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A CLASSIFICATION-BASED COGNITIVE FUNCTIONAL APPROACH FOR THE MANAGEMENT OF BACK PAIN

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THE FAILURE OF CURRENT PRACTICE

Hi, I am almost 25 years old and up until June 2007 I was very active and played a lot of sport. My back problems began in late 2004. The physical therapist gave me core strength exercises. I was determined not to reinjure my back and did a lot of core stability/strength work prior to the June 2007 injury. In June 2007, I felt some restriction and pain on the lower right side of my back. It is still the same today and I am nowhere near the once active lifestyle I had a few years ago.

I have seen a number of specialists, including physical therapists, chiropractors, osteopaths, an orthopaedic surgeon, neurosurgeon, sports physician, golf physical therapist, and pain doctor, and have tried orthotics to try and get rid of my leg length discrepancy.

My MRI shows a damaged L5-S1 disc and damaged L4-5 disc. Up until a few months ago, I didn't really know what was causing my pain, until I had a discogram done. I could only describe it as the worst pain I've ever had when they put a needle in my L5-S1 lumbar disc. This proved that the majority of the pain and problems are coming from this area. A neurosurgeon says he can perform a fusion on my lower back but I think this may be very risky.

I am disappointed that I can never play basketball, golf, and go for a run ever again. Does my back problem sound like something that you may be able to help me with? Is surgery the right thing for a 25-year-old? My pain is very restricting, which is why I am considering surgery. I am even considering getting an ozone disc injection, which was recommended

to me by a prolotherapist a few weeks ago.

Is this the kind of problem you can help? I would like to get a professional opinion on my back problem…

–E-mail, July 2010

This true story highlights the enormous personal, social, and economic burden of persistent back pain (PBP) disorders, and the failure of current therapies to effectively manage them. The biomedical approaches to manage PBP over the past 15 years have led to an exponential increase in rehabilitation therapies that have largely focused on enhancing the core stability of the spine, magnetic resonance imaging (MRI), spinal injections, surgical interventions, and pharmacological treatments, with a massive increase in healthcare costs. Ironically, this has been associated with a concurrent increase in disability related to PBP.[7]

THE MULTIDIMENSIONAL NATURE OF PBP

There is growing evidence that PBP disorders are associated with a complex combination of physical, lifestyle, cognitive, psychological, social, neurophysiological, and genetic factors that can coexist to maintain a vicious cycle of pain and disability.[10,23]

Pathoanatomical Factors

- A definitive pathoanatomical diagnosis cannot be made for the majority of low back pain (LBP) disorders.[26]
- There is a high prevalence of abnormal findings on MRI in pain-free populations (disc degeneration [91%], disc bulges [56%], disc protrusion [32%], annular tears [38%]).[19]
- Prospective research shows that depression is more predictive of future LBP than MRI findings.[15]
- Early MRI for minor back strains results in poorer prognosis, more sick leave, and a greater risk of surgery.[28]
- Healthcare practitioners (HCPs) play a critical role in communicating radiology findings to the patient.

Physical Factors

- People with PBP demonstrate increased trunk muscle coactivation and an inability to relax the back muscles,[5,11] as well as a tendency for earlier onset of activation of the transverse abdominal wall muscles,[12] challenging the basis of core stability practice prevalent in the world.
- Growing evidence suggests that people with PBP adopt maladaptive movement behaviors that become provocative of their disorder.[5,22] This is like a limp that persists past natural tissue healing time. These behaviors are not stereotypical[5,22] and can be characterized and identified by trained therapists.[6,9]
- High levels of back muscle electromyography correlate with pain intensity, disability levels, and a range of psychological factors, supporting the close mind-body relationship in people with PBP.[16]
- There is evidence that altered movement behaviors are associated with central nervous system changes reflecting altered body schema.[18,27]

Lifestyle Factors

- Lifestyle factors such as smoking, sedentary behaviors, activity levels, obesity, sleep deficits, and chronic stress are all known to be risk factors for LBP.[2,20]

Cognitive and Psychosocial Factors

- Cognitive factors such as negative LBP beliefs and fear of movement and activity are more predictive of disability than pain intensity levels.[3] HCPs provide a critical role in transferring back pain beliefs to their patients. Language such as "your back is unstable" may be interpreted as "my back is damaged and it is dangerous to move." A "lack of core stability" may mean to the patient that "my back is weak and vulnerable and I need to be vigilant to protect it when I move."
- Emotional factors such as fear, stress, anxiety and depression, catastrophizing, and vigilance act to reinforce maladaptive behaviors, further enhancing the pain experience and disability levels.[10] They also influence pain processing via dysregulation of the hypothalamic-pituitary-adrenal axis and altered immune and neuroendocrine function.[4]

Social Factors

- Factors such as work and family stress, poor family functioning, low job satisfaction, low socioeconomic level, and cultural factors have an influence on pain beliefs, coping, and vulnerability.[10,23]

Neurophysiological Factors

- PBP has been associated with a loss of gray matter, increased resting state of the brain, changes in the sensorimotor cortex/body schema, and loss of endogenous pain inhibition.[27] These factors contribute to widespread sensory changes as well as altered motor and movement disturbances.[21,27]
- LBP may manifest as any one or a combination of pain states (nociceptive, inflammatory, functional, and neuropathic), with different associated sensory profiles, supporting the need for targeted management.[29]

Individual Considerations

- The presence of health and pain comorbidities; perceived general health; and the patient's goals, values, health literacy, levels of acceptance, expectation, and readiness for change are known to be important considerations in the assessment, management, and prognosis of people with LBP.[3,10,23,25]

Genetic Factors

- There is growing evidence to support that genetic-envi-

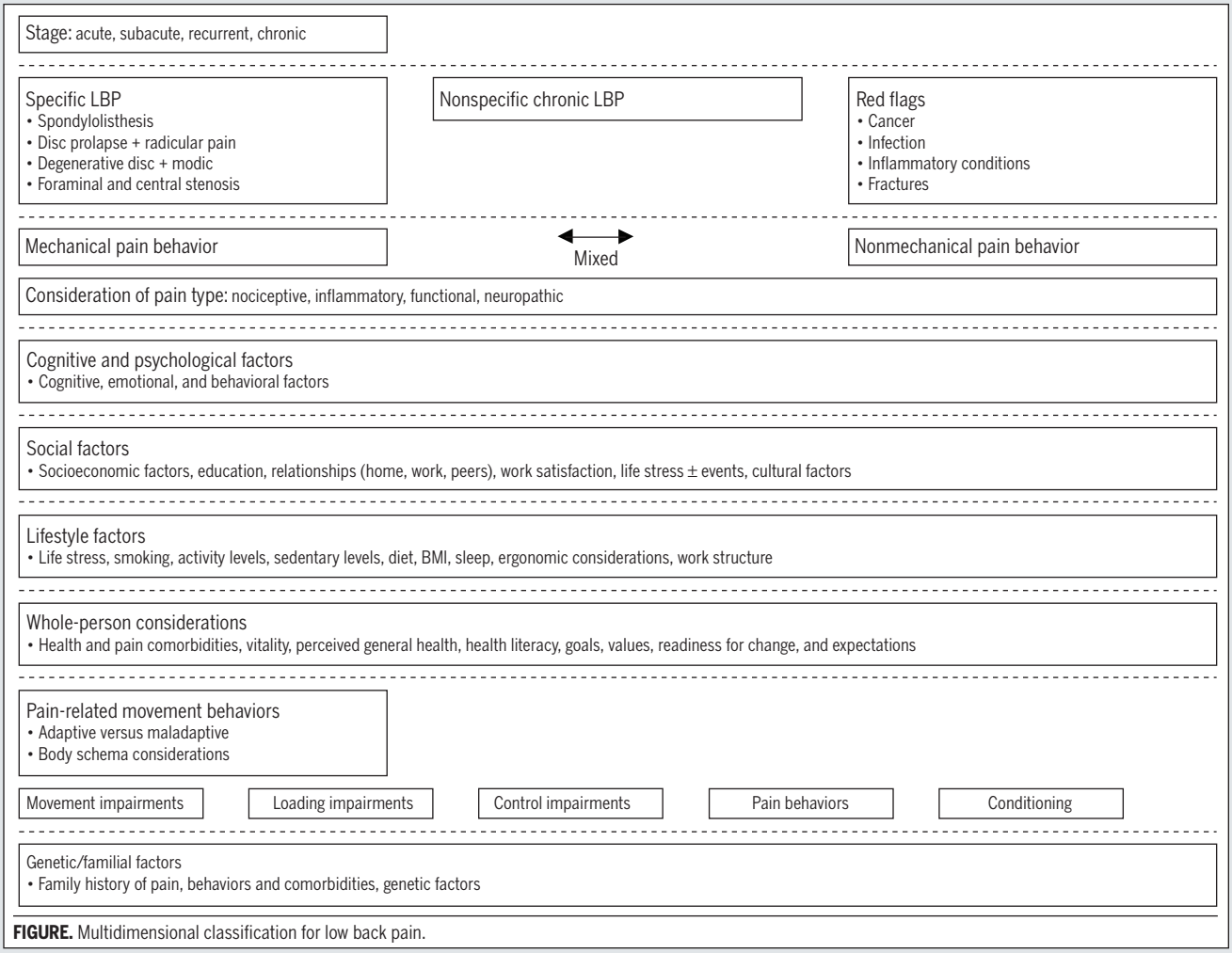

FIGURE. Multidimensional classification for low back pain.

ronmental interactions have a potential influence on pain vulnerability in specific populations.[10,24]

- There is a clear need for a consensus in the diagnosis and classification of LBP disorders. A multidimensional model (**FIGURE**) is proposed, directed by a clinical reasoning process based on the patient's "story," screening questionnaires,[13,17] and clinical examination. During this process, consideration is made to determine the relative weighting, dominance, and relevance of the different factors to the person's disorder.

COGNITIVE FUNCTIONAL APPROACH TO MANAGE PBP DISORDERS

There is growing evidence to support that, for many patients with PBP, targeting the beliefs and behaviors that drive pain and disability is more effective than simply treating the symptom of pain.[1,8,14]

An integrated person-centered and goal-orientated management approach for PBP called cognitive functional therapy (CFT) is proposed. The focus of this process is directed by the findings on the multidimensional examination (**FIGURE**) as to the primary contributing factors (across the different domains) linked to the person's disorder.

The key components of the CFT approach involve the following:

- Addressing negative beliefs and fear regarding pain and MRI findings.
- Providing effective patient-centered education regarding the multidimensional mechanisms that drive the vicious cycle of pain and disability.
- Promoting active coping strategies for pain and instilling confidence and hope for change.
- Facilitating goal-orientated behavioral change regarding stress management, sleep hygiene, physical activity, pacing, and diet.
- Utilizing motivational interviewing techniques.
- Training mindfulness of body and movement (body schema retraining).
- Feedback is critical to this process and involves:
  - Mindfulness of the body-mind responses to pain, movement, and its perceived threat.
  - Visual feedback with the use of mirrors, video, and

written instruction.

- Maladaptive movement and pain behaviors are identified and provocative movement patterns are broken down into component parts and retrained in a mindful/relaxed manner.
- The "new" movement behaviors are gradually targeted toward the activities and movements that provoke pain and/or are avoided by the patient to reduce the threat value of the task and normalize it.
- These new behaviors are then integrated into activities of daily life to ensure carryover to activities of daily living.
- Targeted strengthening and conditioning are incorporated as required by the functional goals of the patient.

In situations where central pain mechanisms and/or psychological comorbidities dominate, CFT may need to be integrated with medical and/or psychological management. Manual therapy is only used as a window of opportunity to change behaviors where movement impairments are present.

A recent randomized controlled trial has demonstrated that CFT resulted in superior outcomes (reduced pain intensity and episodes, disability, fear, improved mood, less need for ongoing care, and reduced sick leave) when compared to manual therapy and stabilizing exercises.[8] Further trials are under way.

It is proposed that this model of assessment and management applies to musculoskeletal pain disorders in general.

WHAT HAPPENED TO THE YOUNG MAN?

The young man in the story had a belief that his back was damaged and no active coping strategies to manage it. He was hypervigilant to his pain, fearful, anxious, and avoidant of movement and activity. He had a predominant mechanical behavior to his pain linked to movement and loading. This was reinforced by maladaptive movement behaviors related to avoiding loading his right leg and abnormal bracing strategies through his back and abdominal wall muscles, due to fear of pain. He was highly deconditioned, was in a depressed state, and had low levels of self-efficacy. He adopted unhealthy lifestyle habits such as sedentary behaviors, slept poorly, and adopted unhealthy dietary habits. He had little hope for change. Many of his beliefs and behaviors were reinforced by well-meaning HCPs.

He was provided with a CFT intervention based on these findings. This involved education that his MRI findings were common in active people without pain, and that pain did not equal harm. It was explained that his pain state represented sensitization of his nervous system, fed by a vicious cycle of fear, anxiety, negative beliefs, vigilance, protective muscle guarding, and avoidance of movement and activity. He was educated that the spine is strong and robust and about the importance of adopting relaxed, normal patterns of movement.

In conjunction with this, he underwent a graduated functional rehabilitation program that focused on training him to relax his back and abdominal wall muscles with diaphragm breathing and adopting relaxed postures and movements. He was given a graduated program of loading his right leg with visual mirror feedback to reinforce a normal body schema. Once he realized that loading his leg and moving in a relaxed manner did not provoke his back pain, his fear of movement reduced. This was progressed in a gym setting, where his functional capacity was gradually developed around his goals to run and play golf and basketball again. Whole-body functional movements specific to his sport were used to reinforce his confidence in this process.

These are his words after completing this program:

Just an update on my lower back problem. It has been just over 6 months since I began my rehab program and I have improved in lots of areas. My fitness has gotten better and I am doing things that I believed I would never do again. A previous PT told me I could never run again. I ran 5 km the other day, played basketball, and then played volleyball in the evening. I am doing these things with a bit of pain, but it decreases when I'm active and not thinking about it. On a good day I almost feel perfectly normal and just want to go out and be active. I would like to thank you for getting me back on the right track.

–E-mail, December 2010

This young man is now (2 years later) traveling around the world with no need for ongoing healthcare, has confidence in his back, and has full functional capacity and hope for the future. This outcome is not the case for all people with PBP, and, sadly, many never get the opportunity to take this journey.

It is our challenge as HCPs to help our patients on this journey!

(E-mails published with permission.)

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WHAT IS OUR BASELINE FOR MOVEMENT? THE CLINICAL NEED FOR MOVEMENT SCREENING AND ASSESSMENT

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The musculoskeletal system is unique among the systems of the human body. However, unlike other systems of the body, we professionals wait for symptoms before we consider the meaningful signs of dysfunction and disease. Screening for and proactive early detection of dysfunction have been an evolutionary hallmark among many other health and medical practices, such as optometry, dentistry, and cardiology, for example. We currently benefit from the use of meaningful biomarkers of elevated risk and dysfunction for other organ systems in the body, but we have not used this example or taken the challenge to employ the same logic into orthopaedic practice. Orthopaedic practice lags behind other medical specialties in the field of risk prediction and postrehabilitation prognosis. Most other specialty practices routinely investigate clinical signs with established biomarkers to practice in a proactive manner, and acting whenever possible before symptoms are present. Conservative orthopaedic practice does not currently support a standard operating procedure (SOP) for movement-related biomarkers for prognosis and future risk prediction. An effort to establish movement-related biomarkers would support both clinical practice as well as the clinical efficacy of yearly preventative screens in the active asymptomatic population.

As orthopaedic physical therapists, if we were given access to the general public for a yearly movement-based checkup, what would we do? How would we handle this responsibil-