

Chapter Outline

- I. Overview
- II. List of Subtopics
- III. Literature
- IV. Recommendations
- V. Comments
- VI. References

I. OVERVIEW

This chapter provides a topical summary of typical chiropractic procedures in current use. Most chiropractic named technique procedures consist of a combination of various analytic and care components. This chapter does not serve to review and pass judgement on any particular named technique system as a whole. Indeed, the Board of Directors of the International Chiropractors Association has stated, as a matter of official ICA policy, that: "Doctors of chiropractic should be free to apply any chiropractic technique in which they are appropriately trained, to meet the needs of the patient." The choice of technique is an integral part of the discretion reserved to the judgement of the attending doctor.

Procedures are presented and ratings are made based on current available information and expert opinion. Clinical practice and scientific investigation are ongoing processes and it is understood that this document is a dynamic entity that will require modifications as new knowledge becomes available. There are three basic types of techniques, segmental, postural and tonal. Many of the techniques fall within more than one of these categories

Although this chapter does not include every possible chiropractic technique or procedure, an overall categorization of chiropractic approaches is presented. In addition, a more elaborate classification system is presented here for the non-manual chiropractic procedures.

II. LIST OF SUBTOPICS

- A. Use of ineffective or unsafe mode of care
- B. Chiropractic adjustment modes
 - 1. High velocity thrusts without recoil
 - 2. High velocity thrusts with recoil
 - 3. Low velocity thrusts without recoil
 - 4. Low velocity thrusts with recoil
 - 5. Sustained force
 - 6. Blocking techniques
 - 7. Manually assisted mechanical thrusts
 - 8. Mechanically assisted manual thrust
 - 9. Neurological reflex techniques
 - 10. Low velocity controlled vectored force
- C. Non-manual Procedures
 - 1. Exercise and Rehabilitation
 - 2. Education Procedures
 - 3. Electrical Modalities
 - 4. Thermal Modalities
 - 5. Ultrasound
 - 6. Bracing, Casts, and Supports
 - 7. Traction
 - 8. Nutritional Advice
 - 9. Lifestyle Recommendation
 - 10. Wellness Care/Prevention - Health Promotion/Spinal Hygiene

III. LITERATURE

The literature reveals that there are many articles on adjusting modes, largely written by

technical researchers and chiropractic college faculty. The majority of articles are, therefore, expository and educational and show a wide ranging interest in and discussion of the modes of care in chiropractic.

Specific literature on named chiropractic techniques has traditionally been proprietary and procedurally oriented. In addition, it has rarely been peer reviewed or indexed, which makes access difficult. This problem has been addressed in recent years by the chiropractic profession primarily through three vehicles.

Firstly, *the Journal of Chiropractic Technique* was established to provide a forum for articles relevant to chiropractic procedures. Secondly, a number of discussions, position papers and round tables have been sponsored by professional associations. The Consortium for Chiropractic Research, in collaboration with the Council on Technique and others, held a series of consensus conferences attended by technique teachers, academicians, chiropractic researchers, and private practitioners. See, for example, the proceedings of the 1990 Seattle Consensus Conference (Bergman 1990). Thirdly, a sophisticated standards of care project has been undertaken jointly by the RAND Corporation, the Consortium for Chiropractic Research, and the Foundation for Chiropractic Education and Research (Shekelle, et al., 1991a, Shekelle, et al., 1991b).

Kent and Vernon have developed perhaps the best summary of the matter of categorizing technique procedures as tonal, postural or segmental. In their text, *Case Studies in Chiropractic MRI*, they write:

Cooperstein described two broad approaches to chiropractic technique, the segmental approach and the postural approach. Murphy² added a third, the tonal approach. These conceptual models determine the nature of the analytical procedures employed, the type of adjustments applied, and the criteria for determining the success or failure of a given intervention. A summary of each follows:

1. The segmental model. *Subluxation is described in terms of alterations in specific intervertebral motion segments. In segmental approaches, the involved motion segments may be identified by radiographic procedures which assess intersegmental relationships, or by clinical examination procedures such as motion palpation. Examples of segmental approaches are the Gonstead and Diversified techniques.*

2. Postural approaches. *In postural approaches, subluxation is seen as a postural distortion. Practitioners of postural approaches evaluated "global" subluxations using postural analysis and radiographic techniques which evaluated spinal curves and their relationship to the spine as a whole. Examples of techniques emphasizing a postural approach are Pettibon Spinal Biomechanics and Applied Spinal Bio-engineering.*

3. Tonal approaches. *In 1910, D.D. Palmer wrote: Life is an expression of tone. Tone is the normal degree of nerve tension. Tone is expressed in function by normal elasticity, strength, and excitability...the cause of disease is any variation in tone. Tonal approaches tend to view the spine and nervous system as a functional unit. Tonal approaches emphasize the importance of functional outcomes, and acknowledge that clinical objectives may be achieved using a variety of adjusting methods. Examples of tonal approaches include Network Spinal Analysis and Torque-release Technique.*

In reviewing the preceding basic science and clinical models of the subluxation, it may be seen that the wide diversity of techniques in chiropractic may use different methods, but generally share the common objective of correcting spinal nerve interference caused by vertebral subluxation. Commonality and accountability may be achieved through the

development of models which emphasize clinical outcomes yet afford the practitioner flexibility in determining how those objectives are achieved. Such outcomes include, but are not limited to, evidence of functional integrity of the nervous system, and improvement in general health and quality of life indicators. Research resources should be directed toward the development of models and clinical strategies which result in more predictable and more efficient practice procedures.

IV. RECOMMENDATIONS

1. The chiropractor shall not use any mode of care which has been demonstrated by critical scientific study and field experience to be unsafe or ineffective in addressing vertebral subluxation and other malpositioned articulations and structures.

10.1.1 **Rating:** Established
Evidence: E, L

B. Chiropractic Adjustment Modes

The following recommendations refer to the application of techniques as employed in the correction of vertebral subluxation and other malpositioned articulations and structures.

1. High velocity thrusts without recoil

10.2.1 **Rating:** Established
Evidence: E, L

High velocity thrusts with recoil

10.2.2 **Rating:** Established
Evidence: E, L

3. Low velocity thrusts without recoil

10.2.3 **Rating:** Established
Evidence: E, L

4. Low velocity thrusts with recoil

10.2.4 **Rating:** Established
Evidence: E, L

5. Sustained force

10.2.5 **Rating:** Established
Evidence: E, L

6. Blocking techniques

10.2.6 **Rating:** Established
Evidence: E, L

7. Manually assisted mechanical thrust

10.2.7 **Rating:** Established
Evidence: E, L

8. Mechanically assisted manual thrust

10.2.8 **Rating:** Established
Evidence: E, L

9. Neurological reflex techniques

10.2.9 **Rating:** Established
Evidence: E, L

10. Low velocity controlled vectored force without recoil (see previous page)

10.2.10 **Rating:** Established
Evidence: E, L

C. Manual Reflex and Muscle Relaxation Procedures

1. **Muscle Energy Techniques:** A variety of procedures fall under this classification including post-facilitation stretch, post-isometric relaxation, and reciprocal inhibition, among others. In addition, there are several chiropractic techniques that use procedures mechanically and physiologically similar to these as part of their therapeutic armamentarium. The rationale for such procedures is based on the concept of reciprocal innervation and inhibition between agonist and antagonist muscles. Care is directed at finding such sites and having the patient do movements and muscle contractions, typically against some kind of active resistance in order to cause a relaxation of a hypertonic muscle. These techniques are commonly in use and are the subject of much investigation.

10.3.1 **Rating:** Established
Evidence: Class II, III

2. **Myofascial Ischemic Compression Procedures:** Ischemic compression involves placing a sustained compressive force on a tight or contracted muscle. This is thought to relax the muscle and thereby reduce stress to any joints to which the muscle is attached. The chiropractic profession has employed myofascial ischemic compression procedures and other soft tissue procedures as part of a care regimen for a long time (e.g., Receptor-tonus Technique, myofascial trigger point therapy).

10.3.2 **Rating:** Established
Evidence: Class II, III

3. **Miscellaneous Soft Tissue Techniques:** There are many different kinds of muscle work in widespread use. They involve applying manual pressure in order to relieve muscle spasm. Some common techniques of muscle work include: massage (superficial, effleurage, petrissage, percussion), pressure point work (accupressure and shiatsu),

and deep tissue techniques (Rolfing). There is little controversy regarding the clinical utility of such procedures for relaxation and uncomplicated musculoskeletal dysfunction. However, comparative clinical investigations are sparse. Light massage has occasionally been used as a placebo control in manipulation studies.

10.3.3 **Rating:** Established
Evidence: Class II, III

4. Non-Manual Procedures

a. Exercise and Rehabilitation

(1) **Mobility and Stretching Exercise:** Activity mobility maintenance and stretching by the patient are traditionally encouraged in chiropractic practice. Training, counseling and advice in stretching and mobility exercises are common, and various descriptions of chiropractic programs exist in the literature. Trials on exercise in chiropractic settings have not been published, but there is function and performance information available in exercise physiology and sports medicine literature.

10.4.1 **Rating:** Established
Evidence: Class I, II, III

(2) **Strengthening, Conditioning and Rehabilitation:** Active conditioning exercise is thought to be helpful for both healing and prevention of many mechanical back and neck problems. Conditioning and spinal stabilization programs are becoming more common for chiropractic management of low-back conditions. In addition, numerous programs are in place that involve job stimulation and work hardening protocols that are directed at chiropractic management and conditioning for specific tasks.

10.4.2 **Rating:** Established
Evidence: Class I, II, III

(3) **Passive Stretch:** Passive stretch is gentle sustained muscle lengthening applied by the practitioner or therapist. Its use is common within the chiropractic profession. Practitioners, especially within the field of sports chiropractic, teach and use these procedures frequently.

10.4.3 **Rating:** Established
Evidence: Class I, II, III

5. Educational Programs

1. **Back School/Spinal Hygiene Courses:** Knowledge about how to take care of one's health problems and how to modify behavior or lifestyle is likely to be beneficial for most patients. Back school programs and patient education have traditionally been an integral part of chiropractic case management. It is supportable when used as an appropriate teaching aid.

10.5.1 **Rating:** Established
Evidence: Class I, II, III

D. Prevention and Wellness Services

1. Wellness Care/Disease Prevention/Health Promotion: A relatively new area of interest in chiropractic as a distant service, prevention has long been a primary consideration of the chiropractic profession's approach to health care. Typical disease prevention programs, smoking cessation, weight reduction efforts and the like fit well within chiropractic practice scopes. Organizations such as the American Chiropractic Association, International Chiropractors' Association and the Chiropractic Forum of the American Public Health Association have adopted policies or expressed support for such programs and practitioners with a particular expertise and interest in this area are increasing in number.

10.5.2 **Rating:** Established
Evidence: Class II, III

2. Nutritional Counseling: Nutritional training is included in the chiropractic curriculum. As a general issue concerning scope of practice, there is little disagreement regarding the capability or qualifications of practitioners to counsel patients concerning nutritional matters.

10.5.3 **Rating:** Established
Evidence: Class I, II, III

Comment: Specific nutritional therapy is an extensive field that requires a great deal of delineation. This should be addressed in the future.

10.5.4 **Rating:** Established
Evidence: Class II, III

D. Ancillary Procedures

6. Electrical Modalities:
Electrical modalities have been a part of chiropractic education in some colleges and they are included in scope of practice regulations in many jurisdictions.

10.5.5 **Rating:** Established
Evidence: Class I, II, III

7. Thermal Modalities
These include cryotherapy, infrared, hydrotherapy, hydrocollator and others. These procedures are recognized within the chiropractic scope of practice in most jurisdictions. Protocols are documented and standardized.

10.5.6 **Rating:** Established
Evidence: Class I, II, III

8. Ultrasound
Ultrasound is a conservative procedure. It is included as a physiotherapeutic modality in some chiropractic statutes.

10.5.8 **Rating:** Established
Evidence: Class I, II, III

9. Bracing and Supports
Supports, braces, orthotics and the like may be useful components of chiropractic care.

10.5.9 **Rating:** Established
Evidence: Class I, II, III

10. Traction
Traction may be employed to stretch muscles, joints, and intervertebral discs. Its use is typically included in chiropractic education..

10.5.10 **Rating:** Established
Evidence: Class I, II, III

VI. COMMENTS

Chiropractic modes of care encompass a wide variety of approaches. As chiropractic addresses health care from a perspective involving the role that body structure plays in overall physiologic function, many procedures emphasize manual care procedures such as adjusting and soft tissue work. However, the profession has traditionally maintained a strong interest in wellness care and disease prevention, as well as lifestyle and ergonomic issues. Therefore education, conditioning, nutrition, counseling and other approaches are often used by many practitioners..

It should be emphasized that chiropractic practitioners are typically well trained in a variety of standard assessment procedures, as well as specialized neurological and structural evaluation protocols. There has traditionally been an emphasis in chiropractic practice on lifestyle, wellness, prevention, and other natural approaches to health care.

It is not the intent of this document to exclude any particular technique or procedure, but rather to provide general guidelines for the assessment of the safety and effectiveness of generic methodologies utilized by the chiropractic profession. As a living document, this chapter will be subject to periodic review as new and innovative methodologies are developed and submitted for evaluation.

VII. REFERENCES

- Anderson R, Meeker W, et al: Meta-analysis of randomized clinical trials on manipulation for low back pain. *J Manip Physiol Ther* 1992, 15(3): 181-194.
- Bartol KM: A model for categorization of chiropractic procedures. *J Chiropractic Technique* 1991, 3(2): 78-80.
- Bergman T (ed): Special Issue on Seattle Consensus Conference. *J Chiropractic Technique* 1990, 2(3).
- Boone WR, Dobson GJ: A proposed vertebral subluxation model reflecting traditional concepts and recent advances in health and science. *Journal of Vertebral Subluxation Research* 1996, 1(1):19.
- Brennan PC, Kokjohn K, Kalatiner CJ, et al: Enhanced Phagocytic cell respiratory burst induced by spinal manipulation: potential role of substance p. *J Manip Physiol Ther* 1991, 14(7).
- Bronfort G, Nielsen N, Bendixt B, Madsen F, Weeks B: Chiropractic treatment of asthma: a controlled clinical trial. Proceedings of International Conference on Spinal Manipulation FCER, Arlington, VA., 1989.
- Bryner P: Technique System Application: The Gonstead Approach. *Chiropractic Technique* Aug 1991, Vol. 3(3) pp. 134.

Byrd RC: Positive therapeutic effect of intercessory prayer in a coronary care unit population. *Southern Med J* 1988, 81 (7):826-829.

Cauwenbergs P: Vertebral subluxation and the anatomic relationships of the autonomic nervous system. In Gatterman M (ed): *Foundations of Chiropractic Subluxation*. Mosby Year Book, Inc. 1995, St. Louis, MO.

Changjiang I, Yici W, Wenquin L, et al: Study on cervical visual disturbance and its manipulative treatment. *Journal of Traditional Chinese Medicine* 1984, 4:205.

Clarkson J: Low Back Pain Related to Cervical Subluxations. *Arch Cal Chiro* 1973, Vol. 3(2), pp. 28-32.

Cleveland C, Luttges M: Spinal connection effects on motor and sensory functions. In Mazzerelli J (ed): *Chiropractic Interprofessional Research*, Edizioni Minerva Medica, Torino Italy: 1985, 21-32.

Cooperstein R: Innominate Vertical Length Differentials as a Function of Pelvic Torsion and Pelvic Carrying Angle. *Transactions of the Consortium for Chiropractic Research*, Jun 1990.

Coopenstein R: Contemporary approach to understanding chiropractic technique. In: Lawrence DJ (ed): *Advances in Chiropractic*, Vol. 2, St Louis, MO: Mosby, 1995.

Cox W: Overview of the Gonstead Technique. *Chiropractic, Interprofessional Research* 1982, pp. 41-6.

Cox JM: *Low-Back Pain, Mechanism, Diagnosis and Treatment*, 4th ed, Williams & Wilkins, 1985.

Cremata E, Plaughter G, Cox W: Technique System Application: The Gonstead Approach. *Chiropractic Technique* Feb 1991, Vol. 3(1), pp. 19-25.

Epstein D: The spinal meningeal functional unit: tension and stress adaptation. *Digest Chiro Econ* 1986;29(3):58.

Epstein D: Network chiropractic explores the meningeal critical. Part 1: anatomy and physiology of the meningeal functional unit. *Digest Chiro Econ* 1994; 26(4):78.

Fracheboud R: A Survey of Anterior Thoracic Adjustments. *Journal of Chiropractic Research* 1988, Vol. 1, pp. 89-92.

Frost EAM, Hsu C, Saadonski D: Acupuncture therapy: comparative values in acute and chronic pain. *NY State J Med* 1976, 76:695-697.

Fuhr AW, Smith DB: Accuracy of piezoelectric accelerometer measuring displacement of a spinal adjusting instrument. *J Manip Physiol Ther* 1986, 9(2):15-21.

Fuhr A, Smith D: Accuracy of Piezoelectric Accelerometers Measuring Displacement of a Spinal Adjusting Instrument. *Journal of Manipulative and Physiological Therapeutics* Mar 1986, Vol. 9(1) pp. 15-21.

Gemmell H, Jacobson B, Heng B: Effectiveness of Toftness Sacral Apex Adjustment in Correcting Fixation of the Sacroiliac Joint: Preliminary Report. *Am J Chiro Med* Mar 1990, Vol 3(1), pp. 5-8.

Gillman G, Bergstrand J: Visual recovery following chiropractic intervention. *Journal of Behavioral Optometry* 1990 1(3):3.

Gitelman R: A Chiropractic Approach to Biomechanical Disorders of the Lumbar Spine and Pelvis. Book Excerpt 1979, pp. 297-330.

Gorman RF: The treatment of presumptive optic nerve ischemia by spinal manipulation. *JMPT* 1995, 18(3):172.

Greenman P: *Principles of Manual Medicine*, Baltimore: Williams & Wilkins, 1989.

Grieve G: *Modern Manual Therapy*, Edinburgh: Churchill Livingstone, 1986.

- Haldeman S: The Compression Subluxation. *J Can Chiro Assoc* 1976, Vol 20(2), pp. 32-7.
- Haldeman S (ed): *Modern Developments in the Principles and Practice of Chiropractic*, 2nd ed. Appleton-Lange, 1992.
- Hasselberg PD: Chiropractic in New Zealand, *New Zealand Commission of Inquiry*, Wellington, 1979.
- Herbst R: *Gonstead Chiropractic Science and Art*, Book Excerpt 1971, pp. 249-60.
- Herbst R: *Gonstead Chiropractic Science and Art*, Book Excerpt 1970, pp. 237-48.
- Holder JM, Talsky M: Torque-release technique. Seminar notes 1995.
- Hyman CA: Chiropractic adjustments and infantile colic: a case study. In Proceedings of the 4th National Conference on Chiropractic and Pediatrics. International Chiropractors Association. Arlington, VA. 1994.
- Kaminski M: Validation of chiropractic methods. *J Manip Physiol Ther* 1987, 10(2):61-64.
- Keating J: Technique System Application: The Gonstead Approach. *Chiropractic Technique* Aug 1991, Vol 3(3), pp. 135-6.
- Kent C: Models of vertebral subluxation: a review. *Journal of Vertebral Subluxation Research* 1996, 1(1):11.
- Kirk CR, Lawrence DJ, Volvo NL: *States Manual of Spinal, Pelvic, and Extravertibral Technique*, 2nd ed., Lombard, IL: Lombard National College of Chiropractic, 1985.
- Klougart N, Nilsson N, Jacobsen J: Infantile colic treated by chiropractors: a prospective study of 316 cases. *JMPT* 1989, 12(4):281.
- Koes BW, Bouter LM, Beckerman H, van der Heijden G, Knipschild PG: Physiotherapy exercises and back pain a blinded review. *Brit Med J* 1991, 302:1572-76.
- Kokjohn K, Schmid DM, Triano JJ, Brennan PC: The effect of spinal manipulation on pain and prostaglandin levels in women with primary dysmenorrhea. *JMPT* 1992 15(5):279.
- Korr IM (ed): *The neurobiologic mechanism in manipulative therapy*. Plenum Press. 1978 New York.
- Krumhansl BR, Nowacek CJ. Manipulation under anesthesia. In: Grieve GP. (ed.) *Modern Manual Therapy of the Vertebral Column*, Edinburgh: Churchill Livingstone, 1986, 777-786.
- Lantz C: Back to basics. A review of the evolution of chiropractic concepts of subluxation. *Topics in Clinical Chiropractic* June 1995, 2(2):1.
- Lantz C: The vertebral subluxation complex. *JMPT* Jan 1990, 13(1):56.
- Lantz C: The vertebral subluxation complex part II. *Chiropractic Research Journal* 1990, 1(4):19.
- Lantz C: The vertebral subluxation complex part I. *Chiropractic Research Journal* 1989, 1(3):23.
- Leach RA: *The Chiropractic Theories: a Synopsis of Chiropractic Research*, 2nd ed., Baltimore: Williams & Wilkins, 1986.
- Leach RA: *The Chiropractic Theories*. Williams and Wilkins. Baltimore, MD 1990.
- Leboeuf C, Brown P, Herman A, et. al: Chiropractic care of children with nocturnal enuresis: a prospective outcome study. *J Manip Physiol Ther* 1991, 14(2):110-115.

- Liebenson C: Active muscular relaxation techniques. Part II: clinical application. *J Manip Physiol Ther* 1990, 13(1):2-6.
- Liebenson C: Active muscular relaxation techniques. Part I: basic principles and methods. *J Manip Physiol Ther* 1989, 12(6):446-454.
- Lopes M, Plaughner G, Ray S: Closed Reduction of Lumbar Retrolisthesis: A Report of Two Cases. Proceedings of the Int'l Conference on Spinal Manipulation (Wash D.C.) Apr 1991, pp. 110-4.
- Maitland GD: *Vertebral Manipulation*, 4th ed. London: Butterworths, 1977.
- Malik D, Slack J, Walk L, Brooks S: Effectiveness of Chiropractic Adjustment and Physical Therapy to Treat Spinal Subluxation. *PC Northern J Clin Chiro* 1985, Vol 3(2), pp. 25-9.
- Mansel D, Cremata E, Carison J, Szlazak M: Effect of Unilateral Spinal Adjustments on Goniometrically-Assessed Cervical Lateral-Flexion End-Range Asymmetries in Otherwise Asymptomatic Subjects. *Journal of Manipulative and Physiological Therapeutics* Dec 1989, Vol 12(6), pp. 419-27.
- Mayer TG, Gatchel RJ, et al: A prospective two-year study of functional restoration in industrial low-back pain. *J Am Med Assoc* 1987, 258:1763-1767.
- Meeker WC: Chiropractic manipulation: techniques and rationale for the cervical spine. In White A (ed): *Cervical Spine and Upper Extremity in Sports and Industry*. Daly City: San Francisco Spine Institute, 1990.
- Mootz RD: Chiropractic Models: Current understanding of vertebral subluxation and manipulable spinal lesions. In Sweere J (ed): *Chiropractic Family Practice*, Gaithersburg: Aspen Publishers, 1992.
- Morey LW: Osteopathic manipulation under general anesthesia. *J Amer Osteopathic Assoc* 1973, 73:116-127.
- Morey LW: Manipulation under general anesthesia. *Osteopathic Annals* 1976,3:127-132.
- Murphy D: Seminar notes, 1995.
- North American Spine Society's ad hoc committee on diagnostic and therapeutic procedures: Common diagnostic and therapeutic procedures of the lumbosacral spine. *Spine* 1991, 16(10):1161-1167.
- Nyiendo J, Phillips RB, Meeker WC, et al: A comparison of patients and patient complaints at six chiropractic colleges. *J Manip Physiol Ther* 1989, 12(2):79-85.
- Palmer DD: *Textbook of the Art, Science and Philosophy of Chiropractic. The Chiropractor's Adjuster*. Portland, OR: Portland Publishing House, 1910.
- Parker G, Tupling H, Pryor D: A controller trial of cervical manipulation for migraine. *Aust NZ J Med* 1978,8(6):589-593.
- Pettibon B: *Introduction to Spinal Biomechanics*. Tacoma, WA: Pettibon Spinal Biomechanics Institute.
- Phillips RB, Mootz RD, Nyiendo J, et al.: A comparison of patients and patient complaints presenting to private chiropractic practitioner's offices.
- Plaughner C: Inter and Intraexaminer Agreement Using Gonstead Line Marking Methods. *Chiropractic: The Journal of Chiropractic Research and Clinical Investigation*, Oct 1991, Vol 7(3), pp. 62.
- Plaughner G, Hendricks A: The Inter and Intraexaminer Reliability of the Gonstead Pelvic Marking System. *J Manip Physiol Ther* Nov 1991, Vol 14(9), pp. 503-8.
- Plaughner G, Lopes M, Melch P, Cremata E: The Inter and Intraexaminer Reliability of a Paraspinal Skin Temperature Differential Instrument. *J Manip Physiol Ther* Jul 1991, Vol 14(6), pp. 361-7.
- Plaughner G (ed): *Textbook of Clinical Chiropractic: A Specific Biomechanical Approach*. Baltimore, MD: Williams and Wilkins.

Pluhar GR, Schobert PD: Vertebral subluxation and colic: a case study. *Chiropractic: The Journal of Chiropractic Research and Clinical Investigation* 1991 7(3):75.

Quebec Task Force on Spinal Disorders: Scientific Approach to the Assessment and Management of Activity-related Spinal Disorders. *Spine Supplement* (1987, 12(7s).

Richards G, Thompson J, Osterbauer P, Fuhr A: Use of Pre- and Post-CT Scans and Clinical Findings to Monitor Low Force Chiropractic Care of Patients with Sciatic Neuropathy and Lumbar Disc Herniation: A Review. *Journal of Manipulative and Physiological Therapeutics* Jan 1990, Vol 13(1), pp. 58.

Rinzler SH, Travell J: Therapy directed at the somatic component of cardiac pain. *Am Heart J* 1948, 35:248.

Rogers JT, Rogers JC: The role of osteopathic manipulative therapy in the treatment of coronary heart disease. *J Am Osteop Assoc* 1976, 76:71-81.

Rumney IC: Manipulation of the spine and appendages under anesthesia: an evaluation. *J Amer Osteopathic Assoc* 1986,68:235-245.

Sandoz R: Some Critical Reflections on Subluxations and Adjustments. *An Swiss Chiro Assoc* 1989, Vol 3, pp. 7-29.

Sato A: The reflex effects of spinal somatic nerve stimulation on visceral function. Proceedings of the scientific symposium of the world Chiropractic Congress. May 4-5, 1991. Toronto, Canada.

Schaefer RC (ed): *Basic Chiropractic Procedural Manual*, 4th ed. Arlington: American Chiropractic Association, 1984.

Schutte B, Teese H, Jamison J: Chiropractic adjustments and esophoria: a retrospective study and theoretical discussion. *J Aust Chiro Assoc*. Dec 1989 19(4):126.

Shekelle PG, Adams AH, et. al: *The Appropriateness of Spinal Manipulation for Low-Back Pain: Project Overview and Literature Review (R-4025/1-CCR/FCER)*, Santa Monica: RAND: 1991a.

Shekelle PG, Adams AH, et. al: *The Appropriateness of Spinal Manipulation for Low-Back Pain: Indications and Ratings by a Multidisciplinary Expert Panel (R-4025/2-CCR/FCER)*, Santa Monica: RAND, 1991b.

Siehl D, Olson DR, Ross HE, Rockwood EE: Manipulation of the lumbar spine with the patient under general anesthesia: evaluation by electromyography and clinical-neurologic examination of its use for lumbar nerve root compression syndrome. *J Amer Osteopathic Assoc* 1971, 70:433-440.

Smith DB, Fuhr AW, Davis BP: Skin accelerometer displacement and relative bone movement of adjacent vertebrae in response to chiropractic percussion thrusts. *J Manip Physiol Ther* 1989, 12(1):26-37.

Speiser R, Aragona R, Heffeman J: The application of therapeutic exercises based on lateral flexion roentgenography to restore biomechanical function in the lumbar spine. *Chiro Res J* 1990; 1(4):7.

Speiser R, Aragona R: Applied spinal bioengineering (ASBE) methodology utilizing pre-and post-stress loading roentgenographs and biomechanical physiological rehabilitative spinal exercises. Arlington, VA. Proceedings of the International Conference on Spinal Manipulation. 1989.

States AZ: Spinal and Pelvic Techniques. Lombard, IL: National College of Chiropractic.

Stonebrink RD: *Evaluation and Manipulative Management of Common Musculoskeletal Disorders*, Portland: Stonebrink, 1990.

Terrett A, Webb M: Vertebrobasilar Accidents (VA) Following Cervical Spine Adjustment Manipulation. *Journal Australian Chiropractic Association* 1982, Vol 12(50), pp 24-7.

Travell, JG, Simons D: *Myofascial Pain and Dysfunction. The Trigger Point Manual*, Baltimore: Williams & Wilkins 1983.

Ulman D: Homeopathy: *Medicine for the 21st Century*, Berkeley: North Atlantic Books, 1988.

Vernon H, Dhimi M, Howley TP, Annett R: Spinal manipulation and betaendorphin: a controlled study of the effect of a spinal manipulation on betaendorphin levels in normal males. *J Manip Physiol Ther* 1986, 9(2):115-124.

White AH, Anderson R (eds): *Conservative Cure of Low-Back Pain*, Baltimore: Williams & Wilkins, 1991.

Wiles MR: Visceral disorders related to the spine. In Gatterman M (ed): *Chiropractic Management of Spine Related Disorders*. Williams and Wilkins. Baltimore, MD 1990.

Yates, RG, Lamping DL, et.al: Effects of chiropractic treatment on blood pressure and anxiety: a randomized controlled trial. *J Manip Physiol Ther* 1988, 11(6):484-488.