The Truth About Back Pain

A Biopsychosocial Approach to Treatment

By Shelly Prosko

Over the past sixteen years as a physical therapist (PT) and yoga therapist working in an outpatient orthopedic clinic, the most common complaint I hear from my clients is related to low-back pain (LBP). In fact, over 80% of North Americans suffer from back pain at some point in their lives.[1] The Global Burden of Disease Study 2010 revealed that LBP is the number one cause of disability globally[2] and has been found to be the most common reason for time loss from work in much of the world.[3,4] There are many different opinions about what causes LBP. Perform an online search with the keywords "causes of low back pain," and 44 million entries will result. This is quite ironic, since approximately 90% of LBP cases are nonspecific, meaning the exact causes remain unclear.[5] I must clarify that I will be discussing nonspecific LBP throughout this article and not the remaining 10% of cases that do have specific known causes.

Causes of Nonspecific Low-Back Pain

What do we know about the causes of the majority of LBP cases? Are they due to dysfunctional or damaged structures? Are they due to muscle strength and flexibility imbalances or to joint dysfunctions surrounding the spine? Are they related to postural alignment, postural habits, or body mechanics? Abnormal neuromotor sequencing and timing? Dysfunctional synergistic action of muscle groups? Or are they related to psychosocial factors such as unmanaged stress, depression, anxiety, fear-avoidance behaviors, dysfunctional relationships, or ineffective emotional awareness, expression, and management? Does a sedentary lifestyle or being overweight play a role? Or is it a combination of the above? Different groups of people offer different answers, and quite often these answers appear to depend on what type of service the groups provide. Many risk factors have been reported to be associated with nonspecific LBP, but there is little evidence that demonstrates actual causation of the majority of LBP cases. In fact, for a long time now we have known that the specific damage to the spine or tissues has a very poor correlation to LBP.[6–11] To make it even more confusing, the underlying mechanisms that explain how and why each treatment approach works—when it does, for example, core stability training or acupuncture—are often poorly understood.

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Shelly is gently nurturing and guiding a client into a modified version of *utthita parsvakonasana* (side-angle stretch) using a physio-exercise ball for added support.

The more we learn about how complex the science surrounding pain and the pain experience is, the more we realize that pain, including LBP, is an experience that involves numerous systems in our physical bodies; in our minds, emotions, and spirits; and in our social relationships. Lorimer Moseley, PhD, a leading pain science researcher, confirms that the pain experience "does not provide an accurate measure of the state of the tissue."[12,13] In other words, pain is a biopsychosocial process rather than a purely anatomical or physiological one,[14] so it would make sense that in order to successfully and optimally treat such a complex biopsychosocial problem such as LBP, one would need to take a biopsychosocial approach.[14,15,16]

Yet it amazes me that even with this knowledge and the science to support it, our current healthcare system continues to primarily use a biomedical model that focuses on just the physical aspects of the patient when assessing and treating LBP. The biomedical model does not address psychological factors such as the client's mental and emotional health, or sociological factors, such as the client's relationships with others, self, and the environment; cultural factors; and socioeconomic factors. This reductionist approach of trying to find and treat the one underlying cause of LBP oversimplifies a complex issue. Perhaps this is one of the reasons why LBP tends to be so poorly managed or treated in the context of our current healthcare system.

I feel that the majority of cases can certainly be better managed if people suffering from LBP, along with their healthcare providers (including yoga therapists), had a better understanding of the complexity of the causes of back pain and also had exposure to some of the research about the efficacy of some of the treatment approaches to back pain.

In this article, I share my perspective, experience, and knowledge about what I have learned so far in my career of treating clients with persistent LBP using a combination of physical therapy and yoga therapy. My insights come from a combination of clinical experience with clients; my studies of the evidence-based literature; reflections on perspective pieces of other leaders in the field; and my personal yoga practice, intuition, and self-reflection. Following are some trends that I have seen in working with the persistent LBP population:

1) Create an individualized treatment plan unique to each client's needs.

I have learned that people with persistent LBP respond differently to different methods of treatment regardless of diagnosis. For example, two people could have the exact same diagnosis of spinal stenosis at L4-5 with irritation to the left exiting L4 nerve root, and even have the exact same structural presentation such as tight hip flexors and adductors, weak gluteals, quadratus lumborum compensation, and increased lumbar lordosis, but they each may respond differently to a proposed treatment protocol (which may include yoga asana, PT exercises, manual physical therapy methods and education) based solely on the structural biomechanical presentation. Sometimes directly addressing the structural deficits helps, sometimes it does not.

In physical therapy school, for safety and to help guide our treatment plan, we learn numerous treatment guidelines, precautions, and contraindications that are essential to understand and follow with each diagnosis. However, also incorporating a well-rounded therapeutic yoga approach and addressing all five *koshas* by using a biopsychosocial assessment can result in a more individualized approach to developing and implementing each client's treatment plan. It is important to point out that assessment of all the layers is an ongoing process that continues each time I see a client for follow-up treatment sessions. The "bio" aspect of the assessment consists of analyzing the physical and subtle bodies, which includes alignment, movement mechanics, stability, nutritional habits, breathing patterns, and energetic expenditure and levels (*annamayakosha* and *pranamayakosha*). The "psyche" aspect involves discovering a sense of the client's mental and emotional state of health (*vijnanamayakosha* and *manomayakosha*). The "social" aspect of the assessment involves discovering a sense of the client's relationships to others, to self, and to the environment (*anandamayakosha* and *manomayakosha*). Gaining knowledge about any cultural or socioeconomic factors that may influence treatment is also considered. As a physical therapist, I am not trained to perform formal mental health or behavioral assessments. I am also not a trained spiritual guide. I perform a thorough subjective interview, which is a combination of asking questions, sometimes guided intuitively, and listening and observing. By actively listening to the client, I can often get a sense of the client's social connections to others, to self, and to the surrounding environment, as well as their emotional awareness and intellectual state—that is, I get a sense of the client's ability to discriminate, think critically, and problem solve. Knowing this helps to determine what type of client education is best for treatment and for achieving patient compliance, which in turn results in more successful outcomes. Throughout the entire physical examination, I am also watching, listening, and observing cognitive-behavioral responses and getting a sense of the depth of the mind-body connection that the client evinces. Additionally, each individual may have different imbalances of *doshas* or *gunas*, breathing-pattern dysfunctions, or learning styles that will also influence what treatment approach to use. The intention is always to treat the person, instead of the diagnosis.

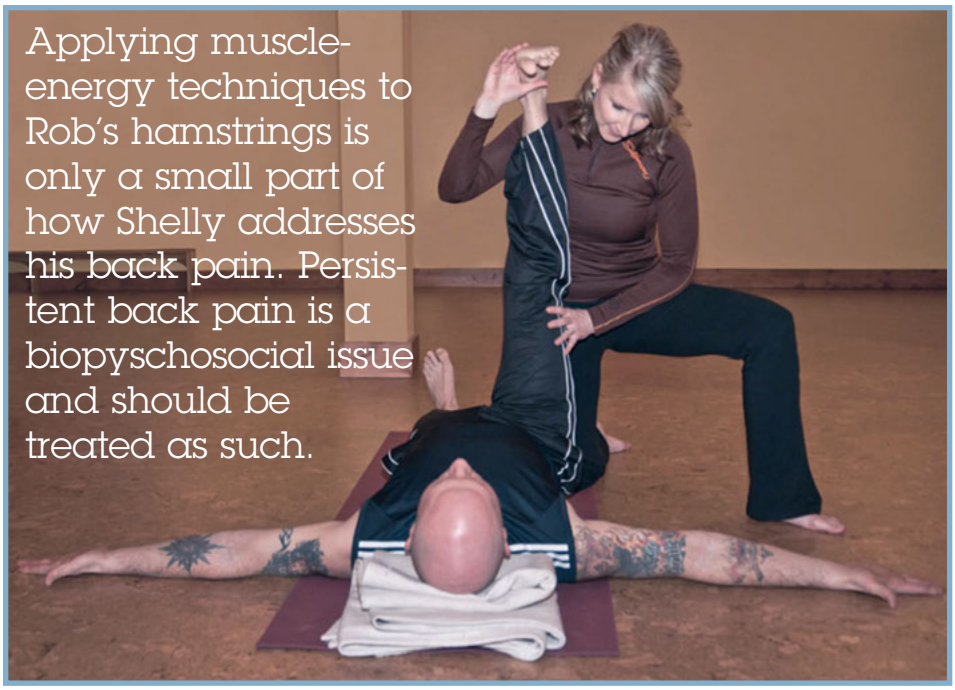
Furthermore, I find the individualized treatment plan is a good base to start from, but ultimately the client's response to each treatment modality is what dictates the next step during the session and beyond. A practice that calms the nervous system one day may create anxiety or irritation and worsen the pain experience another day. Practicing ongoing reassessment of the efficacy of the treatment and modifying as appropriate is part of the work of a therapist. I am hesitant to say that I sense some trends in our yoga therapy profession developing toward a less individualized approach. Workshops, articles, books, and classes geared towards asana, pranayama, or meditation protocols for specific dysfunctions or illnesses are becoming more prevalent. These are essential educational tools for us to learn from and the information we glean from them serve as guidelines. However, we must remember that the "therapy" in yoga therapy is about addressing the individual needs of each person and not the general trends of the dysfunction itself. If we are not cautious, we can fall into the same paradigm we are trying to improve upon with our current healthcare system! I believe this individual approach to treating persistent LBP is especially important, and consequently more effective, because of the complexity associated with LBP.

> We know that certain muscles of the core activate just prior to limb movement and that training the timing of the core is more effective than strengthening; however, there are no conclusive studies that I could find that show core training is significantly any more effective for nonspecific persistent low-back pain treatment compared to other forms of exercise.

2) Teach biomechanically safe movement.

Most of us will agree that postural alignment plays a role in maintaining a healthy spine. The three natural curves help absorb shock, allow for ease of movement, and distribute forces evenly throughout the spinal column. Dr. M. Panjabi, leading international researcher of spine biomechanics and past director of Yale Biomechanics Laboratory, which specializes in lumbar spine biomechanic research, defined the term "neutral spine" as "[t]he posture of the spine in which the overall internal stresses in the spinal column and the muscular effort to hold the posture are minimal."[17] Neutral spine may be important when the spine is being loaded through heavy lifting, performing repetitive movements, or when we are in prolonged static positions. But overall, the spine is designed and meant to move in healthy and biomechanically efficient ways, including in and out of its static neutral position. Panjabi defines this as the "neutral zone" of spinal movement: "That part of the range of physiological intervertebral motion, measured from the neutral position, within which the spinal motion is produced with a minimal internal resistance."[17] In other words, whether the spine is in its static neutral position or moving out of neutral position, the load throughout the spine still needs to be evenly distributed in the most optimal way, that is, the spine needs to be stable. Panjabi outlined three components of joint stability: 1) passive components (bones, ligaments, discs), 2) active components (muscular tissues), 3) neuromotor control. These three systems have to work together in order to transfer load efficiently and safely along the spinal column.[17] Additionally, Diane Lee, a physical therapist known for co-developing the Integrated Systems Model of Function that is widely used by therapists internationally, describes a fourth component to pelvic stability: awareness and response to emotional stress factors.[18] People with persistent LBP move and breathe differently, perhaps partly due to fear or anxiety, and this can lead to even more reduced or abnormal movement patterns that further feed into the pain cycle. As a result, the nervous system starts to change and the neural pathways that contribute to the pain experience can persist, even when no real damage or threat to the tissues exist.[12,13]

Clinically, I find that the majority of my LBP clients respond much better to gentle, dynamic, and biomechanically safe movements within pain-free ranges instead of attempting to find and hold a neutral spine. Generally, I find when they are instructed to keep a neutral spine, it seems to perpetuate the guarding, rigidity, bracing, reduced movement, altered breath pattern, and muscular inefficiency by activating more muscle groups than required. This leads me to share my perspective on core strengthening in the context of LBP treatment. We know that cer-



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tain muscles of the core activate just prior to limb movement[19] and that training the timing of the core is more effective than strengthening; however, there are no conclusive studies that I could find that show core training is significantly any more effective for nonspecific persistent LBP treatment compared to other forms of exercise.[20]

In my experience with LBP clients, I find that when they attempt core-stability exercises, the result is more of a "bracing" of the spine. Chronic LBP patients have been found to evince an abnormally increased co-contraction muscular force with regular movement,[21] one that can potentially contribute to an even more abnormal movement pattern, reduced movement, muscle inefficiency, and even increased spinal compression.[21–24] I find that traditional core exercises tend to feed into the abnormal and reduced movement pattern that persistent LBP clients are already experiencing. I find that introducing biomechanically safe, gentle, slow movements in a pain-free range and in conjunction with efficient breathing patterns seems to yield more favorable outcomes in pain reduction and functional abilities than core strengthening. Biomechanically safe spinal movement patterns are those in which the forces acting along and within the spine are at a minimum. In other words, the spine still must remain relatively stable as it is moving. However, what may be biomechanically safe for one person may not be for the next. The components of spinal stability as discussed above by Panjabi and Lee must all be considered for each individual in order to determine what movements would be safe. I sometimes forget that my training, knowledge, and skills as a physical therapist are not necessarily shared by other yoga therapists. Yoga therapists can learn more about biomechanically safe patterns in their training programs and ongoing continuing education courses. I also recommend that yoga therapists communicate with the client's physical therapist for guidance regarding the physical component of treatment, just as I would communicate with the client's psychologist for guidance on precautions, contraindications, or areas of mental health to focus on during the yoga therapy treatment.

I commonly initiate the introduction of movement by asking clients to explore and allow their normal and natural breath pattern to emerge. I may follow with a mindfulness meditation that consists of observing the abdomino-diaphragmatic breath, or belly breath, followed by gentle hip, shoulder, or spinal range-of-motion assessment while promoting concepts of "less is more" or "letting go and getting out of your own way." I find that giving a client several instructions such as "engage this muscle, then lift this, then hold that while keeping this in" typically results in abnormal and inefficient movement patterns, breath holding, and frustration, all of which exacerbate the pain cycle. When the client is practicing asanas, I tend to keep the asana very "alive" and moving, either with small oscillations in timing with the breath pattern or moving into and out of the asana in a safe and enjoyable way for each client. The asanas or movements I choose depend on the assessment findings and are continually being reassessed and modified as the session unfolds. All five *koshas* are taken into consideration, as well as the *gunas* and *doshas* as appropriate.

3) Address the breath.

In my clinical experience, I have noticed that dysfunctional breath patterns are a common denominator in the majority of the LBP clientele. An inefficient apical breath pattern results when the accessory muscles of respiration are habitually used. The respiratory diaphragm excursion is reduced with such dysfunctional breath patterns. The respiratory diaphragm is an important contributor to spinal stability,[25] and it has also been shown that breathing exercises can be used as a component of spinal stability exercises.[26] One study compared breath therapy (defined as "a Western mind-body therapy integrating body awareness, breathing, meditation, and movement")[27] and high quality, extended physical therapy in a group of thirty-six chronic LBP patients for twelve sessions over six to eight weeks. The results showed that the chronic LBP patients improved just as much with breath therapy as with extensive physical therapy.[27] Also, I have noticed that reduced rib expansion and poor thoracic mobility are also common in my LBP clientele. Clinically, I have witnessed an improvement in thoracic and rib mobility and a subsequent successful reduction in LBP in many clients who have been instructed to use ujjayi breathing as part of their LBP management program. However I do not know if the success in reducing back pain is due to improved biomechanics of the breathing pattern (including mechanical efficiency and spinal stability), changes in overall movement patterns as a result of improved breathing pattern, reduced fear and anxiety resulting in increased confidence to move, changes at the level of the nervous system that are responsible for pain modulation, or a combination of the above. What I do know is that breathing somehow plays a significant role in the treatment of LBP. Research supports some of what I found clinically: that breathing pattern disorders such as hyperventilation syndrome or use of accessory breathing muscles can reduce chest wall movement and reduce diaphragmatic function.[28] Science also shows us that an inefficient breath pattern causing an over-stimulation of the sympathetic nervous system response can further increase anxiety, muscle pain, and fatigue.[29]

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4) Encourage pleasure.

It is likely not a huge surprise to yoga therapists that there is a strong correlation between psychological factors and chronic LBP.[30] When LBP clients focus on the stories surrounding their unpleasant and stressful personal or professional situations, there is a reduction in movement, change in breath pattern, and an increase in pain complaints, but when they arrive for treatment just after experiencing something that brought them profound joy, they seem to focus on that rather than the pain. They move and breathe with more ease, as if joy has permeated every cell, and their symptoms and complaints significantly reduce. *Manomayakosha, vijnanamayakosha,* and *anandamayakosha* are important to address in any plan of care, but they are particularly essential for clients suffering from persistent LBP. I refer clients to mental health care professionals or to their spiritual counselors as appropriate. Sometimes I encourage, or even help, clients make a list of things that bring them joy in their life that they can feasibly access, such as listening to music, spending time in nature, visiting a grandchild or friend, having a phone conversation with a loved one, and so on. I try to carefully observe clients' emotional responses to different treatment modalities. I may notice a certain asana or pranayama practice resonates on a pleasurable level for some clients. Or I may even ask clients to observe how a practice makes them feel and to share their feelings with me if they choose. I think it is important not to force joy or try to make someone feel something they are not feeling. We have a tendency to want to fix the client, instead of listening and discovering what the client needs. However, introducing joy and pleasure can be very healing, particularly for persistent LBP clients who may be stuck in patterns of negativity. This fosters a mindful presence and sense of observation throughout their home practices as well.

5) Develop trust and confidence.

I recall a presentation I gave to PT students about fourteen years ago. I was asked to speak about the factors that I thought were most important in contributing to successful patient treatment outcomes. I had only been practising for about two years. I spoke from my heart and my two years of experience—I did not do any research for the presentation. My last slide had one big word across the screen: T R U S T. I spoke about how important it was to develop a strong rapport with clients and how I thought that if clients gained trust in their therapists, then they could more easily trust in themselves and feel confident about what they were doing. Consequently, they seemed to have a better chance of improving. I continue to believe this today. There is also now some research to support this hypothesis as it relates to LBP. Treatment methods that restore confidence have been shown to reduce LBP by addressing clients' emotional factors such as fear or anxiety.[31] As yoga therapists, we have many tools at hand to help build rapport and restore confidence in our clients. Here are a few of mine I would like to share:

Treatment methods that restore confidence have been shown to reduce LBP by addressing clients' emotional factors such as fear or anxiety. As yoga therapists, we have many tools at hand to help build rapport and restore confidence in our clients.

Listen. Many people with chronic pain feel they just need someone to listen to them and understand. Developing a strong rapport can start with taking the time to listen. Once good rapport is developed, it is more likely the clients can start to relax, let go, and begin to trust in you and themselves. **Observe.** Paying close attention to body language and other subtleties can improve communication. Maintaining your own meditation practice will help with clarity so that your observation and critical-thinking skills are optimal. **Educate.** Keeping up on the recent literature of evidence-based practices and being able to share the information in a clear way will help your clients to trust you and the treatment approach and process, and from there, ultimately, to trust themselves when it is time to perform movement. **Provide.** To the best of your ability, ensure that the physical, energetic, emotional, spiritual, and mental space you are providing makes clients feel safe. If they do not feel safe, they will not be able to let go or trust. **Guide.** Use your knowledge, skills, talents, specialized training, and experience as authentically as you can. I always set an intention prior to seeing each client, and I ask the client to set one as well (we don't share these with each other, although you may wish to). This seems to serve us both well. I also meditate briefly with the client prior to setting the intention.

I hope this perspective has shed some light on the management of nonspecific LBP using a therapeutic yoga approach. I have consistently seen an overall improved outcome in movement, function, and pain reduction in my LBP clients by using this approach. Yoga therapy can be very effective in managing a biopsychosocial issue such as nonspecific LBP because the assessment and treatment modalities are also biopsychosocial in nature. YTT

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