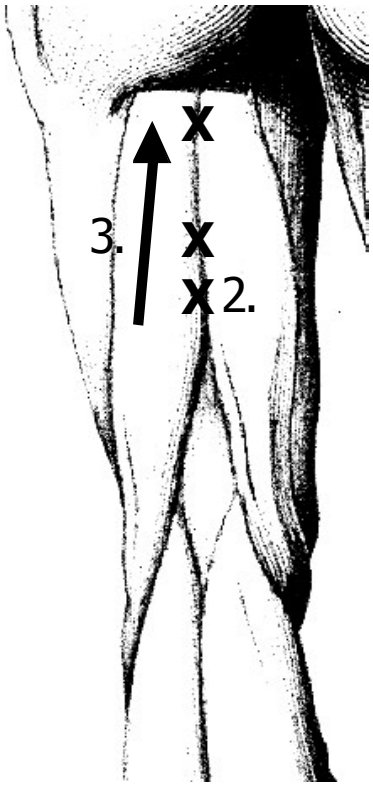
If your client experiences back pain during the psoas stretch, have them hold their other knee to their chest (this posteriorly rotates the pelvis, reducing compression on the lumbar spine).

Test

To perform a range of motion test, have your client hug one knee to their chest, and posteriorly rotate the pelvis. Normal range is indicated if the other leg can lay flat on the table. If the other leg raises off the table, then there is restriction in the hip flexors on that side.

Hip Extensors

semimembranosus, semitendinosus, biceps femoris, gluteus maximus



Client prone:

1. Glide up the hamstrings with your forearm
2. Apply static elbow point pressure between the hamstring muscles
3. Use your thumbs to search for trigger points

Referral Pattern

semimembranosus: posterior hip
semitendinosus: posterior hip
biceps femoris: posterior knee

Cautions & Comments

These muscles posteriorly rotate the pelvis.

Test

To test the length of the hamstrings, position your client supine. Then flex the hip to 90 degrees so that the femur points toward the ceiling. Slowly extend the lower leg. Women should be able to fully straighten their leg. Men should get to within a few inches of straight.

Back

Dynamics of Lumbar Pain

Four groups of muscles support the pelvis in anterior-posterior alignment. The low back extensors pull upward on the pelvis posteriorly, the hamstrings pull downward posteriorly, the abdominal muscles pull upward anteriorly, and the hip flexors pull downward anteriorly. When there is good muscle balance, the pelvis is maintained in good alignment. With imbalance, the pelvis tilts anteriorly or posteriorly. With anterior pelvic tilt, the low back arches forward into a position of lordosis. There is undue compression posteriorly on the vertebrae and the articulating facets, and there is undue tension on the anterior longitudinal ligament in the lumbar area. The imbalances associated with an anterior tilt may include all or part of the following: Weak anterior abdominal muscle; tight hip flexor muscles (chiefly Iliopsoas); tight low back muscles; weak hip extensor muscles.

When all four muscle groups are involved, correction of the anterior pelvic tilt requires that the anterior abdominal muscles and the hip extensors be strengthened, and that the tight low back and hip flexor muscles be stretched. Any one of the above may be a primary factor but the tight low back and weak hip extensor muscles are least likely to be the primary cause.

Frank Ober stated “It is well known that a lordotic spine may be a painful spine, but this, of course, is not true in every case.” Farni and Trueman have emphasized the common association of increased lumbar lordosis and low back pain. It is true that some individuals with a lordosis complain of low back pain while others with a more severe lordosis may not complain of any pain. A lordosis may be habitual, but if the muscles of the back are flexible enough that position can be changed from time to time, symptoms may not develop. However, a back so tight that the lordotic position is fixed tends to be a painful back in any position of the body.

The best index in regard to a painful low back is not the degree of lordosis or other mechanical defect visible on examination of alignment, but the extent of muscle tightness that maintains a fixed anterior – posterior alignment, and the extent of muscle weakness that allows the faulty position to occur and to persist.

Therefore, we use an assessment of posture to give us clues as to what muscles might be tight and rigid. Postural assessment is not an end in itself. The end goal should be painless, fluid and graceful movement patterns. When we confront injury and pain, we use postural assessment to guide our work and to give us a clear measurement to whether or not we are shifting the dysfunctional patterns, bringing the body into greater homeostasis.

Back

Lumbar pain **(Cont'd.)**

Tight one–joint hip flexors (Chiefly Iliopsoas).

Tight one–joint hip flexors cause an anterior tilt of the pelvis in standing. The low back goes into lordosis as the subject stands erect. Occasionally, a subject inclines forward from the hips, avoiding an erect position that would result in a marked lordosis.

Some people can sit for long periods of time without pain or discomfort, but have pain when standing for brief periods. One should examine for hip flexor shortness in such cases. Lying on the back or on the side with hips and knees flexed relaxes the pull of the tight hip flexors on the low back. Patients often seek these means to relieve pain in the back and legitimately so in the acute stage. However, the problem is the giving in to the tightness by flexing the hips in the various positions aggravates the underlying muscle problem permitting further adaptive shortening of the very muscles that are causing the problem.

Trying to accomplish stretching of tight hip flexors by occasional periods of treatment is difficult if occupation requires staying in a sitting position. The patient must realize that it may be necessary to do stretching of the tight muscles daily in order to counteract the effects of a continuous sitting position.

Weak Anterior Abdominal Muscles

Weakness of the anterior abdominal muscles allows the pelvis to tilt forward. The muscles are incapable of exerting the upward pull on the pelvis that is needed to help maintain a good alignment. As the pelvis tilts forward, the low back is drawn into a position of lordosis.

The individual with a lordosis in which abdominal muscle weakness is the main problem usually complains of pain across the low back. In early stages it is described as fatigue and later as an ache which may or may not progress to back pain. Pain is usually worse at the end of day and is relieved by recumbency to such an extent that after a night's rest the individual may be free of symptoms. Sleeping on a firm mattress allows the back to flatten and this change from the lordotic position gives relief and comfort to the patient.

—Taken from Muscles Testing and Function, 4th Edition, Kendal, Florence; Williams & Wilkins, 1993.

Back

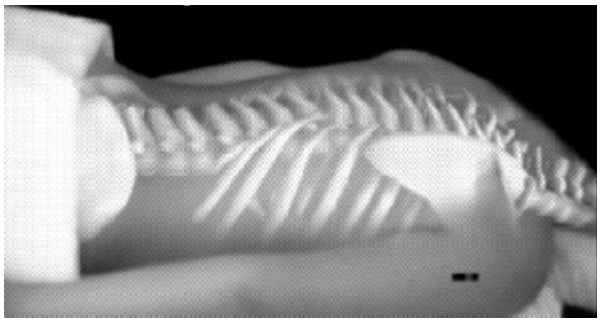
Facet Joint mobility

The most important factor in whether or not a person experiences pain is mobility. If a person has a postural distortion with good joint mobility, they will probably not experience any pain. When joints in the body become immobile, the soft tissue then has to take the brunt of the shock. This shock causes tissue damage and more tightening.

To get a good sense of where there is dysfunction in the back, we can use a Spring Test to assess the mobility of the vertebral facet joints. Then we can work on the muscles surrounding the joint in order to bring more freedom of movement into the joint.

To perform the Spring Test, start on the lower back and make contact with the spinous processes with the base of your palm. Then apply springing pressure, keeping contact with the spinous processes. Move up one vertebra and test again. As you move up the spine, change the pressure from directly anterior, to an anterior-superior motion to account for the changing shape of the spinous processes. When you reach the upper back, begin to push directly anterior again.

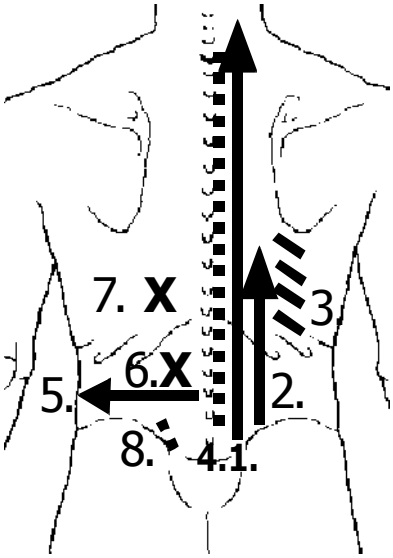
After performing the spring test, you should have a good idea of the mobility of the spinal joints.



Torso

Back

longissimus, spinalis, iliocostalis, multifidus,
quadratus lumborum, serratus posterior inferior



Client prone:

1. Forearm strip the longissimus with your elbow.
2. Thumb strip the multifidi.
3. Friction the iliocostalis rib attachments.
4. Stand at the head and friction the spinalis with your thumbs.
5. Elbow glide over the quadratus lumborum.
6. Release the quadratus lumborum with your thumbs.
7. Static thumb pressure on the serratus posterior, inferior.
8. Friction the iliolumbar ligament.

Referral Pattern

longissimus, spinalis, iliocostalis and multifidus: the back
quadratus lumborum: the sacrum and crest of the ilium
serratus posterior inferior: around itself

Test

To test for spinal facet joint mobility, apply a gentle spring to each of the spinous processes. Work on the muscles around the area of restriction.

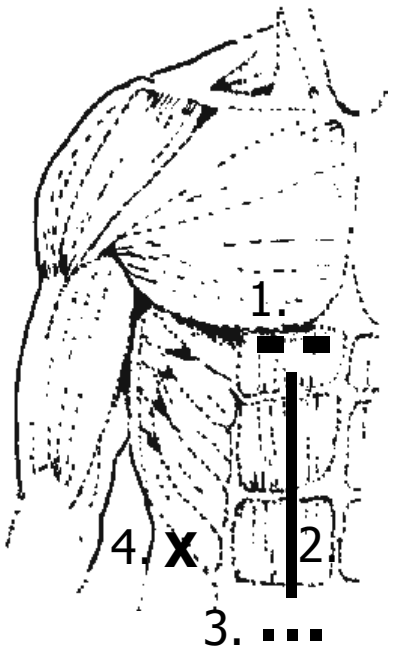
Cautions & Comments

Be gentle around the 12th rib.
For lower back issues, always include a hip ROM evaluation and work on the restricted area. The gluteus medius is often a main contributor to pain.

Torso

Anterior

rectus abdominis, obliques



Client supine:

1. Friction the fibrous attachment to the ribs.
2. Stabilize with one thumb, while stretching the muscle toward the pubic bone using a clawing motion with the other hand.
3. Friction the superior part of the pubic bone.
4. Squeeze the obliques between your fingers and thumb.

Referral Pattern

rectus abdominis: belly and sometimes to the back

Cautions & Comments

Be cautious of the inguinal ligament when frictioning the pubic bone.

For people with slumping posture, perform this routine as well as the routines for the shoulder protractors, anterior neck and scalenes work.

Shoulder Introduction

The shoulder can be divided into two functional groups. One grouping is the muscles that move the joint between the humerus and the scapula. All the muscles that support this "glenohumeral" joint are called the rotator cuff muscles, and they all originate from the scapula and insert on the head of the humerus.

These muscles can be remembered in that they spell SITS.

Supraspinatus	abducts
Infraspinatus	externally rotates
Teres minor	externally rotates
Subscapularis	internally rotates

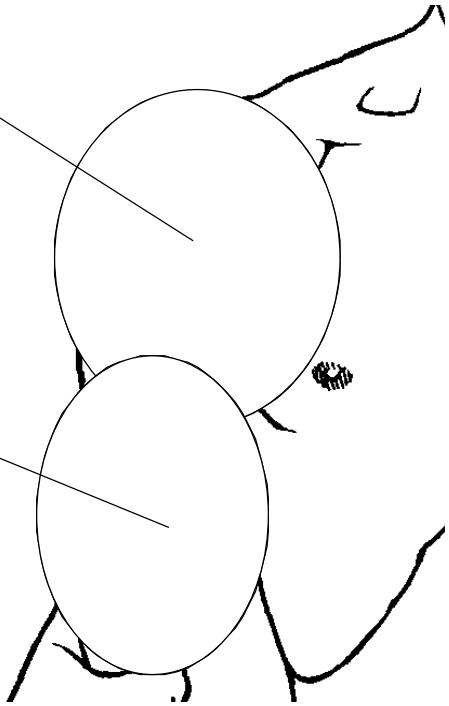
The other grouping of muscles are those that position the scapula on the rib cage. These muscles originate from the rib cage and spine and insert on the scapula or humerus. The muscles on the back (rhomboids, trapezius, and latissimus dorsi) are often confused in that they are not really back muscles (they don't move the back), they are really shoulder and arm muscles. When people complain of mid to upper back pain it is usually related to these shoulder moving muscles. The deeper neck muscles have their root in the upper back as well. Always check the neck range of motion when you find upper back tension.

You'll find the *Shoulder Movers* section next. It is located in *The Torso* video. The *Rotator Cuff* section is later in this manual, and is shown in *The Extremities* video.

Shoulder Referral Zones

Infraspinatus
Deltoid
Scaleni
Supraspinatus
Pectoralis major
Pectoralis Minor
Biceps brachii

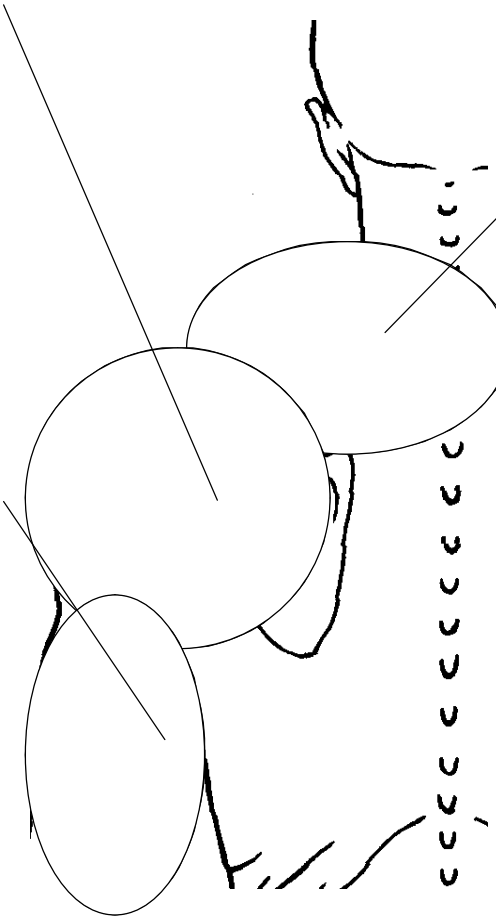
Scaleni
Infraspinatus
Biceps brachii
Brachialis
Triceps brachii
Supraspinatus
Deltoid



Deltoid
Levator scapulae
Scaleni
Supraspinatus
Teres major
Teres minor
Subscapularis
Triceps brachii
Trapezius

Scaleni
Levator scapula
Supraspinatus
Trapezius
Multifidi
Rhomboids
Splenius cervicis
Triceps brachii

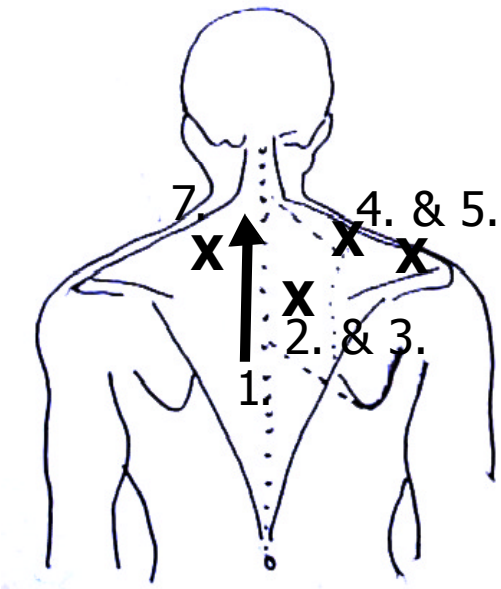
Scaleni
Triceps brachii
Deltoid
Subscapularis
Supraspinatus
Teres major
Teres minor



Shoulder

Retractors & Elevators

rhomboids, trapezius, levator scapula



Client Prone:

1. Stand at the head, elbow glide superiorly
2. Apply static pressure with your elbow
3. Thumb knead the back
4. Squeeze the upper trapezius between your fingers and thumb
5. Apply static pressure
6. Release the levator scapula by squeezing it through the trapezius
7. Apply static pressure on the levator scapula attachment

Referral Pattern

rhomboids: vertebral border of the scapula

trapezius: all over the back. The upper trigger points can refer into the head and neck. The most lateral point is famous for headache pain.

levator scapula: neck

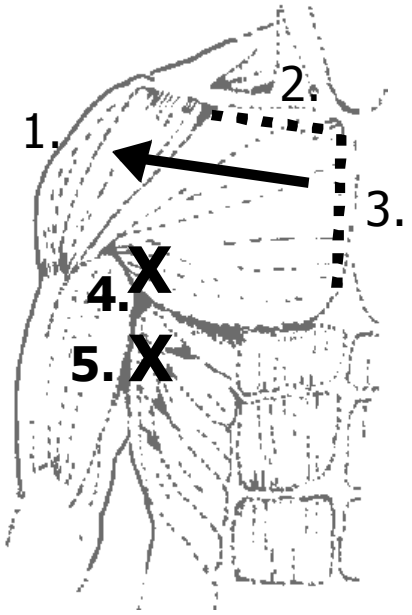
Cautions & Comments

The upper back is the root of the neck. When clients experience restricted neck flexion or rotation, always include upper back work first.

Shoulder

Protractors

pectoralis major, serratus anterior



Client supine:

1. Palm glide out the pectoralis major
2. Friction just inferior to the clavicle
3. Friction just next to the sternum
4. Squeeze the edge of the pectoralis major between your fingers and thumb

Client prone:

5. Reach across the body and use your fingertips to strip across the serratus anterior, just on top of the rib cage, anterior to the scapula

Referral Pattern

pectoralis major: itself and the radial arm
serratus anterior: itself

These two muscles on the left side can mimic myocardial infarction.

Cautions and Comments

These muscles become tight when a client's shoulders hang forward of the midline. People with forward shoulder posture often experience upper back pain because those muscles are lengthened yet tight. Always include the front of the body to relieve upper back pain.

Neck

Introduction

The motion of the neck can be divided into rotation (looking side to side), lateral flexion (ear to shoulder), flexion (chin to sternum) and hyperextension (looking up). We will evaluate the neck in these various directions to test for restriction.

When working on older clients or people who have had severe neck trauma we need to check that moving the neck into these various positions does not impinge the vertebral artery. An occluded vertebral artery does not deliver enough blood to the brain and is, therefore, a dangerous situation.

How to perform a vertebral artery test

Client extends head. Watch their eyes for 15 seconds and note if one or both pupils dilate. Ask them two simple questions (their name and where they are). Notice any signs of disorientation or confusion. If there are any of these signs, they may have an occluded vertebral artery. Do not perform neck work and refer to a physician.

Most necks are 100 percent safe to work on, but because the neck is a particularly vulnerable area, our work must be precise, directed and gentle. Don't just rub the neck muscles if you are not sure of the correct motions. Know what you are doing and why. Have a picture of the neck anatomy in front of you or in your mind so that you know where you are pushing.

Neck

Scalenes

The brachial plexus emerges between the anterior and middle scalene muscles, then passes downward across the rib attachment of the scalene medius. When taut and shortened, the anterior and middle scalene muscles are likely to entrap part of the brachial plexus at the thoracic outlet. Pain, numbness or tingling is experienced on the ulnar side of the hand with dysesthesia and objective sensory impairment. However, pain referred from scalene trigger points is experienced on the radial side of the forearm and hand, without objective sensory loss.

Edema of the fingers and dorsal aspect of the hand can be caused by an impairment of the lymphatic and venous return. Impairment of the venous return is often due to compression of the subclavian vein by the firm, shortened scalene anterior muscle behind it, the first rib below it, and the clavicle in front of it. Of the three structures surrounding the space through which the subclavian vein passes, only the scalene anterior has resilience, which it loses when the muscle develops trigger points. Shortening of either the anterior or middle scalene muscles by trigger point activity tends to lift the first rib against the clavicle, intensifying compression of the vein.

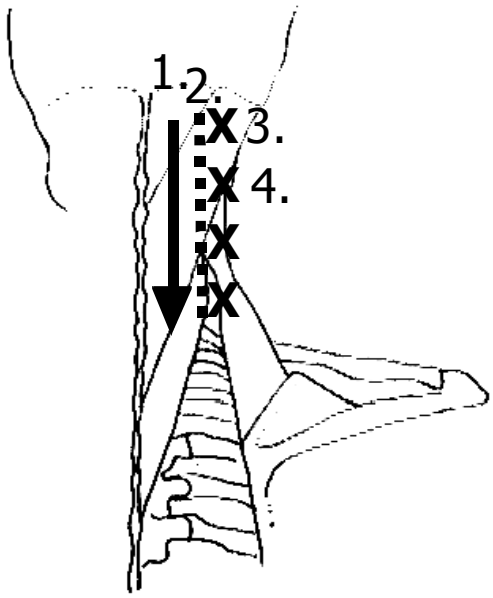
Entrapment of the axillary artery is more often due to trigger point activity and tautness of the pectoralis minor than to trigger point activity of the scalene muscles. The artery also may be entrapped by costoclavicular compression, which is often aggravated by poor posture. Since pectoralis trigger points are likely to be associated with scalene trigger points, the arterial flow may suffer a double entrapment where the subclavian artery emerges from the thorax wedged between the first rib and the tendon of the scalene anterior, and where the axillary artery hooks beneath the pectoralis minor muscle.

Remember: test–work–retest

Neck

Rotators & Extensors

suboccipitals, semispinalis cervicis, semispinalis capitis,
splenius capitis, splenius cervicis, trapezius, sternocliedomastoid



Client supine:

1. Thumb strip the posterior neck.
2. Friction the transverse processes of the cervical vertebrae.
3. Apply deep pressure to the splenius capitis.
4. Apply static pressure while moving the neck.
5. Gently pinch the sternocleidomastoid.
6. Apply moderate friction just under the mastoid process.
7. Apply static pressure to the inferior attachment.

Referral Pattern

All these muscles refer pain into the posterior neck and head. Trigger points in these muscles are the leading cause of headaches. See the video for a compilation of trigger point areas that cause headaches.

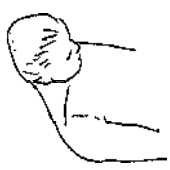
Cautions and Comments

The muscles just next to the spinous processes can restrict rotation the most. Release any fibrous tissue and retest.

Test

To test the rotators, roll the client's head to the right and left. The chin should touch the shoulder.

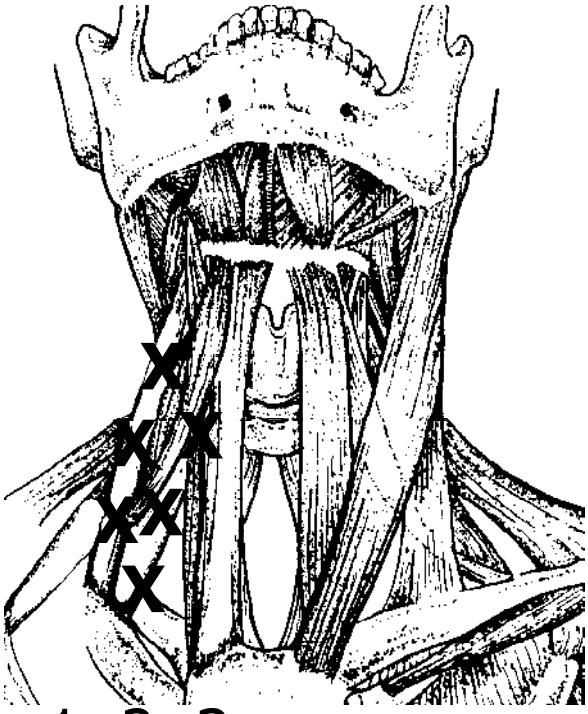
To test the extensors, bring your clients chin to their chest by flexing the neck. The chin should get to within an inch of the sternum.



Neck

Lateral Flexors

scalene anterior, scalene medius, scalene posterior



Client supine:

On the scalene anterior and then the medius, perform these techniques.

1. Static finger pressure.
2. Gently friction.
3. Static pressure with movement.

Referral Pattern

scalenes: chest, upper back, radial side of the arm and posterior wrist

Cautions & Comments

The scalenes can entrap the brachial plexus, which can cause pain, numbness or tinging down the arm. When working on the scalenes, if the referral pain increases or doesn't go away after 30 seconds, you may be pressing on the nerves.

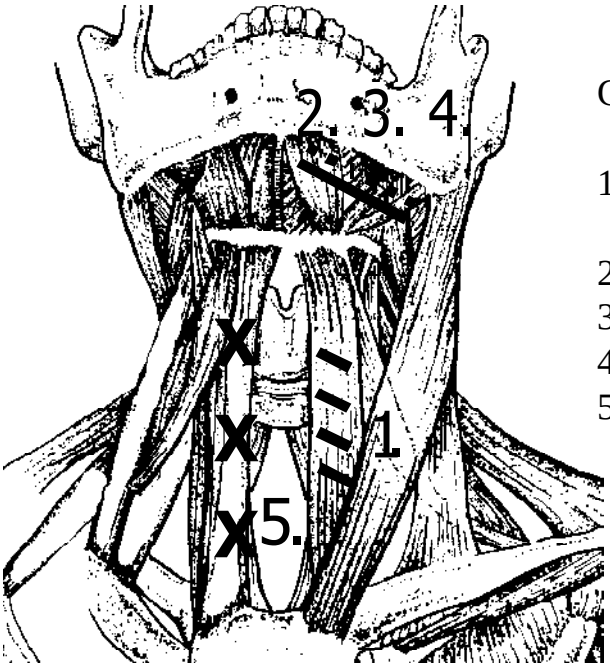
Test

To test the scalenes, laterally flex the head from side to side (ear to shoulder). Keep the face straight up. Notice where movement occurs – at the top of the neck, or at the bottom where the scalenes are in control.

Neck

Anterior

infrahyoids, suprahyoids, longus colli, longus capitis



Client supine:

1. Stabilize the trachea, friction the infrahyoid muscles with your finger tips.
2. Glide out the suprahyoid.
3. Apply static pressure under the mandible.
4. Friction under the mandible.
5. Push the trachea aside with your thumb, and apply gentle fingertip pressure to the longus colli and capitis, just next to the trachea on the anterior cervical vertebra.

Referral Pattern

The deeper muscles, the longus colli and longus capitis can actually refer pain into the posterior neck.

The more superficial muscles, the infra and suprahyiod muscles refer into the anterior neck.

Test

Gently use your fingers to push the cervical vertebra towards the ceiling noting how well they extend. Restriction will feel like a few vertebrae stuck together moving as a unit.

Cautions and Comments

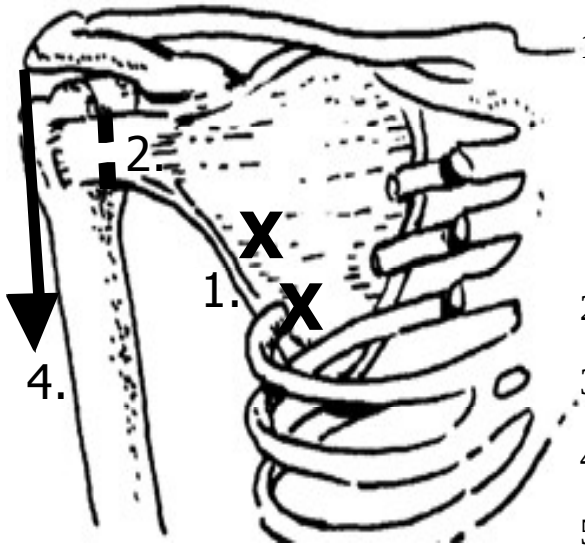
The anterior cervical technique is a very skilled maneuver. Apply enough pressure to get to the vertebrae, without impinging on the other structures. These structures don't get touched very often, so a few seconds of contact is enough.

Do not impinge the carotid artery and internal jugular vein. Be very cautious.

Rotator Cuff

Internal Rotators

subscapularis, (pectoralis major, anterior deltoid)



Client supine:

1. Place the client's hand next to their neck and stabilize their elbow. Apply static thumb pressure to the subscapularis on the anterior surface of the scapula while moving the elbow around in a circle. **Stay inferior to the vessels going through the armpit.**
2. Friction superior to inferior on the subscapularis tendon for one to three minutes.
3. Lay your client's arm in slight external rotation, and palm out the pectoralis major.
4. Elbow glide inferiorly on top of the anterior deltoid.
5. Stretch by bringing your client's shoulder to the edge of the table, extend and externally rotate their arm.

Referral Pattern

subscapularis: posterior shoulder joint.

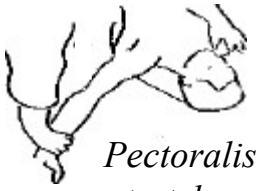
A simple way to remember the referral patterns in this area is to realize that the subscapularis, a muscle on the front, refers to the back, and the infraspinatus, on the back, refers pain to the front.

Test

Client internally rotates against your resistance.

Cautions and Comments

There are many vessels, nerves and lymph nodes that go through the arm pit. Stay inferior to these structures while you work.

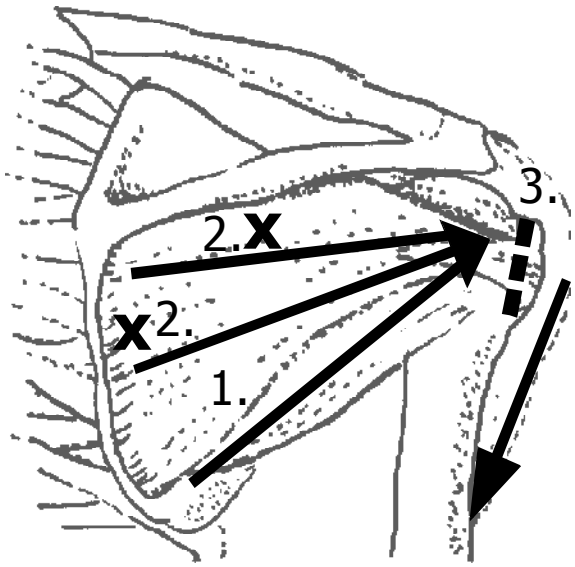


Pectoralis major stretch

Rotator Cuff

External Rotators

infraspinatus, teres minor, (posterior deltoid)



Client prone:

1. Thumb glide from origin to insertion in a fan pattern.
2. Search for trigger points.
3. Position your client's arm on their back (shown below) to stretch the tendon. Use the spine of the scapula as a landmark, and cross fiber friction the Infraspinatus tendon.
4. Elbow glide down the posterior part of the deltoid.

Referral Pattern

infraspinatus: anterior and lateral shoulder, down the radial side of the arm

Test

Client externally rotates against your resistance.

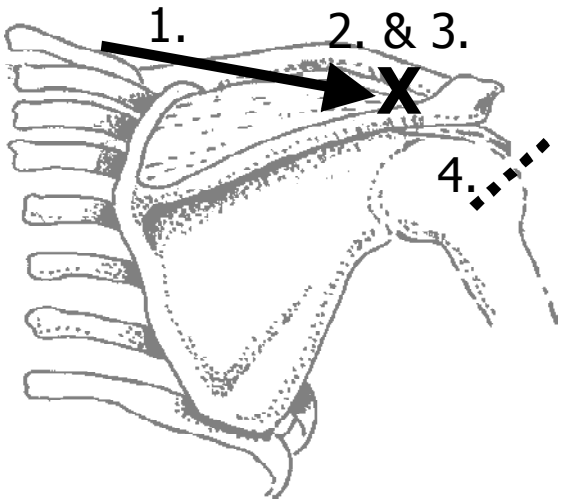
Cautions & Comments

To make the work more intense, you can place the client's hand on their back while you release the infraspinatus muscle and tendon.

Rotator Cuff

Abductors

supraspinatus, (lateral deltoid)



Client prone:

1. Thumb glide laterally between the clavicle and the scapular spine, standing next to the client's head.
2. Apply static pressure on top of the supraspinatus while your client abducts and adducts their arm. Alternately, you can do this motion for them.
3. With client's arm abducted, cross fiber friction between the clavicle and scapular spine by rotating thumbs ceiling to floor.
4. Massage the fibers of the lateral deltoid.

Referral Pattern

supraspinatus: deep ache in lateral shoulder

Cautions and Comments

Another cause of pain in this area is subacromial bursitis. Massage can't help the bursal sack, but loosening up all the muscles around it can help to balance the joint mechanics.

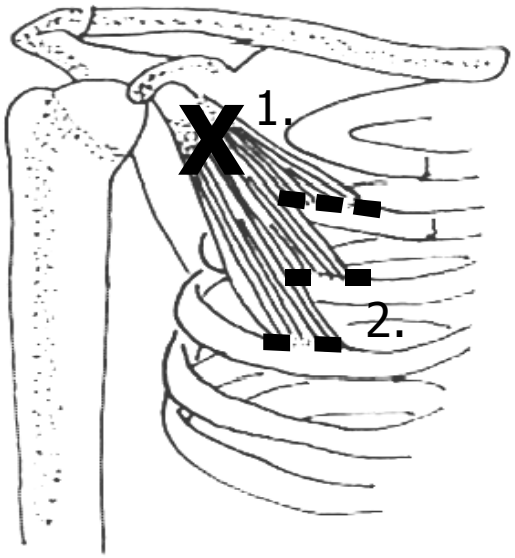
Test

With their arm at their side, your client forcefully abducts their arm against your resistance.

If this test doesn't elicit any pain, try it with your client's arm already abducted to 90 degrees.

Shoulder

Pectoralis Minor



Client supine:

1. Apply static pressure to the pectoralis minor just inferior to the corocoid process.
2. Cross–fiber friction the attachment at the ribs.
3. Stretch by pushing the shoulder into the table, or externally rotating the arm.

Referral Pattern

pectoralis minor: chest, shoulder and ulnar side of the arm

Cautions and Comments

A tight pectoralis minor will bring the shoulder forward and down. It can impinge on the axillary artery and brachial plexus, causing numbness, tingling or pain down the radial side of the arm.

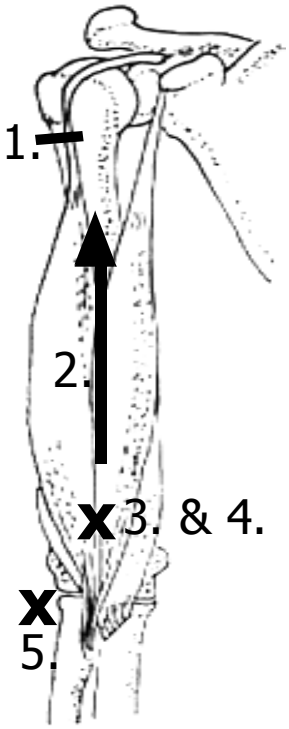
Test

Palpate the radial pulse at the wrist and extend and externally rotate the arm. An imperceptible pulse indicates neurovascular entrapment.

Elbow

Flexors

biceps, brachialis, brachioradialis



Client supine:

1. Friction across the fibers of the long head of the biceps tendon.
2. Palm glide up the biceps and brachialis.
3. Apply static palm pressure on the biceps while extending and flexing the elbow.
4. Squeeze the biceps between your finger and thumb.
5. Apply static compression to the brachioradialis.

Referral Pattern

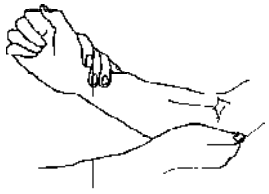
biceps: anterior shoulder and anterior elbow joint.
brachialis: thumb and anterior shoulder
brachioradialis: thumb and radial side of the arm and lateral epidondyle.

Cautions and Comments

Find the biceps tendon by first finding the greater and lesser tubercles (bumps on the humerus). The bicipital groove lies just between these two landmarks.

Test

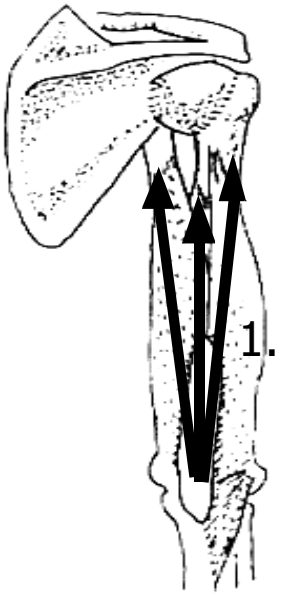
Client forcefully flexes their elbow against your resistance. Position the palm up to focus on the biceps, and the palm in neutral to focus on the brachioradialis (shown).



Elbow

Extensors

triceps & anconeus



Client supine:

1. Client grasps the edge of the table with their hand. Thumb glide from elbow to the shoulder covering the medial, central and lateral heads.

Referral Pattern

triceps: posterior arm, shoulder and elbow. Also into the lateral aspect of the elbow joint (can mirror tennis elbow pain).

Test

Client extends their elbow against your resistance.

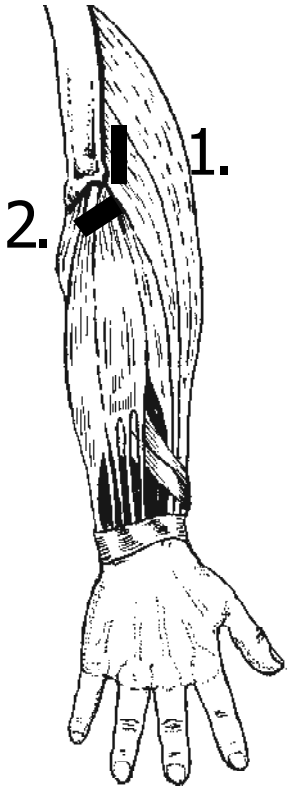
Cautions & Comments

Don't apply pressure to the ulnar nerve, which travels between the olecranon process and the medial epicondyle.

Elbow

Tennis elbow

wrist extensor attachments, supinator



Client supine:

1. Cross–fiber friction the attachment of the flexor carpi radialis longus for one to three minutes.
2. Cross–fiber friction the attachment of the flexor carpi radialis brevis for one to three minutes.

Address the supinator (page 74)

Referral Pattern

wrist extensors: Lateral elbow and posterior wrist.

Cautions and Comments

This is one of those injuries that people end up living with for a long time, not knowing what to do. It usually takes about 10 minutes to release the area, and another 5 to teach the person how to perform the techniques on themselves. Usually a few treatments should do the trick.

Test

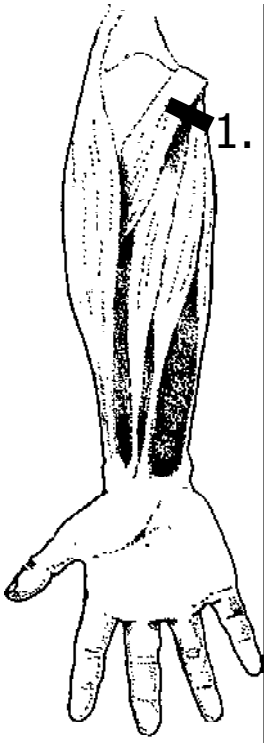
Client forcefully extends their wrist against your resistance.
Also test the supinator by having the client forcefully supinate against your resistance. Work the supinator if this is painful for the client.

If pain is felt in the wrist, consult the wrist extensors section.

Elbow

Golfers Elbow

wrist flexor attachments



Client supine:

1. Cross fiber friction the common flexor attachment at the medial epicondyle of the humerus for one to three minutes.

Referral Pattern

wrist flexors: medial elbow and wrist

Cautions & Comments

The ulnar nerve lays between the olecranon process and the medial epicondyle. The client will experience pain, numbness or tingling in their fourth and fifth digits if you are pushing on the nerve. Be very aware of this, because deep frictioning on a nerve can cause damage.

Test

Client flexes their wrist against your resistance.

If pain is felt in the wrist, consult the wrist flexors

Wrist, Fingers & Thumb

The muscles of the forearm control the movements of the wrist, fingers and thumb. When people experience dysfunction in their wrists, we should first look for tension in the forearm. Usually releasing tension in the forearm will "lighten the load" of the wrist and fingers tendons, allowing them to heal. Also, many muscles in the forearm refer pain or strange sensations into the wrist and hand. By relieving the inflammation in the forearm, we can relieve the wrist and hand referral pain. If this is not effective, there may be a misalignment of the bones in the hand. This will pull on the ligaments in an unusual way and cause them to hurt. This can be the case if someone feels more pain in the morning on rising, when the wrists have not been used. Muscles will usually repair themselves at night and be less sore, while ligaments (and tendons) become stiff with no movement. If the bones are out of alignment, then a chiropractic adjustment should be performed by a chiropractor. If the tendons (not the ligaments) are causing the discomfort, then relieving the muscles that are pulling on the tendons will be effective.

Thinking about the arm

The muscles of the forearm can be divided primarily into flexors, extensors, supinators and pronators. The flexor group arise from a common origin on the medial epicondyle. The extensor group arise from a common origin on the lateral epicondyle. The deeper flexor and extensors arise along the shafts (bodies) of the ulna and radius. *The flexors are on the anterior side of the forearm, while the extensors are on the posterior side of the forearm.*

We can also divide the flexors into wrist flexors, finger flexors, and thumb flexors. The same is also true of the extensors. This is the most useful way to categorize the muscles, because it will guide the way we work on the wrists and forearms.

Bodywork in general

When working with the body, use appropriate pressure. The most effective work elicits tenderness from the area of inflammation, while not being so deep as to cause major discomfort or pain. The muscles should be flushed with blood, lengthened and soothed without causing more inflammation. If someone is sore from the massage for two days or more, then you probably went too deep. If you are worried that you went too deep during a session, use an ice pack on the area to cool it down and reduce the chance of inflammation.

Wrist, Fingers & Thumb
Carpal Tunnel Syndrome

It seems that when anyone has pain in the wrist or hand, they immediately cry "carpal tunnel syndrome." True carpal tunnel syndrome happens when the eight finger flexor tendons swell and cause impinge on the median nerve as it goes through the carpal tunnel. When the median nerve is entrapped, it causes neurological symptoms (pain, numbness, tingling) in all fingers excluding the little finger and the outside of the ring finger. Traditional treatment has the client wearing a wrist brace in an attempt to reduce inflammation, or surgery to create more space in the carpal tunnel. These two treatments do not directly address the core issue, tight finger flexor muscles.

Massage is an excellent treatment for carpal tunnel syndrome. By relaxing the finger flexors, the constant pull on the tendons is reduced, allowing the inflammation to lessen. This allows more space for the median nerve.

Most wrist and hand pain is not carpal tunnel syndrome. Usually tight forearm muscles simply refer pain into the wrist and hand. Releasing these muscles should offer *immediate* relief. The other common cause of pain is strained ligaments in the wrist. In this case, passive flexion or extension will hurt at the end range. Another indication of ligament damage is that the pain will not be lessened by massaging the forearm muscles. For damaged ligaments, rest and immobilization (a wrist band) is helpful.

The other cause of wrist or hand pain can be found in the shoulder and neck. The pectoralis minor and scalene muscles can impinge on the arm nerves, causing the client to experience pain down into the hand. If you are not getting a good response from your work in the forearm, look to these muscles.

General evaluation

Test passive range of motion to determine limitation of movement and general tension. Then use resistive tests to see if there is any muscle or tendon inflammation. Remember, with resistive tests only an acutely inflamed muscle will show up, so this is a great way to test when people have acute pain, but it isn't the best test if the discomfort is less severe.

If resisted motions hurt, apply massage to the muscle, and then retest the muscle to see if the pain has subsided. Often times the pain will be completely gone or greatly diminished. If it is not, continue working to the tolerance of the tissue. Keep in mind that injured tissue can't take a lot of stimulation without becoming more inflamed, so be careful.

Remember: test–work–retest

Wrist, Fingers & Thumb Referral Patterns

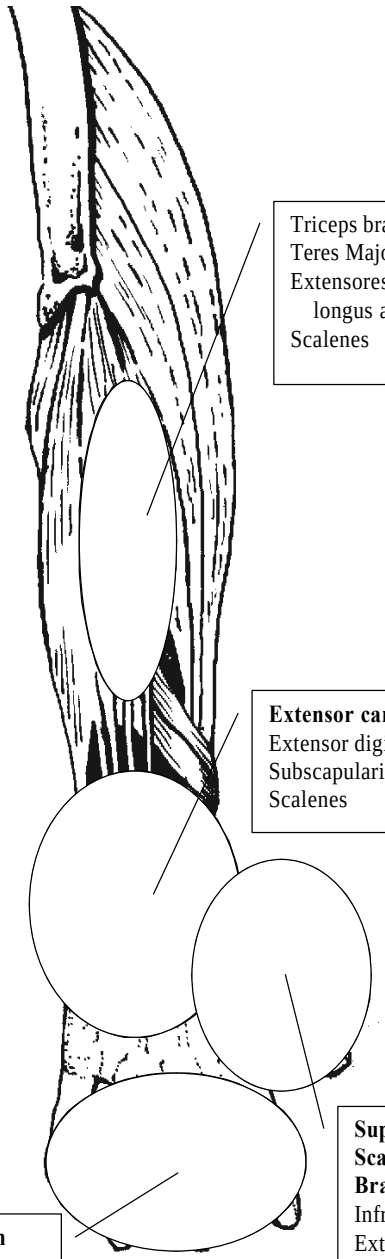
-Most common referrals are listed first.
-Muscles in bold indicate this area is their primary referral zone.

Palmaris longus

Flexor carpi muscles
Opponens pollicis
Pectoralis major
Pectoralis minor
Palmaris longus

Flexor pollicis longus
Opponens pollicis
Adductor pollicis
Supinator
Scaleni
Brachialis
Infraspinatus
Extensor Carpi rad.-lon.
Brachioradialis

Flexor digitorum muslces
Interossei
Serratus anterior



Triceps brachii
Teres Major
Extensores carpi radialis longus and brevis
Scalenes

Extensor carpi muscles
Extensor digitorum
Subscapularis
Scalenes

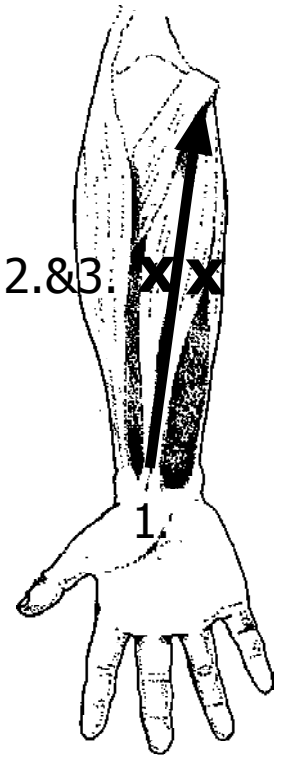
Extensor digitorum
Interossei
Scalenes
Pectoralis major
Pectoralis minor

Supinator
Scaleni
Brachialis
Infraspinatus
Extensor carpi radialis longus
Brachioradialis
Opponens pollicis
Adductor pollicis
Adductor pollicis

Wrist

Flexors

flexor carpi radialis, flexor carpi ulnaris, palmaris longus



Client supine:

1. Thumb glide up the muscle bellies.
2. Apply static pressure with your fist, while your client flexes and extends their wrist. Alternately, use your thumbs.
3. Passively flex and extend your clients wrist as you apply pressure.
4. Stretch by extending the wrist.

Referral Pattern

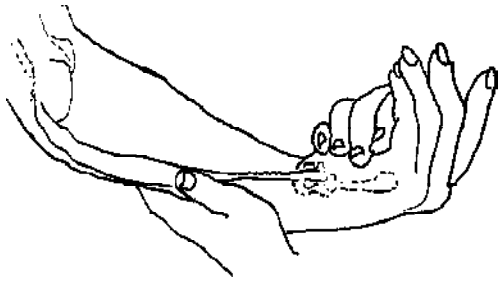
wrist flexors: anterior wrist

Cautions and Comments

Don't perform the stretch above in the presence of strained wrist ligaments. *Strained ligaments are indicated when there is pain on passive flexion or extension at the end range.*

Test

Hold the palm while the client flexes their wrist against your resistance.



Finger Flexors

flexor digitorum superficialis, flexor digitorum profundus

Client supine:

1. Thumb strip up the muscle bellies.
2. Apply static pressure on the belly of the finger flexors with your fist while the client flexes and extends their fingers. Alternately use your thumbs to apply pressure.
3. Passively flex and extend your client's fingers while you apply pressure.
4. Stretch by fully extending the fingers.

Referral Pattern

finger flexors: fingers (can also be involved in dull wrist and forearm pain)

Test

Client flexes their fingers against your resistance.

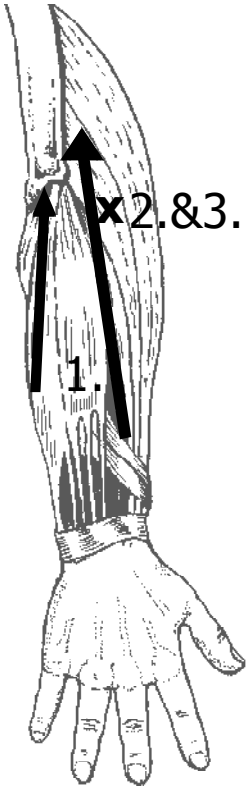
Cautions and Comments

It is these 8 finger flexor tendons that go through the carpal tunnel, along with 1 thumb flexor tendon. These finger flexor tendons are most likely responsible for true carpal tunnel syndrome. Because of this, releasing the finger flexor muscles can be very helpful.

Wrist

Extensors

extensor carpi radialis longus and brevis, extensor carpi ulnaris



Client supine:

1. Thumb strip up the muscle bellies.
2. Apply static pressure with your thumbs while the client flexes and extends their wrist. Alternate method: use an open fist.
3. Passively flex and extend the client's wrist.
4. Stretch by flexing the wrist.

Referral Pattern

extensors: posterior wrist

Test

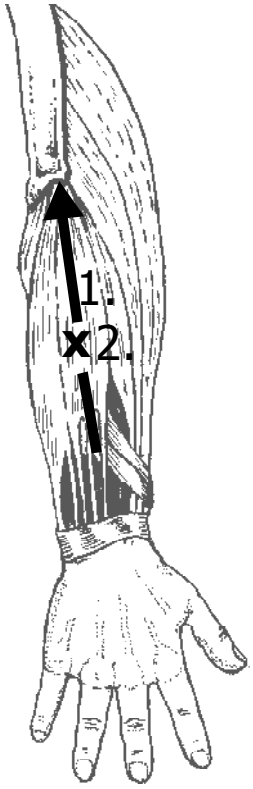
Client extends their wrist against your resistance.

Cautions and Comments

Caution: Don't perform this stretch in the presence of strained ligaments. Strained ligaments are indicated when there is pain on passive flexion or extension at the end range.

Finger Extensors

extensor digitorum



Client prone:

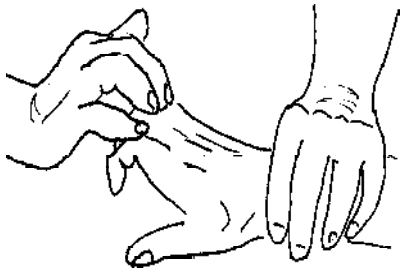
1. Strip from the wrist out to the lateral epicondyle with slow deep pressure.
2. Apply static thumb pressure into the belly of the finger extensors while the client flexes and extends their fingers *and wrist*.
3. Stretch by curling the client's fingers into a fist, and flexing their wrist.

Referral Pattern

finger extensor: stiffness in the finger joints.

Test

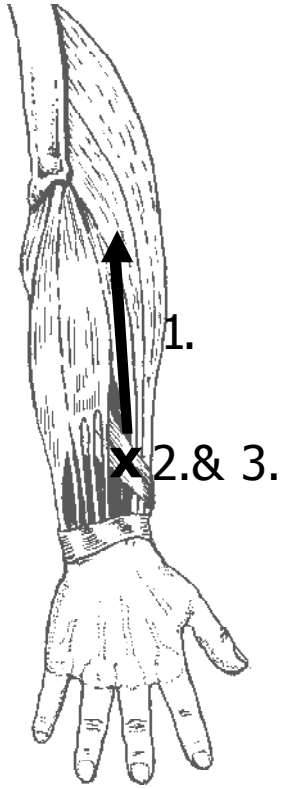
Client extends their fingers against your resistance.



Thumb

Extensors & Abductors

extensor pollicis longus and brevis, abductor pollicis



Client supine:

1. Thumb strip just inside the radius.
2. Strip right over the radius where the thumb muscles cross it.
3. Apply static thumb pressure on the thumb extensors while your client circumducts their thumb.
4. Stretch by curling the thumb under and then take the wrist into ulnar deviation.

Referral Pattern

thumb extensors and abductors

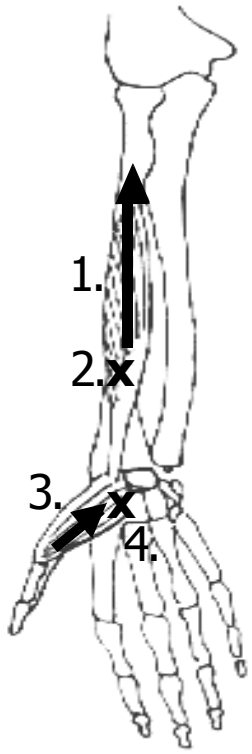
Test

Client extends their thumb against your resistance.

Thumb

Flexors

flexor pollicis longus, short thumb flexors and adductor



Client supine:

1. Thumb strip up the inside of the radius.
2. Apply static thumb pressure just inside the radius while the client flexes and extends the tip of their thumb**. If your thumbs are hurt themselves, you can always use a knuckle instead.**
3. Glide from the thumb toward the palm.
4. Apply static pressure at the base of the palm while your client touches their thumb to the base of their little finger.
5. Stretch the thumb by bringing it into full extension.

Referral Pattern

thumb flexors: the thumb, and can be involved in dull wrist and forearm pain

Test

Client flexes just the tip of their thumb against your resistance.

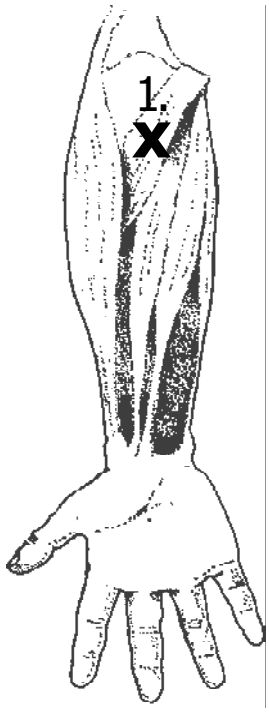
Cautions and Comments

The long thumb flexor muscle is responsible for a great deal of wrist and thumb pain, especially in massage therapists. Often this one muscle is responsible for months of wrist pain. Knowing how to test these muscles is the key in unlocking wrist, finger and thumb pain.

Wrist

Pronator

pronator teres, pronator quadratus



Client supine:

1. Apply static pressure on the belly of the pronator while pronating and supinating the wrist.

Referral Pattern

pronator: down the forearm and deep into the radial side of the wrist

Test

Grasp your client's hand, then stabilize the wrist with your other hand. Have the client forcefully pronate against your resistance.

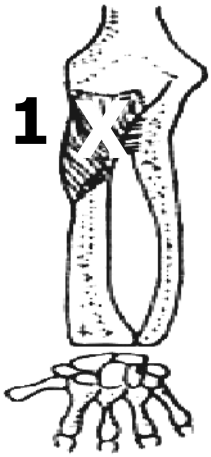
Cautions and Comments

Many cases of wrist pain are actually pronator referral pain. Make sure to test this muscle when people have wrist pain.

Wrist

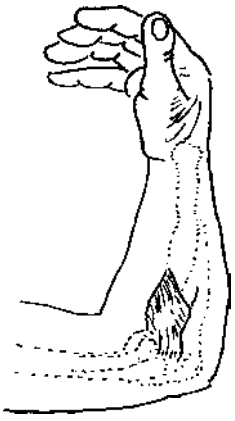
Supinator

supinator



Client supine:

1. Move aside the brachioradialis, and apply static thumb pressure on the supinator while pronating and supinating the wrist.



Referral Pattern

supinator: the supinator refers pain into the lateral elbow and back of the forearm and base of the thumb

Test

Grasp the client's hand, then stabilize their wrist with your other hand. Client forcefully supinates their wrist against your resistance.

Cautions and Comments

This muscle is involved in tennis elbow syndrome, check it for pain when you check the wrist extensors.

It can also cause thumb (and sometimes wrist) pain.

Bibliography

MYOFASCIAL PAIN AND DYSFUNCTION, THE TRIGGER POINT MANUAL, by Janet Travell & David Simons, Williams and Wilkins, Baltimore, MD, 1983.

MUSCLES TESTING AND FUNCTION, 4th edition, by Florence Peterson Kendall, P.T., F.A.P.T.A.; Williams & Wilkins, Baltimore, Md., 1993

PRINCIPLES OF MANUAL MEDICINE, by Philip E. Greenman, Williams and Wilkins, Baltimore, MD, 1989

PHYSICAL EXAMINATION OF THE SPINE AND EXTREMITIES, Stanley Hoppenfeld, Appleton and Lange, Norwalk, CT, 1976

ANATOMY, a regional atlas of the human body, 3rd edition, Carmine Clemente, Lea and Febiger, London, 1987

ANATOMY OF MOVEMENT, Blandine Calais-Germain, Eastland Press, Seattle, 1993

LISTEN TO YOUR PAIN, by Ben E. Benjamin, Ph.D.; Penguin Books, 1984

SOFT TISSUE MANIPULATION, by Leon Chaitow, N.D., D.O.; Healing Arts Press, Rochester, VT, 1980

PRINCIPLES OF ANATOMY & PHYSIOLOGY, 6TH EDITION, by Gerard J. Tortora & Nicholas P. Anagnostakos; Harper & Rowe, NY, 1990

JOB'S BODY: A HANDBOOK FOR BODYWORKERS, by Deanne Juhan; Station Hill Press, 1987