



## Physiologic Effects of Basic Massage Strokes and Techniques

### THE IMPORTANCE OF MOVING BLOOD

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Blood is so important that the massage therapist takes great effort to move it and to increase its presence in areas of hypertonicity (tightness). Without the movement of blood, there can be no therapy, no healing, no health—no life. Instead, pain, stagnation, disease, and accumulated waste products in tissues result. Stroking, for example, usually initiates profound parasympathetic (relaxing) effects on the body by aiding the release of hormones and other calming chemicals in the brain.

By increasing circulation, the massage therapist supports the following important physiologic processes:

- Cellular oxygenation
- Healing and proper functioning of cells, tissues, muscle, and bone
- Removing waste products
- Regulating body temperature
- Fighting disease
- Moving hormones to their target organs

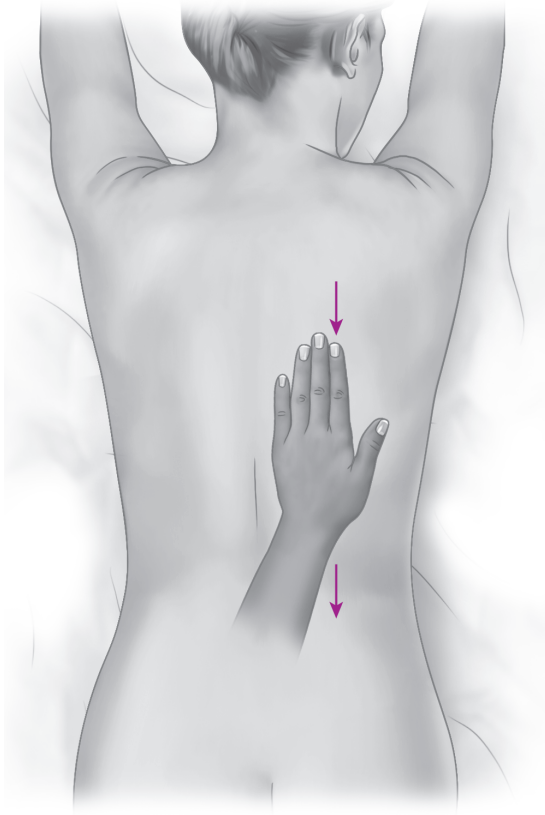
By reviewing the physiologic effects of specific massage techniques, and truly understanding how they can profoundly affect the body, the therapist gains the knowledge for starting to treat specific conditions. This knowledge is, of course, combined with an understanding of the client's or patient's health or medical condition itself, which is covered in Part II of this book. We will describe the most commonly used massage strokes and techniques and outline their physiologic effects on the body. The goal for the massage therapist is to reflexively understand, "If technique A is performed on the body, then result B can be expected."

While technique is clearly important, massage is an art; different hands and intentions produce different results. The physiologic effects described in the succeeding text bring together science and art, with the understanding that varying levels of skill and focus produce different results.

### STROKING

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The movement that makes a cat purr, a dog's tail thump, and a baby sleep is an intuitive starting point to explain stroking. Stroking is the *unidirectional* (for our purposes), slow, not deep but not feathery, noninvasive, gliding, careful, usually slow drag of the full hand on the body (Figure 2-1).



**FIGURE 2-1** Stroking. The client is lying prone while the therapist's slightly open, flattened hand strokes her back, applying only the weight of the hand itself.

The specific physiologic effects of stroking include:

- Sedation
- Decreased pain perception
- Decreased anxiety and distress
- Decreased nausea and temporarily decreased spasticity if applied over the spine
- Rehabilitation of nerve afferent transmission
- Decreased sympathetic nervous system activity

Stroking alone has been used on premature infants to soothe them and to increase their weight gain and activity level, as well as to increase alertness and improve body tone. For people of all ages, the slow-stroke back massage is effective in decreasing blood pressure and reducing heart rate.

## EFFLEURAGE

Effleurage can be thought of as “stroking with depth.” The lighter and faster effleurage is performed, the more stimulating its effects; the deeper and slower the stroke, the more relaxing. It is often used as an introductory or parting stroke during a massage session. It is also used to apply lubricant, and as a transition technique either between strokes or when moving from one body part to another. The therapist uses the whole hand with fingers gently closed, conforming to the body, or uses the ulnar surface of the forearm. Long, flowing, moderate-to-deep pressure is delivered to a broad surface of the body (Figure 2-2).

The specific physiologic effects of effleurage include:

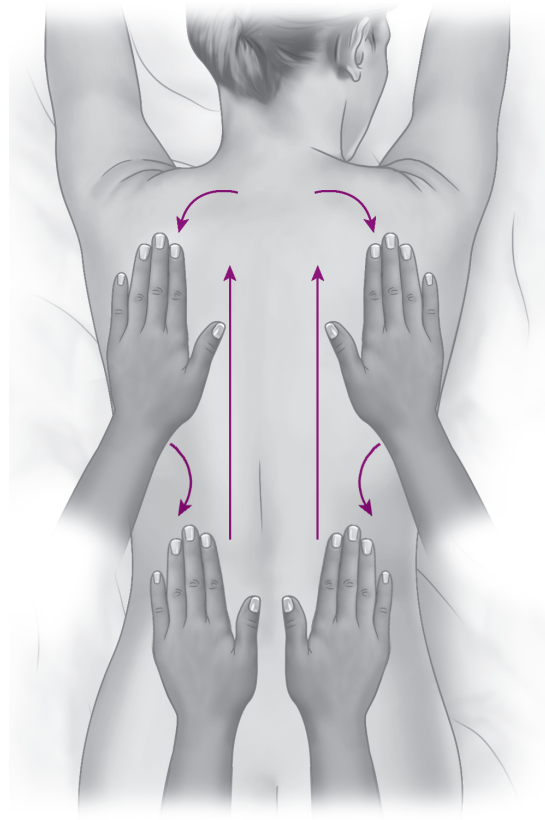
- Increased venous return
- Increased lymphatic drainage and decreased edema
- Strengthened immune function



### Massage Therapist Tip

#### Different Names for the Same Stroke

You may notice that strokes sometimes have different names, depending upon the textbook or article you're reading. "Lifting and rolling" may be the same stroke we call "skin rolling." "Myofascial spread" is another term for fist kneading. A stroke's name depends on the author, the country, and the therapist's educational background. The intent, however, is the same—to have an effect on the body with specific actions. No matter what the strokes are called, your job is to know when to use them based on their physiologic effects.



**FIGURE 2-2 Effleurage.** Slightly deeper than stroking, effleurage is used to apply lubricant and as a transition technique between strokes.

- Localized warming and tissue softening
- Enhanced hormone release
- Initial increased heart rate and blood pressure followed by decreases in both

## PETRISSAGE

Petrissage "goes for the muscle." Leaving behind superficial or broad work, the therapist uses petrissage to firmly grasp either individual muscles or groups of muscle to affect underlying tissues. Relying on previous tissue warming (effleurage is always used prior to this technique), petrissage begins the serious business of mobilizing and softening tissue. This stroke is performed rhythmically as the therapist squeezes and releases muscle tissue. Maintaining full hand contact, she grasps the muscle belly firmly with the palm of the hand, forcing the tissue up into the slightly arched fingers. Tissues are pumped with the one-hand or two-hand cephalic (toward the head) movement as the muscle is gripped, squeezed, and then released.

Various forms of petrissage include the following:

- *Knuckle kneading:* The knuckles are used to deeply move the tissue.
- *Digital kneading:* The fingers are used to deeply move the tissue.
- *Fist kneading:* The entire balled fist is used to deeply move the tissue.
- *Wringing:* The tissue (normally part of an extremity) is grasped as if wringing out a large sponge, and pressure with two hands is applied in opposite directions.
- *Skin rolling:* The skin is plucked up off the underlying muscle and rolled along to move the superficial fascia from deep fascia (Figure 2-3).

The desired results of petrissage include deep, lasting, warming effects on blood and muscle. The intelligent use of these techniques forms the basis of therapeutic massage.



**FIGURE 2-3 Petrissage.** The therapist firmly grasps the client's calf muscle with the full palm of her hand. She makes deep contact while lifting the muscle away from the bone.

The specific physiologic effects of petrissage include:

- Movement of cellular waste products
- Decreased muscle tension
- Decreased muscle hypertonicity
- Pain relief
- Increased joint range of motion (ROM)
- Increased connective tissue extensibility and loosening
- Localized tissue warming

## TAPOTEMENT

The techniques described thus far are intended to sedate, relax, or at least not stimulate the body. By moving into tapotement, the therapist recognizes the necessity of periodically stimulating the body for either a localized or a systemic effect.

Tapotement includes the following techniques:

- *Tapping:* Using alternating quick, loose wrists, the therapist taps the fingertips on the skin, snapping the fingertips back quickly to affect superficial tissue only (Figure 2-4). Tapping is most effective when used directly on the skin.
- *Pincement:* Using alternating loose wrists, the therapist plucks the skin between thumbs and fingertips wherever ample skin allows for lifting (Figure 2-5). The technique is superficial only and is applied directly to the skin.
- *Hacking:* Using alternating quick, loose ulnar sides of the hands, the therapist applies as much pressure as the client will allow (Figure 2-6). Hacking can be performed directly on the body or through sheets.
- *Cupping/clapping:* With semirigid, cupped hands but loose, alternating wrists, the therapist creates a little cup with each hand as it strikes the anterior, lateral, and posterior surfaces of the thoracic cavity (Figure 2-7). The technique is performed directly on the skin or through sheets, and the therapist is careful not to invade the breast tissue.
- *Pounding:* With soft but clenched fists and quick alternating wrists, the therapist pounds the body with the soft ulnar surface with gently closed hands (Figure 2-8). Pounding is performed directly on the skin or through sheets.

The specific physiologic effects of light tapotement include:

- Increased nervous system stimulation
- Increased muscle tone
- Rehabilitation of sensory nerve transmission



### Massage Therapist Tip

#### Tapotement Intensity

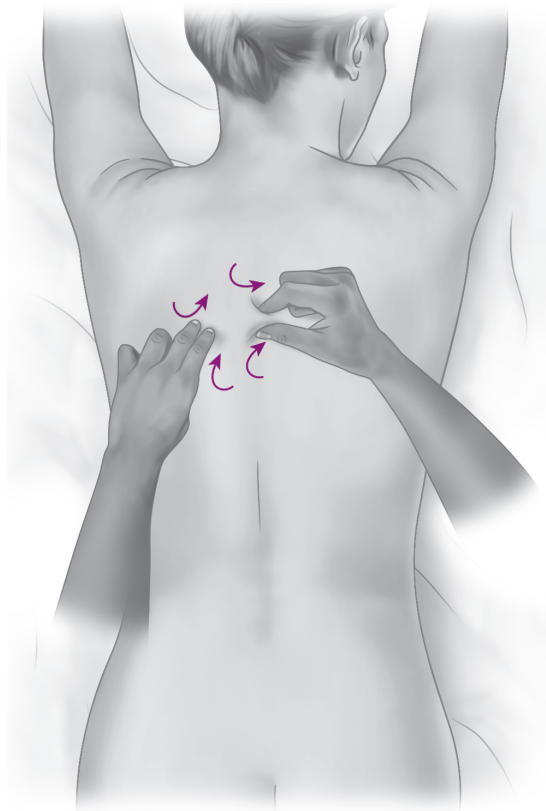
When applying tapotement, always gently alert your client that you are about to begin this sometimes startling technique. Begin lightly as an introduction to the body, increase intensity as your stroke reaches its full, committed vigor, and then ease off before exiting the body with care.



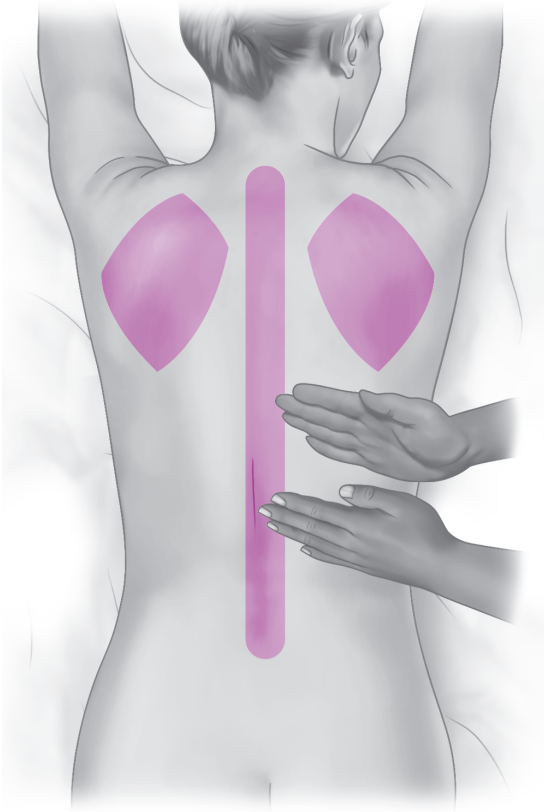
**FIGURE 2-4** Tapping. The therapist uses her fingertips to lightly tap the client's forehead.

The specific physiologic effects of heavy tapotement include:

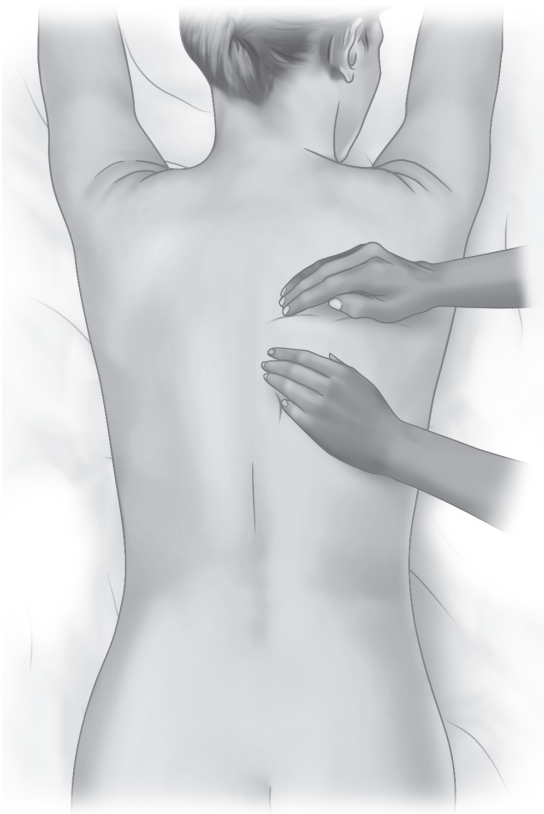
- Local numbing
- Increased local circulation
- Increased muscular blood flow
- Increased sympathetic nervous system activity
- Increased muscle tone temporarily, followed by muscle relaxation
- Loosening of mucus in the lungs
- Desensitization of a local area of skin



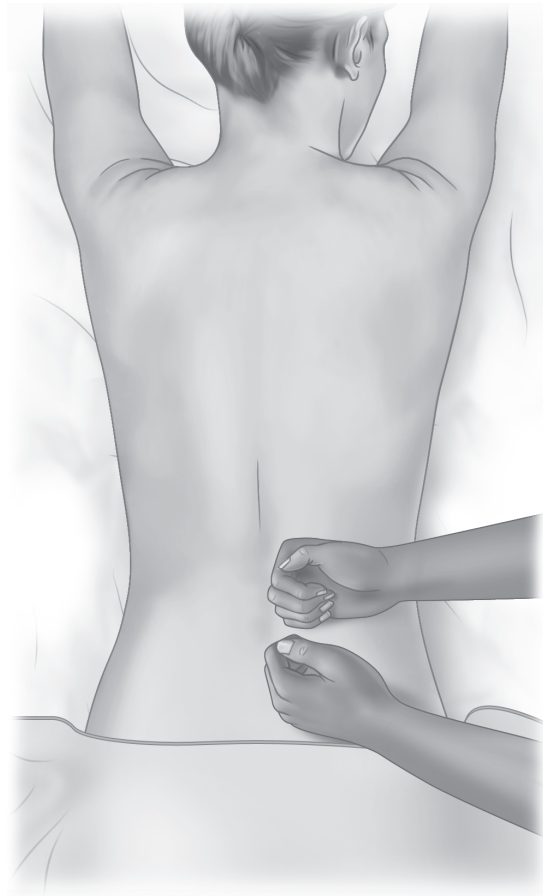
**FIGURE 2-5** Pincement. The therapist uses a twisting and plucking technique to move the superficial tissue.



**FIGURE 2-6** Hacking. Loose, flexible wrists allow the ulnar side of the therapist's hand to intermittently strike the client's back. Remember to stay away from bony prominences, as indicated by the shaded areas.



**FIGURE 2-7** Cupping. Firmly cupped hands and loose, flexible wrists create a popping sound if cupping is properly performed to the posterior thoracic cavity.



**FIGURE 2-8** Pounding. Gently held fists and loose, flexible wrists intermittently strike the client's gluteal region.

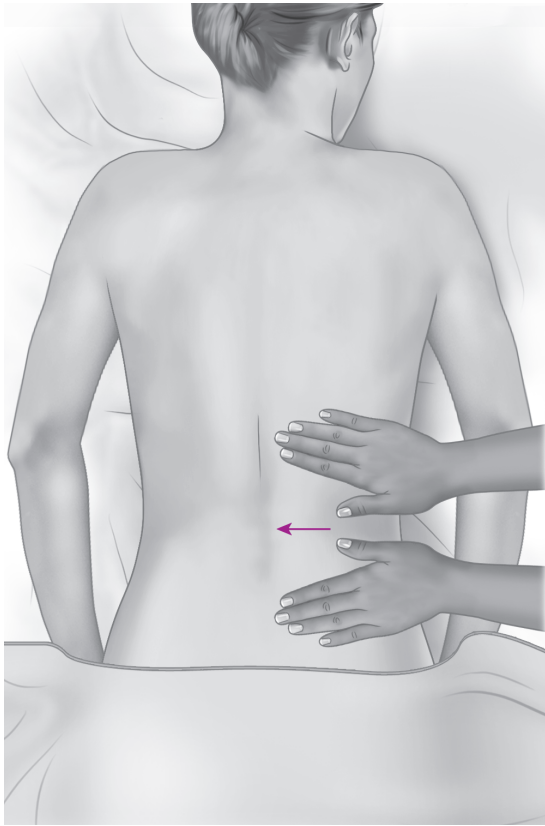
## ROCKING

Perhaps as natural as the act of stroking, rocking, too, can easily be applied at the beginning or end of a session. Without the advantage of a rocking chair, the therapist is limited to rocking the body in only one plane. Therefore, she must be careful with the rate and depth of rocking to avoid agitating the body and reversing the calming intention. Rocking is one technique that can be incorporated at any point during a session when the massage therapist intuitively feels the client needs to be placed into a deeper state of relaxation.

Rocking can be performed with the client lying supine or prone:

1. With the client in the supine position, the therapist places her hands gently and slightly laterally to the anterior superior iliac spine (ASIS). The body is nudged from side to side by the force of the therapist's alternating hands, creating a rocking motion. The client's body does not move more than an inch or two from side to side. The rhythm is continued until the therapist feels as if the client's body has, itself, almost unconsciously taken over the rocking process, at which point she simply continues to help nudge the body. The stopping point is reached intuitively.
2. With the client in the prone position, the therapist places her hands gently and slightly laterally to the gluteus medius, and the same process discussed previously is followed (Figure 2-9).

It is difficult to rock an adult at any other point of the body without either invading personal space or causing vertigo.



**FIGURE 2-9** Rocking. The therapist's hands gently placed along the bilateral gluteus medius push each other to create a rocking motion.

The specific physiologic effects of rocking include:

- Muscle relaxation
- Increased parasympathetic nervous system activity
- Increased feeling of well-being
- Improved balance

## CROSS-FIBER FRICTION

Used with discretion and intelligence, this technique is highly effective. If the technique is used without focus or knowledge, the therapist can irritate the tissues and the person, in which case the client will never return and the therapist will have failed in the attempt to help. “Do no harm” is worth remembering in the context of using cross-fiber friction.

Cross-fiber friction can be performed at the point where a muscle turns into tendon (at the origin or insertion of muscle on bone), in the middle of the muscle belly itself, anywhere along the muscle mass, on and around scar tissue, at any location where muscles are deeply layered in the body, and at places where superficial muscles lie directly against bone. The therapist performs cross-fiber friction using the tips of her thumbs, an elbow, or a knuckle. Here is the basic technique:

1. The therapist identifies a small, localized, focused area of tissue.
2. Using her thumbs or fingertips, the therapist begins rubbing “across the grain” of the muscle fiber using no lubricant and *without moving over the skin* (Figure 2-10). She focuses on the client’s level of discomfort, paying close attention to body language indicators for pain beyond “good hurt.” Communication with the client is essential.

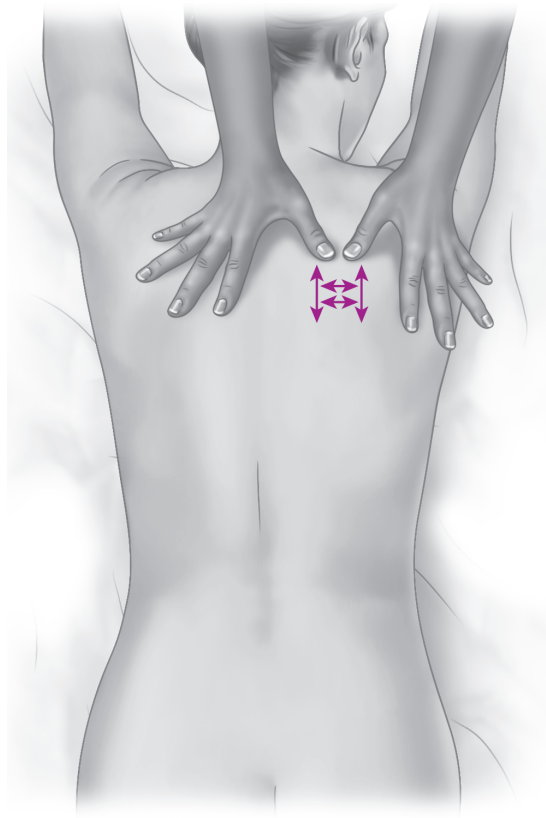


### Massage Therapist Tip

#### Cross-Fiber Friction and Medication

When considering whether to use cross-fiber friction, be aware of your client’s medications. If she is taking high doses of pain medication, she may not be able to accurately report her pain level, and you could inadvertently bruise her by moving beyond acceptable limits of tissue tolerance.





**FIGURE 2-10** Cross-fiber friction. The therapist's thumbs are focused on unlubricated skin, remain stationary in one place, and move subcutaneous tissue deeply in a criss-cross motion.

3. The back-and-forth cross-fiber friction is continued until a localized area of hyperemia (redness) is noted on the skin; until the desired region, tendon, or muscle has reached an acceptably decreased level of hypertonicity (tightness); or until the client requests stopping the technique.
4. Cross-fiber friction is always preceded by effleurage and petrissage to warm and prepare the tissue. It is also always followed by effleurage and petrissage to “clean out” the effects of this aggressive but effective technique.

The specific physiologic effects of cross-fiber friction magnify the effects of friction. The physiologic effects of both include:

- Breaking down existing soft tissue adhesions, as well as those about to be formed through injury, surgery, or inactivity
- Breaking down the erratic formation of scar tissue; repeated treatments can realign the collagen fibers to create a more normal, mobile muscle fiber direction
- Increased connective tissue extensibility
- Localized hyperemia, followed by a localized inflammation and healing
- Temporary analgesia
- Decreased hypertonicity

The mechanism by which the massage therapist creates a localized reaction to which the body is forced to respond proves to be one of the most valuable tools in treating many conditions. After the body suffers a localized insult, it *attempts to heal*. The insult can be a fresh injury around which a scar is forming, or an older injury around which scar tissue has already formed, or perhaps merely a localized area of hypertonicity that has set up the pain-spasm-pain cycle (see Chapter 3). Whatever the cause, this injured, disorganized tissue needs the body's resources to heal.

In order for soft tissue to heal, it is necessary to increase the blood supply to the injured area. Cross-fiber friction creates a localized area of hyperemia, leading to a localized area of inflammation so the healing can begin. An example of this process is

the body's response to a simple splinter. The splinter, a mild irritant, within a day or two is encased in a small reddened, pus-filled area surrounding the offending matter (phagocytes doing their job). The body recognized the splinter as an irritant and responded by sending blood and special chemicals directly to the area. This is the physiologic effect of cross-fiber friction, which the massage therapist can create by sending blood to a specific region that requires attention.

The medial epicondyle (bony landmark at the medial, anterior surface of the antecubital fossa) and a case of epicondylitis are an appropriate example:

1. The tender area is precisely identified by the therapist and the client.
2. The therapist's thumb begins to rub in a perpendicular direction at several spots along the tendons that insert the muscle onto the bone.
3. Because of the friction, blood vessels are dilated and the blood supply to the area is increased.
4. Because of the depth of the therapist's work (she is working to the point of "feel good" pain), she causes minor tissue damage.
5. Whenever the body experiences tissue damage, no matter how small, chemicals are sent to the area to dilate blood vessels and affect local pain receptors.
6. The local increased blood circulation speeds healing by transporting more healing chemicals to the area.
7. While the therapist works, the client first identifies pain and then notices the pain slightly decreases because the friction reduces the activity of local pain receptors, thereby allowing the therapist and the client to work "through the pain."
8. The chemicals in the blood facilitate tissue repair and a reorganization of the collagen fibers, producing more efficient muscle fiber function.

## USING HEAT AND COLD

The effective application of heat and cold is a complicated issue for massage therapists. Some massage schools do not teach these therapies, believing they are not within the therapist's scope of practice. Other schools teach the use of hot and cold packs to address superficial tissues, with the understanding that it is only the physical therapist who has all the tools to substantially affect the body's deeper tissues by alternating hot and cold therapies.

To the extent that the massage therapist has been trained, hot or cold applications should be moist, not dry, for the most effective therapeutic use. The length of application varies depending on the reference used and on the patient's tolerance. The techniques listed as follows assume that hot or cold is applied externally and locally—not by submersion. Here are some safety guidelines.

### Heat Application

Heat can safely be applied for 15–20 minutes, as long as the therapist observes both the local area of hyperemia and the patient's level of tolerance. The specific physiologic effects of the application of heat include:

- Increased local skin temperature
- Increased local vasodilation and blood flow to the skin and muscles directly below
- Increased local cellular metabolism and nutrient supply
- Increased local oxygenation
- Decreased pain perception because of decreased nerve conduction velocity
- Reduced muscle tone and decreased spasm from reduced sensitivity and firing rate in the muscle spindles
- General sense of sedation and relaxation

Because of the simultaneous comforting, relaxing, and mildly therapeutic effects on both the entire body and the localized tissue, the therapist will be able to



### Massage Therapist Tip

#### The Application of Heat

A rice pack or electric heating pad is not considered a therapeutic application of heat. Heat is most effective when applied in a moist form—either a microwaved gel pack, a hot water bottle, or a compress made from a hot wet towel. *Do not place these applications directly on the client's skin; lay them over a thin sheet of cotton, such as a pillowcase.*



#### Contraindications and Cautions: Local Applications of Heat

**If, for multiple reasons, a client cannot accurately report the effects of a heat application, that client represents a contraindication for this modality. Examples are unconsciousness, inebriation, infancy, old age, and the intake of high doses of pain or mood-altering medications. Further, patients with an acute injury, a circulatory pathology, or an active, systemic infection would represent a contraindication. For a patient who presents with a local skin compromise, such as an open wound or a rash of unknown origin, the therapist can safely apply heat to unaffected surfaces of the body.**



## Massage Therapist Tip

### The Application of Cold

It is normal for a patient receiving a local application of cold to experience first the sensation of cold, then a tingling or itching feeling, then a dull aching or burning sensation, and followed finally by numbness. You should inform your patient that the “therapy isn’t working” until he experiences all of these phases. When he finally reaches the point of numbness, and this might take encouragement on your part for him to leave the pack in place, it is time to remove the pack for 30 minutes before reapplying the cold therapy.



### Contraindications and Cautions: Local Application of Cold

The contraindications and cautions listed previously for the local application of heat hold true for the local application of cold. In addition to those are the patient’s hypersensitivity or allergic reactions to cold (itching, hives, sweating), her possible compromised local circulation or circulatory insufficiency, and any statements indicating she is experiencing a whole-body chilling.

## Step-by-Step Massage Therapy Protocols for Common Conditions

comfortably use heat during many of the protocols outlined in this book. The effects of heat will help the therapist “get into” the body on both a psychological and a physical level.

### Cold Application

Just as there are times when the massage therapist wants to increase circulation to a localized area of the body, it is often appropriate to decrease a local inflammatory process, or to try to slow down or decrease swelling. Following are guidelines for the general application of cold. (The distinction is made between “cold” and “ice” here because most massage therapy schools do not teach the application of “ice pops” or “ice massage,” but rather the application of frozen gel packs, which are merely very cold, but are not ice.)

The specific physiologic effects of the application of cold include:

- Activation of the pain-gating mechanism in the spinal cord, thereby decreasing perceived pain in the area and allowing localized therapeutic work to be performed (see Chapter 3)
- Reduced nerve conduction velocity
- Reduced local temperature of skin and muscle
- Duration of local effects up to 45 minutes after prolonged application
- Decreased local blood flow, initially, from vasoconstriction
- Increased blood viscosity resulting in less bleeding of the injured tissue, decreased inflammation, and decreased swelling and edema
- Decreased pain and muscle spasm
- Stimulation from brief application and analgesia from prolonged application

Cold packs can be locally applied safely for 5–20 minutes “on,” with a rest period of 30 minutes “off.” The therapist’s cues from the patient for the beginning of the “off” phase would be words like “numb” and “painful” in reference to the effect of the cold.

## PASSIVE AND ACTIVE RANGE OF MOTION

If you remember the Tin Man from *The Wizard of Oz*, it’s easy to understand the relationship between continuous joint movement and the lack of joint pain. The Tin Man stood in the middle of a field, frozen solid, barely able to use his jaw muscles from years of disuse. He painstakingly called, “Oil . . . oil” to Dorothy and the Scarecrow as they walked by. When “oil” was applied to each of his joints, the immediate sigh of relief and movement let us know the oil had done the trick. And so it is with the “oil”—synovial fluid—in the joints of the body that facilitates smooth, pain-free joint movements. The more body movement, the more synovial fluid is released in the joints.

Further discussion about effective ROM exercises is found in Chapter 5. The specific physiologic effects of ROM exercises include:

- Controlled stimulation to joint mechanoreceptors (nerve signals monitoring and directing movement)
- Decreased sensitivity of joint sensory nerve receptors, with passive movement
- Increased synovial fluid production
- Increased lymphatic and venous return

## IN SUMMARY

Massage therapists often erroneously believe they can do very little when confronted with the chronic pain associated with many medical conditions. Nothing is further

from the truth. The following allow the therapist to have a profound effect on pain and discomfort:

- Increasing local circulation, which supports important physiologic processes, such as cellular oxygenation, removal of waste products, and moving hormones to target organs
- Stroking to sedate or quiet the nervous system
- Using effleurage transitionally or to apply lubricant
- Employing petrissage to move the deep muscle tissue
- Stimulating either the entire body or specific regions with tapotement
- Rocking the body as a means of sedation or to induce calm
- Breaking up adhesions and scars with the use of cross-fiber friction
- Applying heat or cold therapeutically and safely

The next chapter discusses the physiology of pain and moves the therapist one step closer to treating conditions.

## Review

1. List the physiologic effects of increasing local circulation.
2. List specific physiologic effects of stroking.
3. List specific physiologic effects of effleurage.
4. List specific physiologic effects of petrissage.
5. List various forms of tapotement.
6. List specific physiologic effects of rocking.
7. Explain and demonstrate cross-fiber friction.
8. When is heat appropriately applied? Describe safe application.
9. When is cold appropriately applied? Describe safe application.

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## Massage Therapist Tip

### Range-of-Motion Exercises

Active ROM is movement performed by the client, without your help. You observe as your client performs requested movements. When your client's joint movements are completely dependent upon your assistance, passive ROM is being performed. In either method, ROM is never performed beyond the point of a little client discomfort and should never be forced.



# The Physiology of Muscular Activity and Pain

## THE PAIN-SPASM-PAIN CYCLE

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Knowledge of muscle physiology, pain perception, and the role of emotions is fundamental as the skilled massage therapist attempts to relieve pain. The pain-spasm-pain cycle is an invaluable tool with which the therapist can critically think through the client's pain status. Understanding this cycle is so central to the therapist's effective use of the massage protocols in Part II of this text that we will take time to discuss a typical demonstration of how myofascial pain is created in the body. Equipped with this knowledge, the therapist can use her wide array of skills to learn how best to interrupt the cycle to help eradicate, or at least decrease, myofascial pain.

### How the Cycle Works

Figure 3-1 shows the step-by-step progression soft tissue undergoes when hypertonicity is not addressed.

#### Hypertonicity

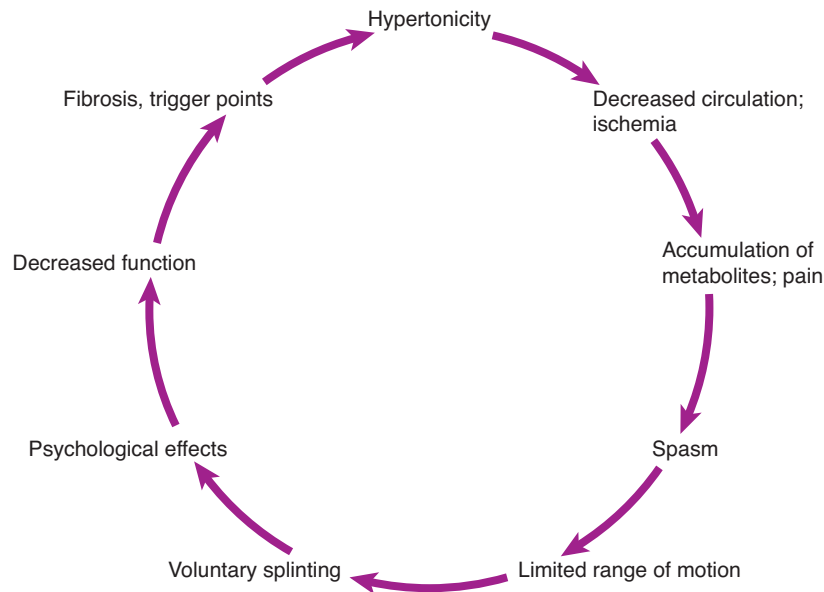
Overused or underused muscles become hypertonic, or tight. Blood normally flows freely in and out of the moving muscle. Hypertonicity slows the free movement of oxygenated fresh blood in and metabolic waste products (like lactic acid and metabolites) out. When this happens, the client feels slight discomfort. No real pain has developed at this point.

#### Ischemia

With prolonged hypertonicity, local circulation (and therefore oxygen) decreases, causing a condition known as ischemia (lack of oxygen). Oxygen debt is accompanied by the beginning of the sensation of pain. Prolonged ischemia leads to more severe pain, resulting from the retention of metabolites. Normal, moving healthy muscle needs a constant supply of fresh oxygenated blood to function properly. Once the nutrients in blood are metabolized in the muscle tissue, waste products are produced, which must be washed out. This normally occurs through muscular activity. In the absence of adequate muscle movement, or upon physical exertion, wastes, such as carbon dioxide and lactic acid, accumulate. Lactic acid creates hydrogen ions, which stimulate the pain receptors (nociceptors) in the muscle.

#### Spasm

Ill equipped to handle the buildup of waste products, the muscle now begins to spasm. Metabolites have not yet moved out of the muscle, so the pain continues.



**FIGURE 3-1** The pain-spasm-pain cycle. Simple hypertonicity leads to painful trigger points unless the cycle is broken.

### Decreased Range of Motion

If the client is experiencing pain and spasm, the natural result will be a decreased range of motion (ROM) at the proximal joint. Compensation in other muscles occurs as he tries to adjust his body to the localized pain.

### Voluntary Splinting

At this point, the client will “guard” a joint, a compensatory action known as voluntary splinting, or muscle splinting. Splinting protects the affected muscle from movement, which he has learned causes pain.

### Emotional and Psychological Manifestations

Physical pain takes its toll on the psyche, and now the client’s pain gains emotional and psychological components. These manifestations, combined with the pain in movement, lead to a further decrease in function. The client must adapt either his movement or his daily functioning.

### Fibrosis

With prolonged muscle disuse, compensation, and splinting, tissue changes occur and the process of fibrosis, the development of excess connective tissue, begins. Fibrosis further restricts movement. As healthy muscle tissue is replaced by fibrotic tissue, the client is unable to move and function normally.

### Trigger Points

The presence of fibrotic tissue embedded in normal muscle tissue creates trigger points. This is the stage at which many clients will seek help.

### Continuation of the Cycle

Having moved from mild stiffness and irritation to pain to spasm to voluntary splinting, the client’s movements are now accompanied by radiating pain beyond the initial point of hypertonicity. He experiences more hypertonicity, and the cycle continues.

## A Classic Example of the Pain-Spasm-Pain Cycle

Taking a common example of a client, let's call him Sam, who spends one intensive week working on a major project, we can see how the previous physiologic explanation quickly becomes clear:

- *Monday, 11:00 a.m.:* Sam has been seated, hunched over his computer screen, since 8:00 a.m. He notices a mild discomfort in his superior trapezius, rubs his shoulders unconsciously, but continues to work without addressing the impending problem. (*Hypertonicity*)
- *Wednesday, 8:00 a.m.:* Sam's stress level has risen, he's not making his deadline, and he's clenching his jaw. He notices a mild burning sensation at his superior trapezius and in the middle of his back. Throughout the day, he grabs at his shoulder and rolls his neck but keeps on working. (*Decreased circulation and ischemia*)
- *Thursday, 6:00 p.m.:* Sam has not slept much, probably is not hydrating properly, and continues to put in long days, hunched in front of the screen. The discomfort in his shoulder has progressed to a noticeable, distracting pain. He continues to ignore the problem. (*Accumulation of metabolites and pain*)
- *Friday, 6:30 a.m.:* When Sam gets out of bed and reaches to turn off the alarm clock, his superior trapezius spasms and burns, finally getting his conscious attention. (*Spasm*) He notices while taking his shower that his shoulders aren't as mobile as they used to be, and he can't reach to dry his back. (*Limited ROM*)
- *Friday, 12 noon:* Sam's coworkers ask him why he's "holding himself" when he reaches for his cup of coffee, and he realizes he's adjusted his movements because he's in so much pain. (*Voluntary splinting*) At this point, because of his pain, his choice not to address it, and his overall stiffness, he becomes grouchy. (*Psychological effects*)
- *Saturday morning:* Sam sleeps in, but when he rolls out of bed, he notices his shoulder movement is accompanied by stabbing pain. Shaving is difficult for him. (*Decreased function*) When his wife tries to rub his painful shoulders, she tells him she feels "knots" deep in his muscle. (*Fibrous trigger points*)

Unless Sam addresses the causes of the hypertonicity, the pain-spasm-pain cycle will continue. In order to relieve pain, *the cycle must be broken—and it can be broken at any point.* The painful region needs movement, increased blood flow, stretching, and strengthening. If the massage therapist can address even one component of the pain-spasm-pain cycle, she has a good chance of stopping, or at least reducing, myofascial pain.

## Breaking the Cycle

There are many ways to break this cycle, medications and surgery being the two most dramatic. Massage therapy, however, is a simpler, noninvasive method that takes longer but that can have profound long-term effects not only on the body but on the mind as well. Table 3-1 outlines the various pain relief techniques available to all levels of massage therapists. Part II of this book is dedicated to the use of massage skills in treating specific conditions; Table 3-1 is simply a taste of things to come. (For the specific physiologic effects of each stroke listed in the table, see Chapter 2.)

## THE GATE CONTROL THEORY OF PAIN

Understanding myofascial pain is only one component of clinical massage. A thorough understanding of the patient's *perception of pain* is also essential. The concept of pain and where exactly it is perceived in the body or brain have mystified scientists for a long time. Although scientists understood that nerve endings that respond to pain are different from those that respond to gentle touch, no one was sure what role the brain or spinal cord played in how pain is perceived. The gate control theory of pain is widely

**TABLE 3-1** Techniques for Breaking the Pain-Spasm-Pain Cycle

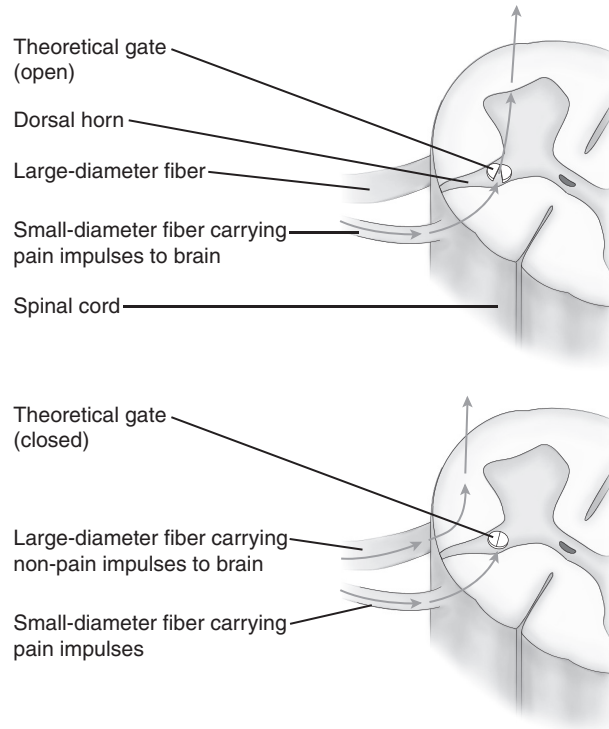
Cycle Component	Pain Relief Technique
Hypertonicity	ROM exercises, application of heat, effleurage-petrissage-effleurage, kneading, vibration
Decreased circulation	All of the previous
Accumulation of metabolites	Application of heat followed by deep effleurage-petrissage-effleurage, contrast (hot-cold-hot-cold) therapy, deep kneading.
Pain	All of the previous, compassion
Spasm	Very localized, deep kneading followed by effleurage-petrissage-effleurage; application of heat; rocking; localized deep vibration; cautious stretching; calming, careful work.
Limited ROM	Application of heat, ROM exercises, effleurage-petrissage-effleurage, kneading, vibration, encouragement
Voluntary splinting	Therapist assesses this mechanism and watches for compensatory patterns that are developing. Massage to compensating muscles, not simply the localized area of pain or injury.
Psychological effects	Compassion, increased listening skills, understanding that the client is more than her physical pain, asking sufficient questions to determine the extent of the “terrible triad”
Decreased function	Keen observation and assessment to determine functional impairment, followed by the use of all previous techniques as appropriate
Fibrosis	Manual assessment to determine where normal muscle fibers have moved into an abnormal state of fibrosis; all previous techniques as appropriate
Trigger points	Initial warming of distal tissue, followed by warming techniques to exact trigger point location, followed by heat application, effleurage-petrissage-effleurage and kneading, proximal joint ROM, and client self-care homework assignments

accepted as a comprehensive explanation of how the brain perceives pain and—for the massage therapist’s purposes—how the perception of pain can be decreased.

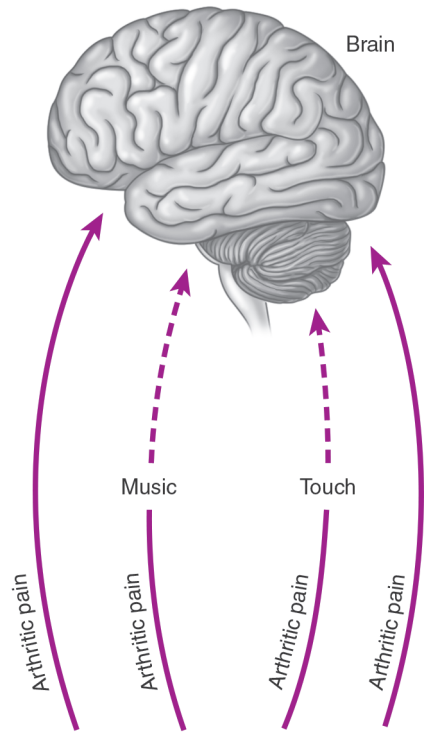
In 1965, Canadian psychologist Ronald Melzack and British physiologist Patrick Wall proposed the gate control theory. However, before discussing the science, let’s consider another simple example. If a client is having a bad day to begin with and slams his toe into the corner of his desk at work, it will really, *really* hurt. He might utter a few expletives, rub the spot, and go on with his day, more irritated than before the minor injury. What if the same client just found out he won the lottery? In his rush to tell the world, he slams his toe—just as hard, at exactly the same spot—but he barely notices it; in fact, the injury doesn’t even slow him down on his way to the phone. A few days later, he notices a bruise and wonders where it came from.

The physiologic explanation of what happened to this client is the gate control theory of pain (Figure 3-2). Melzack and Wall suggested that there is a gating mechanism in the *spinal cord* that closes in response to normal stimulation of fast-conducting “touch” nerve fibers and then opens when slower-conducting, higher-volume, and high-intensity sensory signals of “pain” are received. The two scientists determined that signals of “pain” and “touch” could be intermittently sent and not sent to the brain, depending on input received by the spinal cord. In other words, *whatever is going on in the periphery of the body combined with whatever is going on in the brain itself will determine pain perception*. Figure 3-3 diagrams the gate control theory, using music and touch as examples.





**FIGURE 3-2** The gate control theory of pain. The brain has a gating mechanism that controls how many stimuli it can receive.



**FIGURE 3-3** The massage therapist can use the brain's gating mechanism to reduce her client's pain perception.

The scientific world quickly accepted this theory because it explains many previously misunderstood concepts of the emotional, psychological, and cultural components of pain. The application of this knowledge for the practicing massage therapist is profound: *She can directly alter her client's perception of pain.*

When the client is experiencing pain and that pain is the only message going to his brain, the therapist has the opportunity to “block” his pain perception by adding “touch” signals to the “pain” signals in his nervous system. The touch signals in the therapist’s toolkit—heat, rocking, deep work, effleurage, petrissage, vibration, music, candles—are literally sending so many messages to the client’s brain that he (according to the gate control theory) has to block *something* out, and some of what gets blocked out is his *perception of the physical pain.*

## SLAYING THE DRAGON

An ancient concept of Japanese warfare is a metaphor for effectively treating a painful site. If there is a dragon across the field and a warrior wants to slay it, if she yells loudly and runs straight for the dragon, she will probably not meet with great success in her attempts to slay the dragon. If, however, she is contemplative, careful, strategic, and perhaps sneaks up to the side or behind the dragon, she has a better chance of victory. So it is with treating pain in the body.

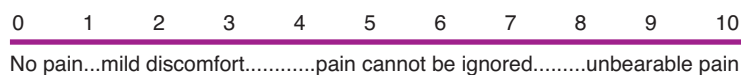
If a hasty therapist begins her treatment by digging into the client’s exact point of pain, the client will wince and *pull away*. But if she starts farther away from the point of pain—even going to the extent of relaxing the client by massaging the hands first—the body relaxes and the local pain is much more receptive to treatment. The body, in all of its wisdom, does not take a liking to being invaded. Slaying the dragon is an easy concept of pain treatment that simply means: *When a localized area of pain is identified, start somewhere else; don’t treat the immediate point of pain first.* Simple dragon-slaying examples include:

- Massaging the shoulders for 5 minutes before treating a tension headache
- Working on the gluteus maximus before approaching lumbar spine area pain
- Softening and warming the superior trapezius before working on burning pain in the rhomboids

These techniques are respectful and dignified approaches to treating the body with care and compassion.

## THE PAIN SCALE

Therapists need a measuring tool to indicate the level of the client’s initial pain and the point when that pain has decreased. Used by nurses, physical therapists, chiropractors, physiatrists, and many other medical professionals, the 0–10 pain scale is commonly applied in massage therapy as an effective method of assessing before- and after-treatment myofascial pain (Figure 3-4). The patient is asked to verbally indicate his level of pain, with 0 representing no pain at all and 10 indicating the worst pain imaginable. The therapist then documents the patient’s pain on a SOAP chart (see Chapter 1) at the beginning of the treatment (under subjective) and after the treatment (under assessment). Periodic questioning of the regional severity of the pain by the therapist, and accurate reporting of the client’s responses, will, over time, give a clear picture of whether the therapy is effective.



**FIGURE 3-4** The pain scale is a simple tool to determine the location, presence, and decrease of pain.



### Massage Therapist Tip

#### Adapting the Pain Scale for Children or Non-English-Speaking Clients

Not all of your clients will understand your questions about their pain “on a scale of 0–10.” Children, stroke patients, and clients who don’t understand or speak English will find it difficult to communicate about pain unless you simplify the measuring tool. Many hospitals use a “smiley to frowney face” chart that they create on a card or piece of paper for these patients (Figure 3-5). The “no hurt” face corresponds to 0 and the “hurts worst” face corresponds to 10. Through body language and facial expressions indicating pain, show your client the chart and draw a line with your finger from the happiest face to the saddest face. Point from the card to your client and then back again with a questioning look on your face. Most clients will understand and point to their “level of pain” on the card. You can then have a reasonably accurate method of determining pain increase or decrease, which you then document.



**FIGURE 3-5** The Wong-Baker FACES™ Pain Rating Scale is one way of measuring pain in children and adults with communication challenges. Copyright 1983 by the Wong-Baker FACES™ Foundation, [www.WongBakerFACES.org](http://www.WongBakerFACES.org). Used with permission.

Here are two examples of effective charting using the 0–10 pain scale:

- Client states pain is at a 5 on a scale of 0–10, and he points to the left lumbar spine region.
- Patient states pain is at an 8 on a scale of 0–10, indicates that the pain is shooting down his hamstrings and into the bottom of the foot.

### Chronic and Acute Pain

Massage therapists treat chronic pain. A client does not stop off at the massage therapist's office after a car accident; therapists are not first responders. Chronic pain treatment is well within the massage therapist's scope of practice, yet defining "chronic" is often a challenge. Many massage schools and medical theories attempt to place a timeline on when pain is considered "chronic" and when it is "acute." For the purposes of this book, the common medical definition of the terms will be our reference point.

Chronic pain is an unpleasant sensation or discomfort that lasts over a long period (such as 3 or 6 months) and often does not have one easily defined cause. Examples of chronic pain are arthritis, trigger points, tension headaches, and diabetic neuropathy. Acute pain has a sudden onset and often is associated with a specific medical event. Examples of acute pain include the pain associated with appendicitis, labor pains, and a fall or accident.

The therapist must remember, however, that it is not up to her to determine whether pain is chronic or acute. The client or the physician will describe or label the chronic or acute nature of the pain.

### EMOTIONS AND PAIN PERCEPTION: THE TERRIBLE TRIAD

Volumes have been written about the effect of emotions and cultural inclinations on the perception of pain. Overall health, mood, self-esteem, attitude, and feelings of being loved all affect an individual's perception of physical and emotional pain.

Scientists have studied the effects of chronic pain on more than the body and have identified that irritability and depression often accompany chronic pain. This cycle can lead to a state called the "terrible triad" of suffering, sleeplessness, and sadness. In her role as a health care professional, the massage therapist has an obligation to understand that she is treating many levels of the client's pain, and she must use all her available tools to attend to the client's mind, spirit, and body.

## Why a Horse's Pain is Different than Ours

While staying at a friend's horse farm, I once witnessed a dramatic example of how the human emotional response to pain adds significantly to our perception of that pain and how deeply we suffer. Walking with my friend early in the morning on our way to feed the horses, we noticed that one of the stall doors had been kicked open and a horse had escaped during the night. Looking out in the field, we saw the escapee standing very still next to a large fencepost. Upon approaching the horse, we noticed that about a 12-inch flank of flesh had been peeled back and was bleeding badly. My friend surmised that the horse had, in the dark, run into a fencepost and cut himself open. As I watched her assess the damage and determine that she had better call the vet, I marveled at how the horse just stood there. I don't know what I expected him to be doing, hopping up and down or making some sort of fuss perhaps, because I knew he had to be in pain. But he just stood there, blinking and allowing my friend to probe the wound.

When I mentioned how amazed I was that the horse didn't seem to be in very much pain, her response opened a whole new world of understanding about pain and suffering. "He's in a lot of pain," she said. "He just doesn't have an emotional reaction to the pain the way we humans do." Her simple explanation helped me to understand how our emotions determine not only our perception of the pain but also the level to which we choose to suffer.

## IN SUMMARY

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Most common medical problems are accompanied by some level of soft tissue pain. A massage therapist who understands both the physiology of pain and the effects of basic massage techniques can effectively become a part of the client's solution. Helping to effectively reduce pain includes:

- Assessing the client's stage in the pain-spasm-pain cycle
- Understanding the emotional, cultural, and psychological components of pain
- Determining the wise use of mechanisms to block pain signals to the brain
- Utilizing the appropriate massage therapy techniques at the appropriate time

The next chapter discusses medications your clients might be taking, and how these substances affect both your treatment and your client's response.

## Review

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1. Explain the pain-spasm-pain cycle and its relevance to the massage therapist.
2. What is ischemia?
3. What is fibrosis?
4. Explain the gate control theory of pain and its relevance to the massage therapist.
5. Explain the concept of slaying the dragon; offer two examples the therapist might use during a massage session.

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