

The Rehabilitation Model Embraces a Revolution

THE BIOPSYCHOSOCIAL MODEL

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Today's literature is in pursuit of the holy grail: "Why do some people recover and others become disabled?". While admitting that proof is still lacking, Waddell, in his new book *The Back Pain Revolution*, argues for a new biopsychosocial approach to low-back patients.¹ The traditional orthopedic approach is shown to medicalize back pain by overprescribing passive approaches such as medications and bed rest and overdiagnosing often coincidental rather than causative factors such as herniated discs and degenerative arthritis. This only encourages patients to take on a sick role, thinking they are injured or damaged, becoming passive recipients of care and looking for someone to "fix" their problem. The new model reassures patients that their problem is not sinister and encourages them to stay active as that will facilitate recovery.

A key factor which determines who will recover and who will become disabled is shown to be whether a person is a pain avoider or a pain confronter. Waddell explains how to approach patients from a biopsychosocial perspective and teach patients a different coping strategy. Yet unlike many other authors, Waddell does not conclude that back pain is all in the mind. He argues that while most patients are classified as having non-specific pain, this does not mean that there is not a link between specific "pain generators" and pain, only that present research has not sorted out these relationships.

The Back Pain Revolution provides a step-by-step guide on how to identify patients at risk of not recovering from acute pain ("yellow flags") and how to treat them. The recent New Zealand back pain guidelines show how to capture yellow flags and has a simple scoring system.² The techniques of converting patients from pain avoiders to pain copers is addressed by numerous authors.¹⁻⁴ The key is to reassure patients that rest will increase their pain and impairment and that reactivation is the road to recovery.

Waddell recommends sweeping changes to the present way back pain is managed. For instance, he suggests management of back pain patients should be mainly by primary care (i.e., chiropractic) rather than specialist (i.e. orthopedic) services. He explains that there are three distinct phases of back pain, and the management is different in each phase. The acute phase is the first 3-4 weeks, and management is very simple. Due to the good prognosis for most patients, the main principle is "First, do no harm" -- or don't medicalize the problem. The subacute phase starts around the fourth week and ends around the 12th week. Treatment should become very aggressive between the third and sixth week to prevent chronic pain behaviors from becoming established. Rather than expending most of the health care system's limited resources on patients in whom chronic pain behaviors are fully established, Waddell's book argues resources should be concentrated much earlier, in particular on subacute patients with "yellow flags" of psychosocial risk of chronicity.

Functional Pathology of the Motor System

Over the past few years, a revolution has occurred in the Prague school of manual medicine's approach to rehabilitation of the motor system. For decades, the emphasis has been on identifying key joint dysfunctions and associated faulty movement patterns (or muscle imbalances). Ongoing work by Kolah has demonstrated that various reflex stimulation points exist which are key links in functional pathology of the motor system.⁵ These points relate to the points of support an infant uses to transition from one stage of locomotor development to another.

Kolah has demonstrated how appropriate resistance to these points can be used to facilitate involuntary muscle contractions involved in such activities as diaphragmatic respiration, rolling over, trunk extension, etc. What these involuntary movements have in common is that they relate to specific stages of neurodevelopment which result in the stable upright vertical posture being achieved in a three year old. Kolah explains that a three-year-old child can stand without support on one leg. This represents that the postural system has reached a key stage in its maturity.

The postural system is born around four or five weeks of life when the infant learns to raise its head. This is the first step towards verticalization of posture and is under a higher neural control than reflex activities such as gripping and sucking. What is most important from a rehabilitation perspective is that the way an infant raises its head is reflective of whether development (both mentally and physically) is occurring normally. If the infant does not raise its head by the sixth week, or if the head is raised with the C0-C1 joint in hyperextension, a problem should be suspected. For each stage of neurodevelopment, specific joints such as C0-C1, scapula-thoracic, hip, etc. must be stabilized in a "neutral range" by agonist-antagonist contractions in order for neurodevelopmental progress to continue normally.

According to leading biomechanical research of the last decade, agonist-antagonist muscle contractions are known to be essential for maintaining joints in a "neutral range" during loaded tasks.^{6,7} A failure of the agonist-antagonist muscle system to centrare joints is believed to occur in about 30% of infants and be present by the end the fourth month of life. This is the earliest sign of muscle imbalance and suggests that repetitive strain from sedentary posture is not the primary cause of muscle imbalance in a significant percentage of our patients.

From a clinical perspective, Kolah's new contributions point the way towards a more focused examination of key links responsible for our patients' functional pathology. For instance, chains of trigger points in key agonist-antagonist muscles can be palpated for (i.e., pectoralis major and middle trapezius). When a chain of points are linked up, treatment of a key link is usually efficient in bringing about a change throughout the entire chain. In particular, areas of greater afferent concentration are the most important. These include the C0-C1 joint, soles of the feet and palms of the hand. Certain points of support such as the nuchal line are also crucial as they relate to maintenance of a centrare joint position such as in C0-C1. The clinical relevance can easily be appreciated when addressing headaches associated with a head-forward posture.

Kolah shows how treatments which facilitate many of the inhibited muscles found in the upper and lower extremity can also release many of these chains. For instance, eccentric manual resistance may be given to the forearm supinators, wrist and finger extensors and shoulder external rotators. This work was originally described in English by Lewit and is attributed to the European neurologist Brugger.⁸

Brugger's postural reeducation approach, exteroceptive stimulation and myofascial release techniques from Ward at Michigan State Osteopathic College have all been updated in a recently presented new edition to Karel Lewit's classic *Manipulative Therapy in Rehabilitation of the Motor*

System.⁸ One of the most relevant new areas of clinical research addresses the pelvic diaphragm as a common source of painful dysfunction throughout the locomotor system. Treatments incorporating abdominal hollowing are described to facilitate the pelvic diaphragm. Pelvic diaphragm dysfunction is shown to be a key perpetuating factor of the Silverstolpe reflex -- a very tender trigger point in the longissimus thoracis with a twitch that extends to the pelvis.

Sports Medicine Embraces a Functional Approach

While traditional sports medicine approaches focus exclusively on treatment of the injured tissues, new work shows how treatment should also address the biomechanical source of tissue overload.⁹ In particular, the techniques for unraveling the biomechanical linkage system for both common and rare sports injuries are being discovered. As an example, Kibler and colleagues discuss that an anterior glenoid labrum tear may require surgery, but the rehabilitation is shown to include scapulothoracic stabilization along with treatments to increase lumbar spine extension and hip rotation.

Sports medicine experts from Puget Sound to Beth Israel Hospital in New York city are taking an aggressive new approach to rehabilitation.⁹ For each region of the body the clinical symptom complex is linked to the tissue injury diagnosis and source of biomechanical overload. Finally, the associated functional deficits in the kinetic chain for each clinical syndrome have been described.

Modern Technology and Rehabilitation

Poor compliance is the major reason why more doctors don't prescribe exercise for their patients. A new handbook with accompanying CD-ROM allows chiropractic rehabilitation specialists to use a new motivational tool.¹⁰ Patients can display video images of their exercises right at their work station or home computer. A new technique for reflex facilitation of the transverse abdominus is demonstrated by having patients perform a trunk curl while applying light resistance to their forehead.

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