

Therapeutic Exercise For Spinal Segmental Stabilization in Low Back Pain: Scientific Basis and Clinical Approach
Carolyn Richardson, Gwendolen Jull, Paul Hodges
Churchill Livingstone, 1999
ISBN 0-443-058024

This hard cover is forwarded by Manobar M. Panjabi, an acknowledged researcher on Lumbar Spine Biomechanics. In total, there are 191 pages, which are divided into five sections. These sections include: Introduction, The Scientific Basis, Applying Science to Practice, The Clinical Approach, and Future Directions; all addressing the issue of Spinal Segmental Stabilization. Each section is broken down into its own table of contents and the purpose of each chapter is defined.

Section one asks the questions: What muscles are most important for spinal segmental support? Are these muscles operating in a supporting role in back pain patients? Could dysfunctional muscles be retained to regain their supporting role? Could muscles be trained to compensate for impaired passive support?

Section two attempts to give evidence through scientific research, to answer the questions in section one. Panjabi presents the basic premise for the concept of spinal stabilization on the concept of the “Neutral Zone”, as it relates to “Load Deformation Behaviour of the Spinal Segment”. Anatomy and function of the muscles of the Lumbar Region and abdominal wall are described and through EMG investigation are cited as primary stabilizers of the Lumbar Spine and Pelvis. These muscles include the lumbar multifidus, longissimus thoracic and lumborum, iliocostalis lumborum, transversus abdominis, and the pelvic floor. Much of the relationship to segmental stabilization revolves around the authors research related to intra-abdominal pressure management. The relationship between co-contraction of the transverse abdominal, pelvic floor, multifidi, and diaphragm are discussed with upper and lower limb positioning. These findings are then related to low back pain and the treatment of low back pain with the firing patterns of these muscles considered (The effect of respiration on the stabilization muscles is also discussed for part of a chapter, as it relates to inter-abdominal pressure). To assess muscle firing patterns the authors attempt to use objective diagnostic tools such as surface EMG, diagnostic ultrasound, and a pressure algometer.

Section three describes various strategies to re-educate muscle in their stabilization function. The authors admit that their concepts and principles are not universally agreed upon. The more thoroughly researched concepts of joint stabilization are reviewed through the concept of co-contraction. The authors advocate motor skill rehabilitation through motor relearning, rather than through conventional exercise for increasing the strength and endurance of muscle.

Section four then deals with a “three-tiered” model of assessment depending on the degree of motor control deficit. This model moves from high-tech assessment to crude visual assessments dependant on the facilities resources. Chapter nine describes treatment strategies to address the inappropriate firing patterns that can develop in the low back pain patient. Some of the recommendations are purely anecdotal, others are occupation reintegration targeted.

Section five is like a breath of fresh air, giving the curious investigative clinician future direction and the impetuous to further investigate the concepts presented in this text. Key areas for suggested future research are identified by the authors.

The reference section includes 365 items. These items are both of foundational knowledge, which most of the more current items are based on, but also highlighting research by Bogduk, Cresswell, McGill, Panjabi, and Sheppard, which should be of great interest to the chiropractor. All of these researchers have contributed enormously to the knowledge base in neuromuscular biomechanics, in the past ten years.

In all, this text is well organized following a natural progression from theory to laboratory testing to practical application in the clinical setting. It is a reasonably priced text and I would recommend it for all chiropractors and athletic therapists.

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Ergonomics in Health Care and Rehabilitation

Valerie J. Berg Rice

Butterworth-Heinemann Inc., 225 Wildwood Ave.

Woburn MA USA 01 801

369 pages, hardcover, \$ 47.50 U.S.

ISBN 0750697148

In today's work place, ergonomics is becoming a major health issue. Chiropractors are often on the front line, as patients presenting to clinics may suffer from work place injury. There is a need for health practitioners to address the source of worker injury in order to prevent further incidents. *Ergonomics in Health Care and Rehabilitation* is an excellent reference for the chiropractor who wishes to take his or her practice experience into the community through the application of ergonomic principles. A wide variety of topics are covered by 27 contributing authors with varying credentials ranging from one-on-one ergonomic consulting to user centered equipment design. The main focus of this publication is the field application of human factors/ergonomics and areas that overlap with health care rehabilitation.

A well-rounded Introduction section enables the novice to understand the basic concepts, terminology, and evolution of ergonomics. Case studies of wide ranging appeal provide specific examples of physical, cognitive and psychosocial factors involved in the ergonomic approach.

The book also includes a section on musculoskeletal ergonomics, which should be of great interest to chiropractors. Work place safety issues are identified and information is provided for the health practitioner to address common occupational hazards. There is also a notable section addressing problems with the design and development of health care equipment.

This book also has a large focus on United States health law, more specifically, the Americans with Disabilities Act. It is somewhat difficult to know how much of this information would apply to Canadian health law, but at the very least, it provides an understanding how to comply with governmental standards in an industrialized country.

Various tables, forms, charts and questionnaires are provide information which is practical, easy to read, and well referenced. The clinician can utilize this information to address ergonomic issues in environments ranging from the office to heavy industry. Work simplification techniques, proper body mechanics, and promotion of healthy

work habits are within the scope of chiropractors to recommend. This book is an excellent source that can aid the chiropractor in becoming proficient in this role.

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Exercise Prescription

Kamala Shankar, MD

Hanley & Belfus, Inc., Medical Publishers,

Philadelphia, PA 19107

Soft Cover, 498 pages, 1999, \$65.00 (CDN)

ISBN 1-56053-258-0

This book was intended for the practising health professionals that use exercise as a therapeutic modality in conjunction with their main treatment for a patient's presenting disease. Most of us in the chiropractic profession will use exercise as a means to help the patient recover from a musculoskeletal dysfunction or injury. This book goes far beyond that in scope. It is an in depth look at why, how, and when to prescribe exercise to individuals that not only have musculoskeletal injuries, but also disabling conditions of other organ systems. It includes exercise for those from youth to the elderly.

"Exercise Prescription" is a compilation of the works of over thirty different contributors divided into five sections, including basic principles, general medical issues, neurologic aspects, musculoskeletal aspects, and lastly by a section on special groups; postmenopausal women, computer injury, youth and the elderly. The author feels that if exercise is to be effectively prescribed, the effects on the organ systems should be well understood. Descriptions of these effects are given throughout the book prior to the discussion on exercise for the various conditions. This is not light reading.

The book has numerous pictures, charts, and drawings showing some exercises, effects of exercise or lists of contact organizations. These are not type of things that one would give a patient for home use.

Overall, this is a well written, understandable book on

exercise and its numerous positive and negative effects on the patient with the most common types of disorders including cardiopulmonary, neurologic (tetra and paraplegia), neuromuscular diseases, amputees and many others. It is not for the average field practitioner, but there are some chapters that may be of interest concerning the history of exercise and exercise related to children and the elderly. Although having a relatively inexpensive price tag of \$65.00 (CDN), it is not a book I would recommend for the office book shelf. Borrow it from the library if you want to browse through it.

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The Adult Spine: Principles and Practice (2nd ed.)
2 volumes

John W. Frymoyer (editor-in-chief)
Lippencott-Raven, 1997

2443 pages, hardcover, illustrated, \$591.50
ISBN 0-7817-0329-8

The premise of the Adult Spine is that clinical diagnosis of spinal disorders should be based on the history and physical exam, as opposed to extensive, and often low-yield, testing procedures. The first volume of this seminal work is comprised of 68 chapters divided into three sections. N. Hadler authors Chapter 4, and in his usual fashion, manages to gel the salient features of the overly complex low back pain (LBP) conundrum into a concise, and utterly lucid essay. Some of his notable insights include the notion that it is almost impossible to get well if you have to prove you are sick; the impairment rating system is fatally flawed and should be discarded; and there is every reason to question the surgical algorithm of low back pain management. Chapter 20 stands out in its clear and definitive presentation of the important subjects of sensitivity, specificity and predictive value. This chapter is invaluable in determining the relative usefulness of the myriad of ancillary testing available to clinicians involved in spinal care.

The second volume of the Adult Spine is comprised of 44 chapters divided into three sections: Thoracic and thoracolumbar spine; Lumbar spine and sacrum; Sacrum and

coccyx. Chapter 86 should be required reading for all chiropractors. As stated by Haldeman et al. in the first paragraph, "Spinal manipulative therapy (SMT) represents the best example of the legitimization over the past two decades of a controversial modality for the treatment of spinal disorders." This well-referenced chapter examines SMT in terms of its history, efficacy, various models, indications and contraindications.

Section Two focuses a to a large extent on the evidence, or lack thereof, concerning the use of various forms of conservative therapy in the treatment of LBP. There seems to be some agreement as to which forms of therapy are appropriate based on the duration of LBP, in terms of acute, sub-acute or chronic. What is confusing in the context of this discussion is the lack of consistency in the definitions of these three subsets of LBP. Fardon, in Chapter 80, defines acute LBP as less than 2 weeks, sub-acute as 2 to 7 weeks, and chronic as more than 7 weeks. In Chapter 82, Deyo defines acute LBP as less than 6 weeks, sub-acute LBP as 6 to 12 weeks, and chronic LBP as more than 3 months. In Chapter 86, Haldeman et al. provide a reference for defining acute LBP as less than 3 weeks, sub-acute LBP as 3–13 weeks, and chronic LBP as more than 3 months duration. Given the importance that the various authors place on determining therapy with respect to the stage of LBP it would be of considerable benefit to reach a consensus on their definitions. In their defense however, lack of consistency in regards to defining acute, sub-acute and chronic is paramount throughout the literature.

Overall, this two-volume set should be considered an essential addition to the library of any practitioner involved in the care of the adult spine. Although the diversity inherent to this text obviously goes beyond the scope of any one profession, the editors have managed to clearly separate the material into brief, concise chapters. Furthermore, the style of writing is for the most part immensely approachable for anyone with a rudimentary knowledge of the field of spinal care. The editors and numerous contributors set out with the task of creating a definitive treatise on the adult spine, and they have succeeded to an enviable degree.

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