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Sprain and Strain

Definition: Sprain: an injury to a ligament; strain: an injury to a muscle or tendon.

GENERAL INFORMATION

- Torn or stretched ligament = *sprain*
- Torn or stretched muscle or tendon = *strain*
- Primary causes: stressful or traumatic incident or repetitive low-level motions that lead to structural malfunction
- Contributing or predisposing factors: previous injury, inadequate warming before exercise, joint or muscle comorbidities
- Most commonly affected joints: ankles and knees, then fingers, wrists, toes

Morbidity and Mortality

There are no published data on the frequency of sprains or strains. It is a rare, in active human who has not experienced even a mild joint injury. Although rarely life threatening by itself, the secondary effects of a sprain or strain on soft tissue or bone, combined with compensatory movements, can significantly hinder complete, or correctly aligned, joint healing. Compensation occurs in the contralateral limb and/or proximal or distal joint. In addition, slings, removable casts, or crutches can create hypertonicity or hypotonicity. With or without aids, the sprain or strain itself creates immediate protective voluntary splinting and/or spasm. If the person returns to activity too quickly, a secondary overuse injury can compromise complete healing.

Adhesions naturally and quickly form in and around an injured joint; they can prolong healing and cause a limited, painful limb. Scar tissue, another natural but limiting response to soft tissue injury, although taking weeks to develop, can result in range-of-motion (ROM) limitations. Both adhesions and scar tissue slow healing and can lead to chronic, long-term pain.

Sprains and strains usually heal completely within days, weeks, or months, depending on severity. Although localized tenderness, regional stiffness, radiating pain, and/or weather-dependent aching may persist over the long term, the injured area generally returns to full functioning and strength.

PATHOPHYSIOLOGY

A quick review of bone and joint anatomy will help clarify sprain or strain pathophysiology. Joint and muscle movement is possible because the (soft, mobile) muscles terminate in tendon, and then attach to a (hard, stationary) bone, giving the sanguinous (blood-filled) muscle something to hold onto and work against. An excellent example of a readily palpable muscle-tendon complex is the distal end of the gastrocnemius, which terminates in the Achilles tendon, which then attaches to the calcaneus (heel bone).

Bones are secured to other bones by ligaments—nonsanguinous ropes that intertwine, connect, and keep joints stable. Palpable examples of ligaments are those



Massage Therapist Tip

When It's Not a Simple Sprain or Strain

Although common, joint injuries can also be serious. Although most simple sprains and strains can be treated at home, be aware that if any of the following symptoms occurs, immediate medical attention is necessary:

- A joint that appears irregular, or one that can bear no weight, may indicate a broken bone or joint dislocation.
- Numbness or tingling associated with the injury may indicate nerve injury.
- A cold or discolored body part may indicate circulation loss and/or damaged blood vessels.
- A fever higher than 100°F accompanied by heat and redness at the injured site may indicate infection.

found on either side of the malleoli and knees. When fascia, muscles, tendons, or ligaments are torn or damaged, bleeding occurs. Visible or invisible swelling and bruising immediately follow interstitially and/or subcutaneously; these signs may not be noticeable for minutes or hours.

Sprain or strain severity is graded, usually in degrees from 1 to 6. A lower degree sprain involves a minor ligament tear or stretch, while a higher degree sprain indicates the breaking of a ligament off the bone and/or a breaking of the bone itself.

Diagnosis is made according to the absence or persistence of swelling, the deformation of the joint, the joint “sound” heard upon injury, the mechanics of the actual incident, the person’s medical history (osteoporosis, previous injuries, etc.), and following a thorough examination of the injured joint and surrounding tissue. Immediate X-rays to determine bony involvement may be taken if swelling is not pronounced. X-rays will not indicate soft tissue damage, however, and swelling can adversely affect the accuracy of an X-ray reading; therefore, diagnostic X-rays are often taken a few days post-injury.

OVERALL SIGNS AND SYMPTOMS

Here are the signs and symptoms of a typical low-grade sprain or strain.

- Immediate pain
- Increasing pain after 1–2 days as spasm begins
- Swelling: immediate or within hours
- Spasm
- Popping sound (sprains only)
- Bruising: immediate or within hours or days
- Deformity
- Loss of function of affected joint
- Decreased function of affected limb

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

Massage therapists are not first-line responders for traumatic injuries. It is not within a massage therapist’s scope of practice to perform the compression component of the typical, appropriate rest, ice, compression, elevation (RICE) treatment. The most effective treatment a massage therapist can offer an immediate traumatic injury that involves swelling is lymphatic drainage techniques. These techniques are not covered in this book. All the following information regarding sprains and strains assumes the massage therapist is attending to subacute pain, swelling, and stiffness and/or chronic pain, stiffness, and scarring secondary to an initial (now past) sprain or strain injury.

TREATMENT OPTIONS

The traditional, conservative, and most effective immediate care for a sprain or strain is RICE. Rest means the affected joint is used little or not at all, and weight bearing is limited. The recommended timeframe for resting an injured limb is 7–10 days for mild injuries, and 3–5 weeks for more severe cases. Ice packs are applied immediately to the affected area for up to 20 minutes at a time or three or four times a day for the first 24–72 hours after injury. Ice reduces pain, swelling, and inflammation. A compression bandage is wrapped around the affected joint, but not so tightly as to compromise circulation. Compression helps reduce painful swelling and provides minimal support. The limb is elevated, preferably above the heart. Elevation uses gravity to help reduce swelling and increase venous return.

RICE usually suffices for treating simple sprains and strains—as long as it is followed by vigilant avoidance of overusing the injured joint or limb. Although the use of a healing joint is imperative for proper healing to occur, premature overuse may

lead to reinjury. Internal injured structures need time to heal, even in the absence of obvious symptoms. Physical therapy (PT) rehabilitation often follows a relatively serious sprain or strain to ensure the proper return to strength and aligned healing. Imaging studies are necessary if symptoms persist or worsen, or if surrounding structures will not heal. Surgery is rare and indicated only for significant tendon or ligament tears, or if surrounding bony structures must be rebuilt or stabilized.

Preventive techniques include warming and stretching muscles both before and after exercise, creating a safe work or home environment, not trying new exercise regimens or recreational activities without proper training, wearing appropriate footwear, increasing awareness of physical surroundings, and taping or bracing a weak or previously injured joint before athletic activity.

Common Medications

- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil)
- Nonopioid pain reliever fever reducers, such as acetaminophen (Tylenol, FEVERALL, Anacin, Panadol)

MESSAGE THERAPIST ASSESSMENT

Remembering that the massage therapist is not a first-line health care responder and that new or recent, still swollen joints will not be addressed with massage therapy; the therapist can consider the following assessment points before treatment. She can ask the questions while palpating the injured area to determine ROM restrictions, the presence of scarring and/or adhesions, tenderness, redness, heat, or swelling.

- Did a pre-existing medical condition predispose the client to injury? Conditions might include osteoporosis, frailty, arthritis, previous injury to the same or nearby joint, or compensating from an earlier injury.
- When did the injury occur?
- Did the person hear a popping sound at the time of injury?
- How is the client compensating for the injured limb? Which other structures are affected or painful?
- Which treatment(s) was performed at the time of and immediately after the injury?
- Is the client seeing a physician or PT?
- Is the client taking pain medications? Narcotics? Blood thinners?
- Is the client using any physical aids, such as crutches, splints, or canes?
- What exactly are the current symptoms, and how localized are they? Do they radiate?
- How limited is the ROM compared to previous use and the contralateral side?
- Which movements aggravate symptoms?
- Which activities of daily living (ADLs) are directly affected by the injury?

THERAPEUTIC GOALS

Reasonable goals resulting from the judicious use of common massage therapy techniques include reduced pain and spasm, increased ROM, decreased hypertonicity, reduced spasm, pain of compensating structures, and fewer adhesions and scar tissue.

MESSAGE SESSION FREQUENCY

- Ideally: 60-minute sessions twice a week, until full use and ROM are regained
- Minimally: 60-minute sessions once a week, until full use and ROM are regained



Thinking It Through

What are the effects of limping, the body's compensatory response to an ankle injury? How is the body compensating? Why would a massage therapist be concerned not only with an original site of injury, but also with all compensating structures? How could a distal ankle injury compromise a contralateral shoulder? Could this injury create a headache? Using the example of a right ankle sprain, the therapist thinks through the mechanics of compensation. This exercise will help clarify the treatment approach.

- If the right ankle is swollen, spasming, painful, and unable to bear weight, which proximal joint will contract and experience overuse to help keep weight off the ankle?
- How will the workload of the contralateral ankle be affected?
- What is the effect on the ipsilateral and contralateral hips?
- If the hips are affected, what is the effect on the lower back?
- If the lower back is now spasming as a result of overwork, how will the shoulders most likely react?
- If the trapezius is involved, where does it attach, and how can this lead to a headache?

- Maintenance: 60-minute sessions once a month
- Mildly effective: 60-minute sessions in response to episodic radiating pain; each session must be followed by vigilant self-care exercises

MASSAGE PROTOCOL

As mentioned earlier, massage therapists do not treat a fresh strain or sprain. However, if the injury remains untreated or unmoved, debilitating scar tissue and adhesions will lead to long-term chronic pain. Your job in treating sprains or strains is to use your palpation, listening, and diplomacy skills to discern whether your client has sufficiently healed to allow you to work. You must also convince him to let you perform the sometimes aggressive techniques that will be most effective, and persuade him to return to you with sufficient frequency. Remember that you will also need to break up the adhesions and scars that have already formed. You can assure your client that the skills you have to offer will decrease long-term chronic pain secondary to the compensatory effects of the initial injury.

Your protocol will not merely address the injured site but will also include *every layer of tissue, from the most superficial fascia working all the way to the bone*. The careful, persistent, and thorough use of warming techniques, compression, friction, cross-fiber friction, longitudinal muscle stripping, and diplomatic-but-challenging ROM techniques are the staples of effective joint injury work. In order for complete healing to occur, blood must be brought to the area (even to nonsanguinous ligaments), waste must be flushed toward the heart, and the joints and muscles must be returned to their full functional capacity.

Hot packs can be applied to the injured site and left to warm while you begin work on compensating structures. If you are tempted to apply ice because of swelling, heat, or pain, this is a sign that you are working on the injury too early and that you should stop treatment until these symptoms have subsided.

Compression is always an effective introductory technique and can be applied progressively from light to bone-deep.

Use of your fingertips, thumbs, elbows, and/or forearms can provide extremely effective friction techniques. Attention to the amount or lack of lubricant will significantly affect the efficacy of this work. Although you want to be careful and not bruise the client, you *must* create localized redness, which will indicate effective friction is being performed.

Muscle stripping presupposes your anatomic knowledge of origins and insertions. Be careful not to “cross over” long muscles, causing the uncomfortable and sometimes painful “thump” experienced by the client. (Noncareful forearm effleurage to the long heads of the quadriceps will often result in this painful “thump”; learn to work slightly medial or lateral to the rectus femoris and you’ll avoid this uncomfortable technique.) Friction techniques should always be followed by centripetal flushing techniques and ROM.

Pain-free, relaxed, passive, but challenging joint play and ROM techniques will help break up adhesions and scar tissue and avoid long-term joint limitations and chronic pain. These techniques should be performed slightly past the client’s comfort zone, but this is definitely not a “no pain, no gain” technique.

Getting Started

Have hot packs, pillows, and bolsters ready for the application of heat and comfortable positioning. Remove throw rugs or obstacles, and rearrange the room for safety if the client is using a cane, walker, or wheelchair. Review the specific injured joint anatomy so you can be sure you address every inch of the muscle, as well as the insertions and origins, and attaching/surrounding tendons and ligaments. Ask yourself repeatedly: Which structures will be compensating for this injury? Keenly observe your client as he comes through your door.

Step-by-Step Protocol for

Severely Strained Right Ankle 3 Weeks Post-Injury

Technique	Duration
Apply a hot pack to the affected ankle. Perform thorough, deep compression to the entire ipsilateral and contralateral limb.	5 minutes
Remove the hot pack. Perform compression on the right ankle. Palpate with your fingertips to determine areas of tenderness, scarring, and adhesions. Get client feedback while you work, performing gentle ROM to determine restrictions. Use the ROM performed at this point in the protocol to compare to the ROM performed at the end of the protocol.	3 minutes
Digital kneading, effleurage, petrissage, ROM, cross-fiber friction, muscle stripping <i>to the unaffected, proximal, ipsilateral (right) joints before approaching the affected ankle.</i> <ul style="list-style-type: none"> • Knee and all immediately surrounding muscles • Hip and all surrounding muscles, including the iliotibial (IT) band 	5 minutes
Place your hands on the injured ankle and simply hold for a few seconds. Then slowly and carefully perform <i>passive right ankle</i> ROM, moving it to end-feel as you plantar flex and dorsiflex and move it in a 360-degree circle. Carefully watch the client's reactions and do not cause pain. Ask the client to perform <i>active</i> ROM and again watch his response.	2 minutes
Digital muscle stripping, deep centripetal effleurage performed slowly and rhythmically. <ul style="list-style-type: none"> • A few inches <i>above</i> the affected ankle working on the distal section of the tibialis anterior and gastrocnemius/Achilles tendon complex • Work both anteriorly and posteriorly 	3 minutes
Now begin work on the injured ankle itself. Perform digital muscle stripping, digital and palmar kneading, cross-fiber friction, deep muscle stripping combined with frequent deep centripetal effleurage and frequent, gentle ROM performed carefully and rhythmically. <ul style="list-style-type: none"> • Into every crevice of both malleoli • Following the tibia and fibula up, proximally, several inches above the malleoli • Into, around, and underneath every tarsal and metatarsal bone; include the plantar surface of the foot • Into, around, and underneath every toe 	15 minutes
Grasp the toes in your fingers and hyperflex and hyperextend them. Repeat ROM of the ankle, now moving slightly beyond end-feel, if necessary, to the point of slight discomfort. Notice if this ROM differs from the original ROM performed during warm-up.	2 minutes
Leave the affected area. Effleurage, petrissage, knead, vigorously and not necessarily rhythmically. <ul style="list-style-type: none"> • Ipsilateral gastrocnemius and rectus femoris muscles 	2 minutes

(continued)



Contraindications and Cautions

- Do not work on a sprain or strain too early in the injury process. Premature massage therapy could release much needed protective voluntary muscle splinting, disturb a hematoma, and/or cause more inflammation.
- ROM techniques that are too aggressive can further injure a joint.
- Determine whether the client is taking narcotics for pain and if he can describe accurate reactions to pressure and discomfort.
- If your client is taking a blood thinner, this contraindicates the use of cross-fiber or deep friction techniques.
- Heat should not be applied if any redness or swelling still exists in the joint or surrounding tissue.
- Heat, redness, pain, swelling, and/or a fever can indicate infection, so avoid massage.
- Be aware of surgically reduced ligaments and of the presence of pins, rods, or other stabilizing hardware in the affected or surrounding joints.

Technique	Duration
Reapply the hot pack to the affected ankle. Ask the client which areas of his body are stiff or in pain secondary to compensation. Work these areas for most of the remainder of the session.	20 minutes
Remove the hot pack. Perform passive ROM to the affected ankle. Follow with deep, slightly vigorous centripetal effleurage. Ask the client to perform active ROM to the affected ankle. Compare the difference from the initial ROM exercise.	3 minutes

HOMWORK

If your client is severely affected by a sprain or strain injury, his self-care instructions from a PT or a physical medicine physician will preclude any of your own. If the injury is minor and/or you are working as a team member with the PT, you are completely within your scope of practice to suggest the following homework assignments:

- Apply heat before stretches, before exercise, or whenever you're feeling stiff. Make sure it's moist heat in the form of a hot water bottle or microwaveable gel pack. A heating pad or rice pack does little but provide palliative comfort.
- Perform your stretching exercises to the point of mild discomfort but not to the point of pain.
- Use your affected joint as much as possible; unless you see swelling or are in pain, do not pamper it. Be aware of compensating movements that will cause long-term pain.
- Do not refer to your affected joint or limb as your "bad" side; the body "takes offense" at being referred to as such, and this negative mind-body connection hampers healing.
- At any resting opportunity, deeply massage the affected joint.
- See a PT for lengthening shortened muscles and strengthening weakened muscles.

Review

1. Define a sprain and a strain and make a clear distinction between them.
2. List massage contraindications for treating a client who has a sprain or strain.
3. Why are X-rays performed immediately post-injury not always an accurate indicator of injury?
4. Name one distinctive sign or symptom that distinguishes a sprain from a strain.
5. Why is applying compression outside the massage therapist's scope of practice?

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Stress

Definition: Physiologic reactions to real or imagined, normal or extreme, physical, medical, emotional, or psychological events.

GENERAL INFORMATION

- Causes: anxiety, uncertainty, or fear from real or imagined threats; acute one-time events; sustained low-level irritations; medical, emotional, or psychological upset or trauma; illness
- Onset: before, during, after, or long after any of the earlier mentioned causes
- Short-term or lifelong duration
- Experienced in some form by all individuals

Morbidity and Mortality

Stress is considered a major health problem in the U.S. About 33% of Americans report living with extreme stress, and 48% state that their stress has significantly increased for the last 5 years. Although most Americans believe that they are handling stress well, 77% report experiencing physical symptoms, and 73% experience psychological stress-related symptoms. The health conditions and comorbidities associated with stress can affect every aspect of a person's life, including his or her physical, emotional, psychological, interpersonal, and spiritual well-being. Prolonged, unrelenting stress is medically and psychiatrically linked to anxiety and depression.

Medically, persistent severe and/or low-level stress can do the following:

- Cause skin rashes, hives, various skin outbreaks, and hair loss
- Exacerbate chronic obstructive pulmonary disease (COPD), asthma, and other breathing difficulties
- Decrease fertility and erections; cause painful menses and difficulty during pregnancy
- Worsen gastrointestinal problems, such as gastroesophageal reflux disease (GERD), peptic ulcers, irritable bowel syndrome (IBS), ulcerative colitis
- Cause muscular tension in the neck, back, and shoulders
- Exacerbate or cause headaches
- Worsen arthritis
- Lead to insomnia
- Elevate blood pressure, cause an abnormal heartbeat, increase blood clots and hardening of the arteries, increase the propensity for heart attack and heart failure
- Compromise the efficacy of the immune system, thereby increasing the incidence and severity of chronic diseases

Psychologically and emotionally, severe and/or low-level stress can do the following:

- Develop into an inability to deal with large and small problems
- Lead to frustration, increased intolerance, and loss of temper
- Increase fatigue
- Destroy the ability to focus
- Lead to anxiety and depression

PATHOPHYSIOLOGY

The human body functions within the framework of its reaction to stressors. The simple act of breathing depends on the brain's continual need for oxygen; the normal stress set up by that need triggers the automatic and predictable next breath. Every physiologic function the body performs, from digestion to pupil restriction, exemplifies its response to normal stressors.

When imbalance or trauma occurs, such as excess alcohol consumption or a bleeding injury, the body's heightened response to stressors is again predictable and efficient. A temporary, sympathetic state—the “fight-or-flight” response—results in a rush of hormones and chemicals that are necessary to balance or heal. This extreme state lasts only until the physiologic trauma subsides and homeostasis (physiologic equilibrium) is restored. The sympathetic state is neutralized and replaced by a “business-as-usual” parasympathetic (“rest and digest”) calm.

The sympathetic state, although a normal reaction to crisis—real or imagined—is not intended to be sustained. The chemical and hormonal flush that rushes through the body to dilate pupils, increase breathing, flood the muscles with blood, slow digestion, and cause mental hypervigilance is as dramatic in the short term as it is caustic (literally) over the long term. The sympathetic state removes the individual from the path of the oncoming car; and once safety is assured, the body, usually within 45 minutes, rids itself of these caustic chemicals and returns to a quiet state of efficient functioning.

Stress becomes a killing disease when the brain is repeatedly tricked into “believing” there is a reason to continue to flood the body with caustic chemicals. Healing, on any level, from the cellular to the psychological, cannot occur if the body is in a sympathetic state. No system—from immune to gastrointestinal—can function normally and/or heal unless the body is in the parasympathetic mode.

OVERALL SIGNS AND SYMPTOMS

- Headache
- Irritability, anxiety, restlessness, crying, anger
- Inability to focus, forgetfulness
- Insomnia
- Rapid speech; persistent, inappropriate laughing
- Social withdrawal
- Increased smoking
- Inappropriate emotional responses
- Drug or alcohol abuse
- Reduced or increased appetite
- Increased heartbeat and/or breathing rate
- Sweating
- Nausea, diarrhea, upset stomach
- Hypochondria
- Multiple joint aches and pains
- Nightmares
- Personality change



Massage Therapist Tip

Associating Stress with Most Client Conditions

In a society that tends toward self-reliance and glorifies those who “pull themselves up by their bootstraps,” it can be an act of courage to acknowledge that life may be overwhelming at times. It is safe to assume, even in the most seemingly perky clients, that major underlying stressors coexist with their primary complaints. Although it is beyond our scope to explore psychological trauma, it certainly is within our regimen of compassionate care to assume that any number of stressors can temporarily defeat most adults, and that these challenges can wear many faces. The challenges of parenting, joining the Armed Forces, losing one’s job, an abusive spouse, a dying pet, moving a household, or a wedding can unravel the strongest human. It’s best to assume your clients are undergoing great and possibly back-breaking stressors, whether spoken or unspoken. Even the most therapeutic session (as opposed to a strictly relaxing one) should contain a strong element of leaving the body in a parasympathetic state.

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

Since the body, mind, and emotions cannot heal when the body is in a sympathetic state, and since most massage therapy techniques help put the body into a parasympathetic state, the therapist can decrease many of the earlier mentioned symptoms by performing any calm-inducing techniques with compassion and healing intention.

TREATMENT OPTIONS

Addressing stress is not a clear-cut, direct path from diagnosis to cure. Stress is inherent in our everyday life, whether or not we have health problems. Although stress accompanies every condition from a paper cut to cancer, it is often treated as the “stepchild” of any medical or psychological condition. Some astute health care professionals will identify stress as a comorbidity and will include it in the treatment plan for the primary medical condition. For example, an antidepressant is often prescribed for cancer patients undergoing chemotherapy, and anti-anxiety medications are often prescribed for patients following a car accident or other types of physical trauma.

The pervasive, secondary, life-threatening effects of stress accumulate when the *perceived (untreated) stress* continues well after the trauma of the initial event has been resolved. At that point, treatment options include age- or trauma-related support groups, psychotherapy or psychiatry, medications, mind-body techniques, guided imagery, massage therapy, hypnotherapy, and exercise.

Common Medications

Because stress is so often linked to anxiety and depression, the most commonly prescribed medications for anxiety include those that are proven effective for depression.

- Tricyclic antidepressants, such as amitriptyline hydrochloride (Apo-Ami Triptyline, Endep)
- Selective serotonin reuptake inhibitors (SSRIs), such as escitalopram oxalate (Lexapro)
- Immune regulators, antirheumatics, such as anakinra (Kineret)
- Antihistamines, sedatives, antispasmodics, such as hydroxyzine embonate (Atarax)
- Antidepressants, such as venlafaxine hydrochloride (Effexor)
- Benzodiazepine anxiolytics, sedative hypnotics, such as lorazepam (Ativan)

MASSAGE THERAPIST ASSESSMENT

Because stress is so pervasive, most clients will come to a massage therapist with a self-diagnosis, either as a manifestation of muscular tension or as an accompaniment to some other chronic condition. Because therapists are trained to visually “take the client’s emotional pulse,” most will be able to determine the presence or absence of stress based on easily discernible signs and symptoms, such as headache and tight shoulders. The treatment can then move ahead to address stress as either the primary condition or a strong, secondary comorbidity.

THERAPEUTIC GOALS

Whether stress is presented as the primary or secondary condition, the treatment goal is to return the body to a parasympathetic state, thereby facilitating physical and/or emotional healing.

MESSAGE SESSION FREQUENCY

Frequency is dictated by either the comorbidity being treated or the muscular effects of the stress itself.

- Ideally: 60-minute sessions once a week

MESSAGE PROTOCOL

Two simple, calming techniques are used by many massage therapists working in high-stress environments, including hospitals, hospices, and nursing homes. These techniques are very effective in treating the stress experienced by agitated psychiatric, pediatric, cancer, intensive care unit (ICU), or cardiac care unit (CCU) patients; or those suffering with intractable pain. The techniques are also effective for addressing unrelenting or day-to-day stress observed in clients in private massage practices.

The following two protocols can be provided alone or in combination with other relaxing Swedish techniques. The duration of the session depends on whether you are treating stress as the primary or secondary condition.

Other massage therapy techniques, such as slow compression and effleurage, stroking, rocking, and energy work, can also be incorporated into the protocols. If you are also addressing muscular hypertonicity of the head, neck, shoulders, and back, the most common massage techniques of heat application, effleurage, wringing, compression, and petrissage are extremely beneficial.

Slow-Stroke Back (or Front) Massage

This protocol assumes the client is positioned prone, but in many cases (as in a hospital or nursing home environment), the patient may be able to lie supine only.

- Stand at the side of the hospital bed or massage table, facing the client's head. Lay your *non-lubricated* hands (either directly on the client's skin or over the clothes) at the base of the client's neck (see Figure 22-1). Using only the weight of your hands (no lighter, because this will be stimulating to the body; and no deeper, because your intent is not to massage muscle) and maintaining full hand (not fingertip) contact, slowly slide your hands down the client's back to her sacrum. It should take you about 1 minute to travel the length of her spine.
- When your hands reach the sacrum, slowly "brush off" your hands to either side of the body.
- Return to the base of the neck immediately and repeat. *This work is unidirectional—running down the spine only.*

Hold and Stroke

This technique can be performed with the client lying in any comfortable position.

- Facing the massage table, standing at about the location of the client's waist, gently place one of your hands on your client's shoulder and the other on her hand. Simply rest for a full minute. Focus, and determine your intent. Breathe slowly and evenly. Do nothing. Do not speak.
- Once you are focused, begin stroking *down* the arm with the *non-lubricated* hand that was holding your client's shoulder. Use the weight of your full, open hand; do not use your fingertips. Move slowly. This work is performed to the depth at which you would normally apply lubricant and goes no deeper than superficial fascia.
- Repeat three times on one arm.
- Move silently to the contralateral upper extremity and repeat.
- Use slow-stroke back (or front) techniques to the trunk of the body.



Thinking It Through

Stress is ubiquitous and often shrugged off as a normal part of life; it is not taken as the serious condition it can become. The massage therapist should think through the pervasiveness of common stressors and the danger of ignoring the body's responses.

- Often the most common response to a person's emotional problem is, "No problem, I'm okay," when in fact this is not the case. What effect could this outward state versus inward struggle have on the body?
- It is easy to belittle others for "worrying too much about small things" without finding out the cause of such worry. What are some helpful skills for being a more considerate listener?
- It is common for individuals to experience unrelenting stress, with attendant multiple physical ailments, and still believe they are not at risk for life-threatening disease. How can these people be reached and convinced to address the underlying stressors?
- People who seem hypochondriacal, or who complain of multiple, frequently traveling points of bodily pain, may be experiencing deep stressors. What are some suggestions that might help these people make the connection between their stressors and their body's reactions?



Contraindications and Cautions

- Avoid any stimulating techniques that might excite a stressed client.
- The presence of untreated, unrelenting stress could lead to serious medical problems; in this case, use all your diplomatic and professional skills to convince the client to visit a physician, a psychotherapist, or a psychiatrist.

- Moving to the lower extremities, place one hand near the head of the femur and the other as far down the leg as you can comfortably reach. Again, center yourself and focus in silence.
- Repeat the slow stroking down the leg.
- Silently move to the other lower extremity and repeat.
- Finish with about 5 minutes of slow-stroke back (or front) massage.

Getting Started

As simple as these techniques are, they can cause back spasms in a massage therapist who is not used to performing slow, focused work. Be careful to bend your knees, work from your core, breathe deeply, and shift your weight rather than stretch from your shoulders as you perform these highly effective but surprisingly demanding massage therapy techniques.

Warm packs are often very soothing and can be applied anywhere on the client's body. A heated table pad is also comforting. If the client is comfortable with complete silence, consider forgoing the use of music.

HOMEWORK

Think about your own reactions to the stressors in your life, and be reasonable and nonjudgmental as you make the following suggestions for your client's self-care:

- Try to become more aware of your body when you are stressed. Do you raise and tighten your shoulders? Do you hold your breath? When you find yourself tensing up, "shake it out" and try to relax.
- When you're in a private place, either at home or at work, and you have 5 minutes to yourself, practice tensing and relaxing every major muscle group in your body. Start at your feet. Tense your feet as tightly as you can, inhale deeply, then exhale, and release the muscles. Next, tighten your calves as tightly as you can, take a deep breath, and release. Work all the way up your body, tensing and releasing your thighs, abdomen, chest, arms, face, and head muscles. As you exhale during each muscle set, imagine all tension draining out of your body through the bottom of your feet or the top of your head.
- Close your eyes. Imagine your most perfect vacation spot. See the green grass, feel the cool breeze off the ocean on your face. Feel the sand in your toes. Relax your shoulders. Feel your face gently relaxing and smiling. Remember what your body feels like when you are this relaxed, and then open your eyes.
- Find music or nature sound recordings that soothe you. Buy a CD, play it at work through your computer, or go for a walk and listen to it through a headset. Lie on the floor at home, put in your ear buds and listen to your special, relaxing music or sounds. Feel how your body feels when you are completely relaxed, and try to replicate this sensation throughout your day.
- Gently think about all the physical ailments that are produced by the existence of sustained stress. Remember: You can compromise your health and shorten your life if you keep yourself stressed all the time. Try to remove as much stress from your life as you can.
- Pray, meditate, sing, dance, and laugh.

Review

1. Name some of the body's normal physiologic stress responses.
2. What is the difference between the sympathetic and parasympathetic state?
3. Which state is the body's natural healing mode?
4. Is stress really a serious medical condition?
5. List some characteristic symptoms of stress.
6. Describe some bodily symptoms that result from unrelenting stress.

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Also known as:

Brain Attack, Cerebrovascular Accident (CVA)

Stroke

Definition: An acute impairment of normal blood flow to a specific area of the brain that lasts longer than 24 hours.

GENERAL INFORMATION

- Causes: atherosclerosis (narrowing of major arteries to the brain); a deep brain arterial occlusion (blockage), or an embolus (clot) originating from the heart, from poor cardiac output or a broken aneurysm
- Primary cause: clots, 88% of all strokes
- Increased incidence secondary to blood-clotting disorders, hypertension, heartbeat irregularities, cardiac disease, diabetes, hyperlipidemia (excess lipids in the blood), chronic bronchitis, periodontal disease, changes in age-related brain blood flow, and peripheral vascular disease
- Lifestyle risk factors: inactivity, alcohol consumption, excess stress

Morbidity and Mortality

Every 45 seconds, one U.S. citizen has a stroke, and more than 700,000 people suffer a stroke every year. About 4 million Americans live with the effects of stroke; two-thirds will require rehabilitation. Stroke is the third leading cause of death after heart disease and cancer, and it is the number one cause of disability in adults. Among stroke survivors, 10% recover almost completely, while 25% experience minor impairments; 40% have impairments requiring special care, and 10% need permanent care in a long-term facility. About 15% die soon after having a stroke. Of those experiencing a first stroke, 14% will experience a second stroke within 1 year.

Stroke causes five types of disabilities that result in life-altering comorbidities: paralysis, sensory disturbance, language difficulty, cognitive and memory difficulties, and emotional disturbances. Tendonitis, bursitis, adhesive capsulitis, and rotator cuff tears are common post-stroke complaints. Stroke patients often live with feelings of fear, anxiety, frustration, depression, and grief.

PATHOPHYSIOLOGY

The body's muscles cannot function without direct input from the brain and spinal cord. In addition, mental activity, coordination, imagination, memory, logical thinking, and speech, as well as breathing, heartbeat, and all senses, depend on a fully functioning brain. As with any organ, blood inflow and outflow must be maintained at precise pressures in order for the brain to send thousands of minute commands every second. When either too much blood or not enough blood disrupts the brain's delicate homeostasis, dramatic and serious symptoms immediately occur. The result is a stroke. The longer this blood loss or excess flooding lasts in the brain, the more serious and extensive the damage to the brain and, thus, the rest of the body.

There are two main categories of stroke:

- *Brain hemorrhage*: Blood seeps into the spaces around, or within, the brain, causing pressure and damage to cerebral tissue; a less frequent type of stroke.
- *Ischemic stroke*: Inadequate blood supply causes damage to cerebral tissue; the most common type of stroke.

A mini-stroke, or *transient ischemic attack* (TIA), occurs when the brain's blood supply is briefly interrupted (for less than 24 hours). Microemboli (tiny clots) or microvascular spasms cause a transient reduction in blood flow. The aftereffects of a typical TIA are either subtle, short-lived, or nonexistent. When symptoms are absent, the TIA might not even be noticed, but undetected TIAs can show up on brain scans later. A TIA is often a precursor to a full-blown stroke, occurring months or years after the initial "silent stroke."

Typically, permanent or temporary deficits in speech, memory, movement, and cognition result from damage to the area of the brain that normally regulates these functions. Damage to one side of the brain causes a contralateral response in the body. For example, a right-sided stroke causes functional deficits in the body's left-sided musculature. A stroke frequently results in flaccid paralysis (lack of nerve impulse transmission, so muscles cannot move); spastic paralysis (excess nerve signal transmission, so muscles spasm involuntarily and frequently); or paresthesias (numbness, tingling, changes in sensation). Affected musculature leads to further long-term difficulties, such as shortened tendons, ossified joints, forearm and leg contractures, and pressure sores or open skin ulcers from prolonged immobility. All these complications are accompanied by pain, compromised range of motion (ROM), loss of function, depression, and ironically, an increased risk of further clot formation. The extent of the damage of any stroke is directly related to two equally important factors: the affected brain region, and the timing of both the emergency treatment and post-stroke convalescent therapy.

OVERALL SIGNS AND SYMPTOMS

- Sudden onset of numbness in one arm, one leg, or the face
- Sudden slurred speech
- Sudden impaired vision in one or both eyes
- Sudden inability to repeat a simple phrase
- Sudden drooping of one side of the face or a noticeably uneven smile
- Sudden severe headache of unknown cause

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- Massage therapists do not address immediate stroke symptoms, but once the patient is stabilized, massage therapy is appropriate and effective.
- Given the new medical understanding of neuroplasticity, the brain's ability to reroute signals in order to regain function after trauma, massage therapy's contribution to the stroke patient can be essential.
- The effects of massage therapy during rehabilitation are discussed in the Therapeutic Goals section.

TREATMENT OPTIONS

The prompt administration of anticoagulants for blood clot reduction is the best medical treatment. Quick intervention is crucial for minimizing the effects of long-term damage to the brain and body. Rehabilitation begins while the patient is still in the hospital. The success of a treatment plan is determined by the swiftness and skill with



Thinking It Through

More than muscle is affected following a stroke. Joints particularly take a beating, as the weight of the affected muscles pull and the compensating joints work double time. The therapist can consider the ways in which the joints might be affected.

- The weight of the affected arm's pull on the shoulder will affect both ipsilateral and contralateral back and chest muscles as the shoulder girdle rolls anteriorly, pulling the trapezius forward and shortening the pectoralis complex.
- The drag of the affected leg places tremendous pull on the ipsilateral ankle, knee, and hip, while the contralateral hip becomes hypertrophied in the attempt to help swing the leg forward during every difficult step.
- Lower extremity challenges always necessarily directly affect the sacroiliac joints' structure and function.

which it is initiated, the involvement of caregivers, and the patient's determination to overcome obstacles.

Rehabilitation teaches patients how to perform daily tasks with either temporary or permanent muscle loss. Even while in hospital, patients are urged to perform both passive and active ROM exercises and to begin using the stroke-affected limbs. Speech, occupational, recreational, and physical therapy focus on frequent, focused, repetitive exercises. Complementary therapies include acupuncture to relieve pain, increase blood flow, and restore energy. Yoga helps the patient regain balance, muscular control, and strength.

Eighty percent of strokes are preventable by the use of medication and/or lifestyle changes. Medications and a controlled diet can help lower and stabilize blood pressure. The risk of recurrence can be minimized by controlling weight and by avoiding alcohol and cigarette smoking.

Common Medications

The most typical strokes, those caused by a clot blocking blood flow to the brain, are ideally immediately treated with tissue plasminogen activator (tPA), a powerful fast-acting medication that dissolves blood clots. The drawback to this drug's efficacy is that it must be given within 3 hours of the brain attack, thus, the importance of getting the possible stroke patient to the hospital immediately so the evaluation can be performed and then, if appropriate, tPA can be administered.

Drug therapy with blood thinners is the most common post-stroke treatment.

MESSAGE THERAPIST ASSESSMENT

Before working with a stroke patient, the therapist should consult the patient's physician and/or rehabilitation team. Although massage therapy is extremely beneficial to the patient's overall rehabilitation program, it is helpful to know his complete stroke history, the medications he is taking, and any potential risks before assessing, in preparation for planning the sometimes rigorous and often repetitive massage therapy protocols.

Here are some questions to ask the physician, the lead rehabilitation therapist, the patient, and/or the patient's caregiver:

- When did the stroke occur?
- Which medication is the patient taking?
- What is the medical treatment, and what is the rehabilitation program thus far?
- Is the patient taking narcotics or muscle relaxants?
- If contractures exist, for how long? What previous therapy was performed, and what progress was achieved?
- If PT is being performed, what results have been achieved? How can the massage therapist enhance the PT's efforts?
- What is the best way to effectively communicate with this patient?
- Does the patient have seizures or emotional outbursts?
- Does the patient have pain? How does he demonstrate the severity?
- If skin breakdown is a problem, what are the positioning challenges?
- What are his greatest challenges in terms of daily activities?
- What was his general lifestyle before the stroke?

Once the therapist has received a medical clearance to proceed and understands the present therapy and medication regimen, an extensive and thorough palpation examination will search for disuse atrophy, compensating hypertonicity, contractures, low-level barely palpable spasms, and spastic flexors and/or extensors. A thorough written treatment plan should include repetitive techniques and should fit appropriately into the medical care practitioner's goals. Assessment might include any of the following. The therapist should take detailed notes before and after each session.

These notes can be used to prove progression and digression, and they can provide a solid basis for encouragement.

- Postural and balance assessment of sitting, standing, walking, rising out of a chair, getting on/off the massage table, and so forth
- Observation of fine motor skills, such as buttoning and unbuttoning, putting on makeup, writing (These skills can be pantomimed.)
- Observation of gross motor skills, such as putting on clothes, washing hair, catching a ball
- Determining the fist grasping strength
- Palpation of muscles on both the affected and the unaffected side
- Palpation and passive ROM exercises of muscles of both the affected and the unaffected side
- Evaluation of communication facility
- Discovery of edema and any areas of skin breakdown

THERAPEUTIC GOALS

The multiple treatment goals are tied directly to the primary physician's objectives for the patient, and will depend on the point in the rehabilitation process at which the massage therapist enters. The therapeutic goals are to provide a safe, calm, comfortable, and encouraging treatment environment; decrease stress; induce the parasympathetic state; reduce edema; reduce or limit contractures; decrease or eliminate pain; increase muscle use and strength; minimize muscle atrophy and spasticity; decrease muscle hypotonicity and hypertonicity; and stop the pain-spasm-pain cycle.

MESSAGE SESSION FREQUENCY

A stroke patient may not find his way to the benefits of massage until well after the disruption from the initial event has settled down. However, significant rehabilitation is possibly weeks, months, or even years after the stroke occurred, as long as the massage therapist's expertise is applied in frequent sessions, and the patient makes a commitment to improve, including performing homework exercises.

Massage session frequency is determined by the patient's rehabilitation stage and the arena in which the therapist is working. A therapist in a hospital setting could begin treating a stroke patient as soon as 48 hours after the incident, at which point, daily sessions would last only a few minutes. Those in private practice or in a rehabilitation clinic will find it most effective to see the patient at least weekly. However, even in this setting, session duration is often linked to the patient's tolerance and lifestyle, the area of the body being addressed, the limitations of the surroundings, and the conflicting therapeutic appointments. The therapist must learn a way to diplomatically insist that massage is a crucial part of the patient's overall rehabilitation program.

MESSAGE PROTOCOL

"A massage therapist's work is never done" could be the slogan for therapy offered to stroke patients. Except for the small percentage of patients who completely recover, the patient's body is a tapestry for ongoing, lifelong massage therapy. The following list outlines the initial reasons you and your patient may well have a long therapeutic relationship:

- Facial muscles may be hypertonic, hypotonic, spastic, or flaccid. The muscles of expression and eating (essential for self-esteem, socialization, and survival) need daily therapy.



Thinking It Through

The therapist might assume, since the stroke patient might have paralysis, that he cannot "feel" pain. Nothing could be farther from the truth. Stroke patients suffer with a variety of chronic pain syndromes. The therapist can think through the various ways pain can manifest in a body that has experienced a stroke.

- Uncontrolled and spastic muscular movement results in constant flexing and extending of major muscles. Because the muscle is rarely in a fully resting phase, a pain-spasm-pain cycle is continuous.
- A paralyzed limb places an unusual, unrelenting pull at the proximal joint, which can cause radiating pain both proximally and distally.
- The unaffected limb is forced to perform twice the work as it takes over for the weakened side. This compensation leads to hypertonicity, trigger points, and radiating pain.
- The possible disfigurement, the loss of self-control, the need for constant help, and the loss of income and a job obviously lead to anxiety and depression. Not all pain manifests physically.



Massage Therapist Tip

Communicating with a Stroke Patient

If your stroke patient is experiencing problems using or understanding language (aphasia), it will be important for you to devise a method of communication. You naturally will rely on his primary caregiver for hints about the patient's communication style. If he can write but not speak, keep a pad and pencil handy. If he cannot speak or write, use simple methods of communicating, like having him raise a finger to indicate a positive response, or make a fist to indicate a negative response. Be patient. Communication is possible with all but the most unresponsive of stroke patients.

- Flexors are stronger than extensors. Arms, forearms, thighs, and legs, which manifest the muscular difficulties described earlier, are usually severely imbalanced and easily fatigued as the battle rages between compensation and function.
- Joints are either pulled beyond or shortened into abnormal angles. Passive and active ROM exercises must be performed daily, if not hourly, in order to relieve and revive joints.
- Constipation is a common side effect of inactivity and of narcotic and muscle relaxant use. Colon massage is a helpful component of every session.

The massage therapy performed on a stroke patient is different from other types of work you might have performed. It is extremely detailed, specific, repetitive, and slow. You need to observe everything about every muscle you work on and to note the difference from the last session. Your work must place the patient in a profound parasympathetic state while you simultaneously encourage him to do his best and not give up. Techniques vary from session to session, depending on what you hope to accomplish, what he will allow, and what is the level of his pain tolerance that day.

The subsequent step-by-step protocol focuses on a stroke-affected upper extremity. The techniques remain the same for any portion of the body you may need to address. You can use cross-fiber friction on contracted limbs, for example, but modified according to the patient's mood and pain tolerance level. If you do not know where to start, or need a technique to simply get to know the patient, or if he is particularly agitated, you can always perform the slow-stroke back (or front) massage to help quiet your patient and reduce his pain and anxiety (see Chapter 38).

Getting Started

Confirm in the phone interview with your patient or his caregiver how you will need to adjust your massage therapy setting and communication style. Can he speak? Is he using a cane or walker? Will he need multiple pillows for appropriate positioning? Does he experience seizures? Often a significant other, or family member, will want to be in the room to explain the extent of the condition, help with positioning the client, offer feedback about your work, and certainly to listen to homework assignments.

Adequate, comfortable pillowing in the supine position, with a large pillow under his head and knees, may be the best way to accommodate his stiffness and the work you have to perform, without placing further pressure on a limb with limited blood flow. Remember that all your techniques must be slow, rhythmic, predictable, steady, and repetitive. Do nothing to surprise or stimulate the muscle and risk setting off a spasm. The protocol lasts a full 60 minutes and only covers the upper extremity. It is not possible to address an entire body affected by a stroke in one session.

HOMEWORK

Self-care is an ongoing trial for stroke patients, because almost *everything they do takes effort*. Giving your patient a set of boring, repetitive (although necessary) self-care exercises will almost ensure noncompliance. The following homework assignments are not only very helpful, but they are also intended to add humor to his daily regimen. Suggest only those exercises appropriate for his particular challenges.

Facial Paralysis

Explain the homework exercise to your patient as follows, while demonstrating every move with your own face:

- Remember when you learned the vowels A E I O U in school? Over-enunciate each one very slowly while stretching every single muscle in your face and holding the position for several seconds at a time. (*At this point, demonstrate, so he can see how humorous the exercise can be. Exaggerate each move.*)

Step-by-Step Protocol for Stroke, Upper Extremity

All techniques can be adapted for use on the large muscles and joints of the lower extremity and the hips, as well as the smaller involved muscles and joints of the face, hands, and feet.

Technique	Duration
Apply a warm pack to the affected shoulder and/or elbow.	
Ask your client to take three large breaths. Slow, even, and deep. While he is breathing, place your hands on his chest to make initial contact and establish trust.	1 minute
Compressions, slow, medium pressure, very rhythmic, using your full, open hand <ul style="list-style-type: none"> • Foot, lower leg, knee, thigh, hip • Abdomen, chest • Ipsilateral hand, forearm, arm, shoulder • Across the top of the shoulders • Down to the contralateral arm, forearm, hand • Down to the contralateral hip, thigh, knee, lower leg, foot • Hold both feet for one moment 	2 minutes
Remove the warm pack. Effleurage, petrissage, effleurage, compression, medium pressure, evenly rhythmic but briskly <ul style="list-style-type: none"> • <i>Unaffected</i> shoulder, arm, forearm, hand 	2 minutes
Grasp the affected arm gently. <ul style="list-style-type: none"> • Examine every inch of the tissue. • Palpate every joint, shoulders, elbow, wrist, and every finger joint. • Move every joint to its comfortable end-feel to determine ROM. 	3 minutes
Effleurage, deeply to the patient's tolerance, slow, rhythmic <ul style="list-style-type: none"> • Every inch of the affected arm from shoulder to fingertips 	2 minutes
Effleurage, petrissage, digital kneading, effleurage, medium pressure, slow, rhythmic <ul style="list-style-type: none"> • Every inch of the affected arm from shoulder to fingertips 	5 minutes
Digital kneading combined with compressions, medium pressure, very detailed, probing every bony prominence and every palpable joint surface, a little briskly, very rhythmic <ul style="list-style-type: none"> • Affected side shoulder girdle • Down the arm, into and around the humerus, around the elbow joint, into and around the ulna and humerus • Around and into the wrist bones, into and around each finger joint, into the palm and back of the hand, into the metacarpals 	10 minutes

(continued)



Contraindications and Cautions

- The patient may have lost the ability to feel touch, pain, or temperature. Be sure to check it regularly during the session, using the agreed-upon communication style.
- Avoid work on the sternocleidomastoid (SCM) muscle and the anterior neck unless the patient is completely stable and unless you have a physician's clearance.
- If the patient is stabilized and not taking anticoagulants, work on the lateral and posterior neck with light pressure only, one side at a time. Do not stretch the neck.
- If a limb (or even a toe) feels cooler than normal, looks more swollen than normal, or appears brown, the patient should see a physician immediately.
- If a region of broken skin, such as between the toes, under the heel or coccyx, or under the elbows, has a particularly strong smell, the patient should see a physician immediately.

Technique	Duration
<p>Cross-fiber friction, used judiciously. Using your thumb, find the underlying bony prominence, friction back and forth, until you feel the tissue release or see the skin significantly redden. Pay close attention to the patient's reaction; stop if he expresses any discomfort. Follow with ample cephalic effleurage. Cross-fiber friction should be performed after all tissue is well-warmed and prepared; slightly briskly, very rhythmically.</p> <ul style="list-style-type: none"> • Limited to use at areas of extreme hypertonicity and contracture. Not to be used on the entire limb. 	10 minutes
<p>ROM exercises to the affected side. Move joints to end-feel, stop, and then move slightly beyond end-feel. ROM is the last technique after all other techniques have warmed and moved the tissue. Perform <i>both passive and active</i> exercises slowly, methodically, rhythmically, with the limb well-supported, and the patient relaxed. Note even the smallest improvements.</p>	10 minutes
<p>Because the unaffected side will be compensating and thus hypertonic, try to allow for at least a few minutes during each session to address the contralateral, compromised limb. The same techniques used on the affected side can be used to address the extreme hypertonicity of the unaffected side, but you may be able to work more briskly and deeply, depending on his tolerance and ability to report discomfort.</p>	10 minutes
<p>Finish the session with firm, steady, long effleurage strokes.</p> <ul style="list-style-type: none"> • From hand to forearm to arm to shoulder • Across the shoulders • From arm to forearm to hand 	5 minutes

- Open your eyes and mouth wide for the "AAAAAAA."
- Grimace to the point of (feigned) horror and show all your teeth for the "EEEEEE."
- Open your mouth and eyes wide for the "IIIIIIII."
- Furrow your brow, pull the muscles tight over your cheekbones, and open your eyes wide for the "OOOOOOO."
- Purse your lips, thrust your jaw forward, and look devilish for the "UUUUUUU."

If you perform the exercises correctly, your facial muscles will feel as if they've had a workout.

Limited Range of Motion at the Shoulder

- Put on your favorite music that has a definite beat. Use music you enjoy that makes you want to move. Perform all of the following exercises *to the beat*.
- Rotate your *unaffected* shoulder both forward and backward, making large circles.
- Move your *unaffected* arm in a wide arc both forward and backward, making large circles.
- Rotate your *affected* shoulder both forward and backward. Making circles as large as you can. After every completed circle, snap your fingers with your *unaffected hand*. The sequence: Large circle (with the beat) with your

affected shoulder, snap your fingers once (with the beat) with your unaffected hand. You may feel clumsy at first, but in time, you'll be moving like a choreographer.

Limited Range of Motion at the Knee and Ankle

- Put on your favorite music that has a definite beat.
- Sit so you are stable and can freely swing your lower leg, from your knee down.
- To the beat, swing your *unaffected* lower leg forward and backward, five times.
- To the beat, swing your *affected* lower leg forward and backward, five times. Each time your toe comes forward, make a fist with your unaffected hand and rap your unaffected knee (to the beat). The sequence: Affected leg swings forward and backward (to the beat), rap fist to knee with unaffected hand. Repeat five times. Don't give up. You will feel awkward at first, but the music will keep you moving. You'll be able to measure progress much more easily as you see how you move from feeling clumsy to moving to the music.

Poor Balance or Limited Hip Movement

(Make sure he is reasonably stable, but needs to improve his balance, or ask his PT or physician if he is ready for this exercise before you assign it.)

- Purchase a big exercise ball appropriate for your height. Inflate it, but not completely; keep it slightly soft.
- Place it next to the sofa, a big easy chair, or to something soft and stable that you can hold onto. (It's not a good idea to put it next to a table with sharp edges.)
- Put on music that has a beat.
- If you think you need a little stabilizing, ask a partner to sit or stand in front of you and place her hands on your knees or hold your hands. Start bouncing to the beat. Begin with little bounces to get your bearings. At first, this will be a very unusual sensation, but in time you'll realize you can bounce and not fall over. As you feel more confident, make the bounces a little bigger. Stay with the beat.
- The first time you bounce, you might last only a few seconds or minutes. That's okay. As easy as this bouncing looks, you are engaging all of your thigh, leg, back, and hip muscles to stay upright and bounce. It's a great exercise and will help you regain balance and become stronger.
- Work up to being able to bounce for a whole song.

Deep-Breathing Technique

Breathing deeply is important for your general health, to avoid respiratory complications, and to help you relax. Whenever you have a moment, or before falling asleep, perform the following breathing exercise:

- Inhale as deeply as you can.
- Hold your breath to the slow count of three.
- Forcibly exhale until you feel as if you can't exhale any more breath. Hold your breath for a second.
- You'll immediately feel as if you must inhale. Do so, and rest for a moment.
- Repeat a few times.
- It's sometimes easier and more fun to purchase a bag of helium balloons and see how far you can blow them up.

Review

1. Describe the pathophysiology of a stroke.
2. Which area of the brain is affected if a stroke patient cannot use his left arm?
3. Explain why is it essential to get a possible stroke patient to the hospital immediately.
4. Name some comorbidities of a stroke.
5. At which point in the disease process can a massage therapist provide helpful therapy?
6. What are some contraindications in the care of a stroke patient?
7. Name the other health care team members who might be involved in a stroke patient's care.

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40

Temporomandibular Joint Dysfunction

Also known as:

TMJD, TMJ disorder, TMJ syndrome, Myofascial Pain Dysfunction (MPD) Syndrome, Craniomandibular Pain Syndrome

Definition: A group of conditions that cause jaw dysfunction and pain.

GENERAL INFORMATION

- Cause: often unknown
- Common causes, some not well proven: joint adhesions and scarring, intrajoint dysfunctions, hypertonic muscles, trigger points, postural distortions, abnormal teeth alignment, stress, mineral and vitamin deficiencies, osteoarthritis, direct facial trauma, mouth overstretching, habitual head or neck forward jut
- Contributing factors include bruxism (teeth grinding), teeth clenching, aging
- Duration self-limiting, most often weeks to months; rarely long term or debilitating
- Prevalence: more common in women, usually at age 20–40

Morbidity and Mortality

It is estimated that about 10 million Americans are affected by TMJD. Although 75% of adults have signs and symptoms, only 5% actually need treatment. Trigger points in the upper body caused by referred pain, hypertonicity in surrounding muscles caused by TMJ pain, and secondary conditions such as migraine and tension headaches, earaches, and toothaches often accompany this condition.

The prognosis is very good; most cases are treated conservatively and successfully. For many, untreated symptoms are short-lived and do not return.

PATHOPHYSIOLOGY

The TMJs are complicated, synovial, highly innervated, and modified hinge articulations of the mandibular condyles into the fossa of the temporal plates (Figure 40-1). The joint's function is easily palpated by pressing a finger in front of the ear while opening and closing the mouth. A fibrocartilage disc seated between the two bones prevents bone-on-bone contact. In its healthy state, the TMJs are bathed by slippery synovial fluid, which facilitates the chewing, talking, singing, yawning, and laughing movements demanded of such small, compact joints.

The muscles involved in jaw protrusion, retraction, contraction, compression, and side-to-side gliding are shown in Figures 40-2, 40-3, and 40-4. The masseter closes the jaw, the temporalis helps close the jaw and pull the mandible into retraction, and the pterygoids facilitate protrusion and side-to-side deviation. The suprahyoid and infrahyoid muscles form a sleeve that supports the jaw. The digastrics, which open and retract the jaw, form much of the floor of the mouth.

A TMJD diagnosis is difficult to confirm due to the preponderance of conflicting opinions in the medical literature. For example, bruxism is a contributing factor versus there is no proof that teeth grinding causes TMJD; pain is always present versus

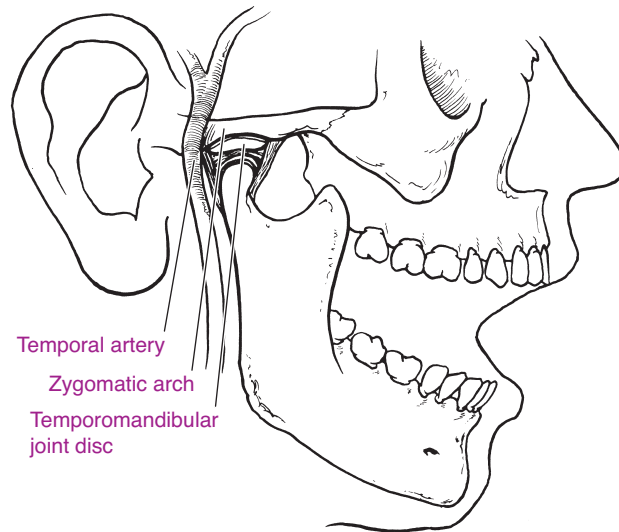


FIGURE 40-1 The temporomandibular joint. From Koopman WJ, Moreland LW. *Arthritis and Allied Conditions: A Textbook of Rheumatology*, 15th ed. Philadelphia: Lippincott Williams & Wilkins, 2005.

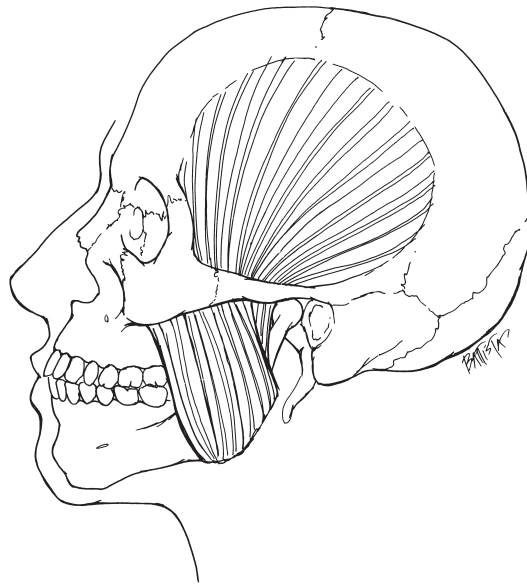


FIGURE 40-2 The masseter and temporalis muscles. From Hendrickson T. *Massage for Orthopedic Conditions*. Philadelphia: Lippincott Williams & Wilkins, 2003.

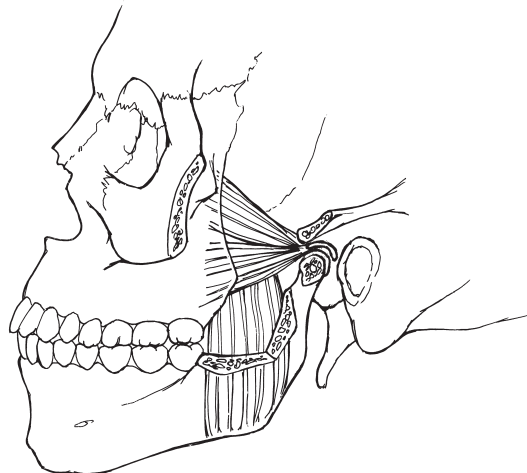


FIGURE 40-3 The medial and lateral pterygoids muscles. From Hendrickson T. *Massage for Orthopedic Conditions*. Philadelphia: Lippincott Williams & Wilkins, 2003.



FIGURE 40-4 The suprahyoid, infrahyoid, and digastric muscles. From Hendrickson T. *Massage for Orthopedic Conditions*. Philadelphia: Lippincott Williams & Wilkins, 2003.

pain is not necessarily a symptom. Given these variances, combined with an absence of a firm medical diagnostic standard, it is not surprising that many cases are not diagnosed, incorrectly diagnosed, or self-diagnosed. Symptoms are often mistaken for migraines, sinus infection, neuralgias, or toothache.

Diagnostic efforts may include a thorough history of jaw clenching, gum chewing, and eating habits, as well as questions about stress management. Palpation will indicate bony or muscular abnormalities. A medical history will indicate past or present arthritis, extensive dental work, and/or facial trauma. Finally, X-rays, CT scans, or MRIs may be done to determine bony and soft tissue damage and displacement.

OVERALL SIGNS AND SYMPTOMS

TMJD generally occurs bilaterally, but it occasionally affects only one side. The following symptoms can occur either bilaterally or unilaterally.

- Asymmetrical jaw movement
- Uncomfortable bite
- Reduced range of motion in the jaw
- Occasional jaw locking
- Popping or clicking sound in the jaw
- Constant, sporadic, or use-related pain; can be sharp, intolerable
- Dull, aching facial pain, sometimes radiating to the neck and shoulders
- Slight facial swelling on the affected side
- Headaches, vertigo, hearing problems, earaches

SIGNS AND SYMPTOMS MASSAGE THERAPY CAN ADDRESS

- TMJD causes the pain-spasm-pain cycle and can also lead to trigger points; many massage therapy techniques effectively reduce localized hypertonicity.
- The condition is often secondary to profound stress, and easing a client into a parasympathetic state is one goal of most therapy sessions.
- Massage therapy techniques focusing on the face, head, neck, and shoulders, combined with relaxing modalities, can relieve muscle pain and anxiety.

TREATMENT OPTIONS

TMJD is usually treated conservatively; rarely is it necessary to resort to aggressive or irreversible measures. Moderate holistic approaches are usually preferred, especially since, inexplicably, symptoms can persist for a short, intense period; disappear; and then return later.

Treatment goals include relieving pain and improving efficient jaw movement. Since there is rarely one right way to treat this condition, several health care specialists may be involved simultaneously. These may include a dentist, a psychotherapist, a physical therapist (PT), a chiropractor, a massage therapist, an orthodontist, or an oral surgeon.

Initial, conservative treatment usually includes resting the jaw by eating soft foods, avoiding gum chewing and big joint movements (such as open-mouthed laughing or biting into a large sandwich), applying warm and/or cold compresses to the joint, and performing gentle mandibular exercises.

A mouth guard is one mildly invasive treatment. Used for decades to address teeth grinding, night clenching, and TMJ disorders, the effectiveness of this oral appliance remains questionable. Its use is intended to be short term; it does not “cure” the condition but instead protects the teeth from destruction. The person’s bite could be altered by the long-term use of a mouth guard.

An aggressive treatment is a corticosteroid injection into the joint. Treatments of last resort include dental equilibrations, oral surgery, teeth extraction, facial surgery, and bridgework.

Prevention of occasional jaw pain involves avoiding gum chewing and biting hard objects, eliminating hard or sticky food, and supporting the lower jaw when yawning or laughing.

Common Medications

Muscle relaxants and/or antidepressants may be prescribed if the jaw pain is intolerable or if the emotional stress is uncontrolled. In rare cases, corticosteroid injections directly into the joint are beneficial. Over-the-counter (OTC) pain medication is typically used.

- Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil) and naproxen (Aleve, Anaprox, Naprelan, Naprosyn)
- Nonopioid pain reliever fever reducers, such as acetaminophen (Tylenol, Feverall, Anacin, Panadol)



Massage Therapist Tip

Avoiding Intraoral Work

Although the treatment of TMJD can be profoundly aided by massage both inside and outside the mouth, most massage therapy schools do not teach intraoral techniques. Moreover, most states regulate against massage therapists entering any body orifices. Given these restrictions, the assessment and treatment outlined in this chapter focus on work that does *not* enter the oral cavity.

MASSAGE THERAPIST ASSESSMENT

Ideally, the massage therapist works as a member of a health care team. In reality, however, a person will usually come to a massage therapist after having self-diagnosed and has no intention of seeing a physician or dentist. In this situation, the therapist can intelligently assess to determine treatment.

Upon digital palpation, the normal masseter and other jaw muscles should feel as relaxed and almost as pliable as the gastrocnemius, for example. They should be easily mobile at the muscle belly (which is comparatively small), and superior and distal attachments should be palpable. (All facial muscle palpation and assessment should be performed bilaterally, for comparison.) The therapist is looking for hypertonicity and/or unilateral differences.

The client’s mouth should easily open from 1.5 to 2.0 inches with no effort or pain. A practical measurement is to ask her to stack three fingers and place them in her mouth vertically (Figure 40-5). A limited or painful opening may indicate TMJ difficulties. The following actions should be performed easily and with no pain: gliding the jaw from side to side, protruding and retracting the jaw, chewing, yawning, and laughing. As the therapist observes the client, he is looking for indications of wincing from pain or lateral deviations.



FIGURE 40-5 Determining a normal jaw opening: Ask the client to place three fingers, stacked vertically, into the opening of the mouth. From Hendrickson T. *Massage for Orthopedic Conditions*. Philadelphia: Lippincott Williams & Wilkins, 2003.

The therapist can inquire about past injuries, whiplash, trauma to the face, surgeries, lengthy dental procedures, and (while staying within scope of practice) past emotional traumas that might have caused bruxism. Further inquiries about how the pain is managed will help the therapist determine a treatment plan.

THERAPEUTIC GOALS

Since there is a good chance that, left untreated, TMJD will resolve in time, the massage therapist can help hasten the recovery by reducing the pain-spasm-pain cycle before permanent joint damage is done to bone or cartilage. He can also relieve hypertonicity in surrounding muscles; address secondary or contributing factors (e.g., back pain from kyphosis); facilitate smooth, pain-free movement and function of both TMJs; and decrease irritable innervation.

MASSAGE SESSION FREQUENCY

- 60-minute sessions twice a week when the pain is severe
- 60-minute sessions once a week until recovery is complete
- 60-minute sessions once a month for maintenance

MASSAGE PROTOCOL

You will notice in the following protocol that extensive time is spent first relaxing the client, then softening superficial localized tissue, well before detailed or deep therapeutic work begins. The reason is multifaceted. The face is personal, rife with emotional agendas, and cannot be invaded as directly as the gastrocnemius, for example. A client who habitually clenches and grinds her teeth, when startled or distrusting, will clench and grind harder. Effective therapy to this region must be relatively deep, and trust must be gained and superficial tissue must be softened before “to the bone” deep work can be accomplished.

Getting Started

For easy access to relevant anatomic structures, position the client supine while working on the TMJ. Assure the client that, although you are focusing on her jaw, it is essential that she disrobe so you can easily get to the muscles that may contribute to her condition. The prolonged prone position, with the face compressed in the face cradle, may not be comfortable for the client’s jaw. Side-lying is always a good alternative (with the neck supported and with a pillow between the knees) and is often the position in which many people sleep. Have hot towels or cold packs ready. Be sure to begin and end the session with relaxation techniques performed away from the face, neck, and jaw.

During the entire protocol, the client should be able to easily breathe, swallow, and speak. At no time should your pressure or hand positions compromise these functions.



Thinking It Through

It is not possible to separate TMJ problems from hypertonicities and imbalances in the rest of the body. Thinking through the following will clarify the importance of avoiding “spot work” when treating this condition and will prompt the therapist to investigate distal, seemingly unrelated, variances contributing to TMJD.

- Is there a leg-length variance? This common condition would lead to lateral pelvic tilt that affects spinal alignment, which in turn leads to head/neck misalignment, thus directly affecting the TMJ.
- Does the client have either scoliosis or kyphosis? Spinal curvatures ultimately cause imbalances at the cranial-spinal junction, therefore forcing the TMJ to adjust.
- Does the client carry her head forward or jut her jaw forward several hours a day, while sitting at a computer, for example? This position creates mandibular imbalance, which places direct abnormal pressure on the TMJ.
- Does the client have a sunken chest? This condition is common among radical mastectomy survivors, long-time smokers or asthmatics, or those with long-term kyphosis. A sunken chest pulls on the pectoralis complex, thus pulling the mandible forward.



Contraindications and Cautions:

- While treating the anterior neck muscles, do not compress the carotid artery.
- While treating the sternocleidomastoid (SCM), do not simultaneously work both sides.
- When palpating for the mastoid process and working on the occipital ridge to release the digastrics, be careful not to compress the styloid process.
- Ask permission before placing your hands anywhere near the face, jaw, or anterior neck.

Step-by-Step Protocol for Temporomandibular Joint Dysfunction

Technique	Duration
With the client positioned comfortably supine, perform relaxation techniques anywhere on the body (other than the jaw and face) that the client requests. (Scalp, feet, hands, and abdomen are some options.) If the client allows, place a warm compress on one or both sides of the jaw. She can help hold it in place.	5 minutes
Ask the client to perform full range-of-motion (ROM) movements at her jaw. Note imbalance and ask about pain or restrictions. Compression, effleurage, petrissage, digital kneading, effleurage, pressure to tolerance, slow, long, evenly rhythmic strokes <ul style="list-style-type: none"> • Occipital ridge • Superior trapezius • Posterior cervical spine musculature • Superior pectoralis major (pushing down with your fingers under the clavicle) • Pectoralis minor • Superior deltoids 	8 minutes
With permission, place your soft hands and fingers on the anterior and lateral neck. Staying superficial and without compromising underlying structures, imagine your hands are glued to the <i>skin only</i> (you are also moving fascia at this point) and glide your hands around this region, moving in all directions, gently tugging the skin to its farthest comfortable extension, then allowing it to return and relax.	2 minutes
With slightly more pressure and more focused work, repeat the previous technique while applying sufficient pressure on the anterior and lateral neck so that you can palpate underlying <i>muscles</i> . Again, your hands and fingers are soft and open.	2 minutes
With permission, place your soft hands on either side of the client's face. Rest a moment. Repeat the previous technique by slowly and carefully moving the skin (fascia) of the entire face first and then progressing to palpating underlying muscles. Use broad, slow, noninvasive strokes but tug the tissue—the epidermis, dermis, underlying fascia, and superficial muscles—so that they begin the softening process and become accustomed to your touch. Now the real work begins.	3 minutes
Compression, skin rolling, plucking, pressure to tolerance, evenly rhythmic <ul style="list-style-type: none"> • From the chin to the TMJ, following the line of the mandible and along the zygomatic arch 	3 minutes

(continued)

Technique	Duration
<p>Digital kneading, in a gentle to-and-fro motion, at origin and insertion first, then move to the muscle belly, pressure to tolerance, evenly rhythmic, working one side of the face/jaw at a time.</p> <ul style="list-style-type: none"> • SCM • Masseter • Temporalis • Medial and lateral pterygoids • Suprahyoids and infrahyoids • Digastrics 	10 minutes (for both sides)
Rest for a moment, stroke the face, and then place your open, soft, still hands and fingers on the face and jaw.	A couple of breaths
Repeat your digital kneading techniques as listed previously, but move to a pressure that creates <i>slight</i> discomfort in its depth and stretch. Pain is not necessary for effective treatment. <i>Remember to stay on the bony prominences when working origins and insertions, and use caution when working on the muscle belly; stay well away from the most delicate and easily compromised structures, such as lymph nodes and major arteries and veins.</i>	10 minutes (for both sides)
<p>Effleurage, medium pressure, with a soft, open hand, slow, evenly rhythmic</p> <ul style="list-style-type: none"> • Occipital ridge • Superior trapezius • Deltoids • Pectoralis major • Anterior, posterior, lateral neck 	2 minutes
<p>Muscle stripping, used with great caution, focusing on the tiny muscles alone and not compromising underlying structures, working slowly, watching the client's reaction, interspersing frequent stroking and effleurage</p> <ul style="list-style-type: none"> • SCM • Masseter • Temporalis • Medial and lateral pterygoids • Suprahyoids and infrahyoids • Digastrics 	10 minutes (for both sides)
Ask the client to perform full ROM movements at her jaw. Note imbalance and ask about pain or restrictions. Note differences from the beginning of the session.	
Medium pressure, compression, effleurage; long, smooth, stroking techniques to the entire worked surface of the face, neck, and shoulders	2 minutes
Perform relaxing techniques anywhere else on the body other than the face, head, and neck.	3 minutes



Massage Therapist Tip

Using Caution in the Anterior Neck

There is good reason for all massage therapy schools to teach that the anterior neck is an "endangerment zone." The small, compact area is dense with easily damaged tissue. Lymph nodes are nestled under the mandible. Major arteries and veins are easily palpable, and incorrect or rigorous compression can compromise circulation to and from the brain. The small fragile styloid process can be moved with pressure that is too aggressive. All of this does not contraindicate your work; instead, it forces you to stay completely focused on the positions of your fingers and hands. With a keen awareness of the anatomy that you touch and the pressure you use, you'll be able to work safely in this delicate region.

HOMework

Working in your favor is the fact that TMJD will often spontaneously resolve. You can help move this recovery forward more quickly by making some homework assignments. As always, it is best to work with a PT or a physician, but in the (most probable) absence of either, you can safely suggest the following self-care exercises.

- Think “swan neck.” Think of your neck as long, relaxed, and easily moved. When you feel yourself clenching or grinding, quickly open your mouth, take a big breath, and elongate your neck.
- Become aware of when you clench or grind. Gently place your fingers to your jaw, stroke it slowly, and try to relax.
- Try placing your tongue lightly at the roof of your mouth, which makes it impossible to clench your teeth.
- *Gently* stretch the muscles of your face and neck. Stretch your facial muscles by reciting the vowels AEIOU throughout your day.
- Here is the normal, relaxed posture for your head and neck; practice it throughout the day: shoulders down and relaxed, jaw free of tension, lips closed, teeth slightly apart, tongue gently touching the roof of your mouth behind the teeth.
- Breathe through your nose, not your mouth.

Review

1. List some of the names that refer to this condition.
2. Which bones meet to create the TMJ?
3. Name the muscles that are involved in normal jaw functions.
4. What are some cautions in working on clients who have TMJD?
5. How is TMJD usually treated?

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