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# A Holistic Approach to Therapy and Management of Lower Back Pain

Lauren Ross

Western Michigan University, [lauren.j.ross@wmich.edu](mailto:lauren.j.ross@wmich.edu)

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A Holistic Approach to Prevention and Management of Low Back Pain

By: Lauren Ross

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Pain in the body can be a very serious and debilitating experience that has a substantial effect on daily living. Depending on the source and symptom(s), the pain can be acute, chronic or reoccurring. One of the most common forms of chronic pain is lower back pain. (Brannon, Feist & Updegraff, 2010) It is common among young adults, older adults and elders, and comes in several forms with various symptoms. In order to better understand the costliness, effects and coping strategies for lower back pain, it is vital to understand the concept of pain. Low back pain can be related to problems with nerves or discs, inflammation of tissue or ligaments, tightness of muscle or, as in most cases, a combination. The symptoms and severity usually vary depending on where the pain is. The spine is one part of the back that has a large association with low back pain; the areas that could be affected are the lower thoracic, lumbar or sacral. Due to the fact that low back pain is such a common and debilitating condition, several preventative and holistic approaches to treatment have started to surface within the health care field. However, the problems of cost, access and quality of health care are growing and making it difficult for people to find and obtain treatment or coverage for treatment. Some of the techniques that are utilized in physical therapy and alternative methods such as Tai Chi, Yoga and Meditation, can be more attainable provide some take-home exercises towards treatment.

In order to understand the costs of low back pain, it is important to first understand and define pain. Pain can be defined as an alert system that is used by the body to identify a problem through sensory cues, and guide the body on how to best respond and react. (Butler & Moseley, 2003) Pain can come in several different forms and severities, but its purpose remains the same, to warn your body of a painful experience. The body not only stops the pain, but also learn how to prevent or deal with it in the future. (Butler & Moseley, 2003) In order to understand pain regarding the human body, we can break it down into four categories: perception, alarm system,

input and nervous system. (Butler & Moseley, 2003) Pain is systematic through the central and peripheral nervous systems. These two systems work together to combat pain and heal the body. (Brannon, Feist & Updegraff, 2010)

The central nervous system consists of the brain and the spinal cord, and the peripheral consists of the somatic nervous system and the autonomic nervous system. Both systems are divided into smaller, more complex components. Neurons, which are electrically charged particles, help in the process of sending and receiving input to and from the central nervous system. (Brannon, Feist & Updegraff, 2010) When neurons are excited, they reach an activation level where they are able to send neurotransmitters, or electrically charged messages from the tissue, or danger site to nociceptors, via the peripheral nervous system. Once the message reaches the spinal cord, it travels up to the brain via the central nervous system. (Butler, 2000) Once this input reaches the brain, it is reviewed and a response message is created and sent back to the rest of the body through a motor nerve.

One of the most significant concepts of pain in the body is perception. If the body was unable to accurately perceive these signals, then it wouldn't be able to efficiently or correctly recognize and fix the problem. The body's perception of pain may differ depending on several factors such as family history, the environment they grew up in, one's gender, or their environment. For example, the working environment in a rural farming job in New Zealand has a different perception of work ethic than most companies, which changed the worker's views of pain tremendously. According to this study, which studied non-specific low back pain of rural New Zealand workers that worked in a setting that promoted the idea of commitment to employment, the importance of pushing through obstacles, and the capacity to allow the passion for their land to be a primary motivator. The workers are driven with quotes like "*Just carry on*",

and “*Love of the land*”. These workers viewed lower back pain merely as “a part of everyday life”, something that they had to accept and move forward with. Most of the older workers who had experienced chronic low back pain for many years, and continued working without substantial breaks for treatment, changed their perception of work many years after their first experience with the pain. The results showed high self-efficacy and a potential for rehabilitation intervention within the work place. If their employers can manage “LBP within the context of having job control and flexible work practices,” they can promote a more preventative approach and positive attitude towards providing treatment for their employees. (Dean, S. G., Hudson, S., Hay-smith, E., & Milosavljevic, S., 2011) This article shows that one’s environment can dramatically alter pain perception. A work setting that promotes toughness, strength, good work ethic or persistence, can alter the way people perceive their pain, and therefore their ability to avoid it or seek proper treatment. Perception is key in the pain development and prevention processes.

Another vital component of pain is the concept and perception of the fear-avoidance model. This model suggests that overly fearful people are likely to either end up with chronic pain or maintain long-term avoidance behaviors even when the pain is gone; they avoid activities and movement that shows risk of pain. This type of avoidance can lead to several other problems with human behavior. (Leeuw, Goossens, Linton, Crombez, Boersma & Vlaeyen, 2006) The avoidance of “stimulation plays an active part in reducing the sufferer’s sense of control over pain, and [increases] his or her expectation that exposure will increase pain.” (Philips, 1987) This type of reoccurring stimulation of fear increases one’s tolerance for stimulation and their withdrawal from several additional normal activities. Not only does the fear-avoidance model describe behavioral issues with painful experiences, but it also used to explain the role of

avoidance behaviors in the relationship between the clinician and patient. For example, the avoidance behaviors of chronic pain might be seen, from the patient, as normal, safe and reassuring, but from their clinician's view, these behaviors might be seen as crippling, disabling, or might show that they have unhealthy coping strategies. (Philips, 1987)

Avoidance behaviors can come with any sort of pain. In one particular article, 267 people with chronic headaches (for at least a year), were surveyed on their most prominent behaviors in association with headaches. The most prominent behavior was avoidance; it listed avoidance in several areas such as withdrawal from social contexts, avoidance of particular movements and actions, just to name a couple. In terms of low back pain, the researchers of this article believed that similar results would occur. Avoidance behaviors for low back pain could include avoidance of daily tasks such as grocery shopping or a parent picking up their kid; it could be avoidance of walking, standing or running; it could also be avoidance of social stimuli like discussing the pain or engaging in social functions. Fear-avoidance is representative of those individuals who have difficulty finding healthy coping strategies for pain and painful experiences. (Philips, 1987)

An important component to recognize with any painful experience is that the input and alarm system are crucial in stimulating messages to the brain; they act as initiators for electrical messages and must act in combination with other factors such as psychological and social input. For example, if someone takes a cookie tray out of the oven and carries it to the counter, and in the process, are burning their fingers. Their alarm system turns on and alerts the brain of the pain. The brain processes the painful situation and quickly finds a way to set the cookie tray down safely while also relieving the painful feeling, rather than just dropping the entire twenty minutes of hard work and happiness onto the kitchen floor. Human behavior "relies on the concurrent processing of a variety of inputs, context and concurrent apportioning to the response

of homeostatic systems.” (Butler, 2000) Once the threshold for the activation of an action potential is ignited, the processing can begin. The initiation of the message is crucial in beginning any pain process.

Input is segmented into nociception and peripheral input. Nociceptive pain is the pain that is at the end of a neuron. The nerve endings within tissues are ignited by either chemical or mechanical processes. Once these nerves are excited, the neuron(s) hits a threshold that allows for activation, and the message is sent through the peripheral and central nervous systems up to the brain. Peripheral input nerves are “long, living and responsive tissue components of the entire nervous system,” that help relay and process messages from the dorsal root ganglion of the vertebrae to the rest of the nervous system. (Butler, 2000) These components of input are important in the relay and processing of messages from the pain site to the brain and back to the pain site.

Once low back pain is distinguished, it is important that the body finds a healthy way to treat it. There are several approaches to low back pain, including physical therapy or more alternative methods, the most common being Tai Chi, Yoga, and Meditation. The treatment depends primarily on the source of pain and the type of injury. Despite their differences, these treatments have very similar techniques in healing. For example, both physical therapy and these alternative methods utilize specific breathing techniques to calm, treat and identify pain or illness. (Brannon, Feist & Updegraff, 2010) It is one of many components of alternative and conventional therapies that can be used in several circumstances to create calmness, serenity and focus.

Alternative methods tend to take more of a preventative approach to treatment. They focus on improving overall health, strengthening bone and muscle mass, enhancing controlled

breathing and educating people on how to both, stay in the present moment and release tension by targeting pain. Alternative medicine is simply “a group of diverse medical and health care systems, practices and products that are not currently considered part of conventional medicine.” (Brannon, Feist & Updegraff, 2010) Alternatives to conventional medicine were explored through various cultures such as Chinese medicine. Tai chi and Meditation both have similar techniques that help their practitioners to develop the balance between the yin and yang energies to promote health and to focus on posture and controlled breathing. Yoga, however, has been used to focus on the treatment of low back pain specifically, and has been proven successful.

Yoga, in particular, is an alternative form of therapy that focuses primarily on treatment through breathing, movement and the connection between the two. In a study done at West Virginia University, 90 adults between the ages of 23-66, were split into two groups in order to compare the effects of Iyengar Yoga and “usual medical care” treatment of low back pain. Hatha yoga is one that combines the mind, body and spirit through classical poses or deep breathing meditation. Iyengar yoga is a form of hatha yoga that uses props like mats, blankets, blocks or belts to help those with either lack of experience or physical limitations practice the exercises to the best of their abilities. When the participants weren't in the yoga class, they were instructed to practice yoga with a provided DVD and any necessary props. This study compared Iyengar yoga with “usual medical care”, meaning these participants utilized other normal forms of healthcare, other than yoga. They were followed up with survey phone calls on their pain status and the details of their therapies. The results were that the group who practiced yoga saw 29% reduction in functional disability, 42% reduction of pain and a 46% reduction of depressive symptoms, over a 24 week time period. This study is one of many that directly shows the benefits of such focused and deep-breathing exercises. Whether it is mental, emotional, physiological, or

spiritual, yoga and other forms of alternative therapies utilize areas of the mind, body and spirit that bring about calmness and healing. (“In the journals: Yoga therapy helps relieve chronic lower back pain”, 2009)

The concentration of breath allows one to be in the present moment and focus on one thing at a time. According to an article from the *Journal of Osteopathic Medicine*, breathing pattern disorders, such as “hyperventilation, result in a variety of negative psychological, biochemical, neurological and biomechanical influences... [and] automatically increase levels of anxiety and apprehension.” (Chaitow, 2004) More specifically, when ventilation is increased, the rate of exhalation is increased and more CO<sub>2</sub> is released from the body. When this release of CO<sub>2</sub> exceeds its accumulation rate in the tissues, it can produce respiratory alkalosis, which proceeds to promote vascular constriction and decrease blood flow. This decrease of CO<sub>2</sub>, “increases the affinity of hemoglobin (Hb) for oxygen (O<sub>2</sub>)... [and] the Hb molecule is therefore less likely to release its oxygen in tissues...due to breathing.” (Chaitow, 2004) When stress and anxiety levels increase, vascular constriction increases, and causes a reduction of oxygen to the tissues. When the tissues have a decline in oxygen level, it experiences negative changes such as muscular imbalances, altered muscle length, or variation in pressure of muscles and tissues. These changes are associated with chronic low back pain in that “the speed and intensity of muscular contractions are commonly altered with deep segmentally related muscles losing both contraction speed and intensity, while over activity and tonic contraction occurs in the larger multi-segmental muscles.” (Chaitow, 2004) Yoga, Tai Chi, Meditation and Physical Therapy treatments focus on similar components of breathing as part of treatment. In Yoga and Tai Chi, breathing is encouraged during specific movements and postures, whereas in Meditation and Physical Therapy, breathing is most utilized during moments of stillness and focus. Seeing as

how anxiety and stress levels can affect breathing patterns, it is important to monitor these aspects and keep them at a minimum. When stress increases, it constricts blood vessels, and problems with tissue and muscle functioning. Breathing interventions promote relaxation, which in turn, dilates blood vessels and allow for blood flow. (Brannon, Feist & Updegraff, 2010)

Breathing patterns can affect back pain in several other ways, one of which affects the trunk muscles. In one particular study, 29 outpatients with neck, back pain or both were observed to determine whether “poor respiratory chemistry was present...with neck or low back pain and secondly whether biofeedback training could improve chemistry, pain and function.”

(McLaughlin, Goldsmith & Coleman, 2011) Three challenges were conducted including sitting, standing and supine that measured postural control from the trunk muscles and any potential limited postural demands. The ideal partial pressure of CO<sub>2</sub> in the “alveoli and arterial blood is 40mmHg... [with] Hypocapnia, or insufficient CO<sub>2</sub>, occurs when the arterial CO<sub>2</sub> level drops below 35mmHg.” (McLaughlin, 2009) This results from an excess of CO<sub>2</sub> is exhaled. This study conducted a breathing intervention that included an analysis, education, awareness, biofeedback, behavior modification and manual therapy. In the analysis segment, faulty breathing behaviors are identified. In the education segment, the client and therapist gain a mutual understanding of what ‘good breathing’ is as well as what is involved in the transition from poor to good breathing. In the Awareness portion, the symptoms associated with altered breathing are identified as well as how their breathing mechanics change in response to external situations and triggers. Next in biofeedback, a capnography is used to monitor ETCO<sub>2</sub> and “wave form tracking information about breath rate ratio of inhale to exhale and pattern. In the behavior stage, daily practice of go do breathing techniques is reinforced and poor breathing is modified subtly. In the final stage, manual therapy takes place where poor motor control is identified in the trunk

or cervical spine and postural corrections are made as well as implementation of an exercise program. (McLaughlin, 2009) All of the subjects in the study who “had poor breathing as tested with capnography...were able to improve their breathing with retraining.” (McLaughlin, 2009) Breathing patterns have been proven to affect back pain in several different ways.

Physical therapy uses very similar techniques as other alternative methods, but has a stronger focus on the process and evaluation component of therapy. Physical therapists “review patients’ medical histories, and measure patient’s strength, range of motion, balance, coordination, muscle performance, and motor function.” (Sultz & Young, 2011) Physical therapists can work in several different settings such as hospitals, clinics, schools or assisted-living facilities. Physical therapy can help reduce symptoms of low back pain through specific exercises, manual therapy or relaxation techniques like ice, heat or electrical stimulation. Several physical therapists use the “Nagi Model” in their initial evaluation. The basic components of this model are impairment, functional limitation and disability. The idea is that the initial evaluation will establish the client’s impairment through evaluating range of motion, strength, tone, pain and sensation. Once the therapist can identify the impairment, they can define the effects on the client’s functional abilities such as trouble walking or the inability to squat or lift. The final evaluation focuses primarily on the disability, which is the effect of the functional limitation on their daily living. An example of this model is if a client came in with shoulder pain. Their impairment might be that they have a small and painful range of motion and are very weak. Their functional limitations might be that they can’t lift moderate to heavy objects. If their job requires them to do a lot of lifting, their disability is that they cannot perform their job to their highest abilities. The role of the physical therapist is then to create a treatment plan so that the client is able to not only do their job, but also have full function. (“Who are physical,” 2013)

An important place to start treating low back pain, is by testing the client's areas of strength and weakness. Testing can also help determine the source of the problem. Some of these tests include that of strength, flexibility, coordination, endurance and function. For example, if the flexibility of one's hip flexion or extension is limited, this may lead the therapist to test other areas of the hip and leg muscles as potential sources of the back pain. (Durstine, Moore, Painter & Roberts, 2009) Once the source of the pain is discovered, the therapist can move onto to evaluating the client's abilities through specific exercises and movements; this is an important step because it helps both the client and therapist determine the limits of the client's body, and which exercises or movements will provide safe yet progressive results. Once the therapist has enough information on their client, they create a treatment plan. It is also important for the therapist to review a patient's medical history, specific symptoms and social or environmental factors such as daily routines and activities and the structure of the home, work and any other frequently used areas. This helps the therapist to better understand how to help the client function and adapt to their daily living as normal as possible.

Education is an important component within treatment and therapy. It involves the role of the client and the clinician. It is the responsibility of the therapist to recognize their client's ability to learn, understand and grasp concepts, and to educate them based on what they understand. It is the responsibility of the client to educate themselves on their ailment and their goals for treatment based on their personal will to recover. When both the clinician and client are educated, they can grow and learn together while maintaining steady communication. (Brannon, Feist & Updegraff, 2010) For example, it is important for the client to specify all medical and personal concerns they have prior to the start of treatment so that the therapist can identify these cues and adjust the treatment accordingly. An example might be if the client has Diabetes. If the

client seeks treatment for their shoulder, but feels light-headed during therapy, it is important for their therapist to recognize this and provide them the necessary tools and aids to allow them to perform therapy to the best of their ability. It is also important for the therapist to recognize health disparities within their client, and know how to best approach them. Education also plays a significant role in the levels of health literacy within the U.S.

Health literacy is a vital component of education within health care that varies greatly within different populations. Within particular ethnic groups in countries all around the world, “people who have higher education and income also have better health and longevity than those with lower education and income.” (Brannon, Feist & Updegraff, 2010) There has also been a primitive focus on filling the more competent practitioners in areas of terminal illness or long-term care, leaving “primary and preventative services for...other community populations in need of basic medical services”. (Sultz & Young, 2011) There are certain “community hospitals [that] are recognizing this disparity by conducting outreach and education programs for the medically underserved.” (Sultz & Young, 2011) In order to see an improvement in accommodation and utilization of health care services, health literacy rates need to be more evenly distributed throughout different populations. The first step in this is defining what a health disparity is. A health disparity can be defined as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage”, according to an excerpt from the textbook, “Health Psychology, An Introduction to Behavior and Health”, and their article from the organization *Healthy People 2020*. (Brannon, Feist & Updegraff, 2010) Among these, racial and economic health disparities are the most prevalent. These are key components of research that have sufficient evidence supporting health disparities such as lack of insurance, difficulty in obtaining access to health care, higher infant mortality rates, higher likeliness of developing

diabetes, obesity and hypertension, and lower health literacy. (Brannon, Feist & Updegraff, 2010) Understanding health disparities is the first step in abolishing them. The second step is for health professionals, such as physical therapists to define and develop a healthy and communicable relationship with their clients.

The U.S. is making a movement towards improving health care through several new policies and health care acts. However, problems such as health care costs, quality of care and the ability to obtain care, are significant issues that need detailed care. Health care costs are significant in the ability to obtain treatment and yet have risen from “5.3% of the U.S. gross domestic product in 1960 to over 17.6% in 2009.” A recent study showed that 46.7 million Americans are without coverage. Not only is this number fluctuating, but since health coverage costs are rising at such an exponential rate (133%), employers began limiting or completely getting rid of said health benefits. However, the U.S. health care system is constantly changing and is making strides towards more affordable and quality care. One primary example is the Patient Protection and Affordable Health Care Act. The Patient Protection and Affordable Health Care Act addresses “consumer protections, the pivotal role of employer-provided insurance coverage and government’s role in providing health care access for the most vulnerable populations.” (Sultz & Young, 2011) For example, consumers are affected in that financial barriers of preventative care are diminished; employers are affected allows for more affordable employee coverage and offsets cost of expensive health claims; vulnerable populations are affected in that Medicaid coverage is expanded to non-medicare eligible persons. (Sultz & Young, 2011) The intentions of the PPACA is to expand coverage and make healthcare improvements, providing better quality of health care that is more affordable. With more affordable care, the pattern might include show an increase in those seeking treatment, more job

opportunities for persons within clinical fields, and less concern for cost-effectiveness within employers, which in turn re-establishes health care benefits for employees. (Sultz & Young, 2011) Not only is this beneficial for consumers in terms of healthcare and coverage, but also in regards to treatment. In order for people to seek treatment, they must be able to either afford it out of their own pocket or use coverage from their insurance. Health care, and therefore, treatment, are becoming more accessible due to these health care acts. Once insurance coverage is determined, there is a long process before someone with low back pain can see a physical therapist. Depending on the state, access to physical therapy can either be "Direct Access" or requires a referral. According to Apta.org, "direct access" is when patients can see a therapist directly. A referral is required by particular insurance companies in order for them to pay for the therapy. A referral can be provided by the patient's primary physician or other medical provider. ("Faq: Direct access," 2013) Treatment for low back pain can either be a difficult or simple process depending on the individual's healthcare coverage and insurance.

Low back pain is one of the most common forms of pain, and a frequent case within physical therapy clinics. It is common amongst younger adults, older adults and elders. There are several approaches to treat low back pain that depend on the source and progression of the pain. Physical therapy and alternative methods such as Tai Chi, Yoga and Meditation are common approaches to treatment and use few similar techniques such as breathing, stretching, and exercising. Although these forms of treatment are common amongst low back pain, they also provide other health benefits that include improving the relationship between mind, body and spirit, lowering stress levels, (Brannon, Feist & Updegraff, 2010) One primary approach to low back pain is the regulation of regular breathing patterns, and several approaches to medicine and therapy can help in both sustaining these patterns as well as preventing breathing pattern

disorders. Treatment can be found through alternative methods as well as through more conventional and clinical settings. Health education and literacy are important components in the process of treatment and prevention. It is the responsibility of the client as well as the therapist to educate themselves on preventative approaches to daily living as well as in terms of health care and insurance. Knowledge of health care, treatment and holism provide each individual with the tools to live a healthy and limitless life.