A retrospective cross sectional survey of extremity cases on record at the Durban University of Technology Chiropractic Day Clinic (1995-2005)

by

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I, Surasha Kandhai, do hereby declare that this dissertation represents my own work in both conception and execution, except where specific assistance is sought and duly acknowledged.

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DEDICATION

This study is dedicated to my dad, Nagasar Kandhai (1942-1992) and my mum, Bhugwanthi Kandhai. Their hard work and sacrifices to provide me with the life that I have today can never be measured.

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ABSTRACT

The increasing contribution of chiropractors in health care has generated greater interest in understanding the characteristics of chiropractic practice patterns and treatments (Mootz *et al*., 2005). However, despite the rapid growth and extensive use of chiropractic, good descriptive data on chiropractors and their patients remains limited (Coulter and Shekelle, 2005). Even fewer studies have been reported which deal specifically with patients attending chiropractic-teaching clinics (Nyiendo and Olsen, 1988).

According to Nyiendo and Haldeman (1986), there remains a paucity of empirical data regarding the type of patients seeking care at a chiropractic-teaching clinic and the types of treatments provided at these clinics. According to Till and Till (2000), South Africa is largely a developing country with scattered developed communities. Its requirements and opportunities as they relate to chiropractic may differ significantly from those in other developed countries. It was also estimated that in South Africa only a fraction of the country's population have any notion of what chiropractic is, thus the largest challenge lies with educating the public about chiropractic (http://www.chiroweb.com, 2005).

The lack of attention given to the chiropractic management of extremity conditions has contributed to a perception that chiropractic is unable to manage extremity conditions proficiently (Hoskins *et al*., 2006). There is a noted lack of research on the management of extremity conditions within chiropractic (Hoskins *et al*., 2006); therefore the current study focused on all components of the extremity system.

Project Design:

This study was designed in the form of a retrospective, cross-sectional, non-experimental, clinical survey.

Objectives:

The purpose of this research is to conduct a descriptive study of extremity cases on record at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005 and the objectives are as follows:

- To determine the prevalence of extremity complaints over the past decade at the Durban University of Technology Chiropractic Day Clinic.
- To identify the demographics of patients that visited the Durban University of Technology Chiropractic Day Clinic.
- To identify the most common presenting region and complaints of the extremity system as well as the aetiology and associated signs and symptoms of these complaints at the Durban University of Technology Chiropractic Day Clinic.
- To identify the nature of the interventions and methods most commonly used in the management of patients at the initial consult and where possible contra-indications to any treatment modality.

Results:

- The overall prevalence of extremity complaints from 1995 to 2005 was 9.38%. A statistically significant increase in the prevalence of extremity complaints between the first five years and second five years was detected, from 8.83% to 11.04%. The lower extremity was more frequently affected than the upper extremity. The knee was the most frequently affected site, followed by the shoulder and the foot.
- Analysis of patient demographics revealed that the majority of patients that presented with extremity complaints was between 20-29 years of age with males outnumbering females.
- The most common reported presenting condition of the upper extremity was shoulder pain and for the lower extremity, knee pain. The most common diagnosis of the upper extremity was Myofasciitis whereas for the lower extremity Patellofemoral pain syndrome was most common.
- The most common treatment protocol used was electro modalities followed by soft tissue mobilisation. Thirteen contra-indications to

treatment were identified and of these, eight were to all treatments and three were to mobilisation and manipulation and two were unknown.

Conclusions:

The use of chiropractic for the treatment of spinal conditions has been well documented as compared to the management of extremity conditions. The findings of this study have shown that extremity conditions are common and can be managed with chiropractic care. Not many studies have been documented, which deal exclusively with patients attending chiropractic-teaching clinics, as a result this study attempted to provide an updated descriptive analysis of the extremity cases on record at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005. Furthermore, the information provided in this study could also offer insight into the usage of chiropractic and may be of interest to chiropractic leaders and education planners for professional development purposes and aid in the establishment of inter-professional relationships.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

According to Coulter and Shekelle (2005) in order to obtain a coherent, objective and contemporary account of chiropractic; patient demographics, patient use patterns and the health status of patients, are a few of the basic criteria required to provide adequate descriptive data about chiropractic practice patterns.

The increasing contribution of chiropractors in health care has generated greater interest in understanding the characteristics of chiropractic practice patterns and treatments (Mootz *et al*., 2005). However, despite the rapid growth and extensive use of chiropractic, good descriptive data on chiropractors and their patients remains limited (Coulter and Shekelle, 2005). Even fewer studies have been reported which deal specifically with patients attending chiropractic-teaching clinics (Nyiendo and Olsen, 1988).

According to Nyiendo and Haldeman (1986), there remains a paucity of empirical data regarding the type of patients seeking care at a chiropractic-teaching clinic and the types of treatments provided at these clinics. In South Africa there is a lack of such information. According to Till and Till (2000), South Africa is largely a developing country with scattered developed communities. Its requirements and opportunities as they relate to chiropractic may differ significantly from those in other developed countries. It was also estimated that in South Africa only a fraction of the country's population have any notion of what chiropractic is, thus the largest challenge lies with educating the public about chiropractic (www.chiroweb.com, 2005).

Studies carried out, demonstrate the widespread use of chiropractic for the treatment of spinal conditions (Sorensen *et al.,* 2006; Mootz *et al*., 2005; Hartvigsen *et al.*, 2003 and Hurwitz *et al*., 1998). Extremity conditions in these

studies made up an insignificant percentage of the number of conditions treated. The focus of chiropractic on the management of the spine has often resulted in the management of peripheral conditions seeming unimportant. The lack of attention given to the chiropractic management of extremity conditions has contributed to a perception that chiropractic is unable to manage extremity conditions proficiently (Hoskins *et al*., 2006). There is a noted lack of research on the management of extremity conditions within chiropractic (Hoskins *et al*., 2006) therefore this current study has focused on all components of the extremity system.

As there is scant information available on patients that present to chiropractic teaching clinics in South Africa, the patient database that was available at the Durban University of Technology Chiropractic Day Clinic was used, in order to document the progression of chiropractic at a teaching clinic. As a result, this study is an attempt to provide an updated descriptive analysis of the extremity cases on record at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005.

The current study took place at the Durban of University Technology Chiropractic Day Clinic. Data was obtained from patient files that were opened at the Durban University of Technology Chiropractic Day Clinic from the 13th January 1995 to 30th November 2005.

1.2 OBJECTIVES OF THIS STUDY

The purpose of this research is to conduct a descriptive study of extremity cases on record at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005 and the objectives are as follows:

- To determine the prevalence of extremity complaints over the past decade at the Durban University of Technology Chiropractic Day Clinic.
- To identify the demographics of patients that visited the Durban University of Technology Chiropractic Day Clinic.

- To identify the most common presenting region and complaints of the extremity system and to identify the aetiology and associated signs and symptoms of these complaints at the Durban University of Technology Chiropractic Day Clinic.
- To identify the nature of the interventions and methods most commonly used in the management of patients at the initial consult and where possible contra-indications to any treatment modality.

1.3 Hypotheses

1.3.1 Hypothesis 1

There shall be a shift in the demographics of patients presenting with extremity conditions to the D.U.T Chiropractic Day Clinic from 1995 to 2005.

1.3.2 Hypothesis 2

There shall be a lower prevalence of extremity complaints from 1995 to 1999 and a comparatively higher prevalence from 2000 to 2005.

1.4 STATISTICAL ANALYSIS

SPSS version 13 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. A two-tailed 0.05 level of significance was used. Prevalence and 95% confidence intervals (95%CI) per year, per 5 year period, and overall were calculated and compared using EpiCalc 2000 version 1.02 (Gilman and Myatt, 1998).

Descriptive statistics such as frequencies and percentages for categorical variables, and mean, standard deviation and range for quantitative variables were used to describe the sample in terms of demographics and other characteristics. Comparisons of these factors between the two successive five year periods were made using Pearson's chi square tests for categorical variables, and independent t-tests for quantitative variables (Esterhuizen, 2006).

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A teaching clinic is an outpatient clinic that provides health care for patients as opposed to inpatients treated in a hospital. Teaching clinics are often run by educational facilities. The teaching clinic provides an environment for students in the health care profession to learn and practice skills. These clinics are different from standard health clinics in that the treatment and management of patients is carried out by students under the supervision of licensed health care providers (www.wikipedia.org, 2006).

The environment of the teaching clinic is a challenging area for both the supervising clinician and the student intern. The student intern is responsible for the care of the patient and the teaching clinic is both a patient care facility and a learning environment (Gerzina *et al*., 2005). According to Nyiendo and Haldeman (1986) within chiropractic, as in other health professions, the patient is responsible for the survival of the profession. If the patient's health and welfare are of utmost importance then the practitioner must have some means of knowing, with confidence, which management protocols are most reliably associated with successful outcomes for patient problems. This can be fulfilled by having standards of practice and it encompasses what should be acceptable methods of managing patients and their conditions. Within the teaching-clinic, student interns are responsible for demonstrating a wide range of therapeutic, diagnostic and overall patient management skills. This enables them to differentiate between biomechanical and pathological conditions. Extremity conditions are not perceived as part of the scope of practice of chiropractic, although the academic curriculum of chiropractic encompasses the appendicular skeleton and not just the axial skeleton. Due to this training, the chiropractic graduate is also trained in the management of extremity conditions (Hoskins *et al*., 2006).

Few studies have been reported which deal specifically with patients attending chiropractic-teaching clinics (Nyiendo and Olsen, 1988). According to Nyiendo and Haldeman (1986), there remains a paucity of empirical data regarding the type of patients seeking care at chiropractic-teaching clinics and the types of treatment provided. The increasing contribution of chiropractors in health care has generated greater interest in understanding the characteristics of chiropractic practice patterns and treatments (Mootz *et al*., 2005). However, despite the rapid growth and extensive use of chiropractic in the treatment of neuromusculoskeletal conditions, good descriptive data on chiropractors and their patients remains limited (Coulter and Shekelle, 2005).

In South Africa there is a lack of information available on chiropractic-teaching clinics and the type of patients that present to these clinics. According to Till and Till (2000), South Africa is largely a developing country with scattered developed communities. Its requirements and opportunities as they relate to chiropractic may differ significantly from those in other developed countries. It has been estimated that in South Africa only a fraction of the country's population have any notion of what chiropractic is, thus the largest challenge lies with educating the public about chiropractic (www.chiroweb.com, 2005).

In order to document the progression of chiropractic at a South African teaching clinic, the patient database that was available at the Durban University of Technology Chiropractic Day Clinic was used to address this apparent void. The gathering of data available within the teaching clinic setting could also offer insight into the usage of chiropractic and may be of interest to chiropractic leaders and education planners for professional development purposes (Morschhauser *et al*., 2003) and aid in the establishment of inter-professional relationships.

According to Nyiendo and Haldeman (1986), patients that attend chiropractic-teaching clinics maybe demographically and clinically dissimilar from those that attend private clinics or private practitioners. It was also speculated that since chiropractic student interns were responsible for the recruitment of patients,

they were more likely to recruit patients from their own socio-economic category thereby skewing the patient base of their teaching clinic (Nyiendo *et al*., 1989). Although patients attending chiropractic teaching clinics are unique with respect to the nature of their presenting complaints (Nyiendo *et al*., 1989), at present there is limited information available to evaluate whether chiropractic colleges actually broaden the demographic spectrum of the student interns patient base in order to prepare them for private practice (Morschhauser *et al*., 2003).

2.2 Prevalence of extremity complaints

According to the California Health Benefits Review Program (2005), people commonly consult chiropractors for complaints related to neck pain, back pain, headaches, arthritis, injuries and strains. Other non-musculoskeletal disorders that are referred to as Type O disorders are less frequently treated. The treatment of musculoskeletal conditions such as neck and lower back pain account for the majority of conditions treated by chiropractors (www.chbrp.org, 2005). Review of further literature regarding the types of conditions treated with chiropractic revealed that conditions related to the spine were more routinely treated than conditions related to extremities. According to Hoskins *et al*., (2006) the use of chiropractic for the treatment of extremity conditions has not been well documented as compared to the management of spinal conditions. This has contributed to a perception that chiropractic is unable to manage extremity conditions proficiently. Hoskins *et al*., (2006) documented the quantity of research conducted on extremity conditions and noted that extremity conditions made up 17.1% of chief complaints, the third most common complaint next to the low back/pelvis (23.6%) and the neck (18.7%) surpassing facial pain and headaches (12%), midback (11.5%), wellness (8%) and non-musculoskeletal conditions (2.5%).

A report on community service done by chiropractic interns at Kimberly Hospital in 1997, documented that with regards to the area of complaint, 60% of patients were treated for the spine. Extremity disorders combined constituted 29.8% of complaints of which knee disorders were 11.3% of that total. Organic disorders

that were not specified constituted 8.6% (Till and Till, 2000). Hurwitz *et al*., (1998) documented chiropractic visit rates in six sites in the United States and Canada. They found that 68% of patients sought care for low back pain, while 32% sought care for other musculoskeletal conditions. Morschhauser *et al*., (2003) recorded statistics within the inner city and rural areas of California, Oregon, Iowa and Illinois. Their results revealed that back problems were most commonly treated. Extremity conditions within the city were slightly higher than back complaints but as compared to the rural areas, it was lower. Nyiendo *et al*., (1989) compared six chiropractic-teaching clinics, where approximately 72% of complaints were back and neck related, 18% were extremity conditions, 3% were head complaints, and other conditions that were not specified 7%. Rubinstein *et al*., (2000) reported on chiropractic patients in the Netherlands and documented that 86% of complaints were spine-related, 7% were headache, 4% were extremities and other various neuromusculoskeletal were less than 2%. Non-musculoskeletal complaints made up less than 2% of the total complaints.

Mootz *et al*., (2005) recorded data for 2550 chiropractic patient visits at non-teaching clinics. Almost 75% of consultations accounted for low back, head and neck pain. Extremity conditions and wellness care each accounted for half of the remaining consultations. This concurs with Shekelle and Coulter (2005), who reported on patient demographic data, revealed that 76% of patients were treated for back-related problems and 13% for extremity complaints. This was further supported by Hartvigsen *et al*., (2003) who carried out research on Danish patients between 1962 and 1999, indicating that only 5% of patients over the 40-year period were treated for extremity joint pain. This was further highlighted in an expanded survey carried out in 2002 by Sorensen *et al.*, (2006) in comparison to the 1999 survey in Denmark, which revealed that the majority of patients sought care for pain related to the lower back or pelvis. In Australia, research carried out at the Phillip Institute of Technology revealed that spinal problems represented the largest group treated (77.3%) as compared to extremity problems and non-musculoskeletal problems (22.7%)

(Walsh, 1992). Of the extremity conditions, shoulder problems were the most common complaint (6.4%).

2.3 Demographics

2.3.1 Age

Coulter and Shekelle (2005) noted that the mean age of patients that consulted a chiropractor was 40.6 years. Morschauser *et al*., (2003) carried out research at 14 chiropractic teaching clinics. Their results revealed that a combined average of 46% of patients were in the 18-24 age group followed by 32% in the 45-64 age category and 17% were over 65 years of age.

Walsh and Jamison (1992) compared patients and patient complaints between chiropractic teaching clinics and chiropractic private clinics. In this study, mean and median ages showed similar values in both private clinics and teaching clinics (33.6 – 34.4). A similar trend was observed at both teaching and private clinics, in that the majority of patients at each clinic were in the 20-39 age group followed by the 40-59 year group. However, a greater age range was noted in private clinics.

Nyiendo *et al.,* (1989) compared patients and patient complaints at six chiropractic college teaching clinics. They found that the mean age of patients varied from 34 to 43 years of age. The percentage of patients in the 40 or over category ranged from 30% to 53%.

Waalen *et al*., (1994) analysed the demographic and clinical characteristics of patients treated at the Canadian Memorial Chiropractic College. They found that the median age of patients was 28 years with a range from 1 to 93 years. The mean age of male patients was 32.5 years and the mean age of female patients was 33.4 years.

2.3.2 Gender

Research has been undertaken in Canada in an attempt to identify the epidemiological and demographic characteristics of a particular population of chiropractic patients (Waalen *et al*., 1994), as well as characteristics of conditions with which patients present (Walsh, 1992). Some studies focused

specifically on the characteristics of patients treated at chiropractic-teaching clinics (Waalen *et al*., 1994). Morschhauser *et al*., (2003), reported on survey data collected on 1612 patients from fourteen participating chiropractic-teaching clinics in the U.S.A. They found that, of the patient population the largest proportions were female. The patients in the main and outreach clinics were younger than those of the satellite and inner city clinics. This concurs with Coulter and Shekelle (2005) who carried out a descriptive analysis of chiropractic in North America. It revealed that the majority of patients that visited chiropractors were predominantly women. Sibbritt *et al*., (2006) with reference to other concurrent research studies revealed that chiropractic users were more likely to be females as well and is further supported by the findings of Gaumer and Gemmen (2006), that the users of chiropractic often tend to be female.

2.3.3 Occupation

Many studies carried out at teaching clinics included the occupational status of the patient in order to document any differences that existed between teaching clinic patients and those seen in private practice. Waalen *et al*., (1994) noted that 26% of patients seen at a teaching clinic in Canada were students versus only 4% treated by private chiropractors. Nyiendo and Haldeman (1986) speculated that since chiropractic students shared responsibility for patient recruitment, they were more likely to draw from the non-manual labour category thereby skewing results to reflect a specific patient base. In this respect it is also pertinent to note that the cost of treatment at a teaching clinic, which is generally lower, might also help to attract patients Nyiendo *et al*., (1989). This too is therefore identified as a factor in possibly altering the demographics of patients and their complaints seen at teaching clinics.

A survey carried out by Dias and Schutte (2005) in South Africa on coal, gold and platinum miners revealed that second to backache, extremity complaints such as the hip, knee, foot and ankle complaints were most common. The authors speculated that the higher prevalence of lower limb musculoskeletal

complaints could have been attributed to the work environment. Walsh (1992) noted four categories of occupation in his study namely heavy manual (e.g. labourers and truck drivers), light manual (e.g. nurses and tradesmen), non-manual (e.g. clerical and management) and unemployed (e.g. students and retirees). This classification was chosen to reflect the degree of physical stress rather than skill levels. The largest occupation group that attended the chiropractic teaching clinics was non-manual, followed by light manual and heavy manual being the smallest group. Nyiendo *et al*., (1989) also noted that a higher percentage of patients from the non-manual labour category (e.g. clerical, professional) attended teaching clinics.

Morschhauser *et al*., (2003) noted that a limitation of their survey was that questions concerning manual versus non-manual occupation were not included.

2.4 Reason for visit

For many patients, a chiropractor is the primary contact and care provider (Coulter and Shekelle, 2005). Referrals to chiropractors account for a small percentage of the patient population seen. Mootz *et al*., (2005) noted that approximately 85% of patients that consulted chiropractors were self-referred whereas referrals from medical practitioners accounted for approximately 6% of visits. Rubenstein *et al*., (2000) also noted that 71% of patients were referred to chiropractors through family and friends that had previous chiropractic treatment. Only 17% of patients were referred to chiropractors by their general practitioner. However, advertising which is a mode that is prohibited, accounted for 6% of referrals. Sorensen *et al*., (2006) who carried out an expanded survey on patients in Denmark noted that 24% of patients were referred to chiropractors through family and friends but, an almost equivalent percentage of patients (19%) were referred by a general practitioner.

Despite the increasing acceptance of chiropractic for the treatment of neuromusculoskeletal conditions, there is still a noted lack of inter-professional referrals between chiropractors and conventional healthcare providers which

would allow for patients to consult chiropractors instead of other manual therapists (Rubenstein *et al*., 2000) for these conditions. As a result, the author of the current study assumed that the data gathered at the Durban University of Technology Chiropractic Day Clinic could offer insight into the of use chiropractic at this institution and may be of interest to chiropractic leaders and education planners for future reference in the development of the profession (Morschhauser *et al*., 2003) and establishment of inter-professional relationships.

2.5 Presenting complaint and aetiology

Shekelle and Brook (1991) noted that pain, swelling or injury to the back region was commonly reported as the reason for consultation with a chiropractor. Morschhauser *et al*., (2003) noted in their study that pain was the primary reason patients attended clinics with the second-most common reason being a non-pain complaint (e.g. stiffness, numbness, tingling). The causes as well as factors associated to these complaints were not clearly identified. Walsh (1992) noted the cause of the chief presenting complaint in his study involving teaching clinics. In his study, 44.9% of the chief complaints were of an unknown aetiology whereas trauma related aetiologies made up 28% of cases and sports injuries were 10.2%. Many studies have however focused more attention on the duration of the chief complaint and omitted the aetiology of these complaints.

2.6. Management protocol

2.6.1 Treatment modalities

Chiropractic treatment of conditions, primarily involves joint manipulation. According to Nyiendo and Haldeman (1986) the treatment approaches reported on their study of interns' practice activities at a teaching clinic revealed that spinal manipulation was the treatment of choice for 90% of conditions whereas physical modalities were used only 33% of the time. Other treatment methods included soft-tissue manipulation (25%), trigger point therapy (21%), nutritional counseling (17%), exercise instructions (16%) and patient education (13%).

However, no note of the treatment methods of extremity conditions was made. Hurwitz *et al*., (1998) reporting on chiropractic patient data in the United States and Canada noted that spinal manipulative therapy was recorded for 83% of visits.

Shekelle and Brook (1991) analysed data from the RAND Health Insurance Experiment and their results also revealed that spinal manipulation was the treatment method of choice, accounting for 61% of all services provided. No note of the treatment methods of extremity conditions was made. Mootz *et al*., (2005) recorded data of chiropractic visits and their results also revealed that spinal manipulation therapy was carried out for 85% of cases. Extremity adjustments were carried out, but in only 10% of cases as compared to adjustments of the spine. Other treatment methods included diversified procedures; instrument adjusting and mechanically assisted thrust procedures. Ischemic compression and active soft-tissue techniques were the more commonly used forms of soft tissue mobilisation. Thermal modalities were also used, but not frequently.

2.6.2 Investigations

For many years, x-rays have been an important part of chiropractic. X-rays have been used as a means of verifying pathological or anatomical abnormalities as well as to offer information relative to the structural and functional status of the musculoskeletal system (Gatterman, 1990).

Pringle and Wyatt (2006) described plain film radiography as being a staple diagnostic test often used by chiropractors as a screening tool and for medico-legal purposes.

2.6.3 Number of treatments

Hurwitz *et al*., (1998) noted that patients that visited private chiropractors with non-spinal complaints had a mean of 9 visits for the treatment of their conditions. This is similar to Waalen *et al*., (1994) where patients that presented to a chiropractic college clinic with non-spinal complaints received on average 7 treatments for their condition.

2.7 Musculoskeletal conditions

One in four persons in both developed and less developed countries report musculoskeletal impairments. It is ranked as one of the most common cause of chronic musculoskeletal pain in the U.S.A. In a Swedish, cost of illness study, musculoskeletal conditions were the most expensive disease category, representing 22.6% of the total cost of illness (Woolf and Akesson, 2001). Musculoskeletal disorders include a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. These include clinical syndromes such as tendon inflammations and related conditions, nerve compression disorders and osteoarthrosis, conditions such as myalgia, low back pain and other regional pain syndromes, not attributable to known pathology. Anatomical regions involved are the low back, neck and the upper and lower extremity (Punnett and Wegman, 2004).

With regards to extremity disorders, many authors have specifically focused on differentiating between upper limb and lower limb musculoskeletal disorders. Upper extremity disorders include the shoulder, elbow, wrist and hand whereas lower extremity disorders include the hip, knee, foot and ankle. These disorders are briefly discussed below.

2.7.1 Upper extremity musculoskeletal disorders

Upper limb musculoskeletal disorders involve the shoulder, elbow, forearm, wrist and hand (http://osha.eu.int, 1999). Hupert *et al*., (2004) reported that upper extremity musculoskeletal disorders are among the most common and costly work-related medical conditions. Punnett and Wegman (2004) reported that although these disorders are not only caused through work, numerous surveys involving working populations have shown that they experienced upper extremity symptoms 20% to 30% higher than the general population. However, Huisstede *et al*., (2006) have further emphasised that although occupational use of the upper limb can cause these disorders, psychosocial work characteristics such as high job demand and personal characteristics can result in these disorders. According to Huisstede *et al*., (2006) most of the upper

extremity disorders are characterised by pain, discomfort, or tingling in the upper extremity. Of the upper extremity disorders, the shoulder is the most commonly affected region.

2.7.1.1 Shoulder

Shoulder pain is characterised as pain in the deltoid and upper arm region (Kuijpers *et al*., 2006). Shoulder pain can be caused by intrinsic disease of the shoulder joints or pathology in the peri-articular structures or it may originate from the cervical spine, chest or visceral structures (Magee, 2002). Pribicevic and Pollard (2005) reported that shoulder pain is the most common extra-spinal complaint encountered in primary care clinics, and in clinical frequency is surpassed only by low back and neck pain. According to Wofford *et al*., (2005) shoulder pain is a common clinical problem. Their study documented that the one-year prevalence of shoulder pain was as high as 50% in the general population of which 50% of those affected sought care from a physician. Kuijpers *et al*., (2006) reported that shoulder pain usually has an unfavourable outcome in many patients as many report persistent symptoms even six to twelve months after receiving treatment for the condition.

2.7.1.2 Elbow

Elbow pain usually arises from repetitive overuse of the forearm. According to the National Institute for Occupational Safety and Health (NIOSH) (1997), repetitive work involving cyclical flexion and extension of the elbow or cyclical pronation, supination, flexion and extension of the wrist generates loads to the elbow and forearm regions resulting in dysfunction. Overuse injuries of the elbow and forearm are very common among throwing athletes and racquet sports (Disabella, 2004).

2.7.1.3 Hand and Wrist

Hand injuries account for approximately 5-10% of consultations to physicians (Lese *et al*., 2006). Wrist pain is an equally challenging complaint due to the complexity of the anatomical properties of the wrist (Forman *et al*., 2005).

Logan *et al*., (2004) reported that approximately 50% of injuries sustained by rock climbers involved the hand and wrist. A study by Silverstein *et a*l., (1998) which compared upper extremity work-related conditions, revealed that workers compensation claims were the highest with regards to hand and wrist disorders.

2.7.1.4 Temporomandibular Joint

According to the American Association of Oral and Maxillofacial Surgeons (2005), temporomandibular joint (TMJ) disorders are not uncommon and have a variety of symptoms. Aetiology of this disorder is multi-factorial but arthritis and bruxism are common causes of TMJ symptoms and dysfunction. Another common cause involves displacement or dislocation of the disk that is located between the mandible and the socket. A displaced disk may produce clicking or popping sounds, limit jaw movement and cause pain when opening and closing the mouth (American Association of Oral and Maxillofacial Surgeons, 2005). Temporomandibular joint disorder or syndrome has been identified as one of the most common causes of facial pain (Berman *et al*., 2006).

2.7.2 Lower extremity musculoskeletal disorders

Lower limb musculoskeletal disorders involve the foot, ankle, leg, knee, thigh and hip. Lower limb disorders occur disproportionately among truck drivers, construction workers, heavy machinery operators and some patient care workers (Punnett and Wegman, 2004). According to El-Metwally *et al*., (2006), the lower limb is the most commonly reported musculoskeletal site of pain especially in children and adolescents. Research carried out by this author on lower limb pain among pre-adolescents revealed that the knee was the most common area affected for both traumatic and non-traumatic categories.

2.7.2.1 Knee

Knee complaints are amongst the most frequent reasons for consulting primary care physicians (Heintjies *et al*., 2005). Pain within the knee can be caused by a variety of disorders that include inflammatory and degenerative arthritides, bursitis and injuries to cartilage, ligaments and other structures within or surrounding the joint (Baker *et al*., 2003). According to data, Urwin *et al*., (1998)

as cited by Symmons, (2001), in older adults, knee pain is relatively more common than back pain. According to the World Health Organisation (2003) approximately 40% of persons over the age of 70 years suffer from osteoarthritis of the knee. A nationwide study into the incidence and prevalence of diseases and complaints in Dutch general practices revealed that the incidence of unspecified knee complaints in general practice was 13.7 per 1000 patients per year, ranking as one the of most frequent reasons for visiting a physician (Heintjies *et al*., 2005).

2.7.2.2 Hip

According to Birrell *et al*., (2005), hip pain is actually difficult to define. This is due to the joint not being superficial thus pain across the joint involves a broad area making it difficult to isolate if the actual joint is problematic. Structures outside the hip such as the groin or genital tract refer pain to the hip making it further unclear to differentiate musculoskeletal hip pain. Pope *et al*., (2003) reported that although hip pain may arise from many causes, the most common are osteoarthritis, trochanteric bursitis as well as referred pain from visceral structures. According to the World Health Organisation (2003), osteoporotic hip fractures account for a large percentage of the morbidity, mortality and cost of musculoskeletal disease. The cause of hip pain varies with age. In younger age groups developmental disorders are more common, but osteoarthritis is considered to be the most important underlying disorder of the hip.

2.7.2.3 Foot and Ankle

At least 80% of the general population suffers with foot problems (Magee, 2000). According to Dunn *et al*., (2004) foot and ankle disorders especially in adults are associated with falls, fractures, disabilities and balance and mobility impairments. The foot functions to protect the body by acting as a barrier and a source of sensory information from the external environment. When these functions are compromised, a person is more susceptible to develop foot disorders. Foot pathologies requiring management and treatment are common in persons over the age of 65, affecting 71% of that population (Keegan *et al*.,

2002). The prevalence and severity of foot disorders increases with age as the aging process can make persons vulnerable to conditions such as neuropathies, ischemia and plantar atrophy of the fat pad. Chronic conditions such as diabetes mellitus, peripheral vascular disease and arthritis often involve the feet. Lesions within the foot and ankle can result in the alteration of gait and further impact on other lower limb joints (Magee, 2000). This has been further emphasised by Keegan *et al*., (2002) who stated that the slightest deformity of the foot could result in impaired proprioception, skeletal problems and pain.

2.8 Summary

According to Cleary (1999), surveys and reports can provide results that are interpretable and suggest specific areas for quality improvement efforts. Data gathered through surveys is less subjective and less influenced by patient characteristics and is more interpretable making it useful too, for quality improvement purposes.

According to Coulter and Shekelle (2005), in order to obtain a coherent, objective and contemporary account of chiropractic; patient demographics, patient use patterns and the health status of patients are a few of the requirements to provide adequate descriptive data about chiropractic practice patterns. Although there is widespread use of chiropractic, there is a lack of good descriptive data on chiropractic patients and particularly their presenting conditions (Coulter and Shekelle, 2005). Furthermore few studies have been reported which deal specifically with patients attending chiropractic-teaching clinics (Nyiendo and Olsen, 1988).

At the Durban University of Technology Chiropractic Day Clinic, a diverse patient population is served due to the geographical location of the clinic, which borders the CBD and residential areas thus making it easily accessible. The institution provides a service that helps meet a need for health care services in the province and through this, public awareness is created. Little is known

about the differences - if any - of the patient population at the clinic in terms of demographics and clinical presentation.

The time frame for the study was selected to avoid overlap with a previous study done from February 1994 to April 1994 at the clinic regarding analysis of patient data (Drews, 1994). Since then, the number of patients visiting the clinic has increased over 100 fold. This growing number of patients and the larger time span being assessed, may allow for any changes in trends that may have occurred, to be picked up. In this manner, an updated descriptive analysis of the patient cases at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005 could be provided.

CHAPTER 3

MATERIALS AND METHODS

3.1 INTRODUCTION

This chapter will include a detailed description of the study design, the selection of the patient files and data collection. The statistical procedures that were implemented in analysing the data have been included in this chapter.

3.2 STUDY DESIGN

This study was designed in the form of a retrospective, cross-sectional, non-experimental, clinical survey. It involved the gathering of data from patient files with relevance to the extremity system in an attempt to analyse the overall presenting trends at the Durban University of Technology Chiropractic Day Clinic over a ten-year period from 1995 to 2005. Data was obtained from patient files that were opened at the Durban University of Technology Chiropractic Day Clinic from the 13th January 1995 to 30th November 2005. This time frame was selected to avoid overlap with a previous study done from February 1994 to April 1994 at the clinic regarding analysis of patient data (Drews, 1994). Since then, the number of patients visiting the clinic has increased over 100 fold. This growing number of patients and the larger time span being assessed, may have allowed for any changes in trends that have occurred, to be picked up. In this manner, an updated descriptive analysis of the patient cases at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005 could be provided.

3.2.1 Patient Confidentiality

The appropriate steps were undertaken in order to maintain patient confidentiality throughout the course of the research study. The researcher signed a statement of confidentiality (Appendix 19) and consent was obtained in writing from the clinic director prior to the research process. All data that was obtained from the patient files were captured on the specific data collection form (Appendices 1-8). Only the researcher and the research supervisor had access to this information. Once the data had been captured, the spreadsheet

containing the randomised sampled file numbers was destroyed, therefore denying access to third parties.

3.2.2 Sampling and Sample Allocation

With the timeframe selected from the 13th January 1995 to 30th November 2005, a total of 24487 active and dormant patient files were recorded at the Durban University of Technology Chiropractic Day Clinic. In this study, a random sampling procedure was used. Of the total number of files, a 30% sample size of 7500 files was randomly generated using the SPSS version 13 (SPSS Inc., Chicago, Illinois, USA) statistical package (Esterhuizen, 2006). To improve reliability the researcher manually extracted all files from the total sample size and thereafter only analysed those files pertaining to the extremity system.

3.2.3 Inclusion and Exclusion Criteria

Inclusion Criteria

1) This study was limited to patient files opened from 13th January 1995 to 30th November 2005, with the exception of those files that met the exclusion criteria.
2) Both dormant records (files not in use for 3 years or longer from the date of the patient's last consult) as well as active records (files in use within 3 years from the date of the patient's last consult) were analysed.
3) Analysis was done on files that had all the attached and completed initial visit paperwork, which included the case history, physical examination, regional examinations of the extremities in question, and corresponding SOAPE notes (Appendices 9-18).

Exclusion Criteria

1) Data within patient files that referred to the cervical, thoracic and lumbosacral spine were not analysed.
2) Data within patient files referring to any clinical research study done during the allocated timeframe was not analysed due to the possibility of those results being skewed either through participant or researcher bias. However, only the number of research studies per extremity was noted.

3) Patient files containing incomplete paperwork were excluded and noted accordingly.

3.2.4 Data Collection

The data collection procedure was done within the confines of the Durban University of Technology Chiropractic Day Clinic. Data collection involved both primary data and secondary data.

3.2.4.1 The Primary Data

The primary data was obtained from patient files that were opened at the Durban University of Technology Chiropractic Day Clinic from 13th January 1995 to 30th November 2005.

This was done through the use of the data collection tool, which was a survey sheet. The survey sheet was designed to gather demographical information from patient files. It also consisted of specific questions that were related to the physical examination as well as each component of the extremity system and these included questions such as the presenting complaint/s, associated signs and symptoms, findings of the regional examination/s, diagnosis/es, management protocols, contra-indication to any treatment modality, any special investigations sought or done, as well as any referrals recommended and the total number of follow up treatments over a four week period for the diagnosed condition. The data collection tool was designed through the use of the current data sheets that are used for documenting a patient's visit at the Durban University of Technology Chiropractic Day Clinic (Appendices 9-18). In order to test for the validity of the data collection tool, a focus group was held prior to the research process. This method, allowed for an efficient means of gathering information considered useful for the study, whilst eliminating unnecessary information. The focus group was conducted at a meeting where participants met as a group to assess and criticise the data collection tool, whilst, at the same time proposing logical solutions to any problems which may have been noted, as well as suggesting any relevant questions/points to be added to it and irrelevant questions/points to be removed. Relevant changes were only made to the questions/points after a general consensus of all the participants was

obtained. This process was followed for each question/point. The comments and suggestions made and noted during the focus group were taken into consideration and the data collection tool was changed accordingly. The final and corrected data collection tool was developed thereafter and printed for use in this study (Appendices 1-8).

3.2.4.2 The Secondary Data

This was obtained from various sources, which included journals, books and the Internet.

3.2.5 Research Procedure

This research study was carried out in two phases to ensure patient confidentiality and maintain order throughout the duration of the study.

3.2.5.1 Phase One

Patient files contained within the confines of the Durban University of Technology Chiropractic Day Clinic were used. File numbers were used as an initial source of identification during the selection of the files and thereafter all file numbers were converted to a code form to maintain confidentiality. To further maintain patient confidentiality, an individual not involved in the study, blocked off the patient names on the file and paperwork. This method was used to ensure that no persons were identifiable to either the researcher or research supervisor.

A total number of 24487 files were available for the randomised sampling. A sample size of 30% of the total number was generated which was approximately 7500 files. Only those files pertaining to the extremity system from 13th January 1995 to 30th November 2005 were set aside. Those files pertaining to extremity system meeting the inclusion criteria were further sorted into the different extremity regions. Prior to data collection, the number of files that contained research studies pertaining to any of the extremities was noted and thereafter excluded.

3.2.5.2 Phase Two

After the patient names were blocked off and the file numbers were converted to code form, data collection began. The patient files were evaluated with focus on demographical information and specific questions that were related to the physical examination as well as each component of the extremity system. Management protocols, special investigations sought or done, referrals including the total number of follow up treatments over a four week period was also documented. Any new musculoskeletal complaint aside from the condition treated in the initial visit was also noted.

All information that was gathered was recorded accordingly on the survey sheet that was specified for each component of the extremity system. It included the following specific aspects so as to attempt to analyse in detail the objectives of this study as listed in detail in chapter 1. The survey sheets contained the following aspects (Appendices 1-8):

- File code
- Demographics
- Reason for visit
- Consultation fees
- Patient participation in extremity research
- History of pre-existing conditions
- History of trauma
- Vitals
- Blood pressure abnormality
- Findings of general examination
- Presenting complaints
- Aetiology
- Associated signs and symptoms
- Diagnosis/es
- Management protocols
- Contra-indication to any treatment modality
- Investigations
- Referrals
- Total follow up treatments over a four week period

3.3 STATISTICAL ANALYSIS

The statistical package SPSS version 13 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data of this study.

3.3.1 Method of data analysis

A two-tailed 0.05 level of significance was used. Prevalence and 95% confidence intervals (95%CI) per year, per 5 year period, and overall were calculated and compared using EpiCalc 2000 version 1.02 (Gilman and Myatt, 1998).

Descriptive statistics such as frequencies and percentages for categorical variables, and mean, standard deviation and range for quantitative variables were used to describe the sample in terms of demographics and other characteristics. Comparisons of these factors between the two successive five year periods were made using Pearson's chi square tests for categorical variables, and independent t-tests for quantitative variables (Esterhuizen, 2006).

3.4 Hypotheses

3.4.1 Hypothesis 1

The Null Hypothesis (Ho) states that there shall not be a shift in the demographics of patients presenting with extremity conditions to the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005.

The Alternate Hypothesis (Ha) states that there shall be a shift in the demographics of patients presenting with extremity conditions to the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005.

3.4.2 Hypothesis 2

The Null Hypothesis (Ho) states that there shall not be a lower prevalence of extremity complaints from 1995 to 1999 and a comparatively higher prevalence from 2000 to 2005.

The Alternate Hypothesis (Ha) states that there shall be a lower prevalence of extremity complaints from 1995 to 1999 and a comparatively higher prevalence from 2000 to 2005.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

Statistical methodology

SPSS version 13 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. A two-tailed 0.05 level of significance was used. Prevalence and 95% confidence intervals (95%CI) per year, per 5 year period, and overall were calculated and compared using EpiCalc 2000 version 1.02 (Gilman and Myatt, 1998).

Descriptive statistics such as frequencies and percentages for categorical variables, and mean, standard deviation and range for quantitative variables were used to describe the sample in terms of demographics and other characteristics. Comparisons of these factors between the two successive five year periods were made using Pearson's chi square tests for categorical variables, and independent t-tests for quantitative variables (Esterhuizen, 2006).

4.2 RESULTS

4.2.1 Prevalence and location of extremity complaints of patients that presented to the Durban University of Technology Chiropractic Day Clinic between 1995 and 2005.

A total of 7487 files from 1995 to 2005 were extracted randomly from the clinic's records. There were 702 files which met the criteria for upper and lower limb extremity complaints during this time period.

4.2.1.1 Prevalence of extremity complaints at the Chiropractic clinic from 1995 to 2005

The annual prevalence and 95% CI are shown in Table 1. The overall prevalence of extremity complaints from 1995 to 2005 was 9.38% (95% CI 8.73% to 10.06%). The lower limb sites were mostly affected more frequently than the upper limb sites.

In the 10 year period from 1996 to 2005, the prevalence was 9.8% [95% CI 9.13%, 10.52%]. A statistically significant increase in prevalence between the

first 5 years (1996 to 2000) and the second five years (2001-2005) was detected (p=0.002) from 8.83% to 11.04%.

Table 1: Prevalence (95% CI) of extremity complaints at the Chiropractic clinic from 1995 to 2005

Year		*Site*		*Total*
		Upper limb	*Lower limb*	
1995	*Count*	*4*	*1*	*5*
	Prevalence (95% CI)	*1.06 [0.34, 2.89]*	*0.27 [0.01, 1.71]*	*1.33 [0.49, 3.26]*
1996	*Count*	*28*	*27*	*55*
	Prevalence (95% CI)	*3.18 [2.16, 4.63]*	*3.07 [2.07, 4.49]*	*6.25 [4.78, 8.11]*
1997	*Count*	*24*	*43*	*67*
	Prevalence (95% CI)	*2.90 [1.91, 4.35]*	*5.20 [3.83, 7.00]*	*8.10 [6.38, 10.23]*
1998	*Count*	*39*	*42*	*81*
	Prevalence (95% CI)	*4.65 [3.37, 6.36]*	*5.01 [3.67, 6.76]*	*9.65 [7.78, 11.91)*
1999	*Count*	*25*	*55*	*80*
	Prevalence (95% CI)	*2.87 [1.90, 4.27]*	*6.31 [4.83, 8.18]*	*9.17 [7.38, 11.34]*
2000	*Count*	*27*	*43*	*70*
	Prevalence (95% CI)	*4.67 [3.16, 6.81]*	*7.44 [5.50, 9.97]*	*12.11 [9.62, 15.12)*
1996-2000	*Count*	*143*	*210*	*353*
	Prevalence (95% CI)	*3.58 [3.03, 4.21]*	*5.26 [4.59, 6.00]*	*8.83 [7.98, 9.77]*
2001	*Count*	*31*	*39*	*70*
	Prevalence (95% CI)	*3.45 [2.40, 4.92]*	*4.34 [3.15, 5.95]*	*7.80 [6.17, 9.79]*

2002	***Count***	***32***	***44***	***76***
	Prevalence (95% CI)	***4.58 [3.21, 6.48]***	***6.30 [4.67, 8.44]***	***10.89 [8.72, 13.49]***
2003	***Count***	***27***	***40***	***67***
	Prevalence (95% CI)	***5.82 [3.94, 8.46]***	***8.62 [6.30, 11.65]***	***14.44 [11.44, 18.05]***
2004	***Count***	***35***	***35***	***70***
	Prevalence (95% CI)	***6.54 [4.66, 9.07]***	***6.54 [4.66, 9.07]***	***13.08 [10.40, 16.31]***
2005	***Count***	***27***	***34***	***61***
	Prevalence (95% CI)	***5.19 [3.51, 7.56]***	***6.54 [4.64, 9.11]***	***11.73 [9.16, 14.89]***
2001-2005	***Count***	***152***	***192***	***344***
	Prevalence (95% CI)	***4.88 [4.16, 5.71]***	***6.16 [5.36, 7.08]***	***11.04 [9.97, 12.21]***
10 years (1996-2005)	***Count***	***295***	***402***	***697***
	Prevalence (95% CI)	***4.15 [3.70, 4.64]***	***5.65 [5.13, 6.22]***	***9.80 [9.13, 10.52]***
Total (1995-2005)	***Count***	***299***	***403***	***702***
	Prevalence (95% CI)	***3.99 [3.57, 4.47]***	***5.38 [4.89, 5.92]***	***9.38 [8.73, 10.06]***

4.2.1.2 Frequency of area of extremity complaints at the Chiropractic clinic from 1995 to 2005

The affected areas are shown in Table 2, in cases from 1995 to 2005. The most frequently affected site was the knee (28.6%), followed by the shoulder (25.8%), and foot (22.2%). The other areas were less frequently affected.

Table 2: Frequency of area of extremity complaints at the Chiropractic clinic from 1995 to 2005

	Frequency	*Percent*
Knee	***201***	***28.6***
Shoulder	***181***	***25.8***
Foot	***156***	***22.2***
Hand and wrist	***61***	***8.7***
Elbow	***47***	***6.7***
Hip	***46***	***6.6***
TMJ	***10***	***1.4***
Total	***702***	***100.0***

4.2.2 Demographics

Since the prevalence in 1995 (n=5) was much lower than in the other years, and the cases were only taken from a portion of the year, inclusion of these cases would bias the results. Thus it was decided to exclude the 1995 cases from this point forward and base the analysis on the 697 cases from 1996 to 2005.

4.2.2.1 Age

Age of the sample ranged from 4 years to 90 years. The mean age was 39.6 years (SD 18.18 years). The age group distribution of the sample is shown in Table 3. The majority were young, in the 20-29 year age group (30.9%). There were 2 missing ages.

Table 3: Age group distribution in the sample (n=695)

	Frequency	*Percent*
<10	*4*	*.6*
10-19	*66*	*9.5*
20-29	*215*	*30.9*
30-39	*82*	*11.8*
40-49	*95*	*13.7*
50-59	*120*	*17.3*
60-69	*68*	*9.8*
70-79	*36*	*5.2*
80-89	*8*	*1.2*
90-99	*1*	*.1*
Total	*695*	*100.0*

4.2.2.1.1 Comparison of mean age between two five year periods

There was a statistically significant change in mean age between the first and second five year period (p=0.003), and the mean age increased from the first to the second five year period. This is shown in Table 4.

Table 4: Comparison of mean age between two five year periods

	5 year period	*N*	*Mean*	*Std. Deviation*	*Std. Error Mean*	*P value*
AGE	*1996-2000*	*351*	*37.55*	*18.001*	*.961*	*0.003*
	2001-2005	*344*	*41.69*	*18.149*	*.979*	

4.2.2.2 Gender

Table 5 shows that there was no difference in the gender distribution between the first 5 years and the second 5 years (p=0.444). Overall there were 62.1% males and 37.9% females in the sample, and this proportion did not change significantly over the years. There was one case with missing gender.

Table 5: Comparison of gender distribution between two five year periods (n=696)

			Gender		*Total*
			Male	*Female*	
5 year period	*1996-2000*	*Count*	*224*	*129*	*353*
		Row %	*63.5%*	*36.5%*	*100.0%*
	2001-2005	*Count*	*208*	*135*	*343*
		Row %	*60.6%*	*39.4%*	*100.0%*
Total		*Count*	*432*	*264*	*696*
		Row %	*62.1%*	*37.9%*	*100.0%*

Pearson's chi square 0.585, p=0.444

4.2.2.3 Occupation

343 participants were employed. The other 354 were students, scholars, self employed, pensioners, or their occupation was not recorded. Of the 343 employed participants, only 137 (19.7% of the whole sample) were employed in occupations that were classified as active (e.g. housewife, artisan, professional sports person etc.) while the majority had sedentary jobs which mostly involved office work (294, 42.2% of the whole sample). Figure 1 shows this distribution in the sample as a whole, including those who were not employed formally or their employment was not recorded (38.2% of the sample - N/A in Figure 1).

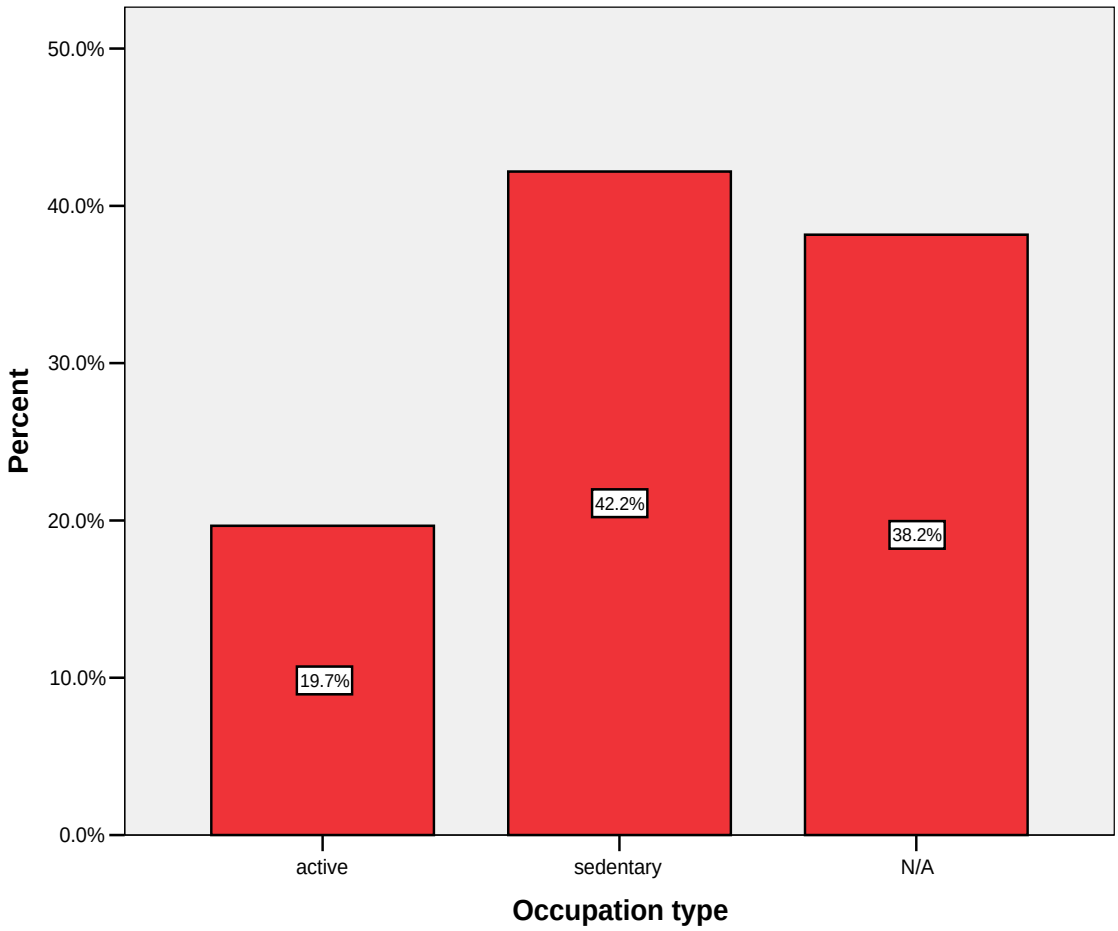

Figure 1: Type of occupation of sample (n=697)

4.2.2.3.1 Comparison of type of occupation over the two five year periods

When the distribution of sedentary or active jobs was compared between the two five year periods, there was no significant difference (p=0.638). This is shown in Table 6. The proportions in each category were very similar between the two five year periods.

Table 6: Comparison of type of occupation over the two five year periods

			Occupation type			*Total*
			Active	*Sedentary*	*N/A*	
5 year period	*1996-2000*	*Count*	*68*	*155*	*130*	*353*
		Row %	*19.3%*	*43.9%*	*36.8%*	*100.0%*
	2001-2005	*Count*	*69*	*139*	*136*	*344*
		Row %	*20.1%*	*40.4%*	*39.5%*	*100.0%*
Total		*Count*	*137*	*294*	*266*	*697*
		Row %	*19.7%*	*42.2%*	*38.2%*	*100.0%*

Pearson chi square 0.897, p=0.638

4.2.2.3.2 Distribution of employment in sample (n=697)

Almost half the sample was employed (49.2%). There were also a high percentage of scholars or students (22.2%). The distribution for the sample is shown in Table 7.

Table 7: Distribution of employment in sample (n=697)

	Frequency	*Percent*
Employed	*343*	*49.2*
Self employed	*34*	*4.9*
Scholar/student	*155*	*22.2*
Housewife	*56*	*8.0*
Unemployed	*20*	*2.9*
Retired/welfare	*67*	*9.6*
Unknown	*22*	*3.2*
Total	*697*	*100.0*

4.2.2.3.3 Comparison of the distribution of employment over the two five year periods (n=697)

There was a borderline non significant difference in the distribution of employment over the two five year periods (p=0.094). The main trend observed was a slight decrease in employed, self employed and scholars and students from the first to the second 5 year period, with a slight increase in housewives, unemployed and retired patients. This is shown in Table 8.

Table 8: Comparison of the distribution of employment over the two five year periods (n=697)

		Employment							Total
		Employed	Self-employed	Scholar / student	House-wife	Un-employed	Retired/ welfare	Un-known	
1996-2000	Count	179	22	84	24	8	25	11	353
	Row %	50.7%	6.2%	23.8%	6.8%	2.3%	7.1%	3.1%	100.0 %
2001-2005	Count	164	12	71	32	12	42	11	344
	Row %	47.7%	3.5%	20.6%	9.3%	3.5%	12.2%	3.2%	100.0 %
Total	Count	343	34	155	56	20	67	22	697
	Row %	49.2%	4.9%	22.2%	8.0%	2.9%	9.6%	3.2%	100.0 %

Pearson chi square = 10.83, p=0.094

4.2.3 Pre-existing medical conditions

One hundred and eighty-six cases (26.7%) had a pre-existing medical condition. The conditions are listed in Table 9 by site of injury. Cardiac conditions were the most frequent type (9.2% in upper limb cases and 8.2% in

lower limb cases), while respiratory conditions (7.5% in upper limb and 5.7% in lower limb) were also common.

Table 9: Pre–existing medical conditions

	Site			
	Upper limb		***Lower limb***	
	Count	***%***	***Count***	***%***
CARDIAC	***27***	***9.2%***	***33***	***8.2%***
RESPIRATORY	***22***	***7.5%***	***23***	***5.7%***
ABDOMINAL	***11***	***3.7%***	***7***	***1.7%***
HAEMATOLOGICAL	***1***	***.3%***	***0***	***.0%***
NEUROLOGICAL	***5***	***1.7%***	***2***	***.5%***
MUSCULO-SKELETAL	***10***	***3.4%***	***11***	***2.7%***
ONCOLOGICAL	***1***	***.3%***	***7***	***1.7%***
DERMATOLOGICAL	***4***	***1.4%***	***5***	***1.2%***
ENDOCRINE	***22***	***7.5%***	***8***	***2.0%***
VASCULAR	***3***	***1.0%***	***0***	***.0%***
PSYCHIATRIC	***7***	***2.4%***	***6***	***1.5%***
OTHER	***10***	***3.4%***	***7***	***1.7%***

4.2.4 Presenting conditions

4.2.4.1 Main complaint in the sample by upper or lower limb site

The main presenting complaint of the 697 extremity patients is shown in Table 10 by upper or lower limb site. For upper limb complaints, the most frequent complaint was shoulder pain (54.9%), followed by elbow pain (13.2%). For lower limb sites, the most common complaint was knee pain (44.3%), followed by ankle pain (16.9%).

Table 10: Main complaint in the sample by upper or lower limb site (n=697)

		Site			
		Upper limb		Lower limb	
		Count	%	Count	%
Complaint	Ankle pain	0	.0%	68	16.9%
	Knee pain	0	.0%	178	44.3%
	Foot pain	0	.0%	4	1.0%
	Shoulder pain	162	54.9%	0	.0%
	Elbow pain	39	13.2%	0	.0%
	Hand pain	13	4.4%	0	.0%
	Wrist pain	26	8.8%	0	.0%
	Arm pain	24	8.1%	0	.0%
	Buttock pain	0	.0%	4	1.0%
	Thigh pain	0	.0%	21	5.2%
	Calf pain	0	.0%	17	4.2%
	Foot pain	0	.0%	41	10.2%
	Finger pain	20	6.8%	0	.0%
	Groin pain	0	.0%	3	.7%
	Hamstring pain	0	.0%	9	2.2%
	Heel pain	0	.0%	18	4.5%
	Hip pain	0	.0%	28	7.0%
	Jaw pain	5	1.7%	0	.0%
	Low back pain	0	.0%	2	.5%
	Temporomandibular joint pain	2	.7%	0	.0%
	Toe pain	0	.0%	8	2.0%
	Other	4	1.4%	1	.2%

4.2.4.2 Aetiology of main complaint

Table 11 shows that in most cases for both upper and lower limb injuries, the cause was unknown (53.9% of upper limb and 53% of lower limb), while the most common known cause was sport (19.7% of upper limb and 25.4% of lower limb), followed by fall or accident (14.9% of upper limb and 14.4% of lower limb) and medical or surgical causes (3.1% of upper limb and 2.5% of lower limb).

Table 11: Cause of main complaint by site of injury (n=697)

		Site			
		Upper limb		*Lower limb*	
		Count	*%*	*Count*	*%*
Cause	*Unknown*	*159*	*53.9%*	*213*	*53.0%*
	Sport	*58*	*19.7%*	*102*	*25.4%*
	Bending / lifting / carrying	*13*	*4.4%*	*1*	*.2%*
	Fall / accident	*44*	*14.9%*	*58*	*14.4%*
	Occupational ergonomics	*9*	*3.1%*	*4*	*1.0%*
	Stress / depression	*0*	*.0%*	*0*	*.0%*
	Driving	*1*	*.3%*	*1*	*.2%*
	Poor posture	*1*	*.3%*	*1*	*.2%*
	Medical / surgical	*9*	*3.1%*	*10*	*2.5%*
	Pregnancy and childbirth	*1*	*.3%*	*0*	*.0%*
	Standing / walking	*0*	*.0%*	*5*	*1.2%*
	Airconditioner	*0*	*.0%*	*0*	*.0%*
	Poor adjustment	*0*	*.0%*	*0*	*.0%*
	Assault	*0*	*.0%*	*0*	*.0%*
	Environmental (cold)	*0*	*.0%*	*1*	*.2%*
	Incorrect footwear	*0*	*.0%*	*6*	*1.5%*

4.2.4.3 Associated symptoms and signs in patients with extremity complaints

Associated symptoms and signs are shown in Figures 2 and 3. Only 142 patients (20.3%) presented with associated symptoms, of these 69 patients had upper extremity complaints and 73 had lower extremity complaints. The most common symptom in those with upper limb complaints was numbness (15.9%) followed by parasthesia (14.5%) and weakness (13%). In patients with lower limb problems, the most common associated symptom was calf pain (11%), followed by numbness (9.6%) and lumbo-sacral pain (9.6%).

108 (15.5%) had associated signs, 26 with upper limb complaints, and 82 with lower limb complaints. The most common associated sign was swelling for both the upper and lower limb patients (50% and 48.8% respectively).

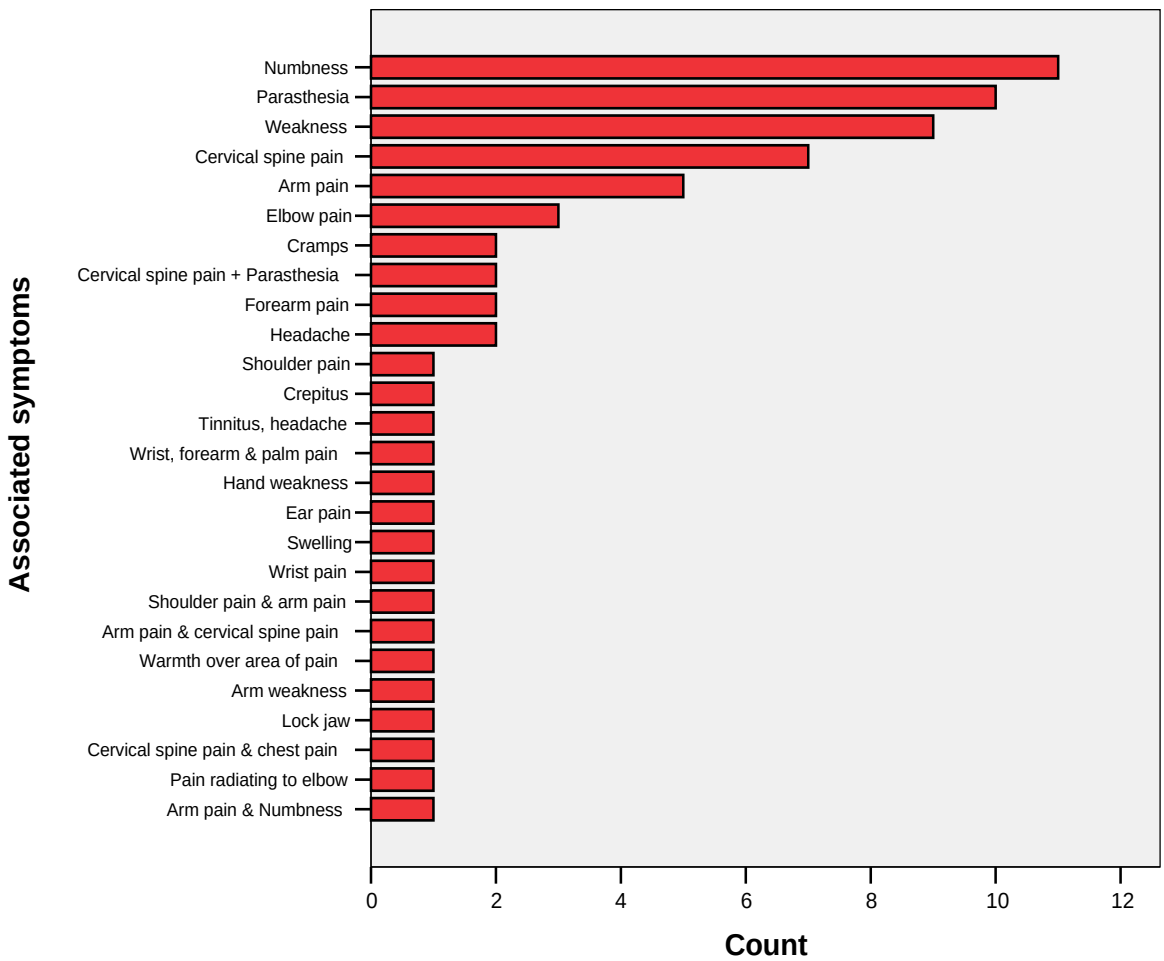

Figure 2a: Associated symptoms in patients with upper limb complaints (n=69)

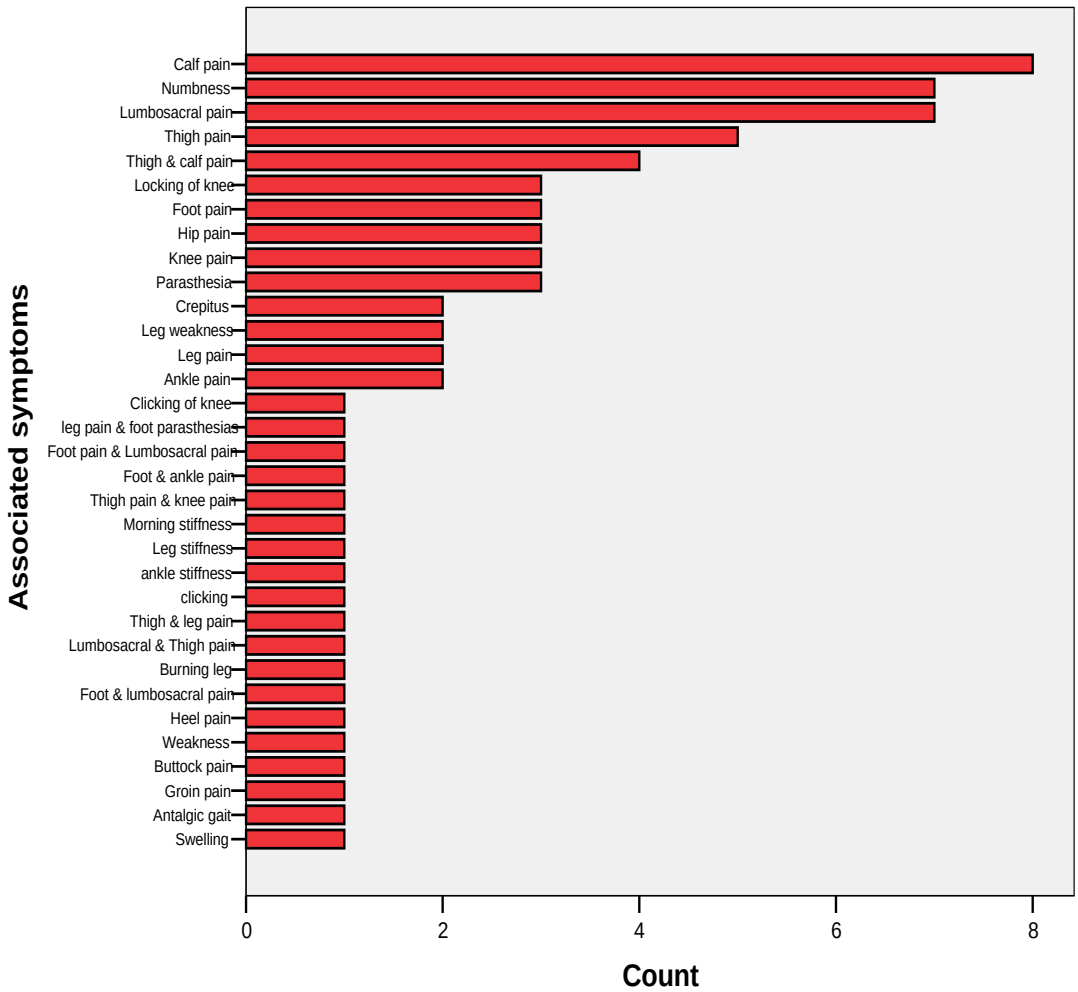

Figure 2b: Associated symptoms in patients with lower limb complaints (n=73)

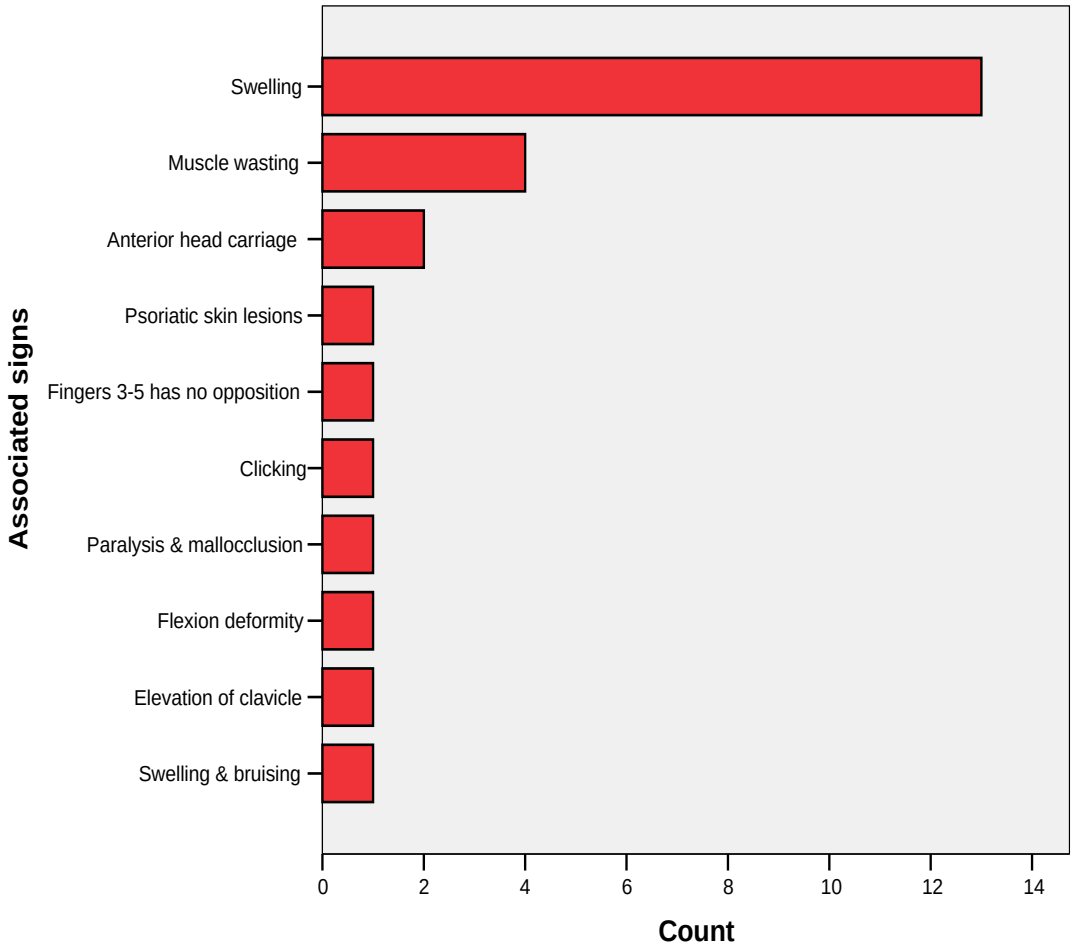

Figure 3a: Associated signs in patients with upper limb complaints (n=26)

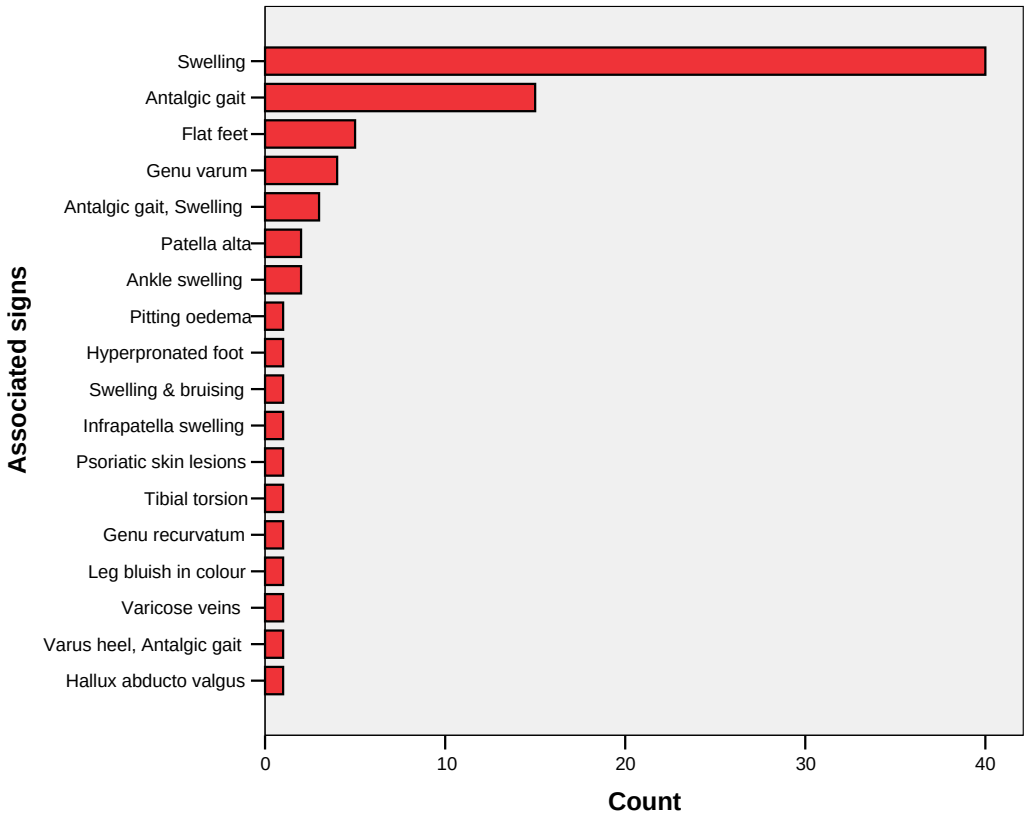

Figure 3b: Associated signs in patients with lower limb complaints (n=82)

4.2.4.4 History of trauma and blood pressure abnormalities

In total 17.9% of the extremities patients had a history of trauma. A higher percentage of the upper limb patients had a history of trauma (22.4%) than lower limb patients (14.7%). Similarly there was a higher percentage of upper limb patients with blood pressure abnormalities than lower limb patients. This information is shown in Table 12. Of the 40 upper limb patients with blood pressure abnormalities, 95% had high blood pressure and 5% had low blood pressure. Of the 37 lower limb patients with blood pressure problems, 86.5% had high blood pressure and 13.5% had low blood pressure.

Table 12: History of trauma and blood pressure abnormalities in extremities patients by site.

		Site					
		Upper limb		*Lower limb*		*Total*	
		Count	*%*	*Count*	*%*	*Count*	*%*
HISTORY OF TRAUMA	*No*	*229*	*77.6%*	*343*	*85.3%*	*572*	*82.1%*
	Yes	*66*	*22.4%*	*59*	*14.7%*	*125*	*17.9%*
BLOOD PRESSURE ABNORMALITY NOTED	*No*	*254*	*86.4%*	*365*	*90.8%*	*619*	*88.9%*
	Yes	*40*	*13.6%*	*37*	*9.2%*	*77*	*11.1%*

4.2.4.5 General examination abnormalities

Fifty–seven (8.2%) patients had abnormalities on general examination. Of these, 26 were upper limb patients and 31 were lower limb patients. The specific abnormalities are shown by site in Table 13 and 14.

Table 13: General examination abnormalities found in upper extremity patients (n=26)

	Frequency	*Percent*
Lymphadenopathy	*8*	*30.8*
Lipoma	*2*	*7.7*
Irregular heartbeat	*2*	*7.7*
Iliac fossa tenderness	*1*	*3.8*
High blood pressure	*1*	*3.8*
Hepatomegaly	*1*	*3.8*
Abdominal tenderness	*1*	*3.8*
Umbilical hernia	*1*	*3.8*
Ankle oedema	*1*	*3.8*

Abnormal gait	***1***	***3.8***
Varicose veins	***1***	***3.8***
Heberdens node, palmar erythema, cataract	***1***	***3.8***
Clubbing	***1***	***3.8***
Swelling of fingers	***1***	***3.8***
Eczema	***1***	***3.8***
Weakness of grip of hand	***1***	***3.8***
Total	***26***	***100.0***

Table 14: General examination abnormalities found in lower extremity patients (n=31)

	Frequency	***Percent***
Lymphadenopathy	***8***	***25.8***
Antalgic gait	***3***	***9.7***
Pitting oedema	***2***	***6.5***
Ankle oedema	***3***	***9.7***
Irregular heartbeat	***2***	***6.5***
Liver tenderness	***1***	***3.2***
Gynaecomastia and Flat foot	***1***	***3.2***
Pain on heels/toe walking	***1***	***3.2***
Hepatomegaly	***1***	***3.2***
Decreased breath sounds	***1***	***3.2***
Pain on knee flexion	***1***	***3.2***
Non-pitting oedema	***1***	***3.2***
Athletes foot	***1***	***3.2***
Hyperpronated foot	***1***	***3.2***
Clubbing	***1***	***3.2***
Varicose veins	***1***	***3.2***
Hallux abducto valgus	***1***	***3.2***
Aortic murmur	***1***	***3.2***
Total	***31***	***100.0***

4.2.5 Primary diagnosis

While up to three different diagnoses were made for some patients, the main diagnosis is shown in Tables 15 and 16. For upper limb patients the most common diagnosis was Myofasciitis (12.9%). The next most frequent was Supraspinatus tendonitis (7.8%), followed by Lateral epicondylitis (7.1%). In the case of lower limb patients, the most common diagnosis was Patellofemoral pain syndrome (12.2%) followed by Inversion ankle sprain (8.2%) and Myofasciitis (8.2%).

Table 15: Primary diagnosis of upper limb patients (n=295)

	Frequency	*Percent*
Myofasciitis	***38***	***12.9***
Supraspinatus tendonitis	***23***	***7.8***
Lateral epicondylitis	***21***	***7.1***
Biciptal tendonitis	***20***	***6.8***
Adhesive capsulitis	***16***	***5.4***
Muscle strain	***14***	***4.7***
Shoulder instability	***11***	***3.7***
Acromioclavicular joint sprain	***8***	***2.7***
Impingement syndrome	***7***	***2.4***
Rotator cuff tendonitis	***6***	***2.0***
Temporomandibular joint syndrome	***6***	***2.0***
De Quervain's tenosynovitis	***5***	***1.7***
Supraspinatus tendonitis & Bicipital tendonitis	***5***	***1.7***
Carpal tunnel syndrome	***5***	***1.7***
Acromioclavicular joint dysfunction	***5***	***1.7***
Medial Epicondylitis	***4***	***1.4***
Osteoarthritis	***4***	***1.4***
Glenohumeral capsulitis	***4***	***1.4***
Rheumatoid arthritis	***3***	***1.0***
Flexor tendonitis	***3***	***1.0***

No diagnosis	***3***	***1.0***
Extensor tendonitis	***3***	***1.0***
Avascular necrosis	***2***	***0.7***
Ganglion	***2***	***0.7***
Joint dysfunction	***2***	***0.7***
Brachialis tendonitis	***2***	***0.7***
Wrist sprain	***2***	***0.7***
Biceps tendonitis	***2***	***0.7***
Capsule strain	***2***	***0.7***
Biceps tendon rupture	***1***	***0.3***
Gout	***1***	***0.3***
Ulnar neuritis	***1***	***0.3***
Infraspinatus tendonitis	***1***	***0.3***
Scaphoid fracture	***1***	***0.3***
Ulnar & Median nerve neuropathy	***1***	***0.3***
Dislocation	***1***	***0.3***
Sternoclavicular joint subluxation	***1***	***0.3***
Thoracic spine dysfunction	***1***	***0.3***
Rotator cuff tear	***1***	***0.3***
Carpal dysfunction	***1***	***0.3***
Metacarpophlangeal joint overuse injury	***1***	***0.3***
Proximal interphalangeal joint contusion	***1***	***0.3***
Cervical facet syndrome	***1***	***0.3***
Bell's palsy	***1***	***0.3***
Ganglion cyst	***1***	***0.3***
Sternoclavicular joint sprain	***1***	***0.3***
Acromioclavicular joint fixation	***1***	***0.3***
Lymphadenopathy	***1***	***0.3***
Clicking shoulder	***1***	***0.3***
Shoulder sprain	***1***	***0.3***
Post-traumatic elbow dislocation	***1***	***0.3***
Acromioclavicular ligament sprain	***1***	***0.3***

Cubital tunnel syndrome	***1***	***0.3***
Carpal subluxation	***1***	***0.3***
Glenohumeral joint dislocation	***1***	***0.3***
Interphalangeal ligament sprain	***1***	***0.3***
Hand contusion	***1***	***0.3***
Brachial plexus neuralgia	***1***	***0.3***
Muscle tear	***1***	***0.3***
Idipathic pruritis	***1***	***0.3***
Unknown	***1***	***0.3***
Wrist fracture	***1***	***0.3***
Post-surgical metacarpophalangeal flexion restriction	***1***	***0.3***
Shoulder dysfunction	***1***	***0.3***
Elbow dislocation	***1***	***0.3***
Rotator cuff strain	***1***	***0.3***
Arthritis	***1***	***0.3***
Nerve root entrapment	***1***	***0.3***
Schapolunate dysfunction	***1***	***0.3***
Radial head dysfunction	***1***	***0.3***
Shoulder dislocation & impingement syndrome	***1***	***0.3***
Degeneration of Acromioclavicular joint	***1***	***0.3***
Metacarpophalangeal joint sprain	***1***	***0.3***
Extensor carpi radialis brevis tendonitis	***1***	***0.3***
Triangular fibrocartilage complex tear	***1***	***0.3***
Translocation of mandibular condyle	***1***	***0.3***
Periosteal bruising	***1***	***0.3***
Interphalangeal joint instability	***1***	***0.3***
Stress fracture	***1***	***0.3***
Shoulder subluxations	***1***	***0.3***
Neuropraxia	***1***	***0.3***
Trigeminal neuralgia	***1***	***0.3***
Chip fracture	***1***	***0.3***

Fracture of scaphoid	***1***	***0.3***
Muscle rupture	***1***	***0.3***
Post-surgical impingement syndrome	***1***	***0.3***
Anterior dislocation of Glenohumeral joint	***1***	***0.3***
Shoulder capsule tear	***1***	***0.3***
Joint fixation	***1***	***0.3***
Compartment syndrome	***1***	***0.3***
Degenerative joint disease	***1***	***0.3***
Ulnar nerve entrapment	***1***	***0.3***
Extensor & adductor pollicus tenosynovitis	***1***	***0.3***
Intercarpal sprain and dysfunction	***1***	***0.3***
Gamekeepers thumb	***1***	***0.3***
Shoulder capsule strain	***1***	***0.3***
Total	***295***	***100.0***

Table 16: Primary diagnosis of lower limb patients (n=402)

	Frequency	***Percent***
Patellofemoral pain syndrome	***49***	***12.2***
Inversion ankle sprain	***33***	***8.2***
Myofasciitis	***33***	***8.2***
Osteoarthritis	***28***	***7.0***
Plantar fasciitis	***17***	***4.2***
Iliotibial band syndrome	***13***	***3.2***
Achilles tendonitis	***13***	***3.2***
Medial collateral ligament sprain	***13***	***3.2***
Fat pad syndrome	***10***	***2.5***
Muscle strain	***8***	***2.0***
Unknown	***7***	***1.7***
Metatarsalgia	***6***	***1.5***

Patella tendonitis	***5***	***1.2***
Medial tibial stress syndrome	***5***	***1.2***
Infrapatella tendonitis	***5***	***1.2***
Ligament strain	***5***	***1.2***
Medial collateral ligament tear	***4***	***1.0***
Meniscal injury	***4***	***1.0***
Lateral mensicus injury	***3***	***0.7***
Anterior cruciate ligament injury	***3***	***0.7***
Iliotibial band friction syndrome	***3***	***0.7***
Lateral collateral ligament sprain	***3***	***0.7***
Sacroiliac syndrome	***3***	***0.7***
Hip joint capsulitis	***3***	***0.7***
Ankle sprain	***3***	***0.7***
Trochanteric bursitis	***3***	***0.7***
Suprapatella bursitis	***2***	***0.5***
Patella tendonosis	***2***	***0.5***
Sesamoiditis	***2***	***0.5***
Eversion ankle sprain	***2***	***0.5***
Hip strain	***2***	***0.5***
Hallux abducto valgus	***2***	***0.5***
Post-surgical ankle joint dysfunction	***2***	***0.5***
Cuboid syndrome	***2***	***0.5***
Mortons neuroma	***2***	***0.5***
Gastrocnemius muscle strain	***2***	***0.5***
Lateral collateral ligament tear	***2***	***0.5***
Patella tendinitis	***2***	***0.5***
Tarsal tunnel syndrome	***2***	***0.5***
Fracture of tibia + fibula	***2***	***0.5***
Hip bursitis	***2***	***0.5***
Avulsion fracture	***2***	***0.5***
Infrapatella bursitis	***2***	***0.5***

Medial meniscus tear	***2***	***0.5***
Psoriatic arthritis	***1***	***0.2***
Foot fixation	***1***	***0.2***
Adductor strain	***1***	***0.2***
Post traumatic ligamentous sprain	***1***	***0.2***
Degeneration of tibio-fibular joint	***1***	***0.2***
Gastrocnemius muscle tear	***1***	***0.2***
Vastus medialis muscle strain	***1***	***0.2***
Chondromalacia patella	***1***	***0.2***
Dislocation of toe	***1***	***0.2***
Biceps femoris strain	***1***	***0.2***
Hamstring strain	***1***	***0.2***
Tensor fascia lata syndrome	***1***	***0.2***
Hip joint contracture	***1***	***0.2***
Shin splints	***1***	***0.2***
Chronic vascular insufficiency	***1***	***0.2***
Knee pathology	***1***	***0.2***
Medial meniscus injury	***1***	***0.2***
Plica syndrome	***1***	***0.2***
Metatarsal joint sprain	***1***	***0.2***
Rectus femoris scar tissue	***1***	***0.2***
Heel spur	***1***	***0.2***
Muscle contusion	***1***	***0.2***
Peroneal tendonitis	***1***	***0.2***
Posterior tibial tendonitis	***1***	***0.2***
Heloma dura	***1***	***0.2***
Pes planus	***1***	***0.2***
Tibial fracture	***1***	***0.2***
Rigid flat foot	***1***	***0.2***
Ankle instability	***1***	***0.2***

Compartment syndrome	***1***	***0.2***
Anterior tibial ligament sprain	***1***	***0.2***
Patella instability	***1***	***0.2***
Retinacular ligament syndrome	***1***	***0.2***
Haematoma	***1***	***0.2***
Adductor spasm	***1***	***0.2***
Hamstring tear	***1***	***0.2***
Metatarsophalangeal joint sprain	***1***	***0.2***
Anterior tibial enthesopathy	***1***	***0.2***
Disc bulge	***1***	***0.2***
Subtalar joint restriction	***1***	***0.2***
Degeneration of ankle	***1***	***0.2***
Fibular head dysfunction	***1***	***0.2***
Quadriceps contusion	***1***	***0.2***
Sacroiliac syndrome	***1***	***0.2***
Tendonitis	***1***	***0.2***
Hamstring insertional tendonitis	***1***	***0.2***
Soleus syndrome	***1***	***0.2***
Tibial stress syndrome	***1***	***0.2***
Congenital hip dislocation	***1***	***0.2***
Avascular necrosis	***1***	***0.2***
Medial collateral ligament adhesions	***1***	***0.2***
Hip dysfunction	***1***	***0.2***
Pes anserine bursitis	***1***	***0.2***
Lateral meniscus tear	***1***	***0.2***
Nerve root entrapment	***1***	***0.2***
Bunions	***1***	***0.2***
Adhesions	***1***	***0.2***
Mallet toe	***1***	***0.2***
Prepatellar bursitis	***1***	***0.2***
Tibio-fibular dysfunction	***1***	***0.2***

Iliotibial band strain	***1***	***0.2***
Cruciate ligament rupture	***1***	***0.2***
Muscle dysfunction	***1***	***0.2***
Ankle and toe fracture	***1***	***0.2***
Leg Calve Perthe's disease	***1***	***0.2***
Medial mensicus injury	***1***	***0.2***
Iliotibial band contracture	***1***	***0.2***
Knee sprain	***1***	***0.2***
Extensor tendonitis	***1***	***0.2***
Tarsal dysfunction	***1***	***0.2***
Navicular dysfunction	***1***	***0.2***
Knee bursitis	***1***	***0.2***
Hip joint fixations	***1***	***0.2***
Post operative scar tissue	***1***	***0.2***
Patella tracking	***1***	***0.2***
Adductor and hamstring tendonosis	***1***	***0.2***
Foot fracture	***1***	***0.2***
Foot joint dysfunction	***1***	***0.2***
Osgood Schlatter's disease	***1***	***0.2***
Ankle dysfunction	***1***	***0.2***
Knee instability	***1***	***0.2***
Chondromalacia patella	***1***	***0.2***
Multiple foot fracture	***1***	***0.2***
Gastrocnemius myofasciitis	***1***	***0.2***
Total	***402***	***100.0***

4.2.6 Management protocol

4.2.6.1 Treatment modalities

Treatment protocols used are shown in Figure 4. Often several combinations of treatments were used on a patient. The most common was electro modalities which were used in 49.6% of the cases, followed by soft tissue mobilization (42.2%).

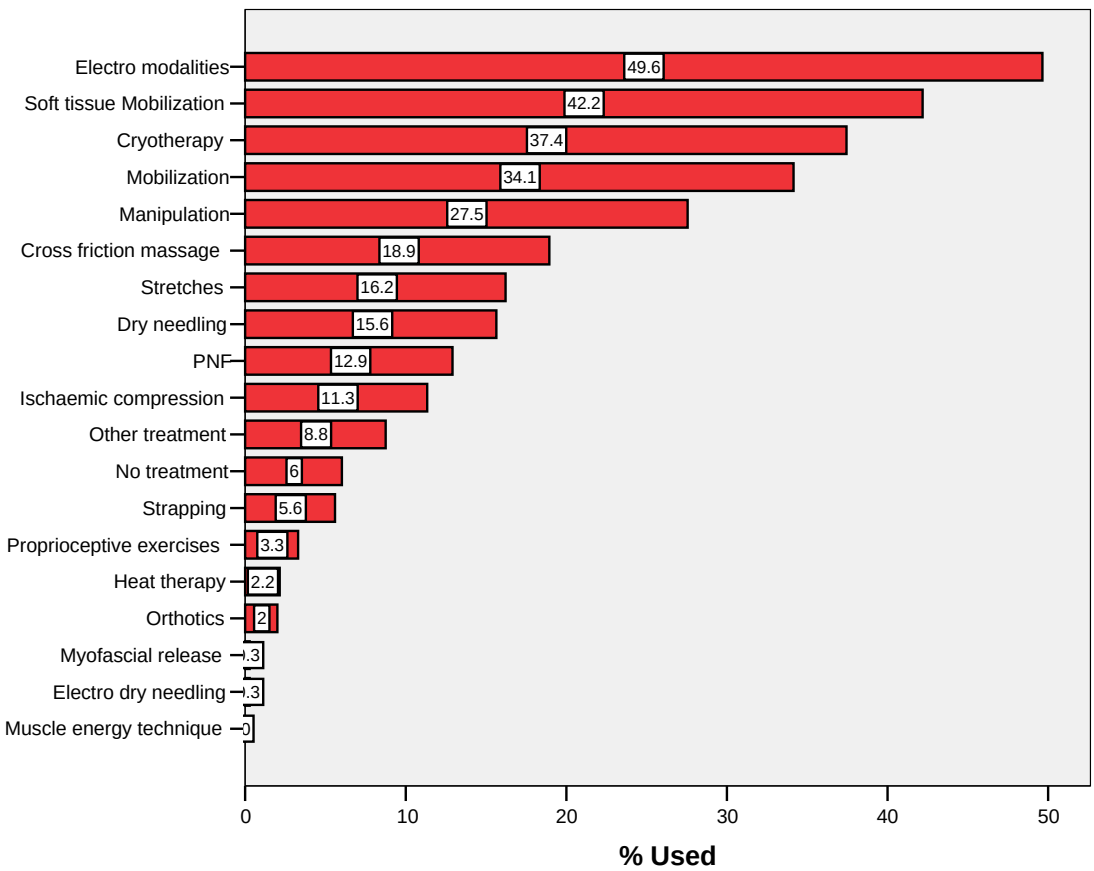

Figure 4: Percentage of times that each treatment was used

4.2.6.2 Contra-indications to treatment

Thirteen (13) contra-indications to treatment were identified (1.9%) and of these, eight (8) were to all treatments, and three (3) were to mobilisation and manipulation and two (2) were unknown. The reasons for contra-indications are shown in Table 17.

Table 17: Reasons for contra-indication to treatment (n=13)

	Frequency	***Percent***
View x-rays prior to treatment	***4***	***30.7***
Unknown	***4***	***30.7***
Possible fracture	***2***	***15.4***
High blood pressure	***2***	***15.4***
Nerve root entrapment	***1***	***7.7***
Total	***13***	***100.0***

4.2.6.3 Investigations

X-rays were the most common investigation (5.1% in upper limb and 4.7% in lower limb patients). The other investigations such as blood tests and MRI were very infrequently used.

Table 18: Investigations in extremities patients by site

	Site			
	Upper limb		***Lower limb***	
	Count	***%***	***Count***	***%***
Blood test	***2***	***.7%***	***3***	***.7%***
X-ray	***15***	***5.1%***	***19***	***4.7%***
MRI	***0***	***.0%***	***1***	***.2%***
Ultrasound	***1***	***.3%***	***0***	***.0%***

4.2.6.4 Joint of management

The area of location of management is shown in Tables 19 and 20 by site of injury. In upper limb patients the most common joint of management was the shoulder (18.6%). In lower limb patients it was the knee (23.9%).

Table 19: Joint of management in Upper limb patients (n=295)

	Frequency	*Percent*
None	***111***	***37.6***
Shoulder	***55***	***18.6***
Glenohumeral joint	***32***	***10.5***
Wrist	***17***	***5.7***
Elbow	***16***	***5.4***
Acromioclavicular joint	***16***	***5.4***
Temporomandibular joint	***7***	***2.4***
Interphalangeal joint	***6***	***2.0***
Thoracic spine	***5***	***1.7***
Radial head	***5***	***1.7***
Sternoclavicular joint	***4***	***1.4***
Carpals	***4***	***1.4***
Metacarpophalangeal joint	***3***	***1.0***
Hand	***3***	***1.0***
Thumb	***1***	***0.3***
Triquetrum	***1***	***0.3***
Sternocostal joint	***1***	***0.3***
Scaphoid	***1***	***0.3***
Rib	***1***	***0.3***
Cervical spine	***1***	***0.3***
Distal radio-ulnar joint	***1***	***0.3***
Forearm	***1***	***0.3***
Knee	***1***	***0.3***
Lunate	***1***	***0.3***
Trapezoid	***1***	***0.3***
Total	***295***	***100.0***

Table 20: Joint of management in lower limb patients (n=402)

	Frequency	*Percent*
None	***133***	***33.3***
Knee	***96***	***23.9***
Ankle	***29***	***7.2***
Foot	***25***	***6.2***
Patella	***20***	***5***
Hip	***19***	***4.7***
Talocrural	***13***	***3.2***
Subtalar	***11***	***2.7***
Sacroiliac joint	***10***	***2.5***
Superior tibio-fibular joint	***8***	***2***
Tibio-femoral joint	***5***	***1.2***
Tarsals	***4***	***1***
Inferior tibio-fibular joint	***4***	***1***
Fibular head	***3***	***0.7***
Cuboid	***3***	***0.5***
Interphalangeal joint	***2***	***0.5***
1st ray	***2***	***0.5***
Metatarsal joint	***2***	***0.5***
Intermetatarsal joint	***2***	***0.5***
Navicular	***1***	***0.2***
Leg	***1***	***0.2***
Lumbar facet joint	***1***	***0.2***
Cuneiform	***1***	***0.2***
Midtarsal	***1***	***0.2***
Total	***402***	***100.0***

4.2.6.5 Referrals

Twenty patients (2.9%) were referred to other practitioners, mostly due to high blood pressure. The most common other practitioners for referral were general practitioners (6, 30%) and orthopedic surgeons (3, 15%). This is shown in Table 21.

Table 21: Referral to other practitioners (n=20)

	Frequency	***Percent***
General practitioner	***6***	***30.0***
Orthopeadic surgeon	***3***	***15.0***
Biokinetist	***1***	***5.0***
Neurosurgeon	***1***	***5.0***
Orthotist	***1***	***5.0***
Physician	***1***	***5.0***
Vascular surgeon	***1***	***5.0***
Dermatologist	***1***	***5.0***
Unknown	***1***	***5.0***
Dentist	***1***	***5.0***
Pathologist	***1***	***5.0***
Hospital	***1***	***5.0***
Cardiologist	***1***	***5.0***
Total	***20***	***100.0***

4.2.6.6 Follow up consultations

Of the 697 extremity patients, 521 (74.7%) presented for follow up visits. The number of follow up visits in a 4 week period are shown in Table 22. The median number of follow up visits in those who were followed up, was 3, with an inter-quartile range from 1 to 4.

Table 22: Number of follow up visits in a 4 week period

	Frequency	*Percent*
0	***175***	***25.1***
1	***144***	***20.7***
2	***95***	***13.6***
3	***70***	***10.0***
4	***85***	***12.2***
5	***81***	***11.6***
6	***21***	***3.0***
7	***14***	***2.0***
8	***6***	***.9***
9	***1***	***.1***
10	***5***	***.7***
Total	***697***	***100.0***

4.2.7 New complaints

Of the upper limb patients, 49 (16.6%) had a new complaint, of which the most common site was the cervical spine (29.8%), followed by the lumbar (23.4%). This is shown in Figure 5.

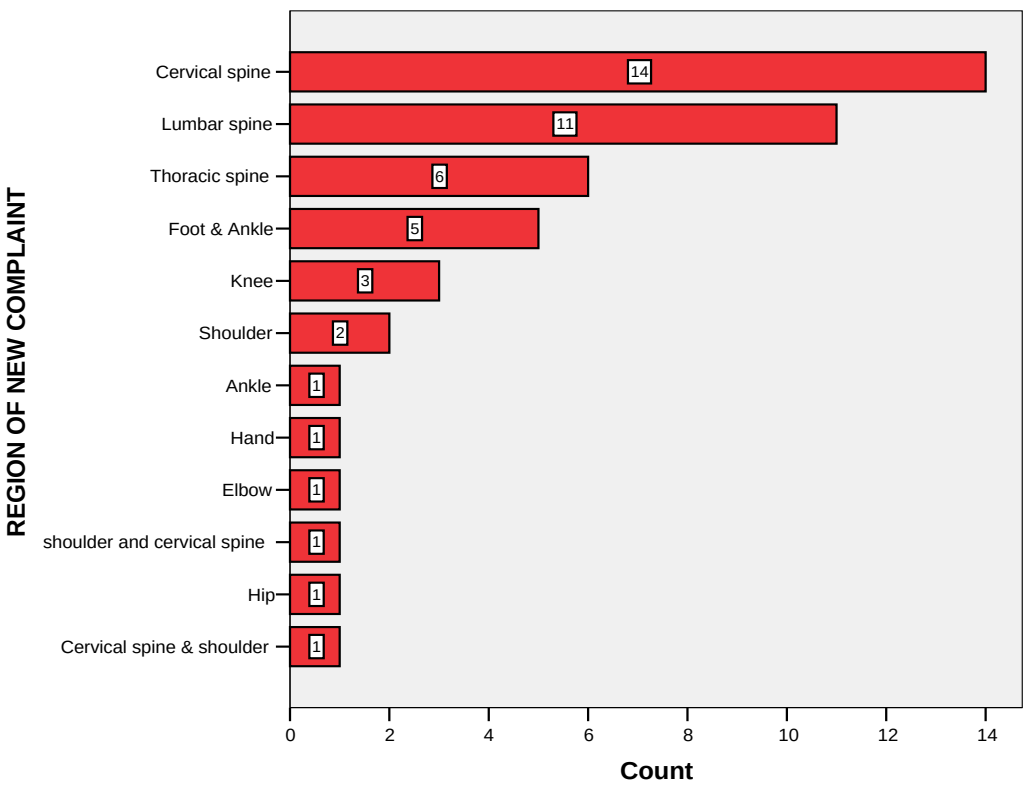

Figure 5: Region of new complaint in upper limb patients (n=49)

Of the lower limb patients, 52 (12.9%) had a new complaint, of which the most common site was the lumbar spine (30.2%), followed by the cervical spine (20.8%). This is shown in Figure 6.

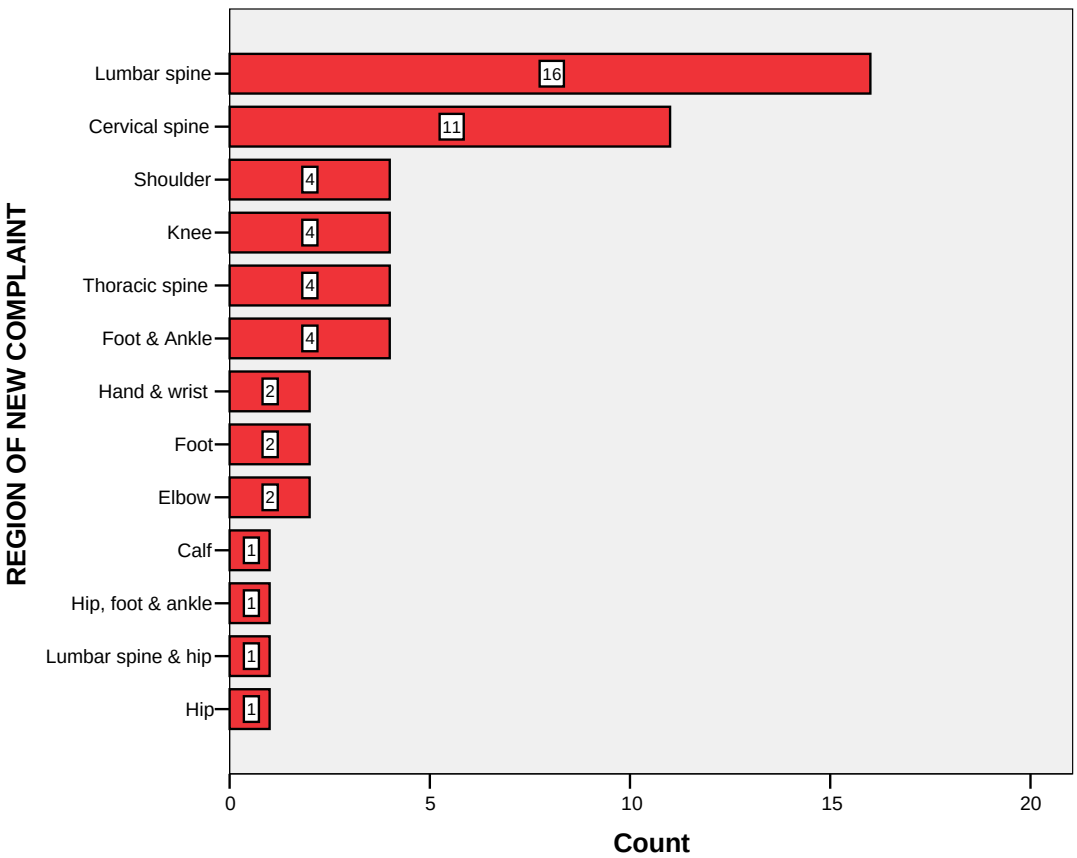

Figure 6: Region of new complaint in lower limb patients (n=52)

4.2.8 Consultation fees

The vast majority of patients paid the full fee for their consultations (95.1%). This is shown in Table 23.

Table 23: Consultation fee in extremities patients

	Frequency	*Percent*
Full fee	***663***	***95.1***
Fee reduction	***14***	***2.0***
No charge	***20***	***2.9***
Total	***697***	***100.0***

CHAPTER 5

DISCUSSION OF RESULTS

5.1 INTRODUCTION

This chapter discusses the results obtained through the statistical analysis of the data.

The sample size for the present study included a total of 7487 files from 1995 to 2005 which were extracted randomly from the clinic's records at the Durban University of Technology Chiropractic Day Clinic. From this, there were 702 files which met the inclusion criteria for upper and lower limb extremity complaints during this time period.

5.2 INTERPRETATION OF DATA

5.2.1 Prevalence and location of extremity complaints

The annual prevalence of extremity complaints were shown in Table 1 of chapter 4. The overall prevalence of extremity complaints from 1995 to 2005 was 9.38%. The lower limb sites were affected more frequently than the upper limb sites. Literature reveals that upper extremity musculoskeletal disorders are among the most common and costly work-related medical conditions (Hupert *et al*., 2004), however the findings of this study has shown that lower extremity musculoskeletal disorders can be equally prevalent.

Despite the focus of chiropractic primarily on the spine, Hoskins *et al*., (2006) documented the quantity of research conducted on extremity conditions and noted that extremity conditions made up 17.1% of chief complaints the third most common complaint next to the low back/pelvis (23.6%) and the neck (18.7%) surpassing facial pain and headaches (12%), midback (11.5%), wellness (8%) and non-musculoskeletal conditions (2.5%).

Pribicevic and Pollard (2005) reported that shoulder pain is the most common extra-spinal complaint encountered in primary care clinics, and in clinical frequency is surpassed only by low back and neck pain. However, the findings of this study revealed that of the overall extremity system, the most frequently

affected site was the knee (28.6%), followed by the shoulder (25.8%), and the foot (22.2%). The other areas were less frequently affected.

The findings of this study does however concur with current literature in that with regards to upper extremity disorders the shoulder is the most commonly affected region (Huisstede *et al*., 2006) and the knee is the most commonly affected region in lower extremity disorders (El-Metwally *et al*., 2006).

In the 10 year period from 1996 to 2005, the prevalence of extremity complaints was 9.8%. A statistically significant increase in prevalence between the first 5 years (1996 to 2000) and the second five years (2001-2005) was detected from 8.83% to 11.04%. We therefore reject the Null hypothesis (Ho) and accept the Alternate hypothesis (Ha) with respect to the prevalence of extremity conditions between 1995 and 2005.

Thus the increase in prevalence of extremity complaints over the latter five year period at the clinic could be due to an increase in the awareness of patients that were previously treated for spinal complaints and discovered that extremity complaints could also be treated through chiropractic. Thus establishing a specialist extremity injury service at the clinic may be of use.

5.2.2 Demographics

Since the prevalence in 1995 (n=5) was much lower than in the other years, and the cases were only taken from a portion of the year, inclusion of these cases would have biased the results. These cases were excluded from this point onward and the analysis was based on the 697 cases from 1996 to 2005.

5.2.2.1 Age

The age of the sample ranged from 4 years to 90 years. The mean age was 39.6 years. There was a statistically significant change in mean age between the first and second five year period and the mean age increased from the first to the second five year period.

The majority of patients that presented with extremity complaints were young and in the 20-29 year age group (30.9%). These results could be due to the

clinic being located at a tertiary institution and is therefore easily accessible to students.

5.2.2.2 Gender

There was no difference in the gender distribution between the first 5 years and the second 5 years. Overall there were 62.1% males and 37.9% females in the sample, and this proportion did not change significantly over the years. The finding of this study however differs from current literature which indicates that the largest proportions of the population that visit chiropractors, tend to be female (Morschhauser *et al*., 2003). This was further emphasized by Coulter and Shekelle (2005) who carried out a descriptive analysis of chiropractic in North America They revealed that the majority of patients that visited chiropractors were predominantly women.

5.2.2.3 Occupation

343 participants were employed. The other 354 were students, scholars, self employed, pensioners, or their occupation was not recorded. Of the 343 employed participants, only 137 (19.7% of the whole sample) were employed in occupations that were classified as active (e.g. housewife, artisan, professional sports person etc.) while the majority had sedentary jobs which mostly involved office work (294, 42.2% of the whole sample). These results are consistent with the findings of Walsh (1992) where the largest occupation group that attended the chiropractic teaching clinics was non-manual, followed by light manual and heavy manual being the smallest group. Nyiendo *et al*., (1989) also noted that a higher percentage of patients from the non-manual labour category (e.g. clerical, professional) attended teaching clinics.

There was a borderline non significant difference in the distribution of employment over the two five year periods.

5.2.3 Pre-existing medical conditions

One hundred and eighty-six cases (26.7%) had a pre-existing medical condition. Cardiac conditions were the most frequent type (9.2% in upper limb

cases and 8.2% in lower limb cases), while respiratory conditions (7.5% in upper limb and 5.7% in lower limb) were also common.

5.2.4 Presenting conditions

5.2.4.1 Main complaint

The findings of this study indicated that of upper limb complaints, the most frequent complaint was shoulder pain (54.9%), followed by elbow pain (13.2%). This concurs with the findings of Pribicevic and Pollard (2005), where shoulder pain was the most common extra-spinal complaint encountered in primary care clinics.

With regards to the lower limb complaints, the most common complaint was knee pain (44.3%), followed by ankle pain (16.9%). These findings concur with Heintjies *et al*., (2005) in that knee complaints are amongst the most frequent reasons for consulting primary care physicians.

5.2.4.2 Aetiology

In most cases for both upper and lower limb injuries, the etiology of the main complaint was unknown (53.9% of upper limb and 53% of lower limb), while the most common known cause was sport (19.7% of upper limb and 25.4% of lower limb), followed by fall or accident (14.9% of upper limb and 14.4% of lower limb), and medical or surgical causes (3.1% of upper limb and 2.5% of lower limb). The finding of this study does share some similarities with Walsh (1992). He noted the cause of the chief presenting complaint in his study involving teaching clinics. Of the chief complaints 44.9% were of an unknown aetiology whereas trauma related aetiologies made up 28% of cases and sports injuries were 10.2%.

5.2.4.3 Associated signs and symptoms

Only 142 patients (20.3%) presented with associated symptoms, of these 69 patients had upper extremity complaints and 73 had lower extremity complaints. According to Huisstede *et al*., (2006) most of the upper extremity disorders are characterised by pain, discomfort or tingling in the upper extremity. The findings of this study exhibit some similarities to this as the most

common symptom in those with upper limb complaints was numbness (15.9%) followed by parasthesia (14.5%) and weakness (13%).
In patients with lower limb problems, the most common associated symptom was calf pain (11%), followed by numbness (9.6%) and lumbo-sacral pain (9.6%).

108 (15.5%) patients had associated signs, 26 with upper limb complaints, and 82 with lower limb complaints. The most common associated sign was swelling for both the upper and lower limb patients (50% and 48.8% respectively).

5.2.4.4 History of trauma

In total 17.9% of the extremities patients had a history of trauma. A higher percentage of the upper limb patients had a history of trauma (22.4%) than lower limb patients (14.7%).

5.2.4.5 Blood pressure abnormalities

Similarly there was a higher percentage of upper limb patients with blood pressure abnormalities than lower limb patients. Of the 40 upper limb patients with blood pressure abnormalities, 95% had high blood pressure and 5% had low blood pressure. Of the 37 lower limb patients with blood pressure problems, 86.5% had high blood pressure and 13.5% had low blood pressure.

5.2.4.6 General examination abnormalities

Fifty–seven (8.2%) patients had abnormalities on general examination of which lymphadenopathy was the most common finding.

5.2.5 Primary diagnosis

For upper limb patients the most common diagnosis was Myofasciitis (12.9%). The next most frequent was Supraspinatus tendonitis (7.8%), followed by Lateral epicondylitis (7.1%).
In the case of lower limb patients, the most common diagnosis was Patellofemoral pain syndrome (12.2%) followed by Inversion ankle sprain (8.2%) and Myofasciitis (8.2%). These findings concur with Dixit *et al*., (2007) in

that Patellofemoral pain syndrome is the most common diagnosis in outpatients presenting with knee pain

5.2.6 Management protocols

5.2.6.1 Treatment modalities

Chiropractic treatment of conditions primarily involves joint manipulation. According to Nyiendo and Haldeman (1986) reported on interns' practice activities at a teaching clinic and revealed that spinal manipulation was the treatment of choice for 90% of conditions whereas physical modalities were used only 33% of the time. Other treatment methods included soft-tissue manipulation (25%), trigger point therapy (21%), nutritional counseling (17%), exercise instructions (16%) and patient education (13%). In the current study several combinations of treatments were noted. The most common was electro modalities which were used in 49.6% of the cases, followed by soft tissue mobilisation (42.2%). These findings differ significantly from the available literature on extremity conditions as documented by Hoskins *et al*., (2006) in that, 46.8% of patients received extremity joint manipulation as part of their treatment.

5.2.6.2 Contra-indications to treatment

Thirteen (13) contra-indications to treatment were identified (1.9%) and of these, eight (8) were to all treatments, and three (3) were to mobilisation and manipulation and two (2) were unknown.

5.2.6.3 Investigations

X-rays were the most common investigation (5.1% in upper limb and 4.7% in lower limb patients). This concurs with Mootz *et al*., (2005) where x-rays were the most commonly used diagnostic investigation. Other investigations in the current study such as blood tests and MRI were very infrequently used.

5.2.7 Follow up consultations

Of the 697 extremity patients, 521 (74.7%) presented for follow up visits. The median number of follow up treatments in those who were followed up was 3, with an inter-quartile range from 1 to 4.

5.2.8 Referrals

Twenty patients (2.9%) were referred to other practitioners, mostly due to high blood pressure. The most common other practitioners for referral were general practitioners (6, 30%) and orthopedic surgeons (3, 15%). Chiropractic interns are taught diagnostic skills which allow them to carry out physical examinations of patients as well diagnose conditions. Patients are therefore commonly referred out of the clinic to the appropriate practitioner if abnormalities that are found on examination are not within the management scope of chiropractic

5.2.9 New complaint

Of the upper limb patients, 49 (16.6%) had a new complaint, of which the most common site was the cervical spine (29.8%), followed by the lumbar spine (23.4%).

Of the lower limb patients, 52 (12.9%) had a new complaint, of which the most common site was the lumbar spine (30.2%), followed by the cervical spine (20.8%).

5.2.10 Consultation fees

The vast majority of patients paid the full fee for their consultations (95.1%). A handful of patients were treated free of charge and pensioners and unemployed patients were charged a reduced fee.

5.3 Conclusion

In the 10 year period from 1996 to 2005, the prevalence of extremity complaints was 9.8%. A statistically significant increase in prevalence between the first 5 years (1996 to 2000) and the second five years (2001-2005) was detected, from 8.83% to 11.04%. We therefore reject the Null hypothesis (Ho) and accept

the Alternate hypothesis (Ha) with respect to the prevalence of extremity conditions between 1995 and 2005.

There was a statistically significant change in mean age between the first and second five year period and the mean age increased from the first to the second five year period.
There was no difference in the gender distribution between the first five years and the second five years.
There was a borderline non significant difference in the distribution of employment over the two five year periods.
We can therefore accept the Alternate hypothesis (Ha) with respect to there being a shift in the mean age between the first and second five year period. We can accept the Null hypothesis (Ho) with respect to there being no difference in gender and occupation distribution between the first and second five year period.

The results of this study bear some similarity to present literature available, however, these findings are based on patients that presented to this clinic over a decade and thus may not be a true reflection of the general population. Not many studies have been documented which deal exclusively with patients attending chiropractic-teaching clinics, as a result this study attempted to provide an updated descriptive analysis of the extremity cases on record at the Durban University of Technology Chiropractic Day Clinic from 1995 to 2005.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

From the findings of this study the following conclusions were drawn:

- A statistically significant increase in prevalence of extremity complaints between the first 5 years (1996 to 2000) and the second five years (2001-2005) was detected.
- Of the overall extremity system, the most frequently affected site was the knee, followed by the shoulder and the foot.
- Analysis of patient demographics revealed that the majority age group that presented with extremity complaints was between 20-29 years of age with males outnumbering females.
- The most common reported presenting condition of the upper extremity was shoulder pain (54.9%) and for the lower extremity, knee pain (44.3%). The most common diagnosis of the upper extremity was Myofasciitis whereas for the lower extremity Patellofemoral pain syndrome was most common.
- The most common treatment protocol used was electro modalities which was followed by soft tissue mobilisation. Thirteen contra-indications to treatment were identified.
- Subsequent to the treatment of the upper limb complaints, 49 had a new complaint, of which the most common site was the cervical spine and of the lower limb complaints, 52 had a new complaint, of which the most common site was the lumbar spine.

These results indicate that the treatment of extremity conditions through chiropractic is on the rise. Equal emphasis should therefore be placed on the treatment non-spinal conditions. Within the teaching clinic setting it may be of use to implement a quota system with regards to the treatment of extremity and spinal conditions. In this way students can be exposed to extremity conditions more often and gradually gain experience in treating these conditions.

6.2 RECOMMENDATIONS

In this study, the author is of the opinion the following are recommended to gain further information on the teaching clinic setting:

- Future studies should compare chiropractic teaching clinics within the country as well as abroad. Ideas can be shared between institutions on how to further improve on the chiropractic teaching clinic setting.
- The upper and lower extremity system should be analysed separately with a larger sample size for each in order to obtain more meaningful results.
- Within this study a large amount of data was gathered of which some had no impact on the overall outcome of the study. Future studies should therefore focus on developing a more refined data collection tool in order to extract information that is of significance to the study.
- As there is a lack of research on the management of extremity within chiropractic (Hoskins *et al*., 2006), one can focus on the prevalence and management of extremity conditions within chiropractic teaching clinics as compared to private chiropractic practice.

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Internet sites

http://en.wikipedia.org/wiki/Teaching_clinic

Appendix 1

GENERAL TEMPLATE

FILE CODE

DATE OF 1ST VISIT	
MONTH	**YEAR**

AGE (@1st visit)

GENDER	
MALE	1
FEMALE	2

RACE GROUP	
UNKNOWN/UNSURE	0
OTHER: SPECIFY	1
BLACK	2
INDIAN	3
WHITE/COLOURED	4

OCCUPATION

REASON FOR VISIT	Y/N
REFERRAL	
SELF- REFERRAL	
GENERAL CHECK-UP	
SECOND OPINION	
OTHER, SPECIFY:	

ABNORMALITIES FOUND ON GENERAL EXAM	
YES	1
NO	0
IF YES SPECIFY:	

CONSULTATION FEES	Y/N
FULL PAYMENT	
FEE REDUCTION	
NO CHARGE	

HISTORY OF PRE-EXISTING MEDICAL CONDITION/S	
YES	1
NO	0
IF YES SPECIFY:	

HISTORY OF TRAUMA	
YES	1
NO	0
IF YES SPECIFY:	

VITALS	
HEIGHT:	
WEIGHT:	
B.M.I	

BLOOD PRESSURE ABNORMALITY NOTED	
YES	1
NO	0
IF YES SPECIFY:	
HIGH	1
LOW	2

PATIENT PARTICIPATION IN EXTREMITY RESEARCH	
YES	1
NO	0
SPECIFY:	

KEY	
YES (Y)	1
NO (N)	0
HIGH	1
LOW	2

Appendix 2

TMJ TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
CERVICAL SPINE PAIN	
CARDIOVASCULAR SXS	
EAR PAIN	
DYSPHAGIA	
HEADACHES	
NUMBNESS	
PARASTHESIA	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS	Y/N
PARALYSIS	
MALOCCLUSION	
DEVIATION OF MANDIBLE	
NORMAL TONGUE MOVEMENT	
OTHER	

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MYOFASCIAL RELEASE	
PNF STRETCHING	
SOFT TISSUE MOBILISATION	

ASSOCIATED SIGNS SPECIFY OTHER

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS: SPECIFY SPECIALIST

REASON FOR REFERRAL

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

ANY NEW COMPLAINTS	
YES	1
NO	0

IF NEW COMPLAINT DONE: SPECIFY REGION

FINAL DIAGNOSIS

Appendix 3

SHOULDER TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
CERVICAL SPINE PAIN	
CARDIOVASCULAR SXS	
NUMBNESS	
PARATHESIA	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS- SPECIFY

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE MOBILISATION	
STRAPPING	

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS: SPECIFY SPECIALIST

REASON FOR REFERRAL

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

ANY NEW COMPLAINTS	
YES	1
NO	0

IF NEW COMPLAINT DONE: SPECIFY REGION

FINAL DIAGNOSIS

Appendix 4

ELBOW TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
SHOULDER PAIN	
HAND & WRIST PAIN	
CERVICAL SPINE PAIN	
CARDIOVASCULAR SXS	
NUMBNESS	
PARASTHESIA	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS- SPECIFY

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE	
STRAPPING	

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS: SPECIFY SPECIALIST

REASON FOR REFERRAL

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

ANY NEW COMPLAINTS	
YES	1
NO	0

IF NEW COMPLAINT DONE: SPECIFY REGION

FINAL DIAGNOSIS

Appendix 5

HAND AND WRIST TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
CERVICAL SPINE PAIN	
CARDIOVASCULAR SXS	
SHOULDER PAIN	
ELBOW PAIN	
NUMBNESS	
PARATHESIA	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS	Y/N
VASOMOTOR CHANGES	
MUSCLE WASTING	
OTHER	

ASSOCIATED SIGNS-SPECIFY OTHER

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
ORTHOTICS	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE MOBILISATION	
STRAPPING	

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	0
OTHER	1
BLOOD TESTS	2
BONE MINERAL DENSITY	3
BONE SCAN	4
CT SCAN	5
ECG	6
MRI	7
ULTRASOUND	8
X-RAYS	9

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS:
SPECIFY SPECIALIST

REASON FOR REFERRAL

ANY NEW COMPLAINTS	
YES	1
NO	0

IF NEW COMPLAINT DONE: SPECIFY REGION

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

FINAL DIAGNOSIS

Appendix 6

HIP TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
LUMBOSACRAL PAIN	
THIGH PAIN	
VISCERAL PAIN	
NUMBNESS	
PARATHESIA	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS	Y/N
HIP FLEXION CONTRACTURE	
LUMBAR LORDOSIS	
SCOLIOSIS	
OTHER	

ASSOCIATED SIGNS-SPECIFY OTHER

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE MOBILISATION	

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS: SPECIFY SPECIALIST

REASON FOR REFERRAL

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

ANY NEW COMPLAINTS
YES
NO

IF NEW COMPLAINT DONE: SPECIFY REGION

FINAL DIAGNOSIS

Appendix 7

KNEE TEMPLATE

PRESENTING COMPLAINT

ASSOCIATED DIAGNOSIS

AETIOLOGY OF CHIEF COMPLAINT

CONCOMMITANT DIAGNOSIS

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
HIP PAIN	
LUMBOSACRAL PAIN	
THIGH/CALF PAIN	
FOOT/ANKLE PAIN	
NUMBNESS	
PARASTHESIA	

DIAGNOSIS: SPECIFY

ASSOCIATED SYMPTOMS: SPECIFY OTHER

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE MOBILISATION	
STRAPPING	

ASSOCIATED SIGNS	Y/N
GENU VARUM	
GENU VALGUM	
GENU RECURVATUM	
TIBIAL TORSION	
PATELLA ALTA	
PATELLA BAJA	
OTHER	

JOINT OF MANAGEMENT

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

ASSOCIATED SIGNS-SPECIFY OTHER

REFERRALS	
YES	1
NO	0

ANY NEW COMPLAINTS	
YES	1
NO	0

IF YES TO REFERRALS: SPECIFY SPECIALIST

IF NEW COMPLAINT DONE: SPECIFY REGION

REASON FOR REFERRAL

FINAL DIAGNOSIS

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

Appendix 8

FOOT & ANKLE TEMPLATE TEMPLATE

PRESENTING COMPLAINT

AETIOLOGY OF CHIEF COMPLAINT

ASSOCIATED SYMPTOMS	Y/N
UNKNOWN	
OTHER	
LUMBOSACRAL PAIN	
THIGH/ CALF PAIN	

ASSOCIATED SYMPTOMS: SPECIFY OTHER

ASSOCIATED SIGNS- SPECIFY

ASSOCIATED DIAGNOSIS

CONCOMMITANT DIAGNOSIS

DIAGNOSIS: SPECIFY

TREATMENT MODALITIES	Y/N
UNKNOWN	
OTHER	
NO TREATMENT	
CROSS FRICTION MASSAGE	
CRYOTHERAPY	
DRY NEEDLING	
ELECTRO-DRY NEEDLING	
ELECTRO-MODALITIES	
HEAT THERAPY	
MANIPULATION	
MOBILISATION	
MUSCLE ENERGY TECHNIQUE	
MYOFASCIAL RELEASE	
ORTHOTICS	
PNF STRETCHING	
PROPRIOCEPTIVE EXERCISE	
SOFT TISSUE MOBILISATION	
STRAPPING	

JOINT OF MANAGEMENT

CONTRA-INDICATION TO TREATMENT	
YES	1
NO	0

IF YES TO CONTRA-INDICATION TO TREATMENT: SPECIFY MODALITY

REASON FOR CONTRA-INDICATION TO TREATMENT MODALITY

INVESTIGATIONS	Y/N
UNKNOWN	
OTHER	
BLOOD TESTS	
BONE MINERAL DENSITY	
BONE SCAN	
CT SCAN	
ECG	
MRI	
ULTRASOUND	
X-RAYS	

REFERRALS	
YES	1
NO	0

IF YES TO REFERRALS:
SPECIFY SPECIALIST

REASON FOR REFERRAL

FOLLOW-UP CONSULTATION	
YES	1
NO	0
IF YES:SPECIFY FREQUENCY OF CONSULTS OVER 4 WEEKS	

ANY NEW COMPLAINTS	
YES	1
NO	0

IF NEW COMPLAINT DONE: SPECIFY REGION

FINAL DIAGNOSIS

Appendix 9

DURBAN INSTITUTE OF TECHNOLOGY

Patient Name:	***File #:***	***Page:***
Date: ***Visit:*** ***Intern:*** ***Attending Clinician:*** ***Signature:***		
S: ***Numerical Pain Rating Scale (Patient)*** ***Intern Rating*** ***A:*** ***Least 0 1 2 3 4 5 6 7 8 9 10 Worst*** ☐ ***0:*** ***P:*** ***E:*** ***Special attention to:*** ***Next appointment:***		
Date: ***Visit:*** ***Intern:*** ***Attending Clinician:*** ***Signature:***		
S: ***Numerical Pain Rating Scale (Patient)*** ***Intern Rating*** ***A:*** ***Least 0 1 2 3 4 5 6 7 8 9 10 Worst*** ☐ ***O:*** ***P:*** ***E:*** ***Special attention to:*** ***Next appointment:***		

Appendix10

DURBAN INSTITUTE OF TECHNOLOGY
CHIROPRACTIC DAY CLINIC
CASE HISTORY

Patient: _____ Date: _____

File #: _____ Age: _____
Sex : _____ Occupation: _____

Intern: _____ Signature: _____

FOR CLINICIANS USE ONLY:
Initial visit
Clinician: Signature:

Case History:

Examination:

Previous: Current:

X-Ray Studies:

Previous: Current:

Clinical Path. lab:

Previous: Current:

CASE STATUS:

PTT:	Signature:	Date:

CONDITIONAL:
Reason for Conditional:

Signature: Date:

Conditions met in Visit No:	Signed into PTT:	Date:
Case Summary signed off:		Date:

Intern's Case History:

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

3. Present Illness:

	Complaint 1	Complaint 2
Location Onset : Initial: Recent: Cause: Duration Frequency Pain (Character) Progression Aggravating Factors Relieving Factors Associated S & S Previous Occurrences Past Treatment Outcome:		

4. Other complaints:

5. Past medical history:

- General health status
- Childhood llnesses
- Adult Illnesses
- Psychiatric Illnesses
- Accidents/Injuries
- Surgery
- Hospitalisations

6. Current health status and life-style:

- Allergies
- Immunizations
- Screening Tests incl. x-rays
- Environmental Hazards (Home, School, Work)
- Exercise and Leisure
- Sleep Patterns
- Diet
- Current Medication
- Analgesics/week:
- Tobacco
- Alcohol
- Social Drugs

7. Immediate Family Medical History:

- Age
- Health
- Cause of Death
- DM
- Heart Disease
- TB
- Stroke
- Kidney Disease
- CA
- Arthritis
- Anaemia
- Headaches
- Thyroid Disease
- Epilepsy
- Mental Illness
- Alcoholism
- Drug Addiction
- Other

8. Psychosocial history:

- Home Situation and daily life
- Important experiences
- Religious beliefs

9. Review of Systems:

- General
- Skin
- Head
- Eyes
- Ears
- Nose/sinuses

- Mouth/throat
- Neck
- Breasts
- Respiratory
- Cardiac
- Gastro-intestinal
- Urinary
- Genital
- Vascular
- Musculoskeletal
- Neurologic
- Haematological
- Endocrine
- Psychiatric

Appendix 11

Durban Institute of Technology

PHYSICAL EXAMINATION: SENIOR

Patient Name : _____ **File no :**_____ **Date :**_____

Student : **Signature :**

VITALS:				
Pulse rate:			Respiratory rate:	
Blood pressure:	R	L	Medication if hypertensive:	
Temperature:			Height:	
Weight:	Any recent change? Y / N		If Yes: How much gain/loss	Over what period

GENERAL EXAMINATION:		
General Impression		
Skin		
Jaundice		
Pallor		
Clubbing		
Cyanosis (Central/Peripheral)		
Oedema		
Lymph nodes	Head and neck	
	Axillary	
	Epitrochlear	
	Inguinal	
Pulses		
Urinalysis		

SYSTEM SPECIFIC EXAMINATION:
CARDIOVASCULAR EXAMINATION
RESPIRATORY EXAMINATION
ABDOMINAL EXAMINATION
NEUROLOGICAL EXAMINATION
COMMENTS

Clinician: **Signature :**

Appendix 12

DURBAN INSTITUTE of TECHNOLOGY

TMJ REGIONAL EXAMINATION

Patient: _____ File no: _____ Date: _____

Student: _____ Signature: _____

Clinician: _____ Signature: _____

.....

Observation

Posture of C-spine and head (bipupital, otic and occlusive lines parallel) _____

Facial symmetry _____ Paralysis _____

Malocclusion (crossbite or overbite) _____

Deviation of mandible on opening or closing mouth _____

Normal bulging of masseters when patient bites down _____

Normal movement of tongue _____

Palpation

		Right	Left
Cervical spine	Facet joints		
	Muscles		
	Lymph Nodes		
Mandibular condyles: Tenderness			
Mandible			
Hyoid bone (normal movement on swallowing)			
Mastoid processes			
Movement (palpate with fingers in EAM)	smooth		
	symmetrical		
	pain / tenderness		
Masseters			
Temporalis			
Thyroid cartilage and gland			
Parotid gland			
Teeth and gums			

Active Movements

Cervical spine: Flexion _____ Extension _____

Lateral flexion _____ Rotation _____

Opening the mouth: Deviation? _____

Functional opening (2-3 flexed PIP joints) _____

Closing the mouth: Deviation? _____

Resting position / Freeway Space (2-4mm) _____

Protrusion of mandible: _____

Retraction of mandible: _____

Lateral deviation of mandible: _____

Resisted Isometric Movements (perform with TMJ in resting position)

Opening (depression) _____

Closing (elevation, occlusion) _____

Lateral deviation _____

Joint Play Movements

Inferior distraction (tissue stretch) _____

Special Tests

Chovstek Test (facial nerve pathology) _____

Auscultation of TMJ's _____

Reflex

Jaw reflex (CN 5) _____

Appendix 13

SHOULDER REGIONAL EXAMINATION

DURBAN UNIVERSITY *of* TECHNOLOGY

Patient: ..... File No: ..... Date: .....

Intern: .....Signature: .....

Clinician: .....Signature: .....

Observation

Posture		S-C Joints	
Skin		Clavicles	
Swelling		A-C Joints	
Shoulder levels		Scapulae	
Comments			

Palpation

S-C Joint:		SCM:	Scalenes:
Sternum:		Ribs and costal cartridge:	
Clavicle:		Coracoid process:	
A-C Joint:		Acromion:	
Greater Tuberosity:			
Lesser Tuberosity:			
Intertubercular (bicipital groove):			
Trapezius:		Deltoid:	
Biceps:		Triceps:	
Supraspinatus insertion:			
Musculotendinous portion of supraspinatus:			
Axilla:	Lymph nodes:		
	Brachial artery:		
	Serratus anterior (medial wall):		
	Pectoralis major (anterior wall):		
	Lattisimus dorsi (posterior wall):		
Scapula	Borders:	Spine:	
	Supraspinous fossa:		
	Infraspinous fossa:		
Cervico-thoracic spine:			

Active Movements (note ROM and pain)

Elevation through abduction (170-180°):	
Painful arc with abduction:	
Elevation through forward flexion (160-180°):	
Elevation through scapula plane (170-180°):	
Lateral rotation (80-90°):	Medial rotation (60-100°):
Extension (50-60°):	Adduction (50-75°):
Horizontal adduction/abduction (130°):	
Circumduction (200°):	
Apley's Scratch:	

Passive movements (note end-feel, ROM and pain)

Elevation through abduction (bone to bone or tissue stretch).....
Elevation through forward flexion (tissue stretch).....
Lateral rotation (tissue stretch).....
Medial rotation (tissue stretch).....
Extension (tissue stretch).....
Adduction (tissue approximation) .....
Horizontal adduction (tissue stretch or approximation).....
Horizontal abduction (tissue stretch).....
Quadrant Test.....

Resisted Isometric Movements (note strength and pain)

Flexion		Medial rotation	
Extension		Lateral Rotation	
Adduction		Elbow flexion	
Abduction		Elbow extension	

Joint Play Movements (and motion palpation)

SC Joint	Supero-inferior (shrug shoulder with arm at side):
	Horizontal add/abduction (arm abducted 90°):
AC Joint	A-P Shear:
	Supero-inferior shear:
Scapula	Normal scapulo-humeral rhythm?:
	General mobility of scapula:

Glenohumeral Joint

Lateral movement of humeral head _____
Inferior movement of humeral head (Caudal glide)(50°) _____
Anterior movement of humeral head (P-A glide) (25°) _____
Posterior shear of humeral head (A-P glide) **>50%** At 10° flexion _____
At 90° flexion _____
Backward glide of humeral head in abduction _____
Long-axis distraction of humeral head in abduction _____
Downward and backward (S-I → A-P) _____
Outward and backward (med-lat → A-P _____
External rotation of humeral head _____
Internal rotation of humeral head

Instability Tests

1. Anterior Instability Tests

	R			L		
	Pos	Neg	n/a	Pos	Neg	n/a
Anterior drawer Test						
Rowe Test						
Fulcrum Test						
Apprehension (crank) Test						
Clunk Test (tear of labrum)						
Rockwood Test						

2. Posterior Instability Tests

	Pos	Neg	n/a	Pos	Neg	n/a
Posterior Apprehension Test						
Norwood Stress Test						
Push-pull Test						
Jerk Test						

3. Inferior and Multi-directional instability tests

	Pos	Neg	n/a	Pos	Neg	n/a
Inferior Shoulder Instability Test						
Feagin Test (antero-inferior instability)						

A-C Joint Stress Test: _____

S-C Joint Stress Test: _____

Tests for Muscle or Tendon Pathology

1.	Speed's Test (bicipital tendonitis)	
2.	Gilchrest Sign (bicipital tendonitis)	
3.	Supraspinatus Test (supraspinatus tendonitis)	
4.	Hawkins-Kennedy Impingement Test (supraspinatus tendonitis)	
5.	Drop –arm Test (rotator cuff tear)	
6.	Impingement Test	
7.	Pectoralis Major Contracture Test	
8.	Ludington's Test (rupture of long head of biceps)	

Tests for neurological function

Brachial Plexus Tension Test			Radial Nerve										
			Median Nerve										
Tinel's Sign (Scalene triangle)													
Dermatones	C4		C5		C6		C7		C8		T1		T2
Reflexes	Biceps(C5/6)						Triceps (C7/8)						

Thoracic Outlet Syndrome Tests

Adson's Test		Halstead's Test	
Costoclavicular Test		Eden's Test (cervical rib)	
Hyperabduction Test		Roos Test	
Allen's Test			

Appendix 14

ELBOW REGIONAL EXAMINATION

Patient: _____ File No.: _____ Date: _____
Intern / Resident: _____ Signature: _____
Clinician: _____ Signature: _____

OBSERVATION:

- Posture and willingness to move _____
- Carrying angle (anatomical position) _____
- Colour and texture of skin _____
- Bony and soft tissue contours _____
- Swelling _____
- Position of function (triangle sign) _____

PALPATION:

Anterior :

- Cubital fossa _____
- Bicep tendon _____
- Brachial artery _____
- Coronoid process _____
- Radial head _____
- Bicep and Brachialis_____

Medial:

- Medial epicondyle _____
- Medial collateral ligament _____
- Ulnar nerve _____

Lateral:

- Lateral epicondyle _____
- Supracondylar ridge (ECRL) _____
- Lateral collateral ligament _____
- Radial head and annular ligament _____

Posterior:

- Olecranon process _____

ACTIVE MOVEMENTS:

- Flexion (140 – 150°) _____
- Extension (0-10°) _____
- Supination (90°) _____
- Pronation (80-90°) _____

PASSIVE MOVEMENTS:

- Flexion (tissue approximation) _____
- Extension (bone to bone) _____
- Supination (tissue stretch) _____
- Pronation (tissue stretch) _____

RESISTED ISOMETRIC MOVEMENTS: (elbow at 90° flexion and supinated)

- Flexion _____
- Extension _____
- Supination _____
- Pronation _____
- Elbow flexion _____
- Elbow extension _____

JOINT PLAY MOVEMENTS:

- Upward glide of radial head on ulna _____
- Downward glide of radial head on ulna _____
- Rotation of radial head _____
- Medial to lateral side tilt _____
- Lateral to medial side tilt _____
- Distraction of olecranon process on the humerus (90° flexion) _____

SPECIAL TESTS:

- Ligamentous Instability Test:
  - valgus / adduction stress (MCL) _____
  - varus / abduction stress (LCL) _____
- Lateral epicondylitis:
  - Cozen's Test _____
  - Mill's Test _____
  - Lateral epicondyle test (extensor digitorum) _____
- Medial epicondyle test _____
- Tinel's Sign (ulnar nerve) _____
- Wartenberg's Sign (ulnar neuritis) _____
- Elbow flexion test (ulnar nerve - cubital tunnel syndrome) _____
- Pronator teres syndrome test (median nerve) _____
- Pinch Grip test (ant. interosseous branch of median nerve) _____

NEUROLOGICAL:

- Reflexes
  - Biceps (C5/6) R _____ L _____
  - Brachioradialis (C5/6) R _____ L _____
  - Triceps (C7/8) R _____ L _____
- Dermatomes C4 _____ C5 _____ C6 _____ C7 _____ C8 _____
  T1_____ T2 _____
- Cutaneous distribution
  - median nerve _____
  - ulnar nerve _____
  - radial nerve _____

RADIOLOGICAL EXAMINATION:

_____
_____
_____

DIAGNOSIS:

_____
_____
_____

MANAGEMENT PLAN:

_____
_____
_____

Appendix 15

DURBAN UNIVERSITY of TECHNOLOGY

Hand and wrist regional examination

Patient:_____ File no:_____ Date:_____
Intern:_____ Signature:_____
Clinician:_____ Signature:_____

Observation:

		Right	Left
1.	bony and soft tissue contours		
2.	hand posture		
3.	vasomotor changes		
4.	scars, skin creases, and muscle wasting		
5.	fingernails		
6.	dominant hand		

Palpation:

Posterior surface			Right	Left
1.		Anatomical snuff box		
2.		Carpal bones		
3.		Metacarpal bones		
4.		Phalanges		
5.		Pulses and capillary refill		
6.		Radial styloid		
7.		Radial (Lister's) tubercle		
8.		Ulnar styloid		
9.		6 extensor tendon tunnels	Right	Left
	i.	Abd poll long		
		Ext poll brev		
	ii.	ECRB		
		ECRL		
	iii.	Ext poll long		
	iv.	Ext digit		
		Ext index		
	v.	Ext digiti mini		
	vi.	ECU		

Anterior surface			Right	Left
1.		Tendons (Lat to med)		
	a.	Flexor carpi radialis		
	b.	Flexor poll longus		
	c.	Flexor digit super		
	d.	Flexor digit profund		
	e.	Palmaris long		
	f.	Flexor carpi ulnaris		
2.		Palmar fascia and intrinsic muscles		

Active movements **Passive movements**

		Right	Left		Right	Left
1.	Pronation (85-90°)			Tissue stretch		
2.	Supination (85-90°)			Tissue stretch		
3.	Ulnar deviation (15°)			Bone		
4.	Radial deviation (30-45°)			Bone		
5.	Wrist flexion (80-90°)			Tissue stretch		
6.	Wrist extension (70-90°)			Tissue stretch		
7.	Finger movements					
8.	Thumb movements					

Resisted isometric movements

			Right	Left
1.	Flexion			
2.	Extension			
3.	Radial dev			
4.	Ulnar dev			
5.	Finger	Opposition		
		Adduction		
		Abduction		

Functional movements

Gross Grip Strength

		Right	Left
1.	fist grip		
2.	cylinder grip		
3.	hook grip		
4.	sphere grip		

Precision Grip Strength

	Right	Left
pinch		
chuck		
key		

Special tests

		Right	Left
1.	Finkelstein's test		
2.	Tinel's		
3.	Phalan's test		
4.	Reverse phalan's test		
5.	Allen's test		
6.	Froment's sign		
7.	Watson's test		
8.	Scaphoid compression test		
9.	Lunatotriquetral ballottment test		
10.	Bunnel littler test		
11.	Tight retinacular test		
12.	Ligament stability		

Joint play movements

Hand and fingers

			Right	Left
1.	MCP and PIP + DIP	Long axis extension		
		AP, PA glide		
		Rotation		
		Side glide		
2.	Distal inter-metacarpals	AP, PA glide		
		Rotation		

Wrist

			Right	Left
1.	Long axis extension			
2.	AP glide			
3.	Carpal extension			
4.	Carpal flexion			
5.	Ulnar deviation			
6.	Radial deviation			
7.	Ul-men-triq AP+ PA glide			
8.	Inf rad-ulnar rotation	AP, PA glide		
		Rotation		

Appendix 16

HIP REGIONAL EXAMINATION

DURBAN UNIVERSITY of TECHNOLOGY

Patient: _____ File no: _____ Date: _____

Intern / Resident: _____ Signature: _____

Clinician: _____ Signature: _____

Observation

- Gait: _____
- Posture: _____
- Weight-bearing symmetry: _____
- Balance and proprioception (Stork-standing test): _____
- Bony / soft tissue contours: Buttock contour _____
  Hip flexion contracture _____
  Lumbar lordosis _____
  Scoliosis _____
- Skin: _____
- Swelling: _____
- Leg length inequality: _____

Palpation

❖ Anterior aspect

			Right	Left
1.	Iliac crests			
2.	Greater trochanter			
3.	Pubic symphysis and tubercle			
4.	Femoral head			
5.	Femoral Δ	femoral artery		
		lymph nodes		
6.	ASIS's			
7.	Inguinal ligament			
8.	Inguinal hernia			
9.	Muscles -	Quadriceps		
		Adductors		
		Abductors		
		Psoas		

❖ Posterior aspect

			Right	Left
1.	Iliac crests posteriorly			
2.	Ischial tuberosity			
3.	Muscles	Piriformis		
		Gluteals		
		Hamstrings		
4.	PSIS's			
5.	Sciatic notch			
6.	SI joints			
7.	Lumbar Spine			
8.	Sacrum + coccyx			

Active Movements (note ROM and pain)		Right	Left
1.	Flexion (110-120°)		
2.	Extension (10-15°)		
3.	Adduction (30°)		
4.	Abduction (30-50°)		
5.	Medial rotation (30-40°)		
6.	Lateral rotation (40-60°)		

Passive Movements (note end-feel, ROM and pain)		Right	Left
1.	Flexion (tissue stretch or approximation)		
2.	Extension (tissue stretch)		
3.	Adduction (tissue stretch or approximation)		
4.	Abduction (tissue stretch)		
5.	Medial rotation (tissue stretch)		
6.	Lateral rotation (tissue stretch)		

Resisted Isometric Movements (note strength and pain)		Right	Left
1.	Flexion		
2.	Extension		
3.	Adduction		
4.	Abduction		
5.	Medial rotation		
6.	Lateral rotation		
7.	Knee flexion		
8.	Knee extension		

Joint Play Movements		Right	Left
1.	Caudal glide (long axis traction)		
2.	Compression		
3.	Lateral distraction		
4.	Quadrant (scouring) test		

Special Tests			Right	Left
1.	Patrick's FABER Test			
2.	Trendelenberg Test			
3.	Craig's Test			
4.	Leg Length	Actual		
		Apparent		
5.	Sign of the Buttock			
6.	Thomas Test (hip flexion contracture)			
7.	Rectus Femoris Contracture Test			
8.	Ely's Test (rectus femoris hypertonicity)			
9.	Ober's Test (ITB contracture)			
10.	Noble Compression Test (ITB Friction Syndrome)			
11.	Piriformis Test			
12.	Hamstrings	Hamstring Contracture Test		
		90°-90° SLR Test		
		Tripod Test		

Appendix 17

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DURBAN UNIVERSITY OF TECHNOLOGY
KNEE REGIONAL EXAMINATION

Patient:_____ File:_____ Date:_____
Intern:_____ Signature:_____
Clinician:_____ Signature:_____

- **OBSERVATION** (Standing, Seated and during gait cycle).

A. Anterior view
Genu Varum:_____
Genu Valgum:_____
Patellar position:_____
Tibial Torsion:_____
Skin:_____
Swelling:_____

B. Lateral view
Genu Recurvatum:_____
Patella Alta:_____
Patella Baja:_____
Skin:_____

C. Posterior view
Swelling:_____
Skin:_____

D. General
Movement symmetry:_____
Structures symmetry:_____

- **ACTIVE MOVEMENTS**

Flexion (0 - 135°)_____
Extension (0 - 15°)_____
Medial Rotation (20 - 30°)_____
Lateral rotation (30 - 40°)_____

- **PASSIVE MOVEMENTS**

Tissue approx_____
Bone-bone_____
Tissue stretch_____
Tissue stretch_____
Patellar movement_____

- **RESISTED ISOMETRIC MOVEMENTS**

Knee: Flexion:_____
Extension:_____
Internal rotation:_____
External rotation:_____

Ankle: Plantarflexion_____
Dorsiflexion_____

- **LIGAMENTOUS ASSESSMENT**

One-Plane Medial Instability
Valgus stress (abduction)
Extended_____
Resting Position_____

One-Plane Lateral Instability
Varus stress (adduction)
Extended_____
Resting Position_____

One-Plane Anterior Instability
Lachman Test (0-30°)_____
Anterior Drawer Sign _____

One-Plane Posterior Instability
Posterior "sag" Sign_____
Posterior Drawer Test_____

Anterolateral Rotatory Instability
Slocum Test_____
Macintosh Test_____

Anteromedial Rotatory Instability
Slocum Test_____

Posterolateral Rotatory Instability
Jacob _____
Hughston's Drawer Sign_____
Reverse pivot shift test_____

Posteromedial Rotatory Instability
Hughston's Drawer Sign_____

- **TESTS FOR MENISCUS INJURY**

McMurray_____ Anderson med-lat grind_____
"Bounce Home"_____ Apley's_____

- **PLICA TESTS**

Mediopatellar Plica _____ Hughston's Plica_____
Plica "Stutter"_____

- **TESTS FOR SWELLING**

Brush/Stroke Test _____ Patellar Tap Test_____

- **TESTS FOR PATELLA FEMORAL PAIN SYNDROME**

Clarke's Sign _____ Passive patella tilt test_____
Waldron test_____

- **OTHER TESTS**

Wilson's_____ Quadriceps Contusion Test_____
Fairbank's_____ Leg Length Discrepancy_____
Noble Compression_____

- **JOINT PLAY**

Movement of the tibia on the femur P → A:_____ A → P:_____
Translation of the tibia on the femur M → L:_____ L M:_____
Long axis distraction of the tibiofemoral joint _____
Inf, sup, lat, + med glide of the patella _____
Movement of the inf. tibiofibular joint A → P:_____ P → A:_____
Movement of the sup. tibiofibular joint A → P:_____ P → A:_____
Movement of the sup. tibiofibular joint S → I :_____ I → S_____

- **PALPATION**

Tenderness_____ Swelling_____
Joint line_____ Nodules/exostoses_____
Ligaments_____ Muscles: thigh:_____
Patella:_____ Leg :_____
Patella tendon:_____ Popliteal artery:_____
Bursae:_____

- **REFLEXES AND CUTANEOUS DISTRIBUTION**

	R	L
Patellar Reflex (L3,L4)		
Medial Hamstring Reflex (L5,S1)		

- **DERMATOMES**

	R	L		R	L
L2			S1		
L3			S2		
L4			S3		
L5					

07/02/2007

Appendix 18

DURBAN UNIVERSITY of TECHNOLOGY

Foot and ankle regional examination

Patient:_____ File no:_____ Date:_____

Intern / Resident_____ Signature:_____

Clinician:_____ Signature:_____

Observation

Gait analysis (antalgic limp,toe off, arch, foot alignment, tibial alignment).

_____

_____

Swelling_____

Heloma dura / molle_____

Skin_____

Nails_____

Shoes_____

Contours (achilles tendon, bony prominences)_____

Active movements

Weight bearing:	**R**	**L**	***Non weight bearing:***	**R**	**L**
Plantar flexion			50°		
Dorsiflexion			20°		
Supination					
Pronation					
Toe dorsiflexion			40°(mtp)		
Toe plantar flexion			40° (mtp)		
		Big toe dorsiflexion (mtp) (65-70°)			
		Big toe plantar flexion (mtp) 45°			
		Toe abduction + adduction			
		5° first ray dorsiflexion			
		5° first ray plantar flexion			

Passive movement motion palpation (Passive ROM quality, ROM overpressure, joint play)

	R	**L**		**R**	**L**
Ankle joint: *Plantarflexion*			Subtalar joint: *Varus*		
Dorsiflexion			*Valgus*		
Talocrural: *Long axis distraction*			Midtarsal:*A-P glide*		
First ray: *Dorsiflexion*			*P-A glide*		
Plantarflexion			*rotation*		
Circumduction of forefoot on fixed rearfoot			Intermetatarsal glide		
			Tarso metatarsal joints: *A-P*		
Interphalangeal joints: *L→A dist*			Metatarsophalangeal dorsiflexion (with associated plantar flexion of each toe		
A-P glide					
lat and med glide					
rotation					

Resisted Isometric movements

	R	L		R	L
Knee flexion			Pronation (eversion)		
Plantar flexion			Toe extension (dorsiflexion)		
Dorsiflexion			Toe flexion (plantar flexion)		
Supination (inversion)					

Neurological

	R	L
Dermatomes		
Myotomes		
Reflexes		
Balance/proprioception		

Special tests

	R	L
Anterior drawer test		
Talar tilt		
Thompson test		
Homan sign		
Tinel's sign		
Test for rigid/flexible flatfoot		
Kleiger test (med. deltoid)		

Alignment

	R	L
Heel to ground		
Feiss line		
Tibial torsion		
Heel to leg (subtalar neutral)		
Subtalar neutral position:		
Forefoot to heel (subtalar & Midtarsal neutral)		
First ray alignment		
Digital deformities		
Digital deformity flexible		

Palpation

Anteriorly

	R	L
Medial maleoli		
Med tarsal bones, tibial (post) artery		
Lat.malleolous, calcaneus, sinus tarsi, and cuboid bones		
Inferior tib/fib joint, tibia, mm of leg		
Anterior tibia, neck of talus, dorsalis pedis artery		

Posteriorly

Calcaneus, Achilles tendon, Musculotendinous junction		

Plantarily

Plantar muscles and fascia		
Sesamoids		

21/10/2002

Appendix 19

STATEMENT OF CONFIDENTIALITY

I, the Chiropractic student researcher, am bound by the rules of confidentiality in the Chiropractic Day Clinic and the guidelines of the South African Medical Research Council (2001).

The following Statements of the SAMRC guidelines are binding on myself as the principle researcher in the study titled:

A retrospective cross sectional survey of extremity cases on record at the Durban University of Technology Chiropractic Day Clinic (1995-2005).

- To seek consent in writing from the Chiropractic Day Clinic Director to access medical records within the clinic
- Limit access to those to whom it is essential for the provision of health care (the researcher, the supervisor and the Clinic Director).
- To code file numbers on data collection sheet to ensure patient anonymity.
- To destroy the spreadsheet containing the file numbers and respective codes after the completion of the study.
- To store information derived from medical records for research purposes securely within the archives and, as far as possible, ensure subjects involved are unidentifiable to third parties.

These guidelines will be followed by the Chiropractic student researcher at all times.

_____
Ms. S. Kandhai
(Chiropractic student researcher)

_____
Date