

# INSIGHTS INTO CHIROPRACTIC

*Discerning the true nature of an alternative health care method*

## What is Spinal Manipulation?

### INTRODUCTION

Spinal manipulation is an ancient healing art practiced by a wide variety of cultures. The earliest known recorded reference to spinal manipulation is found in a Chinese document dating to approximately 2700 BC(1).

But what exactly is spinal manipulation?

Indeed, there is much confusion regarding the term spinal manipulation. The term has been used to connote anything from the gentle stroking of the paraspinal soft tissues all the way up to a "gross assault" upon the articulations of an unconscious patient(2). Medical manipulators Bourdillon, Day and Bookhout state, "There is still disagreement as to the breadth of the meaning of the word manipulation. In Europe the term is used, in this context, almost solely for procedures involving a high velocity, low amplitude, thrusting movement. In North America it is used in a much wider sense, to include any active or passive movement initiated, assisted or resisted by the operator. This includes treatments sometimes listed as articulation, mobilisation, isometric and isotonic techniques, myofascial, functional or indirect and even craniosacral techniques(3)."

### SPECIFIC DESCRIPTIONS

Doctors of chiropractic utilize a wide variety of methods to induce controlled, forced movements of spinal joints in the treatment of the neuromusculoskeletal dysfunction syn-

dromes with which their patients present. Although using many different methods, the high velocity, short amplitude thrust, referred to above, is the method of manipulation most commonly used by doctors of chiropractic. Two specific descriptions of the controlled, high velocity, short amplitude thrust have been proposed by chiropractors and physiotherapists. These descriptions are presented below.

### PARAPHYSIOLOGIC JOINT SPACE MANIPULATION

Chiropractic manipulators Haldeman(4) and Kirkaldy-Willis and Cassidy(5) have described a model of the high velocity, short amplitude thrusting movements used by chiropractors which they refer to as the paraphysiologic joint space manipulation. In this model of synovial joint manipulation three ranges of motion are discussed-the active range of motion, the passive range of motion, and the paraphysiologic range of motion of the involved joint(s).

The active range of motion is defined as that range in which the muscles acting over the joint can produce movement. The passive range of motion is that range through which the joints can be moved by an external force acting on the joints.

For example, using the intrinsic muscles of your forearm and hand flex and extend your right index finger maximally. This action

would induce the maximum active range of motion of your right first metacarpophalangeal joint. Next, extend your right first metacarpophalangeal joint maximally. Then, with your left hand gently force your right index finger further into extension. The additional extension you are able to induce beyond the active maximal extension of your right first metacarpophalangeal joint is the additional passive range of motion allowed by the joint tendons and ligaments.

The paraphysiological range of motion is the small amount of additional movement that may be passively forced beyond the maximal passive range of motion, but just short of the limits of the anatomical integrity of the joint (i.e. just before the joint would become dislocated).

Kirkaldy-Willis and Cassidy state: "At the end of the passive range of motion an elastic barrier of resistance is encountered. This barrier has a spring-like end-feel which is the result of a negative subatmospheric intra-articular pressure. This negative pressure is a stabilizing factor in the coaptation of the articular surfaces. If the separation of the

articular surfaces is forced beyond this elastic barrier, the joint surfaces suddenly move apart with a cracking noise. This additional separation can only be achieved after cracking the joint. This has been labeled the paraphysiological range of motion. This constitutes a manipulation(5)."

A graphic representation of these three ranges of motion are presented in Figure 1.

### GRADED MOBILIZATIONS

Another model of controlled, forced, passive movements of synovial joints is presented by Saunders(6). Saunders, a medical physiotherapist, discusses the idea of graded mobilizations of synovial joints ranging from gentle movements performed within the beginning of the range of motion of a joint up to forced, controlled movements that take the joint in question to the limit of anatomical integrity (Figure 2). The movements are graded as follows:

Grade 1-gentle movements of small amplitude done at the beginning of the available range of motion of the joint

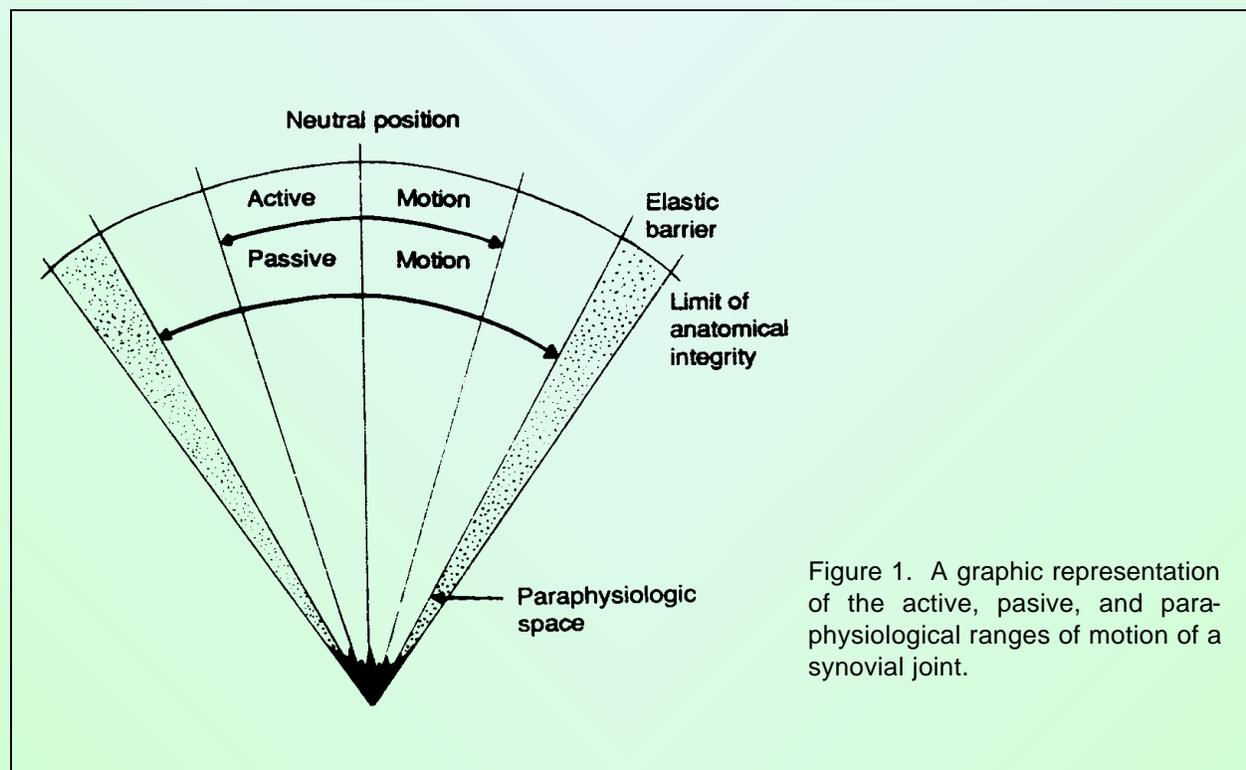


Figure 1. A graphic representation of the active, passive, and paraphysiological ranges of motion of a synovial joint.

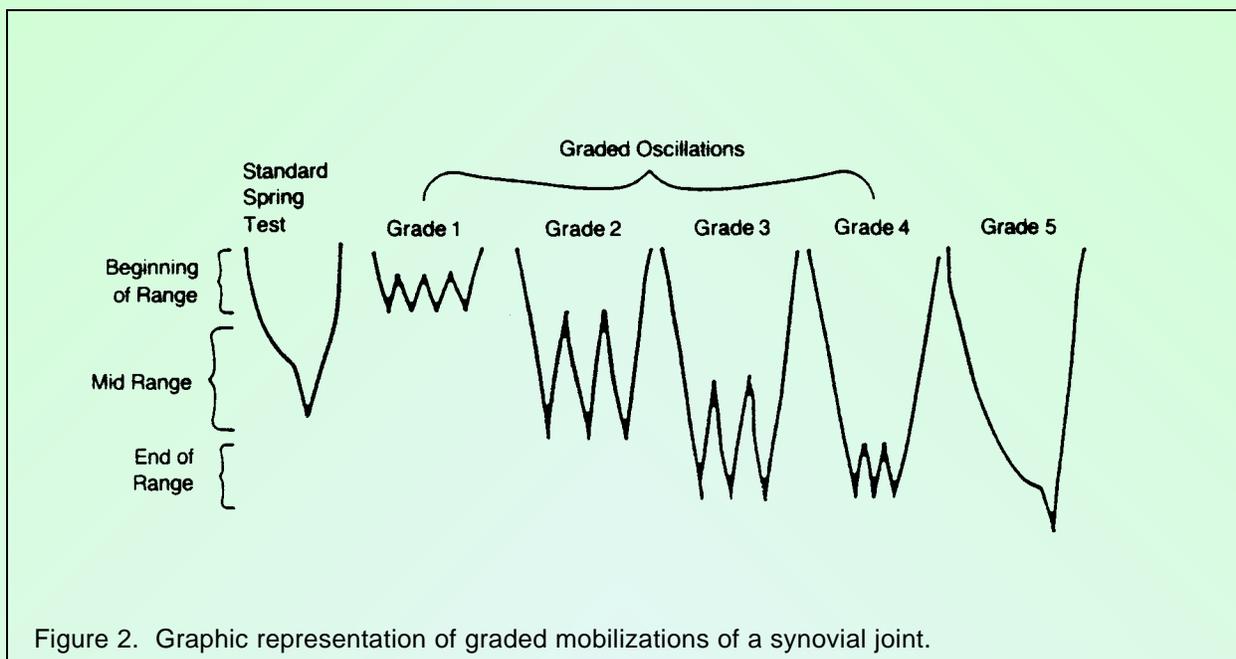


Figure 2. Graphic representation of graded mobilizations of a synovial joint.

Grade 2-gentle movements of large amplitude done into the available midrange of motion of the joint

Grade 3-moderate movements of large amplitude done through the available range of motion of the joint and extending into any restriction of movement

Grade 4-oscillating movements of small amplitude done at the end of the available range of the motion of the joint and into any restriction of movement

Grade 5-high velocity, short amplitude thrusting movements performed up to the anatomic limits of the joint

It should be obvious to the reader that a Grade 5 mobilization is equivalent to the parapsyiological joint space manipulation described above.

#### WHY DO CHIROPRACTORS MANIPULATE JOINTS?

Prolonged rest and/or immobilization have been shown to cause a variety of adverse biomechanical and biochemical changes in injured joint tissues. In regards to these adverse effects, medical orthopedist Cyriax states, "When non-bacterial inflammation attacks the soft tissues, that move, treatment

by rest has been found to result in chronic disability later, although the symptoms may temporarily diminish. Hence, during the past century, treatment by rest has given way to therapeutic movement in many soft tissue lesions. Movement may be applied in various ways: the three main categories are, 1) active and resistive exercises; 2) passive, especially forced movement; and 3) deep massage(7)."

Doctors of chiropractic have always advocated therapeutic movement as a means to limit these adverse effects and to promote health. Although practicing for many years without research to validate what chiropractors believed to be true, recent research has been accumulating that confirms the clinical effectiveness of chiropractic manipulation.

For example, the recent clinical practice guideline published by the Agency for Health Care Policy and Research (AHCPR), a division of the U.S. Department of Health and Human Services, states, that for acute low back problems in adults: "Relief of discomfort can be accomplished most safely with nonprescription medication and/or spinal manipulation(8)." The AHCPR recommendations for treatment for acute low back problems was made after an exhaustive review of

over 350 scientific articles on the subject of low back pain. Among the 350+ articles were over 37 randomized controlled trials of spinal manipulation for low back pain.

### CONCLUSION

The purpose of this brief article was simply to provide a physiologic explanation of the mechanics of the chiropractic spinal manipulation. The two models discussed were the paraphysiological joint space manipulation and the model of graded mobilizations.

A minimal explanation was provided regarding the rationale as to why manipulation is beneficial for specific types of neuromusculoskeletal lesions to, hopefully, stimulate interest in related subjects. In future installments of this series topics will be presented relating to the clinical effectiveness of chiropractic manual methods, cost-effectiveness, safety, patient satisfaction with doctors of chiropractic and their methods, indications and contraindications for chiropractic manipulative therapy, and physiologic mechanisms of manipulation. I believe you will find the information interesting.

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