THE EFFICACY OF THE COMBINATION OF CHIROPRACTIC AND AN ANTHROPOSOPHICAL REMEDY IN THE TREATMENT OF SYMPTOMATIC CERVICAL SPONDYLOSIS

by

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Dissertation submitted to the Faculty of Health Services in the partial compliance with the requirements for the Masters Degree in Technology: Chiropractic, at Technikon Natal

I, Alison Louise Crofton Hopkins, do declare that this dissertation is representative of my own work

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DEDICATION

This Dissertation is dedicated to my parents, Chris and Alison Hopkins, for their undying support and forever believing in me. It is through you both and your sacrifices, that I have discovered the great value of education.

Mum and Dad, thank you.

AKNOWLEDGEMENTS

Over the last two years many people have been involved in the creation of this dissertation. I would like to express my gratitude to them for their assistance and contribution toward the completion of this dissertation.

My thanks go to Dr Chris Penter, my supervisor, for your time and guidence - thank you. Other important members of staff to thank are Mr Worku, Dr F. Burger, and Dr G. Parkin-Smith.

Without my research patients this study may never have taken place, my sincere gratitude for your tolerance of the treatment protocol and for being so compliant.

To my family and friends, thank you, the last six years have been a great experience and I have been priviledged to be associated with you all.

Finally to Simon Keyes, your infinite patience, understanding and support has carried me through the last two years. THANK YOU.

ABSTRACT

Symptomatic cervical spondylosis is a common condition in patients over the age of forty. This condition has been successfully treated by means of chiropractic adjusting. However, to date little research has been conducted to investigate whether the combination of chiropractic adjusting and an alternative therapy may be more effective than just chiropractic treatment alone.

The purpose of this study was to investigate whether the combination of chiropractic adjusting and an Anthroposophical remedy, **Disci comp.cum Stanno,** would be more effective in the treatment of symptomatic cervical spondylosis than chiropractic adjustments alone.

It was hypothesized that cervical spine manipulation, and the combination of chiropractic adjusting and the **Disci** remedy would both be effective in the treatment of symptomatic cervical spondylosis. Moreover, with reference to objective and subjective clinical findings, it was assumed that the combined chiropractic adjustments and the **Disci** remedy would be more effective than chiropractic adjusting alone.

The study was a controlled, double-blind clinical trial consisting of thirty patients, fifteen comprising the control group and fifteen the experimental group. The age range of the sample group was from forty to seventy-nine years. The patients were randomly divided into the two groups. The control group was treated with chiropractic adjustments to the

cervical spine and received subcutaneous placebo injections paraspinally. The experimental group received cervical adjustments and the subcutaneous **Disci** remedy injectioned paraspinally.

The patients were assesed prior to treatment, and were then treated twice a week for a five week period after which they were reassessed at a follow-up consultation one month after their final treatment. The patients were assessed by means of obtaining subjective information consisting of three questionnaires: the Numerical Pain Rating Scale-101, the McGill Short-Form Pain Questionnaire and the CMCC Neck Disability Index. The objective data were obtained by goniometric measurements of the range of motion of the patient. The information used for statistical purposes was the data collected at the first, fifth, final and follow-up consultations. Patient age and the duration of the symptoms were noted in the study; however, no consideration was given to these variables during the data analysis.

The data was analysed using Wilcoxen's paired signed rank test for intra-group analysis and the Mann-Whitney U test for the inter-group analysis. The statistical level of significance was set at 5% for both of these tests. The results were presented by means of tabulation.

The results for both the subjective and objective data suggested that there was a significant improvement within both treatment groups and that there was a corresponding rate of improvement. There was no significant difference in the efficacy of the treatments when comparing the two groups. Moreover, both treatments produced similar and favourable results.

As the sample size of this particular study was too small, it is recommended that further studies be conducted. It is suggested that the study be repeated with a much larger sample size, and a longer period of treatment. The age of the patients and the duration of the symptoms should be taken note of and the study should be adapted accordingly, i.e. the study should be repeated using a younger sample group. This should be done in order to investigate the efficacy of Disci in patients with less advanced cervical spondylosis.

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DEFINITION OF TERMS

ADJUSTMENT

A joint adjustment can be defined as a passive, manual manoeuvre during which an articular element is suddenly carried beyond the usual, physiological limit of movement without exceeding the boundaries of anatomical integrity. The usual but not obligatory characteristic of an adjustment is the thrust which is brief and sudden, and the carefully dosed impulsion delivered at the end of the normal passive range of movement is usually accompanied by a cracking noise (Sandoz 1976:91).

ANTHROPOSOPHICAL MEDICINE

An extension of medical thinking and practice inspired by and based on the work and teaching of Rudolf Steiner (Stanway 1979: 48).

CERVICAL SPINE

In the context of this study the cervical spine was defined as the vertebrae making up the bony skeleton of the neck (C0 to C7), including the intervertebral discs, zygopophyseal joints and accompanying soft tissue.

CERVICAL SPONDYLOSIS

(Cervical degenerative joint disease, Cervical osteoarthritis, Cervical osteoarthrosis, Cervical degenerative arthritis, Cervical degenerative arthrosis)

Cervical spondylosis is a chronic condition in which there is progressive degeneration of the intervertebral disc(s) leading to secondary changes in the surrounding structures, including the posterior apophyseal joints. It is a result of direct trauma, occupational stress, ageing degeneration, or found in association with and adjacent to congenitally nonsegmented vertebrae. (Corrigan and Maitland 1983: 296)

FIXATION

The state whereby articulation has become temporarily immobilized in a position that it may normally occupy during any phase of physiological movement (Haldeman 1992: 623). Fixation is caused by muscular spasm, a shortened ligament or by intra-articular blocking (Gatterman 1990: 408).

GONIOMETER

An instrument for measuring angles, used for measuring the range of motion of a joint or a set of joints in degrees (Gatterman 1990: 408).

FACET SYNDROME (JOINT DYSFUNCTION)

Mechanical neck pain is neck pain not due to organic causes but is associated with degenerative changes of the spine. It is associated with phase one joint degeneration (dysfunction), e.g. facet joint syndrome, hypomobility and early disc degeneration (Kirkaldy-Willis 1992:63).

INCIDENCE

Incidence refers to the rate at which indivduals develop a syndrome or disease over a specific period of time (Porterfield 1995: 2).

MANIPULATION

A passive therapeutic manoeuvre in which specifically directed manual forces are applied to the vertebral and extra-vertebral articulations of the body, with the object of restoring mobility to restricted areas (Gatterman 1990: 410).

PLACEBO

A dummy treatment administered to the control group in a controlled clinical trial in order that the specific and non-specific effects of the experimental treatment can be distinguished (Dorland's Medical Dictionary 1988: 1299).

PREVALENCE

Prevalence is a measure of the number of people in a given population who have the syndrome or disease at a particular time (Porterfield 1995: 2).

RADICULOPATHY

The inflammation or disease of the spinal nerve roots causing the interruption of normal nerve transmission (Gatterman 1992: 410).

CHAPTER

ONE

CHAPTER ONE

INTRODUCTION

A large percentage of the chiropractic patients consists of elderly people suffering from back pain which is age related. Experience has shown that temporary relief can be achieved by chiropractic treatment. (Sandoz, 1994: 167)

Geriatric care, particularly where the locomotor system is concerned, has become a great challenge to the Chiropractic profession (Sandoz, 1994: 168). Unfortunately, very little information, especially in terms of statistical surveys, is available in the limited literature on the subject. However, Sandoz (1994: 168) does intimate that Chiropractic geriatrics is very rewarding and that the profession has a great deal to offer such patients.

Neck pain with a decrease in range of motion of the cervical spine is a very common disorder (Cassidy et al. 1992: 570). In the majority of cases the neck pain is attributed to mechanical dysfunction of the cervical spine (Cassidy et al. 1992: 570). Spinal manipulation is a very popular treatment for neck pain; however, to date few controlled clinical trials have been performed in this field (Cassidy et al. 1992: 570).

The understanding of the epidemiology of neck disorders is a great deal less than that of low back disorders, and research into problems associated with the lumbar spine has advanced further than research conducted on the cervical spine (Porterfield and De Rosa, 1995: 1). In the light of this, Lawrence (1993: 723) argues that the future acceptance and credibility of the chiropractic profession, could rest on the research conducted to substantiate and demonstrate that Chiropractic treatment is reliable in the management of clinical conditions.

Degenerative change (spondylosis) of the cervical spine is a very common condition and the incidence of this disease associates very closely with the ageing process (Fenlin, 1971: 371). Maigne (1972), Mathews (1972) and Cyriax (1971) indicate manipulation of the cervical spine in the treatment of symptomatic cervical spondylosis and non-specific neck pain.

The Disci preparations (Anthroposophical remedies) were developed in order to address the need for a remedy for specific spinal disorders. They have been used extensively to treat a wide range of spinal disorders, e.g. spinal degenerative diseases, intervertebral disc prolapse, degenerative arthrosis, osteochondrosis, spondylarthrosis, and chronic degenerative disease with the tendency to form exostosis. (Wala, Literature 1990: 1). A large number of doctors, both medical and homoeopathic, has made use of these remedies over the last twenty years. However, to date very little research has been conducted to investigate the efficacy of the Disci preparations.

The combination of both Chiropractic and Anthroposophical medicines is uncommon, and this concept presents an interesting and possibly beneficial avenue to be explored. Tyler (1990: foreword) is of the opinion that even though the chiropractic adjustment is the cornerstone of chiropractic practice, other modalities may be applied to enhance the physiological effects of the adjustment.

CHAPTER TWO

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

2.1 INTRODUCTION

The ensuing discussion focuses on the nature of the condition under investigation viz. symptomatic cervical spondylosis, and presents information about current chiropractic management of the condition. With reference to the related literature, the value of cervical spine manipulation in the treatment of cervical spondylosis is discussed. Additionally, the information about the Wala preparation, **Disci comp. Cum Stanno**, is presented.

2.2 INCIDENCE AND PREVALENCE OF NECK PAIN DUE TO CERVICAL SPONDYLOSIS

Degeneration of the cervical spine is an extremely common phenomenon (Fenlin, 1971: 371 and Bland, 1994: 212), and according to Turk and Ratkolb (1987 : 15) up to 40 % of all headaches is as a result of degenerative changes of the cervical spine. Long (1983) states that degenerative osteoarthrosis of the cervical spine occurs frequently, affecting more than 80 % of the population over the age of fifty five.(Long, 1983: 424-429).

In an investigation conducted by Lawrence (1969: 131) amongst 1803 males and 1572 females all aged fifteen and over, routine x-rays showed that 42 % of males and 37 % of females had certain evidence of disc degeneration. (It was minimal in 21 % and 20 % respectively). There was a relationship between cervical disc degeneration and neck-shoulder-brachial pain in both sexes; however, this was significant only in those with moderate or severe disc narrowing. The greatest prevalence of cervical disc degeneration was found in various manual workers, who showed significantly more change than those involved in outdoor work or light to medium industry. (Lawrence, 1969: 131).

2.3 PSYCHOSOCIAL ASPECTS OF CERVICAL SPINE DISORDERS

Neck pain is one of the more impairing musculoskeletal disorders. Painless, unrestricted movement of the cervical spine is necessary for many occupational, recreational and social functions (Porterfield, 1995: 13). Thus a disturbance in neck function may have an important influence on daily activities and occupational demands. (Porterfield, 1995: 13).

2.4 MECHANISMS AND PATHOPHYSIOLOGY OF CERVICAL SPONDYLOSIS

The neck under normal circumstances moves over six hundred times per hour, regardless whether the person is awake or asleep. No other part of the musculo-skeletal system undergoes such constant motion or stress (Bland, 1994: 71). Osteoarthritis is a common, usually slow, progressive disorder occurring in middle age to late in life. It affects mobile weight-bearing joints and produces clinical characteristics of pain, deformity, loss of range of motion and functional loss. (Bland, 1994: 97).

Bland (1994: 185) states that osteoarthritis of the synovial joints and cervical spondylosis often appear concurrently but they are two different pathologic processes, one affecting the synovial joint and the other causing disc degeneration.

There is a general agreement that regardless of the initiating event, two characteristic pathologic processes are present in osteoarthritis (Bland, 1994: 97):

a) loss and finally ulceration of the weight-bearing surface of the joint;

b) hypertrophy and proliferation of new bone, ligaments, cartilage, tendons and capsular tissues around the joint - broadly termed osteophytosis.

Sokoloff (1982: 11) describes three different general theories of the sequential development of osteoarthritis:

1. Articular cartilage degeneration occurs resulting in the denudation of the joint

surface. This theory is contradictory with the fact that extensive bony remodelling takes place.

2. The most commonly accepted view is that fibrillation of the cartilage occurs resulting in secondary remodelling of the periarticular structures, in particular the bony components.

3. Osteoarthritis begins as a result of increases in the stiffness of the subchondral bone, with changes in the cartilage occurring secondarily. The remodelling of the hyaline cartilage is not well explained in this theory.

Wilkinson (1971: 35) suggests that in cervical spondylosis, secondary changes to the vertebrae are preceded by degenerative changes to the corresponding intervertebral discs.

There are significant resemblances between the aetiology, pathogenesis and prognosis of low back pain and the aetiology , pathogenesis and prognosis of neck pain (Porterfield 1995: 3). Likewise there are similarities between the mechanics and anatomy of the lumbar spine and the anatomy and mechanics of the cervical spine. The aggravating factors and the resolution of mechanical neck pain are analogous to those of low back pain. (Porterfield, 1995: 3).

Kirkaldy-Willis (1988: 55) describes the degenerative process in the lumbar spine, which appears to be similar to the process of degeneration of the cervical spine.
Kirkaldy-Willis (1988: 55) highlights the relationship between the two posterior joints and the intervertebral disc. This is labeled the Three Joint Complex. Changes affecting the posterior joints also affect the disc and vice versa. He describes the three phases of

degeneration, namely:

1. **Stage of Dysfunction** (Phase I): normal movement is restricted and muscle hypertonicity is present. This stage may be as a result of injury.

2. **Stage of Instability** (Phase II): there is an abnormal increase in mobility on examination of the patient. This is possibly due to laxity of the posterior capsule and the annulus fibrosis.

3. **Stage of Stabilization** (Phase III): due to the fibrotic and osteophyte formation around the posterior joints and within and around the disc, which occurs in the advanced degenerative stages, the unstable segment becomes more stable.

The above is disputed by Bland (1994: 72), who states that too many gross differences exist between the cervical and lumbar spines to allow for the above theory that cervical spine degeneration is analagous to lumbar degeneration. He states several obvious differences:

1. The neck is designed to move through a far greater range of motion than the lumbar spine;

2. the cervical vertebrae are smaller and are anatomically more involved than the lumbar vertebrae;

3. the zygapophyseal joints are aligned in completely different planes;

4. the cervical intervertebral discs are clearly different from the lumbar discs, i.e. anatomically, physiologically, biochemically, biomechanically and embryologically;

5. little or no nucleus pulposus is present in the cervical spine as opposed to the

lumbar spine after the age of 45;

6. biomechanically and hydrodynamically the lumbar spine is different from the cervical spine;

7. cervical discs tend to be more ligamentous and have less proteoglycan material present when compared to the lumbar discs;

8. the cervical spine is subjected to different forces, i.e. those of increased mobility as opposed to the weight-bearing stresses of the lumbar discs;

9. Myelopathy is a great deal more common in the cervical spine than radiculopathy. The converse is true of the lumbar spine.

2.4.1 Cartilage Changes

The earliest morphological change to the cartilage is that of the breaking up of the collagen net, particularly on the joint surface. A crack-like change known as fibrillation occurs; chondromalacia occurs over the whole joint surface and a decrease in the concentration of the proteoglycan material is evident in the hyaline cartilage of the zygapophyseal joint. Later resultant small ulcerations, flaking, erosions and pitting occur in the cartilage. A tiny nidus of osteoarticular tissue, known as the "joint mouse", is found detached from the joint surface in the synovial cavity. However, the bone of the nidus becomes obsolete due to the avascular nature of the cartilage, and new cartilage is formed. It is arranged concentrically in artificial layers around the nidus and within the synovial joint. (Bland, 1994: 98).

Bland (1994: 98) states that tissue repair does take place. The reparative collagen is arranged in a disorderly fashion and is synthesised by the chondrocytic clone or by the chondrocytes themselves (Bland, 1994: 98). Other tissues assist in the repair process by metaplasia or by synovial membrane, subchondral bone, or marrow cells that migrate through the microfractures in the subchondral bone to reach the cartilage and proceed with the synthesis of cartilagenous macromolecules (Bland, 1994: 98).

2.4.2 Bone Changes

The subchondral bone increases in density, proliferation occurs and later microfractures transpire resulting in callus formation. As the microfractures occur, the altered subchondral bone undergoes focal pressure necrosis in the superficial layers. Osteophytes (new bone formation) then appear at the margins of the articular cartliage; these are in fact a combination of connective tissues, consisting of a coating of fibrocartilage, islands of fibrocartilage and hyaline cartilage. There may even be some tendon-like material present. (Bland, 1994: 101).

2.4.3 Synovial Membrane Changes

A polymorphonuclear response is initiated within the synovium as a result of the changes in the bone and cartilage, which leads to the accumulation of debris within the joint space. The phagocytic synovial cells remove the debris while the synovial membrane becomes

hyperelastic and hypertrophic. During active osteoarthritis, pannus-like lesions develop which may become aggressive, synthesize and secrete collagenase and prostaglandin. The increase in volume, hyperplasia and hypertrophy of the synovial membrane are accompanied by angiogenesis which results in marked capillary proliferation. Therefore, when the synovial tissue extends into the joint cavity, it may be traumatised between the joint surfaces and bleeding of varying degrees will result. The normal synovial membrane provides sufficient nutrition to the hyaline cartilage; however, where there is a scarred and chronically inflamed synovium, this function is lost, thus allowing the osteoarthritic changes to be accelerated. (Bland, 1994: 103).

2.4.4 The Intervertebral Discs

Disc degeneration of the cervical spine occurs more commonly than in the lumbar spine (Corrigan and Maitland 1983: 345). This is possibly due to the extensive mobility of this region of the spine compared to the lumbar and thoracic segments of the spine (Corrigan and Maitland ,1983: 345).

Situated between the vertebral bodies , the intervertebral discs vary in thickness in both the different parts of the same disc and at separate regions of the cervical spine. Anteriorly, they are thicker than posteriorly, thus contributing to the normal cervical lordosis. Alteration to the normal curve in patients with cervical spondylosis is mainly caused by changes in the intervertebral discs. The upper and lower surfaces of the vertebral bodies are covered by layers of hyaline cartilage which adhere to the intervertebral discs and are continuous with the anterior and posterior ligaments. (Wilkinson, 1971:35).

The intervertebral disc has two components. The first, the annulus fibrosis is the outer portion which has concentrically arranged fibers. These fibers are obliquely arranged in the vertical plane and are angulated in converse directions in successive lamellae. (Wilkinson, 1971: 35).

The nucleus pulposus forms the remainder of the disc. It is a soft pulpy extremely elastic substance composed of a fine fibrous matrix forming a reticular structure (Wilkinson, 1971: 35). Within the salt- and water rich substance is a meshwork of proteoglycan and collagen fibers (Moroney, 1992: 138). By means of their hydrophilic properties, the proteoglycans are largely accountable for the ability of the nucleus to retain water under physical and osmotic pressures and to exhibit resilience to applied loads (Moroney, 1992: 138).

Bland (1994: 77) states that the nucleus pulposus is present at birth, is less evident in adolescence and is absent by the age of forty. Bland (1994: 77) believes that this is a physiological event and is associated with biomechanics. As the nucleus pulposus gradually disappears, it is replaced with the deposition of a ligamentous, fibrocartilage type tissue. (Bland, 1994: 77). In people over the age of sixty the majority of the disc becomes a dry and non-gel-like material, perhaps due to the absence of proteoglycans, thus acquiring a dense ligamentous structure, and a marked loss of disc tissue volume occurs (Bland, 1994: 79).

The most commonly involved disc space is at the C5-C6 region followed by the C6-C7 disc space and then the disc between C4-C5 (Fenlin, 1971: 371). Degeneration of the intervertebral disc is a slow process and it may be some time before it gives rise to pain. This pain often arises in the zygapophyseal joints rather than in the disc (Crisp, 1955: 805).

2.4.5 The Zygapophyseal Joints (Posterior Facet Joints)

The zygapophyseal joints are synovial joints formed by the articulation of the contiguous superior and inferior facets of the vertebral pedicles. The superior facets are directed upwards, backwards and medially whereas the inferior facets face downwards, forwards and laterally. These joints constitute the posterior and lateral borders of the intervertebral foramina. Osteoarthritic changes to these joints are nearly as common as changes to the intervertebral disc. Changes to the zygapophyseal joints usually occur in the upper cervical spine (C2-3, C3-4) where discs appear to be relatively normal, whereas changes in the lower cervical spine are less common despite the more frequent spondylotic changes in this area. (Wilkinson, 1971: 42).

All zygapophyseal joints have menisci which are arranged in a circular pattern and have varying degrees of penetration into the joint. There appears to be a tendency for the menisci to proliferate in a fibrous-like pannus which can destroy hyaline cartilage. (Bland, 1994: xviii, 82)

Zygapophyseal joint synovial folds or menisci contain pain receptors (nociceptors) within the folds; therefore, should the synovial fold become compressed or entrapped between the

articular facets of the zygapophyseal joints, pain may result (Gatterman, 1995: 20-21).

Encroachment of the spinal canal or the intervertebral foramina may occur if osteophytes are present on the articulating facets of the zygopophyseal joints, especially from the posterior and lateral aspects. If the degenerative changes of the intervertebral discs and zygopophyseal joints occur at the same level, there is a significant increase in the possibility of nerve root involvement, as encroachment occurs from the posterior and lateral changes in the zygopophyseal joints, and from the medial aspect by the spondylotic bars. (Wilkinson, 1971:42).

Crisp (1955: 806) suggests that the origin of the pain is the osteoarthritis and capsulitis which is as a result of the erosion of the articular cartilage in the zygapophyseal joints. The pain may also arise from facet subluxation or locking of the facets due to a loose body, or it may be as a result of a pinched synovial membrane (Crisp, 1955: 806).

2.4.6 Vertebral Bodies

The vertebral bodies of the lower cervical spine are small, have broad bodies with laterally raised uncinate processes on the upper surfaces and have sloping posterior arches which enclose the large triangular vertebral foramen. The upper cervical vertebrae are unique in that the atlas has no vertebral body and articulates with the axis by means of the dens. It is this anatomic arrangement of the axis that allows the upper cervical spine such a large range of axial motion. (Moroney, 1992: 138).

Sclerosis of the subchondral bone neighbouring the cartilaginous end plate becomes apparent; at later stages sclerosis of part of the cancellous bone may occur. In advanced stages of the disease where there is complete loss of disc height, bony ankylosis may occur between the two contiguous vertebrae. (Fenlin, 1971: 375).

Bevelling of the antero-superior margins of the vertebral bodies is one of the earliest changes in cervical spondylosis, this is followed by the antero-inferior margins of the vertebrae above (Fenlin, 1971: 379). Later wedging of the vertebrae will occur resulting in a decrease in the cervical lordosis. As the condition progresses, osteocartilaginous beaks (osteophytes) extend from the rounded off vertebral margins on a level parallel to the cartilaginous end plates. (Fenlin, 1971: 379).

As the osteophytes of both the superior and inferior vertebral margins of adjacent vertebrae start to enlarge, they project along the anterior longitudinal ligament. It is not unusual for the osteophytes to meet and form a bony ankylosis between the adjacent vertebrae. In older people the most commonly affected levels are again C4-5, C5-6 and C6-7. Anterior osteophytes are rarely clinically significant; however, they may be associated with dysphagia due to the protrusion of the osteophyte encroaching upon the oesophagus. Posterior osteophytes are most commonly found at C6-7 and are frequently clinically significant. These osteophytes may compromise the vertebral canal and compress the nerve roots and spinal cord anteriorly. They may also be responsible for radiculopathies and spinal compression. (Fenlin, 1971:379).

2.4.7 Joints of Von Luschka

Osteophyte formation commonly occurs at the joints of Von Luschka. These postero-lateral projections encroach upon the contents of the intervertebral foraminae. Fenlin (1971: 379) postulates that osteophytes in the joints of Von Luschka contribute to more foraminal encroachment than any other factor.

This is opposed by Bland (1994: 82), as he states that anatomically a joint must have certain structural elements, such as a synovium, synovial space, hyaline cartilage, a capsule and subchondral bone. He found that at the proposed site of the Von Luschka joints none of the aforementioned were present and concluded that because of this it was incorrect to call this region a joint (Bland, 1994: 82).

2.4.8 Muscle changes

Degenerative processes in joints may induce or accompany concomitant changes in the skeletal muscle and attachment-tissues which are neurologically and embryologically associated with the functions of these joints. Muscle abnormality may be indicated by palpable nodules, bands, stringiness, crepitus and evidence of muscle tenderness. (Grieve, 1989: 243).

Bland (1994: 213) states that tender sections and local muscle spasm may be found over the muscles of the neck, shoulder girdle and arm. The above represents external evidence of the surrounding tissue changes which accompany the slow degenerative transformations in the vertebral joints (Grieve 1989: 243). The external evidence may or may not be painful. If pain is present, connective tissue and muscular lesions tend to assume diagnostic entities

because they repeatedly arise in a singular pattern of distribution and therefore are given specific names such as tennis elbow, bicipital tendonitis and golfer's elbow. (Grieve, 1989:243).

2.5 CLINICAL MANIFESTATIONS OF CERVICAL SPONDYLOSIS

The syndromes of degenerative disc disease in the cervical spine are as a result of biochemical and mechanical changes that accompany the ageing process. These changes are inevitable; however, they may not necessarily always be symptomatic. (Heller, 1992: 381).

Clark (1991: 1145) divides cervical spondylosis into three particular groups. The first includes patients with radicular signs and symptoms. The second group comprises of patientswho have cervical myelopathy secondary to cervical spondylosis. Those patients presenting mainly with neck pain without a true radicular or myelopathic component comprise the third group.

Common symptoms of cervical spondylosis manifest mainly in stiffness, crepitus on passive and active motion, movement limitation, muscle spasm, local pain and tenderness. Flexion is the least limited range of motion. (Geringer et al.1988: 757).

2.5.1 Neck pain

Classically neck pain is worse on waking in the morning (Wilkinson, 1971: 66). The pain may be aggravated by both active and passive movements and can be associated with crepitus occasionally audible to both the practitioner and patient. Tenderness over the posterior cervical muscles and spinous processes is often associated with a painful neck in cervical spondylosis (Wilkinson, 1971: 66).

Aching pain in the posterior neck or the trapezius area, and a sense of stiffness and grating on movement have been described (Adams and Hamblen, 1990:149). Aching pain is felt diffusely in the neck or in the interscapular area (Corrigan and Maitland, 1983: 347). In addition to the posterior paraspinous neck pain, there may be associated occipital headaches and interscapular pain (Clark, 1991: 1149).

Grieve (1989: 378) describes a "Monks's Cowl" of symmetrical neck and yoke pain which progresses during the day and is aggravated by driving and reading when these activities are performed for over an hour. The pain is characterized as unpleasant and burning in nature (Grieve 1989: 378).

2.5.2 Headache

Headaches are commonly associated with cervical spondylosis. No less than 40% of all headaches is caused by degenerative processes of the cervical spine (Turk and Ratkolb, 1987: 15). Bland (1994: 219) agrees with this statement, stating that a headache is the

most common symptom in cervical osteoarthritis.

The headaches are mainly concentrated in the occipital region, referring to the parieto-temporal and frontal regions. They tend to be worse on wakening and fade during the course of the day. This type of headache may occur due to spondylotic changes in the lower cervical discs or may be due to changes in the upper zygapophyseal joints. (Wilkinson, 1971: 66).

2.5.3 Radicular symptoms

Cervical spondylosis can lead to radicular pain which may be as a result of a disc herniation or encroachment of the vertebral foramina by osteophytes (Clark, 1991:1147).
In cervical radiculopathy, nerve root involvement may be single or multiple, unilateral or bilateral, symmetric and asymmetric. Both sensory and motor symptoms may be present when motor and sensory roots are involved. (Geringer et al.1988: 578).

The pain may be referred to the neck, head, periscapular, pectoral and shoulder regions with referral of symptoms down the upper extremities. The onset of pain is normally slow and progressive. The neuralgic pain is described as shooting, stabbing and intermittent with dermatomal and scleratomal distribution. Root pains are normally found in the proximal region of the arm and do not usually extend below the elbow. However, paresthetic symptoms (pins and needles), hot or cold sensations and numbness are often distal. (Geringer et al. 1988: 758) and (Clark, 1991: 1149).

2.5.4 Cervical myelopathy

Cervical myelopathy involves the compression and ischaemia of the spinal cord by spondylotic bars and surrounding structures (Wilkinson, 1971: 61). The neurological signs and symptoms are variable and hinge upon the site, magnitude, severity and the degree of evolution of the lesions (Geringer et al. 1988: 758). The most common symptoms include gait disturbance and lower extremity weakness. However, upper extremity spasticity and weakness may also occur (Geringer et al. 1988: 758).

2.5.5 Viseral symptoms

On occasion anterior osteophytes impinge upon the neighbouring structures resulting in hoarseness and dysphagia (Wilkinson, 1971:90).

Another common symptom is crepitus on movement of the cervical spine (Bland, 1994: 129). This is normal in most people; however, in patients with cervical osteoarthritis the magnitude of this crepitus increases (Bland, 1994: 219). Pain in the left precordium, left side of the neck and radiating pain down the left arm may indicate a severe radiculopathy at the C6/ C7 level. This is known as pseudoangina (Bland, 1994: 220). Cervical osteoarthritis is also associated with the triggering of rotator cuff shoulder syndromes, reflex sympathetic dystrophy, frozen shoulder, epicondylitis, carpel tunnel syndrome and dupreytrens contracture (Bland, 1994:220).

Caillet (1981: 104) suggests that because the degenerative process is so slow, and the nerves are able to adapt to the narrowing foraminae, the presentation of asymptomatic patients is possible. It is trauma, in the form of mechanical injury, physical stress and emotional strain that causes a breakdown in this adaptation and the symptoms then develop. (Caillet,1981: 104).

2.6 RADIOLOGICAL SIGNS OF CERVICAL SPONDYLOSIS

2.6.1 Plain film changes

The clinical significance of x-ray diagnosis of cervical spondylosis is questionable. This is because many patients with severe degenerative changes on x-ray are completely asymptomatic (Fenlin, 1971: 385). Yochum and Rowe (1987: 548) describe eight radiological signs of degenerative joint disease: asymmetrical distribution, osteophytes, non-uniform loss of joint space, subchondral sclerosis, subchondral cysts, intra-articular loose bodies, intra-articular deformity and joint subluxation.

2.6.2 Intervertebral Discs

The affected discs appear narrowed and there may be associated postural change. Disc narrowing is virtually a consistent feature of cervical spondylosis and is mainly due to dehydration of the nucleus pulposus, followed by disc degeneration. The disc tends to bulge anteriorly which is followed by the formation of osteophytes. These mainly occur at C5-C6

and C6-C7. When there are multiple discs involved the C5-C6 disc is invariably diseased. (Wilkinson, 1971: 89 and Yochum and Rowe, 1987: 551)

2.6.3 Vertebral bodies

Usually if a disc is narrowed due to spondylotic change the adjacent vertebral bodies show varying degrees of sclerosis and osteophytosis. Osteophytes restrict movement and have a protective and compensatory function. These anterior osteophytes may fuse. The smaller posterior osteophytes are more clinically significant as they protrude into the spinal cord or cause extensive soft tissue compression. (Wilkinson, 1971: 90-91).

2.6.4 Zygapophyseal joints

Degenerative changes in these joints form an integral feature of cervical spondylosis. Wilkinson (1971: 92) states that unlike the intervertebral discs, the zygapophyseal joints in the upper cervical spine tend to be more affected than the lower cervical spine zygapophyseal joints; but Yochum and Rowe (1987: 551) state that degeneration of these joints is usually confined to the lower cervical spine. These synovial joints show the typical changes of osteoarthritis, including narrowing of the cartilage, subchondral sclerosis , and osteophytosis. (Wilkinson, 1971: 92 and Yochum and Rowe, 1987: 551).

2.7 EFFICACY OF CERVICAL SPINE MANIPULATION

In their analysis of the literature of manipulation Laban and Taylor (1992: 452), indicate that manipulation may be therapeutic if it is directed at improving joint flexibility. This may be achieved by active or passive movement in the direction of reduced mobility. The clinical effects of manipulative therapy are considered to be achieved by improvement of the musculoskeletal biomechanics, blood circulation, lymphatic drainage and in nervous function (Korr, 1978: xvi).

In the study conducted by Cassidy et al. (1992: 495-500), manipulation was used to treat 50 patients with unilateral neck pain with no neurological deficit. It was found that after manipulation patients showed an increase in cervical range of motion and a significant decrease in pain. However, because the results of the trial were not controlled they cannot be seen as proof of the efficacy of manipulation but may be viewed as being clinically informative. (Cassidy et al. 1992: 495-500).

Cassidy et al. (1992: 570-575) conducted a study to compare the immediate results of manipulation to mobilization in patients with cervical spine pain. The patients received either a high velocity, low amplitude rotational manipulation or mobilization in the form of muscle energy technique. The results showed that the range of motion after the adjustment (manipulation: 85% and mobilization: 69%) was increased in both groups; however, the pain intensity of the manipulated patients decreased 1.5 times more than that of the

mobilized patients. It was shown that a single manipulation was more effective in pain relief than mobilization in patients with mechanical neck pain. (Cassidy et al. 1992: 570-575).

In the study by Howe et al. (1983) 52 patients participated in a randomized controlled trial of manipulation of the cervical spine. The results were assessed according to symptoms and goniometric measurements of the patients. It was found that manipulation demonstrated a significant instant improvement in symptoms with reduced pain and stiffness in the cervical spine and shoulders. In addition, an almost significant recuperation occurred in those patients with pain or parathesias in the arm or hands. After three weeks the measured increase in rotation was still maintained in the manipulated group; however, the increase in lateral flexion was lost after the three week period. The authors recommend that the trial be repeated and if the above results are reproduced they suggest that manipulation be recognized as an alternative treatment for spinal disorders. (Howe et al. 1983: 574-579).

In order to validate the diagnosis of joint dysfunction in the cervical spine, Mennel (1990) undertook a study whereby a group of a 100 patients suffering from cervical pain were assessed and analyzed. This was based on the basis of sex, age, duration of symptoms, nature of injury, analysis of x-ray examination and assessment of manipulative treatment. Eighty three percent of the patients were given manipulative therapy. Thirty percent of those manipulated described a termination of symptoms, and an additional 34% indicated they had improved significantly. Thus it was argued that the above results helped validate the presence of joint dysfunction as a manipulable condition. (Mennell, 1990: 7-12).

Kirkaldy-Willis (1988: 294) indicates manipulation for dysfunction of the posterior joints and paraspinal muscle syndromes as well as lateral stenosis.

Turk and Ratkolb (1987) treated 100 patients suffering from chronic cervicogenic headaches with manipulation and mobilization. Manipulations were repeated twice weekly over a period of three weeks. During this time no physiotherapy or analgoantirheumatics were administered. The patients returned for a follow-up session 6 months later. Of those patients participating in the study, 86% showed strong degenerative changes on x-ray analysis and only 14% had no distinct evidence of cervical degeneration on x-ray. On returning it was found that 25% noted a complete absence of headaches, 40 % said that their condition had improved but were still taking analgesics and the final 35% had benefitted for a month after treatment but had to resume taking analgesics so as to eliminate the headaches. The results show that 50% of the patients participating in the study benefitted from the treatment, showing a significant value of manipulative medicine. It was later discovered that the headaches reappeared in all the patients after some time which indicates that the cause of the headaches had not been removed. Turk and Ratkolb (1987) recommend manual therapy in the treatment of degenerative joint disease because of its advantages, provided that a complete examination is done and that the diagnosed condition does not contra-indicate manual therapy. (Turk and Ratkolb 1987: 15-17).

2.8 MANIPULATION AND CERVICAL SPONDYLOSIS

Manipulation is effective in the treatment of cervical spondylosis particularly in those cases where there has been little or no response to alternative conservative treatment (Rowe, 1963: 1352). Manipulation of the cervical spine has been endorsed for the treatment of symptomatic cervical spondylosis and non-specific neck pain (Mathews, 1972: 107 and Cyriax, 1971: 92); in addition, Cyriax (1977: 92) also indicates manipulation for both early and advanced spondylosis. Bland (1994: 288) states that cervical manipulation must be regarded as being successful.

In advanced spondylosis, excellent results can be achieved from manipulation with almost complete recovery of normal ranges of motion. When the posterior joints are involved the response to manipulation appears to be less satisfactory and tends to take longer to accomplish. In most cases of cervical spondylosis, manipulation is indicated and rapid advantageous results are achieved by means of increasing the ranges of motion of the cervical spine, and thus decreasing pain and other complaints. (Maigne, 1972: 206-207)

Wiles and Sweetnam (1965: 325) state that a large percentage of patients with neck and upper limb symptoms without sensory or motor changes responded very well to manipulation. They recommend that patients suffering from symptomatic cervical spondylosis, be manipulated twice to three times a week following a complete examination (Wiles and Sweetnam, 1965: 325).

According to Laslett (1987: 573), intervertebral disc or zygapophyseal pathology results in the activation of neural pain receptors. In this case manipulation is imperative and a beneficial therapeutic outcome is expected. The direction of manipulation is based upon the patient's responses to the initial positional testing. (Laslett, 1987: 573).

Mathews (1972) mentions two pathological states that respond well to manipulation.

1. Replacement of a displaced structure (i.e. meniscus): Manipulations of this classification are commonly applied to the spinal joints and may provide spectacular and gratifying relief of symptoms, and
2. manipulation for contracture: Joint capsule contracture may result from degenerative or inflammatory joint disease. This commonly occurs in the capsule of the spondylotic zygapophyseal joints thus leading to symmetrical movement restriction. (Mathews, 1972: 107-112).

The objective of a study by Sloop et. al. (1982: 532-535) was to demonstrate any efficacy of manipulation for pain relief and other symptoms in patients with chronic neck pain and to identify the prognostic value of this treatment. Twenty one patients suffering from non-specific neck pain or symptomatic cervical spondylosis were administered an amnesic dose of diazepam followed by a cervical manipulation. The control group consisted of 18 patients who received diazepam but no manipulation. A randomized, double-blind design was used to obtain the results. The results of statements provided by the patients and visual analogue scales showed no significant differences between the manipulated and control groups. No

consistent favourable outcome was found in the control group who received subsequent manipulation. It was concluded that the value of a single manipulation of the cervical spine needs further investigation. (Sloop et al. 1985).

2.9 EFFECTS AND BENEFITS OF SPINAL MANIPULATION

The following have been found by Corrigan and Maitland (1983: 296) and Basmajian (1985: 41-42) to be the most common benefits and effects of spinal manipulation:

1. Range of motion: The major benefit obtained is an increased mobility of the cervical spine, with restoration of the physiological and accessory movements due to the increased range of motion of an intervertebral joint segment (Corrigan and Maitland, 1983: 296).
2. Pain relief: Regardless of the underlying lesion resulting in the decrease in spinal mobility, it may in addition stimulate the sinuvertebral nerves and produce spinal pain. Thus restoration of spinal mobility will also relieve this source of neural irritation. (Corrigan and Maitland, 1983: 296)

   Joint pain is as a result of the transmission of nociceptive afferent activity from the irritated Type IV receptor system. These 'gateway' synapses pass through the basal spinal nucleus up into the brain. During manipulation, the apical spinal interneurones are activated as a result of peripheral mechanoreceptor stimulation.

This produces presynaptic inhibition of nociceptive afferent activity and results in pain suppression. (Wyke, 1985: 75)

3. Reduction of muscle spasm: This may help avoid a pain-spasm-pain cycle (Corrigan and Maitland, 1983: 296).

4. Disc nutrition: Disc nutrition depends upon the fluid exchange between the vascular channels in the vertebrae and the intervertebral disc. It is impeded by a loss of normal joint mobility, thus with the presence of normal mobility disc degeneration may be prevented. (Corrigan and Maitland, 1983: 296)

5. Psychological effects: The tactile nature of manipulation is recognized as having a powerful psychological effect upon the patient (Basmajian, 1985: 41). The audible release frequently associated with manipulation also offers assurance to the patient that a correction has been made (Basmajian, 1985: 41-42).

2.10 ANTHROPOSOPHICAL TREATMENT

2.10.1 Introduction

Anthroposophy was founded by an Austrian scientist and philosopher, Rudolf Steiner (1896-1925) (Evans and Rodger, 1992: 9). The name anthroposophy is derived from the Greek anthropos (*human*) and spohia (*wisdom*) indicating the involvement of the development of spiritual wisdom through human self-knowledge (Evans and Rodger, 1992: 10). Steiner recognised the spiritual element of existence, and his anthroposophy, or spiritual science, views humans as beings of body, soul and spirit. Anthroposophical Medicine occurred as a result of a collection of doctors who recognised that this extended physiology had remarkable implications for medical care (Evans and Rodger, 1992: 10).

The principal objective of anthroposophical medicine is to stimulate the natural healing forces in the patient. These forces are the following: the physical; etheric; astral body and the Ego (Evans and Rodger, 1992: 11). "These four elements interrelate to form a whole , which must be treated as a whole if the patient is to be helped. Anthroposophical doctors seek to understand illnesses in terms of the way the four aspects interrelate" (Evans and Rodger, 1992: 11).

Little literature is available on the Disci Preparations as limited research has been conducted using these particular remedies.

2.10.2 The Treatment of Cervical Spondylosis With WALA Disci Preparations

The Preparation **Disci comp. cum Stanno**, described below is a potentized compound remedy made from specifically effective medicinal plants together with corresponding metals and animal/insect organ substances. The organic substances are obtained from the cervical, thoracic and lumbar sections of the spine. The therapeutic effect is directed at the spinal joints and the lymphatic, venous, muscular and connective tissue surrounding the joints. (Vogel, 1976: 18).

2.10.3 The Basic Formulation of the Disci Preparations

The Disci preparations all have the following common potentized preparations (Vogel, 1976: 19):

1. Intervertebral discs from all three sections of the spine, referred to as Disci Intervertebrales.
2. Bamboo stalk nodes, referred to as Bambusa e nodo.
3. Ants, referred to as Formica ex animale.

2.10.4 Disci Intervertebrales:

A specific organotropic dynamic is given to the Disci preparations by the inclusion of the organ preparation from intervertebral discs of animals. The devitalized intervertebral discs are acted upon by the potentized disc tissue which stimulates exchange processes such as anabolism, nutrition and excretion. (Vogel, 1976: 19).

2.10.5 Bambusa e nodo:

Bamboo is utilized in all the Disci preparations. It belongs to the Graminaceae and this particular plant family has two important characteristics (Vogel 1976: 19):

1. An exceptionally high silica content (80-90% silica in the ash) and the related elastic strength of the stalks.
2. The ability to form starches and sugars (grains and sugar cane).

A strong relationship exists between the intervertebral discs and the bamboo plant. This is indicated by the high glycogen content of the notocord reticulum and starch and sugar production of the grasses. Both the human being and Graminaceae have significantly similar methods in the formation of sugar and starch. (Vogel, 1976: 19).

2.10.6 Formica ex animale:

A significant and widespread process in animal life is that of metabolism of oxalic and formic acid. This process is involved at some stage in spinal diseases. Formic acid plays a major role in the spine because of its function in the arterial and intensive venous blood supplies to the spine. (Vogel, 1976: 20).

Tendons, ligaments, joint capsules and joint surfaces are made up of tissues which are fairly undifferentiated and are therefore susceptible to disease. The role of formic acid is to act as a mediator between regenerative processes and the stress of movement. Thus formic acid is indispensable in the treatment of primary and secondary destructive phenomena in the human being. (Vogel, 1976: 21).

Described above are the basic preparations of the Disci remedies. To these individual preparations are added certain plant and metal potencies, depending on whether the spinal condition is degenerative or inflammatory. (Vogel, 1976: 21).

The remedy made use of in this particular study includes the following additional preparations (**Disci** comp. cum Stanno):

2.10.7 Stannum:

Stannum is present in all Disci preparations for deformative spinal diseases. Tin is a soft metal of a crystalline structure. It maintains its pliant and crystalline nature under varying conditions, i.e. when heated to 180 'C it becomes brittle and when cooled below 18 'C it becomes powdery. The ability of tin to harden when heated and to decay when cold is applied to related processes in the human. When the joint surfaces are affected by primary deformative arthritis or secondary arthrosis, the cartilage may be destroyed by both inflammation and degeneration. (Vogel, 1976: 26).

2.10.8 Silica:

Stannum and silica complement each other in the Disci preparations. They are very alike in their chemical nature and their natural occurrence. Silica operates on the intervertebral discs and the nucleus pulposus, whilst stannum works on the joints, ligaments, tendons and muscles. (Vogel, 1976: 27).

2.10.9 Equisetum ex herba:

As a component of the Disci preparations, Equisetum functions to deter mature degeneration of the cartilaginous structure of the intervertebral discs. The remedy regulates the fluid processes of the fibrous cartilage, a tissue which is continuously alternating between hydration and dehydration. (Vogel, 1976: 25).

2. 11 CONTRA-INDICATIONS TO SPINAL MANIPULATION AND VERTEBRO-BASILAR ARTERY SYNDROME

2.11.1. Contra-indications to spinal manipulation:

Haldeman (1992: 557) and Gatterman (1990: 67) provide an extensive outline of the contra-indications of spinal manipulation.

1.. **Vascular Complications:** vertebral artery insufficiency, atherosclerosis and aneurysm.

2. **Tumours:** lung, thyroid, breast, prostate and bone.

3. **Bone infections:** Tuberculosis, osteomyelitis.

4. **Traumatic injuries:** fractures, joint instabilty, severe sprains or strains and unstable spondylolisthesis.

5. **Arthritis:** Rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis and unstable osteoarthritis.

6. **Psychological considerations:** malingering and hysteria.

7. **Metabolic disorders:** clotting disorders, osteopenia (osteoporosis and osteomalacia).

8. **Neurologic complication:** sacral nerve root involvement due to significant disc bulge, disc lesions (with advanced neurological deficits) and space-occupying lesions.

9. **Congenital malformations.**

2.11.2. Vertebro-basilar artery insufficiency:

Cervical spondylosis may have a profound affect on the cerebral blood supply due to the anatomical relationship between the cervical spine and vertebral arteries. These arteries enter the cervical spine at the level of C6 and migrate vertically through a canal in the transverse processes. On passing through the transverse process of the atlas the arteries then curve round to enter the skull via the foramen magnum. (Wilkinson, 1971:66).

The vertebral arteries are closely related to the Von Luschka joints medially and the zygapophyseal joints postero-laterally. These arteries frequently differ in size and certain physiological and pathological influences may affect the blood flow through the vertebral arteries. It is the combination of cervical spondylosis and atheroma in the vertebral arteries (particularly if they differ in size) that produces ischaemic symptoms. (Wilkinson, 1971: 67).

Other mechanisms altering the brain stem blood supply in cervical spine osteoarthritis include the following: carotid sinus compression, the release of emboli from atheromatous plaques in the great vessels as a result of cervical manipulation, or thrombosis with infarction of the brain stem or cerebellum (Bland, 1994:217).

The characteristic feature is the exacerbation of paroxysmal symptoms by head movement, either by rotation to either side or extension of the neck and less commonly flexion. These movements may trigger brief attacks of giddiness, diplopia, or an attack of syncope.

However any of these manifestations may occur in the absence of head movement, in people suffering from vertebro-basilar ischaemia. (Wilkinson, 1971: 67)

Other symptoms include parathesia, numbness, tingling on one or both sides of the body, dysphagia or dysarthria, tinnitus or vertigo, pain or other sensory perceptions in the tongue, throat or face, diploplia or gaze paralysis, blurred vision or blindness, ataxia or nystagmus, hiccuping, and difficulties in respiration. (Bland, 1994:217).

Jaskoviak (1980: 213) states that the potential for side effects of the cervical spine manipulation does exist, but regarding the fact that in excess of seventy five million cervical spine adjustments are performed annually in the United States, the incidence is minimal. He concludes that anyone not properly instructed in the contraindications and correct technique procedures should not be permitted to perform these manipulations (Jaskoviak, 1980: 213).

2.12 ALTERNATIVE THERAPY FOR SYMPTOMATIC CERVICAL SPONDYLOSIS

The following are treatments suggested for the treatment of symptomatic cervical spondylosis:

1. Bed rest - in severely acute cases bed rest may be suggested (Wilkinson, 1971: 140).
2. Collars (Wilkinson, 1971: 141).

3. Analgesics (Wilkinson, 1971: 140 and Geringer et al. 1988: 759).

4. Heat and cold therapy (Wilkinson, 1971: 147 and Geringer et al. 1988: 759).

5. Massage (Wilkinson, 1971: 147 and Geringer et al. 1988: 759).

6. Active exercise therapy - neck mobilising exercises, shoulder raising exercises and muscle strengthening exercises (Wilkinson, 1971: 146).

7. Cervical traction - both manual and mechanical tractions (Wilkinson, 1971: 143-145).

2.13 CONCLUSION

According to the available literature it appears that there is sufficient evidence to propose that spinal manipulative therapy may be more effective than standard medical care in the management of painful musculoskeletal disorders (Brunarski, 1984: 243-247).

Tyler (1990: foreward) is of the opinion that even though the chiropractic adjustment is the cornerstone of practice, other modalities may be applied to enhance the physiologic effects of the adjustment (Tyler 1990: foreward, as cited in Schafer 1991).

The response from both medical doctors and homoeopaths has been very favourable toward the Disci remedies (Hauschka, 1960: 7), and according to Wala Literature the Wala Disci remedies are " a wellproved aid in the treatment of spinal disorders" (Wala Literature 1990: 1).

CHAPTER

THREE

CHAPTER THREE

MATERIALS AND METHODS

3.1 MEASUREMENT AND OBSERVATIONS

3.1.1 THE DATA

The study utilised both primary and secondary data as set out below:

A. Primary Data

1. Case History form (Appendix A)
2. Physical Examination form (Appendix B)
3. Cervical Regional Orthopaedic Examination (Appendix C)
4. CMCC Disability Index Questionnaire (Appendix D)
5. McGill Short-Form Pain Questionnaire(Appendix E)
6. Numerical Pain Rating Scale-101 (Appendix F)
7.. Goniometric values of the cervical range of motion (Appendix G)

B. Secondary Data

1. Current literature pertaining to Chiropractic and Anthroposophical treatment of symptomatic cervical spondylosis.

2. Recognised diagnostic and evaluative criteria relating to pain perception, disability and spinal ranges of motion.

3.1.2 METHOD OF MEASUREMENT

A. Subjective Measurement

1. CMCC Neck Disability Index (Appendix D)

This questionnaire has been devised so as to provide the researcher with an indication of how the cervical pain affects the patient's ability to cope in everyday life. It comprises questions, each question scoring a maximum of five points and a minimum of zero. The result obtained is represented as a percentage disability and is calculated by scoring the questionnaire out of fifty.

Vernon and Mior (1991: 409) suggest that the Neck Disability Index has a high degree of reliability and internal consistency. It appears to be sensitive to changes in disability during the course of treatment and to the intensity of the problem. In addition, the questionnaire is relevant to a wide broad age spectrum, is not affected by gender and has an adequate level of validity.

2. **Numerical Pain Rating Scale (101 Scale)** (Appendix F)

This questionnaire assists in ascertaining the average pain intensity experienced by the patient. The patient is required to indicate by means of a percentage the intensity of the pain they experience. This is assesed prior to a treatment and records the patient's pain when (a) it is at its worst and (b) when it is at its least.

In the study performed by Jensen et al. (1986: 117), six methods of judging pain intensities were compared. These methods were evaluated according to five criteria:

1. Ease of administration of scoring;
2. relative rates of incorrect responding;
3. sensitivity as defined by statistical power;
4. sensitivity as defined by the number of available response categories;
5. the magnitude of the relationship between each scale and a linear combination of pain intensity indices.

Jensen et al. (1986: 125) report that the Numerical Pain Rating Scale -101 has distinct advantages over other measures because:

1. It is simple and practical to administer and score;
2. both written and oral responses can be obtained
3. the scale does not appear to be associated with age.

Jensen et al. (1986: 125) suggest that when indexing chronic patients' pain at different points in their lives, the Numerical Pain Rating Scale-101 is the questionnaire of choice.

3. **McGill Short-Form Pain Questionnaire** (Appendix E)

This questionnaire is designed to interpret the sensory dimension of the pain experienced by the patient (Melzack and Katz 1992: 162). It was developed for research purposes where there is limited time to obtain information from patients. The questionnaire is derived from the Mcgill Long-Form Questionnaire and consists of 15 representative words (descriptors). These descriptors have been selected on the basis of their frequency of endorsement by the patients. Each adjective is ranked on an intensity scale of: 0 = none, 1 = mild, 2 = moderate and 3 = severe (Melzack and Katz 1992: 163).

Melzack and Katz (1992: 163) state that the results of studies using the questionnaire measuring chronic pain and the sensory dimension of pain compare closely to that of the Long-Form questionnaire. Melzack and Katz (1992: 166) describe that the McGill Pain Questionnaire is designed to assess a multi-dimensional nature of pain experience and they state that it has been demonstrated to be a reliable, consistent and valid measurement tool.

B. Objective Measurement

1. **Cervical Spine Range of Motion** (Appendix F)

In order to measure the cervical range of motion the Cervical Range of Motion Instrument was used, a product of Performance Attainment Associates. Flexion, extension, bilateral rotation and bilateral lateral flexion were the ranges of motion measured and were recorded in degrees.

In a study conducted by Youdas et al. (1992: 771) to determine the reliability of the Cervical Range of Motion Instrument as compared to two other instruments, it was found that the Cervical Range of Motion Instrument demonstrated a high degree of reliability.

It was also found that the Cervical Range of Motion Instrument was reliable when two physical therapists took repeated measurements on the same patient. In addition, it was noted that during the measuring procedure with the Instrument no further aggravation of the patient's condition was found. (Youdas et al. 1992: 779).

Capuano-Pucci et al. (1991: 338-340) stated that the Cervical Range of Motion Instrument showed acceptable intertester and intratester reliability. They also comment on the ease of application and reliability of the instrument in appraising cervical range of motion. Rheault et al. (1992: 147-150) reaffirm this finding in that the Cervical Range of Motion Device is a reliable tool for assessing the cervical range of motion.

3.2 THE LOCATION OF THE DATA

The primary data were obtained from the CMCC Neck Disability Index, Numerical Pain Rating Scale and McGill Short-Form Pain Questionnaire which were completed by the patients at the commencement of the first, fifth, tenth and follow-up consultations. Furthermore, the cervical ranges of motion were also recorded at these consultations. All consultations were conducted at the Technikon Natal Day Clinic.

The secondary data were collected from current journals, text books, CD-Rom and netscape facilities at the Technikon Natal Library. In addition, interlibrary loans were made where literature was unavailable at the campus library.

3.3 STUDY DESIGN AND PROTOCOL

3.3.1 Object of the Study

The object of the study was to determine the efficacy of each treatment in terms of objective and subjective measurements. The study attempted to identify whether the combination of Chiropractic treatment and an Anthroposophical remedy was more effective in the treatment of symptomatic cervical spondylosis than just Chiropractic and placebo treatment.

3.3.2 Allocation of the Subjects

The sample size incorporated thirty subjects who complied with certain criteria regulating the study, and were randomly divided into two groups (computerised randomisation):

1. Control group of 15 patients (C group)
2. Experimental group of 15 patients (E group)

The treatment of the control group consisted of cervical spine manipulation and a placebo subcutaneous injection into the cervical paraspinal skin. The experimental group received cervical spine manipulation and a subcutaneous injection of the **Disci comp. cum Stanno** preparation into the cervical paraspinal skin.

3.3.3 Standards of Acceptance of Patients

All patients had to meet specific requirements in order to be included in the study.

1. Each patient had to undergo a full case history (Appendix A) and physical examination (Appendix B).
2. The patients had to undergo a thorough cervical orthopaedic examination (Appendix G) and were examined for the manifestations of the recognised symptoms and signs of symptomatic cervical spondylosis. Patients experiencing the following symptoms were included into the study:

    a) Neck pain associated with stiffness and constant dull pain which is felt diffusely in the neck or interscapular area.

b) Headaches. This is a common feature of cervical spondylosis. Pain is frequently felt in the suboccipital region (bilaterally or unilaterally) and radiates to the head behind the eyes or into the face.

c) Arm pain which may be due to referred pain from the neck or due to nerve root pressure.

3. All patients were required to undergo x-rays so as to confirm the presence of cervical spondylosis. Radiological changes had to be evident i.e. prescence of any of the following:

a) Subchondral sclerosis;

b) osteophytes;

c) loss of disc height;

d) foraminal encroachment; and

e) subluxation.

Radiographic views required were the following:

* Antero-posterior view;

* Lateral view;

* Right and left obliques;

* Open mouth view;

* Flexion and extension views.

4. The patients were not included in the study if they presented with the following contra- indications to manipulative therapy : infection, inflammation, congenital malformations, trauma and cerebrovascular anomalies.

5. The selected participants were asked to sign an informed consent form before they were treated (Appendix H).

3.3.4 Interventions

After being accepted in the study the patients were treated as follows:

1. At their initial consultation they were asked to complete, prior to the treatment, the CMCC Neck Disability Index, the Numerical Pain Rating Scale and the McGill Short-Form Pain Questionnaire. The cervical ranges of motion were also measured.
2. Each patient received chiropractic treatment , which consisted of spinal manipulative techniques to eliminate any fixations found in the cervical and cervico-thoracic regions of the spine.
3. Thereafter, the patient was then injected six times per treatment, three injections each side, paraspinally in the region of the cervical pain. The contents of the injection depended on whether the patient formed part of the control (placebo) or experimental group (Disci remedy).

The patient was then treated twice a week for a period of five weeks, i.e. ten treatments. This treatment period was based on the indications of the Anthroposophical remedy (Wala 1976: 44). Wiles and Sweetnam (1965: 325) and Turk and Ratkolb (1987: 17-19) recommend that patients suffering from symptomatic cervical spondylosis be manipulated twice to three times a week for a period of three weeks, following a complete examination. Thereafter, the patient returned after a four week period of no treatment for a follow-up

evaluation. It should be noted that questionnaires were completed and cervical ranges of motion were measured at the fifth and tenth(prior to treatment), and follow-up consultations.

The formulations for the **Disci comp. Cum. Stanno** and Placebo preparations are as follows:

1. **Active:** Solution for injection: 1 ml contained:

   Disci intervertebrales (cervicales, thoraci et lumbales) GI D5 0.1g

   Bambusa virdiglaucescens e nodo ferm D5 0.1g

   Formica ex animale GI D6 0.1g

   Stannum metallicum D5 0.1g

   Equisetum ex herba ferm 35b D14 0.1g

These were made up to 1g (1000mg) with isotonic solution.

2. **Placebo:** Active ingredients were replaced by isotonic solution.

   Isotonic solution: 8.8mg NaCl

   0.2mg $NaHCO_3$

   991.0mg water for injections

NOTE: Due to the nature of the study, i.e. a double blind study, the ampoules, which were specially prepared in Germany, on arrival were numbered from one to forty by a member of

staff (uninvolved in the study). The numbering of control and experimental allocations was randomly divided by the resident statistician. The list of allocations was then sent to the selected member of staff who then placed either the placebo or **Disci** ampoules into the correctly numbered sachets. The ampoules, donated by WALA in Germany were specially prepared so that the researcher would not know whether the patient was being injected with the placebo or **Disci**. This was achieved by a unique coding system only given to the elected member of staff who distributed the remedies into the specific sachets.

It is widely accepted that a 20-30 % improvement can be expected from the control/placebo group in most clinical trials (Winer 1985:107).

3.3.5 Addressing the Subproblems

The objective and subjective data collected were statistically analysed. The results obtained from the data were then used so as to address the stated three problems (see Chapter Four).

3.4 STATISTICAL ANALYSIS

3.4.1 Treatment of the data

3.4.1.1 Treatment of the Subjective Data

The subjective data were treated as follows:

1. The questionnaires were screened in order to determine whether they had been completed correctly and completely.
2. The scores obtained from the three questionnaires were expressed as percentages and recorded separately for the control and experimental groups.
3. The data then underwent statistical analysis.

3.4.1.2 Treatment of the Objective Data

The objective data were managed as follows:

1. The cervical ranges of motion were measured by means of a goniometer and the recordings documented in degrees of flexion, extension, left/right rotation and left/right lateral flexion. This was done separately for the control and experimental groups.
2. The data then underwent statistical analysis.

3.4.2 Statistical Analysis of the Data

3.4.2.1 Non-Parametric Paired Hypothesis Tests

The Subjective Data

Using the **Wilcoxen Signed Rank Test**, which is a test to analyse the data within each group, the subjective results were obtained for each of the questionnaires for both treatment groups. The percentages compared were selected from :

1. the initial consultation (IC) and the final cosultation (FC);
2. the intial consultation (IC) and the fourth consultation (4C);
3. the fourth consultation (4C) and the final consultation (FC).

C-Group	E-Group
IC <-> FC	IC <--> FC
IC <-->4C	IC <--> 4C
4C <-->FC	4C <-->FC

The comparison of the figures determined the level of significance.

The Objective Data

Utilizing the **Wilcoxen Signed Rank Test**, both the experimental and control cervical ranges of motion results were statictically analysed.

The degrees of motion for each plane of motion were compared as follows:

1. the initial consulatation (IC) and the final consulatation (FC);
2. the initial consulatation (IC) and the fourth consultation (4C); and
3. the fourth consulatation (4C) and the final consultation (FC).

The level of significance was determined by comparing the figures.

The Wilcoxen Signed Rank Test was selected following advice from the resident Technikon Natal statistician. This was because of its less restrictive assumptions and near equivalence in sensitivity to the parametric t-test (Siegel 1956: 312).

3.4.2.2 Non-Parametric Unpaired Hypothesis Tests

The Subjective Data

Utilizing the **Mann-Whitney U-Test** (a test to analyse the the data between the groups), the measurements , taken separately for each questionnaire, were compared using the median values of the control and experimental groups. The values compared were the following:

1. the initial consultations (IC) of the control and experimental groups;
2. the fourth consultations (4C) of the control and experimental groups; and
3. the final consultations (FC) of the control and experiment groups.

E-Group	C-Group
IC	<----------> IC
4C	<----------> 4C
FC	<----------> FC

The level of significance was determined by comparing these figures.

The Objective Data

Utilising the **Mann-Whitney U-Test** the median units of the cervical ranges of motion for the control and experimental groups were compared.

The values compared were the following:

1. the initial consulatations (IC) of the control and experimental groups;
2. the fourth consultations (4C) of the control and experimental groups;
3. the final consultations (FC) opf the control and experimental groups.

The level of significance was determined by comparing these figures.

The statistical analyses were all performed on the **Statgraphics Plus Version 6**, supplied by Manugistics Inc.

CHAPTER FOUR

CHAPTER FOUR

THE RESULTS

4.1 INTRODUCTION

This chapter covers the results obtained from the respective questionnaires and goniometric readings:

- NRS-101;
- McGill Pain Questionnaire;
- CMCC Neck Disability Questionnaire;
- Goniometer Measurements.

The results obtained from the statistical analyses are tabulated to display the Z value in addition to the exceedence probability value (p-value), which is compared to the level of significance set at 0.05 (5% level of significance) for all the tests.

The control and experimental intra-group data were analyzed, followed by analyses of the inter-group data in order to determine the efficacy of each treatment protocol. The null and alternative hypotheses were then either accepted or rejected depending upon the results.

All questionnaires were completed under the supervision of the researcher; the goniometric readings were measured by the researcher only and all treatments were conducted by the

researcher. The injections were administered by a qualified Homoeopath. If the data did not comply with the criteria at any stage during the study, the patient together with his/her results, was excluded from the study.

Of the 31 patients eligible for the study, only one was found to be non-compliant. The remaining 30 patients completed the treatment programme scheduled for the study.

4.2 THE ANALYZED DATA

Abbreviations

ns = no significant difference in the medians

s = significant difference in the medians

tx1 = first treatment

txF = final consultation

tx4 = fourth consultation

txF/u = follow up consultation

contr = control group

exp = experimental group

If P = < 0.05 = significant difference (5% level of significance)

If P = > 0.05 = no significant difference (5% level of significance)

4.3 TABULATION OF RESULTS

A. SUBPROBLEM ONE: Control group

The first subproblem was to determine the efficacy of the combination chiropractic treatment and placebo injections, in terms of subjective and objective clinical findings, in the treatment of symptomatic cervical spondylosis.

The hypotheses were as follows:

Ho: There would be no difference in the subjective and objective clinical findings on analysis of the intra-group data, indicating that the treatment was not effective.

Ha: There would be a difference in the subjective and objective clinical findings on analysis of the intra-group data, indicating that the treatment was in fact effective.

The subjective data were obtained from the use of the Numerical Pain Rating Scale-101, McGill Pain Questionnaire and the CMCC Neck Disability Index. The results of the statistical analyses are presented below:

Table 1. **A sample analysis of the Numerical Pain Rating Scale-101 comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.00328359	0.00194591	0.00194591	1.0
P value (sig)	0.00164(s)	0.0009729(s)	0.0009729(s)	0.5 (ns)

The null hypothesis was rejected for the control group, because at the 5% level of significance there was a statistically significant difference between the first, fourth, final and follow-up treatments, indicating that there was a an improvement as a result of the treatment.

Table 2. **A sample analysis of the McGill Pain Questionnaire comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0161569	0.00194591	0.00194591	0.00194591
P value (sig)	0.00807(s)	0.00097(s)	0.00097(s)	0.00097(s)

A statistically significant difference was found between the first, fourth, final and follow-up treatments at the 5% level of significance, therefore the null hypothesis was rejected for the control group. This indicates that the improvement was as a result of the treatment.

Table 3. **A sample analysis of the CMCC Disability Index comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0613685	0.00982331	0.00328359	0.00554577
P value (sig)	0.0306842(s)	0.00491(s)	0.0016417(s)	0.0027728(s)

At the 5% level of significance there was a statistically significant difference between the first, fourth, final and follow-up treatments, thus resulting in the rejection of the null hypothesis for the control group. Therefore there was an improvement as a result of the treatment.

Table 4. **A sample analysis of flexion comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	1.1094	1.6641	2.02073	0.316228
P Value	0.1336(ns)	0.04804046(s)	0.0216539(s)	0.375913(ns)

The null hypothesis was rejected for the control group because at the 5% level of significance there was a statistically significant difference between the first and final, and first and follow-up treatments, indicating that there was an improvement as a result of the treatment.

Table 5. **A sample analysis of extension comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.121335	0.0265001	0.422676	0.34278
P Value (sig)	0.0606675(ns)	0.01325(s)	0.211338(ns)	0.171139(ns)

The first and final treatments, at the 5% level of significance showed that there was a statistically significant difference in the control group, therefore the null hypothesis was rejected. This indicates that the improvement was due to the treatment.

Table 6. **A sample analysis of left lateral flexion comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	1	0.181449	0.267256	0.386474
P Value (sig)	0.5(ns)	0.0907245(ns)	0.133628(ns)	0.193239(ns)

No statistically significant difference was found at the 5% level of significance between the first , fourth, final and follow-up treatments, thus the null hypothesis was accepted for the control group. This indicates that there was no improvement as a result of the treatment.

Table 7. **A sample analysis of right lateral flexion comparing the first, fourth, final and follow-up treatments of the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0613685	0.0613685	0.422676	0.751826
P Value (sig)	0.0306842(s)	0.0306842(s)	0.211338(ns)	0.375913(ns)

The first and fourth, and first and final treatments exhibited a statistically significant difference at the 5% level of significance, therefore the null hypothesis was rejected for the control group. This indicates that the control group improved as a result of the treatment.

Table 8. **A sample analysis of left rotation comparing the first, fourth, final and follow-up treatments in the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0388669	0.0161569	0.422676	0.789264
P Value	0.0194334(s)	0.0080784(s)	0.211338(ns)	0.3946632(ns)

The null hypothesis was rejected for the control group as at the 5% level of significance there was a statistically significant difference between the first and fourth, and first and final treatments, indicating that there was an improvement as a result of the treatment.

Table 9. **A sample analysis of right rotation comparing the first, fourth, final and follow-up treatments in the control group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.386474	0.0161569	0.0054577	0.227799
P Value (sig)	0.933237(ns)	0.0080784(s)	0.0027728(s)	0.1138995(ns)

The null hypothesis was rejected for the control group because a statistically significant difference at the 5% level of significance between the first and final treatments occurred. This indicates that the control group improved as a result of the treatment.

B. SUBPROBLEM TWO: Experimental Group

The second subproblem was to determine the efficacy of the combination of chiropractic treatment and an Anthroposophical preparation (**Disci comp. cum Stanno**), in terms of subjective and objective clinical findings, in the treatment of symptomatic cervical spondylosis.

The hypotheses were as follows:

Ho: There would be no difference in the objective and subjective clinical findings on analysis of the intra-group data, indicating that the treatment was not effective.

Ha: There would be a difference in the subjective and objective clinical findings on analysis of the intra-group data, indicating that the treatment was effective.

Table 10. **A sample analysis of the Numerical Pain Rating Scale-101 comparing the first, fourth, final and follow-up treatments in the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z Value	0.00554577	0.00982331	0.00982331	0.504983
P Value (sig)	0.0027728(s)	0.0049116(s)	0.0049116(s)	0.254915(ns)

At the 5% level of significance there was a statistically significant difference between the first and fourth, first and final, and first and follow-up treatments, therefore the null hypothesis was rejected for the experimental group. Therefore the improvement was as a result of the treatment.

Table 11. **A sample analysis of the McGill Pain Questionnaire comparing the first, fourth, final and follow-up treatments in the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.000300669	0.00328359	0.00194591	0.0455
P Value (sig)	0.0001503(s)	0.0016417(s)	0.0009729(s)	0.02279(s)

The null hypothesis was rejected for the experimental group because at the 5% level of significance there was a statistically significant difference between the first and fourth, first and final, first and follow-up, and final and follow-up treatments, indicating that the there was an improvement as a result of the treatment.

Table 12. **A sample analysis of the CMCC Neck Disability Index comparing the first, fourth, final and follow-up treatments in the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.121335	0.00194591	0.00194591	0.0158613
P Value (sig)	0.060675(ns)	0.0009729(s)	0.0009729(s)	0.0793065(ns)

The experimental group exhibited a statistically significant difference at the 5% level of significance between the first and final, and first and follow-up treatments; the null hypothesis was therefore rejected, indicating that there was an improvement as a result of the treatment..

Table 13. **A sample analysis of forward flexion comparing the first, fourth, final and follow-up treatments of the experimental groups:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.57097	0.148914	0.0613685	0.772826
P Value (sig)	0.2895485(ns)	0.074457(ns)	0.0306842(s)	0.386428(ns)

The null hypothesis was rejected for the experimental group because at the 5% level of significance there was a statistically significant difference between the first and follow-up treatments, indicating that there was an improvement as a result of the treatment.

Table 14. **A sample analysis of extension comparing first, fourth, final and follow-up treatments of the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.789264	0.789264	0.605574	1
P Value	0.394632(ns)	0.394642(ns)	0.302787(ns)	0.5(ns)

The null hypothesis was accepted for the experimental group because at the 5% level of significance there was no statistically significant difference between the first, fourth, final and follow-up treatments, indicating that there was no improvement as a result of the treatment.

Table 15. **A sample analysis of left lateral flexion of the first, fourth, final and follow-up treatments of the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0704401	0.0388669	0.096092	0.772826
P Value	0.03522(s)	0.0194334(s)	0.048046(s)	0.386413(ns)

The the null hypothesis was rejected for the experiment group because at the 5% level of significance there a statistically significant difference was found. Thus indicating that there was an improvement as a result of the treatment.

Table 16. **A sample of right lateral flexion of the first, fourth, final and follow-up treatments of the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.0265001	0.0613685	0.0161569	0.504983
P Value	0.01325(s)	0.0306842(s)	0.0080784(s)	0.252915(ns)

The null hypothesis was rejected for the experimental group, because at the 5% level of significance there was a statistically significant difference between the first and fourth, first and final, and first and follow-up treatments, indicating that there was an improvement as a result of the treatment.

Table 17. **A sample analysis of left rotation of the first, fourth, final and follow-up treatments of the experimental group:**

	tx1 - tx4	tx1 - txF	tx1 - txF/u	txF - txF/u
Z value	0.789264	0.121335	0.0433079	0.751826
P Value	0.394632(ns)	0.0606675(ns)	0.0216539(s)	0.375913(ns)

A statistically significant difference was found between the first and follow-up treatments at the 5% level of significance. Thus rejecting the null hypothesis for the experiment group was rejected. This indicates that the experimental group improved as a result of the treatment.

Table 18. **A sample analysis of right rotation comparing the first, fourth, final and follow-up treatments of the experimental group:**

	tx1 - tx4	tx1 -txF	tx1 - txF/u	txF - txF/u
Z value	0.0433079	0.0433079	0.070441	0.789264
P Value	0.0216539(s)	0.0216539(s)	0.03522(s)	0.394632(ns)

The null hypothesis was rejected for the experimental group because at the 5% level of significance there was a statistically significant difference between the first and fourth, first and final, and first and follow-up treatments, indicating an improvement as a result of the treatment.

C. SUBPROBLEM THREE: Control and Experimental Groups

Inter Group Analysis : Unpaired T- Test

The third subproblem was to ascertain which of the two treatment methods was more effective in the treatment of symptomatic cervical spondylosis with reference to subjective and objective data. The hypotheses, comparing the control group to the experimental group, were as follows:

Ho: There would be no difference in the subjective and objective clinical findings on analysis of the inter-group data, indicating that the treatments were equally effective.

Ha: There would be a contrast in the subjective and objective clinical findings on analysis of the inter-group data, indicating that the treatments were not equally effective.

Table 19. **A sample analysis of the Numerical Pain Rating Scale-101 comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.5744442	0.572676	0.949623	0.587146
P Value (sig)	0.287221(ns)	0.286338(ns)	0.4748115(ns)	0.293573(ns)

The null hypothesis was accepted on comparing the control and experimental groups which indicates that at the 5 % level of significance there was no statistically significant difference between the first, fourth, final and follow-up treatments, indicating that neither of the groups improved significantly more than the other.

Table 20. **A sample analysis of the McGill Pain Questionnaire comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.318966	0.559825	0.75254	0.404415
P Value (sig)	0.159483(ns)	0.2799125(ns)	0.37627(ns)	0.2022075(ns)

The null hypothesis was accepted for the control and experimental groups at the 5% level of significance as no statistically significant difference was found between the first, fourth, final and follow-up treatments, indicating that neither of the groups improved significantly more than the other.

Table 21. **A sample analysis of the CMCC Neck Disability Index comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.787065	0.18196	0.379834	0.471717
P Value (sig)	0.3935325(ns)	0.09098(ns)	0.189917(ns)	0.2358585(ns)

Neither the control nor the experimental group, at the 5% level of significance, showed a statistically significant difference between the first, fourth, final and follow-up treatments, hence the null hypothesis was accepted and this indicates that neither of the groups improved significantly more than the other.

Table 22. **A sample of forward flexion comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.240024	0.440166	0.166952	0.317559
P Value (sig)	0.120012(ns)	0.220088(ns)	0.083476(ns)	0.1587795(ns)

The null hypothesis was accepted for the control and experimental groups because at the 5% level of significance there was no statistically significant difference between the first, fourth, final and follow-up treatments, indicating that neither of the groups improved significantly more than the other.

Table 23. **A sample analysis of extension comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.900603	0.900291	0.602626	0.754352
P Value (sig)	0.4503015(ns)	0.4501455(ns)	0.301313(ns)	0.377176(ns)

No statistically significant difference, at the 5% level of significance, was found between the first, fourth, final and follow-up treatments. Therefore the null hypothesis was accepted for the control and experimental group comparison. Neither group improved significantly more profoundly than the other.

Table 24. **A sample analysis of left lateral flexion comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.574013	0.502118	0.571501	0.768601
P Value (sig)	0.2870065(ns)	0.251059(ns)	0.2857505(ns)	0.3843005(ns)

The null hypothesis was accepted for the control and experimental groups which means that at the 5% level of significance there was no statistically significant difference between the first, fourth, final and follow-up treatments, indicating that neither of the groups improved significantly more than the other.

Table 25. **A sample analysis of right lateral flexion comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.8.2726	0.966742	0.949938	0.601646
P Value (sig)	0.401363(ns)	0.483371(ns)	0.473371(ns)	0.300823(ns)

At the 5% level of significance there was no statistically significant difference between the fourth and final treatments, thus the null hypothesis was accepted for the control and experimental groups. This shows that neither of the groups improved significantly more than the other.

Table 26. **A sample analysis of left rotation comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.270089	0.296729	0.0732376	0.16319
P Value	0.1435044(ns)	0.1483645(ns)	0.036645(s)	0.081585(ns)

The null hypothesis was rejected for the control and experimental groups because at the 5% level of significance there was a statistically significant difference between the final treatments, indicating that the experimental group improved significantly more than the control group.

Table 27. **A sample analysis of right rotation comparing the first, fourth, final and follow-up treatments of the control and experimental groups:**

	txC1 - txE1	txC4 - txE4	txCF - txEF	txCF/u - txEF/u
Z value	0.530516	0.900168	0.785517	0.933391
P Value (sig)	0.265258(ns)	0.450084(ns)	0.3427585(ns)	0.4666955(ns)

The null hypothesis was accepted for the control and experimental groups which means that no statistically significant difference, at the 5% level of significance, was found between the first, fourth, final and follow-up treatments. This indicates that neither of the groups improved significantly more than the other as a result of the treatment.

4.4 DEMOGRAPHIC DATA OBTAINED FROM THE PATIENTS' FILES

Table 28. Patient Age Group Range

RANGE	40-49	50-59	60-69	70-79
No. Of Patients	9	6	10	5

Table 29. Division of Patient Gender

MALE	FEMALE
8	22

Table 30. Division of Patient Race

EUROPEAN	INDIAN	COLOURED
21	7	2

Table 31. Demographic Data related to the Chiropractic and Placebo Group. (n=15)

Control Patients	Age	Sex	Chronicity	Trauma	Neck Only	Neck, Head-ache	Neck shou-ler	Arm Pain
1	47	F	5 years	N	*			
2	38	F	15 years	Y - MVA		*	*	
3	58	F	2 years	N			*	*
4	66	M	6 months	Y - Fall			*	*
5	71	M	5 years	Y - MVA			*	
6	54	F	10 years	Y - MVA			*	
7	49	F	8 years	Y - MVA	*			
8	52	F	5 years	N		*		
9	53	F	5 years	Y - MVA	*	*		
10	49	F	8 years	Y - MVA		*		
11	70	M	6 months	Y - MVA	*			
12	69	F	9 months	N		*	*	
13	64	F	20 years	N		*	*	*
14	43	F	5 years	Y - MVA			*	*
15	70	M	3 years	Y -MVA			*	*
Total	**Mean**	**M:F**	**Mean Chronicity**	**Y:N**	**Total**	**Total**	**Total**	**Total**
15	57	4:11	6.18 years	10:5	4	6	9	5

Table 32. Demographic Data related to the Chiropractic and Disci Remedy Group. (n=15)

Exp Patients	Age	Sex	Chronicity	Trauma	Neck Only	Neck, headache	Neck, shou-lder	Arm Pain
1	67	F	10 years	Y - MVA		*	*	
2	46	F	5 Years	Y - MVA			*	
3	65	F	8 Months	N	*			
4	45	F	6 Months	N			*	
5	44	F	1 Year	N	*			
6	43	F	2 Years	Y - MVA		*		
7	73	M	5 Years	N			*	
8	63	F	2 Years	Y - MVA		*		
9	64	F	6 Months	N		*	*	*
10	60	F	6 Years	Y - MVA			*	
11	68	F	10 Years	N		*		
12	56	M	6 Months	Y - MVA			*	*
13	77	M	20 Years	N			*	*
14	69	F	30 Years	N		*	*	
15	60	M	4 Years	N		*		
Total	**Mean**	**M:F**	**Mean Chronicity**	**Y:N**	**Total**	**Total**	**Total**	**Total**
15	60	4:11	6.5 Years	6:9	2	7	9	3

4.4.2 SUBJECTIVE DATA

Table 33. **The average subjective results as perceived by the patients:**

	CONTROL	EXPERIMENTAL
Numerical Pain Rating Scale	25.82 %	24.92 %
CMCC Neck Disability Index	13.45 %	13.26 %
McGill Short Form Questionnaire	11.02 %	12.42 %

4.4.3 OBJECTIVE DATA

Table 34. **The average range of motion readings taken in each plane for each treatment:**

	txC1	txC4	txCF	txCF/u	txE1	txE4	txEF	txEF/u
Flexion	44.93'	49.07'	50.01'	50.27'	48.8'	51.0'	53.2'	53.6'
Exten.	63.2'	66.0'	70.27'	68.27'	63.07'	65.4'	69.07'	69.6'
Lft.lat. flex	33.17'	38.8'	41.08'	41.2'	36.3'	41.47'	43.87'	41.87'
Rht.latflex	32.47'	36.4'	39.6'	38.69'	34.67'	38.0'	39.6'	41.13'
Left rot.	56.53'	62.53'	62.27'	61.33'	60.93'	65.2'	67.33'	66.8'
Right rot.	59.47'	62.0'	65.6'	64.13'	58.27'	63.47'	64.8'	66.0'

Table 35. **The average range of motion for all the planes of movement.**

	CONTROL	EXPERIMENT
Flexion	48.57'	51.65'
Extension	66.94'	66.79'
Left Lat. Flex	38.76'	40.88'
Rht. Lat. Flex	36.79'	38.35'
Left Rotation	60.67'	65.07'
Right Rotation	62.8'	63.14'

4.5 CONCLUSION

All the statistical data have been presented in tabular form. It can be clearly noted that both treatment groups showed a significant improvement; however, neither treatment was found to be superior to the other. This will be discussed in more detail in chapter 5.

Figure 1 **The Subjective Data comparing the Control and Experimental Groups**

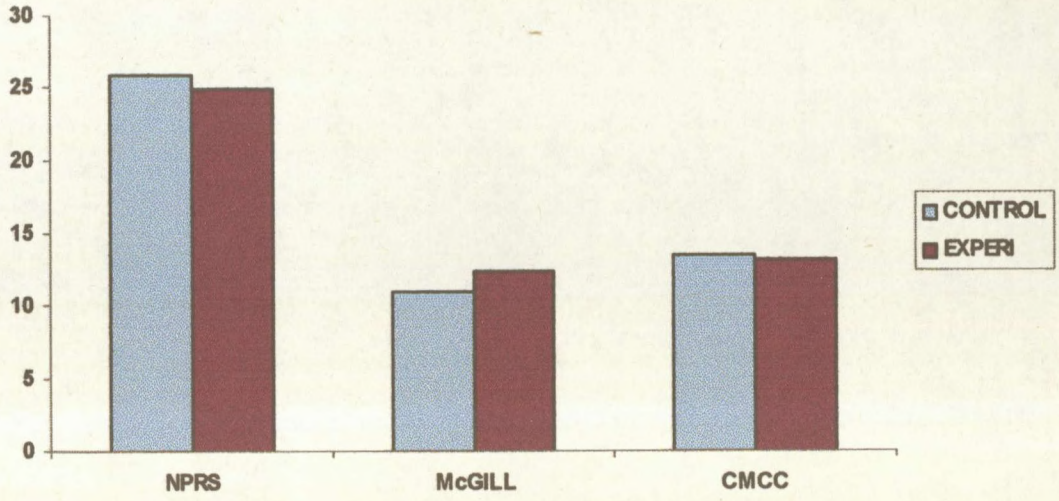
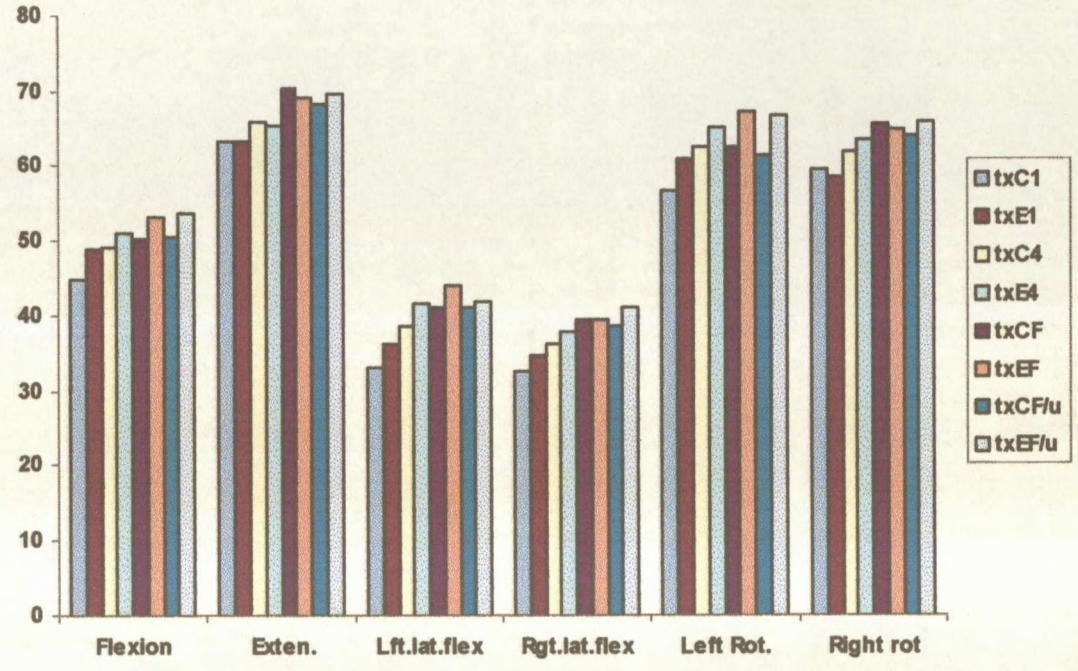


Figure 1 **The Inter-treatment Objective Data Comparison of the Control and Experiment Groups**



CHAPTER

FIVE

CHAPTER FIVE

DISCUSSION

5.1 INTRODUCTION

The following chapter provides a detailed description of the analysed data obtained during the course of the study, and the statistical relevance of these data is discussed.

5. 2 SUBJECTIVE DATA

A. The Numerical Pain Rating Scale-101

(i) Intra-treatment Comparison

The paired analysis of the mean measurements of the Numerical Pain Rating Scale-101 showed that there was a significant improvement in both the control and experimental groups, with reference to the reduction in patients' pain intensity (*Table 1* and *Table 10*).

(ii) Inter-treatment Comparison

The inter-treatment analysis showed that there was no significant difference between the groups (*Table 19*). In the case of the average perceived pain (*Table 33*) there was a 0.9 % difference between the groups; this level was below the level of significance used in this study

B. The McGill Short-Form Pain Questionnaire

(I) Intra-treatment Comparison

A statistical significance was shown in both the control and the experimental groups indicating a significant decrease in the patients'pain perception (*Table 2* and *Table 11*).

(ii) Inter-treatment Comparison

When the two groups were compared statistically (*Table 20*), it was found that there was no statistically significant difference between the two. It was therefore concluded that neither of the treatment groups improved more than the other. The average pain perception (*Table 33*) was also compared (11.02%: control, and 12.42%: experimental), again indicating a similar improvement in both groups.

C. The CMCC Neck Disability Index Questionnaire

(I) Intra-treatment Comparison

Using the data obtained from the CMCC neck disability questionnaire, it was found in both the control and experimental groups, there was a significant reduction in patient disability (*Table 3* and *Table 12*).

(ii) Inter-treatment Comparison

When the median results were compared between the groups (*Table 21*), it was found that there was no statistically significant difference between them. This indicates that there was an equal reduction in disability across both groups.

The average perceived disability (*Table 33*) of the control and experimental groups (13.45% and 13.26% respectively) indicated that the two groups improved at the same rate with regard to neck disability.

5.3 OBJECTIVE DATA

5.3.1 Cervical Range of Motion

(I) Intra-treatment Comparison

All six ranges of motion were measured at the specified consultations. With the exception of left lateral flexion there was a significant improvement in all other ranges of motion for the control group (*Tables 4-9*).

The experimental group showed similar results, with improvements in all planes apart from extension (*Tables 13-18*). Thus both groups proved to have a notable increase in ranges of motion.

(ii) Inter-treatment Comparison

Right rotation was the only range of motion that showed a statistically significant difference between the two groups. This difference was recorded only at the final treatments (*Table 27*). The comparison at the follow-up treatments indicated that the ranges of rotation had become similar.

All other analyzed median measurements showed that there were no significant differences. This indicates that both the control and experimental treatment methods had a beneficial influence with regard to the cervical ranges of motion and they were effective over the same treatment period.

The average cervical ranges of motion for the control and experimental groups (*Table 35*) showed similar results to the above.

5.3.2 Subjective and Objective Measuring Parameter Difficulties

When gathering the subjective data, difficulties were encountered due to the differences in perceived pain and the description thereof. These difficulties appeared to occur along cultural lines particularly where the McGill Pain Questionnaire was concerned.

Difficulty was experienced with the calibration of the goniometer. Its two-degree scale caused some difficulty in measuring small variations in the cervical range of motion measurements.

5.4 GENERAL DISCUSSION OF BOTH THE SUBJECTIVE AND OBJECTIVE DATA

Although both the control and experimental groups improved significantly with their respective treatments, there was no evidence that one treatment method was better than the other. Therefore the first hypothesis, which states that the efficacy of both treatments would similar, was accepted. The second hypothesis, stating that the combination of the chiropractic and Anthroposophical remedy would be more effective than just the chiropractic manipulation, was rejected.

The findings of this study could not be compared to those of other studies, as at the time no other studies involving these two treatment protocols could be located. However, unsubstantiated evidence of the efficacy of the **Disci** remedy as prescribed by medical doctors and homoeopaths who make use of it could be traced (Wala literature 1990). These practitioners found that **Disci** comp. cum Stanno is effective over long treatment periods. They have not, however, documented their findings or conducted any known research to confirm this.

With regard to the chiropractic treatment, several studies have reported improvement with the use of spinal manipulation. The study by Sloop et al. (1982: 532-535), also a double-blind study treating patients suffering from symptomatic cervical spondylosis, involved patients being treated with a dose of diazepam prior to the adjustment (experimental group

(21)) and the other group given just diazepam and no adjustment. The results from the mean visual analogue scales and patients' opinions showed no significant differences between the two groups. It was concluded that the value of a single cervical manipulation was not achieved and it was recommended that further investigations be carried out.

Howe et al. (1983: 574-579), in a randomized clinical trial of cervical spine manipulation on 52 subjects, found that manipulation produced a significant immediate improvement in symptoms in those with neck pain or stiffness and shoulder pain/paraesthesias. A significant improvement in rotation (maintained for three weeks) and lateral flexion was obtained as a result of manipulation.

Koes et al. (1993: 211-219) studied the efficacy of manual therapy (manipulation and mobilization) and physiotherapy in patients with chronic neck pain. It was found that both the patients above and below 40 years of age presenting with neck pain for one year or over (chronic) indicated that manual therapy had improved the main complaint significantly.

The following authors indicate manipulation in the treatment of symptomatic cervical spondylosis: Rowe (1972: 1352) reports that manipulation is effective in the treatment of cervical spondylosis particularly where other alternative treatments have failed. Mathews (1972: 107), Cyriax (1971: 92) and Bland (1994: 288) all endorse manipulation for the management of symptomatic cervical spondylosis.

Maigne (1972: 206-207) suggests manipulation as the treatment of choice for cervical spondylosis. Wiles and Sweetnam (1965: 325) note that a large percentage of patients with cervical spondylosis, presenting with neck and upper limb symptoms respond well to cervical manipulation.

5.5 CONCLUSION

From the statistical analyses of data gathered for this study, it was concluded there was no discernable benefit from the combination of the two treatment protocols. However, both groups showed a significant improvement with regard to pain reduction, decrease in disability and cervical ranges of motion. It was therefore concluded, in terms of the aim of this study both treatments were equally effective.

CHAPTER

SIX

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

The results of the study showed that there was a significant improvement in the two groups over the treatment period; however, neither group improved more favourably than the other. This resulted in the acceptance of the first and second hypotheses, and in the rejection of the third hypothesis.

On the basis of the information gained in this study, it was not possible to conclude which of the two treatment protocols, Chiropractic adjusting alone or the combination of Chiropractic and an Anthroposophical remedy (Disci comp. Cum Stanno), would be the most effective treatment for the management of symptomatic cervical spondylosis.

Although a fairly standard time period for the Chiropractic management of chronic neck pain was allowed, the length of the study may not have have been an adequate for the Disci remedy to have been effective. There is general consensus amongst both the Homoeopathic and Medical practitioners who make use of this remedy, that **Disci comp. cum Stanno** should be used over long periods of time, i.e. in excess of three months. However, no scientific literature could be traced to support this treatment period prescription. It is therefore recommended that future studies be conducted over a longer period of time to test this supposition.

During the study it was found that administering the remedy by injection was painful. It is therefore suggested that future studies make use of the remedy in pilule or cream form.

Future studies are advised to take note of the ages of the patients to be treated. In this study half (15) of the patients participating were between the ages of sixty and seventy-nine. This may have played an important role in the results obtained as elderly patients may have started to undergo late spondylotic changes. It is recommended that further studies concentrate on the age bracket of forty to sixty to eliminate this variable from the study.

Future studies would benefit from a larger sample size to improve the statistical relevance of the study.

To conclude, this study has shown that the combination of the **Disci** remedy and Chiropractic treatment is as beneficial in the treatment of symptomatic cervical spondylosis as chiropractic treatment alone.

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APPENDICES

APPENDIX A

TECHNIKON NATAL CHIROPRACTIC DAY CLINIC

CASE HISTORY

Patient: _____ Date: ____

File No: ___ X-ray No: __

Age: ___ Sex: __ Occupation: _____

Intern: _____ Signature: _____

FOR CLINICIANS USE ONLY

Initial visit Clinician: Signature:

Case History:

Examination:

Previous: TN Current: TN

Other Other

X-ray Studies:

Previous: TN Current: TN

Other Other

Clinical Path. Lab:

Previous: TN Current: TN

Other Other

Case status:

PTT: Conditional: Signed Off: Final sign out:

Recommendations:

Intern's Case History

1. Source of the history:

2. Chief complaint: (patient's own words):

3. Present illness:

   Location:

   Onset:

   Duration:

   Frequency:

   Pain (character):

   Progression:

   Aggrevating factors:

   Relieving factors:

   Associated S & S:

   Previous occurrences:

   Past treatment and outcome:

4. Other complaints:

5. Past history:

   General health status

   Childhood illnesses

Adult illnesses

Psychiatric illnesses

Accidents/injuries

Surgery

Hospitalizations

6. Current health status and life-style:

Allergies

Immunizations

Screening tests

Environmental hazards (home, school work)

Safety measures (seat belts, condoms)

Exercise and leisure

Sleep patterns

Diet

Current medication

Tabacco

Alcohol

Social drugs

7. Family history:

Immediate family:

Age	Health
Cause of death	
DM	Heart disease
TB	HBP

Stroke	Kidney disease
CA	Arthritis
Anaemia	Headaches
Thyroid disease	Epilepsy
Mental illness	Alcoholism
Drug addiction	Other

8. Psychosocial history:

Home situation
Daily Life
Important experiences
Religious beliefs

9. Review of the systems:

General	Skin
Head	Eyes
Ears	Nose/sinuses
Mouth/throat	Neck
Breasts	Respiratory
Cardiac	G-I
Urinary	Genital
Vascular	Musculoskeletal
Neurologic	Haematologic
Endocrine	Psychiatric

APPENDIX B

TECHNIKON NATAL CHIROPRACTIC DAY CLINIC

PHYSICAL EXAMINATION

Patient: _____ File: __

Clinician: _____ Signature: __

Intern: _____ Signature: __

Date: _____

Height: ____ Weight: ___ Temp: ___

Rates: Heart: __ Pulse: ____ Resp: ___

Blood pressure: Arms: L / R /

General Appearance:

STANDING EXAMINATION

Minor's sign
Skin changes
Posture erect Adam's

Ranges of motion

Flex.

L.Rot. R.Rot.

L.lat flex. R.lat flex.

Ext.

Romberg's Sign.
Pronator drift.
Trendelenburg's sign.

Gait.

- Rhythm
- Balance
- Pendulousness
- On toes
- On heels
- Tandem

Half squat.
Scapular winging.
Muscle tone.
Spasticity/Rigidity.

Shoulder: Skin Symmetry
ROM
- Glenohumeral
- Scpulo-thoracic
- acromioclavicular
- elbow
- wrist

Chest measurement: Inspiration Expiration
Visual acuity.

Breast examination:

Inspection:	skin	size	
	contour	nipples	
	arms o/head	hands on hips	
	leaning forward		
Palpation:	axillary lymph nodes		

SEATED EXAMINATION

Spinal posture

Head:	scalp	skull		
	face	skin		
Eyes:	conjunctiva	sclera		
		eyebrows	eyelids	
		lacrimal gland	nasolacrimal duct	
		alignment	corneal reflex	
		ocular reflex		
		ocular m/ment	L	R

III IV VI III IV VI

visual fields — acccomodation
iris — pupils
red reflex — optic disc
vessels — general background
macula — vitroeus
lens

Ears: auricle — ear canal
drum — auditary acuity
Weber test — Rinne test

Nose: external
internal - septum
turbinates
olfaction
sinuses (frontal and maxillary)
- tenderness
- transillumination

Mouth and pharynx:
lips — buccal mucosa
gums and teeth — roof
tongue — pharynx

Neck: posture — size
swelling — scars
discolouration — hair line
ROM — Flex.
L.Rot — R.Rot
L.LFlex. — RLFlex.
Ext.

lymph nodes — trachea
thyroid — carotid arteries

CN V
CN VIII
CN VIII (nystagmus)
CN IX
CN X
CN XI

TMJ: deviation ROM
crepitus tenderness

Neurological:

Dermatomes

C5 C6 C7 C8 T1

Myotomes

C5 C6 C7 C8 T1

Tendon Reflexes

biceps
triceps
brachioradialis

Thorax:

Chest:

inspection -
skin shape
resp. distress resp. depth
resp. rhythm resp. effort

palpation -
tenderness masses
respiratory expansion
tactile fremitus

percussion -
lungs diagphragmatic excursion
kidney punch

auscultation -
breath sounds vesicular bronchial
adventitious sounds crackles wheezes
voice sounds broncophony egophony

CVS:

auscultation (aortic murmurs)
Allen's test

SUPINE EXAMINATION

JVP
heart auscultation
resp. excursion
percussion of chest
breast palpation

Abdomen:

Inspection:	skin	umbilicus	
		contour	peristalsis
		pulsations	hernias
Auscultation:	bowel sounds	bruit	
Percussion:	general	liver	
		spleen	
Palpation:	sup. reflexes	cough	
		light	deep
		rebound t/nes	liver
		spleen	kidneys
		aorta	

Male genitals and hernias:

Inspection:	skin		prepuce
		glans	meatus
		nits/lice	scrotum
		inguinal/femoral bulges	
Palpation:	penis	testes	
		epididymis	inguinal canal
		femoral canal	cremasteric reflex
Auscultation:	scrotal mass		

Peripheral vasculature:

Inspection:	skin	nail beds
	pigmentation	hair loss
Palpation:		
	Pulses - radial, brachial, popliteal, post.tibial, dorsalis pedis	
	LN - epitrochlear, femoral	
	temperature of feet and legs	
	Manual compression test	
	Retrograde filling test	
	Arterial insufficiency test	

Musculoskeletal:

ROM:	hip

knee
ankle

Neurological:

dermatomes: L1 L2 L3 L4 L5 S1
myotomes: hip flexion knee extension
ankle dorsiflexion
plantar flexion

tendon reflexes:

patella Achilles
plantar reflex

Rectal examination:

Inspection: sacrococcygeal and perianal areas
Palpation: sphincter tone tenderness
Induration nodules
prostate
seminal vesicles

Mental status:

Appearance and behaviour:

level of consciousness
posture and motor behaviour
dress, grooming, personal hygiene
facial expression
affect

Speech and language:

quantity rate volume
fluency aphasia

Mood

Thought processes (logical, relevant, organised

Memory and attention:

Orientation (time, place, person)
remote memory remote memory
new learning ability

Higher cognitive functions:

information and vocab (general & specialised knowledge)
abstract thinking

APPENDIX C

TECHNIKON NATAL CHIROPRACTIC CAY CLINIC.

CERVICAL SPINE REGIONAL EXAMINATION.

PATIENT: _____

FILE: __ DATE: __

INTERN/RESIDENT: _____

SUPERVISING CLINICIAN: _____

OBSERVATION:

Posture
Swellings
Scars
Discoloration
Hair line
Bony and soft tissue contours

Shoulder position:
Left-
right-
Muscle spasm
Facial expression

RANGE OF MOTION:

Flex.

L.Rot. R.Rot.

L.Lat.flex. R.Lat.flex.

Ext.

PALPATION: lymph nodes
trachea
thyroid gland

ORTHPAEDIC EXAMINATION:

Tenderness
Active myofacial points:

SCM
Scalenii
Post. cevical mm.

Trapezius
Levator scapulae

Doorbell sign
Kemp's Test

Cevical Compression
Lateral Compression

Cervical distraction
Halstead's test
Hyperabduction Test
Shoulder abduction Test
Dizziness rotation Test
Brachial Plexus Tension

Adson's Test
Costoclavicular Test
Eden's Test
Shoulder depression Test
Lhermitte's Sign
O'Donoghue Manoeuvre

Remarks: _____

NEUROLOGICAL EXAMINATION:

Dermatomes:	C2	C3	C4	C5	C6	C7	C8	T1
Myotomes:	C1	C2	C3	C4	C5	C6	C7	C8	T1
Reflexes:	C5	C6	C7					

VASCULAR EXAMINATION:	LEFT	RIGHT
BLOOD PRESSURE	___	___
CAROTIDS	___	___
SUBCLAVIAN ARTERIES	___	___
WALLENBERG'S TEST	___	___

MOTION PALPATION:

C0 _____
C1 _____
C2 _____
C3 _____
C4 _____
C5 _____
C6 _____
C7 _____
C8 _____
T1 _____
T2 _____
T3 _____
T4 _____

APPENDIX E

MEASUREMENT OF PAIN

SHORT-FORM McGILL PAIN QUESTIONNAIRE

Ronald Melzack

PATIENTS NAME:_____ DATE:_____

	NONE	MILD	MODERATE	SEVERE
THROBBING	0)____	1)____	2)____	3)____
SHOOTING	0)____	1)____	2)____	3)____
STABBING	0)____	1)____	2)____	3)____
SHARP	0)____	1)____	2)____	3)____
CRAMPING	0)____	1)____	2)____	3)____
GNAWING	0)____	1)____	2)____	3)____
HOT-BURNING	0)____	1)____	2)____	3)____
ACHING	0)____	1)____	2)____	3)____
HEAVY	0)____	1)____	2)____	3)____
TENDER	0)____	1)____	2)____	3)____
SPLITTING	0)____	1)____	2)____	3)____
TIRING-EXHAUSTING	0)____	1)____	2)____	3)____
SICKENING	0)____	1)____	2)____	3)____
FEARFUL	0)____	1)____	2)____	3)____
PUNISHING-CRUEL	0)____	1)____	2)____	3)____

APPENDIX F

NUMERICAL PAIN RATING SCALE-101 QUESTIONNAIRE

PATIENT NAME: _____ DATE: _____

Please indicate on the line below, the number between 0 and 100 that best describes the pain you experience **when it is at its worst**. A zero (0) would indicate "no pain at all", and one hundred (100) would mean "pain as bad as it could be". Please write only the number.

_____

Please indicate on the line below, the number between 0 and 100 that best describes the pain you experience **when it is at its least**. A zero (0) would mean "no pain at all", and one hundred (100) would mean "pain as bad as it could be". Please write only one number.

_____

APPENDIX G

RANGE OF MOTION RESULT SHEET

	First	Fifth	Final	Follow-up
Flexion				
Extension				
Left Rotation				
Right Rotation				
Left Lateral Flexion				
Right Lateral Flexion				

APPENDIX H

PATIENT INFORMED CONSENT FORM

I the undersigned, ..., have been explained the nature of this research project involving the treatment of neck pain and therefore give my informed consent to be examined, treated and / X-rayed at the Technikon Natal Chiropractic Day Clinic. I agree to comply with the instructions as stipulated by the intern in order for the successful completion of this research project.

Signature: ..... **Date:** .....