

STUDY INTO THE TREATMENT OF ACTIVE MYOFASCIAL TRIGGER  
POINTS USING INTERFERENTIAL CURRENT AS AN ALTERNATIVE TO  
DRY NEEDLING AGITATION.

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I, Kevin Rodney Christie, do hereby declare that in respect of  
the following dissertation, " Study into the Treatment of Active  
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alternative to Dry needling Agitation"; as far as I know and can  
ascertain no other dissertation exists, and all references  
detailed in the dissertation are complete in terms of all  
personal communications engaged in and published works consulted.

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## ABSTRACT

The aim of this study was to determine whether the use of Interferential Current provided a non-invasive alternative to Dry Needling Agitation in the treatment of Myofascial Pain and Dysfunction Syndrome. A randomised Experimental Method of Single-Variable design was undertaken using the before-and-after-with-control design. Subjects diagnosed with Myofascial Pain and Dysfunction Syndrome of specific upper back and cervical musculature were admitted into the study. Thirty subjects were randomly selected and split into two groups of 15. The control group received Dry needling agitation of the active trigger points and the treatment group received 10 minutes of Interferential Current. All subjects were given the relevant stretch exercises and subjects were subjectively monitored by CCMC Neck Disability Index, Psychological Well Being Schedule and Numerical Pain Rating Scale forms. Objective responses were monitored by algometer readings. Each subject was treated between four and six times with each treatment being within three days of the last. Subjects were then re-evaluated after a three week follow up period.

The results were analyzed at a 95% Confidence Interval as follows:

- 1) Medians of the data obtained from the Psychological Well Being Schedule, CCMC Neck Disability Index and Numerical Pain Rating scales were analyzed using the non-parametric Wilcoxon Sign Rank test comparing median responses of the first with last, first with follow up, and last with follow up consultations.
- 2) Medians of the data obtained from the algometer readings were analyzed in an identical manner using the Wilcoxon Sign Rank Test.
- 3) The Mann Whitney U test was used to compare results between the treatment and control groups at the first, last and follow up consultations.

Analysis of the subjective and objective data showed Interferential Current to be a viable, alternative treatment.

The comparison of both subjective and objective data between both groups showed no significant statistical difference at any time. Thus Interferential Current appears to be as effective as Dry needling in the treatment of Myofascial Pain and Dysfunction Syndrome.



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## LIST OF ABBREVIATIONS

PWBS	Psychological Well Being Schedule
NPRS	Numerical Pain Rating Scale
CMCC	Canadian Memorial Chiropractic College
	Neck Disability Index
F\U	Follow up
T	Treatment
C	Control
MFPDS	Myofascial Pain and Dysfunction Syndrome
TENS	Transcutaneous electrical nerve stimulation
CNS	Central Nervous system



## DEFINITION OF TERMS

The following definitions are applicable to the study:

1.6.1 Active myofascial trigger point: A focus of hyper-irritability in a muscle or it's fascia that is symptomatic with respect to pain. It refers a pain pattern at rest and /or on motion that is specific for the muscle involved. It is always tender and prevents full lengthening of the muscle, weakens the muscle, refers pain on direct compression, mediates a local twitch response of muscle fibres when adequately stimulated and often produces specific referred autonomic phenomena in it's pain reference zone. (Travell and Simons 1983:1)

1.6.2 Latent myofascial trigger point: A focus of hyper-irritability in a muscle or it's fascia that is clinically quiet with respect to spontaneous pain, it is painful only when palpated. It may have all the characteristics of an active trigger point from which it may be distinguished. (Travell and Simons 1983:2)

- 1.6.3 A motor point: The skin region where an innervated muscle is most accessible to percutaneous electrical excitation at the lowest intensity. (Travell and Simons 1983:4)
- 1.6.4 Interferential current: A form of electrical treatment in which two medium frequency currents are used to produce a low frequency effect. (Forster and Palastanga 1990:107)
- 1.6.5 Snapping palpation: A finger is placed against the tense band of muscle at a vertical direction to the taut band, pressing down and drawing the finger back so as to roll the underlying fibres under the finger. Contact with the surface is maintained. (Travell and Simons 1983:16)
- 1.6.6 Reference zone: A specific region of the body at a distance from the trigger point where the phenomena that it causes is observed. (Travell and Simons 1983:4)
- 1.6.7 Dry needling agitation: The insertion of a dry acupuncture needle directly into the active trigger point. Agitation thereof is when the needle is then repeatedly inserted into the trigger point from different angles whilst maintaining the original source of entry into the skin.

- 1.6.8 Electro-acupuncture: The low frequency electrical stimulation of acupuncture dry needles once the skin has been penetrated. (Pomeranz and Stux 1991:184).
- 1.6.9 Vasovagal attack: The excessive activity of the vagus nerve causing sudden slowing of the heart rate and a fall in blood pressure giving rise to fainting. (Clay 1988:656)

## CHAPTER ONE

### INTRODUCTION

According to Travell and Simons (1983:5), the treatment of Myofascial Pain and Dysfunction Syndrome, up until recently, has largely been neglected, poorly understood and hidden under a barrage of terms like fibrositis, muscular rheumatism, myogelosis and myalgia. The same source states that the musculocutaneous system is the largest organ in the body and constitutes approximately 40% of the entire body mass yet the treatment of this organ has been largely ignored (Travell and Simons 1983:5). Approximately four hundred individual skeletal muscles are all potential areas of trigger point occurrence, most of which receive little attention in the way of tutoring. Gatterman et al. (1990:285) emphasises his surprise as to how little emphasis is placed on the pathophysiology of muscles in both Chiropractic and Medical curricula.

Travell and Simons (1983:5) also mentions that both active and latent Myofascial trigger points may manifest in anyone at some time or the other. They also state that the active Trigger points seem to manifest in individuals in their early adult years due to maximum activity, as well as in the aged due to inactivity, stiffness and decreased range of motion due to wear and tear (which sets up Myofascial Pain and Dysfunction Syndrome). The middle-aged suffer less frequently than those individuals who are most active and are therefore most likely to suffer this often exquisitely painful condition. Those suffering have compared the

pain to that experienced during bone fractures, renal colic and heart attacks (Travell and Simons 1983:6). Such is the nature of Myofascial Pain and Dysfunction Syndrome, that it may detract from the very quality of life, causing severe pain, unrelenting, and often leading to depression (Travell and Simons, 1983:6). The need to relieve this agonizing and often incapacitating pain permanently and not merely temporarily by the symptomatic relief of analgesics is obvious. Travell states that people with this syndrome have spent much time and money in search of longlasting pain relief and many industries have lost valuable working time and pain from chronic, disabling causes such as Myofascial Syndrome. Travell and Simons (1983:6) state that the total costs are "enormous". No research into Myofascial Pain and Dysfunction Syndrome has been undertaken in South Africa, but as long as humans are subjected to the same stresses of daily life and activity the above applies worldwide. Competent and effective treatment is invaluable.

Haldeman (1992:524) reveals that despite the agreement amongst practitioners who use their hands to treat patients, Myofascial Pain and Dysfunction Syndrome is still a matter of controversy. Travell and Simons (1983:5) goes on to mention that there is no consensus about the physiological nature of these tender nodules (trigger points) that are so clinically apparent to the Chiropractor



## 1. STATEMENT OF INTENT

### 1.1 THE STATEMENT OF THE PROBLEM

The purpose of this investigation was to evaluate the relative effectiveness of Interferential Current on active myofascial trigger points with respect to the subjects' perception of the treatment and objective clinical findings in order to determine the contribution that Interferential Current treatment provides as an alternative to dry needling agitation as a treatment of active myofascial trigger points.

### 1.2 THE STATEMENT OF THE SUBPROBLEMS

#### 1.2.1 SUBPROBLEM ONE

To evaluate the effectiveness of Interferential Current on active myofascial trigger points as opposed to dry needling agitation in terms of the subjects' perception of the treatment.

### 1.2.2 THE SECOND SUBPROBLEM

To evaluate the effectiveness of Interferential Current on active myofascial trigger points as opposed to dry needling agitation in terms of the objective subject response to the treatment.

### 1.2.3 THE THIRD SUBPROBLEM

To integrate the subjective and objective response to treatment in order to determine the relative effectiveness of Interferential Current as an alternative treatment of Myofascial Pain and Dysfunction Syndrome.

### 1.3 THE HYPOTHESIS

#### 1.3.1 HYPOTHESIS ONE

Interferential Current treatment of active myofascial trigger points is effective in terms of the subjects' perception thereof.

#### 1.3.2 HYPOTHESIS TWO

Interferential current treatment of active myofascial trigger points is effective in terms of objective clinical findings.

#### 1.3.3 HYPOTHESIS THREE

Interferential current treatment of active myofascial trigger points provides an effective alternative to dry needling agitation as a treatment of such conditions.

#### 1.4 THE DELIMITATIONS

The study did not include the following:

1. Subjects presenting with the contra-indications to electrical stimulation stated in the literature review.
2. Subjects who were on, or wished to continue anti-inflammatory or analgesic medication.
3. This study was limited to the treatment of the following posterior cervical, thoracic spine and shoulder girdle muscle: trapezius, levator scapulae, rhomboid major and minor, supra and infra-spinatus and teres major and minor.
4. Factors such as age, sex, race or creed were not taken into account.
5. Those subjects who were non-compliant with the treatment protocol were rejected from the study.
6. This study did not endeavour to evaluate the effects of stretch as a form of treatment.
7. Only active trigger points were treated.

## 1.5 THE ASSUMPTIONS

- 1.5.1 Myofascial Pain and Dysfunction Syndrome is distinct clinical entity.
- 1.5.2 Dry needling is an effective form of treatment of Myofascial Pain and Dysfunction Syndrome.
- 1.5.3 Subjects will comply with the treatment protocol.
- 1.5.4 Improvement of the subject is due to the therapy administered.
- 1.5.5 Subjects will comply with stretch exercises as shown by the author.



## CHAPTER TWO

### 2.0 REVIEW OF THE RELATED LITERATURE

#### 2.1 Introduction

According to Travell and Simons (1983:6), the need for an effective treatment of this common and debilitating disorder has been recognized and various techniques of treatment have been administered, each rendering varying degrees of effectiveness. Up until recent years, Myofascial Pain and Dysfunction Syndrome has been an enigma and has been labelled as fibrositis, myogelosis, myalgia, myitis chronica, rheumatic myositis, chronic rheumatism, nerve pain, nodular fibromyositis, indurations, myofascitis, fibropathic syndrome, myodysneuria and interstitial fibrositis, all of which are ill defined or vague in description (Travell and Simons 1983:8-9). These two authors seem to have specialized in Myofascial Pain and Dysfunction Syndrome and have taken the lead in terms of research conducted in the field of trigger point therapy and management.

According to Sola and Williams (1956:91-95) the muscles most commonly encompassing trigger points are the trapezius, levator scapulae and the infraspinatus, which form part of the muscles used in this study. No reasons were given as to why trigger points in these muscles were more common than in others.

## 2.2 Aetiology of Trigger Points

The aetiology of Myofascial Pain and Dysfunction Syndrome has been listed by Travell and Simons (1983:103-155) as due to mechanical stress, varying psychological factors, sudden overuse, inactivity, poorly conditioned muscles. According to Travell and Simons (1983:5), both latent and active trigger points are extremely common with the former being dominant in prevalence. They also go on to list the important perpetuating factors of MFPDS. These fit into six categories, namely: mechanical stresses, nutritional inadequacies, metabolic and endocrine inadequacies, psychological factors, chronic infections and other factors like allergies, insomnia, radiculopathy and chronic visceral disease.

Travell and Simons (1983:12) classify Myofascial trigger points as either active or latent. The active trigger point causes pain but a latent trigger point is clinically silent with respect to pain, yet may cause a restriction of movement and weakness within the affected muscle. They reveal that a latent trigger point may persist for years and predisposes to attacks of pain if activated by minor overuse, overstretch or cooling of the muscle.

### 2.3 Pathomechanics of Active Trigger Point formation

According to Gatterman (1990:291), muscle strain is invariably associated with macro and microscopic tissue damage. This cellular disruption may cause damage to small blood vessels, triggering the release of platelets which in turn cause metabolites such as serotonin to be released. This sensitizes the nerve endings. As the tissue is damaged, there is simultaneously a release of mast cells containing histamine which aid in this sensitization of nerve endings and contribute to the pain felt.

A histological study carried out by Glogowski and Wallraff (1951), revealed that of the 24 biopsies done on trigger points, only one specimen exhibited the formation of excessive connective tissue to account for the palpable band which is characteristic of a trigger point. The other twenty three biopsies showed non specific changes which were not discussed. Miehke et al. (1960) conducted a study of biopsies on nearly three times as many samples. Paraffin sections were stained with haematoxylin and eosin.

Specimens were divided into four groups viz.

- 1) Non-trigger point control specimens which showed normal muscle.
- 2) Latent trigger points processed with fat stained frozen sections which showed an accumulation of fine fat droplets.
- 3) Active Myofascial trigger points showed an occasional

accumulation of fine fat droplets as well as mild non-specific dystrophic changes.

- 4) Vigorously active Myofascial trigger points showed more severe dystrophic pathology like contracture knots, loss of cross striations in the muscle. In severe cases fat and connective tissue replaced the muscle fibres.

Thus it is only the active trigger points that exhibited definite histological changes which thereby reveals the nature of this syndrome and past difficulty in detection and diagnosis thereof. These authors did not reveal how they distinguished between active and latent trigger points and so this cannot be compared to Travell and Simon's (1983:12) differentiation between the two. Various studies of biopsies of latent, active and highly irritable trigger points have been conducted, all of varying dyes and staining procedures and results. One of them was conducted in 1957 by Brendstrup et al. They biopsied palpable fibrositis areas in the paraspinal musculature of 12 subjects as well as in the normal contralateral muscle. These sections were stained with a metachromatic staining mucopolysaccharide dye called toluidine blue. Some muscles showed intercellular infiltration of this dye. The authors were of the opinion that it may account for the localized increased turgor found in the muscle as it was present in 75% of the fibrositis muscle and 25% of the control muscle biopsies. Awad (1973) found the same substance as above in eight of the ten biopsies of tender nodular areas in the muscles.

Fassbender (1975:303-314) reported a four-stage process of degeneration in the contractile elements in muscle biopsied from regions of trigger points. Stage one revealed swollen mitochondria and frayed myofilaments in the region of the I bands. The second stage revealed destruction of the A bands (myosin filaments) but not the Z bands. In the third stage, there were recognizable disrupted sarcomere remnants and in the last stage there was complete destruction of the contractile substance leaving only a fine granular residue within the sarcolemma.

According to Travell and Simons (1983:17), there is generally a break in the sarcoplasmic reticulum allowing the calcium solution to escape and thereby causing prolonged muscle contraction. They postulate that this microspasm is responsible for the palpable taut band which results in disruption of the blood flow through smaller blood vessels in the area. This leads to the ischaemia and pain mentioned by Gatterman (1990:291) earlier.

Gatterman (1990:291) reveals that this sustained contraction creates an area of uncontrolled metabolism which perpetuates the release of more histamine. The resulting spasm has another important effect in that it disrupts blood flow to the muscle involved. This in turn is further augmented by vasoconstriction of the involved blood vessel from the autonomic nervous system that is now activated due to the trigger point sensory input to the CNS. Thus a vicious cycle is set up in that a self-perpetuating condition is created.



## 2.4 Symptoms

Simons and Travell (1983:16) describe a number of phenomena which are a result of active Myofascial trigger points. They have been described as highly sensitive, painful and irritable spots which refer pain to specific areas either spontaneously or when compressed, or both. Once the underlying cause or perpetuating factors are removed, the trigger points may persist. The pain, caused from active trigger points, may vary from slight to excruciating and unrelenting according to Simons and Travell (1983:16). Other autonomic phenomena such as spasm, localised vasoconstriction, vasodilation, hypersecretion, vertigo, tinnitus, lacrimation, coryza, pilomotor activity, distorted perception of the weight of objects, spatial disorientation and cutis anserinus (goose-flesh) may occur singularly or together with referred pain and tenderness. (Travell and simons 1983:15)

2.5 Criteria for diagnosing Active Myofascial Pain and Dysfunction syndrome. (Travell and Simons 1983:16-17)

- 2.5.1 Passive or active stretch of the muscle increases the pain.
- 2.5.2 The stretch range of motion is reduced.
- 2.5.3 The pain increases if the affected muscle is strongly contracted.
- 2.5.4 The maximum contractile force of the muscle is diminished.
- 2.5.5 Deep tenderness is referred by the Tp to the Zone of reference.
- 2.5.6 Non-sensory functions are disturbed and induce pain in the zone of reference.
- 2.5.7 Muscles in the immediate vicinity are tense.
- 2.5.8 The trigger point itself is exquisitely tender.
- 2.5.9 Manual pressure thereupon causes a jump sign by the patient.
- 2.5.10 Snapping palpation causes a local twitch response.
- 2.5.11 Sustained pressure thereupon causes pain to be referred to the zone of reference.
- 2.5.12 Dermatographia or panniculosis in the overlying area is common.

It is not necessary for all of these findings to be present simultaneously in one subject; This depends on the degree of activity of the trigger point.

## 2.6 Historical Overview of treatment

The earliest form of therapy for what is now known as Myofascial Pain Dysfunction Syndrome (MFPDS) was carried out by De Lange, a student of a German Medical officer before 1931. He used a blunt piece of wood or his knuckles and fingers to apply deep pressure and results were effective (Travell and Simons 1983:6). According to Sandman (1981), pressure to the trigger point should not be painful as this causes reflex spasm in the area which complicates the primary muscle malfunction. This is, however, contradicted by Travell and Simons (1983:27), since they state that firm digital pressure on the trigger point (ischaemic compression) is a form of therapy for deactivating trigger points. In 1937 and 1941 Kraus used vapocoolants as a successful form of treatment and then went on to author a book in 1970, showing the importance of stretch exercise in the treatment of MFPDS. Both of the above factors are supported by Travell and Simons in the treatment of Myofascial Pain and Dysfunction Syndrome. (Travell and Simons 1983:27). Later on it was noted that procaine injection into the trigger point in the muscles around the temporomandibular joint played a role in inactivating active trigger points (Travell and Simons 1983:19). They also found that intracutaneous injections relieved symptoms of myofascial pain only if placed directly into the trigger point. The following substances have been injected into scars containing active trigger points: soluble steroid, triamcinolone acetonide,

lidocaine as well as dexamethasone sodium phosphate. (Bourne 1980). These forms of treatment were successful in that the trigger points were hereby inactivated. Travell and Simons (1983:19-20) explained that there is no consistency in the referred pain patterns of cutaneous trigger points like that observed for myofascial trigger points. They state that, in their experience, TP's that refer burning, pricking or jabs of pain are likely to be found in cutaneous scars.

In Travell and Simon's (1983:6-36) overview of literature on treatment of muscle pain, the following was noted:

In stretch and spray techniques on treatment of MFPDS, passive stretch was of prime importance, with the muscle being at full length. This technique makes use of a vapocoolant spray which cools the passively stretched muscle in it's full length. Excessive cooling tends to aggravate rather than relieve the condition. The vapocoolant has an effect of releasing the compression of the local artery involved by relaxing the muscle around the artery. However, excessive spray tends to cause vasoconstriction in the area rather than vasodilation and thereby aggravates active trigger points. According to Diamond and Coniam (1991), the vapocoolant treatment must be repeated at frequent intervals until the trigger point is inactivated. Direct ischaemic compression (firm digital pressure) is effective due to the removal of metabolites (serotonin, prostaglandins and histamine) produced due to the relative inactivity of the muscle

(due to pain) and therefore causing pooling of toxins. Thereafter hyperaemia occurs.(Travell and Simons 1983:27). They go on to state that a sustained application of low intensity ultrasound serves to deactivate the active trigger point due to it's heating effects causing vasodilation. It also has some additional non-thermal effects due to agitation of the molecules by the high frequency sound waves.

Puncture of the trigger points by dry needling or injection with local anaesthetic or saline, has shown it's effectiveness in relieving pain associated with MFPDS (Travell and Simons 1983:27). Although long acting local anaesthetic requires the least precision of needle placement, it has been known to cause muscle necrosis (Benoit 1978:198). Dry needling needs the greatest precision and many repetitions in order to deactivate the trigger point. (Lange 1931:129)

According to Garvey et al.(1989), therapy with drug-injected medication showed 42% improvement rate, while therapy without drug-injected medication showed a 63% improvement rate (p values and sample sizes were not available). The injected substance may therefore not be the critical factor, but rather the direct mechanical penetration of the trigger point giving symptomatic relief. Garvey et al. (1989) found that the use of repeated ultrasound of low intensity deactivates trigger points and that moist heat diminishes tension on trigger points.

### 2.6.1 Electrotherapies

Interferential current is used to treat the following conditions: Neurological, musculoskeletal, autonomic, arthritic and post traumatic pain, as well circulatory disturbances (Forster and Palastanga 1985:108-111).

Interferential current is a type of electro-therapy whereby two medium frequency currents interact in the tissue to produce an overall low frequency effect . The first current is always of a constant frequency (4000Hz), whilst the second current varies between 4000Hz and 4100Hz, the difference between the currents being 0-100Hz (Forster and Palastanga 1985:107-111).

The biological effects of Interferential current depends on the different frequencies or rhythmical sweeping through the range of frequencies within the available 100Hz:

A constant 100Hz has an analgesic effect.

A rhythmical frequency of 90-100Hz has a similar effect.

A rhythmical frequency of 50-100Hz has a sedative and spasmolytic effect.

Frequencies below 50Hz have a stimulating effect, causing muscle contractions.

Tens is another form of low frequency current used to treat the same conditions as above in the same manner, using similar principles.

In 1974 Shealy advised, from his findings with 1500 acute and chronic trigger point subjects, that low frequency current should be applied before any drug is given and that about 80% of patients with acute pain can be managed this way. (Travell and Simons 1983:17).

Tens (transcutaneous electrical nerve stimulation) and interferential current are widely used in the treatment of pain (of which MFPDS is a cause thereof). The properties of low frequency stimulation is such that it improves muscle power and function, movement across a joint and diminishes spasticity, giving rise to an increased range of motion and less pain by closing the "pain gates" (Melzack 1975:357). In 1993, Levin stated that low frequency electrical stimulation has effect in the therapeutic alleviation of various types of acute and chronic pain in humans, but prolonged use thereof causes hypertrophy and a change in fibre type to slow twitch fibre (Melzack 1975:357). Gatterman (1990:288) relates in his historical overview that in 1843 a German physician (Froriep) treated muscular rheumatism with electricity. He noted painful hard places in the muscles that felt like tendinous cords or wide bands and referred to them as "muscklschwiele" or muscle callus.

Therapeutic low current electricity has certain electromagnetic and chemical effects causing heating of the involved tissue. Rhythmical electrical stimulation causes marked improvement in muscle strength (Forster and Palastanga 1990:109-110).

### 2.6.2 Contraindications to Interferential current:

1. Direct stimulation over a pregnant uterus.
2. Application to an area of haemorrhage and treatment of the pelvis during menstruation.
3. Areas of infection.
4. Neoplastic areas.
5. Areas of thrombosis.
6. The proximity of the heart (in the case of pacemakers).

(De Domenico 1985)

Sandman (1981) shows the following limitations and restrictions with regards to application of electrical current:

1. Patients with heart problems
2. Stimulation over the anterior neck region
3. Females with mastectomies
4. The presence of fever, tumours, tuberculosis
5. Local inflammation, thrombosis, pregnancy, metal implants.

The above sets of restrictions are extended to this study.

### 2.6.3 Pre-needling precautions

1. Subjects should be in the lateral recumbent position to avoid psychological syncope.
2. Those likely to have low serum vitamin C levels (smokers) should be given 500mg of vitamin C thrice daily to decrease ecchymosis. A daily dose of aspirin increases the susceptibility



to bleeding. (Simons and Travell 1983:81)

Tens provides both temporary and prolonged pain relief (Melzack 1975:353). And according to Travell and Simons (1983:92) research is needed to clarify the role that electrotherapy plays in the treatment of MFPDS. This understudy shall incorporate the value of Interferential Current therapy (IFC) as applied to active trigger points in order to provide a non-invasive alternative form of treatment.

According to Diamond and Coniam (1991:44), an "acupuncture-like effect" can be achieved during dry needling of the trigger point by increasing the output and decreasing the frequency of needle penetration (deeper, less often) which produces pain relief. There are, however, conflicting views in this respect.

A double blind study, involving 60 subjects with active trigger points, was conducted into the effects of Tens on myofascial pain and trigger point sensitivity by Graff-Radford et al. (1989).

Both pre and post treatment findings and the visual analogue scale were used. One of five treatment modalities were applied to the patients. They were:

- A. Tens at 2 Hz, pulse width 250 m.sec, asymmetrical rectangular biphasic waveform, with the strongest intensity tolerable (10-40 Ma).
- B. Tens at 100 Hz, pulse width 250 m.secs, identical waveform as above with intensity of <39Ma.

C. Tens at 100 Hz, pulse width 50 m.secs, identical waveform as above with intensity of <39Ma.

D. Tens at 1200-20 000 Hz, pulse width 15 m.secs, identical waveform as above with intensity of 1-4Ma.

The treatment lasted for 10 minutes. The control had no battery. The results showed that category D caused the greatest (50%) pain reduction. According to their results, high frequency and high intensity electrical stimulation is effective in reducing myofascial pain sensitivity. This study demonstrated that low frequency electrical stimulation may reduce myofascial pain without altering the trigger point sensitivity.

Gunn et al. 1980, during conservative management of patients suffering low back pain, observed:

1. 85% returned to work within 8 weeks after treatment, regardless of the modality used.
2. After 8 weeks, progress was slower and those that failed to respond to conservative care responded well to the use of low frequency electrotherapy.
3. 5% (after 12 weeks) did not respond.

They then proceeded to study the effect of dry needling agitation of motor points (not to be confused with trigger points) in the chronic low back pain subjects (those suffering longer than 12 weeks). In the course of treating patients, both in and out of their studies, they found that provided the needle was properly placed, low current electrical stimulation applied

transcutaneously showed little advantage over mechanical agitation of the needle. The results showed that dry needling of motor points was "clearly and significantly better" (Gunn et al. 1980:290). It is important therefore to discover if this holds true for the treatment of active trigger points (as compared to the results from motor points), and to what extent it shows either advantage or disadvantage over mechanical agitation of the needle. Such is the nature of this study.

In another study by D'lin et al. (1980), using Tens treatment for complaints of pain preventing sport participation, it was found that of the 22 subjects, 18 returned to full sport participation after low frequency treatment. Sites of placement of electrodes were on acupuncture and trigger points. They did not comment on the aetiology or chronicity of the pain nor the types of conditions seen.

To date only one study has been conducted to evaluate the effect of treatment of trigger points by electroacupuncture in the treatment of neck and back pain (this is the combination of both dry needling and low frequency electrical stimulation). This was conducted by V.M Frampton (1985). An unselected group of twenty eight consecutive subjects were involved in the study of which twelve had back pain and sixteen had neck pain. The average duration of neck pain was twenty eight months and back ache was sixty one months. The sole criteria for evaluating the presence of myofascial trigger points was the patients' jump sign

(flinching) upon digital palpation, which constitutes one of twelve examination findings for both active and latent trigger points. Subjects were asked to fill in the Visual Analogue Scale (VAS) before and after the treatment (similar to the NPR scale in this study). If pain was a limiting factor, range of motion readings were recorded before and after treatment. If there was no limitation of movement, these readings were not recorded. The study used the Asah El-acupuncture unit to deliver impulses via a search probe over the site of palpable tenderness. In subject's suffering neck pain (after an average of 10.8 treatments and a mean follow up of 5.2 months) there was an improvement of 1.57cm in the VAS and the t-value was 2.06 indicating improvement at the 5% level of confidence. In subject's suffering back pain (after an average of 8.6 treatments and a mean follow up of 6.4 months) there was an improvement of 0.58cm in the VAS and the t-value was 0.43 indicating the improvement to be negligible. Frampton's results showed this treatment to be effective in the treatment of neck pain but not back pain (the origin and reasons thereof were not discussed).

Lehmann et al. 1983 compared electrical stimulation of high frequency, high amplitude with electroacupuncture of low frequency, high amplitude stimulation and found the needling or electroacupuncture to have a slower induction time. Eriksson and Sjolund (1986) found that the consecutive use of subthreshold electrical stimulation was no more effective than "stimulation"

without batteries. Long (1975) found that brief and intense electrical stimulation was effective when applied over a painful area, but rendered only temporary relief. He found that those patients receiving acupuncture, experienced greater relief of peak pain and decrease of average pain experience. The applicability of the above to this study is that Melzack et al. (1977) found a 71% correspondance of trigger points and acupuncture points. The effect, duration of the effect, intensity and frequency of the above electrical stimulation was not documented.

Waylonis (1976) undertook a study to evaluate the use of subcutaneous low frequency electrical stimulation. Although his technique was one of acupuncture, and his study utilized 7 key acupuncture points, it should be noted that Achee points (points of pain) were used which could encompass active myofascial trigger points. The results would therefore apply to electrical stimulation (IFC) of myofascial trigger points. There are conflicting views as to whether trigger points are completely separate entities to acupuncture points or whether they represent the same phenomenon. Travell and Simons (1983:20) suggests that although trigger points associated with myofascial pain may lie in the vicinity of acupuncture points, that they are entirely separate and not to be confused. Melzack et al. (1977) found a 71% correspondence of trigger points and acupuncture points (as already mentioned) and suggests that they both represent the same

phenomenon and can be explained using the same underlying neural mechanisms.

Waylonis (1976:161-165) found that 63% of his "fibrositis" patients responded to subcutaneous electrical stimulation. He noted an "excellent" initial response in 67% of his patients, 53% of whom retained the benefits of the treatment for more than 7 weeks. No p-values were given.

He noted that when applying electrical stimulation (subcutaneously) to trigger points, the patients responded "very well and immediately", yet a significant number of them experienced recurrence of their symptoms which responded well to a further one or two treatments. He observed that in the treatment of fibrositis, electrical stimulation (subcutaneous) appeared to be as effective as heat, massage, ice or steroid injections. However, it was noted that low frequency electrical stimulation alone is insufficient for long term treatment of active trigger points due to the fact that sensitivity remains unaltered. (Graff-Radford et al. 1989)

From the literature, the author can deduce that all techniques boast certain effectiveness, yet each not totally without fault and thereby the need for a solution to the treatment of MFPDS arises ( Travell and Simons 1983, Garvey et al. 1989, Bourne 1980, Diamond and Coniam 1991, Graff-Radford et al. 1989, Gunn et al. 1980, D'Lin et al. 1980, Waylonis 1976, Airaksinen 1992).

This study is undertaken using the value of Interferential

therapy in order find out whether it provides an adequate alternative form of treatment.

In 1992, Airaksinen directed a study into the effects of electrical stimulation of Myofascial trigger points with referred tension headache. His objective method of measuring the subjects pain threshold was the algometer. His subject size was 14 and the muscles used were infraspinatus, levator scapulae, trapezius and the extensor carpi muscles. He did not mention the connection between the extensor carpi muscles and tension headaches. The subjects were treated twice for 30 seconds on each trigger point. The left side of the body was the control and the right was the treatment. The negative output mode was 3.5 volts rms at 2.5 Hz. The results showed a decrease in pain tolerance and threshold (no mention was made of the measurement of pain tolerance). There was no distinguishing between active and latent trigger points in this study. His use of the left hand side of the body as the control for this study seems inadequate since it may have been the case that an active trigger point in one of the above-mentioned muscles ipsilaterally, was solely responsible for the tension headache.

This paves the way for a greater degree of research into this category of electrical stimulation of myofascial trigger points.

## 2.7 Discussion of related literature

In previous studies, Travell and Simons (1983), have shown MFPDS to be of a debilitating nature and with the available treatment protocols, there remains the need for assessment into the most effective form of treatment of this condition. There is a limited amount of literature available on the treatment of Myofascial Pain and Dysfunction Syndrome using Interferential current. There is slightly more on a similar form of low frequency current, namely Tens.

Although different techniques of electrotherapies have been studied, their role, long-term effects and disadvantages\advantages over mechanical agitation remains unclear.

Not all subjects are amenable to dry needling as a form of treatment due to the excessive vasovagal response which causes sweating, dizziness and fainting in those prone individuals.

The mechanical treatment of active trigger points can also be painful and thus a clinical study into the patients' perception and objective clinical findings of Interferential current as an alternate, non-invasive form of treatment should be put to the test.



### CHAPTER THREE

#### 3. THE DATA , THEIR TREATMENT AND THEIR INTERPRETATION

##### 3.1 THE DATA

The data of this research is of two kinds: primary data and secondary data. The nature of these two types are given as below:

##### 3.1.1 THE PRIMARY DATA

3 types of primary data were needed:

1. Questionnaires pertaining to subjects' response to pain.

These are the Numerical pain rating scale (Index 5), CMCC Neck disability Index (Appendix 7) and Psychological Well Being Schedule (Appendix 6).

2. The subjects response to questionnaires.
3. Algometer readings.

### 3.1.2 THE SECONDARY DATA

The secondary data includes the following forms: Case history (Appendix 1), physical examination (Appendix 2), regional cervical examination (Appendix 3) and active trigger point examination (Appendix 4) which are used at the Technikon Natal Chiropractic Day Clinic. Published reports and journal articles relevant to the research were also included.

### 3.2 THE CRITERIA FOR THE ADMISSIBILITY OF DATA

Data from the pain questionnaire completed under the author's supervision of the researcher was used. And only subjects' observation and algometer readings carried out by the author were accepted. Objective data collected from reputable mechanical devices only was used, namely the algometer. Only once subjects had fulfilled the following criteria, were they admitted into the study: Screened for and diagnosed as having Myofascial pain and dysfunction syndrome (Appendix 4), and with no contra-indications.

### 3.3 THE RESEARCH METHODOLOGY

The experimental method was used to assess the relative effectiveness of Interferential current as opposed to dry needling agitation in the treatment of active myofascial trigger points. The experimental design used was the single-variable design using the Before-and-after-with-control design. The questionnaire methodology (Mc Dowell and Newell 1987:104) used was the Numerical Pain Rating Scale (Appendix 5), CCMC Neck Disability Index (Appendix 7) and Psychological Well Being Schedule (Appendix 6).

Subjects' were obtained for this study by the use of advertisements and if they fulfilled all the selected criteria, they were randomly allocated into two groups. The procedures that follow are in accordance with the ethical standards of the responsible committee on Human experimentation.

Thirty subjects meeting the necessary criteria (no contra-indications and diagnosed as MFPDS) were admitted into the study and were split into 2 groups of 15 in the following manner: 6 blocks of 4 sequences of treatment groups (t) and control groups (c) were drawn up (1)ttcc (2)tctc (3)tcct (4)cctt (5)cttc (6)ctct, the first combination was then repeated viz ttcc. This gave 28 subjects. A random number between 1 and 6 was chosen by rolling a dice 6 times which gave numbers 4,1,5,5,2,1. The respective groups were thus allocated: ttcc tctc tcct cctt cttc ctct ttcc which gives 28, a dice was then rolled randomly to

assign the last two subjects to either treatment or control group. This was c and therefore t was the last subject. The order was thus randomly chosen as such: ttcctctctcctccttcttcctctttccct. Each subject was then admitted into the study as follows; A

of the three week follow up period.

The Numerical Pain Rating Scale was completed before and after each treatment in order to evaluate the pain levels.

The qualitative variables obtained from the Numerical Pain Rating Scales, CMCC Neck Disability Index and Psychological Well Being Schedule within the treatment group were compared using the Wilcoxon Sign Rank Test.

The same was performed within the control group.

The data was analyzed using the non-parametric Wilcoxon Sign Rank test because of it's less restrictive assumptions and near equivalence in sensitivity to the T test.

This qualitative data from both the control and treatment group's first, last and follow up period was analyzed and compared within each group in order to investigate the effectiveness of both IFC and Dry Needling over time. This was done first with last, last with follow up and first with follow up treatments due to the fact that some patients need fewer treatments than others.

Medians of the Numerical Pain Rating Scale, CMCC Neck Disability Index and General Well Being Schedule were tabulated (tables 1 - 3) and graphically represented (figures 1 - 3) using Hercules Graphics.

The Null Hypothesis for this first subproblem is that, within each set of comparisons of both the treatment and control groups there is no difference in response to treatment within the treatment group as opposed to the control group over time.

The alternate Hypothesis is that the medians for each pair of visits differ ie. that the treatment is causing change over time at the 5% level of significance.

Hereafter, a full physical examination (Appendix 2) and, where necessary, a regional cervical examination (Appendix 3) were performed prior to treatment. The relevant examination to determine whether the subject presented with active myofascial trigger points was then undertaken (Appendix 4). This was obtained from the literature, specifically: Myofascial Pain and Dysfunction, The Trigger Point Manual, by Travell and Simons, volume 1 (1983), as well as related literature (Lehmann et al. 1983) as set out in the literature review. Those subjects fulfilling the criteria already discussed were then admitted into the study.

Algometer Readings were taken upon each subject before and after each treatment in the following manner:

The Algometer, which measures the maximum pressure reading tolerated by the subject, was zeroed and pressed upon the precise area of the active trigger point up to the point of tolerance, and a reading taken. The Algometer reading was obtained both before and after each treatment of the relevant therapies, and recorded.

Data on the methodology of utilization of the Algometer was obtained from related literature (Haldeman 1992:529) and used

with permission of the Clinician on duty. The Algometer used was the Force Dial type, Wagner Instruments, P.O. Box 1271 Greenwich CT, 0863, USA.

The readings from the algometer captured data pertaining to the pain threshold of each subject. The literature reveals that an active trigger point is more sensitive (hyperirritable) than a latent one and therefore a subject with active trigger points is more likely to have a lower pain threshold than if the trigger points were inactive. (Travell and Simons 1983:1)

The Algometers' quantitative data from the control and treatment groups' first, last and follow up period was analyzed and compared within each group. This was done to investigate the effectiveness of both Interferential current and dry needling over time. Analysis between the first and last, last and follow up and first and follow up treatments of both control and treatment groups was undertaken at the 5% level of significance using the Wilcoxon Sign Rank Test because of it's less restrictive assumptions and near equivalence in sensitivity to the T test. Medians of the Algometer readings are tabulated (table 4) and graphically represented (figure 4.4) using Hercules Graphics.

The Null hypothesis for this second subproblem is that there is no difference in respect to treatment within the treatment group as compared to the control group over time.

The alternate Hypothesis is that the medians for each pair of

visits differ, for example, that dry needling causes change over time.

### TREATMENT APPROACHES

#### THE CONTROL GROUP

The control group was treated by using the dry needling agitation method (to follow) as obtained from the pertinent literature (Pomeranz and Stux 1991) and authorised by the Clinician on duty at the time of the treatment :

The subjects' remained either seated or laterally recumbent (depending upon the site of trigger point) with the area to be treated exposed (which was swabbed clean with rubbing alcohol). The procedure was then explained to the subject and the needle inserted near parallel to the skin and the trigger point punctured (at this point the pain was often recreated by the penetration), the needle was withdrawn to the point that the tip still remains inserted within the skin and then re-inserted into the trigger point at various different angles of approach. This served to deactivate the trigger point. This procedure continued for the necessary time period (up to thirty seconds ie. no literature is available on the time specifications of dry needling), and then the needle withdrawn. A new needle was used for each treatment.



#### THE TREATMENT GROUP

The procedure was explained and subjects' in the treatment group were instructed to lie prone. The area containing the active trigger point was swabbed with alcohol and Interferential current was applied to the trigger point through the pencil-shaped 5mm point electrode for 10 minutes. The Interferential equipment used was the Endomed M 433 manufactured at the Enraf-Nonius Medical Distribution Centre in Delft, Rontgenweg 1, P.O Box 483, 2600 AL Delft, The Netherlands. The methodology for using the above equipment was obtained from the same source and was used with permission from the Head of Chiropractic Department, Technikon Natal. A frequency of 150hz with a carrier wave frequency of 4 Kilohertz was delivered. These particular parameters were chosen because of the results of the study conducted by Graff-Radford et al. 1989 as discussed in the review of related literature. It was the subject who determined the intensity of current, within the limits of the author.

In both groups, the muscle/s containing the trigger point/s were then placed at a passive stretch by the researcher as set out in Travell and Simon's 1983, Trigger point Manual for two minutes (so as to standardise treatment in both groups) and each subject was informed how to do this correctly. Subjects were instructed to actively stretch the muscle involved to full range of motion for the same period of time mornings and evenings. All subjects were treated 4 -6 times. Each treatment was within three days of

the previous, with a three week follow-up period after the last treatment.

Analysis was done between the first (c) and first (t), last (c) and last (t) and follow up (c) and follow up (t) treatments in order to compare both qualitative and quantitative variables between the treatment and control groups.

Thus the Mann Whitney - U test was conducted on the following at the 5% level of significance :

- The General Well Being Schedule.
- The CMCC Neck Disability Index.
- The Numerical Pain Rating Scale.
- The Algometer Readings.

The Null Hypothesis for this third subproblem is that there is no difference between the medians obtained for the treatment and control groups at any one particular visit. The Alternate Hypothesis is the medians for each pair of visits differ ie that the treatment is causing change over time. This was tested by means of the nonparametric Mann Whitney U Test at the 5% level of significance.

### 3.4 THE SPECIFIC TREATMENT OF EACH SUBPROBLEM

#### 3.4.1 THE TREATMENT OF SUBPROBLEM ONE

To evaluate the effectiveness of Interferential current on active myofascial trigger points as opposed to dry needling agitation in terms of the subjects' perception of the treatment.

#### THE DATA NEEDED:

The data needed for testing the hypothesis of subproblem one was obtained from the Numerical Pain Rating Scale, CMCC Neck Disability Index and General Well-Being Schedule.

Other data needed includes:

1. Results of Numerical Pain Rating Scale
2. Results of CMCC Neck Disability Index.
3. Results of General Well Being Schedule

#### TREATMENT OF THE DATA

The questionnaires were completed under the author's supervision and analyzed using the Wilcoxon Sign Rank Test at the 5% level of significance as described in detail in the methodology.

### 3.4.2 THE TREATMENT OF SUBPROBLEM TWO

To evaluate the effectiveness of Interferential current on active myofascial trigger points as opposed to dry needling agitation in terms of objective clinical findings.

#### THE DATA NEEDED

The data needed for testing subproblem two includes :

1. Algometer readings.

#### TREATMENT OF THE DATA

The algometer readings were taken under the author's supervision and analyzed using the Wilcoxon Sign Rank test at the 5% level of significance as described in detail in the methodology.

### 3.4.3 THE TREATMENT OF SUBPROBLEM THREE

To integrate the subjects' perception of Interferential current treatment as opposed to dry needling agitation of active myofascial trigger points with the objective clinical findings in order to determine the effectiveness of Interferential current therapy as an alternative treatment of such conditions.

#### THE DATA NEEDED

The data obtained from the subjective results of subproblem one and the objective results of subproblem two were needed.

#### TREATMENT OF THE DATA

The subjective data from subproblem one and objective data from subproblem two were analyzed using the nonparametric Mann Whitney U test at the 5% level of significance as described in detail in the methodology.

## CHAPTER FOUR

### RESULTS

Tests were conducted at the 5% level of significance. 'ns' indicates no significant difference between the medians, while 's' indicates a significant difference.

The following codes are used:

- 1t - first consultation, treatment group
- Lt - last consultation, treatment group
- ft - follow up consultation, treatment group
- 1c - first consultation, control group
- Lc - last consultation, control group
- fc - follow up consultation, control group

SUBPROBLEM ONEPsychological Well- Being Schedule:

The lower the percentage, the more favourable the result of the Schedule

TABLE 1 : PWB Median Scores as %

	1	LAST	F/U	n
TREATMENT	46.54	39.48	37.5	15
CONTROL	46.50	36.46	35.37	15

The results of the Wilcoxon Signed Rank Tests are as follows:

pwb1t - pwbLt : s

pwb1c - pwbLc : s

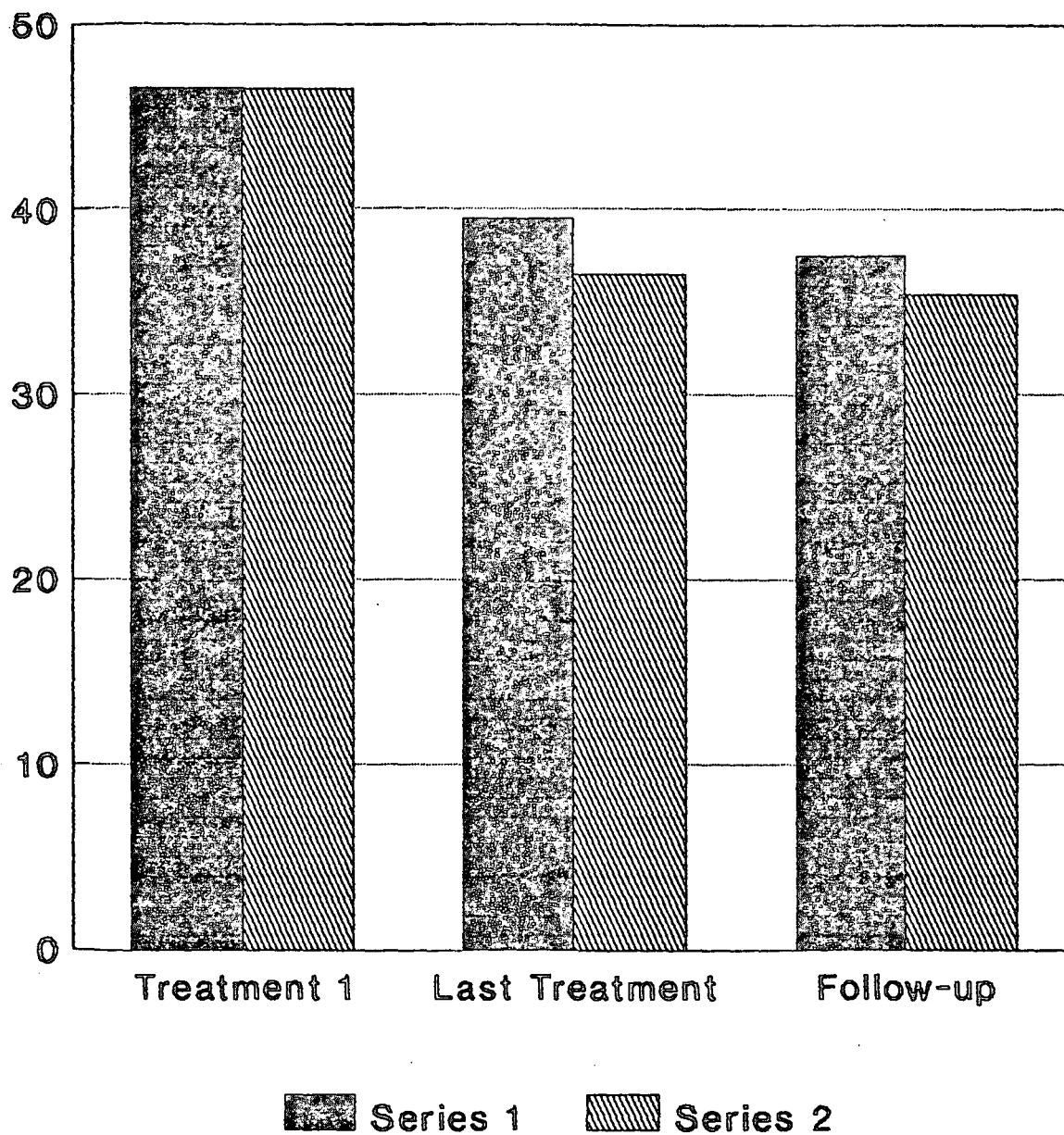
pwb1t - pwbFt : s

pwb1c - pwbFc : s

pwbLt - pwbFt : ns

pwbLc - pwbFc : ns

**Figure 4.1**  
**MEDIAN PWB SCORES (%)**



**Series 1: IFC    Series 2: Dry Needling**



Numerical Pain Rating Scale:

The lower the percentage, the more favourable the result.

TABLE 2 : NPRS Median Scores as %

	1	LAST	F/U	n
TREATMENT	43.63	25.23	27	15
CONTROL	47.5	22.67	16.67	15

The results of the Wilcoxon Sign Rank test are as follows:

nprs1t - nprsLt : s

nprs1c - nprsLc : s

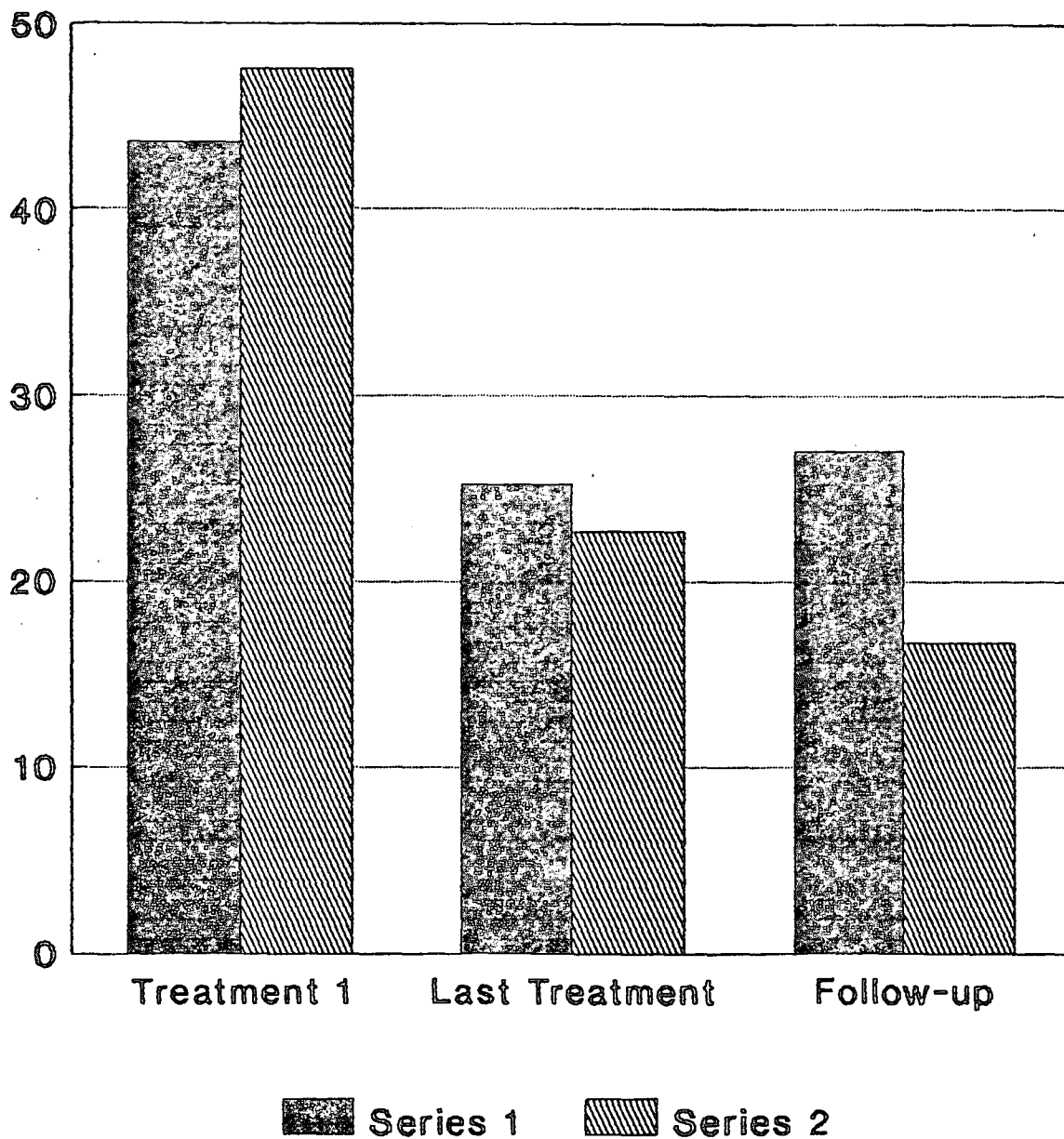
nprs1t - nprsFt : s

nprs1c - nprsFc : s

nprsLt - nprsFt : ns

nprsLc - nprsFc : s

**Figure 4.2**  
**NPRS MEDIAN SCORES (%)**



**Series 1: IFC    Series 2: Dry Needling**

CMCC Neck Disability Index:

The lower the percentage, the more favourable the result.

TABLE 3 : CMCC Median Scores as %

	1	LAST	F/U	n
TREATMENT	34.11	27.77	27.44	15
CONTROL	36.11	27.77	25	15

The results of the Wilcoxon Sign Rank are as follows:

cmcc1t - cmccLt : s

cmcc1t - cmccLt : s

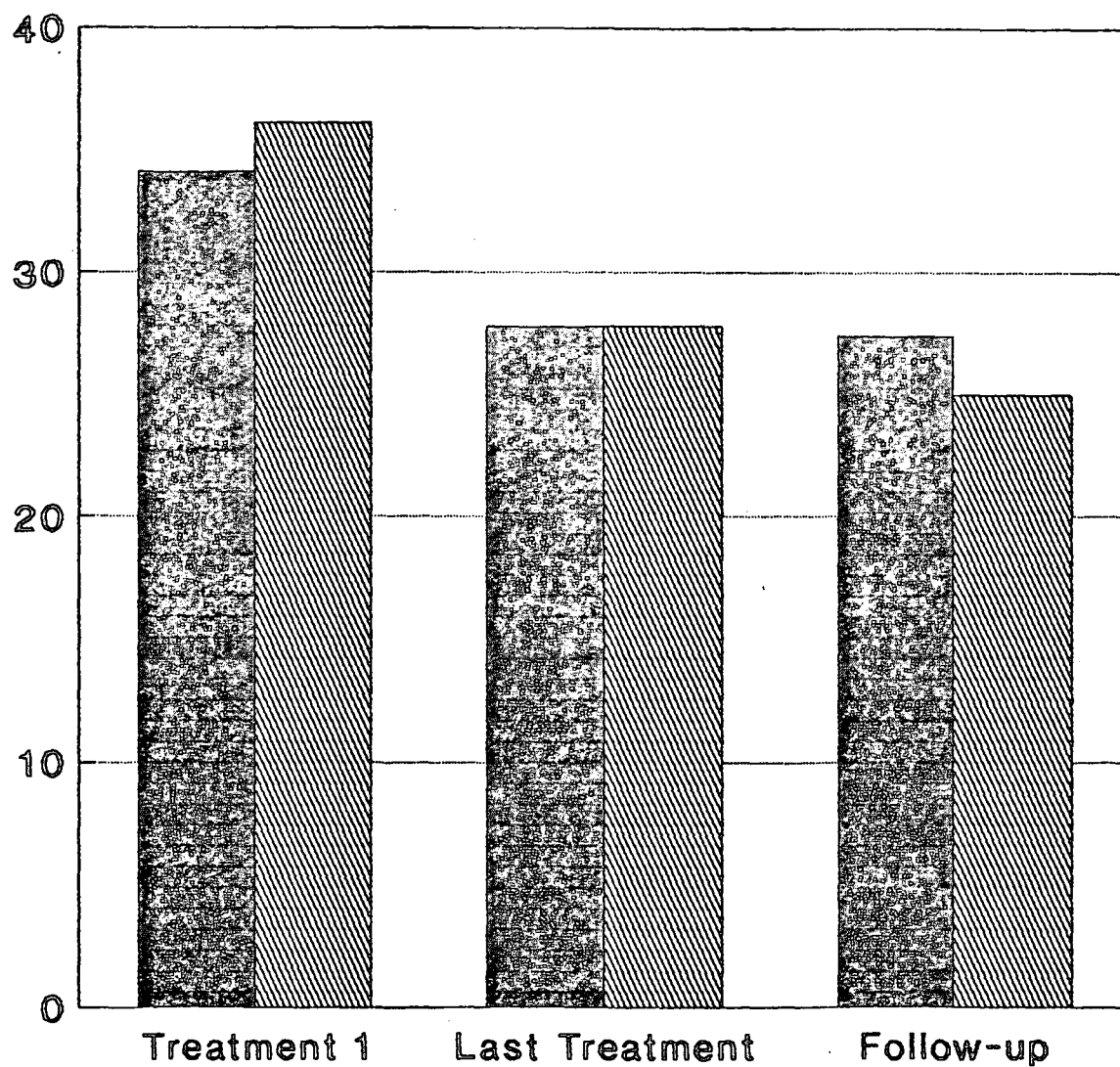
cmcc1t - cmccFt : s

cmcc1c - cmccFt : s

cmccLt - cmccFt : ns

cmccLc - cmccFc : ns

**Figure 4.3**  
**CMCC MEDIAN SCORES (%)**



■ Series 1    ▨ Series 2

Series 1: IFC    Series 2: Dry Needling

SUBPROBLEM TWOAlgometer readings

The higher the percentage, the more favourable the result.

TABLE 4: Algometer Median Scores as %

	1	LAST	F/U	n
TREATMENT	3.97	4.49	4.73	15
CONTROL	4.20	5.37	5.47	15

The results of the Wilcoxon Sign Rank Test are as follows:

alg1t - algLt : ns

alg1c - algLc : s

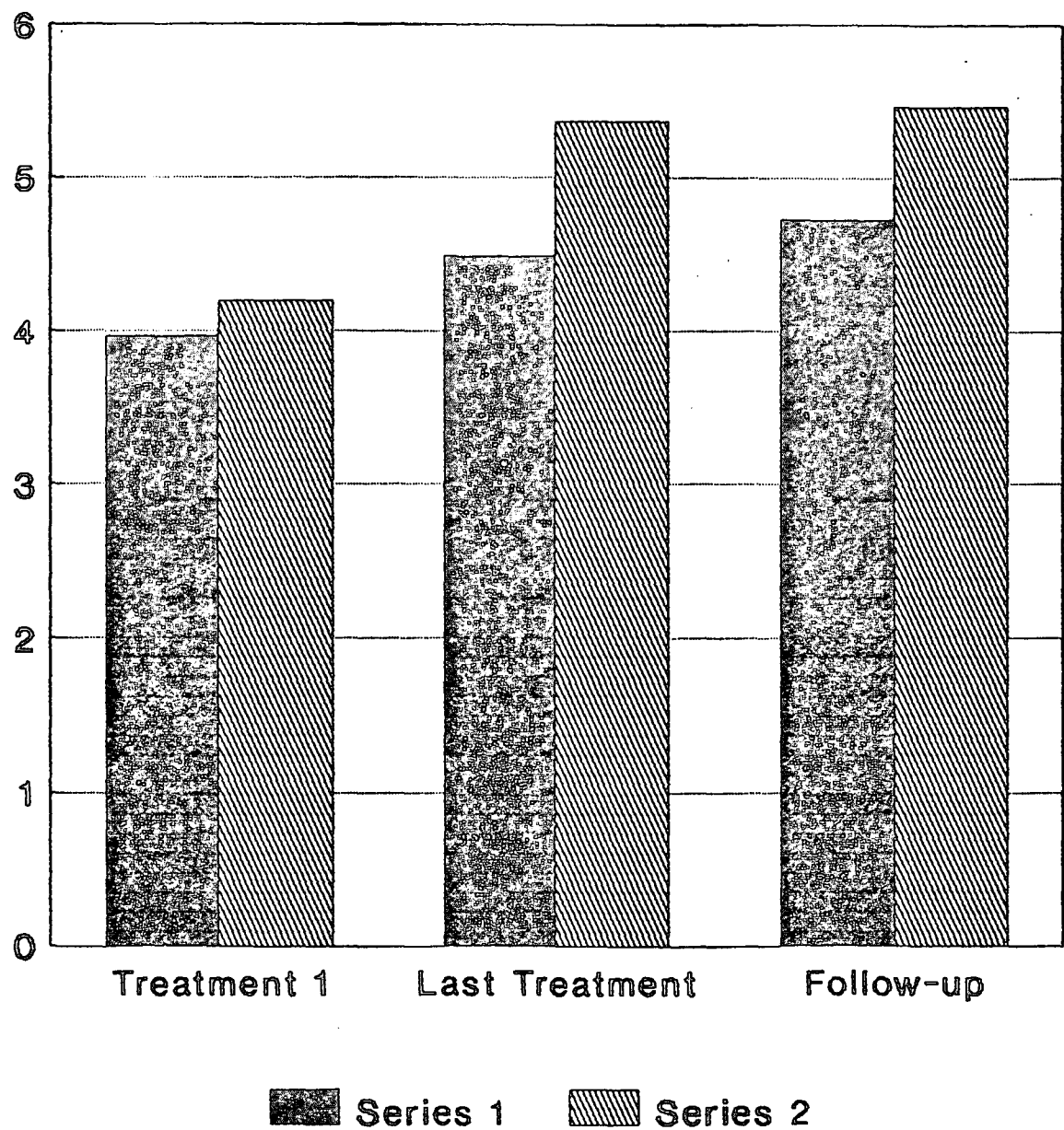
alg1t - algFt : ns

alg1c - algFc : s

algLt - algFt : ns

algLc - algFc : ns

**Figure 4.4**  
**ALGOMETER MEDIAN SCORES**



Series 1: IFC    Series 2: Dry Needling

### SUBPROBLEM THREE

#### Psychological Well Being Schedule

The results of the Mann Whitney U Test are as follows:

pwb1t - pwb1c : ns

pwbLt - pwbLc : ns

pwbFt - pwbFc : ns

#### Numerical Pain Rating Scale

The results of the Mann Whitney U Test are as follows:

npr1t - npr1c : ns

nprLt - nprLc : ns

nprFt - nprFc : ns

CMCC Neck Disability Index

The results of the Mann Whitney U Test are as follows:

cmcc1t - cmcc1c : ns

cmccLt - cmccLc : ns

cmccFt - cmccFc : ns

Algometer Readings

The results of the Mann Whitney U Test are as follows:

alg1t - alg1c : ns

algLt - algLc : ns

algFt - algFc : ns



## CHAPTER FIVE

This chapter serves to discuss the results displayed in chapter four.

### DISCUSSION OF SUBPROBLEM ONE

All results in this subproblem were analyzed using the Wilcoxon Sign Rank Test at a 95% confidence level.

The Psychological Well Being Schedule, CMCC Neck Disability Index and Numerical Pain Rating Scale results of both control and treatment groups showed a significant difference between the first and last as well as the first and follow up consultations ( $p < 0,005$ ). No significant differences were shown between the last and follow up consultations in PWB and CMCC results.

Thus subjectively, in both IFC and Dry Needling groups, the subjects perceived an improvement in their well being during the active treatment, and although this improvement did not continue into the follow up period, the subjects' appear not to have regressed to their original state of discomfort before the first treatment.

Results from the Numerical Pain Rating Scale show the same subject response as above, with the exception that Dry needling subject's perceived a lasting effect into the follow up period showing a significant difference ( $p < 0,005$ ) between the last and follow up consultations.

Perhaps the lack of subjective improvement in the follow up period could be due to subject non-compliance with regards to the prescribed self-stretch exercises during this period.

The broad nature of the Psychological Well being Schedule questions are such that they render subject responses singularly to uncontrollable variables of pain and emotions or to a combination of both. Unfortunately a favourable or unfavourable response may not have been due the Myofascial Pain and Dysfunction Syndrome or the treatment thereof, but due to other emotional causes (which could have affected the response). This questions whether the Psychological Well Being Schedule is a true indication of the response to the treatment.

### DISCUSSION OF SUBPROBLEM TWO

Results were analyzed using Wilcoxon Sign Rank Test at a 95% confidence level.

In all comparisons of algometer readings, IFC did not show an objective statistically significant difference ie. first to last, last to follow up and first to follow up consultations. However, objectively, Dry Needling caused a significant increase in readings during active treatment. The fact that IFC did not show a statistically significant difference with regards to algometer readings is alone of little importance since it does not violate the null hypothesis (which stated that there is no difference between the objective responses in terms of algometer readings over time when measuring IFC and dry needling separately). What is of practical significance, however, is the positive trend in the variables over time in both groups. Although the subjects did not progress as rapidly from the last to follow up consultations as they did from first to last consultations, they did not return to their original pain tolerance level before the first treatment.

Once again this could be due to lack of patient compliance with regards to self stretch exercises during the follow- up period. Thus this is in support with Hypothesis two that IFC is effective in the treatment of MFPDS.

### DISCUSSION OF SUBPROBLEM THREE

A comparison between the treatment and control group was performed and analyzed using the Mann Whitney U Test at a 95% confidence level in order to determine the viability of IFC as an alternative to Dry Needling agitation in the treatment of MFPDS.

When comparing the first with first, last with last and follow up with follow up consultations between the two groups, the results of subproblem three show that all comparisons (subjectively Psychological Well Being Schedule, CMCC Neck Disability Index, Numerical Pain Rating Scale and objective algometer readings) between Dry Needling and IFC revealed no statistically significant difference. Therefore it is stated that IFC is an effective alternative treatment to Dry Needling agitation in the treatment of MFPDS.

## CHAPTER SIX

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

On analysing the results of subproblem one, which were obtained to evaluate the effectiveness of IFC on active TP's as opposed to dry needling agitation in terms of the subjects' perception of the treatment, the following is true: The subjects' perception of IFC treatment was positive thus subjectively showing IFC as a viable alternative form of treatment of MFPDS.

Statistical analysis of the results of subproblem two, in order to evaluate the effectiveness of IFC on active TP's as opposed to dry needling agitation in terms of the objective subject response to the treatment, revealed that IFC did not appear to be a viable alternative form of treatment of MFPDS as a trend during active treatment.

In subproblem three, when comparing the data between treatment and control groups, statistically there was no significant difference at any time between IFC and Dry Needling. Thus IFC appeared to be as effective as Dry Needling in the treatment of MFPDS.

Therefore it is concluded that IFC is an effective non- invasive alternate form of treatment as it appears to be no less effective than Dry Needling agitation in the treatment of MFPDS.

### Recommendations

This study should be repeated using a larger sample size so as to further validify the results.

The lack of continuation of improvement into the follow up period in both forms of treatment could indicate a need for an increased patient compliance into self-exercise programmes so as to ensure long-term effectiveness of both treatments.

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**7. ANNEXURES****APPENDIX 1**

TECHNIKON NATAL CHIROPRACTIC DAY CLINIC

CASE HISTORY

Patient: \_\_\_\_\_ Date # \_\_\_\_\_

File #: \_\_\_\_\_

X-ray #: \_\_\_\_\_

Age: \_\_\_\_\_ Sex: \_\_\_\_\_ Occupation: \_\_\_\_\_

Intern: \_\_\_\_\_ Signature: \_\_\_\_\_

FOR CLINICIAN'S USE ONLY

Initial visit clinician: \_\_\_\_\_

Signature: \_\_\_\_\_

Case History:

Examination:

Previous: TN  
Other

Current: TN  
Other

X-ray Studies:

Previous: TN  
Other

Current: TN  
Other

Clinical path. lab.:

Previous: TN  
Other

Current: TN  
Other

Case status:

PTT: Conditional: Signed off: Final sign out:

Recommendations:

Intern's case history

1. Source of history:
2. Chief complaint: (patient's own words)

3. Present illness:

Location

Onset

Duration

Frequency

Pain (character)

Progression

Aggravating factors

Relieving factors

Associated S & S

Previous occurrences

Past treatment and outcome

4. Other complaints:

5. Past history:

General health status

Childhood illnesses

Adult illnesses

Psychiatric illnesses

Accidents/injuries

Surgery

Hospitalizations

Intern's case history

1. Source of history:
2. Chief complaint: (patient's own words)

3. Present illness:

Location

Onset

Duration

Frequency

Pain (character)

Progression

Aggravating factors

Relieving factors

Associated S & S

Previous occurrences

Past treatment and outcome



6. Current health status and life-style:

Allergies

Immunizations

Screening tests

Environmental hazards  
(home, school, work)

Safety measures  
(seat belts, condoms)

Exercise and leisure

Sleep patterns

Diet

Current medication

Tobacco

Alcohol

Social drugs

7. Family history:

Immediate family:

Age

Health

Cause of death

DM

Heart disease

TB

HBP

Stroke

Kidney disease

CA

Arthritis

Anaemia

Headaches

Thyroid disease

Epilepsy

Mental illness

Alcoholism

Drug addiction

Other

8. Psychosocial history:

Home situation

Daily life

Important experiences

Religious beliefs

9. Review of systems:

General

Skin

Head

Eyes

Ears

Nose/sinuses

Mouth/throat

Neck

Breasts

Respiratory

Cardiac

Gastro-intestinal

Urinary

**Genital**

**Vascular**

**Musculoskeletal**

**Neurologic**

**Haematologic**

**Endocrine**

**Psychiatric.**

## APPENDIX 2

**TECHNIKON NATAL CHIROPRACTIC DAY CLINIC**

**PHYSICAL EXAMINATION**

Underline abnormal findings in RED and elaborate on back of relevant page, if necessary.

Mark "NAD" if normal.

Patient: \_\_\_\_\_ File # \_\_\_\_\_

Last name

First name

Clinician: \_\_\_\_\_ Signature: \_\_\_\_\_

Intern: \_\_\_\_\_ Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Height: \_\_\_\_\_ Weight: \_\_\_\_\_ Temp: \_\_\_\_\_

Rates: Heart: \_\_\_\_\_ Pulse: \_\_\_\_\_ Respiration: \_\_\_\_\_

Blood pressure: Arms: L / R /

Legs: L / R /

General appearance:

## STANDING EXAMINATION.

Minor's sign

Skin changes

Posture

erect

Adan's

° Ranges of motion:

T/L spine: Flexion: 90 Fingers to floor

Extension: 50

R.lat.flex.: 30 Fingers down leg

L.lat.flex.: 30 Fingers down leg

Rot.to R.: 35

Rot.to L.: 35

Flex.

L.Rot.

R.Rot.

L.lat  
flex.

R.lat.  
flex.

Ext.

/ = pain-free limitation; // = painful limitation.

Romberg's sign.

Pronator drift.

Trendelenburg's sign.

Gait.

rhythm

balance

pendulousness

on toes

on heels

tandem

Half squat.

Scapular winging.

Muscle tone.

Spasticity/Rigidity.

**Shoulder:**

skin

symmetry

ROM - glenohumeral

scapulo-thoracic

acromioclavicular

elbow

wrist

**Chest measurement**

inspiration

expiration

Visual acuity

**Breast examination:**

**Inspection:**

skin

size

contour

nipples

arms overhead

hands against hips

leaning forward.

**Palpation:**

axillary lymph nodes.

**SEATED EXAMINATION.**

Spinal posture

Head

scalp

skull

face

skin

Eyes

conjunctiva

sclera

eyebrows

eyelids

lacrimal gland

nasolacrimal duct

alignment

corneal reflex

ocular movement

L  
III IV VI

R  
III IV VI

visual fields

accommodation

iris

pupils

red reflex

optic disc

vessels  
general background  
macula  
vitreous  
lens

Ears:

auricle  
ear canal  
drum  
auditory acuity  
Weber test  
Rinne test

Nose:

external  
internal  
septum  
turbinates  
olfaction

Sinuses (frontal & maxillary):

tenderness  
transillumination

Mouth and pharynx:

lips  
buccal mucosa  
gums and teeth  
roof  
tongue  
inspection  
movement  
taste  
palpation

pharynx  
inspection  
CN X

-Throat:

posture  
size  
swelling  
scars  
discoloration  
hair line



**ROM:**

Flexion: 45 chin to larynx  
chin to sternum  
Extension: 55 forehead parallel  
to floor  
L.lat.flex: 40  
R.lat.flex: 40  
L.rot.: 70  
R.rot.: 70

Flex.

L.Rot.

R.Rot.

L.Lat.  
flex.

R.lat.  
flex.

Ext.

lymph nodes  
trachea  
thyroid  
carotid arteries (thrills, bruit)

CM V

CM VII

CM VIII (nystagmus)

CM IX

CM XI

TMJ --

Inspection

ROM

deviation

Palpation

crepitus

tenderness

**Neurological:**

**Dermatomes**

C5

C6

C7

C8

T1

**Tendon reflexes**

biceps

triceps

brachioradialis

**Muscle strength**

C5

C6

C7

C8

T1

**Coordination:**

point-to-point

dysidiadochokinesia

**Thorax:**

**Chest:**

**Inspection:**

skin

shape

respiratory distress

rhythm (respiratory)

depth "

effort "

intercostal/supraclavicular retraction

**Palpation:**

tenderness

masses

respiratory expansion

tactile fremitus

**Percussion:**

lungs (posterior)

diaphragmatic excursion

kidney punch

**Auscultation:**

breath sounds

vesicular

bronchial

adventitious sounds

crackles (rales)

wheezes (rhonchi)

voice sounds

broncophony

whispered pectoriloquy

egophony

**Cardiovascular:**

auscultation (aortic murmurs)

Allen's test

**SUPINE EXAMINATION**

JVP

PMI

auscultation heart (L.lat.recumbent)

respiratory excursion

percussion chest (anterior)

breast palpation

The abdomen:

Inspection:

skin

umbilicus

contour

peristalsis

pulsations

hernias (umbilical/incisional)

Auscultation:

bowel sounds

bruit

Percussion:

general

liver

spleen

Palpation:

superficial reflexes

cough

light

rebound tenderness

deep

liver

spleen

kidneys

aorta

intra-/retro-abdominal wall mass

shifting dullness

fluid wave

Acute abdomen:

where pain began and now

cough

tenderness

guarding/rigidity

rebound tenderness

Rovsing's sign

psoas sign

obturator sign

cutaneous hyperaesthesia

rectal exam

Murphy's sign.

## Male genitals and hernias.

### Inspection:

- skin
- prepuce
- glans
- meatus
- nits/lice
- scrotum
- inguinal/femoral bulges

### Palpation:

- penis (tenderness/induration)
- testes
- epididymis
- inguinal canal
- femoral canal
- cremasteric reflex

### Auscultation:

- scrotal mass.

### Peripheral vasculature:

#### Inspection:

- skin
- nail beds
- pigmentation
- hair loss

#### Palpation:

- pulses - radial, brachial, femoral, popliteal, post.tibial, dorsalis pedis
- lymph nodes - epitrochlear, femoral (horizontal & vertical)
- temperature (feet & legs)
- Manual compression test
- Retrograde filling (Trendelenburg) test
- Arterial insufficiency test

### Musculoskeletal:

#### ROM

##### hip

- flex. 90/120
- ext. 15
- abd. 45
- add. 30
- int rot 40
- ext rot 45

##### knee

- flex. 130
- ext. 0/15

##### ankle

- plantar flex 45
- dorsiflex 20
- inversion 30
- eversion 20

- leg length

## Neurological:

### dermatomes

L1

L2

L3

L4

L5

S1

### muscle strength

hip flexion

knee extension

ankle dorsiflexion

plantar flexion

### tendon reflexes

patellar

Achilles

plantar reflex

### Rectal examination:

#### Inspection

sacrocaecygeal & perianal areas

#### Palpation

sphincter tone

tenderness

induration

nodules

prostate

seminal vesicles

## Mental status

### Appearance and behaviour:

level of consciousness

posture and motor behaviour

dress, grooming, personal hygiene

facial expression

affect

### Speech and language:

quantity

rate

volume

fluency

aphasia (prn)

### Mood

Thought processes (logical, relevant, organised)

### Memory and attention:

orientation (time, place, person)

remote memory

recent memory

new learning ability

### Higher cognitive functions:

information and vocabulary (general & specialised knowledge)

abstract thinking.

### APPENDIX 3

TECHNIKON NATAL CHIROPRACTIC DAY CLINIC.

REGIONAL EXAMINATION -- CERVICAL SPINE.

PATIENT: \_\_\_\_\_

FILE # : \_\_\_\_\_ DATE: \_\_\_\_\_

INTERN/RESIDENT: \_\_\_\_\_

SUPERVISING CLINICIAN : \_\_\_\_\_

OBSERVATION :

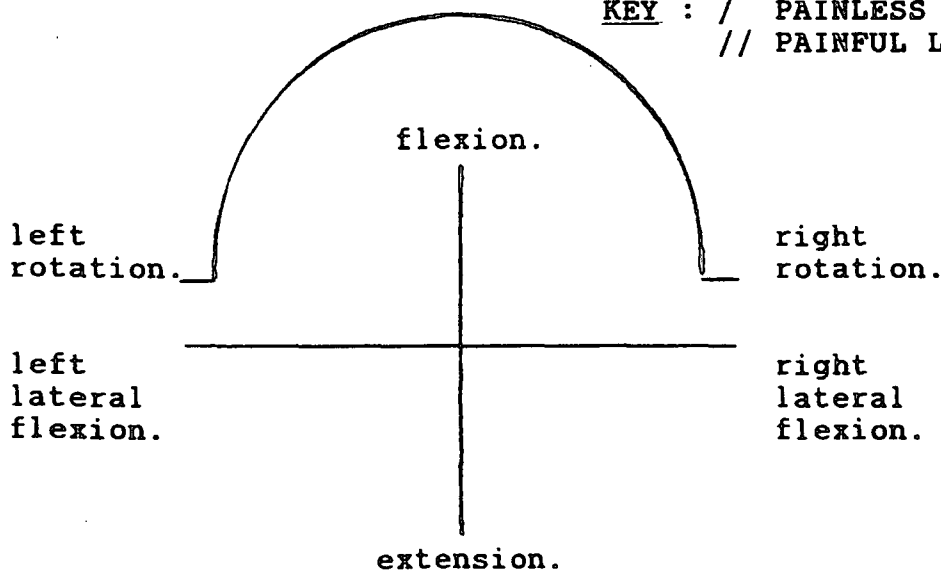
Posture  
Swellings  
Scars  
Discoloration  
Hair Line  
Bony and soft tissue contours

Shoulder position:  
Left =  
Right =  
Muscle spasm  
Facial expression

RANGE OF MOTION:

Flexion = 45 degrees.  
Extension = 70 degrees.  
L/R Rotation = 70 degrees.  
L/R Lateral flexion = 45 degrees.

KEY : / PAINLESS LIMITATION.  
// PAINFUL LIMITATION.



PALPATION : lymph nodes.  
trachea.  
thyroid gland.

**ORTHOPAEDIC EXAMINATION :**

**Tenderness**

- Active MF Trigger Points :**
- SCM.
  - Trapezius.
  - Scaleni.
  - Levator Scapulae.
  - Posterior Cervical musculature.

- |                                |                           |
|--------------------------------|---------------------------|
| Doorbell Sign                  | Cervical Compression      |
| Kemp's Test                    | Lateral Compression       |
| Cervical Distraction           | Adson's Test              |
| Halstead's Test                | Costoclavicular Test      |
| Hyperabduction Test (Wright's) | Eden's (traction) Test    |
| Shoulder abduction Test        | Shoulder depression Test. |
| Dizziness rotation Test        | Lhermitte's Sign          |
| Brachial Plexus Tension        | O'Donoghue Manoeuvre      |

**Remarks :** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**NEUROLOGICAL EXAMINATION :**

**DERMATOMES:** Left; Right. **MYOTOMES:** Left; Right. **REFLEXES:** Left; Right.

C2		C1		C5	
C3		C2		C6	
C4		C3		C7	
C5		C4			
C6		C5			
C7		C6			
C8		C7			
T1		C8			
		T1			



**VASCULAR :**

**LEFT.**

**RIGHT.**

**BLOOD PRESSURE.**

**CAROTIDS.**

**SUBCLAVIAN ARTERIES.**

**WALLENBERG'S TEST.**

**COMMENTS:**

**MOTION PALPATION :**

Jt. play		Left						Right						Jt. play	
P/A	Lat	Flx	Ext	LF	AR	PR		Flx	Ext	LF	AR	PR		P/A	Lat
							C0								
							C1								
							C2								
							C3								
							C4								
							C5								
							C6								
							C7								
							T1								
							T2								
							T3								
							T4								

#### APPENDIX 4

##### ACTIVE TRIGGER POINT EXAMINATION

- When trigger points are present, passive or active stretching of the affected muscle increases the pain.
- The stretch Range of motion of the muscle containing the trigger point is restricted.
- Pain is increased when the effected muscle is strongly contracted against fixed resisted.
- The maximum contractile force of the muscle affected is weakened.
- Deep tenderness and dysthaesia are commonly referred by the trigger point to the zone of reference.
- Disturbances of non-sensory functions are sometimes induced in zone of reference.
- The muscle in the immediate vicinity of the trigger point feels tense to palpation.
- The trigger point is found in a palpable band as a sharply circumscribed spot of exquisite tenderness.
- Digital pressure applied to the active trigger point usually elicits a jump sign.
- Snapping palpation of active trigger point frequently evokes a local twitch response.

-Moderate sustained pressure on a sufficiently irritable trigger point causes or increases pain in zone of reference of that trigger point.

-The skin of some patients undergoes dermatographia or panniculosis in the area overlying the trigger point.

(Travell and Simons 1983:16-17).

## APPENDIX 5

### 7.5 NUMERICAL PAIN RATING SCALE

(Mc Dowell and Newell 1987:236)

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

0 \_\_\_\_\_ 100

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

0 \_\_\_\_\_ 100

## APPENDIX 6

## Exhibit 4.5 The General Well-Being Schedule

a. Name (Last, first, middle)	b. Deck No. 171	c. Sample No. — — — — —	d. Sex 1 Male 2 Female	e. Age — —
<b>READ</b> — This section of the examination contains questions about how you feel and how things have been going with you. For each question, mark (X) the answer which best applies to you.				
1. How have you been feeling in general? (DURING THE PAST MONTH)	1.	(001)	1 <input type="checkbox"/> In excellent spirits 2 <input type="checkbox"/> In very good spirits 3 <input type="checkbox"/> In good spirits mostly 4 <input type="checkbox"/> I have been up and down in spirits a lot 5 <input type="checkbox"/> In low spirits mostly 6 <input type="checkbox"/> In very low spirits	
2. Have you been bothered by nervousness or your "nerves"? (DURING THE PAST MONTH)	2.	(002)	1 <input type="checkbox"/> Extremely so -- to the point where I could not work or take care of things 2 <input type="checkbox"/> Very much so 3 <input type="checkbox"/> Quite a bit 4 <input type="checkbox"/> Some -- enough to bother me 5 <input type="checkbox"/> A little 6 <input type="checkbox"/> Not at all	
3. Have you been in firm control of your behavior, thoughts, emotions OR feelings? (DURING THE PAST MONTH)	3.	(003)	1 <input type="checkbox"/> Yes, definitely so 2 <input type="checkbox"/> Yes, for the most part 3 <input type="checkbox"/> Generally so 4 <input type="checkbox"/> Not too well 5 <input type="checkbox"/> No, and I am somewhat disturbed 6 <input type="checkbox"/> No, and I am very disturbed	
4. Have you felt so sad, discouraged, hopeless, or had so many problems that you wondered if anything was worthwhile? (DURING THE PAST MONTH)	4.	(004)	1 <input type="checkbox"/> Extremely so -- to the point that I have just about given up 2 <input type="checkbox"/> Very much so 3 <input type="checkbox"/> Quite a bit 4 <input type="checkbox"/> Some -- enough to bother me 5 <input type="checkbox"/> A little bit 6 <input type="checkbox"/> Not at all	
5. Have you been under or felt you were under any strain, stress, or pressure? (DURING THE PAST MONTH)	5.	(005)	1 <input type="checkbox"/> Yes -- almost more than I could bear or stand 2 <input type="checkbox"/> Yes -- quite a bit of pressure 3 <input type="checkbox"/> Yes -- some - more than usual 4 <input type="checkbox"/> Yes -- some - but about usual 5 <input type="checkbox"/> Yes - a little 6 <input type="checkbox"/> Not at all	

6. How happy, satisfied, or pleased have you been with your personal life? (DURING THE PAST MONTH)

6. (006)
- 1 ☐ Extremely happy -- could not have been more satisfied or pleased
  - 2 ☐ Very happy
  - 3 ☐ Fairly happy
  - 4 ☐ Satisfied -- pleased
  - 5 ☐ Somewhat dissatisfied
  - 6 ☐ Very dissatisfied

7. Have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel, or of your memory? (DURING THE PAST MONTH)

7. (007)
- 1 ☐ Not at all
  - 2 ☐ Only a little
  - 3 ☐ Some -- but not enough to be concerned or worried about
  - 4 ☐ Some and I have been a little concerned
  - 5 ☐ Some and I am quite concerned
  - 6 ☐ Yes, very much so and I am very concerned

8. Have you been anxious, worried, or upset? (DURING THE PAST MONTH)

8. (008)
- 1 ☐ Extremely so -- to the point of being sick or almost sick
  - 2 ☐ Very much so
  - 3 ☐ Quite a bit
  - 4 ☐ Some -- enough to bother me
  - 5 ☐ A little bit
  - 6 ☐ Not at all

9. Have you been waking up fresh and rested? (DURING THE PAST MONTH)

9. (009)
- 1 ☐ Every day
  - 2 ☐ Most every day
  - 3 ☐ Fairly often
  - 4 ☐ Less than half the time
  - 5 ☐ Rarely
  - 6 ☐ None of the time

10. Have you been bothered by any illness, bodily disorder, pains, or fears about your health? (DURING THE PAST MONTH)

10. (010)
- 1 ☐ All the time
  - 2 ☐ Most of the time
  - 3 ☐ A good bit of the time
  - 4 ☐ Some of the time
  - 5 ☐ A little of the time
  - 6 ☐ None of the time

11. Has your daily life been full of things that were interesting to you? (DURING THE PAST MONTH)

11. (011)
- 1 ☐ All the time
  - 2 ☐ Most of the time
  - 3 ☐ A good bit of the time
  - 4 ☐ Some of the time
  - 5 ☐ A little of the time
  - 6 ☐ None of the time

12. Have you felt down-hearted and blue? (DURING THE PAST MONTH)

12. (012)
- 1 ☐ All of the time
  - 2 ☐ Most of the time
  - 3 ☐ A good bit of the time
  - 4 ☐ Some of the time
  - 5 ☐ A little of the time
  - 6 ☐ None of the time

## Exhibit 4.5 (continued)

13. Have you been feeling emotionally stable and sure of yourself? (DURING THE PAST MONTH)	13.	(013)	<input type="checkbox"/> 1 All of the time <input type="checkbox"/> 2 Most of the time <input type="checkbox"/> 3 A good bit of the time <input type="checkbox"/> 4 Some of the time <input type="checkbox"/> 5 A little of the time <input type="checkbox"/> 6 None of the time
14. Have you felt tired, worn out, used-up, or exhausted? (DURING THE PAST MONTH)	14.	(014)	<input type="checkbox"/> 1 All of the time <input type="checkbox"/> 2 Most of the time <input type="checkbox"/> 3 A good bit of the time <input type="checkbox"/> 4 Some of the time <input type="checkbox"/> 5 A little of the time <input type="checkbox"/> 6 None of the time

## Exhibit 4.5 (continued)

13. Have you been feeling emotionally stable and sure of yourself? (DURING THE PAST MONTH)	13.	(013)	For each of the four scales below, note that the words at each end of the 0 to 10 scale describe opposite feelings. Circle any number along the bar which seems closest to how you have generally felt DURING THE PAST MONTH.
15. How concerned or worried about your HEALTH have you been? (DURING THE PAST MONTH)	15.	(015)	0 None of the time 4 5 6 7 8 9 10 Very concerned
14. Have you felt tired, worn out, used-up, or exhausted? (DURING THE PAST MONTH)	14.	(014)	0 All of the time 1 2 3 4 5 6 7 8 9 10 Not at all concerned
16. How RELAXED or TENSE have you been? (DURING THE PAST MONTH)	16.	(016)	0 A little of the time 5 6 7 8 9 10 None of the time

13. Have you been feeling emotionally stable and sure of yourself? (DURING THE PAST MONTH)	13.	(013)	For each of the four scales below, note that the words at each end of the 0 to 10 scale describe opposite feelings. Circle any number along the bar which seems closest to how you have generally felt DURING THE PAST MONTH.
17. How much ENERGY, PEP, VITALITY have you felt? (DURING THE PAST MONTH)	17.	(017)	0 No energy AT ALL 1 2 3 4 5 6 7 8 9 10 Very energetic, dynamic
15. How concerned or worried about your HEALTH have you been? (DURING THE PAST MONTH)	15.	(015)	0 None of the time 1 2 3 4 5 6 7 8 9 10 Very concerned
14. Have you felt tired, worn out, used-up, or exhausted? (DURING THE PAST MONTH)	14.	(014)	0 All of the time 1 2 3 4 5 6 7 8 9 10 Not at all concerned
18. How DEPRESSED or CHEERFUL have you been? (DURING THE PAST MONTH)	18.	(018)	0 Very depressed 1 2 3 4 5 6 7 8 9 10 Very cheerful
16. How RELAXED or TENSE have you been? (DURING THE PAST MONTH)	16.	(016)	0 A little of the time 1 2 3 4 5 6 7 8 9 10 None of the time

Reproduced from Fazio AF. A concurrent validation study of the NCHS General Well-Being Schedule. Hyattsville, Maryland: U.S. Department of Health, Education and Welfare, National Center for Health Statistics, 1977:34-36. With permission.

17. How much ENERGY, PEP, VITALITY have you felt? (DURING THE PAST MONTH)	17.	(017)	0 No energy AT ALL 1 2 3 4 5 6 7 8 9 10 Very energetic, dynamic
15. How concerned or worried about your HEALTH have you been? (DURING THE PAST MONTH)	15.	(015)	0 None of the time 1 2 3 4 5 6 7 8 9 10 Very concerned
18. How DEPRESSED or CHEERFUL have you been? (DURING THE PAST MONTH)	18.	(018)	0 Very depressed 1 2 3 4 5 6 7 8 9 10 Very cheerful
16. How RELAXED or TENSE have you been? (DURING THE PAST MONTH)	16.	(016)	0 A little of the time 1 2 3 4 5 6 7 8 9 10 None of the time



## APPENDIX 7

# CMCC NECK DISABILITY INDEX

PATIENT NAME: \_\_\_\_\_ FILE #: \_\_\_\_\_ DATE: \_\_\_\_\_

This questionnaire has been designed to give the doctor information as to how your neck pain has affected your ability to manage in everyday life. Please answer every section and mark in each section only the ONE box which applies to you. We realize you may consider that two of the statements in any one section relate to you, but please just mark the box which most closely describes your problem.

## Section 1 - Pain Intensity

- ☐ I have no pain at the moment.
- ☐ The pain is very mild at the moment.
- ☐ The pain is moderate at the moment.
- ☐ The pain is fairly severe at the moment.
- ☐ The pain is very severe at the moment.
- ☐ The pain is the worst imaginable at the moment.

## Section 2 - Personal Care (Washing, Dressing etc.)

- ☐ I can look after myself normally without causing extra pain.
- ☐ I can look after myself normally but it causes extra pain.
- ☐ It is painful to look after myself and I am slow and careful.
- ☐ I need some help but manage most of my personal care.
- ☐ I need help every day in most aspects of self care.
- ☐ I do not get dressed, I wash with difficulty and stay in bed.

## Section 3 - Lifting

- ☐ I can lift heavy weights without extra pain.
- ☐ I can lift heavy weights but it gives extra pain.
- ☐ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example on a table.
- ☐ Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- ☐ I can lift very light weights.
- ☐ I cannot lift or carry anything at all.

## Section 4 - Reading

- ☐ I can read as much as I want to with no pain in my neck.
- ☐ I can read as much as I want to with slight pain in my neck.
- ☐ I can read as much as I want with moderate pain in my neck.
- ☐ I can't read as much as I want because of moderate pain in my neck.
- ☐ I can hardly read at all because of severe pain in my neck.
- ☐ I cannot read at all.

## Section 5 - Headaches

- ☐ I have no headaches at all.
- ☐ I have slight headaches which come in-frequently.
- ☐ I have moderate headaches which come in-frequently.
- ☐ I have moderate headaches which come frequently.
- ☐ I have severe headaches which come frequently.
- ☐ I have headaches almost all the time.

## Section 6 - Concentration

- ☐ I can concentrate fully when I want to with no difficulty.
- ☐ I can concentrate fully when I want to with slight difficulty.
- ☐ I have a fair degree of difficulty in concentrating when I want to.
- ☐ I have a lot of difficulty in concentrating when I want to.
- ☐ I have a great deal of difficulty in concentrating when I want to.
- ☐ I cannot concentrate at all.

## Section 7 - Work

- ☐ I can do as much work as I want to.
- ☐ I can only do my usual work, but no more.
- ☐ I can do most of my usual work, but no more.
- ☐ I cannot do my usual work.
- ☐ I can hardly do any work at all.
- ☐ I can't do any work at all.

## Section 8 - Driving

- ☐ I can drive my car without any neck pain.
- ☐ I can drive my car as long as I want with slight pain in my neck.
- ☐ I can drive my car as long as I want with moderate pain in my neck.
- ☐ I can't drive my car as long as I want because of moderate pain in my neck.
- ☐ I can hardly drive at all because of severe pain in my neck.
- ☐ I can't drive my car at all.

## Section 9 - Sleeping

- ☐ I have no trouble sleeping.
- ☐ My sleep is slightly disturbed (less than 1 hr. sleepless).
- ☐ My sleep is mildly disturbed (1-2 hrs. sleepless).
- ☐ My sleep is moderately disturbed (2-3 hrs. sleepless).
- ☐ My sleep is greatly disturbed (3-5 hrs. sleepless).
- ☐ My sleep is completely disturbed (5-7 hrs. sleepless).

## Section 10 - Recreation

- ☐ I am able to engage in all my recreation activities with no neck pain at all.
- ☐ I am able to engage in all my recreation activities, with some pain in my neck.
- ☐ I am able to engage in most, but not all of my usual recreation activities because of pain in my neck.
- ☐ I am able to engage in a few of my usual recreation activities because of pain in my neck.
- ☐ I can hardly do any recreation activities because of pain in my neck.
- ☐ I can't do any recreation activities at all.

## APPENDIX EIGHT

APPENDIX 8

INFORMED CONSENT FORM

Date: .....

I, the undersigned, ....., give my informed consent to be examined and treated at the Technikon Natal Chiropractic Day Clinic, and will comply with the instructions as stipulated by the author with regards to his/her research dissertation.

Signature .....