

PROPRIOCEPTION The Seventh Sense

Mark Beck

For fifteen years I have been involved with the massage and bodywork profession at nearly every level. I have learned, experienced or taught several styles of massage and bodywork. I have always endeavored to go beyond the mere technical application of any technique to understanding the effects and the physiological bases of the technique. The traditional European styles seemed to mostly involve the enhanced movement of blood and lymph. The Eastern styles (shiatzu and acupuncture) involve the almost mystical movement of *Chi* or life force energy. Lately there have emerged a number of styles that rely on fairly specific neurological responses to accomplish their effects.

As it is with most techniques taught in the field of bodywork, the general rule of thumb is "if the thing works, use it." Seldom is there much attention given to how or why the technique accomplishes what it does. Just do the process properly and the results follow. Inquiring about the physiology of the process generally elicits an answer like "Nobody really knows," or a lengthy, complicated scientific explanation that is more confusing than convincing. Those explanations always seem to include terms like "neuromuscular response" and "proprioceptors." Though these terms are often mentioned in relation to many effective bodywork systems, I believe a clearer understanding of their significance would enhance the ability of the practitioner to use the techniques to the greatest advantage in relieving pain and restoring mobility.

We are well aware of the five senses that function at the conscious level—sight, sound, taste, smell, and touch. The sixth sense, often referred to as intuition, is one that many massage practitioners rely on heavily in the practice of their art. It has to do with the feeling, the connection, the silent dialog between the therapist and client that many times mysteriously guides the session. There is another sensory system in the body and even though it functions at the subconscious level, understanding its activity will enhance the effectiveness of any massage therapist. The seventh—proprioception—is the sense that tells us where our body is in space and monitors our every movement. This sense is intimately involved with the continuous process of learning how we do every move we make. When movements become guarded, painful or difficult, messages from the proprioceptive system perpetu-

ate the dysfunction. It only makes sense that new information fed in though the proprioceptive system might restore function. A better understanding of the function and interaction of proprioception could lead to more effective modalities of soft tissue manipulation that communicate with the body/mind through that system.

What is a Proprioceptor?

Outside of the brain and spinal cord there are two distinct types of neuron, motor neurons and sensory neurons. Motor neurons carry information from the brain and spinal column to the muscles and the impulse or lack of it across these neurons will either stimulate muscles into action or inhibit their action. Sensory neurons carry sensory impressions from the outside toward the spinal cord and brain. The terminal ends of these contain sensory receptors that are imbedded in what tissues they report on. There are several specialized types of sensory receptors, which respond to light, sound, odor, heat, taste, touch, pain or pressure. These receptors lead to conscious sensation and are called *exteroceptors*. There are also sensory receptors that have to do with unconscious sensation, what is called kinesthesia or a sense of inner movement. These are *proprioceptors*.

Deane Juhan sees no functional division between the central and peripheral nervous system. The peripheral nervous system is made up of the proprioceptive nerve ends, the motor nerve ends and the exteroceptors all of which are one continuous structure with the brain and the spinal cord. The thread of exteroceptors and proprioceptors are like the brain's tentacles reaching out into all precincts of the body gathering local data for the central nervous system's processing center (Juhan).

"Proprioception is a feedback system of sensory input and motor activation which provides information about relative positions and rates of movement of different body parts to the central nervous system, restricts extreme contraction of the joints or stretch of the muscles and assists in precise movement. The feedback system works along with the systems of the higher brain centers to make deliberate and learned movements as well as to regulate habitual and involuntary movements. Proprioceptive activation provides feedback as to the contractile state and position of muscles, makes

possible the coordination of smooth and accurate motion and helps prevent injury to muscles and joints due to excessive muscle contractions or stretches," (Hart).

From the most primitive reactive and reflex movements to simple habitual and learned activities to the most complicated and precise achievements of dexterity, it is the proprioceptive system that allows coordinated movement to happen.

Categories of Proprioceptors

Two major categories of proprioceptors are the muscle *spindle cells* and the *Golgi tendon organs*. Their sensory input goes no farther than the brain stem so their activity is all unconscious. There are also proprioceptive receptors located in and around the joints that sense angulation and pressure. Other pressure sensitive nerve ends are situated throughout all planes of connective tissue and together these supply sensory information to the central nervous system to give a concise body-image of soft tissue and of joint position and movement.

Spindle cells are located largely in the belly of the muscle. They are made up of specialized contractile tissue called *intrafusal muscle fibers*. Coiled around the center of the intrafusal muscle fibers are the *annulo-spiral* or *primary receptors*. A secondary sensory nerve receptor, often referred to as a *flower type receptor*, is located adjacent to the annulo-spiral receptor. These sensory nerve ends of proprioceptive neurons relay information directly to the spinal cord. These receptors continuously sense movement in the spindles and in the muscle fibers surrounding them alerting the CNS as to the length and stretch of the muscle as well as how far and how fast the muscle is moving.

The Golgi tendon organs are multi-branched sensory nerve endings located in tendons near the musculotendinous junction. They measure the amount of tension produced in muscle cells as a result of the muscle stretching and contracting. They also monitor the amount of force pulling on the bone to which the tendon attaches.

How Proprioceptors Work

Proprioceptors sense tissue distortion. Each time the tissue is compressed, decompressed, twisted or distorted in a specific way or there is a movement of the body, these nerves record that change with the central nervous system (CNS). These messages feed the integrative areas of the brain with detailed information about every body part. The information is continually assembled into an overall body image that is the brain's way of knowing what the body is doing.

Reflexes

Many reflex responses depend on proprioceptors. These reflexes operate at the level of the spi-

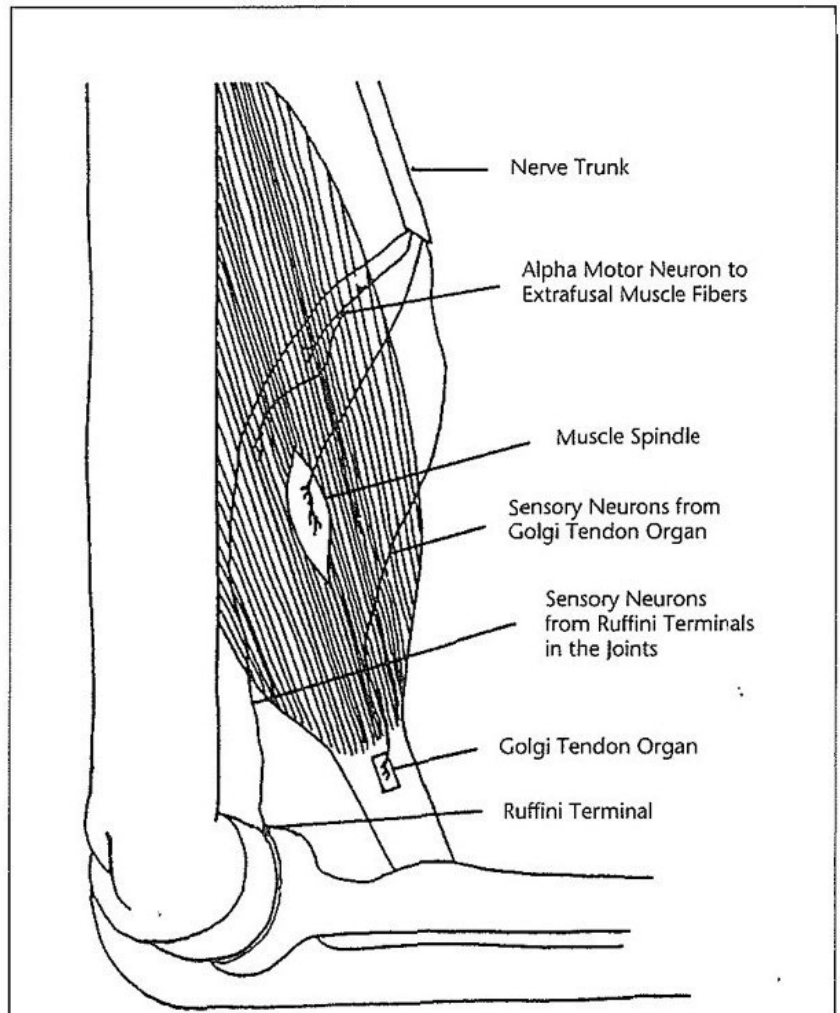
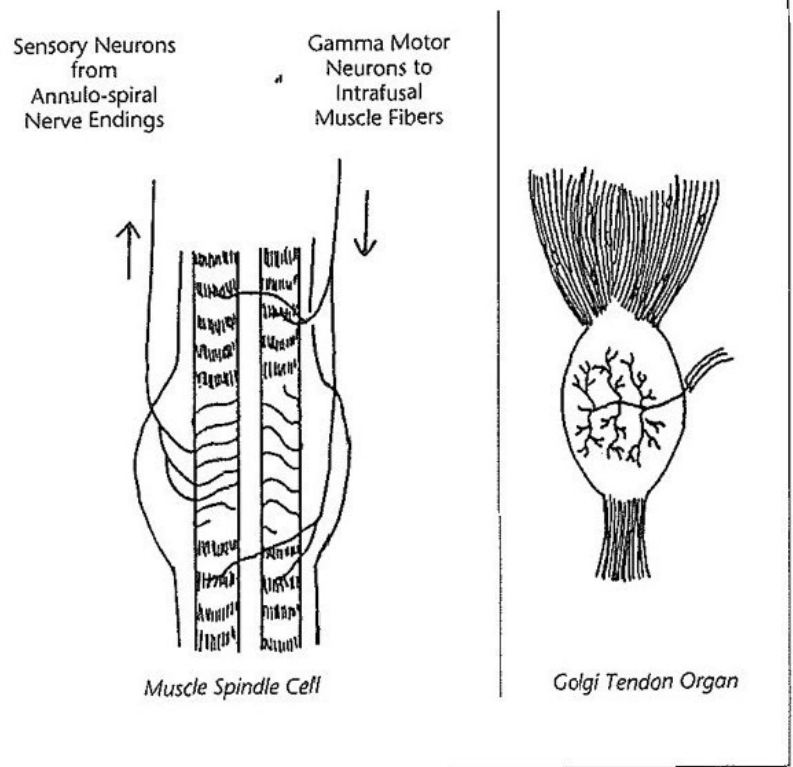


Diagram representing relative location of the major proprioceptive apparatuses



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nal cord and do not require an impulse to travel to the brain to function. Reflexes happen in an arc where the sensory impulse travels along a neural pathway from the periphery to the spinal cord. Without having to go to the brain, the impulse is interpreted and translated and comes right back out of the spinal cord as a motor impulse causing action.

When the spindles sense that a muscle is being stretched, they react by causing the muscle to contract to prevent the possible tearing that might result if the muscle were to continue to stretch. This phenomenon is known as the *myotactic reflex* (stretch reflex).

There could be enough strength in a contracting muscle to actually tear the muscle or tendon from the bone. When the Golgi tendon organ senses too much tension, it will cause an inhibitory action to the muscle to prevent injury. The *Golgi tendon reflex* inhibits muscle contraction and promotes lengthening of the muscle fibers thus preventing the tearing of muscle fibers or of the tendon from the bone.

Protective reflexes are automatic or learned biological processes that protect the body from potential harm. The most common example of this is pulling a finger away from a hot iron (the withdrawal reflex).

Another protective reflex is the *splinting* that takes place when a muscle, tendon, ligament or bone is injured. The muscles surrounding the injury immediately tighten to immobilize the area. By the time that injury heals, the splinting reflex which has acted to protect that injury has been reinforced enough that it becomes an acquired proprioceptive pattern. At the same time there is a learning process taking place where the body/mind records the injury experience. The injured area will continue to be protected by a hypersensitive and hypertonic condition long after the injury heals. If a situation arises that mimics the original injury or threatens the area of injury, the body/mind will immediately and unconsciously react to prevent further injury. This again results in a splinting action in the muscles. Continued splinting results in more hypertonicity.

This hypertonicity and the resulting lack of circulation, reduced flexibility and contractibility of the tissues often perpetuate further injury and dysfunction not only in the same spot, but in other areas of the body as well.

Hypertonicity is a neuromuscular condition that is generally the result of overuse, misuse or trauma. Depending on the severity, its owner may or may not be aware of its existence. The physiological nature of a hypertonic muscle is that the neuromuscular spindle cells overreact, so that when a muscle is not even being stretched, it registers stretch and reflexively contracts. Due to the neurological feedback loop of the proprioceptors the muscle fibers maintain an abnormally contracted and therefore shortened state. This constricts the capillaries, restricting fluid movement which results in reduced delivery of nutrients and oxygen to the area and a build up of wastes from increased metabolic activity due to increased muscle activity. The presence of excessive metabolic toxins further irritates surrounding muscle fibers causing them to contract, perpetuating the condition. When severe enough, this leads to a vicious pain-spasm-pain cycle. Due to another natural proprioceptive reflex termed *reciprocal inhibition*, the contraction in the original muscle causes an inhibitory action weakening the opposing muscle (antagonist). Obviously, this is a dysfunctional condition. When severe, the results are painful and debilitating.

How Proprioception Relates to Massage

"Proprioceptive sensations seem to have a major impact on our body function, postural presentation and the nonverbal messages we convey about who we are and how we feel. This suggests that proprioception may be the physiological mechanism responsible for the effectiveness of (bodywork) techniques designed to access the mind through the body" (Hart).

When working with a client an alert and knowledgeable bodyworker may feel a taut band in the muscular tissue, a nodule that may be tender when compressed, a restriction in the normal movement of a joint or a general hardness of a muscle area. These are generally reactions to trauma, habit, or a whole range of experiences that have gone into defining who

that person is and how they function. Habituated patterns established through years of experience often result in physical conditions that may limit flexibility, cause pain in muscles, irritability, depression, even seemingly unrelated visceral symptoms and dysfunctions. Paul St. John refers to these as *physiopathological reflex circuits* (St. John).

When a practitioner begins to address these conditions, they create new feelings and sensations in tissue and joints that begin to redefine the limits and possibilities of the organism. In manipulating the tissue to create pleasure, freedom and new ranges of movement, the therapist incorporates the natural reflexive actions of the proprioceptive system, supplying new information to the CNS to reset the neuromuscular mechanism to a more neutral state. Bodywork uses the proprioceptive language of tissue distortion as a direct means of creating new feeling, effectively adding new information through the proprioceptive system that is strong enough to override the old and dysfunctional patterns or tapes.

"Muscular patterns run on sensory pictures. Sensory and emotional feelings seems to be the chief form in which sensory/muscular patterns are stored. How a specific pattern feels to the brain is what allows it to be repeated over and over. It is the sensory input that is coming in as the pattern is happening that controls how that movement happens. Once a movement is habituated, the body will do it the same way every time because the feeling is familiar. Even if it is wrong or dysfunctional, it is familiar. This becomes the proprioceptive state that is normal. The beautiful thing about bodywork is that it changes muscle patterns in the same way they were acquired in the first place. That is through the proprioceptive body image print. The more familiar the new patterns become the more you can leave behind the old limitation. What you do with your accumulative experience is produce a specific proprioceptive state that is normal for you. All people who focus on tissue or sensing, like Rolfers, chiropractors, massage therapists, etc., are creating a coherent body image in the proprioceptive system that can be taken up by the unconscious mind to make more functional choices" (Juhan).

One of Milton Trager's favorite comments is, "First comes sensation, then

First comes sensation, then comes movement. If you want to be different you have to feel something different.

comes movement. If you want to be different you have to feel something different" (Juhan).

The bodyworker's physical contact, movement and repositioning of the client's body generates a flood of proprioceptive sensory information that alerts the body/mind to other possible positions and movements so that the mind can reorganize the information to new patterns and choices. "It is not so much what you do to the body that evokes change in the body/mind. What matters is **WHAT THE BODY/MIND DOES WITH WHAT YOU DO TO IT. THE BODY/MIND CHANGES ITSELF**" (Hart).

Adding new proprioceptive information to the nervous system provides the possibility for the mind and brain to pro-

gram a new state of mobility and tonus to the body. By understanding and applying a few simple proprioceptive principles the therapist can facilitate what seems like miraculous relief. "How you (as a bodyworker) manipulate the proprioceptive system measures the difference between your success rate and your failure rate" (Juhan).

Many of the avant garde therapies on the massage therapy scene today depend on the actions of the proprioceptive system for their success. The most effective techniques incorporate movement because without movement, a huge proportion of the proprioceptive system is not engaged. Many of these techniques were developed by individuals from various backgrounds with different traumatic situations to

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overcome and as a result look very different. In fact what they are all doing is finding new ways of movement and flooding the CNS with proprioceptive information that gives it more functional options.

Following are listed a number of effective bodywork modalities and a short explanation of how they employ the proprioceptive system. The modalities are grouped according to the similarities in their application with regard to their effect on the proprioceptive system.

Modalities that Use

Active Joint Movements:

Proprioceptive Neuromuscular Facilitation (PNF), Active Muscular Relaxation Technique (AMRT), Muscle Energy Technique (MET)

Each of these modalities incorporates the active participation between client and therapist to achieve increased function. PNF was developed in the 1940s and 50s and used movement patterns with specified therapist assistance or resistance as a muscular reeducation tool for neurologically impaired individuals. AMRT and MET have adapted techniques very similar to PNF techniques that are especially effective in relaxing overactive muscles.

These therapies that use active joint mobilization (joint movements where the client actively exerts a muscle contraction while the practitioner applies resistance to the action) elicit proprioceptive responses.

Bodywork uses the proprioceptive language of tissue distortion as a direct means of creating new feeling, adding new information strong enough to override the old and dysfunctional patterns or tapes.

One response termed *Post-isometric Contraction*, results in muscle relaxation and lengthening immediately after a resisted contraction.

"Following the contraction, the muscle is in a refractory state where it is inhibited and can easily be lengthened into a new resting length. It is theorized that a restricted contraction loads the Golgi Tendon receptor organs at the musculotendinous junction. These receptors sense increased tension in the muscle and reflexively inhibit the extrafusal fibers of the muscle. The reflex inhibition explains why a muscle can be easily stretched to a greater length following a resisted contraction" (Liebenson).

Another natural proprioceptive response is *reciprocal inhibition*. This process affects the opposing muscles acting on a joint. When a muscle causing an action on a joint contracts, the muscle causing the opposite action must relax. For example when bending the arm: as the muscle causing the elbow to flex (the biceps) is activated, the muscle causing the elbow to extend or straighten (the triceps) must relax. This property is useful when addressing muscle spasms. In order to release a spasm, a resisted contraction of the

antagonist followed immediately by a passive stretch of the spasmed muscle will reduce the spasm. Example: Given a spasm in the calf muscle (gastrocnemius), the therapist would resist the efforts of the client to dorsiflex their foot (pull the toes toward

the knee) for a period of several seconds. Immediately following a command to relax, the therapist would gently and passively dorsiflex the client's foot thereby lengthening and relaxing the spasmed calf muscle.

Post-isometric relaxation and reciprocal inhibition are both contract-relax techniques that depend on reflexes of the proprioceptive system to function.

Modalities that Use

Positioning to Release:

Strain Counterstrain, Orthobionomy, Structural Muscular Balancing

All of these position-release modalities use passive positioning of the body or body part in a manner that is comfortable for the client in order to release dysfunctional or painful muscles or joints. Even though these modalities use similar remedial techniques, their process of determining what positions to use varies greatly.

"The structures of the body responsible for reporting the positional-states of the muscles are the proprioceptor nerve endings. What is accomplished in positioning for comfort... [is to shorten] the muscle containing the dysfunctional pro-

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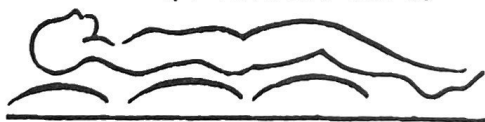
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proprioceptors... This allows the primary and secondary (proprioceptor nerve) endings to cease their abnormal activity" (Jones).

In other words, the body part that contains the hypertonic or dysfunctional muscle is passively moved into a specific position that brings the ends of the muscle in question into close proximity. When the body part has been passively manipulated to a position of comfort (away from pain) a slight compression is applied into the involved joint. This in essence satisfies the intent of the muscle contraction while at the same time shortening the muscle, taking all tension off of the muscle tissue and sensory nerves. Proprioceptively this engages the muscle spindles, the Golgi tendon organs and the Ruffini endings in the joint, floods the CNS with relaxed, non-traumatic, non-threatening information and resets the neuro-muscular reflexes to a normal level. Circulation is improved due to the new found relaxed state and proprioceptive sensory information allows the intra- and extrafusal muscle fibers to release their protective tension and relax. After holding the muscle in the position for the prescribed amount of time, (usually 30 to 90 seconds) the body part is slowly returned to its normal position. When done correctly, the muscle will retain its restored normal resting tonus and length.

Modalities Based on Trigger Points:

Trigger Point Therapy, Myotherapy, Neuromuscular Therapy

According to Travell, a trigger point is, "a focus of hyperirritability in a tissue that, when compressed, is locally tender and, if sufficiently hypersensitive, gives rise to referred pain and tenderness, and sometimes to referred autonomic phenomena and distortion of proprioception" (Travell).

Trigger points are classified as active and latent. Active trigger points cause pain, both local and often referred. Latent trigger points lie quietly in terms of pain but may still cause weakness and restriction and are usually sensitive when compressed. Both cause dysfunction.

According to Travell trigger points are located in taut bands of muscle. When the muscle is stretched, pain increases and range of motion is restricted. When the muscle is contracted against a fixed resistance, pain increases and strength is decreased. (Travell). The fact that trigger

points are located in hypertonic muscle bands indicates that hyperirritable spindle cells are involved.

Trigger point modalities employ techniques to deactivate trigger points to reduce pain in local and reflected areas and to reduce the dysfunction of related tissues and viscera. Unlike the other modalities discussed, trigger point therapies use more invasive techniques to activate the point. Travell suggests dry needling the precise point, cooling the overlying muscle, or most effectively, injecting the point with a procaine solution. Any needling techniques are beyond the scope of practice of most bodyworkers. Myotherapy uses sustained pressure on the trigger point, the discomfort of which should stay within the pain tolerance of the client. Neuromuscular therapy uses a similar pressure technique as well as other deep massage techniques. Once the trigger points are deactivated, there is an immediate relief from the pain both in the trigger point and in the referral areas.

All trigger point modalities stress the necessity of mobilizing the tissue after the points have been activated in order to sustain the beneficial effects of the treatment. Relief is more lasting if the client moves the muscle through its full range of motion after treatment. Bonnie Prudden suggests, "it is important to follow treating trigger points with appropriate stretching exercises. The stretch exercises are a must both during myotherapy work and for several days afterward. They play an important part since they reeducate the muscles newly freed of spasm" (Prudden).

Again, it is movement that instills new proprioceptive information as to the new found freedom. "If the patient continues to guard and restrict movement of the muscle following treatment, the trigger point activity and pain are likely to recur" (Travell).

Movement Therapies:

Alexander, Trager, Feldenkrais, Yoga

In these modalities, the client or patient moves their body, often assisted or directed by a therapist or teacher, in a manner that is non-threatening with great attention given to body awareness. In the process the proprioceptors are flooding the CNS with new information of what is possible thereby overriding old tapes and patterns. The result is a new body image that allows more freedom of movement

with fewer restrictions from protected and contracted muscles and pain. This reinforces new proprioceptive information and maintains length and freedom in the newly released tissues.

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The effective application of each of these bodywork modalities as well as others not mentioned depends on the the proprioceptive system to overcome dysfunctional patterns and create a new awareness of the self. With more understanding of proprioception, the bodyworker opens a valuable communication link in the client/therapist relationship. Carefully listening to the body's needs by sensing tissue texture and mobility and then applying appropriate manipulation and distortion can lead to phenomenal possibilities for positive change.

"Bodywork is creating on a person by person basis, a more aware, sensate, sensitive individual. Between the number of therapists that are being trained and the number of clients they touch, here is our evolutionary hope for humanity. Granted we have a long way to go, but evolution is forever" (Boon).

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References

- Boon, Sandra, DC. Personal Interview. April 17, 1991.
- Hart, Marcia. *The Basics of Structural Muscular Balancing*. Ketchum: Hart, 1990.
- Jones, Lawrence H. *Strain Counterstrain*. Colorado Springs: American Academy of Osteopathy, 1981.
- Juhan, Deane. Personal Interview. April 19, 1991.
- Liebenson, Craig DC. "Active Muscular Relaxation Technique." *Massage Therapy Journal*. Winter 1991: 23-32.
- Prudden, Bonnie. *Pain Erasure*. New York: Evans, 1980.
- St. John, Paul. "The Friday Night Lecture series". Vol 2. *The St. John Neuromuscular Therapy Seminars*. Largo, FL: 1990.
- Travell, Janet G., Simons, David G. *Myofascial Pain and Dysfunction*. Baltimore: Williams & Wilkins, 1983.

Resource list for techniques

Active Muscular Relaxation Techniques

Liebenson, Craig DC. "Active Muscular Relaxation Technique." *Massage Therapy Journal*. Winter 1991: 23-32.

Feldenkrais

Feldenkrais, Moshe. *Awareness Through Movement*. New York: Harper & Row, 1972.

Muscle Energy Technique

Alexander, Dale G. "Muscle Energy Technique." *Massage Therapy Journal*. Winter 1991: 33-34.

Chaitow, Leon. *Soft Tissue Manipulation*. Vermont: Healing Arts, 1988. 241-256.

Myotherapy

Prudden, Bonnie. *Pain Erasure*. New York: Evans, 1980.

Neuromuscular Therapy

Chaitow, Leon. *Soft Tissue Manipulation*. Vermont: Healing Arts, 1988. 201-240.

St. John, Paul. "The Friday Night Lecture Series." Vol. 2 *The St. John Neuromuscular Therapy Seminars*. Largo, FL: 1990.

Orthobionomy

Wilson, Robin J., Pauls, Arthur. *Lecture and Seminar Notes*. 1989-90.

Proprioceptive Neuromuscular Facilitation

Voss, Ionta, Myers. *Proprioceptive Neuromuscular Facilitation*. Philadelphia: Harper & Row, 1985.

Strain Counterstrain

Jones, Lawrence H. *Strain Counterstrain*. Colorado Springs: American Academy of Osteopathy, 1981.

Structural Muscular Balancing

Hart, Marcia. *The Basics of Structural Muscular Balancing*. Ketchum: Hart, 1990.

Trigger Point Therapy

Travell, Janet G., Simons, David G. *Myofascial Pain and Dysfunction*. Baltimore: Williams & Wilkins, 1983.

General

Guyton, Arthur C. *Textbook of Medical Physiology*. Philadelphia: W. B. Saunders, 1986.

Juhan, Deane. *Job's Body*. New York: Station Hill, 1987.

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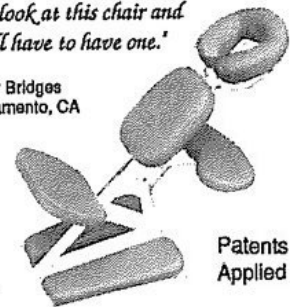
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SIZE	LBS.	AMOUNT	MUSLIN	66 X 104	72.50 dz.	BATH MATHS	PILLOW CASES	WASH CLOTHS
20 x 40	4 1/4	12.95 dz.	PERCALE	66 X 104	84.50 dz.	MASSAGE TABLES	OILS & LOTIONS	
20 x 40	5	15.95 dz.	NO MINIMUM ORDERS					
22 x 44	6 1/4	18.95 dz.	FAST UPS SERVICES					
24 x 48	8	23.95 dz.	CUSTOM PRINTING AVAILABLE					
24 x 50	10 1/2	29.95 dz.	TOWELS ARE 100% COTTON					
HAND TOWELS			PRICES SUBJECT TO CHANGE.					
15 x 25	2 1/2	7.95 dz.	VISA / MASTERCARD ACCEPTED					
16 x 27	2 3/4	9.25 dz.	<p>STAR THERAPIST SUPPLIES (512)349-0631 GREAT PRICES, QUALITY & SERVICE</p>					
17 x 20	Bar mop	6.25 dz.						

HEMMED & DURABLE