LOW BACK PAIN AND DYSFUNCTION

OVERVIEW, ASSESSMENT & TREATMENT

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"Beyond all doubt the use of the human hand, as a method of reducing human suffering, is the oldest remedy known to man…" John McM. Mennel, MD

Preface

It will be assumed by this writer that the reader is well founded in functional anatomy and the involved in a practice of Manual Medicine. I will present issues that I believe are not commonly covered in basic anatomy or training courses. I offer this presentation as fodder, raw material for artistic creation. Please do not take this as a manual on how to fix low backs. I am not sure that low back pain can be "fixed." Some heals itself with time. Sometimes we can relieve symptoms and reduce suffering. Sometimes all we can do is to help others help themselves.

It is my hope that my efforts here will spurn you on to make your own inquisition starting where I have left off. For those taking on the journey: God speed and God bless you. For the rest, I hope you find this informative and maybe even entertaining.

I defined a practice of Manual Medicine as being a forum through which a practitioner. utilizing a multimodality approach, assists others in relieving their discomfort, dysfunction, and pain. The particular combination of modalities available for use will be dependent upon each individual practitioner, their skills, their interests and their training. In many cases, it will also involve psychological, energetic, emotional and spiritual endeavors as well.

Overview

It is far beyond the scope of this paper to review all that has been written on low back pain since the mid-19th century. As of 1993 there were over 7000 publications discussing low back pain and the literature (1).

I would like to present an overview of low back pain and include a discussion on mechanisms, pain generators, assessment and treatment protocols that I have developed over the years. It is my hope that with this information the reader might better understand the nature of low back pain and more efficiently facilitate the patient's effort to ease or end their suffering.

Introduction

Back Pain Generalities

Nearly 80 percent of adults are affected by back pain at some point in their lives. It is one of the most common reasons for hospitalization in the United States. For many years, we assumed that back pain was usually the result of spinal degeneration or injury, especially damage to the intervertebral discs.

It is now believed that the leading cause of back pain is simple muscle strain. Although symptoms may come on suddenly and can be acutely painful, this is actually a problem that develops over a long period of time. When muscles contract, lactic acid and pyruvic acid are produced as byproducts of muscular activity. It is the presence of lactic acid in the muscles that produces the familiar sensation of muscle fatigue following strenuous activity **(**2).

Common Causes of Low Back Pain

Poor posture is a common cause for low back pain. A slouching posture, flexion, puts pressure on the anulus. An exaggerated to low back curve, extension, over a period of time, can strain and inflamed the facet joints. As a result, the low back musculature tightens and usually goes into spasm to support the back adding to or creating low back pain.

It is interesting to note that if you divide humans into two groups squatters and not squatters you find that the squatters have considerably less the degenerative disc problems when compared do not squatters. These findings suggest that lordosis is implicated in the pathogenesis of degeneration of lumbar disc (3).

The lack of exercise leads to poor muscle tone and spinal instability, thereby creating a prime opportunity for injury to the low back during regular and mundane in activities. Overeating to the point of abdominal distention and pelvic tilting is also common cause of low back pain in the American population in a wide range of ages.

Other Causes Include:

Back Strains or Sprains are usually a result of common activities done improperly such as bending, lifting, standing, or sitting.

Ruptured Discs are famous for causing severe back pain. The nucleus of the disc may bulge and press on a nerve root in its tough capsule. It may herniate through the capsule and pin spinal nerves against a bony part of the spine. Radicular pain down the back of the thigh and leg is commonly referred to as sciatica. The first level of complaint of this malady is sensory, such as pain, numbness, or tingling. The second and more serious level of complaint from the patient is motor function weakness or loss of use. Some patients do well without surgery. Some benefit from a laminectomy, diskectomy, or spinal fusion.

Facet Irritation: Osteoarthritis narrows the articulating space and produces irritating spurs on the vertebral bodies. Over time, as discs wear out, osteophytes form and facets begin to inflame, causing pain. This condition may cause or worsen stenosis, which eventually irritates the nearby nerves, causing more pain.

Tension and Emotional Problems such as money worries, family pressures and fatigue can actually cause back pain as well.

Other Causes for low back pain include spondylosis or other degenerative changes in the spine and spondylolisthesis where repeated lumbar extensions eventually cause vertebra to slip anterior and posterior, producing stress fractures. The result is a stretched disc that puts pressure on the anulus, irritating nerve roots. Both of these conditions are low back pain generators.

Kidney, bladder, and prostate problems, female public disorders, and even constipation may produce back pain. Back pain can also be the result of improper footwear, poor walking habits, improper lifting, straining, calcium deficiency, slouching while standing or sitting, and sleeping on a mattress that's too soft. Chronic conditions that cause back pain include arthritis, rheumatism, bone disease, and abnormal curvature of the spine. Fractures are rarely the cause of back pain.

PAIN

I would like to add a few comments on personal style here. This is the beginning of an ongoing relationship with someone who is suffering. They have come to you because you're seen as an authority. You are paid to perform a personal service with people. You know more about relieving

pain and suffering by putting your hands on people than most other physicians of any kind. I call you physicians because you help relieve people suffering. You happen to do it by touching them in a knowing and caring manner. The relationship that you establish with the person before you will finish as it begins. Just like the Basic Series: do a great first hour and the rest will follow.

Both Rolfing and pain management are functions of interacting with another individual. Be a great listener, you'll learn their respect as a human being. Be 100% available on all three levels of the heart, head and hands from the very beginning to the very end. You'll be amazed at the results.

Before embarking in the formidable task of assisting a patient who is suffering from low back pain, or any other pain condition for that matter, you need to take a competent case history, do an appropriate physical examination, make a treatment plan based on the results of the case history and the findings of your examination.

In taking the case history, you will want to make sure that this patient is in the correct office. The easiest screen for this is to review the case for “red flags. ” A “red flag” in a case means only one thing, STOP and LOOK very carefully at this case for appropriateness for referral to a medical or osteopathic physician. I have listed the most common flags below, but this list is not complete. Stay on your toes and remain very aware of what your patient tells you during the case history taking phase.

Danger Signals in Low Back Pain

Bladder or bowel dysfunction
Impotence
Weakness of ankle dorsiflexion
Ankle clonus
Color change in the extremity
Considerable night pain unrelieved by rest
Constant and progressive symptomatology
Fever and chills
Weight loss
Lymphadenopathy
Distended abdominal veins
Buttock claudication

Tissue Sources of Pain

The primary sources of pain are: (1) soft tissue: nerves, ligaments, tendons, and muscles; (2) facet damage or inflammation; (3) damaged/injured disk structures. Understand that there will always be a primary pain generator and almost as often, there will be secondary and tertiary pain generators that act in concert as supportive structures in the bodies effort to control further damage and or pain. This is especially true in low back pain. If a muscle is strained or pulled, it may eventually strain a functional unit unilaterally to the point of facilitating a subluxed or fixated vertebra. This process can set up a compressed nerve scenario, which starts another level of muscle contracture and the myospastic cycle is initiated.

As we are all to well aware of, everything is connected. Understanding these connections is the foundation of knowledge that makes it possible to facilitate pain reduction. Without this understanding, our work becomes a patchwork affair and relief is a matter of luck to a large degree.

Soft Tissue Pain is accompanied by tenderness, which is palpable, but just how much the patient suffers from that pain is very subjective. The examiner can also elicit to soft tissue pain by passive stretching, but often this motion also involves other periarticular soft tissues. Contracting

the involved soft tissue also can produce pain but this contracting also produces pressure within the disc as well, and so this does not represent an isolated tissue response. In summary, there is no laboratory or imaging study that has confirmed myogenic pain, so in such a finding, subjectivity predominates (4).

Injuries to the muscle belly or tendon adversely affect the muscles ability to contract fully because of a mechanical insufficiency or because of pain. If the musculotendinous unit has been mechanically altered through partial or complete tears, the unit can no longer produce the forces required to perform simple movements. Partial tears may create decreased force production secondary to pain elicited during the contraction. Complete tears of the unit resulted in the muscles and ability to produce any motion at all (5).

Strains are indirect injuries to muscles and tendons caused by overstretching or tension within the fibers of the muscle. Muscle strains occur at the junction between the muscle belly and an attendant. More often than not this happens at the distal junction. This evidentiary usually occurs because of a single episode of overstretching or overloading the muscle but is more likely to result from eccentric loading (6).

Tendonitis is inflammation of the muscle tendon. This usually occurs because of small repetitive forces or micro traumas being placed in the muscle. In chronic inflammation, the insulted tendon thickens. In the involve tenderness and tendonitis are usually painful and motion. There may be visible swelling in their sheets because of fluid accumulation and/or inflammation. A lot of attendant, localized tenderness of variables severity can be present (7).

Another soft tissue pain generator is bursitis. The bursae are fluid filled sacs to serve to buffer muscles, tendons, and ligaments from other friction causing services such as bony surfaces. They also serve to facilitate smooth motion. Most bursa cannot be palpating easily except when they are inflamed. Inflammation usually comes about as a result of irritation of the bursal sac. This initial insult can come from disease, increased stress, friction or single dramatic event that activates this process. According to the Merck Manual (8), the symptoms included in pain, swelling and tenderness and. A chronic bursitis condition will cause muscle atrophy and limited motion will ensue.

A sprain occurs when the structures and a joint are stretched beyond their anatomical limits and. This results in the overstretching or tearing of ligaments and/or the joint capsule itself. It first-degree sprained his weather ligaments are stress with little or no tearing. A third-degree sprain is where the ligaments have been completely ruptured. This causes gross joint instability and an empty or absent end point in a range of motion examination.

Subluxations occur when there's a partial or complete disassociation of the joints articulating services that may or may not return to their normal anatomical positions. When this occurs oftentimes there's soft tissue damage as well.

Dislocations occur when there's a complete disassociation of the joints articulating services. When this evidentiary occurs in the forces usually sufficient enough to rupture many of the soft tissue constraints surrounding the joint.

Any imbalance in the trunk musculature will eventually lead to low back pain and strain. The musculature must be balanced in all planes as well as in the agonist/antagonist pairings. The most common culprit here is the overpowering of the lumbar trunk musculature by the hip flexors, namely the psoas. When this happens, the lumbar lordosis increases, the contents of the pelvic bowl are dumped adding to the low back strain and the erector mass and the iliolumbar triangle musculature struggles to maintain the pelvis in some sort of balance: a losing battle. The other major muscle pairs internal and external femoral rotators and the abductors and adductors, obviously, have to be in balance as well. Without balance, you will have pain. When is the question, not if.

Contra lateral balance is just as important. The right hip flexor group must be in balance with the left hip extensor group. If this balance is not maintained pelvic torsion will ensue, followed by pain and dysfunction. The right adductor group must be in balance with the left abductor group. Obviously, this is the case with all paired muscles. That's most of them, isn't it?

Frequently, when the balance of the external femoral rotators is significantly off, what is called the "piriformis syndrome" comes about. The primary symptom of piriformis syndrome is buttock pain, with or without pain in the hamstring region that is exacerbated by sitting or activity. In an isolated piriformis syndrome, the prominent findings include buttock region tenderness from the sacrum to the greater trochanter and reproduction of but pain on the prolonged hip flexion, abduction, and internal rotation. Minor findings include leg length discrepancy, weak adductors, and painful hip abduction while sitting. Sometimes external rotation of the hip while supine has also been found to exacerbate piriformis contracture pain, according to Barton (9). When you have one piriformis contracted and not the other, the sacrum shifts laterally on its long axis. This creates a painful and dysfunctional condition in the low back region, known as an "apex shift."

This muscle acts as an abductor and external rotator of the joint, Cox notes that it is interesting to note that a double insertion of the piriformis muscle is seen in 10 to 15% of patients (10). It is fairly common to see the sciatica nerve or its peroneal division passes through the split piriformis muscle.

In Travell's Volume 2 she reports that a compilation of four cadaver studies of over 3000 bodies revealed four different routes that the sciatic nerve took after exiting the pelvis. Eightyfive percent of them took the usual route: *anterior to the piriformis*. In more than 10% of the cases, the peroneal portion of the sciatic nerve passed *through* the muscle. In 2-3% of the cadavers, the peroneal portion *looped superior and then posterior* to the muscle. Finally, less than 1% of the cadavers had the *undivided sciatic nerve penetrate the piriformis* (11). Cox (12) found that a double insertion of the piriformis was seen in 10 to 15% in patients and that the sciatic nerve or at least its peroneal division passed through the split piriformis muscle.

Currently, Cox reports (13) sciatica is now believed to result of irritation of the sciatica nerve sheaths that is caused by biochemical agents released from an inflamed piriformis muscle were the two structures meet at the sciatica notch. The symptoms the piriformis syndrome present are almost identical to those of lumbar disc syndrome. The difference is that there is a consistent absence of true neurological findings. Assessment is accomplished by palpation of myofascial of the trigger points within the piriformis muscle. Traditional allopathic treatment, which consists of conservative approach employing local anesthetics in osteopathic manipulation, is without significant risk. Reducing muscle spasm, restoring joint motion, and keeping the patient ambulatory and in motion are keys to successful treatment.

In discussing the lumbar intervertebral disc syndrome, there are four elements of the nervous system may be involved in the production of the syndrome:

1. *Lumbosacral nerve roots*: The nerve root is usually irritated because of its being stretched over a protruding or prolapsed disc.

2. *Spinal nerves:* Irritation of the spinal nerve may result from the arthrosis of the zygapophysial joints, the ligamentum flavum or hypertrophy, osteophytes, intervertebral disc protrusion, subluxation, spondylolisthesis, infection, tumor, fracture, Paget's disease, or ankylosing spondylitis.

3. *Dorsal rami*: Which supply the zygapophyseal joints, the erector spinae muscles and the related fascia and skin and the periosteum of verbal arches pain, the multifidus muscles, the interspinous ligament, and interspinous muscles are irritated by articular facet arthrosis, subluxation, sacroiliac joint arthrosis, spinous process impingement, strain of

the sacrum joints, hyperlordosis, scoliosis, myositis, muscle spasm, and reactions of secondary to sclerosis or arthrosis of the articular facets.

4. *Sinuvertebral nerves:* The SVN also known as the recurrent meningeal nerve supplies the posterior longitudinal ligament as well as the anulus fibrosus of the disc. A descending branch runs caudally for a maximum of two segments, supplying the anulus fibrosis and the posterior longitudinal ligament. Any lesion of the anulus and or posterior longitudinal ligament is capable of setting up pain impulses in the sinuvertebral nerve.

"Two **basic** causes of low back pain are internal derangements of the intervertebral disc and irritation of the zygapophysial articulation. The ontogeny of low back pain concerns two structures: the disc and the facet." This is from Bogduk's work (14), "The Anatomy of the Lumbar Intervertebral Disc Syndrome. "

Facet Pain: A number of researchers have confirmed that abnormalities within the facet, or zygapophysial joint can be a source of this persistent or chronic pain. It is reproduced by lumbar extension and relieved by almost any lumbar flexion movement. Facet pain is also relieved by walking but exacerbated by lumbar extension and rotation toward the symptomatic side according to Cailliet (15).

The pedicle-facet complex normally carries only 20 percent of the vertebral pressure applied at the interface. This constitutes 10 times the weight per square inch applied to the knee joint. As the disc loses tugor and resilience, it's also loses its ability to resist compressive forces and to maintain normal and intervertebral separation and alignment. This throws an additional burden on the facet articulations and may accelerate the changes of degenerative arthrosis (16).

Degenerative disease of the facet joints is very common in older people as well as in people who have suffered lots of low back and / or pelvic trauma. Consequently, it is considered a major cause of low back pain. At the same time, there have been many cases of this condition in patients who suffer no low back pain at all.

When the patient does suffer from degenerative disease of a facet and has single leg symptoms, their pain is usually more severe, it has a longer duration, not necessarily traumatically induced, and usually not relieved by bed rest. These people have limited lumbar extension and side bending to the affected side exacerbates their condition (17).

Lumbar Discogenic Pain:

In my work in the field of Manual Medicine, I have only felt comfortable dealing with grades 1 and 2. Grade 3 is risky business and grade 4 is inappropriate for work in my office. With this means is that and comfortable working on stabilized spondylolisthesis. Unstable spinal fractures in my office make me feel nervous.

In General:

Kuslich et al, (18) studied pain data and pain distributions of lumbar structures of progressively anesthetized patients. Here are some of their findings:

No. 1: it was the anulus fibrosis of the disc that was the origin in most cases of low back pain.

No. 2: the facet synovium in was never sensitive.

No. 3: the articulating cartridge of the facet was never sensitive either.

No. 4: the facet joint capsule was tender sometimes but never referred to the leg.

No. 5: the end plate of the vertebra cause a deep rather severe low back pain when it was compressed.

No. 6: when the outer anulus and the nerve root were irritated but pain was elicited.

No. 7: the normal nerve roots were completely insensitive to pain.

No. 8: low back pain was produced when the lumbar fascia was irritated at the supraspinous ligament.

No. 9: the only thing they can reproduce sciatica was the stimulation of a swollen, stretched or compressed nerve root.

No. 10: the surface of the bone, even the periosteum was insensitive. The spinous process, laminae and facet both can be removed with a rongeur without anesthetic.

No. 11: scar tissue was insensitive to pain stimulation. What scar tissue does is to act to fix the nerve root in one position, thereby increasing the susceptibility of the nerve root to tension and compression.

I saved this list for last, not because it was the least important of pain generators of the low back, but because of its level of importance. This list will be covered in your history taking process. You need to structure your case history form in such a manner that you become informed of both the "red flags" to mechanical work on the low back pain patient and the pain generators that do not have a mechanical basis. This is a very important list. If you proceed to work to help facilitate the pain reduction of someone who has one or more of some of these conditions when they should be in the office of a more appropriate physician, you could be making a very serious mistake with their health and perhaps their life.

In my practice, it is important to me that I get the "correct" answer that I want to each of these questions before the examination begins, much less before the treatment begins. If someone tells me that they have a history of abdominal aortic aneurysm, I sit up real straight in my chair. If I had dropped to 98% attention rate, they now have 100%. This list helped me form the first rule of my practice is: **"NO ONE DIES IN MY OFFICE. "** I work hard to make sure that rule is followed. The best way that I have found not to break my first rule is to do is to take a good case history and do a competent physical exam. First things first. This is the first thing to do: your intake process.

Non-Mechanical Low Back Pain Generators (19)

1. Gastrointestinal disorders
    - Colorectal carcinoma
    - Gastric carcinoma
    - Pancreatic carcinoma
    - Retrocecal or pelvic appendicitis
    - Pancreatitis
    - Diverticulitis
    - Irritable bowel syndrome
    - Peptic ulcer with posterior penetration

2. Retroperitoneal disorders
    - Aortic dissection
    - Abdominal aortic aneurysm
    - Retroperitoneal tumor, bleeding or abscess
    - Renal or ureteral colic/carcinoma

3. Gynecologic
    - Endometriosis
    - Urine myomas
    - Gynecologic carcinoma
    - Urine or ectopic pregnancy
    - Pelvic infection
    - Ovarian cyst/torsion
    - Menstruation

4. Others
    - Prostatitis
    - Prostatic carcinoma
    - Incipient herpes zoster

This is not to say that I do not work on folks with serious issues. When an allopathic physician sent a patient over for neck work with two carotid aortic aneurysms on his right side, he simple suggested that I be careful and not work directly on that area. I palpated them carefully, listened to them with a stethoscope and worked around them carefully. Very carefully. In addition, successfully as well, I might add.

If you know what you are dealing with, you can make a wise decision as to whether your work is appropriate for this particular patient at this particular point in time. If you are not sure, start reading**.** Harrison's Principles of Internal Medicine (20) is a good introduction. Then, talk to the referring physician, when the patient is under the direct care of one. Let them know your considerations, findings and treatment plan and ask for their comments. Not all will talk to you, but it is important, to you and for the patient, that you do the responsible, professional and appropriate thing.

Anatomical Tidbits

The muscle imbalance found in the pelvic region produces a clinical scenario known as "lower crossed syndrome" or LCS or the "pelvic crossed syndrome" or PCS. The syndrome is characterized by the over development of the hip flexor and contra lateral spiral erectors and extensors. As a result, the pelvis tilts anteriorly in a torquing manner and a lumbar hyperlordosis develops. Clinical implications here include an increase in facet and sacroiliac joints strain, altered hip mechanics, and overstress of the lumbosacral junction (21).

MUSCLE TENDENCIES RELEVANT TO LOW BACK PAIN PATIENT

Tightness Prone	**Inhibition Prone**
Iliopsoas	Gluteus Maximus
Rectus Femoris	Gluteus Medius
Erector Spinea	Lower Trapezial Fibers
Quadratus Lumborum	Serratus Anterior
Piriformis	Rectus Abdominis
Hamstrings	Oblique Abdominals
Tensor Fascia Latae	Transverse Abdominis
Thigh Adductors	Tibialis Anterior
Gastrocsoleus Complex	Peroneus Longus

Modified from: V, Janda; Muscle Weakness and Inhibition in Back Pain Syndromes. In: Grieve GP, ed, Modern Manual Therapy of the Vertebral Column, New York: Churchill Livingstone, 1986: 197-201

There is a tendency in modern our sedentary lifestyle for the overuse of postural muscles because of prolonged city or other constraint postures. Phasic muscles, on the other hand, are found to become more inhibited and weakened primarily because of this use. Agonist and antagonist muscle groupings are defined by Sherringtons' Law of Reciprocal Innervation. When they agonist\antagonist relationship becomes dysfunctional because of injury, constraint postures, or overuse, muscle and balance results this imbalance leads to dysfunctional movement during activities. They also interrupt coordinated muscular activities required for stabilization. Additional consequences of muscle imbalance often include ever rated joint mechanics. This causes an uneven distribution of articular pressure and altered centers of rotation. The result of all this is once again pain and dysfunction (22).

The "layer syndrome" involves a more generalized and extensive muscle imbalance through the whole body. Alternating layers of tight and deconditioned muscle groups with dysfunction of several movement patterns are commonly found in the syndrome. Over development and activity of the deep neck extensors, scapula elevators, spinal erectors, and hamstrings are common. This is combined with muscle weakness in gluteals, deep neck flexors, lower scapula fixators, and abdominal musculature. Clinical implications include truck destabilization, hypermobility in the transitional joints of the spine, chronic symptoms, and the potential for poor clinical outcome. Where there are syndromes and muscular imbalance patterns in general, are identified by posture of assessment, data analysis, and movement assessment (23).

Lumbar vertebrae have a rotational range of about one degree. So the entire lumbar spine can only rotate approximately 10° in total, but more importantly, remember that any functional unit of the lumbar spine can only turn two degrees combined and a segmental range of only one degree unilaterally (24). Movement on the sagittal plane is limited primarily by the anterior longitudinal ligament and osseous components of the vertebral arch to 60°of flexion and limited to 35°of extension by the spinous ligaments according to Kapandji (25).

The ligaments of the sacroiliac are basically divided into two groups: the iliolumbar and the sacrospinous/sacrotuberous regions. The iliolumbar group bind the sacrum, L4 and L5 to the iliac crests. The sacrospinous ligament runs from the lateral aspect of the lower sacrum and the coccyx to the ishial spine. The sacrotuberous ligament runs from the posterior aspect of the iliac crest along the inferior lateral aspect of the sacrum to the coccyx and attaches to the ishial tuberosity and a bit down the ishial rami (26).

Cailliet (27) found that in people between the ages of 30 and 40 years, the nucleus has a water content of 80%, which decreases with age. DePukey (28) found that the average person is 1% shorter and high at the end of the day than on first arising in the morning. He also found a person in the first decade of life is 2% shorter and bedtime, a person in the 80 decade of life is ½% shorter. This difference he attributes to the decreasing water content in the disc, which occurs with advancing age.

DePukey (28) believes that the hydrodynamics of the disc result from gel like structure of the nucleus pulposus. This quality enables it to absorb nine times its volume of water. No chemical bond influences this water content. This is because the HNP can be mechanically expressed under pressure; thus, weight bearing causes the decrease of 1% on average of height in a day.

Discs absorb shock by squeezing fluid out of the nucleus region of the disc. They also absorb shock by allowing the fibers of the outer shell, or anulus, to stretch. It is interesting to note that studies of disc fibers suggest that they have only limited elasticity and can only stretched 1.04 times their initial length before suffering permanent damage. For example, when a disc is compressed, for instance when we lift a heavy object or jump from a great height and land on our feet, this limited elasticity does not present a major problem. Indeed, when we are standing upright, the disc fibers can take 10 times as much compression as the vertebra themselves, so a heavy load will crush bones before it ruptures a disc compared to when there us lumbar flexion

involved in the activity.

Fibers of the anulus are less able to cope with torsion than with compression because with portion distressed concentrates at points of maximal curvature. This is because the disc shell is made up of layers of fibers that lie obliquely to each other in a crisscrossed pattern, portion tends to shear one layer from another, further weakening the total structure in this combined axial and rotational loading. So, you can see that we stand a much greater risk of damaging our disc when we try and left and object and twist our body or around at the same time (29).

Physical Examination

Clinical Anatomy

Patients without leg length deficiency, level iliac crests, and normal posture usually do not have any significant spinal or hip deformations. Nor do they have many severe joint contractures. Do keep in mind that a comparison of iliac crests by itself is not enough to reveal leg length discrepancy. Sacroiliac rotation and muscle and balance and their effect on the hip joint must be considered in any functional hip -- pelvic -- sacroiliac causes of leg length discrepancies. A weak gluteus medius musculature can also cause a functional short leg finding in the athletic or overweight patient. A contracted hip flexor will also cause apparent leg shortness. Therefore, it is important to do a complete examination of the low back pain patient in order to produce lasting effects from treatment.

For those of you familiar with Buckmeister Fuller and his model of the “tensegrity sphere. ” you can see how interconnected all parts of the whole are. For the rest of you, if you are old enough, you will have to rely on the old song about “dem’ bones” where the chorus would chime in with “the thigh bone connected to the knee bone; the knee bone connected to the leg bone….” When, one piece of the structure breaks integrity with the whole, the whole is affected to some degree. This event becomes easier to see with the passage of time after the body accepts an insult.

Take for example, if I suffered a sprain to my left ankle, I shift my weight over to the right foot to reduce to pain to the left. After some time of walking like this, I start feeling a pain in my right knee from it having to carry more than it’s share of the bodies weight. Over time this over develops my right hip flexor group and the left extensors struggle to maintain balance of the pelvis. This now develops a right anterior pelvic torsion and my spinal column follows the sacral base and twists to the left along with the pelvic. The proprioceptive center of the brain says that my eyes must point in the same direction as my feet and I self adjust the lumbar region of the spine to make the brain happy. The twist continues alternating sides as it moves up to the occiput and back down again on the contra lateral sides.

As the bones shift, the muscles follow in support. As the muscles contract, the bones follow because of their attachments. Both of these actions contribute to dysfunction joints, nerve compression, gait and postural alterations. All this translates into pain, eventually.

In working with the chronic low back pain patient a complete examination is vital to any long-term pain management. I am not suggesting that you do an exam that allopaths or osteopaths do, but I am strongly suggesting that you do a good mechanical examination, while keeping your eyes out and ears open for any signs that this patient needs a referral to another physician while taking in the information that will assist you in helping reduce this persons pain and suffering.

Clinical Examination

Before you can conduct the physical examination, you need to complete a case history taking. There are a number of forms available in books for this process. I took one from a chiropractor

friend and modified it for the needs of my practice. However you go about it, take a competent case history before touching the patient at all. During this process, you will cover “red flags” and referred pain issues that are mandatory considerations before touching a pain patient.

After the patient's formal clinical history has been reviewed, a decent physical examination is mandatory. Prescribing a treatment, whether a massage, in traditional Rolfing session, or a simple glass of water, but is inappropriate without first making a knowledgeable assessment of the patient's needs. Here, I will outline sometime in basic parameters for your inquiry into your patients low back pain complaints.

Exam Protocol

This is the sequence that I use when doing an initial physical examination. The list looks formidable. Don’t let the length scare you off. Practice with friends or relatives. Practice with long time patients. The more often you do it, the easier it gets. Make a record of your findings, refer to it during and between appointments. Compare your findings after re exams during the course of treatment and at the end of your work. Everyone can appreciate objective findings. It isn’t all in their head after all. This process will become second nature to you in short time. You already do many of the things on this list. I offer you a format and structure that will increase your confidence. Your patients will appreciate your level of competence, caring and professionalism.

During the patients first appointment several things get done: Intake interview, taking of case history, physical examination, photographs if appropriate, and a little work to give them a feeling for what the work will entail. Leave them happy after the first appointment. The first job after all is to instill a little hope that things will get better.

<u>STANDING</u>
Weight Distribution On Scales:
Static Posture: Counterbalanced Or Tension
Gait Analysis: Deviations:
Lumbar Flexion:
Lumbar Extension:
Lumbar Side Bending:
Hip Flexion:
Hip Adduction:
Hip Abduction
Hip Extension:
Femoral Rotation:

<u>SUPINE</u>
ASIS Musculature Attachments Tenderness:
Ishial Tuberosity Muscular Attachment Tenderness:
Psoas Tone:
Iliacus Tone:
Leg Length:
Pelvic Torsion:
Symphysis Alignment:
Sacroiliac Tenderness:
Lumbosacral Tenderness:
Iliolumbar Triangle Musculature Tenderness:

<u>PRONE</u>
Lumbar Vertebral Alignment:
Sacral Base Status:
Sacral Apex Status:

Piriformis Tenderness:
Angle of Torsion: Retroversion/ Anteversion
Angle of Inclination: Valgus / Varus

NEUROLOGICAL EXAMINATION
Straight Leg Raise Test:
Toe Walk:
Heel Walk:

Examination Notes

NOTE: Below are some notes on simple tests to determine if there are any significant restrictions in the range of motion of lumbar spine and the hip joints. I use a Craftsman Protractor used to calculate roof pitch angles for years to measure specific degrees. You can spend more but a degree is just a degree.

STANDING

Weight Distribution On Scales: I have two simple bathroom scales that I have the patient stand on with one foot on each scale. I direct the patient not to look at the readouts. This information is invaluable and objective.

Static Posture: Counterbalanced, Debutant Slump, Tension, etc., etc.: Do a simple analysis of the patients side posture. Photos help. Love my digital camera.

Gait/Movement Analysis: Deviations: Note weight transfers, foot placement, knee tracking, etc, etc.

Lumbar Flexion: While stabilizing the pelvis, have the patient go into lumbar flexion which should run around 90°.

Lumbar Extension: Same for extension. Looking for 30°.

Lumbar Side Bending: Same for lateral side bending of lumbar spine. Again, about 30°

Hip Flexion: Have standing or supine patient pull each knee to their chest. It should almost reach the chest or about 135° (30).

Hip Adduction: Have the standing patient alternately cross their straight legs one over the other. They should reach at least 20° (30).

Hip Abduction: Ask the standing patient to spread one leg at a time from the other. 45° from the midline is about average (31).

Hip Extension: Have the patient sit in a chair and then have him stand up straight without bending his back (32).

Femoral Rotation: Have the supine patient turn the knee medially and laterally. They should reach about 35° of internal rotation and 45° lateral. Now have them flex the hip, stabilize the knee and move the ankle medially and then laterally and note the range (33).

SUPINE

ASIS Musculature Attachments Tenderness: Utilize conventional technique here

Ishial Tuberosity Muscular Attachment Tenderness: Utilize conventional technique here

Psoas Tone: Utilize conventional technique here

Iliacus Tone: Utilize conventional technique here

Leg Length: True Leg Length Discrepancy: Compare to distance from the medial malleolus to the anterior superior iliac spine on each leg.

Apparent Leg Length Discrepancy: The results for the true leg length differences are negative is appropriate to assume apparent length discrepancy. This assumption will lead the examiner to the questions of pelvic obliquity and flexion and/or adduction contracture of the hip joint among other things. Functional leg deficiencies can be caused by contracted hip abductors on the apparent long leg or contracted hip adductors on the apparent short leg (34).

Pelvic Torsion or Pelvic Obliquity: Place the patient in the supine position, palpate the anterior superior iliac spinae. You'll often find that the low back pain patient will present with the right side anterior and inferior to the left.

Symphysis Alignment: Philip Greenman (35) states that the pubic symphysis dysfunction is very common and torqued pelvis. It is very uncommon that you'll find a patient with a chronically torqued pelvis who has not suffered from a pubic symphysis displacement. This condition is easily assessed by palpating the superior aspect of the symphysis noting any disparity in height of the pubic tubercle.

Under significant trauma, there can be a total shear of the symphysis. This is best assessed by having the patient stand on one leg while the examiner is palpating the symphysis. In a positive test you will notice and up shift at the pubic tubercle on the supporting leg side. Refer the patient to the orthopedic

Sacroiliac Tenderness: Continue examining the patient in the supine position by placing both of your hands under the patient's iliae and move your fingertips into the sacroiliac joint space. You should find clean open joints bilaterally. In the patient with the right anterior pelvic torsion, very often you'll find a large gap between the ileum and the sacrum on the left side and a compressed joint on the right. In this case, the patient will complain of sharp pain in the left sacroiliac joint space and a dull diffuse pain on the right side.

Lumbosacral Tenderness: Utilize conventional technique here

Iliolumbar Triangle Musculature Tenderness: Utilize conventional technique here

<u>PRONE</u>

Sacral Base Status: *Posterior Sacral Base:*

If you note that the patient is unable to raise their knees anymore than a few inches, say less than 4”, then suspect a posterior sacral base. This will be confirmed by tightness in both of the sacral tuberous ligaments and pain upon palpation of the lumbosacral junction and is referred to as a positive sacral base posterior shift. Note that these results can also indicate sciatica nerve involvement and/or a hip flexor contracture pattern (36).

Sacral Apex Status: *Sacral Torsion:*

Place the patient in the prone position, lock their knees and raise their legs one a time, as high as they can, without raising the pelvis off the table. Note the height to which the patient is able to

raise their legs. The apex will shift towards the affected leg which is the leg that does not go as high as the other. Note any marked difference in height (37).

Piriformis Tenderness: In the horizontal plane look to the balance and tone between the internal femoral rotators. Then, do the same with the external rotators. Recall that the path to setting nerve runs either under or through the piriformis muscle after attaches to the sciatica notch of the pelvis. Any contracture pattern of the piriformis puts pressure on the sciatica nerve, mimicking assignments and symptoms of the lumbar nerve root compression or sciatica and abundant and posterior leg. This collection of symptoms, referred to as the piriformis syndrome, is six times more common in women than men according to Starkey and Ryan (38).

Angle of Torsion: Retroversion/Anteversion:

In the transverse plane, the angle between the head and the shaft, **angle of torsion**, is about 15°. The decreased angle between the femoral condyles and the femoral head is called retroversion. This structural anomaly is commonly found in successful ballet dancers. An increased angle is called anteversion.

This angle may also be roughly determined by analyzing the patient's gait. When the angle is greater than a 15°, anteversion, femoral eversion is produced, characterized by the toe- out stance or gait. When the angle is less than 15°, the femur internally rotates, or retroverterts.

In the ideal anatomical structure the neck of the femur is perpendicular to the acetabulum. If the either the angle of torsion or the angle of inclination is other than ideal there will be a strong tendency for the patient to present valgus or varus regardless of the tone of the soft tissue components. In both of these cases, patients tend to try to self “correct” their static posture or gait. The result is often a varus or valgus knee condition. This test is also from Starkey and Ryan’s “Evaluation of Orthopedic and Athletic Injuries (39).”

Angle of Inclination:

The femoral head joins the shaft of the femur via the femoral neck. They head is angled at about 125° with the long axis of the femur, in the frontal plane in the average male. In most females, the angle is slightly less. This is called the **angle of inclination**. An increase in this angle is called coxa valga; a decrease in this angle is called coxa vara.

A quick test that will assist the examiner here is done with the patient supine. From the side of the patient imagine a line (Nélaton’s line) from the ASIS to the middle of the ishial tuberosity. If the greater trochanter is located well superior to this line, indicating an angle of inclination of less than 125°, say, in the 80°-90° range, there is even more reason to suspect coxa vara leading to bowed or varus legs.

Angles greater than 125° indicate a coxa valga leading to knocked knees or valgus legs.
In both of these cases, the mechanical advantage of the gluteus medius is reduced by changing its line of traction on the femur (40).

After ascertaining the angle of inclination and the angle of torsion of the neck in relation to the head of the femur, you will see that underlying what could appear to be a piriformis contracture pattern. In our *preassessment*, we may notice the patience standing with bilateral femoral eversion. From soft tissue perspective we might suspect, perhaps a piriformis contracture pattern, or an adductor contracture pattern, or a pair of short psoas muscles for example. In our *assessment*, we will ascertain the angle of inclination and the angle of torsion of the neck in

relation to the head of the femur. If we find that the patient presents retroverted hips, they will have normal muscle tone and need no corrective efforts to this end.

NEUROLOGICAL EXAMINATION

The straight leg raising test or the SLR is formally called Lasègue's test. The function of this test is to determine whether the pain in the hamstring region is muscular or nerve dura irritation. Basically, the SLR test is simply extending the hip, with a lower leg extended and eliciting pain in determining and which angle of flexion the pain occurs.

If pain occurs the examiner needs to determine if it is coming from a sciatica nerve stretch or another source, such as a peripheral neuropathy. Radicular pain is localized in the area of dermatome, but sciatica is in the distribution of a sciatica nerve trunk. According to Cailliet (41) a painful SLR is considered a nerve test and not a muscle stretch phenomena and is considered a positive SLR.

To confirm sciatica and rule out hamstring contracture more confidently, I use the Braggard's test where after finding a positive SLR. Drop the patients foot 1" below the point that I found a positive SLR and dorsiflex the foot, If the pain is elicited again: positive for sciatica. There is ample literature available to assist the reader in learning to become competent and performing these simple but important tests.

Two other neurological tests involve the patient walking on their heels to check the L4-L5 nerve root and walking on their toes to check L5-S1 nerve root issues.

Assessment

As helper of those in pain, practitioners of Manual Medicine and others acting with common sense, there is a protocol we follow. It goes something like this: We take a detailed case history and do a complete physical examination in order to make a correct assessment of the patients complaint. This allows us to develop an appropriate treatment plan in order to effectively assist the patient out of dis-ease and suffering and back into healthy functioning and comfort.

Philip Greenman, D.O. (42) reminds us that when we are making an assessment of the pelvis or low back dysfunction we need to look for "the diagnostic triad of asymmetry, range of motion alteration, and tissue abnormality. " A simple evaluation of asymmetry is done by comparing anatomical landmarks within the pelvic girdle itself and lower extremity. Impaired range of motion is measured through standard physical therapy and orthopedic tests. The test for tissue texture abnormality over the sacroiliac joints, within the sacrotuberous ligament, and the gluteal and peroneal muscles is simply palpation results and findings. This diagnostic process helps assess dysfunction at the pubic symphysis and sacroiliac joints.

Soft Tissue Injuries

Injuries to the muscle belly or tendon adversely affect the muscles ability to contract fully because of a mechanical insufficiency or because of pain. If the musculotendinous unit has been mechanically altered through partial or complete tears, the unit can no longer produce the forces required to perform simple movements substantiated by Starkey and Ryan (43). Partial tears may create decreased force production secondary to pain elicited during the contraction. Complete tears of the unit resulted in the muscles and ability to produce any motion at all.

Strains are indirect injuries to muscles and tendons caused by overstretching or tension within the fibers of the muscle. Muscle strains occur at the junction between the muscle belly and an attendant. More often than not, this happens at the distal junction (44). This evidentiary usually occurs because of a single episode of overstretching or overloading the muscle but is more likely to result from eccentric loading.

Tendonitis is inflammation of the muscle tendon. This usually occurs because of small repetitive forces or micro traumas being placed in the muscle. In chronic inflammation, the insulted tendon thickens. In the involve tenderness and tendonitis are usually painful and motion. There may be visible swelling in their sheets because of fluid accumulation and/or inflammation. A lot of attendant, localized tenderness of variables severity can be present (45).

Another soft tissue pain generator is bursitis. The bursae are fluid filled sacs to serve to buffer muscles, tendons, and ligaments from other friction causing services such as bony surfaces. They also serve to facilitate smooth motion. Most bursa cannot be palpating easily except when they are inflamed. Inflammation usually comes about as a result of irritation of the bursal sac. This initial insult can come from disease, increased stress, friction or single dramatic event that activates this process. The symptoms included in pain, swelling and tenderness. In chronic bursitis muscular atrophy and a limitation of motion will ensue (46).

Injuries to Joints

A sprain occurs when the structures and a joint are stretched beyond their anatomical limits and this results in the overstretching or tearing of ligaments and/or the joint capsule itself. It first-degree sprained his weather ligaments are stress with little or no tearing. A third-degree sprain is where the ligaments have been completely ruptured. His causes gross joint instability and an empty or absent end point in a range of motion examination.

Subluxations occur when there's a partial or complete disassociation of the joints articulating services that may or may not return to their normal anatomical positions. When this occurs oftentimes there's soft tissue damage as well.

Dislocations occur when there's a complete disassociation of the joints articulating services. When this evidentiary occurs in the forces usually sufficient enough to rupture many of the soft tissue constraints surrounding the joint.

There two types of arthritis: an osteoarthritis and rheumatoid arthritis. In osteoarthritis, development usually is secondary to some sort of trauma or biomechanical stress being placed across the affected joint. In rheumatoid arthritis is a systemic disorder that activates an inflammatory with response that takes place in the body's joints. The symptom is pain in the joint. Swelling and stiffness may also occur. More often than not in there's a limited range of motion (47).

Spondylolysis is a weakness in the neural arch that predisposes ultimately to listhesis. Spondylolisthesis is a condition where, usually, there is a break in the pars and most commonly, there's a slipping forward of L5 vertebra on the sacrum. It also can occur at L4 on L5, but 70% of the reported spondylolisthesis cases are between L5 and S1. Anatomically, the foreword shear between lumbar vertebrae is limited by the contact of the facet's faces, their capsules, the posterior ligaments, and the integrity of the annular fibers of the disc. The integrity of the facet relationship is predominant, though.

Rene Cailliet (48) has set up five different types of spondylolisthesis: Type 1 (isthmic) where there's an anatomic defect in the pars. The side is usually seen and adolescence and considered to be caused by trauma resulting in a fatigue fracture usually healing with fibrous tissue and becomes a stable injury site. Type 2 (congenital) is where they posterior aspect of the vertebra

and/or sacrum are structurally inadequate due to developmental causes. Type 3 (degenerative) is a result of wear and tear on the pars and/or the facet's. Type 4 (elongated pedicles) here the neural arch is elongated resulting in the facet's positioning more posteriorly. Type 5 (destructive disease) this is usually a secondary result of metabolic, metastatic or infectious disease.

The major symptom of spondylolisthesis is low back pain. It is often radicular in nature but does not have a specific dermatomal pattern. The symptom here oftentimes is paresthesia rather than pain.

A physical examination will often show limited lumbar flexibility and a "ledge" on the midline of the lumbar vertebra from both the anterior as well as posterior approaches in most patients. Generally, you'll have a positive SLR. Grading of spondylolisthesis runs from 1 to 4. Grade 1 indicates a foreword slide of L5 25% of the vertebral body. Where grade 4 reveals a foreword slipping of the vertebra completely off the sacrum (49).

I have found in my work in the field of Manual Medicine, I have only felt comfortable dealing with grades 1 and 2. Grade 3 is risky business and grade 4 is inappropriate for work in my office. With this means is that and comfortable working on stabilized spondylolisthesis. Unstable spinal fractures in my office make me feel nervous.

Differential Diagnosis: Mechanical Instability and Radicular Pain

There are basically two types of mechanical low back pain: (a) mechanical instability and (b) sciatica. Referred pain will be covered in a different section of this paper.

Patients with mechanical instability present exclusively with lumbosacral backache that is exacerbated by activities like bending, lifting and setting. This pain may radiate toward either iliac crest, but it does not radiate down the buttock or the legs. There are no associated leg symptoms or signs with mechanical instability diagnosis. It is almost always relieved by rest, reduced activity, weight reduction, lumbar support felt, or bed rest.

Sciatica or radicular pain can be either acute or chronic, bilateral or unilateral. The anatomic level of dysfunction can usually be assessed during the history taking an examination phases. Problems at L4 nerve root will show motor weakness in an extending the knee. L5 nerve root ankle dorsiflexion will be weak and that nerve root S1 ankle plantar flexion will be weak. Regarding sensory loss changes at nerve root L4 would be indicated from medial shin to knee, at L5 from the dorsum of the foot to the lateral calf and it does one the lateral border of the foot and the posterior calf (50). Most sciatica patients have monoradicular symptoms.

Differential Diagnosis: HNP and Stenosis

Herniated nucleus pulposus is the most common cause of chronic low back pain. Most patients are able to find a position that gives them a partial relief. Pain on coughing, sneezing, or hard laughing are sure indicators of an epidural disease.

Spinal stenosis of text the middle aged population for the most part. It is indicated when there is progressive pain and the calves and feet that increases with walking. It seems to be relieved when the patience stops or lies down. Note here that neurogenic claudication closely resembles claudication caused by vascular insufficiency. Do not confuse the two.

Overtime to long-standing HNP patients symptoms slowly change in nature and come to resemble those of the spinal stenotic patient according to Dawson (51).

Differential Diagnosis: Discal Back Pain and Sciatica

Patients present with back pain and sciatica, with back pain and no sciatica, and with sciatica and no back pain in the opinion of James Cox (52). The most overlooked diagnosis of the disc protrusion and clinical practice today probably involves that patient with back pain without sciatica. Early nuclear protrusion into the annular fibers often involves that patient with acute back pain and perhaps an antalgic stance to one-sided.

Degerative Disease of the Facets

Degenrative disease of the facet joints is very common in older people and in people who have suffered lots of trauma. As a consequence, it is considered a major cause of low back pain. At the same time, there have been many cases of this condition in patients who suffer no low back pain.

When the patient does suffer from degenerative disease of a facet and has single leg symptoms, their pain is usually more severe, has a longer duration, not necessarily traumatically induced, and usually not relieved by bed rest. The people have limited lumbar extension and side bending to the affected side exacerbates their condition (53).

Treatment

Low back pain must be differentiated or broken down into three categories: acute, chronic or recurrent. This approach will define your strategy and the formation of your treatment plan,

Muscular activity in is a predominant cause symptomatic pathology. Consequently, structural diagnosis remains the basis of classification of low back pain disorders (54). Functional assessment of low back pain disorders is based on the premise that trunk musculature both supports and loads the spine during activities. Muscle pain is also a function of the soft tissue component of a low back pain syndrome. Muscle pain is poorly localized it has both a referral pain pattern as well as localized pain.

When low back tissue is injured, reactive local skeletal muscle spasm occurs. This is the beginning of the pain-spasm-pain cycle. The chemical and mechanical substances produced at the peripheral tissue site following an injury of the mechanisms of pain production that must be addressed in the treatment of acute and even some aspects of chronic pain. Alternating applications of ice and heat provide analgesia and reduces the muscle spasm. Connective tissue tends to shorten quickly after it is injured. Soft tissue manipulation is appropriate at this phase of treatment.

Exercise and Treatment of Low Back Pain

Exercise treatment should be a major modality intriguing low back a patient, whether acute or chronic. but just which exercise routine is appropriate may be difficult to ascertain in some cases. Cailliet has found that numerous clinical studies have verified that there is no doubt that muscular weakness and fatigue are prevalent in many musculoskeletal pain syndromes (55).

The chief treatment protocol in managing the low back pain patient is the reduction of pain. In Bonica's (56) classic work on pain management he states "exercise therapy is the cornerstone of treatment for sub acute and chronic pain. During acute pain exercise generally is contraindicated except for maintaining self-administered passive range of motion of all extremities and the truck." However sub acute pain, "is less intense, therefore therapeutic exercise is highly desirable and is realistic for restoration of function to the affected area'."

Low Back Pain and The Rolfing Series

If someone comes into my office with the nail in their shoe, it makes no sense to me to organize their structure without first pulling the nail out of the shoe. If I don't, they will be unable to maintain the order that we bring about in a traditional Series if they are avoiding the pain in their foot from the nail.

I have two approaches to working with the nail, or low back pain and the Basic Series. Depending upon the patience level of suffering, I will choose either to intersperse pain management sessions between traditional Rolfing sessions or I will use a pain management approach to their treatment until they can appreciate and hold the rudiments of basic Rolfing.

I believe that if you do traditional Rolfing on a patient to his suffering a great deal, you're making two mistakes. No. 1 you're throwing away good Rolfing. No. 2 you're prolonging, unnecessarily, the patients suffering. This is always a judgment call. I work with the patient so that they understand the goals of both Rolfing and pain management. They are different: Rolfing is about postural correction and not about treatment of any kind according to the Roth Institute and pain management is specifically and directly about addressing issues of dis-ease, pain and suffering. The judgment and the decision of what to do when in terms of these two strategies is a function of educating the patient, for I believe a well-educated patient will make the best decision.

This decision is not set in concrete. Regardless of the strategy that I take, every two to four weeks I will reevaluate our progress on the treatment plan, discuss this with the patient and the patient will make a new decision. This decision may be to continue with our original treatment plan or modify the plan based on their subjective experience of its efficacy.

I have made mistakes in both directions. Sometimes I did a Basic Series first without directly addressing specific pain issues. I believed that the inherent order brought about by the Basic Series overall would reduce the patients suffering to a large degree. Lots of times I was wrong with this decision. They suffered from their pain complaints needlessly. Other times, I did nothing but pain management work during my entire tenure with these patients. These people wound up with a significant amount pain reduction, but lacked the order in order to maintain that relief over time. Much work needs to be done in this area of thought.

My emphasis here is that this is an artistic endeavor not a linear treatment format. The level of relief and satisfaction from this endeavor will be a function of the relationship to establish between you and the patient. It is a dance to bittersweet music. Take on this challenge and you'll have sweet dreams.

Treatment Format

1. Pre Assessment:

This is where you have the patient standing in the examination room or perhaps walking about to exhibit their gait while you exchange small talk as you make an overall observations of their condition and hear their complaints. Believe what you see.

2. General Soft Tissue Opening:

At this phase of the protocol, generally you are manipulating broad fascial sheets and helping the patient get comfortable on examination table. This is very helpful for those patients who are not used to being touched by a physician. Most of my pain management work is done on a fully or partially clothed patient. When absolutely necessary and with the patients permission, I will have direct contact with patients skin.

3. Assessment:

During this phase of the treatment, perform the basic tests that I have outlined in other sections in this paper. From this assessment will develop a treatment strategy specific to my findings.

4. Soft Tissue Work, Prepare for Osseous Mobilization and Making the Corrections:

Given your findings, assessment and specific treatment strategy, you will now utilize the tools available to you given your experience and training to make the appropriate preparations for expeditious osseous corrections. In most cases, this will involve direct and indirect techniques of both soft and osseous tissues.

Look to see where there is an imbalance in muscle pairings that contribute to joint subluxations, strains or dysfunctions. For example, if the patient presents a right anterior pelvic torsion, check for an imbalance in the hip flexors first of all. Then check the hip extensors for an imbalance right to left. 95% of the time, the right hip flexors are stronger than the left and the left hip extensors are stronger than the right or more contracted. Make the appropriate corrections of the soft tissue, then mobilize the dysfunctional joint. Then move the examination site to the next level cephalic looking for the next level a muscle pairings imbalance that overlays in dysfunctional joint.

Look for patterns. Look for compensations. Look for the original insult.

5. Reorganize Soft Tissue around Corrected Osseous Structures:

Once you have made the appropriate osseous corrections, perform another assessment to ascertain how these osseous corrections have affected the tissues directly adjacent to the correction site. Then, balance out each of the correction sites soft tissue components.

6. Integrate and Balance Recent Changes in the Overall Structure:

To complete the treatment protocol, your efforts now will be directed towards integrating the changes at the patient and you have brought about in the last hour. In my practice, this is best affected by utilizing broad fascial sheet manipulations and kinesiological re education.

Treatment Protocol for "Soft Tissue Work, Prepare for Osseous Mobilization and Making the Corrections:"

1: Eliminate the torsion in pelvis: balance hip flexors and extensors
2: Reset pubic symphysis
3: Eliminate rotation in lumbar vertebra: move posterior transverse processes anterior
4: Fixated sacroiliac joint: open affected joint
5: Posterior sacral base: balance tone of pelvic ligaments
6: Sacral apex shift: balance tone of pelvic ligaments and tone of piriformis

Treatment Notes

1: *Eliminate the torsion in pelvis:* In this step you want to make sure that the hip flexors have equal tonicity. Likewise for the hamstrings and low back musculature. This will assist in the untorquing of the pelvis. Then you want to balance the tone between the hamstrings and hip flexors in order for the pelvis to assume a more neutral position. You'll also need to open the fixated sacroiliac joint and balance tone of pelvic ligaments.

2: *Reset pubic symphysis:* The most direct approach in this task is performed with a supination patient with their knees bent and together. Ask the patient to resist moderately as you pull their knees apart. Do this several times. Next, continuing on with patients knees still bent, ask them to

spread the knees apart and resist your efforts to push the knees together. Again, do this several times.

3: *Eliminate rotation in lumbar vertebra:* With the patient now prone, topping the spinous processes of the lumbar vertebral. Note when you find a painful spinous ligament. After examining the spinous processes, move on to palpating the transverse processes with your thumbs noting processes that are painful and present posteriorly. The majority of the time, a painful spinous ligament indicates a rotated lumbar vertebra. In the chronic low back pain patient, you'll generally find two rotations, one counters the other. This may involve one functional unit or several. The transverse process that present posteriorly can often indicate a rotated lumbar vertebra. Be aware that this may be a simple anatomical anomaly. Palpate the anterior process and you should find it painful to press further in the anterior direction if the vertebra is truly rotated and not just an anomaly. De-rotate lumbar vertebra with your thumb or your elbow in a gentle, toggling manner.

4: *Posterior sacral base:* Balance the tone of pelvic ligaments. Ask the prone patient to move up and support themselves on their elbows while you work to move the sacral base anteriorly. If the patient is comfortable in lumbar extension, you can ask them to support themselves in a push up position while keeping their ASIS on the table.

5: *Sacral apex shift*: Balance tone of pelvic ligaments and the tone of piriformis right to left. With a twisting motion with the heel of your palm, torque the apex in the direction of the affected leg. Several applications of this technique is preferable over a single attempt. More successful as well.

Obviously, appropriate soft tissue work leading up to these specific treatments must be rendered in order to have any chance at achieving long-term pain relief. You will need to re-assess each of these regions for resolution of positive findings until your findings are negative. The correction of one issue may affect a previously corrected finding and necessitate going over this list or part of it several times. Do not mistake this for a linear process. It is a creative and growing process with a life of it's own. You are not the master of the process only the facilitator of easing the effect that the dysfunction has taken on the patient.

Exercise

As you began to reach the goals of your treatment plan, you will need begin to implement the exercise phase of rehabilitation. This will usually involve specific stretches and strengthening exercises appropriate to the patient's physical status. A simple muscle test of the affected area will determine weaknesses and strengths. I use a number of sources including my favorite, "Stretching" by Bob Anderson. I also use the Saunders software program called "Exercise Express." I am fond of referring patients to various yoga programs in my locale.

For overall strengthening, I first encourage folks does take up walking. After that I encourage them to join a local health club and participate in some form of low impact aerobics class. I discourage traditional swimming exercises in chronic lumbosacral instability, because the repetitive rotational action this has on the junction. I'm OK with the use of the kick board and stationery kicking on the side of the pool until the junction has stabilized over, say two weeks, symptom free.

They will need support and follow up work in this phase. Just like folks without low back pain, most everyone gets a little sore during their first week of exercise, much less after injury. Encourage them directly to start off gently and over time move up in intensity and duration. My favorite saying that I repeat frequently is that "I don't want you injured while we are trying to help you feel better. So, take it easy, at first. "

Conclusion

The field of study involving low back pain management is huge. There are many perspectives and lots of differences of opinions, especially in the area of treatment. There are many differences on what actually causes pain, especially in the area of biochemical etiology. In the area of biomechanical causation there is a greater degree of agreement. With this more generally accepted agreement on etiology, there is more congruence on treatment approaches to mechanical low back pain.

I have attempted to present an overview of low back pain, where it comes from, how to tell one thing from another and how to go about bringing about some relief from another person suffering.

In learning more about what causes low back pain, we learn more about the quality of the complaint being presented. Understanding what the patient is talking about helps us work more efficiently after we have taken the case history as we perform our physical examination.

With a case history, we have the patient's subjective experience of their lives and complaint. The physical examination gives us the objective findings. With this combination, we can now formulate a treatment plan that will do two things: the plan will be efficacious and it leave the patient feeling that they were listened to and what they had to say about their condition was important. Both of these effects are very important to easing the patients suffering. I, dare to say, critical to the overall process. Make no mistake, what you know and what you know how to do will never be as important as your relationship to the person you're working with.

In my practice of Rolfing, I do my utmost to stick to the things that I was taught by Jan Sultan. I asked him prior to taking up the craft that I wanted to know what Dr. Rolf taught him. He promised he'd do just that. What I call. Classical Rolfing. In my practice of Manual Medicine. I use a wide variety of tools that I have picked up along the way of honing the Craft. When I stick a Basic Series session in a series of pain management work. I clear that with the patient first.

I defined a practice of Manual Medicine as being a forum through which a practitioner utilizing in multimodality approach assists patients in relieving discomfort, dysfunction, and pain. The particular combination of modalities available for use will be dependent upon each individual practitioner, their skills, their interests and their training. In many cases, it will also involve psychological, energetic, emotional and spiritual endeavors as well.

I will repeat what I said earlier: My emphasis here is that this is an artistic endeavor not a linear treatment format. The level of relief and satisfaction from this endeavor will be a function of the relationship to establish between you and the patient. It is a dance to bittersweet music. Take on this challenge and you'll sleep better, except the nightmares of self-doubt once in a while.

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