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A Detailed Look at the Innovative Manual Therapy Technique: Strain/Counterstrain

Rochelle Skarperud

University of North Dakota

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A DETAILED LOOK AT THE INNOVATIVE MANUAL THERAPY TECHNIQUE:
STRAIN/COUNTERSTRAIN

By

Rochelle Skarperud
Bachelor of Science in Physical Therapy
University of North Dakota, 1994

An Independent Study
Submitted to the Graduate Faculty of the
Department of Physical Therapy
School of Medicine
University of North Dakota
in partial fulfillment of the requirements
for the degree of
Master of Physical Therapy

Grand Forks, North Dakota
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1995
This Independent Study, submitted by Rochelle Skarperud in partial fulfillment of the requirements for the Degree of Master of Physical Therapy from the University of North Dakota, has been read by the Faculty Preceptor, Advisor, and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

Peggy M. Mohr
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Thomas Mora
(Chairperson, Physical Therapy)
PERMISSION

Title

A Detailed Look at the Innovative Manual Therapy Technique: Strain/Counterstrain

Department

Physical Therapy

Degree

Master of Physical Therapy

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ABSTRACT

The purpose of the following literature review is to provide the reader with information regarding the manual therapy technique of strain/counterstrain. The review will describe the origin, theory, rationale, and methods associated with the treatment technique of strain/counterstrain. The role of the muscle spindle and trigger point as utilized in the technique are discussed in detail, along with a comparison of strain/counterstrain to similar manual therapy techniques. Several of the techniques discussed are: acupressure, acupuncture, osteopathic manipulation, and muscle energy techniques. To further support the authors' viewpoints, several case studies are presented and reviewed. The general treatment techniques and guidelines are also presented. Strain/counterstrain is a fairly new technique to the profession of physical therapy, and it is hoped that the following pages will provide the reader with a greater understanding of its rationale, and also stimulate questions regarding the effectiveness and appropriateness of the technique.
CHAPTER ONE
INTRODUCTION

The human hand is an essential tool for the profession of physical therapy. As stated by Mennell:

Beyond all doubt the use of the human hand, as a method of reducing human suffering, is the oldest remedy known to man, historically no date can be given for its adoption.¹

Therefore, it is not surprising that the hands on remedy of manual therapy continues to be an effective form of treatment still today. How we utilize the different forms of manual treatment (i.e., massage, muscle training) continues to evolve. It is sometimes seen as a specialization within the profession of physical therapy. Manual therapy (MT) provides nonsurgical management of spinal and extremity dysfunction. It is also used as an assessment tool to describe pain and function, detect movement abnormalities, and test tissue structures. With all this information about manual therapy available to the
therapist, it is then possible to design treatment programs related to realistic goals.¹

The practice of manual therapy has evolved from numerous clinicians. Their contributions have led to an eclectic set of evaluation and treatment procedures for musculoskeletal dysfunction.² Indications for the use of manual therapy evolved from clinical criteria noted in the evaluation rather than from the pathology description (i.e., altered ROM, functional limitations). Types of manual therapy techniques range from massage, distraction and traction techniques, stretching and shortening of soft tissue, to specific or general high velocity manipulation, and joint mobilization. Manual therapy represents more than just the application of passive movements, and the field continues to evolve as a subspecialty of physical therapy.²

Manual therapy combines the elements of art and science. Clinical observation and manual techniques are central components of the artistry of practice in manual therapy. Feinstein³ suggested that clinical practice is neither art nor science, but the most scientific art and the most humanistic science.

Professional interest in manual therapy techniques such as strain/counterstrain continues to thrive despite continued slow development of a scientific rationale for the treatment procedures. Currently biomechanics, anatomy, and neurophysiology are the disciplines used to provide rationale for manual therapy but further research is needed.² Grieve⁴ described the present state of manual therapy as follows:
We continue to sound as though we know so much, when we know comparatively little. It might be a good thing to admit this. We make much of clinical science, enthusiastically referring to this or that part of the massive mountain of literature which best serves our particular interest... Much of what we do is simply what has been proven on the clinical shop floor to be effective in getting our patients better- we do not always know why.

Strain/counterstrain is just one aspect of manual therapy that can be used as an example pertaining to Greive's description. How manual therapy is currently used has been evolving since the start of the physical therapy profession. Further research, refinement, and discussion of strain/counterstrain as a manual therapy technique is needed to support the efficacy of the treatment technique. The purpose of this study is to review the literature to define the origin, theory, rationale, and methods associated with treatment of somatic dysfunction utilizing strain/counterstrain techniques. The review will provide an overview of the actual treatment technique, including a discussion of several case studies utilizing strain/counterstrain.

This project's goal is to stimulate physical therapists' interest in this innovative treatment technique and to provide them with an awareness of the
basis for its utilization. Furthermore, the study may generate questions regarding the use of strain/counterstrain, and where it fits into the physical therapist's treatment regime. Also, it will provide the field of physical therapy with a greater understanding of how and when this technique can be used effectively.

The Origin of Strain/Counterstrain

The technique of strain/counterstrain was discovered and developed by Lawrence Jones, DO, FAAO. He defined strain/counterstrain as a "passive positional procedure that places the body in a position of greatest comfort thereby relieving pain by reduction and arrest of inappropriate proprioceptor activity that maintains somatic dysfunction." From this definition, it is clear that the strain/counterstrain concept is not directed toward tissue injury but toward aberrant neuromuscular reflexes within that tissue.

The origin of strain/counterstrain was discovered when Jones, frustrated with his treatment of the osteopathic lesion (which is now known as somatic dysfunction), was motivated to experiment with the concept of positional release. Jones was educated to believe that joints became locked and the only way to treat them was to burst them loose via high velocity thrust techniques. His results utilizing those techniques were generally acceptable, but several times he noted no positive response to treatment and became frustrated. He was treating such a case when he discovered positional release.
The following is a case study review of Jones' initial discovery. A young man with psoasitis (stooped posture, unable to stand completely erect with severe pain across the low lumbar area) had been treated by Jones using high velocity techniques for six weeks with no relief of symptoms. He had also been treated by chiropractors for two and a half months with no symptom relief. The patient stated he was unable to find a comfortable position to sit in for over fifteen minutes. Jones decided to devote a whole treatment session to find a comfortable position for the patient to sleep in. A position of comfort was found after twenty minutes of experimentation. The patient was literally rolled into a ball with the pelvis rotated about forty-five degrees and laterally flexed about thirty degrees. This was the patient's first positive response to treatment in four months. Jones left the patient in this position and went to treat another patient. Upon his return, he helped the patient to the standing position and the patient was able to come fully erect with no complaints of pain. Exam revealed full and near pain-free range of motion. Jones was astonished with this discovery, and this was the inspiration that started him experimenting with positional release and applying it to all somatic dysfunctions.

Jones observed over an extended period of time that once a position of comfort was found, the slow return to neutral was an important factor in the outcome of the treatment. This slow approach to comfort and relaxation provided a unique opportunity to observe the behavior of muscles and ligaments under different rates and amounts of stretch. The first observation
was that benefits could be lost if the patient was moved too quickly, especially in the first fifteen degrees of motion. Therefore, the evidence obtained by treating many thousands of these dysfunctions in a position of comfort verified that to obtain success in treatment, the rate of return to neutral position must be slow. This slow return to neutral was done to avoid re-exciting the already highly facilitated reflex, which likely precipitated a return of the dysfunction. The dysfunction referred to was related to joint position. The joint reacted as if it were strained causing an increase in proprioceptor activity. In reality, the joint was not strained but slightly shorter on the affected side than on the contralateral side.

A second feature Jones noted through practice and observation was that he was able to reduce the time of supporting the patient in the position of comfort from twenty minutes initially to ninety seconds. Holding the position less than ninety seconds proved to be inconsistent, and greater than ninety seconds did not prove to be beneficial in the outcome.

By utilizing the positional release technique, the third feature of strain/counterstrain was also developed. This was the discovery of palpable myofascial tender points that had a correlation to specific somatic dysfunctions. The tender points were probed intermittently during treatment. Jones proposed that success in finding the position of comfort would become evident with a palpable decrease in tissue tension and tenderness of the corresponding point. These palpable tender points will be discussed in detail in a later chapter.
Rationale for the Use of Strain/Counterstrain

The rationale for strain/counterstrain treatment was first proposed in an article by Korr\textsuperscript{8} on the role of proprioceptors on somatic dysfunction. His hypothesis indicated the muscle spindle or the primary proprioceptive nerve endings as the causative factor for joint dysfunction.

Denslow\textsuperscript{8} suggested that the proprioceptors, particularly the muscle spindles, were the most likely to be indicated as a reason for joint dysfunction because: 1) they would be sensitive to musculoskeletal stresses; 2) they are nonadapting receptors, sustaining streams of impulses for as long as they are mechanically stimulated; and 3) their influence is highly specific to the muscles acting on the affected joints and the corresponding spinal segments.\textsuperscript{8}

Korr's\textsuperscript{8} concept is based on the importance of decreased joint mobility and ROM for diagnosis of somatic dysfunction, and on the muscle's function to retard and resist joint motion.\textsuperscript{5} Of all the somatic tissues, muscle is the only active one, capable of self-energized, independent motion and of developing great, widely variable and rapidly changing forces. Motion is produced by muscle contraction, and it is also important to remember that the same contractile forces are utilized to oppose motion. This may, in essence, cause improper muscle pull at the corresponding joint, leading to joint dysfunction.\textsuperscript{5}

Somatic dysfunctions have several origins including: musculoskeletal restriction, trauma or disease of the central nervous system (CNS), persistent autonomic impulses due to structural and functional changes, and infectious
Overall, there are many explanations which play a role in the initiation of somatic dysfunction.

Korr reasoned that an impairment of joint motion in a distinct plane was produced by a unilateral active contraction of muscles pulling the joint in a certain direction. He also stated that the behavior of a dysfunctional joint is to move freely and painlessly in certain planes of motion and then create a painful resistance to motion in the opposite direction. Therefore, a contraction of the muscles around that particular joint would resist (bind) motion in a direction that would tend to lengthen or stretch the muscles and surrender (ease) motion in directions that would tend to shorten the muscles. Korr's premise was that high gamma discharge exaggerated afferent firing of the muscle spindle, producing a spasm which fixated the joint in a certain direction and resisted any attempts to return to neutral.

Increased force or decreased force in muscle contractions vary according to the direction of motion of the joint. These variations are caused by several factors: first, the amount of contraction from moment to moment is controlled by variations in impulse traffic along the motor axons supplying the muscle; and second, the impulse traffic varies with changing levels of excitation of the anterior horn cells. The sources of these changing afferents during joint motion are the proprioceptors. The proprioceptors signal physical changes in musculoskeletal tissues. The three main categories of proprioceptors related to joint position are joint position and motion, tendon tension, and muscle length.
The primary receptors involved are the joint receptors, the golgi tendon receptors and the muscle spindle. Korr's hypothesis implicated the muscle spindle as the primary contributing factor in joint dysfunction. The aberrant afferent flow from the muscle spasm fixated the joint in a certain direction and resisted any attempts to return the joint to neutral.

Although research data are limited in support of Korr's model, the practice and observations of practitioners, recounting the immediate changes in palpable pain, tissue tension, and ease of movement following positional release, point to a neural basis. Continuing research observations of clinicians currently utilizing these techniques will help to further support and/or disprove the idea of a neural basis. To the beginner, the treatments may appear straightforward and easily mastered, but development of palpatory skills required to find the optimal position of release will take continuing practice and perseverance.
CHAPTER TWO

ROLE OF THE MUSCLE SPINDLE IN SOMATIC DYSFUNCTION

Korr\(^10\) has stated, "one of the most reliable hypotheses is that the entire nervous system from the highest centers of the brain to the peripheral neurons is involved in all somatic dysfunction and in every manipulative treatment." The muscle spindle, as a part of the nervous system, provides the basis for the neural component of somatic dysfunction. It is important to establish a common understanding among clinicians regarding the muscle spindle and its role in somatic dysfunction as related to the technique of strain/counterstrain.

Muscle spindles are highly specialized sensory receptors scattered throughout each muscle in numbers that vary with the function of the muscle and the delicacy of control.\(^8\) The greater the spindle density, the finer the control the muscles have to perform various tasks. The spindles lie within the muscle itself, surrounded by muscle fibers, and are arranged in parallel to the muscle fibers, with an attachment to them at both ends.\(^5\) (Figure 1)

Each spindle is enclosed in a connective tissue sheath about 3-5 mm long, enclosing 5-12 thin specialized muscle fibers known as intrafusal fibers.\(^8\) The intrafusal fibers lie in parallel to the extrafusal fibers which surround the spindle and are much larger and more powerful. The extrafusal fibers comprise
Fig. 1.--Muscle Spindle.

the majority of bulk of the muscle. The intrafusal fibers are attached to the sheath at each end. Stretching of the muscle itself will also stretch the spindle, and shortening of the muscle will slacken the spindle.

The spindle contains two types of intrafusal fibers: larger fibers with nuclei centrally located in a bag-like pouch called nuclear bag fibers, and smaller fibers containing only one row of chain-like nuclei in their central portion called nuclear chain fibers. These fibers nuclei are centrally located with contractile material making up the two polar ends. In the central (equatorial) region, the primary or annulospiral endings are located. Secondary or flower spray afferents are located on their contractile polar ends. The primary afferents are sensitive to both dynamic and static stretching of the intrafusal fibers, but, in particular, the dynamic component of stretching. The secondary afferents are sensitive only to static stretch of the spindle. The muscle spindle is the primary receptor for length changes in muscle. As the muscle spindle is stretched, the afferents increase their firing rate.

In addition to the sensory afferent component, the muscle spindle intrafusal fibers are innervated by the gamma motor neurons. The gamma cells originate in the ventral horn, pass through the ventral root, and terminate on the contractile polar ends. In contrast to alpha motor neurons which innervate the extrafusal fibers, these neurons are small and their axons are thin. The gamma system controls contraction of the intrafusal muscle fibers and the frequency of spindle discharge at any given length. When the
intrafusal motor fibers are activated, a contraction of the intrafusal fibers occurs; both ends of the fibers contract, and the equatorial region is stretched causing an increase in afferent firing rate. The higher the gamma activity, the larger the spindle response. Therefore, the higher the spindle discharge, the greater the reflex contraction of the muscle. In general, as muscle contraction force increases, the greater the muscle resists being stretched by movement of the affected joint in the opposite direction of the contraction force. The higher the gamma activity, because of its influence on excitatory spindle discharge, the more forceful the muscle's contraction and the greater its resistance to being lengthened. During high gamma gain activity, the spindle may, in effect, be calling for contraction when the muscle is already shorter than its resting length, which leads to joint dysfunction.

The spindle is an essential feedback mechanism by which the musculoskeletal system is controlled and is continually reporting back to the central nervous system. The influence of the afferent discharge of the spindle on the motorneuron of the same muscle is excitatory. When the extrafusal fibers are stretched, the spindle is stretched causing the primary and flowerspray nerve endings to fire. That is, when a muscle is stretched, it is reflexly stimulated by sensory input from the muscle spindles to contract, causing a resistance to stretching. Conversely, shortening of the muscle decreases the afferent discharge, reducing excitation and favoring relaxation (lengthening) of the muscle. The muscle spindle is sensitive to length changes.
Therefore, its influence is to cause the muscle to resist change in length in either direction. Thus the spindle is the sensory component of the familiar stretch reflex.

To further reiterate the above mentioned ideas, an application of Korr's\textsuperscript{12} model (proprioceptors role in somatic dysfunction) using a simple hinge-type joint, the elbow, will be discussed. Let us consider only two antagonistic muscles crossing the elbow joint: the lateral head of the triceps brachii and an extensor of the forearm, the brachialis muscle. With the elbow in a semiflexed position, a weight is placed in the hand. To lift the weight the brachialis contracts and the triceps is concurrently stretched. Both contain muscle spindles that are responsive to stretch. When the muscle is stretched, the spindles are activated. The innervated muscle is reflexively induced to contract and the contraction is accompanied by the reciprocal inhibition of its antagonist. When the muscle shortens, the spindles are "unloaded" and as a result, their responses are quieted or even silenced. Thus, in this example, the triceps muscle spindles increase their response rate as this muscle is stretched. Similarly, the spindles of the brachialis muscle decrease their rate of firing as the muscle shortens.\textsuperscript{12}

In tension and anxiety states or in situations that are threatening, gamma activity may be set too high for efficient, smoothly coordinated motion.\textsuperscript{13} In these states, the muscle is tense and resistant to length changes. Grainger\textsuperscript{13} has shown that incorrect anticipation of the muscular effort required, for
example, to lift an object, may cause the gamma gain of the muscle to be set to high, with serious and painful consequences. Joint dysfunction may occur as various voluntary activities may result in an incorrect setting of the spindle sensitivity for regulation of muscular activity required.⁸

How does all this relate to musculoskeletal disturbance designated as somatic dysfunction and, more specifically, its treatment by the strain/counterstrain technique? The current definition of somatic dysfunction as stated in an article by Antonios Tsompanidis¹⁰ is: impaired or altered function of the related components of the somatic (body framework) system, skeletal, arthrodial, and myofascial structures; and related vascular, lymphatic and neural elements. The somatic dysfunctions to be considered are primarily a result of some form of mechanical trauma.

The somatic dysfunction components of importance to strain/counterstrain diagnosis include the following conditions.⁵ First, tissue texture changes described as tense, ropey, and boggy. This is represented as muscle hypertonicity and tissue edema involving muscles surrounding a particular joint. Secondly, specific tender points which, when palpated, elicit local pain. Each tender point indicates a specific dysfunction. Thirdly, impairment in amplitude and quality of joint range of motion occurs.

In the previous example demonstrating strain/counterstrain, a weight was placed in the semiflexed upper extremity. If the weight had been applied suddenly, the elbow would be abruptly loaded, and the forearm is forced into
immediate extension. The brachialis muscle is suddenly stretched (the *strain* part of Jones' original strain/counterstrain), and the triceps muscle is shortened.

The reflexive reactions that follow the strain begin to establish and maintain the somatic dysfunction. As the brachialis muscle is contracted to avoid the quick movement of the forearm into extension, proprioceptors come into play. According to Korr, this sudden contraction and subsequent silencing of the spindles in the triceps causes both the gamma "gain" in the triceps muscle to be reflexively turned up, and the muscle itself to be reflexively contracted (the *counterstrain* of strain/counterstrain). The central nervous system regains its input from the muscle spindle, but at the expense of a shortened triceps muscle. The triceps is now reporting to the CNS that it is being stretched, even before it attains its neutral length. After recovery from the sudden extension movement, flexion is resisted by the triceps that is now tonically shortened due to inappropriate high gamma gain.

Following the incident, normal symmetry of motion around the elbow joint is disrupted. There are tender points, located on the posterior aspect of the upper arm, along with changes in tissue texture. Jones in his practice, noted that the alteration in this type of somatic dysfunction involved tissues with an essentially atraumatic history; for example, the only external forces applied to the triceps was the counterstrain element of sudden shortening. Only the brachialis muscle (the strained element) was suddenly stretched.
The aforementioned model of somatic dysfunction described by Korr\textsuperscript{12} as related to this example can be summarized as follows: The forearm is suddenly moved from the resting position into extension; the brachialis muscle is stretched and the firing rate of the spindles is increased resulting in the brachialis muscle being \textit{strained}.\textsuperscript{12} The triceps muscle is shortened and its spindles decrease their firing rate. Depriving the CNS of its spindle information, the CNS turns up the gamma gain of the triceps. The triceps then reflexively contracts (\textit{counterstrain}), and increases its spindle firing rate. The triceps is now reporting a neutral position even though the forearm is positioned in extension. The triceps muscle now in a shortened position is limiting flexion and therefore somatic dysfunction is established. Such dysfunction has caused the normal symmetry of forearm motion to be compromised.\textsuperscript{12}

Treatment of the above described dysfunction includes the counterstrain technique of passively placing the upper extremity into a position of extension to approximate the ends of the contracted triceps. According to Jones\textsuperscript{12} this will recreate the original injury and remove the tension from the counterstrained muscle. The inappropriate gamma gain can now be reset by the CNS. The forearm is held in this position for ninety seconds, the tender points are monitored until resolved, and the arm is slowly and passively returned to the neutral position. On reexamination, a pain-free, symmetric range of forearm motion is anticipated.
In somatic dysfunction, we are faced with contradictions between what we view as reality and what our body perceives as a continuing report of pain. Although we associate the cause of the discomfort with the original strain, it is not understood why the evidence of strain persists when there is no more strain occurring. Pain from overstretching would be expected to stop or be markedly reduced when the strain, which is believed to be the cause, is stopped. Yet, evidence of an injury and pain continue to persist or becomes progressively worse. Objective evidence of the eccentric position in which the body holds the affected joint shows, if anything, an abnormal shortening of the tissues that are reporting strain. For example, a patient who enters the clinic bent forward and is unable to stand erect has one or more spinal joints sending continuous messages that they are strained into extension. Any direct force toward extension greatly increases the strain. So the dilemma is the fact that a strained joint reports a continuing strain and behaves as though it is strained even after the actual strain has ceased.

This phenomenon does not result from all strains. Some may occur following a severe wrenching trauma with a real and obvious injury, and some result from a slight strain with no clear-cut history of violent strain. Whatever the patient's history, the problem from which the patient suffers and the treatments needed are surprisingly similar.

Many of the patients seen by Jones and his associates who present with back injuries are unsure when their pain began. However, those who did
recall a specific time usually commented, "It caught when I started to straighten up." The similar responses by those patients revealed that the time of onset was at and during the return from a position of strain. Acting on that premise, Jones experimented with thousands of deliberately applied strains both to patients and to himself. In all tests, he found that even a prolonged strain would not result in neuromuscular joint dysfunction as long as the return from the position of strain to a neutral position was made slowly and without force on the part of the strained body. Thus, Jones proposed that the time of onset of joint dysfunction was not the strain itself, but the body's reaction to strain. This resulted in a panic reaction and too rapid attempt to return the body to a neutral position.

The Role of the Trigger Point

Tender points play a role in the technique of strain/counterstrain as a diagnostic tool and as a monitoring point during treatment. These tense, tender, and edematous spots on the body have been utilized for many years as common components of Oriental therapeutic practice. Other points which are slightly different but closely related, such as acupuncture or acupressure points, have also been known for many years. Trigger points are four times more tender than normal tissue; therefore, they are highly sensitive to external pressure and are easy to palpate. Travell named these sites "myofascial trigger points" because stimulation produced referred pain. Chapman described similar palpable points but related them to visceral function. There
was a great deal of overlap in point locations and the palpatory feel of the tissue at these tender points. However, there were two major differences between these tender points and the tender points described by Jones and the strain/counterstrain technique. First, strain/counterstrain tender points tended to be more segmental in origin. Points along the vertebral column designated segmental dysfunction at the corresponding vertebral level. Other philosophies were more holistic in nature. Second, Jones proposed that strain/counterstrain tender points are a sensory manifestation of a neuromuscular or musculoskeletal dysfunction. The points are utilized to make a diagnosis and also to monitor treatment effectiveness.

The tender point is described as a palpable manifestation of a joint dysfunction. Therefore, treatment is NOT directed at the tender point but at the dysfunction that produces the tender point. Other philosophies treat the painful point by injection, needling, et cetera, but in strain/counterstrain if treatment is proven to be effective the tender point should diminish in tenderness, tension, and edema without requiring an injection or some other form of intervention.

The tender points used in strain/counterstrain are not located just below the skin like many acupuncture points but deeper in muscle, tendon, ligament and fascia. They measure one centimeter across or less, with the most acute point measuring approximately three millimeters in diameter. There may be one point or multiple points. Jones explained the use of tender points in this
way, "a physician skilled in palpation techniques will perceive tenseness and/or edema as well as tenderness although for the beginner tenderness will be the most valuable diagnostic sign." While performing an initial evaluation, Jones maintains his palpating finger over the tender point to monitor changes in tenderness, and the patient is moved into a position of comfort with the other hand. He probes the patient intermittently to report any decrease in tenderness. By using intermittent deep palpation to monitor the tender point, he finds the position with approximately two-thirds reduction in tenderness. Jones contends that marked and prompt reduction in subjective tenderness should follow. Jones calls this the "mobile point." The "mobile point" is the point of maximum ease or relaxation where movement in any direction will increase tissue tension beneath the monitoring finger. The mobile point signifies the ideal position for release. Finding this position of release is only one of the major components of the strain/counterstrain technique. The exact location of the ideal position must be determined on an individual basis and the final degree of positioning may cause the most marked change in tender point response.
CHAPTER THREE
TECHNIQUES AND GUIDELINES

Strain/counterstrain utilizes a mild over stretching applied in a direction opposite to the "false" and continuing message of strain which the body is experiencing.\(^7\) It may be stated as wrapping the body around the point of discomfort, or shortening the muscle on the side of the pain.

When clinically utilizing this technique, heat may be used prior to treatment (i.e., chronic, multiple areas). Using strain/counterstrain after heat application, but prior to other treatment techniques, will enhance mechanical treatment by decreasing unbalanced forces acting on a joint.\(^5\) It can also be used before myofascial release techniques. By clearing corresponding tender points, counterstrain can assist in reducing neurophysiologic activity, allowing myofascial release to break down biomechanical barriers with greater ease.

Technique

1) Locate the tender point or points.
2) Find the position of comfort or "mobile point."
3) Monitor patient response, but take pressure off tender point.
4) Hold position of comfort for 90 seconds.
- If there is fascultation (quivering) noted under the palpating finger, it may need to be held longer than 90 seconds.
- The position should be held longer if you feel a "pulse" under your palpating finger.

5) Return the patient to neutral passively, and SLOWLY.

6) Recheck tender point after treatment.
- A 70% improvement of the tender point is the minimum needed to be viewed as a successful treatment.

NOTE: Patients should be warned of possible soreness following the treatment sessions, but they should be reassured that this is NORMAL!

General Guidelines

There are many things to consider while performing a treatment with strain/counterstrain. In the following section, the general guidelines that should be followed will be discussed.

Once the position of comfort has been found, the position should be held for no less than ninety seconds.\(^5\) As described previously, this time frame has been noted throughout the developmental period of Jones' use of the technique. Holding the position for less than, or greater than, ninety seconds proved to be of no additional benefit to the patient. The return of the patient to neutral must be done slowly. This is done to avoid re-exciting the already highly facilitated reflex that led to the dysfunction.
There are also some basic assumptions regarding the tender points associated with the technique.\textsuperscript{7} Anterior tender points are usually treated with the patient in flexion and posterior tender points are usually treated with the patient in extension. The goal of treatment is to decrease the facilitated reflex. By "folding" the body around the tender point, either by active contraction or passive shortening, the spindle discharge will decrease; and with maximal shortening may even silence it. This will cause the dysfunction to cease.

Tender points on or near the midline are treated with the patient in more flexion or extension. Tender points located lateral from midline are treated with the patient in more rotation and side bending. If the patient presents with multiple tender points, the most severe point is treated first, and if they are present in a row the middle point is treated first. Tender points present in the extremities are usually located opposite the side of pain the patient is experiencing. Large regions of discomfort are to be treated before small regions, and the treatment should proceed from proximal to distal.

Throughout most of the literature cited,\textsuperscript{5-8,16} the authors have concluded that there are no contraindications to the current treatment of strain/counterstrain. It may be used on acute and chronic patients as well as young children to the elderly. The technique is safe and nontraumatic, but the patient should be warned that they may feel sore following a treatment session. This, however, is a normal response as the body is placed in the position of original strain, and painful tender points have been palpated.\textsuperscript{7}
Treatments of certain tender points are usually done a maximum of two to three times a week. The patient may be treated daily on different areas or tender points. Communication with the patient is very important. The therapist may want to watch subjective responses or use a pain scale to determine treatment effectiveness.

These guidelines have been incorporated after many years of Jones's simple trial and error. The anatomical and neurophysiologic basis for treatment utilization has also been incorporated after the theories proposed by Korr and Jones's research.
CHAPTER FOUR
CASE STUDIES

The literature regarding the effectiveness of strain/counterstrain is quite limited. Most of the knowledge obtained about the nature of somatic dysfunction and what strain/counterstrain has accomplished is based on patient accounts of injury, their response to treatment, and the observations of clinicians. Secondary to the limited amount of research in this area, the presentation of several case studies will be reviewed in an attempt to lend support and give the reader insight into the rationale of a strain/counterstrain treatment.

The following case study presented by Jones involved a middle-aged man who had a habit of falling asleep supine on the sofa. Several times during a nap, his right arm would occasionally fall off the edge of the sofa into marked extension. (For a minute or two this position cannot be considered much of a strain, but for a period of 45 minutes, it may become one.) For years, his wife, noticing her husband napping in this position, would slowly and gently replace the arm across his chest without awakening him (a slow return to neutral). This performance was repeated several times. One day he napped when his wife was out, and, as before, he kept his arm extended. He was awakened abruptly
by the ring of a telephone near his head, and he rapidly flexed his
overstretched elbow. He immediately began to feel pain in the right biceps
especially with movement into flexion. In time, his biceps musculature became
smaller from disuse. A diagnosis of biceps strain was made for his condition on
the basis of painful elbow flexion, even though palpation revealed no clinical
evidence of strained or injured tissue. By the time he was seen by Jones, he
had been disabled for two years with pain and progressive weakness of the
biceps. The patient failed to elicit tenderness in the biceps and thus, failed to
reveal any information as to the nature of the problem. However, palpation of
the distal triceps uncovered sharp tender points (evidence of excessive
proprioceptor activity in the triceps). The triceps had been maximally shortened
then suddenly lengthened with a panic response. Despite location of pain in
the biceps, the abnormal myofascial tender point was situated in the triceps.5,7

Treatment consisted of positioning the elbow in hyperextension so that
the biceps was put on a stretch and the triceps was allowed to maximally
shorten (mimicking the original strain position).7 If there had been tissue
rupture in the biceps, the stretch would have aggravated the patient's condition.
The position was held for ninety seconds while monitoring the tender points,
and slowly returned to the neutral position. He was relieved immediately and
left Jones' office with half of his pain gone. After three additional treatments,
full and painfree function was restored.5,7
According to Jones, this case is unusual only in that it demonstrated the importance of slow return from a strained position. The patient's wife did not know this; rather, she was moving his arm slowly to avoid waking him. Yet, according to Jones, her actions served the purpose of aborting a potential joint dysfunction on several occasions. The pain he experienced began because of his sudden flexion of a joint that had been overstretched in extension. The continued dysfunction, complete with its tender points, was on the posterior aspect of the elbow, where tissues had never been strained. The real strain, the pain, and the apparent weakness were on the front of the elbow and biceps, but the tender point was on the extensor side of the elbow related to the triceps. Atrophy of the patient's biceps was from disuse which resolved completely.

In the second case, also reported by Jones, a young man was running down some steps with low risers and wide treads (i.e., similar to many public building entrances). He ran too fast and overstepped with his left foot, so that only his heel landed on the edge of the step. His ankle was sharply and painfully strained or sprained into extension. He presented with residual pain and weakness while lifting his foot. He was unable to clear his toes and occasionally stumbled. The affected foot was, however, strong enough for him to stand, and he could even hop on it.

An orthopedic surgeon advised the patient to undergo surgery for torn ligaments. The patient, not wanting to undergo surgery and its financial
considerations, consulted Jones. His examination revealed no tenderness in the anterior ankle. Sharp tenderness was found upon palpation along the insertion of the achilles tendon. Treatment consisted of positioning the ankle in hyperextension, shortening the gastrocnemius. The position was held for ninety seconds, with a slow return to the neutral position. The tender point and evidence of increased proprioceptor activity were again on the opposite side from the real strain, the pain, and apparent weakness. After two additional treatments, the patient had sufficient lasting comfort.

The third case study, described by Jones, involved a middle-aged businessman who arrived home early for lunch one spring morning. As he walked by his flower garden, he squatted down to pull a few weeds. He was still pulling weeds forty-five minutes later. Finally, his wife called him, and he arose suddenly and felt severe low-back pain, which prevented him from standing erect. Upon examination, a myofascial tender point was found in the psoas muscle. Treatment included marked thoracolumbar flexion until the tenderness subsided. Again, the position was held for ninety seconds with a slow return to neutral. There was no posterior tender point to validate his posterior back pain. Assuming that forty-five minutes of squatting constitutes a strain for a businessman, Jones reported the strain must have been in the posterior part of the spine. Apparently the only injury the psoas muscle had suffered was prolonged shortening and sudden lengthening. Jones proposed
that only one treatment was necessary as the patient sought treatment promptly.

The forth, and final, case study offered by Jones\textsuperscript{7} in support of his technique involved an elderly female. This particular patient had a habit of nodding off, and would then awaken suddenly and raise her head off her chest. After one particularly long doze with her head down, followed by an abrupt awakening, she was unable to hold her head up. She had severe lower cervical pain which radiated across the top of her shoulders. No tenderness was found posteriorly where the pain was located, but there was sharp sensitivity in the suprasternal notch, indicating dysfunction at the level of the first thoracic intervertebral joint. While the patient was seated, and with her hands clasped over the top of her head, it was easy to attain marked cervicothoracic flexion at that level. Ninety seconds of holding this position and slow return to neutral relieved her pain. She continued to have recurrences for several months. The assumption by Jones was that she was continuing to repeat the original strain.\textsuperscript{7}

Based on the research conducted by Jones,\textsuperscript{6} it is proposed that this type of scenario is so standard it becomes almost predictable. In many cases, the area near the pain is examined just because the patient expects it. However, the palpation of a sharp tender point where he had no pain is discovered.

Except for the case study involving the ankle injury, these histories follow a similar course of prolonged strain and sudden recovery. As a result of
Jones' research, he has noted that regardless of the type of strain, whether prolonged or sudden and violent, successful treatment follows the same pattern.

Strain/counterstrain has also been utilized as a technique for specific osteopathic diagnosis and manipulative treatment of bed-bound, acutely ill patients in the medical, surgical, obstetric, and pediatric services. It is considered by Jones and his colleagues to be a nontraumatic method of care used for critically ill patients who are not able to cooperate due to their physical limitations or because they may be attached to multiple supportive devices.

At the medical service of James A. Taylor Hospital, a fifty bed, acute-care general hospital with a thirty-eight bed intermediate-care facility attached, counterstrain is the primary manipulative method used by osteopathic medicine. It is routinely used for treatment in adjunct to other therapies for myocardial infarction, congestive heart failure, respiratory failure, pneumonia, bronchitis, and asthma.

According to Schwartz, in conjunction with Jones' theories, counterstrain can also be used to differentiate between disease and functional disorders. For example, a patient with an anterior myofascial Jones' point at T11 may have appendicitis or somatic dysfunction. The Jones' point (as described previously) is then normalized with the counterstrain procedure. If the pain returns to the Jones' point as well as the abdomen within a very short period of time, acute appendicitis would be strongly suspected. Conversely, if the pain
were markedly improved, there would be little doubt that appendicitis was not involved. This technique also can be used to diagnose between myocardial infarction and acute costochondritis, with the latter being very amenable to treatment for left anterior interspace dysfunction. According to the authors, literally thousands of hospital days could be saved by osteopathic examination for interspace dysfunction and appropriate counterstrain treatment. Jones has stated that all counterstrain positions are amenable to the bed-bound patient. The positions utilized in treatment have been developed from the writings, teachings, and individual adaptations of Jones.

Utilizing the treatment of strain/counterstrain has few disadvantages. For some patients who have been treated by more orthodox methods, it may be difficult for them to realize that such a simple, nontraumatic technique could have such a great impact. Approximately twenty-five to thirty percent of the patients treated in the facility have had some reaction to treatment, despite the ease of administration and the passive motion used.

According to Schwartz, the most important advantage to the use of the technique is that positioning can be carried out for almost every patient, and the patient does not have to be cooperative to be treated. Treatment may be used on patients with fractures, as well as postsurgically for incision site pain. If the part of the body that is to be treated can be moved by the patient, it can be safely treated with counterstrain technique. If administered correctly, the result
should be long-lasting, and it is usually unnecessary to treat the patient on a daily basis unless there is a strong, ongoing neurosensory reflex.
CHAPTER FIVE

COMPARISON TO OTHER MT TECHNIQUES

The treatment technique of strain/counterstrain may be used alone as a treatment or in conjunction with other modalities or manual therapy techniques. Manual therapy techniques are one component part of nonsurgical management of the patient and are used to assist in elimination of pain and improvement of function. Manual therapy techniques include massage, muscle stretching, distraction, mobilization, and manipulation. There are multiple definitions for the terms "manipulation" and "mobilization." For example, Cyriax defined manipulation as the use of hands to passively move a joint for a therapeutic purpose. Paris describes manipulation as the skillful application of a passive movement to a joint. Maitland defined mobilization as the passive movement performed with a rhythm and grade so that the patient is able to prevent the technique from being performed. Paris suggested the terms mobilization and manipulation are identical in meaning and can be used interchangeably. Strain/counterstrain is often times viewed as an osteopathic manipulation. Among some physical therapists in the United States, "mobilization" has probably evolved as a common term for two reasons:
1) therapists may want to avoid the term "manipulation" because of its strong association with the chiropractic profession, and 2) "mobilization" is an accepted term in some physical therapy practice acts.²

The approaches to evaluation and treatment of somatic dysfunction have been a strong point of identification and argument regarding differences among the various approaches to manual therapy. A comparison of four evaluation approaches used in manual therapy as reviewed by Cookson and Kent²¹ is presented in Tables 1 and 2. The philosophical basis presented for the evaluative approaches has also been indicated as a critical factor in understanding how the evaluation will be structured and how the clinical findings will be interpreted. This has lead to a difference in interpreting musculoskeletal signs and symptoms. For example, Cyriax¹⁸ subscribed to an assessment system closely linked with his interpretation of applied anatomy. Mennell's²² primary focus was examination of synovial joints and treatment of joint dysfunction with joint-play techniques. Central to the osteopathic approach has been the belief that the body is an integrated unit or total system; that is, the neuromuscular system is connected with other systems of the body and disease processes are frequently visible in the musculoskeletal system. In strain/counterstrain, the focus has been on somatic dysfunction and the body's response to dysfunction perpetuated through tender points and painful limitations of range of motion.² Each approach has its own set of examination procedures specific to that technique.
<table>
<thead>
<tr>
<th><strong>Philosophical Basis:</strong></th>
<th>1) All pain has an anatomical source.</th>
<th>1) The body is a total unit and the neuromusculoskeletal system is connected with other systems, therefore disease processes are visible in the musculoskeletal system.</th>
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<tr>
<td>2) All treatment must reach that anatomical source.</td>
<td>2) The structure of the body body governs function; abnormal structure can lead to abnormal function.</td>
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<tr>
<th><strong>Key Concepts:</strong></th>
<th><em>Diagnosis of soft tissue dysfunction</em>&lt;br&gt;<em>Categorization of referred pain</em>&lt;br&gt;<em>Differentiation of contractile and non-contractile lesions</em></th>
<th><em>Diagnosis of somatic lesions</em>&lt;br&gt;<em>Exam focuses on asymmetry restricted movement, and palpation</em></th>
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<th><strong>Evaluation Framework:</strong></th>
<th><strong>History:</strong>&lt;br&gt;<em>Age and occupation</em>&lt;br&gt;<em>Symptoms</em>&lt;br&gt;<em>Medical considerations</em>&lt;br&gt;<em>Inspection</em></th>
<th><strong>History:</strong>&lt;br&gt;<em>Knowledge of physical trauma, soft tissue problems</em>&lt;br&gt;<em>Present complaint</em></th>
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<td><strong>PHYSICAL:</strong>&lt;br&gt;<em>AROM</em>&lt;br&gt;<em>PROM</em>&lt;br&gt;<em>RROM</em>&lt;br&gt;<em>Neuro Exam</em>&lt;br&gt;<em>Palpation</em></td>
<td><strong>PHYSICAL:</strong>&lt;br&gt;<em>Detailed eval of dysfunction areas</em>&lt;br&gt;<em>Postural analysis</em>&lt;br&gt;<em>Pelvic girdle</em>&lt;br&gt;<em>Foot</em>&lt;br&gt;<em>Vertebral column</em>&lt;br&gt;<em>Shoulder and hand</em></td>
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| **Interpretation of Evaluation:**<br>*Identification of anatomical structure associated with lesion* | **Interpretation of Evaluation:**<br>*Positional fault*<br>*Restriction fault*<br>*Is it segmental?* |
| --- | --- | --- |

<p>| <strong>Treatment Strategies:</strong>&lt;br&gt;<em>Friction massage</em>&lt;br&gt;<em>Manipulation or Mobilization</em>&lt;br&gt;<em>PT (ex, modalities)</em>&lt;br&gt;<em>Patient education</em> | <strong>Treatment Strategies:</strong>&lt;br&gt;<em>Manipulation or Mobilization</em>&lt;br&gt;<em>Muscle energy</em>&lt;br&gt;<em>Counterstrain</em>&lt;br&gt;<em>PT</em> |</p>
<table>
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<tr>
<th><strong>Philosophical Basis:</strong></th>
<th><strong>Maitland Contentions:</strong></th>
<th><strong>McKenzie Contentions:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1) Personal commitment to understand the pt.</td>
<td>1) Predisposing factors of sitting posture, and loss of range contribute to spinal pain</td>
</tr>
<tr>
<td></td>
<td>2) Think about and apply theoretical and clinical thinking</td>
<td>2) Patient involvement in self-treatment</td>
</tr>
<tr>
<td></td>
<td>3) Continual assessment and reassessment</td>
<td></td>
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</tbody>
</table>

**Key Concepts:**
- Exam, technique, and assessment are interrelated
- Grades of movement
- Testing accessory joint movements
- Differential assessment to prove or disprove hypotheses
- *Exam, technique, and assessment are interrelated |
- *Grades of movement |
- *Testing accessory joint movements |
- *Differential assessment to prove or disprove hypotheses |
- *During movements of the spine, the nucleus undergoes a positional change |
- *Flexion=posterior position of nucleus |
- *Intervertebral disc is a common source of back pain |

**Evaluation Framework:**
- Establish kind of disorder
- Area of symptoms
- Behavior of symptoms
- Observation
- Functional tests
- AROM, PROM
- Palpation
- Neuro exam
- Subjective History
- Posture
- Examine movement
- Repeated movements
- Test movements
- Other tests

**Interpretation of Evaluation:**
- Behavior of pt's symptoms
- The DX
- Stage of disorder
- Stability of disorder
- Irritability of disorder
- Postural syndrome
- Dysfunctional syndrome
- Derangement syndrome

**Treatment Strategies:**
- Based on continual assessment
- Mobilization or Manipulation
- Traction
- Exercise
- Patient education
- Pt self-treatment using repeated movements
- Exercise
- Mobilization or Manipulation
- Patient education
Acupressure and Acupuncture

Acupressure and acupuncture are other forms of therapy that are similar to strain/counterstrain with their use of tender/trigger points. Acupressure is a therapeutic touch technique that is also noninvasive. It is a traditional Chinese technique which substitutes application of pressure for the needles used in acupuncture. Most of the theoretical basis of acupuncture and acupressure are derived from a common source, The Yellow Emperor's Inner Classic on Medicine, which can be used to provide the theoretical and research foundation for acupressure. However, the research findings of acupuncture can not apply directly to acupressure as different techniques are utilized in the two treatment methods.

According to Weaver acupressure should be utilized only after a complete history and physical exam of the patient. Acupressure should be regarded as only one part of the treatment within a holistic system of health care; dietary, life-style changes, and other treatment methods also need to be considered. The decision to use acupressure as a treatment is dependent on the location and probable etiology of the patient's pain. The acupoint (similar to Jones' tender point) is probed deeply with the finger, thumb, or knuckle for a very pressure-sensitive spot in the same area as the acupoint. After the point is located, the client is encouraged to relax as much as possible during application of the stimulation. Approximately twenty pounds of pressure is applied. The acupoint is stimulated by pressing with the finger, thumb, or
knuckle and is massaged briskly in a circular motion for fifteen to twenty seconds. The procedure is repeated over the same point on the opposite side of the body. Effective stimulation should result in a cessation or decrease in symptoms and will often result in a continued sensation of stimulation over the acupoint for a few minutes afterward.  

The technique of acupuncture as stated previously is related to acupressure in its theoretical basis. In comparison to pharmacological treatment, acupuncture has been the more important, or dominant part of traditional Chinese medicine from the very beginning of its development.

Acupuncture is a simple, safe, and visible procedure which can be handled without much knowledge of physics and chemistry. Acupuncture is most frequently used in symptomatological relief of various kinds of pains and aches, regardless of the origin of pain. The scope of the illness in which acupuncture can be effectively used is usually limited to certain types of disease, such as diseases due to neuro-functional disorders, hormonal imbalance, gynecological disturbances, and gerontological conditions.

Acupuncture has, through many years of research, become an essential technique for correcting the reversible physiological malfunction of various parts of the body by physiological means. It is believed that the acupuncture-initiated impulses may activate the autonomic center and the hypophysial system in the brain so as to improve the efficiency of homeostatic and self-defense mechanisms of the body. Another contribution of acupuncture
research to modern medicine which should not be underestimated is that it has greatly advanced our understanding of the neural mechanism of pain and its control. With acupuncture there is new light into the neuronal circuits and the central processes involved in the transmission and integration of pain messages in the CNS.  

"Muscle Energy", Myofascial Techniques, Osteopathic Manipulation

Although there are many different techniques used to relieve somatic dysfunction, most appear to actively stretch the connective tissues in joint capsules, tendons, muscles, and ligaments in the area of restricted motion. For instance, in indirect "muscle energy," the muscles in the shortened area are initially stretched to the maximum extent allowed by the dysfunction. With the tissues in that position, the patient is instructed to contract the affected muscles voluntarily. This activation will stretch the internal connective tissues. Immediately following the isometric phase, passive extrinsic stretch is imposed, further lengthening the tissues toward the normal neutral position. Also, utilizing high-velocity, low-amplitude techniques used by osteopathic physicians, the restricted tissue is stretched carefully to its abnormal limit, thus avoiding further activation of the nociceptors in the affected tissues.

In counterstrain, in contrast, the already shortened and restricted tissues are initially further shortened. Maximal shortening is proposed to remove all internal stresses in the shortened muscle deactivating the nociceptors. By maintaining the position for ninety seconds, it is further expected that local
circulation will improve to release the sympathetic stimulation. With the slow return to neutral, the tissues will be allowed to elongate, absorbing the forces involved and decreasing their distribution to the nociceptor endings. Similar to this concept is the use of myofascial techniques which initially shorten the restricted connective tissues and muscles. This shortening is followed by a gradual stretch of the tissues in all directions natural to the affected joint. Again, the stretching is done slowly to avoid re-exciting the reflex and increasing nociceptive activity.

When considering the techniques of manual therapy, we must not forget the importance of palpation in treatment and diagnosis. Palpation plays a central role in the application of several MT techniques. Palpation is a practical skill that requires many hours of training and practice to master. Many clinicians believe that palpation of the spine and associated areas that contribute to the presenting symptoms may be the most informative aspect of the physical exam. In the case of strain/counterstrain, as well as mobilization, manipulation, acupressure, and many other MT techniques, palpation plays a vital role in determining the source of the musculoskeletal dysfunction and in the treatment of that dysfunction.

Summary

As clinicians become more eclectic in their evaluation and management of patients, the lines between evaluative approaches are likely to continue to blur over time. A challenge for physical therapists will be to search for and
identify the underlying theoretical arguments for manual therapy evaluation and treatment procedures that cross the various "philosophical approaches" so that propositions can be derived from the theories and tested.²

Even though we see that manual therapy approaches are based on somewhat different philosophies, they do share the common dimension of evaluation and treatment of the patients' musculoskeletal dysfunction.
CHAPTER SIX
CONCLUSION

This literature review has provided an overview of the innovative treatment technique of strain/counterstrain. This evolving subspecialty area of manual therapy, and of the physical therapy profession as a whole, has raised many questions, both positive and negative, regarding its usefulness and effectiveness in the field of physical therapy.

Manual therapy includes a broad set of evaluative and treatment procedures and strain/counterstrain is only one of those procedures used to decrease pain and improve function. Strain/counterstrain is proposed to be a safe and noninvasive procedure, for use with a variety of patients from the acute to chronic, and from infants to the elderly. Despite its lack of clear-cut and well-defined neurologic and physiologic basis, it continues to be utilized as a treatment choice in the search for treatment of somatic dysfunction. It is similar to other "hands on" manual therapy techniques but it is unique in its own right. Research and further discussion of the barrage of manual therapy techniques, more specifically the treatment of strain/counterstrain, will help to bridge the gap between the treatment technique itself, and its efficacy in the realm of physical therapy. As the technique becomes more replicable, it is
healthy to maintain skepticism, but the reality of what is noted in clinical practice should not be overlooked. Such research and investigation will be helpful in addressing questions such as: 1) Why are patients getting better? 2) What kinds of patients get better, and with what treatment? Ultimately this will aid in developing theories of practice in the profession of physical therapy.

As Rothstein\textsuperscript{2} stated:

\begin{quote}
We lack facts and evidence. Does this mean that manual therapy techniques do not work? NO!
\end{quote}

It means that, whether we like it or not, our profession's endorsement of manual therapy is based on anecdotal observations and a shared faith, a belief that exists in the absence of evidence.

Perhaps Charles Dickens said it best in a book aptly entitled \textbf{GREAT EXPECTATIONS}: "Take nothing on its looks; take everything on evidence." In order for strain/counterstrain to provide us with that evidence, there is a need for continuing research.
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