

Chapter Outline

- I. Overview
- II. Literature Review
- III. List of Subtopics
- IV. References

I. OVERVIEW

The doctor of chiropractic is a primary care, direct access, first professional degree level provider who serves as a portal-of-entry into the health care system. ICA understands the term primary care provider to be defined as: Any health care provider capable of providing first level contact and intake into the health delivery system, any health care provider licensed to receive patient contact in the absence of physician referral. All laws and regulations in the United States allow any citizen to seek the services of the doctor of chiropractic without referral from any other provider. Individuals are free to seek basic essential care on the same individual initiative basis that applies to other direct access providers.

Only the doctor of chiropractic is professionally competent to evaluate the chiropractic needs of a patient and to determine the level of service appropriate to meet those needs.

Chiropractic intervention is indicated in all instances where the objective and/or subjective presence of subluxation can be demonstrated and/or in a setting of routine checkups. Patient needs must be individually determined on the basis of recognized procedures, but the issue of clinical necessity of providing adjustive care shall be based on the presence of subluxation, and/or other structural misarticulations, which may or may not have yet manifested subjective symptoms.

The International Chiropractors Association recognizes subluxation as an acceptable primary diagnosis, and includes the following official policy statement in their body of formally adopted position statements:

Subluxation is a responsible and credible diagnosis for the doctor of chiropractic and this condition should be recognized and reimbursed as a primary diagnosis by all third-party payment organizations, both public and private.

The analytical/diagnostic determination of a subluxation indicates the need for chiropractic care.

Chiropractic understands that illness, dysfunction (lack of wellness), etc., is the product of the body's inability to maintain itself or to successfully adapt to its environmental circumstances. While recognizing that illness has multiple origins, chiropractic science holds that under normal circumstances, the self-healing powers of the body will be sufficient to deal with illness or dysfunction.

The doctor of chiropractic's duty is to assist the body in this process, and to remove as many barriers as possible to self-healing.

Chiropractic perceives the correction of subluxation at the earliest possible moment as the most basic, essential responsibility of the doctor of chiropractic. The adjustment of the subluxation(s) determined to be present is held by the chiropractic profession to be the unique, fundamental intervention chiropractic has to offer.

II LITERATURE REVIEW

From the very beginning, the chiropractic model of health has had as its foundation the maxim that a human being is an ecologically and biologically unified organism. The relationship between a patient's internal and external environment must be understood. A major chiropractic premise is that the inherent recuperative power of the body aids restoration and maintenance of health. These assumptions comprise a wellness paradigm embraced by the great majority of the chiropractic profession.

A. The Objective Determination of Subluxation

The chiropractic literature specifically addresses the means of objectively identifying the presence of vertebral subluxation(s), apart from subjective patient complaints and/or symptoms. Such reproducible, reliable procedures are the cornerstone of chiropractic practice. A detailed review of instrumentation, imaging, and other procedures is presented in later chapters. It is essential to note here and refer the reader to those detailed discussions later in this work; as such objective indicators are the foundation for the clinical merit of basic essential care.

Strong consensus as to acceptable objective procedures has emerged and such procedures have been incorporated into chiropractic education, authorizing legislation and routine chiropractic practice. Kent, Grostic, et al conducted a consensus study employing a variety of sound procedures that identified the following procedures as, "having progressed beyond the experimental stage, and are acceptable procedures for general clinical practice." Those procedures were:

- a. Palpation (static and motion).
- b. Postural analysis.
- c. Orthopedic and neurological examination.
- d. X-ray spinography.
- e. Video fluoroscopy.
- f. Computed tomography.
- g. Magnetic resonance imaging.
- h. Skin temperature differential analysis, including thermography.
- i. Paraspinal EMG scanning.

Of the procedures identified by Kent and Grostic, six represent imaging or instrumentation procedures that are extensively addressed in Chapter 13, Diagnostic Imaging and Chapter 14, Instrumentation. Those chapters should be consulted regarding the contribution those procedures make towards the objective determination of the presence of subluxation.

Of the non-imaging and instrumentation procedures routinely employed by doctors of chiropractic, palpation is perhaps the primary procedure most universally applied. Indeed, Hass and Panzer state: *The hands are the primary tools of the chiropractic and are of utmost importance in identifying subluxation.*

Faye and Wiles define palpation as:

...the use of the tactile senses to determine variations in tissue consistence to recognize whether these variations are normal or abnormal. During palpation, the practitioner senses variations in temperature, shape and contour, textures, resistance, and motion. Palpation is usually conducted with a light, medium, or deep touch, using the pads of the fingertips...There are two basic classifications of manual palpation, static and dynamic.

Palpation provides the doctor of chiropractic with unique information about the state of the patient and the relationship of the various spinal segments in the patient. Bryner and Bruin found that chiropractic colleges responding to their survey utilize palpation in basic diagnostic instruction, with an emphasis by those responding on motion palpation and joint play assessment.

Palpation has been a key element in the chiropractic examination process from its very beginnings. D.D. Palmer and Dr. B.J. Palmer both wrote extensively on palpation and co-developed a variety of techniques, including nerve tracing, static and motion forms of palpation.

An abundance of chiropractic texts exist which provide extensive and detailed procedural guides to palpation. Haldeman, et al, Faye and Schafer, Gillet and Schafer provide extensive discussions of palpation procedures and articles numbering in the hundreds have been published on various aspects of palpation and the subluxation.

Akin to palpation, range of motion studies provide the doctor of chiropractic with important information about the state of a patient from individual testing and observation. Meeker writes, *Assessing the range of limb and trunk motion is still considered to be one of the most objective ways to judge disability of the motor system and is a standard part of the chiropractor's diagnostic procedures.* Blunt, Gatterman and Bereznick offer a highly detailed discussion of mobility in the human spine and attempt to quantify ranges of normal for the various segments of the spine. In their analysis, *the characteristics and analysis of normal dynamic regional and inter-segmental motion are explored to understand a deviance from these patterns that characterizes the abnormal motion of a subluxation complex. A continuum of abnormal motion is described, from hypomobility to hypermobility and instability.* Blunt, et al note that, *...the literature spawns a wide range of techniques used to evaluate and describe ranges of motion.* The utility and validity of all such procedures is related to the degree to which such procedures allow the patient's status to be quantified and measured, and the validity of the scales of normal and abnormal against which an individual patient's findings are compared. There is consensus, however, regarding the importance of range of motion studies in gathering subluxation related information and such procedures continue to commend themselves to chiropractic practice because of the objective nature of findings.

Muscle testing is also routinely employed in chiropractic practice as a basis for gathering objective indications regarding the status of patients. Meeker writes, *Assessment of muscle function for strength and quality of contraction is a standard test of the motor system. Manual muscle testing is popular and, indeed, forms the basis of several techniques used by chiropractors.* In the general healthcare literature (Mayer and Gatchel, 1988) muscle weakness is related to a number of complaints and dysfunctions. In recent years, the development of sophisticated muscle testing equipment, including computerized muscle testing equipment, has changed the status of these procedures somewhat from individual evaluations done by the DC to measures that fall into the category of instrumentation. A fuller discussion of such computerized muscle testing activities is found in Chapter 16.

Subsequent chapters provide detailed discussions of the standard as well as the developmental means of determining the presence of subluxation by objective means. Those chapters should be consulted for detailed information of the various procedures employed. The essential point necessary to the discussion here is that a wide range of accepted, accurate means of determining the presence of subluxation have been developed and that strong consensus exists within the chiropractic profession as to what those means are and how and when they should be applied.

B. The Progressive Nature of Spinal Subluxation

Behavior such as physical and emotional stress, tension, chemical/environmental stressors, repetitive motion, over-extension of spinal tissues and/or characteristics such as posture, weight, or even footwear can establish patterns of progressive subluxation that lead to the degeneration of spinal segments. As well, injury, periods of confined inactivity or immobilization such as a long hospital stay, and congenital structural problems may give rise to subluxation.

There is growing consensus in the chiropractic profession that inter-vertebral subluxation occurs as a result of numerous postural and traumatic insults, initially creating segmental dysfunction with its motion disturbance and inflammatory and ischemic sequelae, and subsequently results in: 1. JOINT INSTABILITY, 2. SPINAL DEGENERATION, and 3. ABNORMAL STABILIZATION, as the final attempt by the body to ameliorate the spinal lesion.

Attempts have been made to quantify the degeneration process and terms such as "phase of subluxation degeneration" have been commonly used to identify the progressive stages of the subluxation lesion, although there is no single, universally agreed upon description of subluxation phases operative in the profession at this time. The terms "subluxation" and "vertebral subluxation complex" are, however, universally employed to describe the subluxation lesion, regardless of stage or point of progression.

A three-phase model of subluxation generation has been developed by numerous sources. Sandoz, Leach and Gibson have extensively developed this approach to classifying the degeneration process. According to this approach, since the vertebral subluxation complex (VSC) is associated with pathophysiological sequelae of the correctable lesion regardless of the phase or stage of degeneration with which it has been associated, the three-phase model will be utilized in these discussions.

Sandoz may have articulated the natural history of the vertebral subluxation complex more thoroughly than any other chiropractic theorist in his paper "The Natural History of a Spinal Degenerative Lesion."

According to the Sandoz Model, Phase 3 is associated with episodic fixations. A vertebral fixation occurs when a vertebra becomes temporarily immobilized in a position that it may occupy during any phase of physiological spinal movement.

The final stage of spinal dysfunction is termed VSC Phase 3: this is phase of stabilization, of fixation to the point of frank immobilization, and the final phase of repair. This phase is characterized by signs of advanced degenerative joint disease such as ossification of the longitudinal ligaments, formation of uncovertebral arthrosis and, in the most advanced cases, vertebral ankylosis.

Since hypermobility is such a central and perhaps more commonly recognized component of spinal dysfunction, a brief review of scientific literature regarding the role of immobilization in promoting spinal dysfunction and degeneration will be helpful to our discussion of the phases of the Vertebral Subluxation Complex.

Muscular atrophy following immobilization has been extensively investigated. In addition to functional, structural and biochemical properties of immobilization, Appell has discussed oxygen supply and use, connective tissue changes and recovery from immobilization. These sorts of studies, including the postmortem examinations of Hadley and others, show that the earliest phase of Vertebral Subluxation Complex (Spinal Dysfunction with its primary characteristic of restricted joint mobility) can create not only the second phase of VSC--the instability often associated with the radiographically demonstrable intervertebral subluxation—but also lead to the stabilizing and immobilizing final phase of VSC--the response referred to as osteo-arthrosis or degenerative joint disease to the point of vertebral ankylosis.

In human research, the role of immobilization in promoting osteoarthritis and impeding healing is well established. Immobilization promotes thickening of the joint capsule and results in increased capsular tension, compression of articular cartilage, subsequent disturbance of chondrocyte metabolism, fibrillation, depletion of glycosaminoglycans and finally, arthritic changes to the joint. Pain can trigger the immobilization and can result from the arthritic changes as well, thus completing a deleterious cycle.

A few examples of acceptable chiropractic diagnoses using the unified model for phases of vertebral subluxation complex follow:

- 1. VSC PHASE 1 LESION:** C2/C3 Spinal Dysfunction with right rotation, restriction, and cervicogenic headache.
- 2. VSC PHASE 2 LESION:** Grade 2 Spondylolisthesis of L5 (Unstable on flexion of the trunk) with mild degenerative joint disease at L5/S1 (explain particulars of degenerative joint disease in a separate radiology report) and sciatic neuritis.
- 3. VSC PHASE 3 LESION:** C5/C6 Spondylosis (explain particulars of degenerative joint disease

in a separate radiology report) with right lateral bending restriction and cervicalgia.

A three-phase model for the progression of the vertebral subluxation complex (VSC), based upon a synthesis of the literature, includes: VSC Phase 1, the phase of spinal dysfunction; VSC Phase 2, the phase of instability; and VSC Phase 3, the final phase of abnormal stabilization. Research on immobilization degeneration, in addition to other biomedical research, lends strong support for this model to predict progression of spinal degenerative lesions.

Spinal degeneration and its reversibility has been the subject of considerable scientific debate. O.J. Ressel, based on a comprehensive review of 329 published references and a series of detailed case studies, concluded that chiropractic intervention not only halted spinal osteoarthritis, but also reversed the deterioration process by measurable levels. Conversely, individuals who exercise in a manner that puts the spine through a full range of motion on a periodic basis, develop the supporting muscles of the vertebrae and foster strong circulation, and promote spinal health through such activities.

The incidence of spinal degenerative disease is well established. Tencer, et al, stated that osteoarthritis is detectable in 35 percent of the U.S. population by age 30 and Lawrence stated that ten percent of all individuals in the U.S. between the ages of 14 and 24 had roentgeno-graphically identifiable osteoarthritis. Numerous studies have also indicated that spinal degeneration plagues men and women equally and Anderson, Buerger, et al have indicated that osteoarthritis is not influenced by climatic, geographic or ethnic considerations. Spinal degeneration is demonstrably a near-universal condition.

The erosion of spinal tissues is seen by some as simply a natural and predictable manifestation of the aging process. Indeed, the nearly universal incidence of spinal degeneration is powerful evidence that this is a plausible assertion. The response of spinal tissues to the chiropractic adjustment, as demonstrated by Ressel, indicates that the process of spinal degeneration is not an unstoppable process and that chiropractic adjustments revivify the spinal tissues through the restoration of normal nerve function as well as stimulate biochemical changes that enhance the performance of spinal tissues.

The relationship between neurological deficit-related spinal degeneration and the subluxation represent one of the most exciting research frontiers of human health. Likewise the health implications of the chiropractic adjustment, which works to eliminate such neurological deficits and conditions caused thereby, are already well established, but require massive new research if the precise mechanisms of the healing process are to be fully understood.

Spinal degeneration associated with the subluxation complex has been well documented and much written about. Erhardt demonstrated in great detail the progression of the untreated subluxation via x-ray. Lantz, Harrison, Junghanns, and Eisenstein, likewise have shown the progressive nature of the subluxation. Such evidence indicates the high clinical utility of early chiropractic intervention, regardless of the presence of subjective symptoms.

The degenerative nature of the subluxation has been widely described in terms of phases. Commonly, four phases of subluxation degeneration are recognized and have been widely described in the literature. As well, these four phases correspond to x-ray findings and can be demonstrated clearly via diagnostic imaging.

Four-Phase Definition of Subluxation

While not in conflict in any way with the three-phase model of subluxation, some researchers and practitioners have elected to utilize a four-phase approach to describing the degenerative progression of the subluxation. This model is, however, frequently used in interpreting radiological findings.

In this approach, a “Near Normal” spine is presented as a model or baseline. This concept has been defined as follows:

Near Normal: Prior to the emergence of any phase of subluxation degeneration, a patient who is in a state of basic effective functioning can be characterized as near normal. Such patients present with an absence of significant or outstanding clinical indicators and functions within normal limits.

PHASE I - SUBLUXATION

no radiographic degenerative changes
 mild aberrant motion
 mild muscle involvement
 mild local tissue inflammation
 mild biochemical changes/pathology
 mild soft tissue degradation
 mild neurological involvement

PHASE II - SUBLUXATION

mild to moderate radiographic degenerative changes
 mild to moderate aberrant motion
 mild to moderate muscle involvement
 mild to moderate local tissue inflammation
 mild to moderate biochemical changes/pathology
 mild to moderate soft tissue degradation
 mild to moderate neurological involvement

PHASE III SUBLUXATION

Moderate radiographic degenerative changes
 Moderate aberrant motion
 Moderate muscle involvement
 Moderate local tissue inflammation
 Moderate biochemical changes/pathology
 Moderate soft tissue degradation
 Moderate neurological involvement

PHASE IV - SUBLUXATION

severe radiographic degenerative changes
 severe aberrant motion
 severe muscle involvement
 severe local tissue inflammation
 severe biochemical changes/pathology
 severe soft tissue degradation
 severe neurological involvement

C. Early Detection, Early Intervention and "Wellness"

Enhanced public awareness of environmental, psychosocial, and physiological issues through education and community action has forced early detection/early intervention into the public health agenda as a significant new priority. Smoking cessation, weight control, nutritional considerations, stress reductions, advice about exposure to environmental pollutants and education in respect to the potential dangers of over-the-counter drugs are examples of initiatives affecting the chiropractic patient population worldwide. However, the most important and vital preventive measure which has been severely neglected care the importance of which has been illustrated in this chapter is spinal health education and prevention services, best introduced during routine check ups. These guidelines hopefully will aid in rectifying this situation

Coile offers this historical input: "Thirty years ago, Rene Dubos, a research microbiologist, suggested in *Mirage of Health* that the advancements he and others had made in the development of antibiotics and therapeutics had less to do with the real health of populations than a variety of economic, social, nutritional, and behavioral factors. Five years later, the U.S. Surgeon General's landmark report clearly revealed the links between smoking and diseases such as emphysema, chronic bronchitis, hypertension, and lung cancer.

"A new awareness of the contribution of lifestyle, environment, and genetics infused medicine in the decade following. Sometimes called the 'wellness movement', this new orientation broadened the paradigm of traditional biomedicine. Since Dubos' essay on health, a body of research findings has accumulated that demonstrates the validity of a more comprehensive approach to health, one which recognizes the many antecedents and co-factors in the disease and healing process.

"Although not fully accepted by all physicians, the holistic concept of health is gaining stature. Dozens of studies by employers have begun to quantify the beneficial impact of health promotion programs in terms of reduced health care utilization and lower health care costs."

Long-term care concepts and considerations in chiropractic have been discussed by a number of authors. Jamison offers a comprehensive overview of the current trends in chiropractic, and worksheets for health care assessment. McDowell and Newell describe general health care indicators

and instruments. Jamison reviews the improvement of basic health status by alteration of behavior, especially through health education.

Some recent surveys focus upon neuro-musculoskeletal chiropractic practice, but other current literature takes a firm stance on the importance of maintaining a focus on prevention and health promotion, through routine checkups.

A detailed analysis of a database collected during a three-year randomized study of senior citizens over 75 years of age revealed that patients who received chiropractic care reported better overall health, used fewer prescription drugs, and spent fewer days in hospitals and nursing homes than elderly non-chiropractic patients. The chiropractic patients were also more likely to exercise vigorously and more likely to be mobile in the community.

Eighty-seven percent of the chiropractic patients described their health status as good to excellent, compared to only 67 percent of the non-chiropractic patients. Furthermore, the chiropractic patient spent 15 percent less time in nursing homes and 21 percent less time in hospitals than the non-chiropractic patients.

III. LIST OF SUBTOPICS

- A. Basic Essential Care
- B. Chiropractic Patient Evaluation and Care Pathway
 1. Routine Checkups and Prevention Services (wellness)
 2. Initial Presentation-Is Emergency Care Needed
 3. Initial Presentation-Referral Needs
 4. Determining Appropriate Chiropractic Care
 5. Care Delivery
 6. Re-Evaluation for New Condition or Re-Injury
 7. Progress Evaluation
 8. Duration of Care

C. Referral

A. Basic Essential Care

Subluxation is a progressive condition and it is therefore in the patients essential interest to have subluxation addressed through the chiropractic adjustment at the earliest moment. Delay in receiving chiropractic care can result in increasingly severe subluxation dysfunction and require an extended period of chiropractic procedures to correct, proportionally prolonged according to duration of the period of neglect.

Such early detection and intervention to address emerging subluxation patterns is basic, essential patient care, and is addressed at the routine checkup and prevention visit. When the objective indicators of subluxation show the presence of a defined spinal lesion, the doctor of chiropractic is alerted to the specific anatomical and physiological basis for chiropractic intervention.

Subluxation(s) have been demonstrated to be present in persons of all ages, from the newborn infant to the most senior citizen. Likewise, authorizing laws and regulations empower doctors of chiropractic to care for patients of all ages with no exceptions, and chiropractic education instructs professionals in training in the proper procedures and techniques necessary to address the spinal needs of all patients, including infants and the elderly. The Council on Chiropractic Education (CCE) the agency recognized by the United States Department of Education for the accreditation of chiropractic professional programs recognizes no exceptions or limitations on the appropriateness of

chiropractic procedures because of age. The International Chiropractors Association recognizes the utility and appropriateness of chiropractic procedures for all persons regardless of age, and views efforts to restrict the access of any age group to chiropractic services as profoundly discriminatory, contrary to the laws of the several states and unsupported by the scientific literature.

Periodic chiropractic examinations to determine objectively the presence of subluxation(s) are in the patient's interest, and are called routine checkups and prevention visits. This is often referred to as maintenance or wellness care. The frequency of the need for such examinations must be determined on the basis of individual evaluation. Such periodic examinations are a vital component of quality basic health care. In the absence of subjective patient complaints of specific symptoms, the doctor of chiropractic must focus on objective measures and fully educate the patient on the status of their condition, and the measures to be taken to achieve optimal health.

Routine checkups provides both patient and doctor with the opportunity to examine environmental circumstances, behavioral factors and individual patient characteristics that may contribute to spinal problems. In addition to the adjustment of any subluxation(s) demonstrated to be present, if at all, in the course of routine checkups, the doctor of chiropractic may assist patients in altering conditions that might contribute to or set the state for on-going and/or progressively severe subluxation patterns. Such care efforts emphasize patient responsibility and may include exercise programs, weight loss, dietary counseling, life style modifications, education on body postures and mechanics, mental attitude, coordination training, safety habits, ergonomics, spinal hygiene, modification of life stressors, etc.

Health care policy makers, providers and consumers are becoming increasingly aware of the merits of early detection and early intervention in all human health concerns. From tooth decay to cancer, the progressive nature of human deterioration means that in both human and economic terms, early detection and early intervention are highly desirable goals.

B. Chiropractic Patient Evaluation and Care Pathway

This decision tree regarding the pathways and evaluation process for a patient presenting at the chiropractic office is based on the doctor of chiropractic's competence to evaluate the general health status and needs of each patient and determine the appropriateness of chiropractic care and/or the need for referral to other provider(s) for urgent care, additional diagnostic evaluation in the context of another branch of the healing arts, concurrent care, or no care at all, etc. It also recognizes that the majority of patients making the decision to seek the services of any health care professional do so on the basis of some self-perceived symptom, problem or health concern, or at the behest of a patient or guardian. This patient care pathway is graphically presented in Table 1. P. 26(a)

1. Routine Checkup and Prevention/Wellness Care
2. Initial Presentation--Is Emergency Care Needed

Upon presentation of each new patient, the doctor of chiropractic determines whether there is any condition, element or crisis that requires the immediate referral for emergency life-saving care or urgent care.

The attending doctor of chiropractic is competent to determine, on the basis of immediate findings whether the patient is in immediate need of emergency intervention.

3. Initial Presentation--Is the Care of Another Provider Needed

In the course of this evaluation, the attending doctor determines whether there are findings that indicate the need for referral to another provider.

If indications for immediate referral are not present, the patient proceeds along the care pathway to the next level. If such a referral is necessary it does not preclude concurrent chiropractic care.

4. Determining Appropriate Chiropractic Care - Are There Potential Restrictions On Chiropractic Care

The elimination of imperatives to refer having been undertaken, the next step on the chiropractic care pathway centers on the development of an appropriate course of adjustive care, if needed. In that process, the patient's needs and circumstances are evaluated to determine whether there is a need, and if so whether there are any restrictions on the delivery of adjustive care. This evaluation process will direct the attending doctor to employ specific chiropractic techniques that are appropriate to the status of the patient.

5. Care Delivery

Having carefully worked through the evaluation process eliminating potential red flags to standard care and techniques, the doctor of chiropractic next outlines and delivers a program of adjustive care according to the individual needs of the patient, based on the lifestyles and presenting factors, i.e. phase of subluxation.

6. Re-Evaluation for New Condition(s) and/or Re-Injury

On each encounter, the doctor of chiropractic will determine whether new conditions and/or injuries might require alterations in the care plan. If there are no such indications, the program of care previously devised will continue.

7. Progress Evaluation

After a reasonable period of care, each patient's progress will be evaluated to determine the effectiveness of the chosen course of care and to determine whether alterations in that program are indicated, as determined by the clinician.

9. Duration of Care (see Chapter 11)

C. Referral

Referral is a professional obligation that is present throughout all phases and aspects of the chiropractic practice. The primary obligation of Doctors of Chiropractic is to provide the highest quality of care to each patient within the confines of their education and their legal authority. It is the position of the International Chiropractors Association that this primary obligation includes recognizing when the limits of skill and authority are reached. At that point, it is the ICA's position that doctors in all fields of practice are ethically and morally bound to make patient referrals to practitioners in their own and/or other fields of healing when such referrals are necessary to provide the highest quality of patient care. This interchange of professional referrals includes, but should not be limited to, doctors of chiropractic, doctors of medicine, and osteopathy.

Doctors of Chiropractic are also obligated to receive referrals from other health care providers, applying to those patients the same considerations for quality and appropriateness of care as with any other patients. It is the position of the ICA that the professional obligation to the patient includes honest, full and straightforward communication with the referring provider on the issue of optimal patient care.

IV. REFERENCES

- Akeson WH, Woo SL, Taylor TK, Ghosh P, Bushell CR. Biomechanics and biochemistry of the intervertebral discs. *Clin Orthop* (129): 133-140, 1977.
- Balduc H. How chiropractic care can promote wellness. Northwestern College of Chiropractic, Bloomington, MN.
- Barnsley: Cervical Flexion-Extension/Whiplash Injuries. In *Spine: State of the Art Reviews* Sept. 1993, p. 339. Hanley & Belfus.
- Bedford PD: Degeneration of the spinal cord associated with cervical spondylosis. *Lancet* 2: 55-59, 1952.
- Bick EM: Common degenerative disease of the aging spine. *Geriatrics* 19(1):35-40, 1964.
- Bick EM: Vertebral osteophytosis in the aged. *Clin Orthop* 26:50-53, 1963.
- Bick EM: Vertebral osteophytosis in the aged. *Clin Orthoped* 26:50-53, 1963.
- Blanks RH, Schuster TL, Dobson M: A retrospective assessment of network care using a survey of self-rated health, wellness, and quality of life. *Journal of Vertebral Subluxation Research* 1997; 1(4): 15-31.
- Brinckmann P: Pathology of the vertebral column. *Ergonomics* 28(1):77-80, 1985.
- Broberg KB: On the mechanical behavior of intervertebral discs. *Spine* 8(2): 151-165, 1983.
- Buckwalter JA, et al. Age-related changes in articular cartilage proteoglycans; electron microscopic studies. *Orthop Res* 3(3):151-257.8.
- Buerger AA, et al: Empirical approaches to the validation of spinal manipulation Biomechanical properties of the intervertebral disc (pp. 30-41). Pope MH, ed C Thomas Co, Springfield, 1985.
- Burkart SL, Beresford WA: The aging intervertebral disc. *Phys Ther* 59(8):969-974, 1979.
- Calliet R: Lumbar discogenic disease: why the elderly are more vulnerable. *Geriatrics* pp. 73-76, 1975.
- Caplan RL: Health care reform and chiropractic in the 1990s. *JManip Physiol Ther* 1991; 14(6):341-354.
- Coile Jr., Russell CD: *Promoting Health, The New Medicine: Reshaping Medical Practice and Health Care Management*, Rockville, MD: Aspen Publishers, Inc., 1990: 151-166.
- Collins DH: The pathology of articular and spinal disease. Arnold, Long 1949.
- Coulter I, Hurwitz E, Aronow H, Cassata D, Beck J: Chiropractic patients in a comprehensive home-based geriatric assessment, follow-up and health promotion program. *Topics in Clinical Chiropractic* 1996; 3(2): 46-55.
- Coulter ID, Hurwitz EL, Aronow HU, et al: Chiropractic patients in a comprehensive home-based geriatric assessment, follow-up and health promotion program. *Topics in Clinical Chiropractic* 1996; 3(2): 46.
- Coulter IID: The patient, the practitioner, and wellness: paradigm lost, paradigm gained. *JManip Physio Ther* 1990; 13(2): 107-111.
- Drum DC: Conservative management of lumbar degeneration; part 1. *JCan Chiro Assoc* 14(4): 8-11, 1970.
- Drum DC: The posterior gravity line syndrome. *Digest of Chiropractic Economics*, June, 1968.

Drum DC: Disc degeneration; The rationale for a positive therapeutic approach. *JCan Chiro Assoc* 1969; 13(4):18-23.

Drum DC: Conservative management of lumbar degeneration; part 2. *JCan Chiro Assoc* 15(1) 18-21, 1971.

Drum DC: Conservative management of lumbar disc degeneration; part 3. *JCan Chiro Assoc* 15 (2):12-15, 1971.

Emori: Whiplash in Low Speed Vehicle Collisions. *SAE* Feb. 1990, p. 108.

Fallon J: The role of the chiropractic adjustment in the care and treatment of 332 children with otitis media. *Journal of Clinical Chiropractic Pediatrics* 1997; 2(2): 167-184.

Flesia JM : Vertebral subluxation degeneration complex, a review of therapeutic necessity for FSC well patient care, in: Seminar Notes (The New Renaissance, "Global Chiropractic.. one patient at a time"), 7-3 6. Including the 496 various papers referenced therein.

Friedenberg et al: Degenerative disc disease of the cervical spine. *JBone Joint Surg* 45A(6): 1171-1178, 1963.

Fullenlover TM, Williams AJ: Comparative roentgenographic findings in symptomatic and asymptomatic backs. *Radiol* 68:572, 1957.

Gibson, Hugo V., DC, FICA, "Chiropractic Clinical Applications", unpublished paper, ICA, 2000.

Gordon CV, et al: Autopsy study correlating degree of osteoarthritis, synovitis and evidence of articular calcification. *JRheumatol* 1 1(5): 681-686, 1984.

Green WT, Akeson WH, Mankin JIH et al: Can cartilage heal? *Contemp Orthop* 3:157- 177, 1981.

Grieve GE: Lumbar instability *Physiotherapy* 68(1):2-9, 1982.

Guifli C, Zongmin L, Zhenzhong You, Jiaghua W: Lateral rotatory manipulative maneuver in the treatment of subluxation and synovial entrapment of lumbar facet joints. *The Trad Chin Med* 1984; 4:211-12.

Hadley LA: Intervertebral joint subluxation, bony impingement and foramen encroachment with nerve root change. *Am JRoent &Rad Ther* 65:377-402, 1951.

Havsy: Whiplash Injuries of the Cervical Spine and Their Clinical Sequelae. *Am J. of Pain Mang*, Jan. 1994.

Havsy: Whiplash Injuries of the Cervical Spine and Their Clinical Sequelae. *Am J. of Pain Mang*, Jan. 1994, p. 30.

Health Care Financing Administration, Office of the Actuary. Expenditures and percent of gross national product for national health expenditures, by private and public funds, hospital care, and physician services; calendar years 1960-87. *Health Care Financing Review* 10:2, Winter 1988.

A Healthy People 2000, @ National Health Promotion and Disease Prevention Objectives Conference Edition: Summary U.S. Department of Health and Human Services. Public Health Service.

Hildebrandt R: Chiropractic physicians as members of the health care delivery system: The case for increased utilization. *J Manipulative Physiol Ther* 1980; 3(1):23-32.

Hjertquist SO, Lemperg R: Microscopical and microchemical studies of osteochondral articular defects. Comparison of spontaneous healing and transplantation of autologous costal cartilage. *Calaf Tissue Res Suppl*: 107C 109, 1970.

Jamison J: Preventive chiropractic and the chiropractic management of visceral conditions: Is the cost to chiropractic acceptance justified by the benefits to health care? *J Aust Chiro Assoc* 1991; 9(3):95- 101.

Jamison J: Chiropractic as conventional health care. *J Aust Chiro Assoc* 1989; 15(2):55-59.

Jamison J: Preventive chiropractic and the chiropractic management of visceral conditions: Is the cost to chiropractic acceptance justified by the benefits to health care? *Chiropr J Austr* 1991, 9(3):95-101.

Jamison JR: *The Chiropractor as Health Information Resource, Health Promotion for Chiropractic Practice*, Gaithersburg, MD: Aspect Publishers, Inc. 1991, pp. 3 5-36.

Jayson MI: Compression stresses in the posterior elements and pathologic consequences. *Spine* 8(3):338C339, 1983.

Jirout J: The rotational component in the dynamics of the C2-3 spinal segment. *Neuroradiology* 17:177-181, 1979.

Kaplan RM: Behavior as the central outcome in health care. *American Psychologist* 1990, 45:1211-1220.

Karl SV: The Detection and Modification of Psychosocial and Behavioral Risk Factors. Applications of Social Science to Clinical Medicine and Health Policy, Chapter 17. Rutgers University Press, New Brunswick, NJ, 1986.

Kellegren JH, Lawrence JS: Osteoarthritis and disc degeneration in an urban population. *Ann Rheum Dis* 17:338-397, 1958.

Kirkaldy-Willis WH, et al: Pathology and pathogenesis of lumbar spondylosis and stenosis (pp 169-180). San Francisco: Radiology Research and Education Foundation, 1983.

Kirkaldy-Willis WH, Wedge JH, Yong-Hing K, Reilly J: Pathology and pathogenesis of lumbar spondylosis and stenosis. *Spine* 3(4):3 19-328, 1978.

Kraemar J: Dynamic characteristics of the vertebral column, effects of prolonged loading *Ergonomics* 28(l):95-97, 1985.

Kulak RF, Schultz AD, Belytschko T, Galante J: Biomechanical characteristics of vertebral motion segments and intervertebral discs. *Orthop Clin North Am* 6(1): 12 1-133, 1975.

Lawrence JS, Bremmer JIM, Bier F: Osteoarthritis; prevalence in the population and relationships between symptoms and x-ray changes. *Ann Rheum Dis* 25:1-24, 1966.

Leach, R.A., DC, *The Chiropractic Theories: Principles and Clinical Applications*, Third Edition, Williams & Wilkins, 1996.

Lipson SJ, Muir H: Vertebral osteophyte formation in experimental disc degeneration. *Arthritis Rheum* 23(3):319C324, 1980.

Lord: Cervical Flexion-Extension/Whiplash Injuries. in *Spine: State of the Art Reviews*, Sept. 1993, p. 360. Hanley & Belfis.

Mankin JH: The reaction of articular cartilage to injury and osteoarthritis. Part I. *N Engl Jmed* 291:1285-1292, 1974.

Mankin JH: The reaction of articular cartilage to injury and osteoarthritis. Part II. *N Engl Jmed* 291:335- 1340, 1974.

McDowell I, Newell C: *Measuring Health: A Guide to Rating Scales and Questionnaires*, New York: Oxford University Press, 1987.

McKenzie: The Dynamic Behavior of the head and Cervical Spine During >Whiplash. *Journal of Biomechanics*, Vol. 4, 1971: p. 477.

Pellils C, et al: Cervical spondylosis: incidence and implications. *Brain* 77:274-289, 1954.

Phillips RB, Butler R: Survey of chiropractic in Dade County, Florida. *J Manip Physiol Ther* 1982, 5(2):83-89.

Posner I, White AA, Edwards WT, Hayes WC: A biomechanical analysis of the clinical stability of the lumbar and lumbosacral spine. *Spine* 7(4):374-389, 1982.

Prasad GC, Udupa KN, Rajan KT: Effect of insulin on the regeneration of cartilage cells. *Calcif Tissue Res Suppl*:48, 1968.

Pyerson J: Inflammation in osteoarthritis. Review of its role in clinical picture, disease progress, subsets and pathophysiology. *Semin Arthritis Rheum* XI (Suppl 1): 115-116, 1981.

Quinnell RC, et al: Observations of pressures within normal discs in the lumbar spine. *Spine* 8(2):166-169, 1983.

Ressel OJ: Chiropractic and children; a rationale for care. *Int Rev Chiro* 1986 42(3):44-50.

Rice DP, MacKenzie EJ, Jones AS, Kaufman SR, deLissovoy GV, Max W, McLoughlin E, Miller TR, Robertson LS, Salkever DS, Smith GS: Cost of Injury in the United States: A Report to Congress, 1989. San Francisco, CA: Institute for Health and Aging, University of California and Injury Prevention Center, The Johns Hopkins University, 1989.

Ryu J, et al: Biochemical and metabolic abnormalities in normal and osteoarthritic human articular cartilage. *Arthritis Rheum* 27(1): 49-57, 1984.

Schmorll C, Junghans H: The human spine in health and disease. New York: Crone and Stratton, 1971.

Scott D, Bird H, Wright V: Joint laxity leading to osteoarthritis. *Rheumatol Rehabil* 18:167-169, 1979.

Shekelle PG, Brook RH: A community-based study of the use of chiropractic services. *Am J Pub Health* 1991, 81(4):439-442.

Sokoloff L: The biology of degenerative joint disease. Chicago: University of Chicago Press. 1969.

Sportelli L (Commentary): The future of health and health care: Contradictions and dilemmas. *J Manip Physiol Ther* 1985, 8(4):271-182.

Spurling RC: Lesions of the cervical intervertebral disc. Thomas, Springfield 1956.

Stacey TA: Osteoporosis: exercise therapy, pre- and post-diagnosis. *J Manip Physiol Ther* 1989, 12(3):21 1-219.

Suh CU: The clinical significance of research into spinal mechanics. *J Can Chiro Assoc* 20(3): 21-35, 1976.

Teasell, McCain: Cervical Flexion-Extension/Whiplash Injuries. in *Spine: State of the Art Reviews* Sept. 1993, p. 374. Hanley & Belfus.

Teasell, McCain: in *Painful Cervical Trauma*. Baltimore, MD : Williams and Wilkins, 1992, p. 293.

Vear H: The role of chiropractic in preventive health care. *J Can Chiro Assoc* 1974; 18(4): 10-3.

Vernon H: Static and dynamic roentgenography in the diagnosis of degenerative disc disease: a review and comparative assessment. *J Manipulative Physiol Ther* 5(4): 163-169, 1982.

Vernon-Roberts B: Degenerative changes in the vertebral discs of the lumbar spine and their sequelae. *Rheumatol Rehabil* 16:13-21, 1977.

Wardwell WI: The Connecticut survey of public attitudes toward chiropractic. *J Manip Physiol Ther* 1989, 12(3):167-173.

Webb: Whiplash: Mechanisms and Patterns of Tissue Injury. *Journal of the Australian Chiropractors' Association*, June 1985.

White AA, Rinjabi MM: Clinical biomechanics of the spine. JIB Lippincou. Philadelphia, 1978.

Roberts J, Burch TA: Osteoarthritis prevalence in adults by age, sex, race, and geographic area.

Washington, DC. US Public Health Service, Publication 1,000, Series 11, No. 15.

Windsor H. Sympathetic segmental disturbances. The evidence of the association in dissected cadavers of visceral disease with vertebral deformities of the same sympathetic segments. *Med Times* 49:1-7 1921.

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