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PART

I

Foundations of Clinical Massage Therapy

CHAPTER

1

"Is there not such a thing as a diffused bodily pain, extending, radiating out into other parts, which, however, it leaves, to vanish altogether, if the practitioner lays his finger on the precise spot from which it springs? And yet, until that moment, its extension made it seem to us so vague and sinister that, powerless to explain or even to locate it, we imagined that there was no possibility of its being healed."

Marcel Proust, The Remembrance of Things Past
(The Guermantes Way, *1920)*

Approaching Clinical Massage Therapy

A young girl has pain that does not go away. Her mother has heard from a friend that there is a healer not far away who can get rid of such pain. One day the mother takes the girl to see this healer. The healer asks a few questions; then, rather than giving her something to swallow, the healer places skilled hands on her and presses and rubs in various places. When the healer is finished, the girl's pain is diminished. The mother pays the healer and they leave. A day or two later, the pain is completely gone.

These events may very well have taken place in China in 1000 BCE. They could have occurred in India at least as early as the 3rd century BCE. The healer in question could have been Herodicus or his pupil, Hippocrates, in 5th-century (BCE) Greece, or Asclepiades, who brought the practice to Rome in the 1st century BCE. And the story can

often be told today, thanks to the rediscovery and development of **clinical massage therapy,** the use of manual manipulation of the soft tissues to relieve specific complaints of pain and dysfunction.

The practice of massage therapy lay dormant in the Western world from the decline of Rome until the 18th century, when the Enlightenment fostered renewed interest in exploring the frontiers of medical knowledge. In the early 19th century, Per Henrik Ling developed a system of medical exercises and massage that his followers disseminated throughout the western world in subsequent years. This system profoundly influenced the birth and development of physical therapy, and the massage elements of his system became what is known today as **Swedish massage.** This type of massage has been continuously practiced in health clubs and spas over the past century, but was largely considered a luxury available only to the wealthy, and was not generally viewed as a health-related procedure until the gradual resurgence of massage therapy over the last 30 to 40 years.

In conjunction with massage therapy, the term ***bodywork*** has come into common use. This term arose from two principal sources: first, the psychiatrist Wilhelm Reich, originally a disciple of Freud, postulated the expression of the personality through body structure and formulated an approach to the simultaneous treatment of the body and the emotions. His work has been carried on by Alexander Lowen in the system called bioenergetics. Other practitioners, such as Ron Kurtz, have continued to work along similar lines.

Second, Ida Rolf developed a system that she called structural integration, but which has come to be called **Rolfing™** in her honor. Her approach emphasizes the restructuring of the fascia. When we join the terms "massage" and "bodywork," as in the name of the **National Certification Board for Therapeutic Massage and Bodywork,** we reflect the fact that these two streams are in the process of merging, and many therapists consider themselves the heirs and practitioners of both traditions.

Two other approaches to health care in the last two centuries have also made significant contributions to the formation of clinical massage therapy and bodywork. Osteopathy (see further in the chapter) developed as a medical field that sought to relieve health problems through the manipulation of both joints and soft tissues, and many osteopathic practices have found their way into clinical massage therapy with the help of such osteopaths as Leon Chaitow. In medicine, the late Janet G. Travell, MD, and David G. Simons, MD, have explored the phenomenon of referred pain from **trigger points,** tender points in soft tissue that radiate or refer pain to distant areas.

Thus, at a time when many people are looking beyond the traditional medical offerings of pharmacological and surgical intervention, the confluence of these multiple influences has produced the field of clinical massage therapy, which is both one of the oldest and one of the newest health professions.

THE PLACE OF CLINICAL MASSAGE THERAPY IN HEALTH CARE

Because of the complexity of the human organism, a variety of approaches to the manual treatment of the soft tissues have evolved. Other health disciplines take the following approaches to pain and dysfunction:

- ***Traditional western medicine*** employs three principal means of treatment: pharmacology, surgery, and referral to an allied therapeutic specialties practitioner. One of the problems with the traditional medical approach to muscular problems is that no medical specialty focuses primarily on muscles. Aside from the primary care physician (family practitioner, pediatrician, internist, gynecologist, etc.), a patient with soft-tissue pain or dysfunction is likely to see a neurologist or neurosurgeon (specializing in the nervous system), an orthopedist (specializing in bones), or a rheumatologist (specializing in joints). Depending on the particulars of the case, such a patient is most likely to receive either surgery, drugs, or a referral to a physical therapist.
- ***Osteopathy*** began as an approach to health that focused on the manipulation of bones and joints, but has since moved in the direction of classical Western medicine. It tends to be heavily represented in certain areas of this country (British osteopathy is significantly different in education and practice from American osteopathy). Certain representatives of osteopathy, such as Leon Chaitow and Philip Greenman, have maintained the tradition of examining and treating pain problems through joint manipulation, and they have had a profound effect on recent developments in clinical massage therapy.
- ***Chiropractic*** focuses on treatment of the joints, particularly those of the vertebrae. These prac-

titioners attribute pain and other health problems to misalignments (subluxations) of the vertebral joints that impinge on nerve roots.

- ***Physical therapy*** uses physical exercise and movement as a means of restoring healthy function to muscles and joints. Although today physical therapists take advantage of many technological advances, such as hydrotherapy, ultrasound, and electrical stimulation of muscles, their emphasis remains on exercise and movement. Also, physical therapists tend to focus on more severe conditions, such as rehabilitation following surgery, serious injury, or congenital deformities.
- The remaining approach is ***direct manipulation of the soft tissues.*** This approach is the special territory of the clinical massage therapist and is what this book is about.

THE PRINCIPLES OF CLINICAL MASSAGE THERAPY

Clinical massage therapists operate according to certain assumptions that are so self-evident that they might be considered axioms of the field.

1. ***The individual is a whole organism: everything is connected and related.*** Complex systems are more than the mere sum of their parts; that is, it is essential to see the forest and the trees. Although this book is necessarily reductionist to some degree—we cannot understand the whole without a knowledge of the parts, and they must be examined in a linear way—the therapist should remember that the part must also be seen in the context of the whole. For example, a client with a sprained ankle will favor the injured leg, causing muscles in the hip and low back to tighten. The resulting imbalance in the back can affect the neck muscles, causing a headache. Treating the neck muscles alone will not solve the problem.
2. ***Shortened muscle tissue can do no work.*** Muscle tissue does its work by contracting and, therefore, can do no further work if shortened. What we are concerned with as therapists is persistently or pathologically shortened tissue; in other words, tissue that has shortened, in all likelihood for defensive reasons, is unable to work, and resists lengthening.

   A muscle may be shortened actively or passively. Examples of chronic passive shortening are the shortening of biceps brachii when the arm is kept in a sling for a period of healing, and the flexed position of the iliopsoas muscles (hip flexors) in a baby who is not yet standing and walking. Postural misalignment always involves habitual passive shortening of many postural muscles.

   Active shortening, on the other hand, is muscular contraction, and may be either the intentional contraction that is the work of the muscle, or defensive contraction representing the muscle's response to a threat such as overload, repetitive motion, or excessive stretch. When a portion of muscle tissue is contracted in this way, it cannot contract further, and is unavailable to do the work of the muscle.
3. ***The soft tissues of the body respond to touch.*** There are many theories as to why this is so. One of the most persuasive is that myofascial pain is caused by a self-perpetuating neuromuscular feedback circuit in which the stimulation of touch interferes, thus restoring normal function. Depending on the choice of technique, manual intervention in the dysfunctional tissues interrupts this feedback process, forcing some change in the neural response and, therefore, in the functioning of the affected tissue itself. The intervention may take the form of **ischemic compression, passive stretching, passive shortening,** or any simultaneous or sequential combination of these.

Clinical massage therapy, and therefore, this book, is based firmly on these three principles. The clinical massage therapist is one who approaches persistently shortened soft tissues and attempts to restore their natural, pain-free function through touch, while keeping the whole client in mind.

STRUCTURE AND FUNCTION OF MUSCLES

Although we treat muscles as distinct entities for anatomical convenience, we must remember that the neuromuscular system does not activate muscles in that way. The nervous system stimulates portions of contractile tissue to contract in patterns that will produce the desired effect, and this activation usually involves parts of several muscles acting in fine coordination. No action recruits all of a muscle, and no action recruits only one muscle. When we say, for example, that biceps brachii flexes the arm at the elbow, we are making a broad generalization. Depending on the po-

sition of the arm when we make the movement, certain portions of biceps brachii will be activated. In addition, portions of brachialis will also contract, as well as portions of certain muscles in the forearm. Portions of triceps brachii will be recruited to temper the movement and keep it smooth. As the movement occurs, there is a shift in weight, and parts of muscles throughout the torso and legs respond to maintain balance. Therefore, it is not so much individual muscles that do the work of the body as it is patterns of portions of muscle tissue. In order to gain an understanding of these broad patterns of muscular action over the whole body, we must first acquaint ourselves with the elemental parts of muscle tissue and how they work.

The Muscle Cell

The contractile filaments that perform the work of the muscle are called **myofilaments.** Two basic types of myofilaments perform the work of the muscle. One type is the thick **myosin** filament, the other is the thin **actin** filament. The myosin filament has molecular "heads" that extend to attractor sites on the adjacent actin filament and bend to bring about contraction. These myosin and actin filaments lie parallel to each other in an overlapping pattern that produces the characteristic striped (striated) appearance of skeletal muscle. Several of these myofilaments together form a **sarcomere,** which is considered the "unit" of contraction in a muscle cell.

A string of **sarcomeres** lined up in sequence form a **myofibril** (muscle thread) (Fig. 1-1). Surrounding and penetrating the myofibrils is a system of microscopic tubes called **transverse tubules** and the **sarcoplasmic reticulum.** These tubules carry the chemical trigger, calcium, necessary to initiate contraction at the molecular level. A muscle cell is composed of several myofibrils.

The expression **"muscle cell"** is equivalent to the expression **"muscle fiber."** The number of

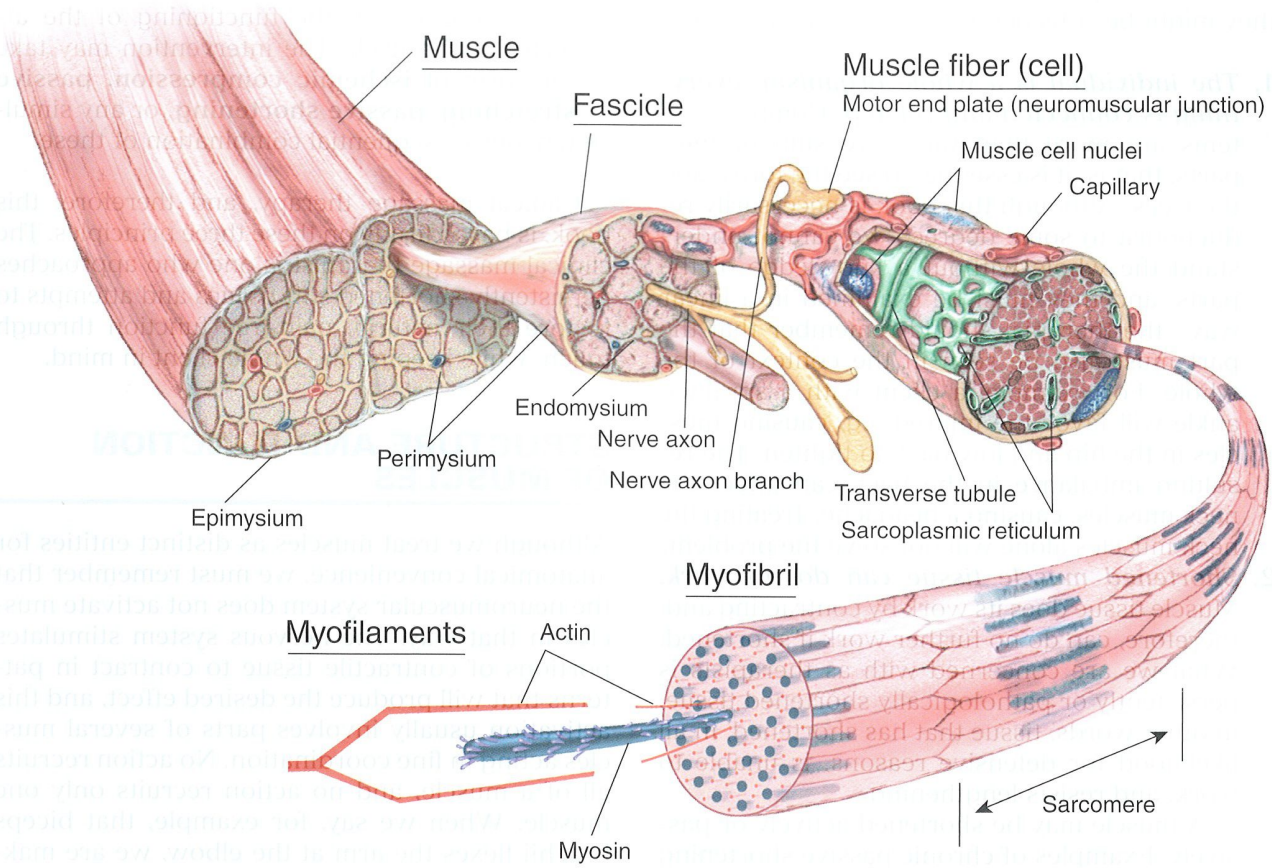

Figure 1-1 Muscle structure

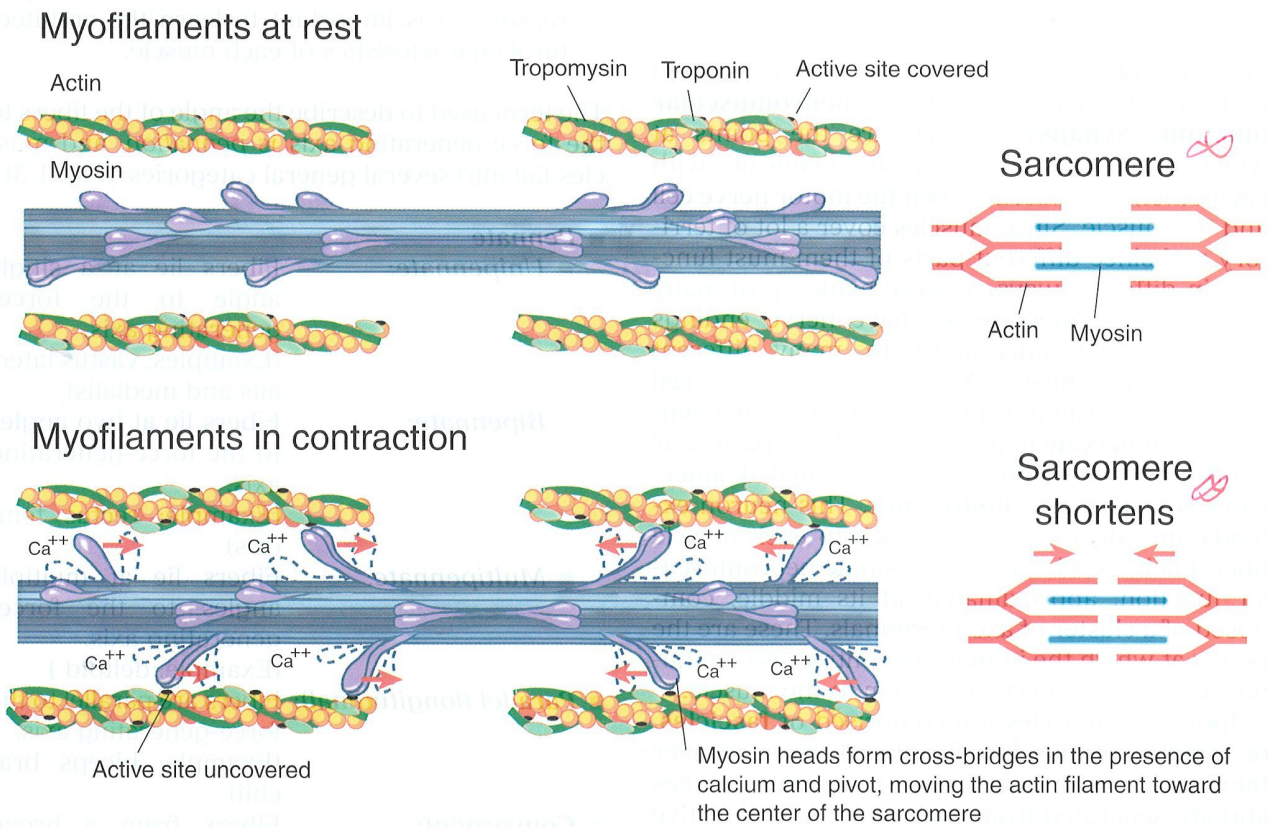

Figure 1-2 Crossbridge theory of muscle contraction

muscle cells in the body is believed to remain constant; when we strengthen muscles or increase their size and bulk, it is the contractile content, not the number, of the cells or fibers that is changed. Unlike most cells, muscle cells contain many nuclei scattered along the length of the cell. Multiple nuclei are necessary because muscle cells can be quite long, and their internal needs, which must be assessed and met by the nuclei, vary from one part of the cell to the next. Muscle cells are second only to nerve cells in length and can be over 11 inches long in some muscles.

The Cross-Bridge Theory

The most commonly accepted theory of muscle function is the cross-bridge theory. It attempts to explain the contractile action of muscle tissue—that is, how muscle tissue shortens when stimulated by a motor neuron.

When a nerve impulse excites the neuromuscular junction, calcium is released from the sarcoplasmic reticulum into the fluid surrounding the myofilaments. This causes a molecular response in which attractor sites on the actin filaments are exposed, attracting "heads" from the myosin filaments, which cross the gap between the filaments, attach themselves to their sites on the actin filaments and bend, propelling the actin filaments into a more deeply overlapped and interlocked position in relation to the myosin filaments. This shortens the sarcomere and, as all the sarcomeres in many muscle cells shorten, muscle contraction occurs (Fig. 1-2). Muscle tissue is capable of shortening by about 40% of its length.

When nerve stimulation ceases, the calcium is actively transported back into the transverse tubules, the myosin heads release and contraction stops. The muscle, however, cannot lengthen on its own. The contractile units (sarcomeres) must be stretched back to their starting position by an outside force, such as the pull of gravity or an opposing muscle, before it can again shorten in contraction.

If you imagine the myosin and actin filaments in fully overlapped position, then you can see how muscle tissue that is shortened in this way can do no further work.

The Neuromuscular Junction

The point of contact between the nervous system and the muscular system is the **neuromuscular junction. Synapses,** which are the points at which nerve cells communicate chemically with each other, also exist between the motor nerve cell and the muscle. Since muscles cover a lot of territory and since different parts of them must function in different ways, a nerve made up of many neurons can innervate, or have nerve endings (neuromuscular junctions) with, many different locations on a muscle. Although each muscle cell (fiber) is innervated by only one neuron, each neuron may innervate many muscle cells. A particular neuron and all of the muscle cells that it innervates is known as a **motor unit.** This neuron extends an individual axon branch to each muscle fiber. Each muscle fiber has a single neuromuscular junction, approximately at its middle, composed of a cluster of axon terminals. These are the points at which the impulse to contract is communicated from the nervous system to the muscle.

Individual muscles are comprised of **fascicles,** or bundles, of muscle cells (fibers). These smaller bundles are held together to form larger bundles and are separated from each other by connective tissue (deep fascia, myofascia).

The source of energy within muscle cells is called adenosine triphosphate (ATP), derived from the metabolism of glycogen (a form of glucose) stored in the muscle. When muscle tissue is excited by the nervous system, it **recruits** a number of motor units based on the strength of the excitation. If the excitation and, therefore, the contraction are sustained, then some motor units may experience **exhaustion;** that is, they deplete their supply of ATP. As this occurs, other motor units are recruited to relieve them. As the excitation increases, additional motor units are recruited.

Muscle Architecture

Muscle architecture is the arrangement of muscle fibers relative to the axis of force generation. It is one of the most important aspects of muscle anatomy for massage therapists for two reasons:

1. The arrangement of the muscle fibers determines the kinesiological function of the muscle or that particular part of the muscle.
2. The direction of the fibers in a particular section of a muscle will often determine the direction and type of the work to be done. For these reasons, it is important to learn the architectural characteristics of each muscle.

The term used to describe the angle of the fibers to the force-generating axis is *pennation,* and muscles fall into several general categories: (Fig. 1-3)

- *Pennate*
  - *Unipennate:* Fibers lie at a single angle to the force-generating axis. (Examples: vastus lateralis and medialis)
  - *Bipennate:* Fibers lie at two angles to the force-generating axis. (Example: rectus femoris)
  - *Multipennate:* Fibers lie at multiple angles to the force-generating axis. (Example: deltoid)
- *Parallel (longitudinal):* Fibers are parallel to the force-generating axis. (Example: biceps brachii)
- *Convergent:* Fibers from a broad attachment converge to a narrow attachment, forming a fan shape. (Example: pectoralis major)

TENDER POINTS, TRIGGER POINTS, RELEASE

In examining clients, you will find points on the body that are tender when pressed. Assuming there is no other explanation for the tenderness, such as bruising or other injury, these points are called **tender points.** In the treatment system called *strain-counterstrain,* or *positional release,* developed by the osteopath Lawrence Jones, these points occur in a systematic fashion. They are treated by placing the muscle indicated into a passively shortened position until it relaxes and the tender point dissipates.

A myofascial **trigger point** is a point found in a nodule in a taut band of skeletal muscle tissue that is extremely tender, and that refers or radiates pain in a characteristic pattern. Trigger points are produced by muscle stress, such as overwork, repetitive motion, or sudden excessive stretch. An

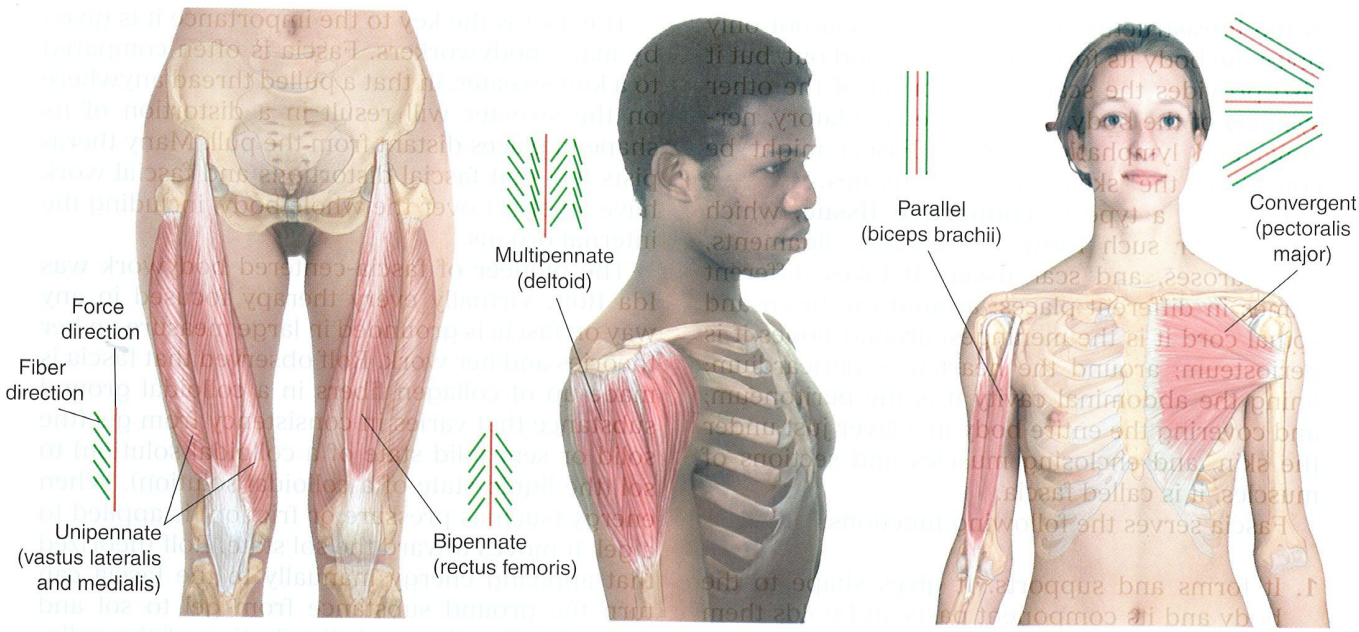

Figure 1-3 Muscle architecture

active trigger point is one that is spontaneously producing referred pain in the client; a **latent trigger point** is one that produces pain only when pressure is applied in palpation. A **primary trigger point** is one that is caused by muscle stress; a **satellite trigger point** is one that is produced secondarily by a primary trigger point.

The term **release** is commonly used by massage therapists to refer to the softening and lengthening of soft tissue in response to therapy. A trigger point is said to release when its nodule is felt to soften and it ceases referring pain. A muscle is said to release when it relaxes while a therapeutic maneuver is being performed. Fascia is said to release when the therapist feels it soften and lengthen. The therapist's sense of release in soft tissue is a subjectively experienced phenomenon that is difficult to describe; however, it is difficult to miss when you feel it, and it is a very gratifying feeling for therapist and client alike.

AGONISTS AND ANTAGONISTS

For virtually all skeletal muscle tissue, there is corresponding muscle tissue that pulls in the opposite direction. Although the actual relationships of such corresponding tissues is complex, we generally refer to muscle pairs as **agonists** and **antagonists**, the agonist being the muscle that is carrying out a motion in question and the antagonist being the muscle that opposes this action. A simple example is biceps brachii (a flexor) and triceps brachii (an extensor), which oppose each other by flexing and extending the arm at the elbow. Not only do these opposing forces produce opposing movements, but the two muscles work in a coordinated way to produce a smooth movement in both directions. When a muscle is contracting to flex a joint by shortening, that is **concentric contraction.** When a muscle functions as the antagonist and contracts to control the movement of a joint while lengthening, that is **eccentric contraction.** The antagonist must overcome its normal resistance to stretch in order for movement to take place. This inhibition of the stretch reflex in antagonists is **reciprocal inhibition.**

We need to be aware of this relationship between muscles because it is reflected in clinical problems. There is a balance in strength between agonists and antagonists under normal circumstances. When muscles are weakened, excessively strengthened, or injured, this balance is upset. When we find a problem of any kind in a muscle, we are very likely to find a problem in its antagonist.

FASCIA

Fascia is a Latin word meaning "band" or "bandage." It is the most pervasive type of tissue in the body: it's everywhere, like ivy on old buildings. It

is the infrastructure of the body. Fascia not only gives the body its form, both inside and out, but it also provides the scaffolding for all of the other systems of the body, such as the circulatory, nervous, and lymphatic systems. Fascia might be considered the "skeleton" of soft tissues.

Fascia is a type of **connective tissue**, which takes other such forms as tendons, ligaments, aponeuroses, and scar tissue. It takes different names in different places: around the brain and spinal cord it is the meninges; around bones it is periosteum; around the heart it is pericardium; lining the abdominal cavity it is the peritoneum; and covering the entire body in a layer just under the skin, and enclosing muscles and sections of muscles, it is called fascia.

Fascia serves the following functions:

1. It forms and supports. It gives shape to the body and its component parts and holds them in place.
2. It restricts. By providing firm boundaries, it increases muscle strength. Muscles from which fascia has been removed are significantly weaker.
3. It guides and molds. Damaged bone deprived of periosteum does not heal within appropriate boundaries.
4. It contains and compartmentalizes. Fascia contains and channels body fluids, helping to prevent the spread of infection.
5. It provides infrastructure for branching systems. It supports capillaries and vessels of the circulatory and lymphatic systems, as well as the ubiquitous branching of the nervous system.
6. It gives rise to new connective tissue. Fascia contains connective tissue cells (fibroblasts) which can specialize as needed to thicken connective tissue, help repair tendons and ligaments, and form scar tissue.

Ironically, the healing and restorative functions of fascia can also lead to problems. Enveloping tissues as a spider envelops its prey, fascia can form adhesions between structures that should remain free. It alters the internal structure of muscles with deposits of gristle (fibrosis) that produce pain and limit movement. Such tissue hardens and contracts with time, becoming increasingly refractory to corrective treatment.

One of the most important things to understand about fascia is that *all fascia throughout the body is continuous.*

This fact is the key to the importance it is given by many bodyworkers. Fascia is often compared to a knit sweater, in that a pulled thread anywhere on the sweater will result in a distortion of its shape in places distant from the pull. Many therapists feel that fascial distortions and fascial work have an effect over the whole body, including the internal organs.

The pioneer of fascia-centered bodywork was Ida Rolf. Virtually every therapy focused in any way on fascia is grounded in large measure on her theories and her work. Rolf observed that fascia is made up of collagen fibers in a colloidal ground substance that varies in consistency from gel (the solid or semisolid state of a colloidal solution) to sol (the liquid state of a colloidal solution). When energy (such as pressure or friction) is applied to a gel, it moves toward the sol state. Rolf theorized that applying energy manually to the fascia can turn the ground substance from gel to sol and make the direction and distribution of the collagen fibers more elastic and malleable. Since fascia is continuous throughout the body, the therapist can adjust the "body stocking" of the superficial fascia by releasing restrictions in the deep fascia and breaking up adhesions between fascial layers that restrict free movement of tissues against each other.

Anyone who has worn stockings, pantyhose, tights, or any other tight-fitting garment knows what it is like to have that garment become twisted out of its proper position; it's an unpleasant, nagging sort of feeling. Fascial therapists believe that the fascia, like a body stocking, can become misaligned through habitual body misalignment, and they attempt to loosen, stretch, and realign the superficial fascia manually by means of various techniques.

Superficial Fascia

The superficial fascia is also called the hypodermis, tela subcutanea, subcutis, or stratum subcutaneum. It is located directly under the skin and contains fat, fascicles of muscle tissue, cutaneous blood vessels and nerves, and about half of the fat in the body.

The orientation of the fibers of the connective tissue (collagen) fibers of the dermis follows lines called Langer's lines, or cleavage lines, the direction of which varies from one body area to another (Fig. 1-4). The fibers in a particular region are aligned against the predominant forces expe-

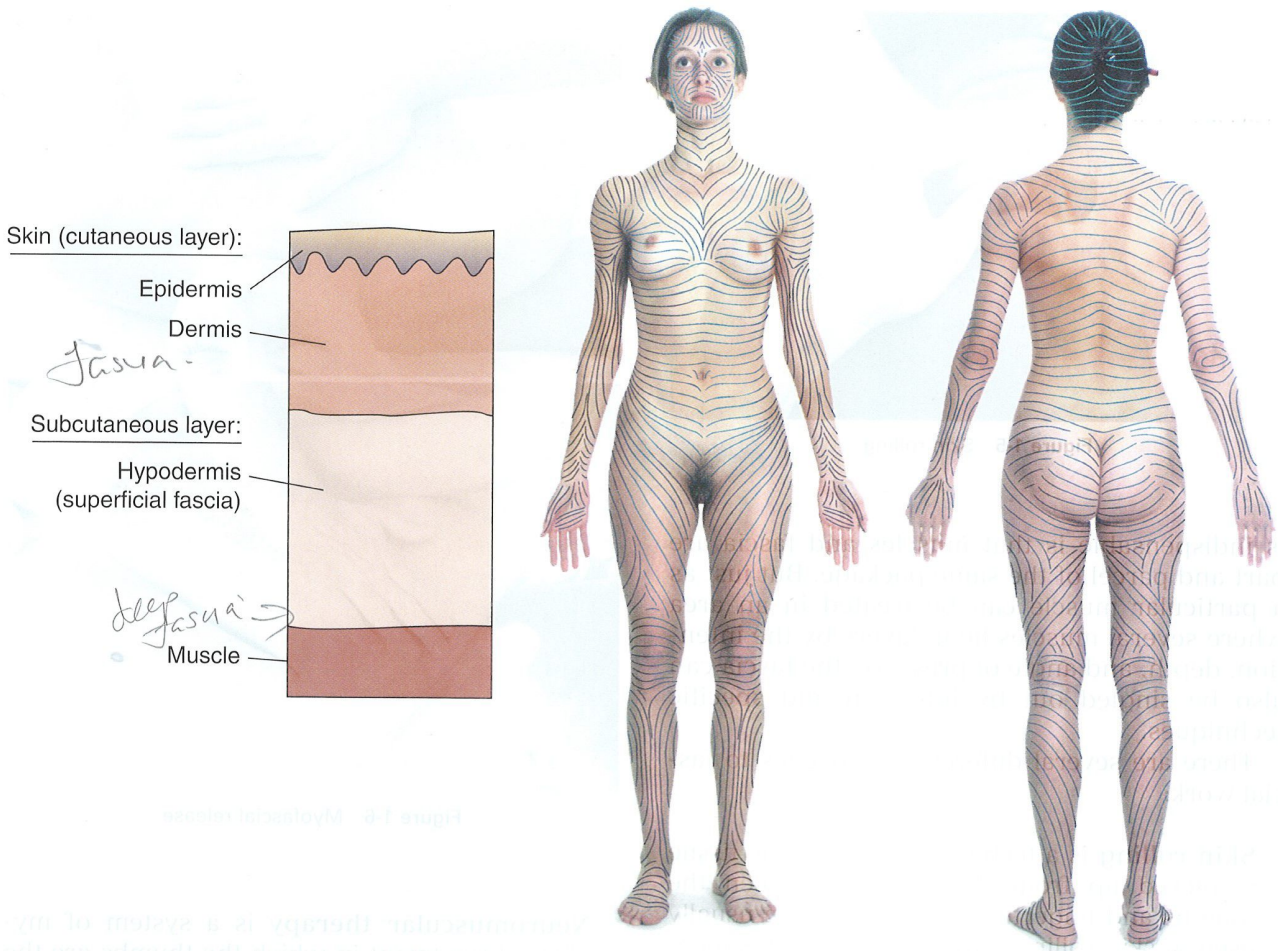

Figure 1-4 Langer's lines

rienced by the tissues in that area of the body. Surgeons often follow these lines in making incisions in order to minimize scarring.

Deep Fascia

The deep fascia is all of the fascia that is deep to the superficial fascia, with which it is continuous. For our purposes, deep fascia includes the fascia covering a group of muscles (*investing fascia*), the fascia surrounding the muscles (epimysium), the fascia surrounding the fascicles within the muscle (perimysium), and the fascia surrounding the individual muscle fibers (endomysium) (Fig. 1-1). Each of these layers of deep fascia gives rise to the next deeper layer. Although one of the roles of deep fascia is to restrict the outward (lateral) force of the muscle in contraction to direct and increase contractile force, excessive restriction or limited elasticity is counterproductive.

Also, as described above, fascial surfaces can develop adhesions that prevent muscles from sliding smoothly against each other in movement. These adhesions must be broken up to restore smooth and pain-free movement.

Types of Fascial Treatment

Extensive treatment of fascia is beyond the scope of this book, but students need to be thoroughly familiar with fascia and its relationship to muscles and remain aware of the importance accorded to fascia by many treatment modalities.

In treating muscles, you are treating fascia: to try to deal with muscle and fascia separately is like trying to deal with a bubble separately from the air inside it. The reason the term *myofascial*

Figure 1-5 Skin rolling

is indispensable is that muscles and fascia are part and parcel of the same package. But just as a particular muscle can be treated in an area where several muscles lie in layers by the intention, depth, and angle of pressure, the fascia can also be singled out by intention and specific techniques.

There are several different approaches to fascial work:

- **Skin rolling** is a technique in which the tissue is picked up from the surface between the thumbs and fingertips. Both hands are usually used in skin rolling. The purposes of this technique are to increase flexibility in the superficial fascia and to treat tender points in the fascial layers (Fig. 1-5).
- **Myofascial release** is a system involving a gentle stretching process, often using two hands to engage and stretch the fascia and move with it according to its inclinations, as sensed by the hands (Fig. 1-6).

Directive fascial approaches (Fig. 1-7) include the following:

- **Bindegewebsmassage** (German, *connective tissue massage*) is a directive technique developed by Elisabeth Dicke.
- **Rolfing™, Hellerwork™,** and **CORE™ Myofascial Therapy** are other directive approaches to the reorientation of the fascia. The latter makes a point of working along Langer's lines, while the former two do not. These descriptions are oversimplifications; therapists interested in learning more about these modalities will need to study them in greater detail.

Figure 1-6 Myofascial release

- **Neuromuscular therapy** is a system of myofascial treatment in which the thumbs are the primary instruments used to engage and release the fascia (Fig. 1-8). There are two chief schools of neuromuscular therapy, the British (Leon Chaitow) and the American (Paul St. John, Judith Walker Delaney).

Figure 1-7 Directive fascial work

Figure 1-8 Neuromuscular therapy

Treating the Fascia

Fascial work is often a very helpful precursor to specific muscle treatment, as it warms and stimulates the tissue, and gives the muscle more freedom to expand into its fascial sheath. In the ensuing chapters on treatment, we will recommend and describe specific fascial treatments for the torso where we feel it is especially important. However, the principles of fascial treatment are easily transferred to other areas such as the limbs, and its application is helpful over the entire body.

Palpation of the fascia is a skill that can be learned only by experience. Place your hand lightly on any broad surface of skin, and take a few moments to become aware of the skin. Then allow your pressure to increase slightly, and become aware of the superficial fascia underneath the skin. Gently move the skin and fascia back and forth with your hand, becoming familiar with the feeling of moving both layers. Now allow your pressure to increase even more, sinking more deeply into the tissue, and become aware of the fascia as a sheath covering the muscle tissue. Whenever you do fascial work, take the time to engage the fascia in this way. Once you have familiarized yourself with the sensation of touching the different layers, follow the instructions for fascial work on the torso given in Chapter 4.

BODY MECHANICS

Before addressing specific treatment techniques, we must first consider the demands of the therapist's body and the safest and most effective ways to use it.

Body mechanics is the key not only to safeguarding your own body integrity but also to the performance of effective therapy. It consists entirely of the use of common sense with regard to the placement and movement of weight in relation to gravity. Clients will often ask, "Don't you get tired?" or, "Don't your hands hurt?" If you have mastered good body mechanics, the answer will be no.

Just as massage therapy should take a holistic view of the client, the therapist must think of body mechanics in a holistic way. You do not work only with your thumb, your fingers, your hands, or even your body—you work with your whole self. Your approach to body mechanics, even though there are elements of it that focus on a small area, must take your whole person into consideration, from your emotional attitude to the position of your thumb joints.

Weight and gravity are the foremost mechanical considerations in body mechanics. We take gravity so much for granted that we seldom give it much thought, leaving our relationship to it in the hands of unconscious behavior patterns established early in life as we were learning to walk. But some activities require a conscious awareness of gravity. Dancers, for example, must relearn their relationship to gravity. So should massage therapists, because our work is largely based on the application of pressure, which is best accomplished through the application of our body weight. Therefore, the first principle of body mechanics is:

Use your body weight, rather than muscle force, to apply pressure.

Using your body weight requires less work. Using muscle strength to apply pressure in massage therapy quickly tires the therapist, particularly the local muscles used for the purpose. In addition, the use of weight applies a smoother pressure, lacking in tension, than the use of mus-

cle force. When muscles sustain a contraction over even short periods of time, the process of recruitment and exhaustion at the tissue level results in an uneven pressure, which communicates a sense of tension to the client. To experience this difference, let someone apply pressure to the same part of your body, using the same point of compression (palm, thumb, knuckles, or whatever) with muscle force and then with body weight. Observe the difference in sensation of the pressure.

You do, of course, use your muscles to stabilize your joints. One of the chief functions of muscles in the body is to stabilize joints, and when using your body weight to apply pressure in therapy, this stabilization becomes a key element in the overall process. Therefore,

Keep the joints through which your weight passes relatively straight (but not locked) and avoid hyperextension of your joints (Fig. 1-9).

If you apply weight through locked joints, then the effect is one of total rigidity, like a solid rod. Although the pressure itself should come from the body weight, the joints should retain the "softness" supplied by muscle stabilization rather than being mechanically locked into place.

Hyperextension of joints stresses both the joint itself and the soft tissues that support and stabilize the joint. Use of muscle force in flexing the joint stresses the muscle themselves and communicates tension, as mentioned above. For example, it is known that carpal tunnel syndrome can be caused by repetitive hyperextension of the wrist, but in all likelihood the actual causal factor is the resulting stress on the soft tissues that control and stabilize wrist and finger movement. To avoid the tissue stress and muscle tension of both flexion and hyperextension,

Let your weight pass through as many joints, in a relatively straight line, as feasible.

The weight that applies the pressure should be as much in line with the joints as possible. The weight that is applied to the client's body is the weight of the therapist's torso, while the point applying pressure is usually some part of the hand or forearm. By lining up the joints between the torso and the point of pressure, you maximize both the stability and the "softness" of the pressure. Since the shoulder joint is the primary joint for transmitting weight from the torso to the arm and hand,

Keep your scapula (glenohumeral joint) rotated downward.

If the glenohumeral joint is rotated upward, the weight of the torso has to be communicated to the arm indirectly by pulling downward at the joint. If it is rotated downward, the torso is above and behind the joint, and communicates the weight directly through the joints.

Support the body part applying the pressure whenever feasible (Figs. 1-10 and 1-11).

Supporting the thumb or fingertips of one hand with the other has two effects. First, it increases po-

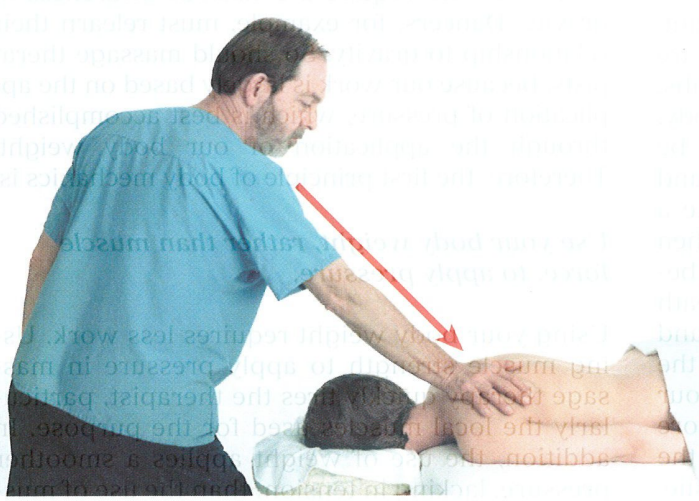

Figure 1-9 Avoid hyperextension of joints

Figure 1-10 Supported pressure

tential pressure, and second, it stabilizes the joints involved to protect the hands from tissue strain.

Whether using muscles for force, stabilization, or movement, use larger, stronger ones rather than smaller, weaker ones.

For example:

Control your center of gravity with your legs; let movement come from your center of gravity and your legs rather than your arms (Fig. 1-12).

The use of the legs to control the placement and movement of one's weight raises an important question: *Should the legs always be placed in balance under the center of gravity, or may the center of gravity fall between the legs of the therapist and the body of the client?* That is, is it permissible to work off-balance and allow the client's body to support the weight of the torso? Opinions of qualified therapists vary a great deal on this issue.

It is often helpful to allow the weight of the torso to be supported by the client's body, and it suggests itself intuitively. The biggest danger, of course, lies in the possible loss of balance (Fig. 1-13). This danger is probably greatest when the therapist is still inexperienced and has not yet learned either the subtleties of body mechanics or the qualities of skin (texture, moisture, etc.) that affect the ability to work safely in this way.

Figure 1-11 Supporting the thumb with the hand

Figure 1-12 Let movement come from your center of gravity and your legs rather than your arms.

Sometimes it is advantageous to work from underneath the client's body, using the client's, rather than the therapist's, weight to apply pressure. This positioning is often an effective way to work, but it must be applied carefully, as its body mechanics is more challenging.

For example, when working from underneath the neck of a supine client, you should be careful not to hyperextend the thumb. When working from underneath on the abdomen or pelvis of a prone client, the same care should be taken with the fingers. Since more muscles are used in these positions to apply force, and smaller muscles are used to stabilize joints, such work should not be done over an extended period. Also, you will need to be even more conscious than usual of feelings of pain or fatigue in your hands.

Sometimes it is advantageous to let your weight generate force through a part of your body other than your shoulder. For example, you can nestle your elbow in your own iliac fossa (just inside your anterior pelvis) and lean into it to transmit force when working on a lateral area on the client's body (Fig. 1-14).

Move into, and out of, pressure slowly.

Slow movement is gentler and less jarring both to the client's tissues (and your own) and to the client's consciousness. Moving slowly into and out of pressure also enables you to monitor the feedback of both your own and the client's body. If your work is not to be purely mechanical, then it is vital that you focus on the tissues you are working with, and take time to exert and release pressure on them. In addition, sensitive tissues (especially the muscles of the lumbar region) are often subject to rebound tenderness. The sudden release of pressure can be painful.

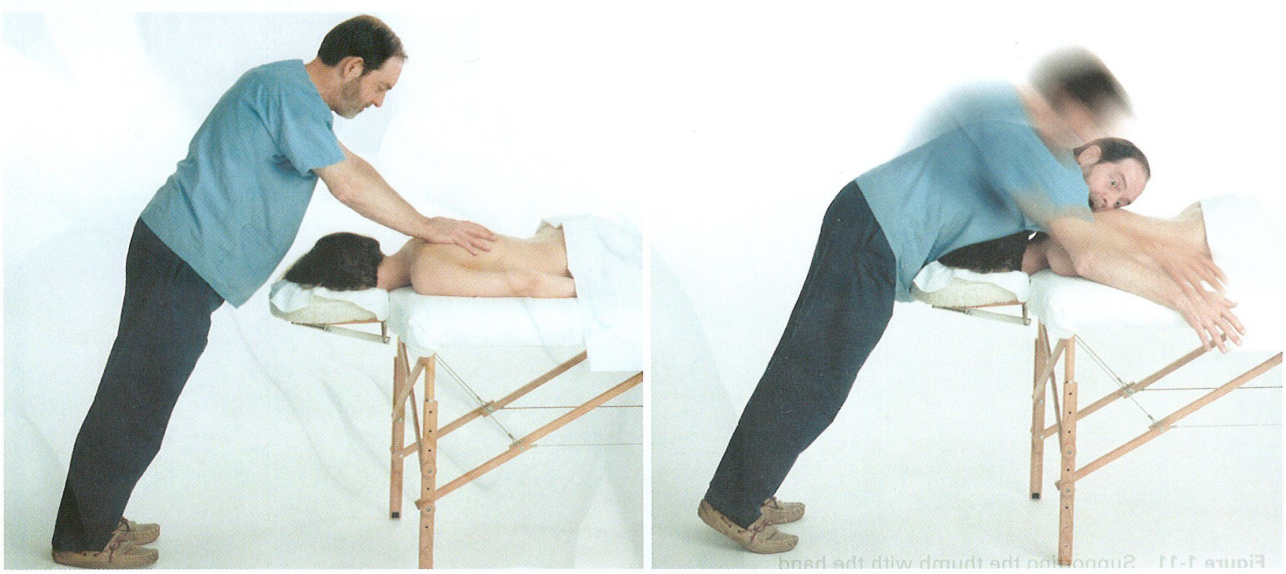

Figure 1-13 Don't lose your balance

Figure 1-14 Transmitting weight through the pelvis

Finally, pay attention to your body. Get to know your own body, and use the mechanics of your own body.

It is important to get to know your body, its strengths and weaknesses, and its weight distribution. If you've ever watched a baseball game on television, then you've probably heard the announcers comment on the peculiarity of a batter's stance. Every baseball player has to find the batting stance that gives him the greatest control and hitting power. The stance varies from player to player, and your own application of body mechanics in therapy will be somewhat different from anyone else's, although the same general principles apply.

Although it may seem peripheral to body mechanics proper, one final point that needs to mentioned here is the use of the secondary hand.

Use your secondary hand mindfully, not casually.

When one is not performing a two-handed stroke or using one hand to support the other, one hand is used to apply pressure or otherwise manipulate tissue. This hand is called the primary hand. Deciding what to do with the secondary hand is important and should not be made in a casual and unconscious way.

The secondary hand is often referred to by shiatsu practitioners as the "mother hand," which is an apt way of thinking of it. If the hand is not used actively to perform some specific function, it can be used to nurture the client. Even then, be careful and conscious of where the hand is placed. Remember to place each hand carefully and consciously before beginning to work.

VARIETIES OF SOFT-TISSUE MANIPULATION

Remember the third basic premise of clinical massage therapy: *the soft tissues of the body respond to touch.* The touch may be extremely gentle or quite forceful, it may be moving or still, but touch, for reasons not yet understood, elicits a response from the soft tissues. If the touch is artfully applied, then the response can be one of healing.

The classical strokes used in Swedish, or relaxation, massage, are quite effective in inducing a generalized relaxation response from the soft tissues and, thus, in the whole person. But the treatment of specific complaints of myofascial pain and dysfunction require a more specific approach.

Clinical massage therapy requires a thorough knowledge of the anatomy and physiology of the soft tissues and the bones and joints they serve. In addition, knowledge of anatomy and physiology will enable therapists to avoid causing injury or gratuitous pain and to recognize contraindications to the work. Therapists must also be thoroughly familiar with the varieties of approaches to the manipulation of the soft tissues. In the end, however, therapists will range from poor to brilliant according to their mastery of the *art* of clinical massage therapy, which is an indefinable combination of intelligence and intuition. This *art* cannot be forced; it comes with a sense of love and devotion to the work and the desire to do it well, and with time and practice, like learning to speak a foreign language, or sing a song, or to dance or swim or play tennis. It arrives when your therapy becomes more than the sum of its mechanical parts.

The purpose of this book is not to set forth a series of treatments of various muscles in a mechani-

cal fashion, as one might write a manual for small engine repair. Its purpose is to help the student investigate the possibilities for manipulation of each muscle and to explore the responses to such work. Just as each singer must discover, through practice, the optimum control of her own vocal chords, clinical massage therapists must continue to explore touching in a variety of ways, constantly evaluating the results of the touch by feeling and observation and feedback from the client—and not just during the "student" period, but throughout their careers.

The purpose of this section is to introduce you to some of the basic ways in which the soft tissues can be touched and manipulated for therapeutic benefit. The approaches and techniques in this section can be applied to a variety of muscles over the whole body. They will be referred to throughout the book as we deal with each specific muscle or muscle group. These techniques are by no means a comprehensive list of possible approaches to tissue manipulation. They are only the most basic techniques. Therapists will expand their repertoire as they study and gain experience.

The intention of the techniques used in clinical massage therapy is to eliminate pain and/or dysfunction in the tissue by inducing persistently contracted tissue to lengthen. The principal difference between the classic strokes used in Swedish massage and the tissue manipulations used in clinical massage therapy is that the former tend to be broader and more general, the latter to be more concentrated and specific.

The Art of Direct Tissue Manipulation: The "Tissue Dialogue"

The key to the art of tissue manipulation is sensitive palpation. Palpation should always be performed initially with the tips of the fingers or thumbs before compressive treatment is begun. One must palpate for the point of resistance in the tissue, then meet it with pressure. Sometimes the resistance will yield only to firm pressure, sometimes to delicate pressure. *The therapist must gauge the willingness of the tissue to respond and adjust the pressure accordingly.* This mindful sensitivity to the tissue might aptly be called the "tissue dialogue," because the therapist, through palpation, negotiates with the tissue the pressure needed to accomplish release. This "dialogue" is the essence of the art of direct tissue manipulation.

All of these manipulative techniques can be used for both *still compression* and *gliding compression;* in fact, you should find yourself alternating between the two: moving through the tissue, and stopping where the condition of the tissue calls for it.

The Tools of the Therapist's Body

Depending on the area and the purpose, different body parts of the therapist can be used to manipulate tissue:

The Heel of the Hand

The heel of the hand, or thenar and hypothenar eminences, can be used to apply a fairly broad compression. It is especially useful when used on larger muscles, such as leg muscles, gluteals, shoulders, or paraspinal muscles. It is also useful over large bony areas, such as the iliac crest. Set in motion, the heel of the hand compresses a relatively wide swath of tissue (Fig. 1-15).

When using the heel of the hand, avoid hyperextension of your wrist. Feel the tissue as you compress it, and be sensitive to tight, hardened areas. Use this information to determine whether another, more localized, stroke should be applied in certain areas.

The Fist

Another way to apply broad compression is with the closed fist. A particular advantage is the ability to shift between broad compression applied with the full length of the proximal phalanges (the bones of the fingers), and more focused compression with the knuckles (the proximal interphalangeal joints). Again, avoid hyperextension of the wrist. Go slower over hypercontracted areas and negotiate depth of pressure and speed of motion with the tissue.

The Knuckle(s)

The proximal interphalangeal joints, or knuckles, of the index and middle fingers can also be used for compression. Knuckles are helpful as an alternative to fingertips to avoid constant strain to the fingers and thumbs. Because the knuckles present a harder and less sensitive compressive surface than the fingertips, the tissue should first be palpated with the fingers before using a knuckle for compression. In sensitive areas, such as the face, neck, and ribs, fingertips are preferable to knuckles.

The Thumb or Fingertips

Still or gliding compression using the tip of the thumb or finger is ideal for the treatment of small,

Figure 1-15 Moving compression with the heel of the hand

concentrated areas, such as trigger points or other tender points. It is important to keep body mechanics in mind while applying pressure with the fingers and thumbs, as it can place a tremendous strain on the muscles of the hand and forearm, especially to points deep in the body. It is often wise to support the fingers or thumb with the other hand to help prevent hyperextension of the joints and provide additional pressure. Throughout this book, we will show the use of fingertips and thumbs, sometime supported, sometimes not. In every case, the practitioner may choose whether to support the thumbs or fingertips according to her or his needs.

Remember to line up as many joints in as straight a line as is feasible, and to use your body weight, rather than muscular force, whenever possible. When it is not possible to use your body weight, as in approaching posterior neck muscles in the supine client, you should strive to line up several joints, and pause and alternate hands frequently.

Although they may be used anywhere on the body, the thumbs and fingertips are used almost exclusively in some areas, such as the face, neck, axilla, abdomen, groin, and all internal work, where the touch must be controlled and sensitive (Fig. 1-16).

The Elbow

The elbow, specifically the olecranon process of the ulna (the bony point of the elbow), is an extremely useful tool for compression (Fig. 1-17). Its use has a number of caveats:

1. An extraordinary amount of force can be applied with the elbow; compression should

Figure 1-16 Use fingertips in sensitive areas

Figure 1-17 Using the elbow for compression

therefore be initiated slowly and applied gradually, with a great deal of attention to the client's responses.
2. The elbow is far less sensitive than the tips of the thumb or fingers. The tissues should be explored first with the fingers, and the elbow used primarily for compression once the need and location have been established.
3. Use of the elbow should be avoided in highly sensitive areas, such as the face, neck, and groin.

The Forearm

The ulnar aspect of the forearm provides a broad surface for deep, gliding compression (Fig. 1-18) of long, straight muscles, such as the erector spinae muscles and many muscles of the leg. Like the elbow, it is comparatively insensitive; palpate the area before treating with the forearm.

Figure 1-18 Using the forearm

Specific Treatment Techniques

Holding

The whole hand, or both hands, may be used to hold an area of the body. Several intentions and effects are possible with this approach:

- *Simple holding* can warm and nurture and communicate intention. Holding a body part in one or both hands involves a physical warming effect and suggests relaxation to the client (Fig. 1-19).
- *Intentional holding* suggests change. The body part is held in one or both hands with a gentle pressure in the direction of a desired change, with the slack being taken up as it occurs.
- *Holding with varying compressions* is a gentle way of applying compression with different parts of the hand. The body part is held in one or both hands and pressure is applied with the fingertips, thumbs, and heads of the phalanges and metacarpals, and possibly even squeezed in places, in varying patterns with varying pressure. These varying applications of pressure may also be combined with intentional holding. This "whole hand work" combines suggestion with an element of confusion that allows muscles to be caught "off-guard" and lengthen.

Compression

Compression consists of pressure exerted perpendicular to the surface of the muscle. Where there

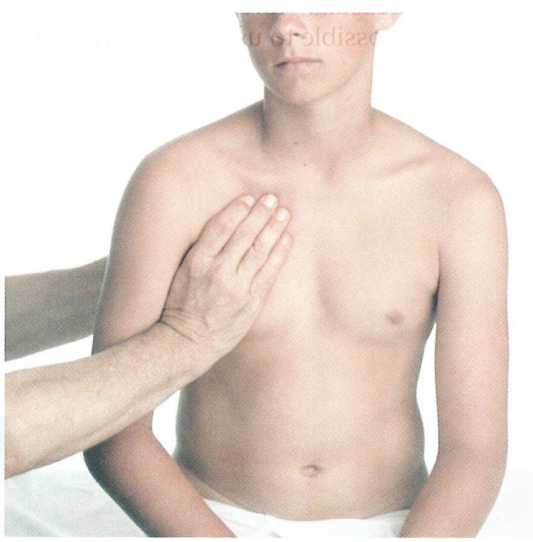

Figure 1-19 Holding

Figure 1-20 Broad compression with the hand

is underlying bone, the muscle tissue is compressed against the bone; otherwise, pressure is exerted against the resistance of the deeper structures of the body. Compression may be firm or light, as appropriate, and may be applied broadly by the entire hand (Fig. 1-20) or on a concentrated point by the thumb, fingertip, or elbow (Fig. 1-21). Pressure is maintained until release is felt, or until the client reports easing of the pain associated with the point.

Pincer Palpation/Compression

Muscles that present a considerable amount of tissue above the surface of the body can be exam-

Figure 1-21 Focussed compression