COLLEGE D'ETUDES OSTEOPATHIQUES
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THE EFFECT OF GENERAL OSTEOPATHIC TREATMENT ON PAIN IN VETERANS DIAGNOSED WITH POST TRAUMATIC STRESS DISORDER

by

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HYPOTHESIS:

General osteopathic treatment will reduce pain in veterans diagnosed with post traumatic stress disorder.

ABSTRACT:

This quantitative osteopathic treatment study measured the effect of general osteopathic treatment on the pain levels of male veterans diagnosed with post traumatic stress disorder (PTSD) using the visual analogue scale (VAS) for pain measuring tool.

Methods: Forty male veterans 30-65 years of age, with combat duty experience, and clinically diagnosed with PTSD were recruited from a retired army physician's practice. They were randomly assigned to an experimental (N=21) or control group (N=19). Baseline measures of pain using the visual analogue scale (VAS) were recorded for both groups at the beginning of the study. The maximum value possible for this scale is 10 and the minimum value is 0. The subjects were in the study for a total of 10 weeks. The experimental group received 6 osteopathic treatments (independent variable) at 2 week intervals coupled with standardized medical care for PTSD provided by the study physician. The control group received only the standardized medical care. Both groups completed the VAS measuring pain at 2 additional intervals throughout the study (week 6 & 10). A PTSD survey was completed by both groups at the beginning and end of the study for use during the discussion.

Measure of visual analogue scale (VAS) for pain scores (dependent variable) were examined for differences between control and experimental groups. Data analyses were conducted by a research analyst using SPSS 20 software.

Results: The VAS for pain findings showed significant results and supported the hypothesis that general osteopathic treatment may reduce pain in veterans diagnosed with PTSD. Pain scores for the control group ranged from 5.4 (baseline), 5.56 (week 6) to 5.87 (week 10) whereas pain scores for the treatment group ranged from 6.74 (baseline), 5.05 (week 6) to 2.76 (week 10). No difference was detected between groups pre-treatment $F=1.74$, $p=.19$ but groups did change over time $F=18.99$, $p=.000$. The control and experimental groups behaved differently over time, $F=30.79$, $p=.000$. Mean VAS scores for control group increased marginally ($x=5.4$ to 5.87) while mean VAS scores for the treatment group decreased significantly ($x=6.74$ to 2.76).

Conclusion: There was statistical significance in pain level reduction for the experimental group. The results of this study show the addition of osteopathic treatment sessions have the potential to improve pain symptoms in male veterans with PTSD beyond those expected from the current standard of care for PTSD. This study reveals that general osteopathic treatment can provide a safe and effective treatment approach in addition to the standard medical care for veterans with PTSD.

Résumé:

Cette étude quantitative du traitement ostéopathique a mesuré l'effet du traitement ostéopathique général (TOG) sur l'intensité de la douleur d'anciens combattants masculins qui avaient un diagnostic de syndrome de stress post-traumatique (SSPT), à l'aide de l'échelle visuelle analogique (ÉVA) comme outil de mesure de la douleur.

Méthodes : Quarante vétérans âgés de 30 à 65 ans, avec de l'expérience de combat et cliniquement diagnostiqués avec un SSPT, ont été recrutés parmi la clientèle d'un médecin de l'armée à la retraite. Ils ont été affectés au hasard à un groupe expérimental (N = 21) ou à un groupe témoin (N = 19). Des mesures de référence de l'intensité de la douleur ont été enregistrées pour les deux groupes au début de l'étude, à l'aide de l'échelle visuelle analogique (ÉVA). La valeur maximale possible pour cette échelle est de 10 et la valeur minimale est de 0. Les sujets participaient à l'étude pendant un total de 10 semaines. Le groupe expérimental a reçu 6 traitements ostéopathiques (variable indépendante) à intervalles de 2 semaines. À cela, se sont ajoutés les soins médicaux habituels pour un SSPT, qui ont été prodigués par le médecin de l'étude. Le groupe témoin a reçu seulement les soins médicaux habituels. Les deux groupes ont complété l'échelle de mesure de l'intensité de la douleur (ÉAV) à 2 autres occasions pendant l'étude (semaines 6 & 10). Un questionnaire sur le SSPT a été rempli par les deux groupes au début et à la fin de l'étude pour une utilisation au cours de la discussion.

Des mesures de l'échelle visuelle analogique (ÉVA) de l’intensité de la douleur (variable dépendante) ont été examinées pour établir les différences entre le groupe expérimental et le groupe témoin. L'analyse de données a été menée par un analyste de recherche à l'aide du logiciel SPSS 20.

Résultats : L'ÉAV pour l'évaluation de l'intensité de la douleur a montré des résultats significatifs, ce qui supporte l'hypothèse que le traitement ostéopathique général (TOG) peut réduire la douleur chez les anciens combattants ayant un diagnostic de SSPT. Les résultats de l’intensité de la douleur pour le groupe témoin variaient de 5.4 (référence), à 5.56 (semaine 6) et à 5.87 (semaine 10) alors que les résultats pour le groupe de traitement variaient de 6.74 (référence), à 5.05 (semaine 6) et à 2.76 (semaine 10). Aucune différence n'a été détectée entre les groupes avant le traitement F=1.74, p=.19, mais les groupes ont changé au fil du temps F=18.99, p=.000. Le groupe expérimental et le groupe témoin se sont comportés différemment au fil du temps, F=30.79, p=.000. Les résultats moyens de l'ÉAV pour le groupe témoin ont très peu augmenté
(x=5.4 à 5.87) tandis que les résultats moyens de l'ÉAV pour le groupe de traitement ont diminué de façon significative (x=6.74 à 2.76).

Conclusion : Le niveau de réduction de la douleur pour le groupe expérimental a été statistiquement significatif. Les résultats de cette étude démontrent que l'ajout de séances de traitements ostéopathiques a le potentiel d’améliorer les symptômes de la douleur chez les vétérans masculins avec un SSPT, au-delà

de celles que l'on attend de l'actuelle norme de soins pour le SSPT. Cette étude révèle qu'un traitement ostéopathique général peut fournir une approche de traitement sûr et efficace, en plus des soins médicaux habituels pour les anciens combattants avec un SSPT.

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LIST OF ABBREVIATIONS:

CEO: College d'Etudes Osteopathiques

DRS: Drug Reaction Scale

DSM: Diagnostic and Statistical Manual of Mental Disorders

EMDR: Eye Movement Desensitization Reprocessing

HEF: Human Energy Field

NASA: The National Aeronautics and Space Administration

OMT: Osteopathic Manual Therapy

PE: Prolonged Exposure

PPCS: Persistent Post Concussive Symptoms

PRM: Primary Respiratory Mechanism

PTSD: Post Traumatic Stress Disorder

SQUID: Superconducting Quantum Interference Device

VAS: Visual Analogue Scale

Introduction

1.1 Introduction:

Post traumatic stress disorder (PTSD) is a mental health condition that develops in some people after a traumatic, often life threatening event. Symptoms include severe anxiety, flashbacks of the event, nightmares, hyper-vigilance, concentration and memory problems, as well as avoidance and emotional numbing. Typically the symptoms occur within 3 months of the event but may not appear until years after the event (Mayo Clinic Staff, 2011). With no known cure, PTSD recovery is a daily, gradual process of coping with symptoms (Veterans Affairs Canada, 2010). The percentage of Canadian veterans receiving services from Veterans Affairs Canada (VAC) who have been diagnosed with PTSD is 42.6% percent, and 70% of veterans require other mental health treatment. The number of veterans requiring mental health assistance is expected to increase as the 30 thousand service personnel who have now returned from Afghanistan move into civilian or other military jobs. Afghanistan represents Canada's largest deployment of personnel since the Second World War. Soldiers who have been involved with combat operations run a 30% risk of developing PTSD or major depression in their lifetime (Pare, 2011). Most recently it was reported that there have been eight apparent suicides by Canadian soldiers suffering with PTSD in a short 2 month time period. This has prompted politicians to ask the Canadian government to take immediate action to address this crisis (CTV News Staff, 2014). These statistics show a strong need for help for veterans suffering from PTSD.

1.2 PTSD and Pain

Pain and PTSD have a high co-occurrence and often interact in such a way that negatively affects each other (Otis, Keane & Kerns, 2003). In a 1997 study on pain and PTSD in Vietnam combat veterans, 80% of 129 veterans with PTSD surveyed reported chronic pain (Beckham et al, 1997).

1.3 Clinical Observations & Motivation for Study:

Clinical observations of two patients not formally diagnosed with PTSD helped fuel the desire to research this subject more fully. One patient had been a first responder at a motor vehicle accident which involved the fatality of a close friend. Symptoms included nightmares, flashbacks and anger outbursts, as well as increased pain. After receiving global osteopathic treatment; the patient's pain levels decreased, and anger outbursts, nightmares and flashbacks all disappeared. The second patient was also treated for pain and showed signs of undiagnosed PTSD. This individual had been in a motor vehicle accident over a year before treatment. The symptoms were flashbacks, nightmares and disabling fear of driving. Following treatment, the patient's pain was resolved, and the fear of driving greatly reduced.

A third patient who was formally diagnosed with PTSD was also treated. This patient became the pilot subject for this study. It was requested by the study's

supervising physician to treat this patient but to not have them in the study. It was felt that their injuries and symptoms of PTSD were too severe and they may not be able to be helped. This subject improved with global osteopathic care beyond the expectations of the researcher and the physician. This subject received additional treatment over the original six pilot program treatments and continues to be treated. The subject was able to enjoy many pain free days and was able to travel south for a family vacation for the first time since issues began.

1.4 Definitions of PTSD:

PTSD is different from most anxiety disorders because it is linked to a traumatic life experience that involves death, potential for death, or serious injury. PTSD is defined by the American Psychiatric Association in their Diagnostic and Statistical Manual of Mental Disorders (DSM). Prior to 1980, the DSM manual referred to conditions such as PTSD as “shell shock” or “battle fatigue”. The term Post Traumatic Stress Disorder first appeared in the 1980 DSM Volume III manual and was considered as *“stress that was outside the range of normal human experience* (Kaplan and Sadock, 1995, p. 682). This definition was found to be unreliable and inaccurate so it was expanded in 1994 in DSM-Volume IV as a condition that *“required that the subject have experienced, witnessed or been confronted with an event or events that involve actual or*

threatened death or serious injury, or a threat to the physical integrity of oneself or others." (Kaplan and Sadock, 1995, p. 682)

PTSD is the result of trauma that occurred in the past and is now producing symptoms in the present through thoughts and experiences. The person re-experiences symptoms as if he/she were engaged in the trauma at that moment. PTSD can affect other aspects of the person's life both physically and mentally; they may have difficulty concentrating, memory gaps or amnesia, sleep disturbances, increased pain symptoms, nightmares, anger outbursts, irritability, hyper-vigilance, and flashbacks of the event (Veteran Affairs Canada, 2010).

Rothschild (2000) explains that PTSD traumatic events are not remembered as events relegated to the past. *"Trauma continues to intrude with visual, auditory, and/or other somatic reality on the lives of its victims."* (p. 6).

1.4.1 Who gets PTSD?

Persons experiencing traumas such as abuse, major accidents and injuries, abduction, murder, military combat and natural disasters have the potential to develop PTSD. *"The stressor must meet two criteria: be life threatening or associated with serious injury or threat and evoke intense fear, helplessness, or horror in the victim"* (Kaplan and Sadock, 1995, p. 1232).

Symptoms are often divided into four categories:

1. Re-experiencing the event in the form of nightmares, flashbacks or memory recurrences.
2. Avoidance of people, places and activities that are reminders of the trauma.
3. Changes in sleep patterns, problems with concentration and hyper-vigilance.
4. Emotional numbing, particularly positive feelings. (Veteran Affairs Canada, 2010).

These symptoms may appear following the event, lasting less than 3 months. They become chronic if the duration of symptoms is longer than 3 months. Sometimes symptoms are delayed in onset and surface years after the event or events (Veteran Affairs Canada, 2010).

1.4.2 Associated Conditions:

People with PTSD also may become dependent on drugs or alcohol, become depressed and have other anxiety disorders. Chronic pain as well as dizziness, immune deficiencies, and gastrointestinal complaints are also common (Canadian Mental Health Association, 2010).

1.4.3 Number Affected:

Canada

The Canadian Mental Health Association states that one in ten people in Canada are affected by PTSD which is part of an anxiety disorder and that women have twice the risk as men for developing this disorder (Canadian Mental Health Association, 2010).

U.S.

In the United States, an estimated 5.2 million adults suffer from PTSD, with veterans making up a large portion of this number. Thirty percent of Vietnam veterans developed PTSD and 31% of veterans returning from Iraq and Afghanistan are seeking treatment for PTSD (Maul, 2010).

1.4.4 Evolution of the Disorder:

Veteran Affairs Canada published a fact sheet titled*, "Mental Health, How is PTSD Measured?"* This publication explains how a traumatic experience could lead to PTSD. After experiencing a trauma, some people will become anxious, possibly depressed, or engaged in avoidance behaviors. However, after a few weeks or months, most find that they can return to normal daily living. If someone continues to have symptoms over a period of a month and these

symptoms drastically affect their activities of daily living, they may be experiencing Post Traumatic Stress Disorder (Veterans Affairs Canada, 2010).

The processing of a traumatic event can be experienced in many different ways by different people. It is as individual to the person as his or her being. It can be experienced emotionally, mentally and/or physically and is part of the body's way to defend itself (Levine, 2005).

The body reacts instinctually to trauma, as it must be hardwired in order to protect the body from danger. Even the birth process can be a very traumatizing experience; the quick entry into the brightly lit, cold room with many loud sounds is a shock after the warmth, darkness, and soft sounds of the womb. Trauma can be exacerbated in what appears as normal stressful events throughout life. Examples including; childhood bullying, injuries, workplace stress, death of loved ones, etc. are common to most people (Bercheli, 2008). However, when it comes to trauma, the important factor is how the threat is perceived and the incapacity to deal with it (Levine, 2005).

1.5 PTSD Research:

Post Traumatic Stress Disorder has been studied in the medical and psychiatric fields for many years. However, osteopathic research on PTSD is limited.

To date there have been no studies investigating the effectiveness of osteopathic manipulative treatment (OMT) by American DOs in patients with PTSD (Reeves, 2007). Few osteopathic physicians use osteopathic manual techniques in their practice. This along with limited research on OMT and its benefit to PTSD is leaving many patients without care that could help them (Romaine, 2012).

An osteopathic manual therapy study entitled *Influence du Traitement Osteopathique sur le Trouble de Stress Post Traumatique chez l'Adulte* was conducted on PTSD in Canada for the College d'Etudes Osteopathiques de Montreal (CEO). It was conducted on adults with PTSD but did not achieve significant statistical results due to a non-homogeneous group, although they did find general improvements in patient health from the osteopathic care provided. They recommended that a study conducted with veterans would provide an ideal homogenous group (Desilet & Issac-Villette, 2007).

A retired military doctor whose patients; veterans with combat experience and clinically diagnosed with Post Traumatic Stress Disorder, agreed to provide access to their patients thus providing the Desilets and Issac-Villette recommended homogenous group for this study.

Chapter Two:

Literature Review & Osteopathic Justification

2.1 Current Therapies for PTSD:

Current therapies for PTSD are mostly a combination of psychological and pharmaceutical medical interventions.

Psychotherapy includes cognitive behavioral therapy. There are two types of cognitive behaviour therapy: cognitive processing therapy and prolonged exposure therapy.

Cognitive processing therapy includes teaching the patient about his/her PTSD symptoms, how to recognize them as well as the various treatments available. It helps the patient become aware of his/her thoughts and feelings, and how to challenge them.

Prolonged exposure therapy (PE) teaches the patient to identify his/her symptoms, how various breathing techniques can help and when they are most appropriate. It involves talking about the trauma while visualizing the traumatizing event. It also includes real world exposure to similar situations that caused the trauma but this time in controlled safe environments.

Group therapy can also be used in psychotherapy to help the patient feel less alone and isolated. Patients who have been through the same or similar traumatic events meet in groups to receive helpful support and validation (U.S. Department of Veterans Affairs, 2011).

Eye Movement Desensitization Reprocessing (EMDR) Therapy. Discovered and developed by Francine Shapiro, PhD in 1987, it is another treatment currently used for PTSD. In their *Post Traumatic Stress Disorder Overview*, Veteran Affairs Canada indicates that EMDR has had some success, but more research is needed. The US Department of Veterans Affairs National Center of PTSD included EMDR in their treatment options for PTSD, saying that studies have shown that EMDR may help the patient have fewer symptoms of PTSD. However, it also suggested that further research was required to understand the mechanism of EMDR, and if it was truly the eye movement that caused the therapeutic effect.

The results of a randomized clinical trial comparing EMDR, the drug fluoxetine (Prozac) and a placebo pill in the treatment of PTSD supported the use of EMDR. Patients in an 8 week study were evaluated using the Clinician Administered PTSD Scale, DSM-IV Version. They found that EMDR group was superior to the placebo pill group but did not differ with patients given fluoxetine. However, at the six month follow- up, EMDR was superior in results to fluoxetine. After the six month follow-up, 58% of EMDR patients were asymptomatic while none of the patients who received fluoxetine were asymptomatic (Van der Kolk et al., 2007).

Medications improve the symptoms of PTSD but do not provide a cure. Medications offer patients a way to regain a certain sense of control over their lives through chemical manipulation of the brain's machinery. This may allow

some people to feel better and learn to cope with their condition (Mayo Clinic, 2011). Antipsychotics may be prescribed in the short course to relieve severe anxiety and antidepressants such as selective serotonin reuptake inhibitor (SSRI) medications help with the symptoms of both depression and anxiety. Zoloft and Paxil, both antidepressants, are FDA approved for treatment of PTSD. Anti-anxiety medications also improve symptoms of stress and anxiety. Prazosin, a drug shown to decrease the effects of adrenaline secretion of the body has also been used in the treatment of PTSD. Although not specifically approved for the treatment of PTSD, it has been helpful with the symptoms of insomnia and recurrent nightmares. It is used for hypertension and blocks the brain's response to norepinephrine (Mayo Clinic, 2011). By reducing the adrenaline response in the body the symptoms associated with the flight or fight (stress) response will be decreased as well. Researchers found that low-dose cortisol treatment for one month reduced symptoms of traumatic memories (De Quervain & Margraf, 2008).

Body-focused therapies: The Royal College of Psychiatrists list various body focused therapies as viable treatment options for PTSD such as: massage therapy, acupuncture, reflexology, meditation, tai chi, yoga, and physiotherapy. Osteopathy was also listed as a treatment to help control distress and reduce feelings of vigilance (Royal College of Psychiatrists, 2009).

2.2 Osteopathic Studies for PTSD:

Osteopathic treatment studies on Post Traumatic Stress Disorder are ongoing. Upledger (2001) wrote the article titled *The Role of CranioSacral Therapy in Addressing Post-Traumatic Stress Disorder*. He discussed treating 22 Vietnam veterans with PTSD using a 2 week intensive CranioSacral therapy regime including decompaction of the SBS, C0-C1 and L5-S1. He concluded that after treatment, these subjects tested much lower on the depression scale.

Research conducted by Reeves (2007) on the *Diagnosis and Management of Posttraumatic Stress Disorder in Returning Veterans*; stated that there was no research to date on Osteopathic Manual Therapy (OMT) and PTSD. He stated:

> *"Nevertheless, it seems logical that OMT could benefit these patients. One might hypothesize that patients with posttraumatic stress are likely to have increased sympathetic nervous system activity and associated somatic dysfunction, particularly in the thoracolumbar region. Uncomfortable paravertebral muscle spasm may accompany these dysfunctions. Thus, in my view, addressing these dysfunctions with appropriate osteopathic manipulative techniques could aid in the healing process."* (Reeves, 2007, p.186)

A pilot study on women with depression was conducted at the Chicago College of Osteopathic Medicine was cited in the September 2001 issue of The Journal of the American Osteopathic Association. The researchers assessed OMT on

premenopausal women who had been recently diagnosed with depression. Eight members of the experimental group received 8 weeks of OMT along with conventional pharmaceutical treatment and psychotherapy. The nine member control group only received just an osteopathic assessment along with the conventional pharmaceutical and psychotherapy treatment. The findings indicated that OMT is a successful supplemental treatment for women with depression (Plotkin, et al., 2001).

Research on OMT and its effect on the endocannabinoid system has shown promising results for the treatment of pain. The endocannabinoid system, also known as the endogenous cannabinoid system, is distributed throughout the body including in the brain, the liver, muscles, adipose tissue and the digestive tract. Discovered in 1992, this system of lipids and their receptors are known to play a role in numerous physiological processes including appetite, memory and pain (U.S. Department of Health and Human Services, 2009). Researchers utilized a double blind randomized controlled trial that measured the effect of OMT on changes in the scores of 31 subjects (n=16 treatment group and n=15 sham group) scores on the Drug Reaction Scale (DRS) and changes in serum levels of anadamide (AEA), 2-arachidonoylglycerol (2-AG) and oleylethanolamide (OEA). They found improvement for DRS scores, but no statistical significance in serum levels, due to large variances. They cited aspects of experimental design that may have contributed to the result as there was an insufficient homogenous group of subjects (McPartland et al., 2005).

AEA is also known as the body's natural marijuana, and may play a role in the commonly known "runner's high" (Sparling et al., 2003). Their research indicates that osteopathic treatment may have an effect on releasing the body's own cache of pain relieving drugs.

> *"In 1897, Andrew Taylor Still MD, DO, the founder of osteopathic medicine, famously stated, 'Man should study and use the drugs compounded in his own body.' Still hypothesized that osteopathic manipulative treatment (OMT) stimulated endogenous compounds that promoted homeostasis and healing." "The endocannabinoid system is a homeostatic mechanism that exemplifies the key osteopathic concepts of mind-body unity on a molecular level."* (McPartland, 2008, p. 586).

We can expect more research to be completed on PTSD as recently the government of the United States has called for additional studies on this disorder. In their initiative *Joining Forces*, First Lady Michelle Obama, and Dr. Jill Biden, asked that American medical schools, and osteopathic medical schools, increase their research and leadership on the needs of the nation's veterans (Obama, 2012).

In the March 2012 report to the Government of Canada: *Post Traumatic Stress Disorder: Out of Sight, Not out of Mind;* the Mood Disorders Society of Canada recommended that an inter-departmental panel be established that would meet

regularly with researchers on PTSD. The findings are expected to be released and will include the latest PTSD research, prevention, and treatment strategies.

2.3 CEO Research on PTSD:

The research investigating the influence of osteopathic treatment on PTSD sufferers by Desilets and Isaac-Vilette, (2007), incorporated the treatment of the cranial sacral, and musculo-skeletal systems, as well as the central chain and endocranial spasms as per Phillipe Druelle DO. There was no significant statistical difference between the experimental (n=17) and placebo group (n=11), postulated to be due to the non-homogeneous group utilized. With their osteopathic treatments, they found compactions at C0-C1 and L5-S1, which was similar to the Upledger study mentioned previously. Experimental subjects showed improvement in PTSD symptoms. An additional finding was that the placebo group, conducted by a researcher untrained in osteopathic treatments, obtained a therapeutic effect with measured symptom improvement. This could have been due to the Hawthorne effect where subjects improve simply because they were being cared for or observed (Draper, 2013). Desilets and Isaac-Vilette recommended that a sham treatment not be offered for future research due to the therapeutic effect.

Bastien (2008) found that osteopathic treatment relieved a degree of anxiety in a mixed population of subjects 20-50 years of age. She took a global osteopathic

approach that paid attention to the cranial and thoracic area to decrease the activation of the sympathic nervous system.

Williams (2010) studied the effect of osteopathic treatment aiming for the hypothalamus-pituitary-adrenal axis (HPA axis) on self-perceived stress. Ten subjects received one relaxation control treatment and two osteopathic treatments specifically for the HPA axis. The subjects measured their perceived stress one week before and one week following the osteopathic treatment. Post treatment scores showed statistical significance and confirmed the value of osteopathic treatment for self-perceived stress reduction. This outcome supports the statement that osteopathic care has a positive effect on psychological health (Williams, 2010).

More recently, a qualitative study was conducted on the effects of emotional trauma on a patient's expression of the Primary Respiratory Mechanism (Hain, 2011). Data was collected through a comprehensive literature review, and interviews with a series of osteopaths, and osteopathic physicians. Thirteen subjects with over twenty years experience were asked how they perceive, describe, and treat emotional trauma as it affects the PRM. All osteopaths interviewed agreed that emotional trauma affected the expression of PRM. They described similar changes in amplitude, rate, variability and quality of the PRM. When triangulated with the literature, the results show the unique contribution that osteopathic manual therapy has on the physiological effects of emotional trauma. Osteopathy may possibly offer the traumatized individual

relief from burdens of the past by releasing emotional trauma from the body (Hain, 2011).

Tait (2012) studied the osteopathic treatment of adults who experienced war as children. It was a chronological study using one subject group. Subjects were given six to eight treatments including both global and endocranial treatments. No significant difference was found between subgroup reaction times in Stroop test analysis; as both groups improved. Further analysis demonstrated that significantly more subjects who receive both global osteopathic and endocranial treatment improved their reaction times faster in Emotional Stroop Interference ($p=.04$) and Counting Stroop Neutral ($p=.03$), than subjects who receive global osteopathic treatment alone (Tait, 2012).

2.4 Pain and PTSD:

It was proposed that the study use pain as the research's dependent variable, as pain was the main symptom of the subjects with PTSD. Chronic pain and Post Traumatic Stress Disorder are linked at a high rate, and pain is often included in the formal symptom list of PTSD. At least 70% of the PTSD patients suffer chronic pain (MacKinnon, 2010).

Chronic pain and PTSD frequently occur together. Other symptoms such as fear, avoidance, hypervigilance and anxiety may exist for maintaining both

conditions (Otis et al., 2003). A study conducted on the prevalence of chronic pain and PTSD as well as Persistent Post Concussive Symptoms (PPCS) examined the medical records of 340 Veterans of Operation Iraqi Freedom, and Operation Enduring Freedom, and found that 81.5% had chronic pain, 68.2% percent had PTSD and 66.8% had PPCS. Only twelve (3.5 %) of the returning veterans had none of the three conditions. The most common symptoms were back and head related (Lew et al, 2009).

2.5 Osteopathic Justification

2.5.1 The Principles of Osteopathy:

Andrew Taylor Still created the four basic principles of Osteopathy in 1874:

1. The structure governs function.
2. The role of the artery is absolute.
3. The body is a functional unit.
4. The natural auto regulation system of the organism (Druelle, 1992, p. 5).

The principles guide osteopaths in their philosophy, knowledge and practice of treating patients. It is the objective of the osteopath to restore the body to its expression of health that will allow the natural functions of the body to return thus following Still's fourth principle of the body's auto regulatory ability. In

individuals with emotional trauma their bodies ability to self regulate is hindered (Hain, 2011). Emotional trauma is a symptom of PTSD.

The body requires a normal flow of fluids that includes: arterial blood supply, venous drainage and circulation of cerebral spinal fluid to restore and maintain health. Any form of obstruction or compression will result in tissue damage and/or dysfunction (Druelle, 1992). Still's second principle; the role of the artery is absolute reminds osteopaths to ensure there is good arterial supply to all tissues. Individuals with PTSD have measured reduced blood flow to medial prefrontal regions (Shin et al., 2006).

2.5.2 Primary Respiratory Mechanism:

Treatment of the cranium was first introduced by its founder William Garner Sutherland, one of Still's first students, in 1929. His discoveries and later teachings were a natural progression of Still's holistic treatment of the patient. His concept of the primary respiratory mechanism (PRM) was introduced in a small text entitled *The Cranial Bowl* in 1939. This mechanism continued Still's concept of the body as a functional unit and included six phenomena:

1. The inherent motility of the brain and spinal cord.
2. The fluctuation of the cerebrospinal fluid.
3. The mobility of the intracranial and intra-spinal membranes.
4. The articular mobility of the cranial bones.

5. The involuntary mobility of the sacrum between the ilia.
6. The effect of all these phenomena throughout the entire body by way of all possible channels. (Magoun, 1976, p. 23)

The primary respiratory mechanism (PRM) expresses itself in a flexion/ extension rhythm known as mobility. Mobility refers to the movement of one structure in relationship to another. Each structure in the body expresses a specific natural pattern of mobility. Motility is the inner breathing of tissues; the expansion and retraction that arises from within a structure. It occurs as the direct expression of the potency of the Breath of Life. When mobility and/or motility are depleted; there is a dysfunction somewhere in the body (Kern, 2001). Hain (2011) concluded that emotional trauma has a negative effect on PRM. PTSD is a disorder of extreme emotional trauma and would therefore affect tissue PRM. This dysfunction could be in the cranium, the torso or the extremities. If there is an impact anywhere on the expression of PRM, it affects the rest of the body (Richter, et al., 2009). Assessing the PRM of tissues is a basic tool used in osteopathic assessment. It provides a unique picture of how the tissue is working within the mechanism (Druelle, 1992).

2.5.3 Fascia:

"The soul of man with all the streams of pure living water seems to dwell in the fascia of his body." (Still, 1899, p. 165).

In Still's third principal, the body is a functional unit; we are reminded that the body is united by its fascial system. A dysfunction in any part of this fascial system will affect other parts of the body. *"The presenting symptom of the patient may be the final expression of a series of restriction or compressions within the fascial system of the body".* (Druelle, 1992, p. 6). Fascia, which embryologically originates from the mesoderm, is a continuous three dimensional web throughout the body. Made up of fibroblasts, elastin, reticulin and primarily collagen fibers, it forms the structure of the body. Fascia is found in all tissues down to the cellular level and is organized into three divisions which are all interconnected: fascia superficialis, fascia profunda (deep) and the deepest fascia (Lindsay, 2008). It has often been referred to as our *organ of form* (Schleip, 2003). Schleip writes that our largest sensory organ is our muscles and their fascia. The greatest amount of sensory nerves sending information to the central nervous system comes from myofascial tissue. James Oschman, and Nora Oschman, write about a concept they call "somatic recall". Somatic recall is where manual therapists and patients, often simultaneously, recall memories of traumatic and other events such as those experiencing PTSD, when the therapist is conducting myofascial work (Oschman & Oschman, 1995).

"The fascia gives one of, if not the greatest problems to solve as to the part it takes in life and death. It belts each muscle, vein, nerve and all organs of the

body." "By its action we live, and by its failure we shrink, or swell, and die." (Still, 1899, p. 164).

2.5.4 The Temporal Bone and Temporal Lobe:

The squamous part of the temporal bone forms part of the lateral wall of the cranium, protecting the temporal lobe of the brain. A lesion in the temporal bone could affect the temporal lobe thus illustrating Still's first governing principle of structure governing function. The temporal lobe is one of the four lobes of the brain. They are paired lobes and are involved with such functions as forming and storing memories, experiencing emotion, comprehending language and organizing sensory input. Researchers Kolb and Whishaw (1990) found eight major symptoms associated with damage to the temporal lobe.

1. Problems with auditory sensation and perception
2. Difficulty attending to auditory and visual stimuli
3. Visual perception disorders
4. Problems organizing and categorizing verbal materials
5. Language comprehension problems
6. Impaired long-term memory
7. Changes in affective behavior and personality
8. Changes in sexual behavior (Kolb & Whishaw, 1990).

These are some of the same symptoms exhibited by patients suffering from PTSD.

The mastoid process of the temporal along with the occipital bone makes up a bilateral structure the occipitomastoid suture. This suture contains the jugular foramen of which the vagus nerve exits from the cranium to innervate the rest of the body. The vagus nerve makes up a large portion of the fibers of the parasympathetic nervous system. This system is responsible for regulation of the internal organs and glands; actions that occur when the body is at rest. It is complimentary to that of the sympathetic nervous system which is associated with the fight or flight response (Liem, 2009). The parasympathetic system helps balance the sympathetic system and assists the body to rest and digest. Sleep disturbances and gastrointestinal problems are two of the symptoms that those with PTSD have difficulty with.

2.5.5 The Brain:

Researchers believe that the areas of the brain that are affected by PTSD are those involved with emotion and memory (Shin et al., 2006). The limbic system including the hypothalamus, the hippocampus and the amygdala, is primarily responsible for our emotional life and the formation of memories. The amygdala is a set of neurons found deep in the temporal lobe and plays a key role in the processing of emotions of both fear and pleasure.

In neuroimaging studies of the brain, three areas of the brain are affected in patients with PTSD: the hippocampus, the amygdala and the medial frontal cortex (Nutt & Malizia, 2004). In their study: *Structural and Functional Brain Changes in PTSD*, Nutt and Malizia found patients with PTSD, compared with control subjects without PTSD, to have hyperactivity in the amygdala when stimulated by exposure to traumatic images. At the same time the hippocampus and medial frontal cortex which normally play a role in lessening the effects of trauma stimuli, seemed to fail in this function.

The function of the medial prefrontal cortex is to help restrain impulsive actions. The connections between the medial prefrontal cortex and the amygdala have only been studied in non-human primates due to the invasive testing protocol required. Individuals with PTSD have inappropriate fear responses in everyday life as well as poor reduction of conditioned fear responses in laboratory settings, which has led to the hypothesis that those with PTSD have impaired medial prefrontal cortexes. Neuroimaging research on humans with PTSD has shown that the medial prefrontal cortex is smaller and is less responsive during symptomatic states and in the performance of emotional cognitive tasks (Shin, Rauch & Pitman, 2006). The hippocampus is involved in the formation, organization, and storing of memories. It is also involved with learning and emotional responses. It is this involvement with emotional response that is relevant to the study of PTSD, as the hippocampus appears to interact with the amygdala during the formation of emotional memories. A research review

revealed that smaller hippocampal volumes are associated with increased PTSD symptom severity (Shin et al., 2006).

2.5.6 The Sacrum and the Occiput:

In previously cited osteopathic research on PTSD it was noted in two different studies that the C0-C1 and the L5-S1 junctions were both treated and deemed to be an important component regarding the positive outcomes of the study. The craniosacral axis, also known as the core link is the function unit connecting both these important areas.

The core link allows the movement of the ilium and the sacrum to work in unison with the movement of the cranial bones, both components of Sutherland's PRM phenomena (Magoun, 1976). Treating the tension held in the core link will assist in relieving post-partum depression symptoms (Gauthier, 2006). Compactions of either end of the core link may have a detrimental effect on its proper functioning.

2.5.7 The Human Energy Field (HEF):

"On that division of the body, all action of arms, legs, chest and all muscles get their life-power and motion." (Still, 1899, p. 45) Dr. Still was clairvoyant (Lee,

2014) and was well aware of the subtle energies of the body and of the universe (Fulford, 2003).

The human energy field also known as the bioenergetic field is the result of electrical activity. This electrical activity is produced by the movement or vibration of charged ions such as sodium, potassium, chloride, magnesium and calcium. This electrical activity arises due to the polarity across cell membranes and the ability of these membranes to temporarily depolarize and repolarize. The body is composed of an organization of molecules and atoms. On the basis of quantum physics, this organizational pattern produces coherent or laser like oscillations also known as vibrations. All parts of this pattern set up vibrations that move about within an organism and are emitted into the environment. The molecular vibrations occur at many different frequencies; however common cells emit the same vibration. These vibrations are the collective or cooperative properties of the body. They serve to provide signals that integrate processes such as growth, injury repair, defense and organism function (Oschman, 2000). Shocks or dysfunctions in the human energy field can cause dysfunction in the body both physically and emotionally (Fulford, 2003)(Hunt, 1996)(Oschman, 2000). These emotional dysfunctions and shocks could be a contributor to PTSD. This has been researched by Diepold and Goldstein who measured brain waves in subjects who thought about trauma as compared to when they thought about a neutral event. There was statistical abnormal brave wave patterns when thinking about trauma compared to the normal pattern when thinking of the neutral event. This case study supports the concept that that trauma based

negative emotions such as those in PTSD do have a correlated and measurable abnormal effect in the thought field (Diepold and Goldstein, 2009).

Through his years of experience treating patients as well as through his numerous research studies, Dr. John Upledger D.O. believes that every tissue has its own consciousness and memories of traumatic events. The traumatic event injects its energy into tissues and these injected energies can reside in an energy field without physical or material substance (Upledger, 2010).

The human energy field emanates from the human body and like other energetic structures, vibrates and carries information. It is comprised primarily of subtle energy called the auric field (i.e. the aura) which is a set of energetic bands that extend out from the body. It is important to note that human energy fields permeate all tissue and cells of the body not just surrounding it. There are two basic types of energies: physical and subtle. Physical energies such as those measured by electrocardiograms are also known as veritable or measurable. Subtle energies are also known as putative or immeasurable (Dale, 2009). However with devices such as the superconducting quantum interference device (SQUID), subtle energies are now being measured (Oschman, 2000). Dr. Barbara Brennan PhD is an expert in the field of human energy therapy and is the founder and president of the Barbara Brennan School of Healing. The former NASA atmospheric physicist has been researching the human energy field for more than 35 years. She states that based on observations by researchers, the aura is perceived as layers and are defined by location, color,

density, fluidity and function. The first three layers are grouped together and this group is called the physical plane. This physical plane includes the etheric body, emotional body and mental body. The astral body is in the astral plane which bridges the physical and spiritual planes. The final group is known as the spiritual group and is comprised of the etheric template, the celestial body and the ketheric body. These layers are not true divided layers but rather extensions of our physical body and each layer contains the layer below. They are not like layers of an onion that can be peeled away and separated. The layers that form more of a structure; the etheric, the mental, the etheric template and the ketheric all contain and affect the tissues that the physical body has. There is a vertical flow of energy that pulsates up and down the spinal cord and extends out of the physical body above the cranium and below the coccyx (Brennan, 1988).

The etheric body or field (first layer): The term etheric comes from the word ether which is the state between energy and matter (Brennan, 1988; Dale, 2009). The etheric field is a web of energy that is in constant motion extending 0.25 to 2 inches from the physical body. It has definite lines of structure upon which the physical body is shaped and anchored (Brennan, 1988; Fulford, 2003). The etheric field permeates every particle of the physical body and acts as a matrix or inner scaffold for it (Dale, 2009; Fulford, 2003). It is the first layer of the human energy field and has the same structure as the physical body including all tissues, organs and anatomical parts (Brennan, 1988). Dale described the etheric field as the blueprint for the physical structure and Fulford

stated that it is what conditions and determines the outer form. Fulford also stated that it is the conveyor of physical vitality.

The emotional body or field (second layer): The emotional body roughly outlines the physical body and is associated with feelings. It extends one to three inches from the body and does not duplicate the body but rather appears like colored clouds in continual motion (Brennan, 1988).

The mental body or field (third layer): The mental body extends beyond the emotional body and is associated with thoughts and mental processes. It is found three to eight inches from the body and like the etheric field, the mental field is a structured body that is yellow in color (Brennan, 1988).

The astral level field (fourth layer): The astral layer is free of time and space and links the physical and spiritual planes (Dale, 2009). It extends approximately 0.5 to 1 foot from the physical body. It has the same range of colors as the emotional body but is infused with rose light (Brennan, 1988).

The etheric template or field (fifth layer): The etheric template is the fifth layer of the human energy field and extends 1.5 to 2 feet from the physical body. It is the blueprint or template for the etheric field which is the blueprint for the physical body and therefore brings us to the original 1st layer as previously explained. When disease or dysfunction happens in the etheric field; work in the etheric template is needed to provide support for the etheric layer to return to

health (Brennan, 1988). The etheric template holds the highest ideals for existence or the ultimate blueprint for well-being (Dale, 2009).

The celestial body or field (sixth layer): The celestial field is the emotional level of the spiritual plane and extends 2 to 2.75 feet from the body. Its form is less defined than the etheric template and appears as a shimmering light composed mostly of pastel colors (Brennan, 1988).

The ketheric template or field (seventh layer): The ketheric template is the mental level of the spiritual plane. It extends from 2.5 to 3.5 feet from the body. It appears as threads of gold-silver light that is very strong and holds the aura together. It is the strongest and most resilient of all the auric field levels (Brennan, 1988).

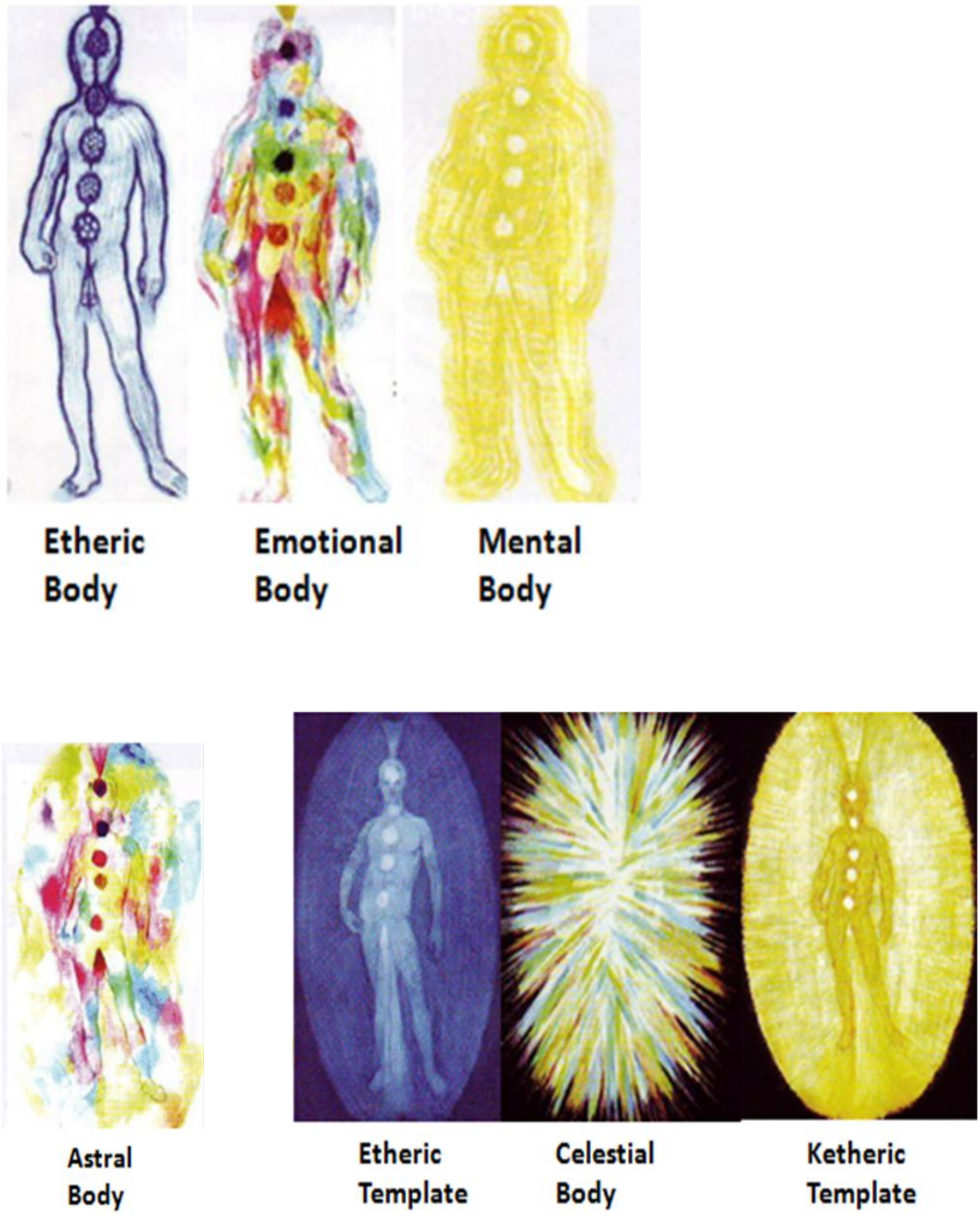


Figure 2.1: Brennan Model of First Seven Layers of Human Energy Field

(Brennan, 1988, page 45)

The fields connect with the physical body through the chakras. Chakra means spinning energy and these cone-shaped vortexes extend from inside the front and back of the body to the edge of each layer of the field they are located in. The chakras vitalize the physical body by transmitting energy between the HEF layers. They direct life energy for the physical and spiritual well-being by shifting energy from a higher to lower vibration and vice versa. Each chakra is frequently associated with a gland of the endocrine system and their measured frequencies are associated with a color and sound. There are many different chakra systems but most place the seven main chakras in the same locations: First chakra - groin, second chakra – lower abdomen, third chakra - solar plexus, fourth chakra – heart, fifth chakra – throat, sixth chakra – forehead, seventh chakra – top of the head (Dale, 2009).

The first chakra or root: This first chakra is located near the perineum and is associated with physical functioning and physical sensation. It is associated with the automatic functioning systems of the body. It appears as the color red and is associated with the spine and glandular system. It connects to the first HEF layer: the etheric.

The second chakra or sacral: This chakra is approximately located anterior to the sacrum and is associated with the emotional life and feelings of human beings. It appears as the color orange and is associated with the ovaries/testes. It connects to the second emotional layer of the HEF.

The third chakra or solar plexus: This chakra is located at the solar plexus and appears as the color yellow. It is associated with the spleen, pancreas and adrenals as well as our mental life. The third layer of the HEF; the mental layer is connected to the third chakra.

The fourth chakra or heart: The fourth chakra is located at the heart and is green in color. It is associated with the heart and thymus gland. This chakra metabolizes the energy of love. It is connected to the astral layer (fourth) of the HEF.

The fifth chakra or throat: This chakra is located at the throat and appears as blue in color. It is associated with the thyroid and parathyroid glands. It connects with the power of the word; speaking things into being, listening and taking responsibility for our actions. It connects to the fifth layer of the HEF: the etheric template.

The sixth chakra or third eye: This chakra is located at the forehead just between the eyebrows. It appears as violet in color and is associated with the pituitary gland. This level connects us with the sixth layer of the HEF: the celestial layer and is associated with celestial love which is a love that encompasses all life.

The seventh chakra or crown: Located at the vortex of the cranium, this chakra appears as the white. It is associated with the pineal gland and connects

us to the higher mind, knowing and integration of our spiritual and physical make up. It connects to the seventh layer of the HEF: the ketheric field (Brennan, 1988) (Dale, 2009)

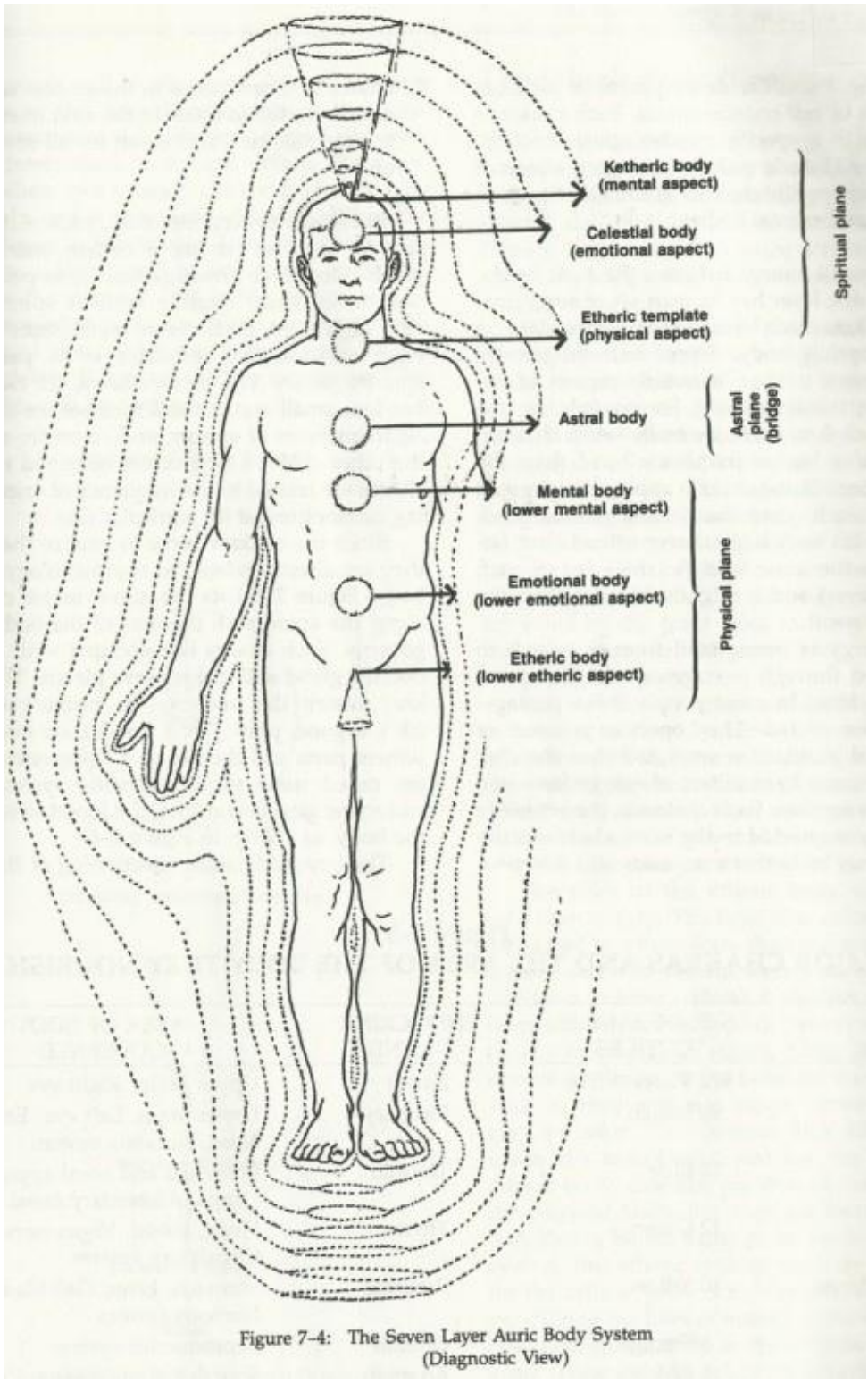


Figure 7–4: The Seven Layer Auric Body System
(Diagnostic View)

Figure 2.2: The Seven HEF Layers Connected to the Chakras

(Brennan, 1988, p. 47)

Dr. Valerie V. Hunt has studied human energy fields for over 45 years. Her research has mapped the effect of trauma, dysfunction, disease, and illness on the human energy field. She found that the human energy field holds patterns that are as unique to each individual as a fingerprint. Traumas with intense memory show an anti-coherency pattern that remains the same until emotions change which have organized that pattern. Hunt's research in scientifically recording the energy patterns of individuals has led her to state*: "I believe every debility and dysfunction begins, continues and stops first in the mind-field."* (Hunt, 1996, p. 258). *"Whenever tissue loses its normal capabilities there is first a disturbance in the energy field. The field is the location of the primary interface."* (Hunt, 1996, p. 257*). "Even pain occurs in the field before it is felt in the body."*(Hunt, 1996, p. 244).

Hunt et al.(1977) showed changes in subjects' anxiety levels. The study used Rolfing treatments performed twice weekly for five weeks to affect tissue change while measuring body surface frequencies. They used aura readers to note changes in subjects' fields that corresponded to the EEG and EMG electronic recordings. They also utilized energy field Kirlian photography. Experimental subjects had significantly less anxiety than controls after Rolfing. Subjects described images and memories connected with different body areas treated. Researchers surmised that memory of experience is stored in body tissue. From their extensive study of energy field emissions they concluded: *"The field defined by the reader and electronic data contained dynamic changes during*

Rolfing that coincided with emotional states, images, and progressive changes in the neuromuscular and connective tissue systems." (Hunt et al.,1977).

Robert Fulford D.O., an American Osteopathic Physician believed in Still's osteopathic approach of treating the physical, mental, and spiritual. Dr. Fulford supported the notion that the etheric body is the framework within which the physical body is constructed. Fulford believed that the physical body relied on the etheric body for its health. He felt that treating both the energetic and physical body by osteopathic manipulative medicine would create improvements in somatic dysfunctions (Lee, 2005).

Fulford's work was influenced by many researchers who studied the human energy field, and he was very interested in the work of Dr. Hunt. He saw his and Dr. Hunt's work as validating the efforts to change the patient's symptoms by intentional manipulation of the patient's field. In the advanced courses that Fulford taught, he would recommend Dr. Hunt's book *Infinite Mind* (Comeaux, 2002).

Fulford (2003) described the human body of being comprised of intricate streams of moving energy. He stated that when these energy streams were blocked or impeded, physical, emotional and mental health was negatively affected. He stated that if this block remained, the result was pain and illness. He described the bioenergetic field that surrounds the human body as the etheric field. The etheric field conveyed vitality to the physical body and any

shock or injury to this field would manifest in the physical body as a lack of vitality (Fulford, 2003).

Fulford felt his approach to the field and its effect on the physical body could be palpated. He taught that with guided intention, the energy of the therapist could interact with this field to form a type of manipulation. Intention is the sense of generally wishing the patient well. Specifically, intention intervenes on a specific level in the physical and etheric bodies by visualizing the problem and its potential solution (Comeaux, 2009). This potential solution or the tissues healthy expression of PRM will occur when asking Sutherland's second question: "Where would you like to live?" (Forget, 2011).

Dr. Paul Lee has also described treating the energy field. He says it is necessary to relieve the energy field of burdens or shocks to allow their effect on the physical form to dissipate. He states he frequently releases shocks from the energy field and then finds the patient's physical disturbances become more available to treatment by OMT. He concludes by saying that until the shock is released, the patient's recovery cannot go to completion (Lee, 2014).

Oschman (2000) states that there are many scientists who now believe that "energy medicine" will be the source of the next great advances in health care. He discusses how all parts of the body produce certain energy fields and that these fields travel through the tissues and extend into the field space around the body. Measuring devices such as the SQUID (superconducting quantum

interference device) are now used in research worldwide to explore human energy fields. With this advanced instrumentation, we now know that the heart has the greatest emittance of energy (Oschman, 2000). Oschman (1995) states that in fact, energy field manipulations may be the direct and powerful way to influence the healing process, and the least likely to produce harmful effects.

Dr. Rollin E. Becker, D.O. identified and utilized bioenergetic fields in his treatment modalities. He stated that that it was possible to feel, assess, and use these fields in diagnosis and treatment. He taught that the bioenergetic field creates the patterns that affect the function of the tissues of the body. He described how the muscles, ligaments, bones, organs, fascia, and their fluids all respond to the function of the bioenergetic field patterns; and that a dysfunction in the bioenergetics field pattern resulted in a dysfunction in these tissues (Becker, 1965).

Becker used the manipulative approach to Osteopathy for ten years and had good patient results; he then switched to the bioenergy field approach and experienced much better results. He described a technique that utilized a fulcrum created by his body such as an elbow on the table and the hand under and assessing the sacrum. He then assessed the amount of force that was being held in the sacrum and matched this force by pressing the fulcrum (his elbow) into the treatment table. This would bring him into the field pattern displayed by the force held in the sacrum and upon holding this fulcrum, the

body then responded by normalizing the force held in the tissues (Becker, 1965).

Chapter Three:

Research Methodology

3.1 Research Design

This research study was a quantitative randomized osteopathic treatment study of experimental design with a randomly chosen experimental and control group. Its purpose was to determine if osteopathic treatment would reduce pain in veterans diagnosed with Post Traumatic Stress Disorder (PTSD). The experimental group received six osteopathic treatment sessions, including pre and post assessment in addition to their standardized pharmaceutical and psychological treatment administered by the study's treating physician. The control group received only the standardized pharmaceutical and psychological treatment protocol administered by the study's treating physician.

3.2 The Participants

The participants were male veterans aged 30-65 who were clinically diagnosed with Post Traumatic Stress Disorder. These participants were recruited from within the private practice of Dr. Heather MacKinnon MD. The inclusion and exclusion criteria were set to secure a homogeneous group within the many variables of persons diagnosed with PTSD.

Inclusion:

* 30-65 years of age

* male
* Combat duty experience.
* Clinically diagnosed with PTSD. (Appendix C, p.xxvii)
* Ability to complete and sign the informed consent form. (Appendix E. p.xxxii)
* Ability to complete the Visual Analog Scale for pain three times during the study: prior to the first treatment, after the third treatment and after the sixth treatment. (Appendix J, p. lvii)

Exclusion:

* Traumatic brain injury.
* Neurodegenerative disease such as Parkinson's, ALS, Multiple Sclerosis.
* Rheumatoid arthritis.
* Any unstable medical conditions.
* Any acute pathology such as fractures or recent surgery.
* Current alcohol and/or substance dependence (prescribed medications excluded)
* Any patient who changes their current medication and / or therapy during the study.
* Undergoing any other form of treatment (acupuncture, physical therapy, massage, etc.)

Subjects were recruited from within the private practice of Dr. MacKinnon M.D. at a meeting in Chester, Nova Scotia on September 14, 2011. Fifty subjects

were recruited; 25 for the experimental group, and 25 for the control group. These subjects were randomly assigned to their group by an independent observer drawing their names out of a hat; the assignments were recorded by the researcher.

Over the course of the next two weeks phone calls were made to subjects informing them of the study; how they met the criteria, how they were chosen for what group, and requesting their participation. In order to secure the number of subjects required, it became evident that two waves of clinical trials would be required to meet the time requirements of the study as well as scheduling needs of the subjects. The treatment sessions were conducted in two locations. Fall River Wellness Center, Fall River, Nova Scotia provided the facility to accommodate the subjects close to the Halifax area while others traveled to a second clinic located in Marriott's Cove, Nova Scotia

3.3 Research Tools

3.3.1 Dependent Variable:

Pain was the dependent variable measured by the Visual Analogue Scale (VAS) (appendix J, p. lvii). The McGill Pain Scale was not used as it was deemed by the supervising physician to be too long and patient compliance would have been an issue. In researching pain scales, a study was found that compared

The Visual Analogue Scale, and the McGill Pain Scale. Scrimshaw and Maher in 2001 used 75 subjects to compare the two scales. They advised that the VAS was the preferred scale when measuring pain in clinical trials (Scrimshaw & Maher, 2001). This scale is accepted and widely used in scientific research. The VAS utilizes a straight line measuring exactly ten centimeters (one hundred mm) with each end marked by perpendicular lines. There are words at each end to describe pain symptoms. Subjects make a mark on the line between the two extremes that represents their level of pain. The distance from zero to the marking made by the subject, measured in millimeters, is the pain level indicator that is processed as a variable for statistical analysis.
(Appendix J, p. lvii)

3.3.2 Independent Variable:

General osteopathic treatment was the independent variable for this study. Treatment protocol for the experimental group followed CEO methodology with the addition of techniques aimed at centering the subjects and ensuring that the consciousness of the tissues being treated were at their proper physiological location within the tissues. This was found to be necessary during the course of the research in order to enable the application of techniques used to follow CEO methodology. An osteopathic assessment was conducted and recorded in the first session and reassessed during the last session. Treatment of

lesions/restrictions was accomplished by using the same methodology for each subject.

3.3.3 CEO methodology for order of Hierarchy of Lesions:

Vitality / Compactions

Scars

Non physiological lesions without respect to axis

Non physiological lesions with respect to axis

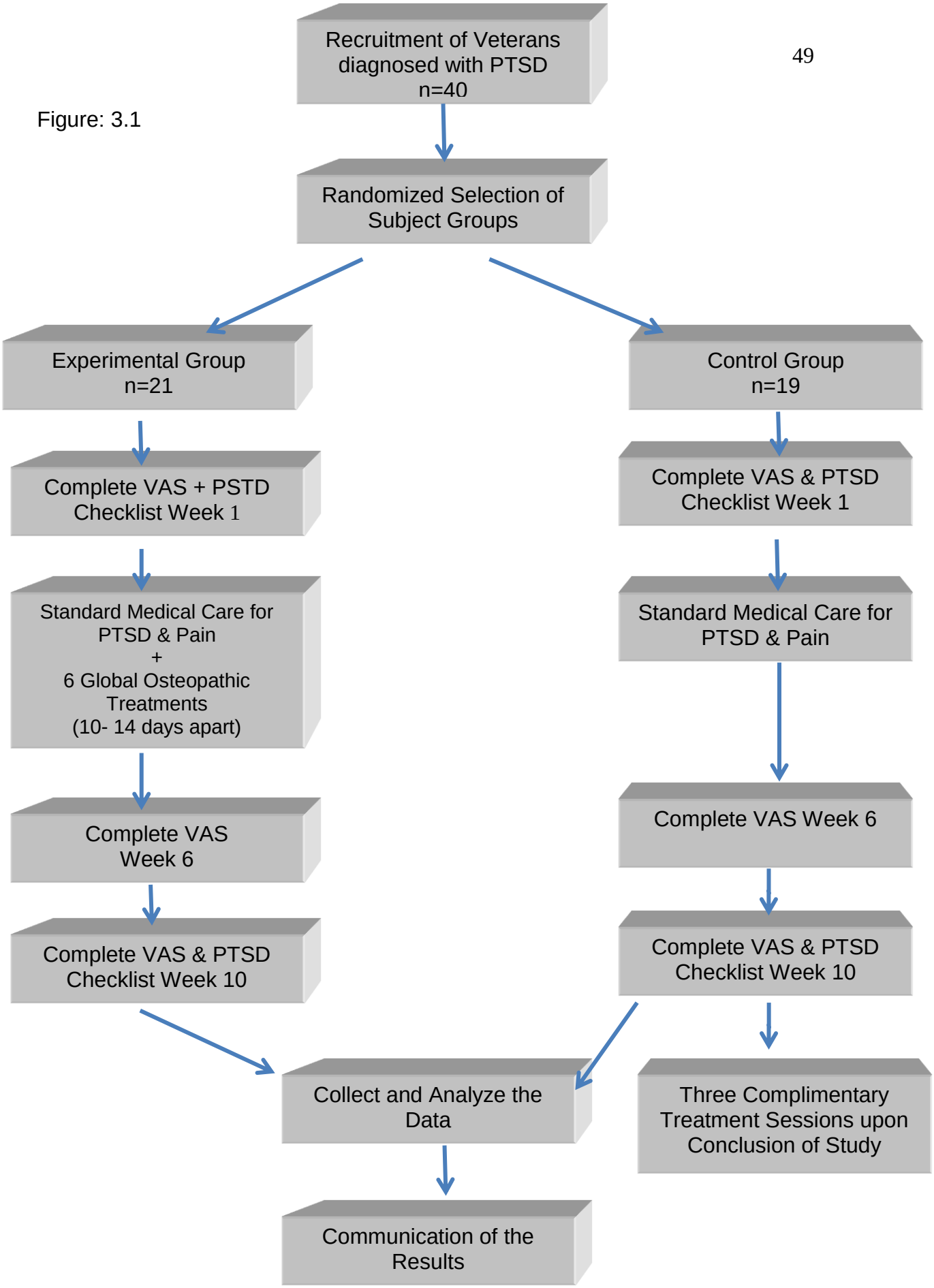
Physiological lesions

Restrictions

3.4 Research Procedure:

An illustration of the research procedure is located here in order to give a global overview of the methodology used. (Figure 3.1, p. 49)

Figure: 3.1


Recruitment of Veterans diagnosed with PTSD n=40
Randomized Selection of Subject Groups
Experimental Group n=21
Control Group n=19
Complete VAS + PSTD Checklist Week 1
Complete VAS & PTSD Checklist Week 1
Standard Medical Care for PTSD & Pain + 6 Global Osteopathic Treatments (10- 14 days apart)
Standard Medical Care for PTSD & Pain
Complete VAS Week 6
Complete VAS Week 6
Complete VAS & PTSD Checklist Week 10
Complete VAS & PTSD Checklist Week 10
Collect and Analyze the Data
Three Complimentary Treatment Sessions upon Conclusion of Study
Communication of the Results

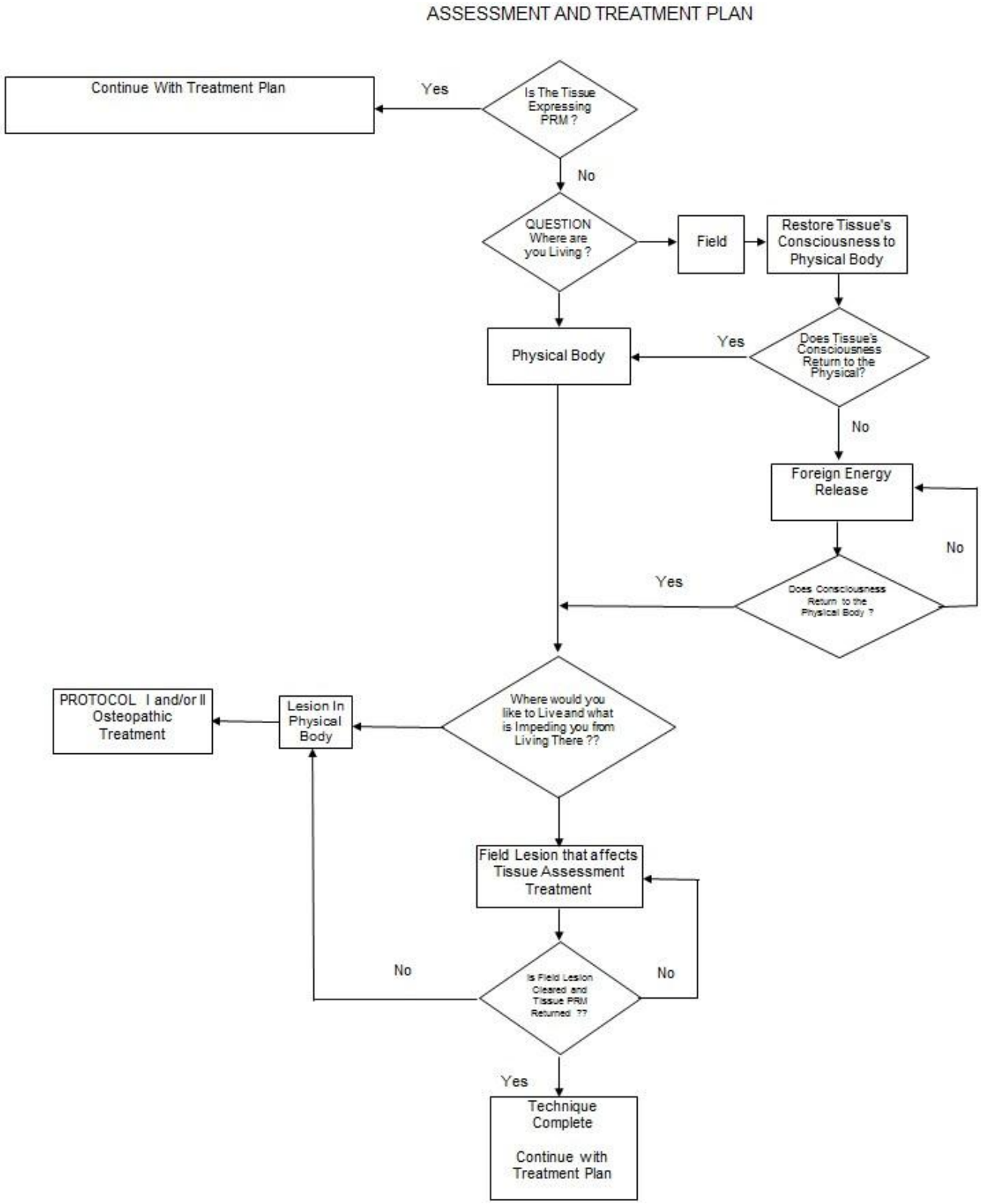
The first experimental wave of sessions, including 12 subjects in the experimental group, and 9 in the control group, began on September 28, 2011. Experimental group subjects were treated every 2 weeks for a total of six treatments over the course of 10 weeks. A total of 9 subjects completed the first wave of trials. Three subjects had to stop the sessions due to personal reasons. Two of these three, were unable to continue with the treatments as their schedules had changed, and one was unable to continue due to transportation issues. Experimental subjects completed their data forms pre, middle, and post treatments while control group subjects completed data forms pre, middle and post trial dates then returned these forms as requested.

The second wave of trials, including 12 subjects in the experimental group, and 9 in the control group, began on April 11, 2012. The same treatment model was used for the second wave as for the first. Each experimental subject was given a treatment every 2 weeks over the course of 10 weeks for a total of six treatments. All 12 subjects completed their treatment sessions and data forms were completed pre, middle and post treatments. Control group members completed data forms pre, middle and post trail dates then returned these forms as requested.

3.5 Assessment and Treatment:

An illustration of the assessment and treatment plan is located here in order to give a global overview of the methodology used. (Figure 3.2, p. 51)

Figure: 3.2


ASSESSMENT AND TREATMENT PLAN
Continue With Treatment Plan
Yes
Is The Tissue Expressing PRM ?
No
QUESTION Where are you Living ?
Field
Restore Tissue's Consciousness to Physical Body
Physical Body
Yes
Does Tissue's Consciousness Return to the Physical?
No
Foreign Energy Release
No
Yes
Does Consciousness Return to the Physical Body ?
Where would you like to Live and what is Impeding you from Living There ??
PROTOCOL I and/or II Osteopathic Treatment
Lesion In Physical Body
Field Lesion that affects Tissue Assessment Treatment
No
No
Is Field Lesion Cleared and Tissue PRM Returned ??
Yes
Technique Complete
Continue with Treatment Plan

The assessment used in the experimentation followed a uniform plan described in appendix G. An assessment was conducted at the beginning of the first session and at the completion of the sixth session.

Before each of the treatment sessions, the Barral fascial draw test was performed to see where the tension in the fascial system resided and to guide the therapist to the primary area of lesion. If a neutral response resulted from the test i.e. there was no fascial attraction to anywhere in the body, the researcher then assessed if the subject's consciousness was indeed residing in the body. Sutherland's question, "Where are you living" was asked to the subject's body. If the subject's consciousness was not in their physical body and was in the human energy field, an attraction, similar to Barral's fascial attraction, was felt pulling to that position outside the body. To return the subject to their body, Druelle's harmonisation of the organism around the central fulcrum technique was used (Appendix M, p. lxix).

If the subject's consciousness was indeed located in the physical body, the Barral fascial attraction test was used to determine which region was deemed primary to look for the area in need of further assessment. From the regional area, the researcher assessed the local tissues and structures using the inhibition test to determine which was to be treated first. The tissue that moved with less healthy PRM was the primary lesion and was treated first. Once the primary structure was found its PRM was assessed. If no PRM was detected in the tissue, Sutherland's question, "Where are you living?" was asked. The

tissue's consciousness either presented itself in the physical body or the field. If in the field, the consciousness was localized and returned to that particular tissue or structure (Appendix M, p. lxx). If the consciousness was found to be in the body then the assessment could proceed in the usual manner in order to investigate why there was a lack of PRM (i.e. compactions, adherences, non-physiological lesions with respect of axis).

Occasionally, the consciousness would not return to its physical location in the tissues after performing the appendix M, p. lxx technique. This indicated to the researcher that a foreign energy was present in the physical body's tissue and was impeding the subject's consciousness from returning to its correct position. This foreign energy was dubbed as a "squatter". NOTE: This phenomenon was a new experience for the treating researcher; it was only discovered during the course of the research while treating the patients suffering from PTSD. It was found that normalization of the tissues allowed a return of PRM. It was an accidental discovery but was methodological in nature because it was used with all the subjects in the study in a reproducible manner. To release this squatter, the researcher raised the vibration of the tissue by connecting to it and with intention increased the vibrational frequency of the molecules in that tissue. Once this vibration was raised, the foreign energy left and the healthy consciousness of the tissue returned to the physical body creating a feeling of balance within the tissue (Appendix M, p. lxxii).

If the tissue was in the physical body, the next question of Sutherland was asked: "Where would you like to live?" The tissue or structure would then show how it lives in health. Finally, the last of Sutherland's questions was asked: "What is impeding you from living there?" This resulted in either the tissue showing a lesion in the physical body or a field lesion such as fixity, imprint or shock in the field. The researcher connected to this shock imprint which felt like a chaotic energy pattern that had part of it attached to the physical body. With intention, the vibrational frequency of the shock imprint was raised and subsequently dissipated. This felt much like detangling the energy pattern subsequently releasing its hold on the tissue in the physical body. Once completed, the tissue then returned to normal PRM or another lesion presented itself (Appendix M, p. lxxiv).

3.6 Data Collection:

Experimental subjects completed health forms, a consent form, a VAS pain scale and PTSD questionnaire on their first visit. On the fourth visit; after having completed three treatment sessions, the next VAS pain scale was administered. The last VAS pain scale and PTSD questionnaire were completed on their sixth and final treatment day to ensure patient convenience and completion of the forms for the study. For each data collection event, the primary researcher gave the VAS pain scale and the PTSD questionnaire to the subjects. The subjects were ushered to a private room where they completed the forms and placed

them in sealed envelopes. These sealed envelopes were then collected by the researcher and held for the statistician to open and compile at a later date.

Control group subjects were informed by phone of their tasks during the trial and then sent packages of forms to complete. All forms were divided into packs with completion dates attached to them along with self-addressed stamped envelopes. The completion dates matched the intervals of data collection dates of the experimental group. The first document packs to be completed and returned included health forms, a consent form, a VAS pain scale and PTSD questionnaire. The second document pack was the VAS pain scale and the third was the final VAS pain scale and PTSD questionnaire. VAS pain scale forms and PTSD questionnaires for both experimental, and control groups, were completed in approximately the same three week time frame. Nine control group subjects in the first wave completed all forms on the required dates, returning the forms in sealed envelopes to the researcher. One control group subject refused to complete the PTSD questionnaire as he felt it gave him too much anxiety. Nine control group subjects in the second wave completed all forms in the time required and returned the forms in sealed envelopes to the researcher.

Twenty one sealed experimental subject envelopes along with eighteen sealed control group envelopes were delivered to Dr. Beth Bruce, statistician, who opened the envelopes and compiled the data. The primary researcher, at no

time, had access to the data forms; they remained in sealed envelopes while in the researcher's possession.

3.7 Bias

This study ensured that subjects had privacy to complete forms. They were handed forms to complete in a private room and asked to place the completed forms in sealed envelopes. This limited a bias as the subjects were given privacy to record and secure their results. They were also given the knowledge that these results were excluded from the attention of the primary researcher.

Prior to each treatment session, two questions were asked: The first was; "Have you had any life changes?" This was to record any confounding factors that may influence results such as accidents. The second question was; "How are you today?" This was an open ended question which provided the subject with an opportunity to discuss their symptoms without the researcher influencing them. Direct questions related to pain or PTSD symptoms were excluded as to not influence score results or cause any PTSD symptom flair up.

The control group were aware that no osteopathic manual therapy would be provided during the course of this study. This could have created a bias because the control subjects knew no additional treatment was going to occur and their responses to questionnaires would reflect this.

3.8 Ethical Considerations

This study followed the 1964 Declaration of Helsinki regulations of ethical human studies.

It followed complete confidentiality of patient identification, their records and information. Each participant was assigned a different number that identified the data collected. A master identification list was stored separately. No subject names or other identifying information was used in any further reports or publications.

Subjects were informed about the nature of their participation in this study, informed consent forms were signed and they were allowed to discontinue their participation in the study at any time.

Both experimental and control group subjects completed the VAS pain scale and PTSD questionnaire in private and placed them in sealed envelopes. These envelopes remained sealed until delivery to Dr. Beth Bruce, statistician, who opened the envelopes and compiled the data.

Upon completion of the clinical trials, control group subjects were offered three complimentary treatment sessions. The complimentary treatment sessions were offered at the time of recruitment.

Chapter Four:

Data Analysis

4.1 Support of Hypothesis:

The VAS for pain findings showed significant results and supported the hypothesis that general osteopathic treatment may reduce pain in veterans diagnosed with Post Traumatic Stress Disorder.

At the conclusion of this study, it was realized that PTSD symptoms should have been part of the hypothesis. The results of the DSM – PTSD questionnaire showed significance in the improvement of PTSD. However this was not a research question so therefore, is not included in the data analysis section of this document. As it is important and relevant information pertaining to this topic, it has been included in the discussion and appendix portion of this document. The data has also been included so it will be available for future studies on osteopathic treatment and PTSD.

Forty-three subjects met the inclusion criteria. Three subjects discontinued the study due to scheduling conflict. Twenty-one experimental subjects received six osteopathic treatments with good results in both pain and PTSD symptoms. Nineteen control group members reported little change in pain and PTSD symptoms.

4.2 Data Analysis Procedure:

Completed raw data forms were placed in sealed envelopes by the subjects and delivered at the conclusion of the study to Beth Bruce Ph. D., statistician. Dr. Bruce opened these envelopes and analysed the results.

To compare the control and treatment groups as to how each group behaved over time, a repeated measures analysis of variance (ANOVA) was conducted. This approach minimized the potential of large variability within subjects that could distort differences between treatment groups. This approach is particularly useful with small samples as the power of analysis is maximized.

Subjects were mutually exclusive with a repeated measure on each subject. Data was examined to ensure all statistical assumptions for analysis were met including homogeneity of variances and compound symmetry. Univariate analysis with epsilon correction was reported for any data that did not meet assumptions.

Repeated measures analysis of variance permitted two levels of analysis, within subjects and between subjects with the examination of three questions:

1. Are there significant differences between the groups?
2. Are there differences across measurement times?
3. Are there differences in the performance of each group over time?

Measures of Visual Analogue Scale (VAS) pain scores and the Post Traumatic Stress Disorder Scale (PTSD) scores were examined for differences within subject groups and between treatment groups; between pre and post treatment measurement times. Data analyses were conducted by the research analyst using SPSS 20.

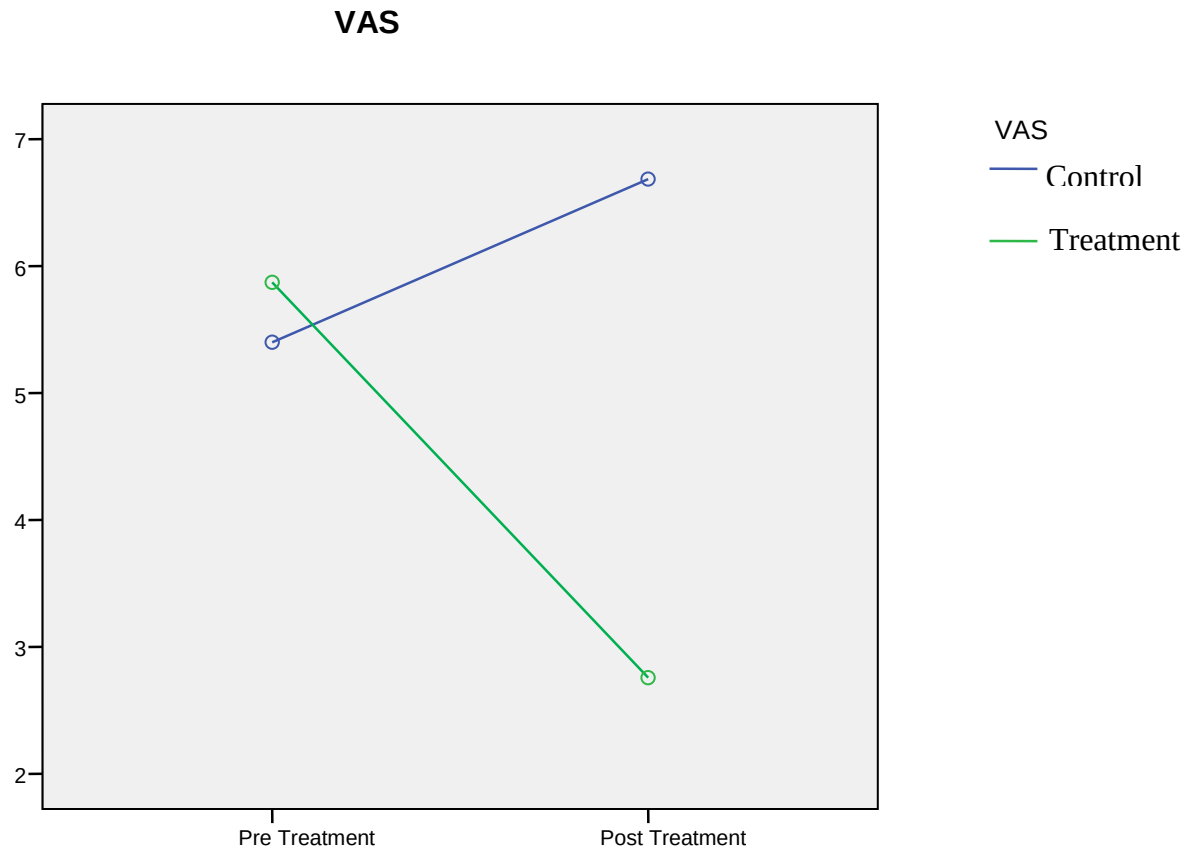
4.3 Pain VAS Data Results:

Descriptive statistics for VAS pain scores were calculated for each group, control (n=19) and treatment (n=21) at three data collection points during the study; pre-treatment, mid treatment and post treatment. At each point, participants reported their level of pain today, one week prior and one month prior. Pain scores were recorded using the Visual Analogue Scale (0-10). Pain scores for the control group ranged from 5.4 (pre-treatment), 5.56 (week 6) to 5.87 (week 10) whereas pain scores for the treatment group ranged from 6.74 (pre-treatment), 5.05 (week 6) to 2.76 (week 10). (See Table 4.1, p. 62)

Table 4.1: Mean (SD) VAS scores pre, week 6 & week 10 treatment phases

VAS	PRE			WEEK6			WEEK10		
	Today	One Week	One Month	Today	One Week	One Month	Today	One Week	One Month
Control (n=19)	5.40 (2.58)	5.47 (2.74)	5.95 (2.82)	5.56 (2.47)	6.15 (2.45)	6.28 (2.21)	5.87 (3.12)	6.36 (2.46)	6.27 (1.98)
Treatment (n=21)	6.74 (1.49)	6.99 (2.18)	6.99 (2.16)	5.05 (2.10)	5.40 (2.26)	6.39 (1.91)	2.76 (2.54)	4.16 (2.19)	5.38 (1.97)

VAS mean scores were compared across measurement times between control and treatment group to determine if groups behaved differently. Repeated ANOVA was used to examine differences. No difference was detected pre-treatment between groups $F = 1.74$, $p = .19$ but groups did change over time $F = 18.99$, $p = .000$. The control and treatment groups behaved differently over time, $F= 30.79$, $p=.000$. Mean VAS scores for control group increased marginally ($x = 5.4$ to 5.87) while mean VAS scores for the treatment group decreased significantly ($x= 6.74$ to 2.76).



Graph 4.1: VAS Scores: Control vs. Treatment Groups

Chapter Five:

Discussion of Results

5.1 Discussion:

This research study is the first to link pain and PTSD at the College d'Etudes Osteopathiques. PTSD and pain have a high correlation. Beckham studied 129 Vietnam veterans with PTSD and found 80% reported chronic pain. (Beckham et al., 1997) Canada has 30 thousand troops who have now returned from Afghanistan of whom 30% run the risk of developing PTSD. This, added to the current 42.6% of veterans currently being treated for PTSD shows the strong need for therapies to help with this condition (Pare, 2011).

It should be noted that the subjects chosen were not familiar with osteopathic treatment but had a strong trust factor in the opinion of the supervising physician; and therefore agreed to participate.

Results of the data analysis show a statistical significance in both pain and PTSD symptoms. The hypothesis that global osteopathic care can reduce pain in veterans diagnosed with PTSD has some credibility. Of course further studies on this population and using different treatment approaches contained within the scope of what general osteopathic care means must be controlled for. This study also shows that general osteopathic treatment may reduce symptoms of post-traumatic stress disorder. This supported our original hypothesis and was found to be an interesting and valid part of this study once the data was analyzed. One reason for improvement in PTSD symptoms as the patient's pain

levels decreased might be that the pain may actually serve as a reminder of the traumatic event, thus triggering the PTSD symptoms (DeCarvalho, n.d.).

5.2 Discussion of VAS for Pain Results:

Experimental subjects recorded improvement in their pain levels over the course of six osteopathic treatments (Table 4.1, p. 62) The VAS for pain findings showed significant results and supported the hypothesis that general osteopathic treatment may reduce pain in veterans diagnosed with PTSD. Pain scores for the control group ranged from 5.4 (baseline), 5.56 (week 6) to 5.87 (week 10) whereas pain scores for the treatment group ranged from 6.74 (baseline), 5.05 (week 6) to 2.76 (week 10). No difference was detected between groups pre- treatment ($F=1.74$, $p=.19$) but groups did change over time $F=18.99$, $p=.000$. The control and experimental groups behaved differently over time, $F=30.79$, $p=.000$. Mean VAS scores for control group increased marginally ($x=5.4$ to 5.87) while mean VAS scores for the treatment group decreased significantly ($x=6.74$ to 2.76).

A database of the structures treated in the 21 experimental subjects was compiled over the course of the six treatments. This data is found in the appendix L, Table L.1 p. lxii. The three most frequently treated lesions were found to be cranial in nature (temporal, SBS, occiput). The sacrum was the fifth most treated lesion. These structures have a direct effect on the core link. A

healthy core link is a key to maintaining good vitality which the body requires to normalize lesions. Many common areas of pain that subjects reported were affected by a dysfunctional core link such as headaches, neck and low back pain. Low back pain was reported by 19 of 21 subjects or 90% of the experimental group, 17 reported neck pain or 81% and 16 reported headaches or 76%. (Table K.1, appendix K, p. lix) As the various structures were normalized and mobility restored, pain levels lowered. Since pain and PTSD have a high co-occurrence (Otis et al, 2003), it is possible that reducing pain may help to reduce the severity of symptoms of PTSD.

"I've been in pain for 12-15 years. I am so much better, this has been a miracle." (Subject #24, July 4, 2012).

It is important to note that no specific inquiries were made as to how each subject's pain was progressing throughout the study. This question was asked only after they had completed the last pain survey and discussion for ongoing treatment took place. Subjects were referred to osteopaths in their area for continued treatment. It should also be noted that many subjects discussed their pain and its effect on them throughout their clinical trial treatment sessions and these comments were noted.

Three subjects still had much pain at the completion of the six clinical trial treatments. It was interesting to note a similar pattern amongst all three subjects; they were paratroopers who had each completed over two hundred

jumps. These subjects presented many field lesions layered with multiple physical lesions

"I've been going to all different types of treatment for 12 years and I have had more pain relief than ever from this treatment. My PTSD symptoms as well as groin area pain, chest, back, legs and feet pain have all improved. What we truly need more in our society are osteopaths." (Subject #7, December 12, 2011)

5.3 Discussion of PTSD – DSM Survey Results

The PTSD checklist – Civilian Version for DSM-IV was administered to the subject's pre and post treatment trials. Recording PTSD symptoms was not a part of this research hypothesis. However, since it was felt an important component of this research, the statistical findings of the responses obtained from the checklist are included. Symptoms recorded on the DSM-IV-PTSD checklist are summarized in Table 5.1. p. 69 and detailed in graphs 1-17 in appendix I, pages: xlvii-lv.

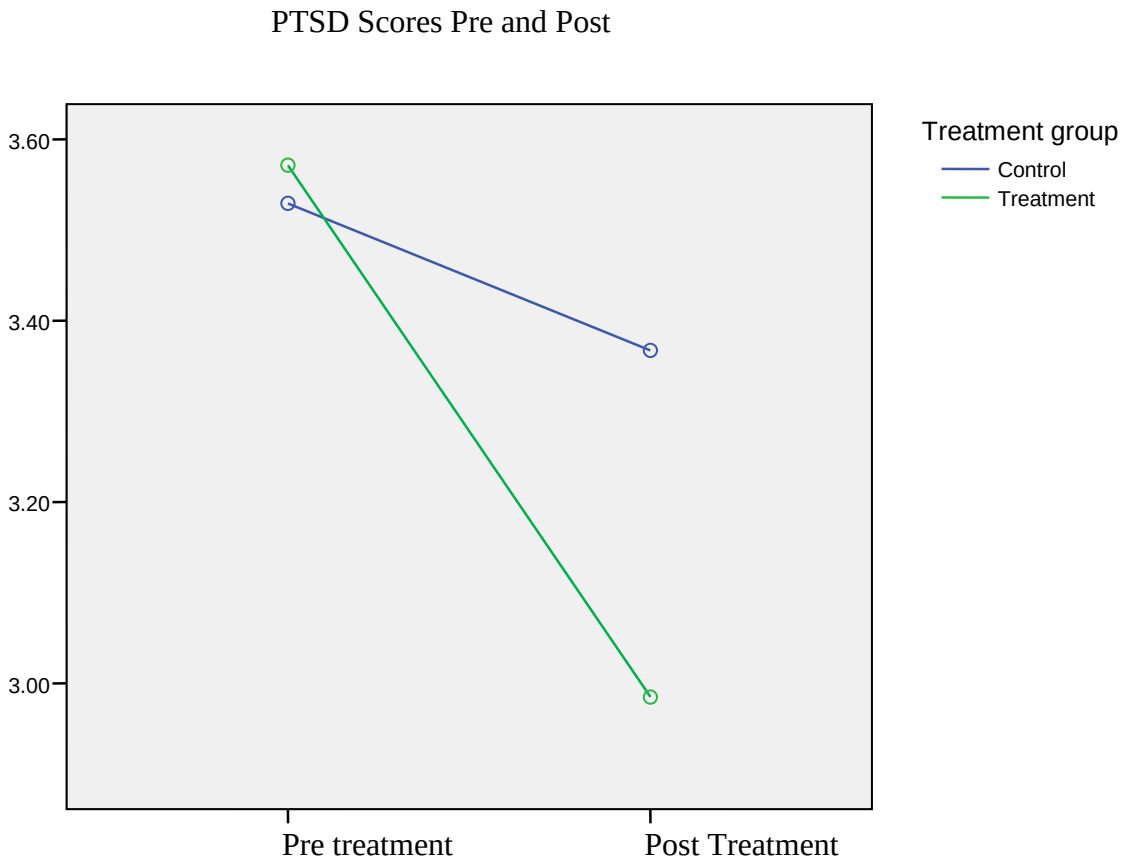
Descriptive statistics for Post Traumatic Stress Disorder (PTSD) scores were calculated for each group, control (n=18) and treatment (n=21) at two data collection points; during the pre-treatment and post treatment phases. At each point, participants reported their level of stress for each of 17 items. Scores (1-5) ranged from "not at all" to "extremely". PTSD total mean scores for the control

group ranged from 3.53 (pre-treatment) to 3.37 (post treatment) whereas PTSD scores for the treatment group ranged from 3.57 (pre-treatment), to 2.98 (post treatment). (See Table 5.1, p. 69)

Table 5.1: Mean (SD) PTSD scores pre and post treatment phases

PTSD	**PRE**		**POST**	
	Mean	SD	Mean	SD
Control (n=19)	3.53	.59	3.37	.84
Treatment (n=21)	3.57	.79	2.98	.95

PTSD mean scores were compared across two measurement times between control and treatment group to determine if groups behaved differently. Repeated ANOVA was used to examine differences. No difference was detected pre-treatment between control and treatment groups, $F = .469$, $p = .498$. However, groups changed significantly over time, $F = 16.72$, $p = .000$. The control and treatment groups behaved differently over time, $F= 5.37$, $p = .03$. PTSD mean scores for control group remained stable ($x = 3.5$ to 3.4) while PTSD scores for the treatment group decreased ($x= 3.6$ to 2.9).



Graph 5.1 PTSD Scores: Control vs. Treatment Groups

Frequency Scores for each question on the PTSD questionnaire were calculated and reported in detailed graphs for the control and treatment groups. These graphs are found in the appendix section of this document. (Appendix I, pages: xlvii-lv)

The study's treating physician requested that subject PTSD symptoms not be discussed during clinical trial treatment sessions. It was felt that if the subjects were asked to discuss their PTSD symptoms, it may trigger a PTSD episode. Some subjects revealed their symptoms openly and these comments were noted on their treatment journals.

"You are opening my mind and changing my body." (Subject #9, October 31, 2011).

Fourteen subjects reported that they were sleeping better at various intervals throughout the trials. Sleep disturbance is one of the criteria of the DSM-IV for PTSD (Kaplan, 1995). Researchers found that 90.7% of 1,200 subjects reported to have difficulties in staying asleep (Neylan et al., 1998).

Two subjects discussed suicide during their treatment sessions and these subjects were referred to the treating physician immediately following the end of the treatment. A phone call was made to inform her of the events before the subjects left the clinic. Both subjects reported that they felt in control and much improved after the treatment before they left the clinic.

5.4 Discussion of Lesions in the Human Energy Field (HEF)

When tissues had little or no expression of PRM, Sutherland's questions were very useful to identify the location of the lesion.

Sutherland's Questions:

"Where are you living",

"Where would you like to live",

"What is impeding you from living there" (Forget, 2011).

During treatment sessions an interesting observation was made. When dialoguing with the tissues, the tissue response was that the lesions were often in the human energy field. See summary of treated lesions in the human energy field (Table L.2, p. lxv) Due to the request of the tissues and as a way to restore PRM, a Protocol III approach was utilized when dealing with human energy field lesions. The hypothesis stated that general osteopathic treatment as opposed to a specific treatment methodology would help decrease pain in patients with PTSD.

To quote Becker:

"To sum it up as simply as possible, the patient is intelligently guessing as to the diagnosis, the physician is scientifically guessing as to the diagnosis but the patient's body knows the problem and is outpicturing it in the tissues." (Becker, p.34)

Shocks or dysfunctions in the human energy field can cause dysfunction in the body both physically and emotionally (Fulford, 2003)(Hunt, 1996)(Oschman, 2000). These emotional dysfunctions and shocks could be a contributor to both pain and PTSD. Twenty of twenty-one experimental subject's consciousness was not in their body (Druelle, 2014). Patients diagnosed with PTSD have been exposed to horrific trauma both emotionally and physically. Perhaps that when exposed to such trauma, consciousness tends to escape to a safe place; to a place of calmness without chaos; to the field. This may happen for the entire being's consciousness or for individual tissue consciousness.

The most often treated human energy field tissue lesion was the kidney. Twenty of twenty-one subjects had one or both kidneys with such field lesions. In Chinese medicine the kidneys are known to encase fear, mainly because the adrenal glands which sit on top of the kidneys release adrenaline into the body in response to excitement, anger, panic and stress (Shaprio, 2006). Barral explains that fear is ancestral and deeply rooted in all of us and that this fear is ready to activate whenever a serious danger signal appears. The fear that is firmly buried deep inside may come out in the form of anger or aggressiveness. When someone's kidneys are not expressing health or are their "weak link", fear is more firmly rooted and may cause more problems (Barral, 2007). Could weak kidney health be one of the potential risk factors for PTSD? Perhaps it would be helpful to assess and treat osteopathic lesions of the kidney in military personnel prior to deployment. Would this then help prevent PTSD?

5.5 Limitations:

The Hawthorne effect may have had an effect on the participants simply because they were participating in the study. The results on the subjective questionnaires may have been skewed if the participants felt different due to being observed (Draper, 2013).

The placebo effect may have come into effect during the study because this research design offered a chance for experimental subjects to feel cared for while the control group did not receive additional care. This may explain the positive outcomes experienced by the experimental group.

A counter argument for the placebo effect is also possible due to the population being studied. Patients with PTSD often do not want to step out of their regular routine due to fear of the unknown. Since osteopathy was not known as an acceptable treatment method by these subjects, being in the experimental group could possibly have had the reverse placebo effect and caused subjects to become more anxious and agitated.

This study did not offer a sham treatment for the control group as it was decided that any therapeutic setting would have an effect on the subject. It was also suggested not use a placebo group with untrained researchers as there was a therapeutic effect simply from touch (Desilets & Issac-Villette, 2007).

Discovery usually starts when people are willing to get off the beaten path and follow something not yet known. When studying a subject like osteopathy that has many variables we must ensure that preliminary research affords the researcher enough leeway to adapt to the situation that the body dictates. Once a topic has been studied and researched many times the ability to design and focus the research becomes clearer. A focus that is too narrow before all possibilities have been investigated is a detriment to osteopathic discovery.

5.6 Recommendations for Future Research:

A study on how osteopathic treatment affects the symptoms of PTSD. Data included in appendix of this study reveals that it does in fact improve PTSD symptoms. A study that includes the hypothesis that osteopathic treatment improves the symptoms of PTSD would be very valuable.

Have a study where subjects complete VAS and PTSD questionnaire forms one month post clinical trials for both the experimental group and control groups. This would have provided valuable data as to how the treatments effects reacted over time and how it was affecting both pain, and PTSD levels.

The measuring devices for this study were subjective. The subjects measured how they felt when they completed both VAS and PTSD forms. It would be favorable to include objective measures such as sleep frequency in future studies as this was a finding that was happened upon by chance during the history taking portion performed before each treatment session. Another objective measurement such as number of anxiety attacks or change in medication dosage could be used. A formal questionnaire completed prior to each session could include some of these types of objective changes.
It would be interesting to do a comparison study between osteopathy and another bodywork modality such as massage or therapeutic touch in the treatment of pain and PTSD.

In this study, kidney lesions were found to be the most treated in the human energy field. Since kidneys hold fear and this fear can lead to anger and aggressiveness, which is one of the symptoms of PTSD, it would interesting to have a study that assesses and treats osteopathic lesions of the kidney. This study would determine if treating osteopathic kidney lesions prior to deployment would possibly help prevent PTSD.

It would be interesting to investigate further into the phenomenon of tissue consciousness residing outside of the physical body in the field. It was by pure accident that this phenomenon was encountered. Was the fact that the population of post war veterans, having experienced severe enough physical and emotional shock to cause PTSD, had similar tissue anomalies that a pattern

was able to be observed by the therapist and subsequently used by the tissues to regain health?

This study hopes to inspire researchers and therapists to investigate the phenomenon of lesions found in the human energy field. It is hoped that other treatment methodologies may be discovered in order to help those suffering with pain, PTSD, and other ailments encountered in osteopathy.

Conclusion

Veterans of wars past and present are increasingly being diagnosed Post Traumatic Stress Disorder; an often debilitating condition causing psychological as well as physiological problems. Pain and PTSD have a high co-occurrence and it was observed that as the subject's pain reduced, some PTSD symptoms improved such as better ability to sleep.

Osteopathic treatment seeks to find health in mind, spirit and body. Due to the high occurrence of human energy field lesions found in subjects; it seems that this phenomenon may affect the symptoms of PTSD. It is as if the subjects' consciousness, including the consciousness of their tissues, reverts back to their original state in the morphogenetic state that is expressed in the field. Part of osteopathic treatment for PTSD may be to assist tissues to return to the physical state in order for PTSD sufferers to better be able to deal with the physical and emotional trauma they have endured. Further such well controlled studies would be a tremendous asset in the care of patients with pain and PTSD.

This research study indicates that general osteopathic treatment may provide a safe and effective additional treatment option to be used with standard medical care for those suffering with pain and Post Traumatic Stress Disorder.

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Appendix A:

Approved Thesis Protocol Research Methodology

METHODOLOGY

3.1 Research Design

This research study is an osteopathic treatment study of experimental design with a randomly chosen control group and experimental group to determine if osteopathic treatment will reduce pain in Veterans diagnosed with Post Traumatic Stress Disorder. The experimental group will receive 6 osteopathic treatment sessions including pre and post assessment while the control group will follow the standardized treatment protocol for PTSD as conducted by Dr. MacKinnon.

3.6 The Participants

The participants will be male Veterans ages 30-55 who have been diagnosed with Post Traumatic Stress Disorder. These participants will be recruited from within Dr. Heather MacKinnon's practice. Inclusion and exclusion criteria will be set to secure a homogeneous group within the many variables of persons diagnosed with PTSD.

Inclusion:

* Veteran males ages 30-55 who have experienced combat duty.
* Has been clinically diagnosed with PTSD by Dr. MacKinnon following the PTSD Check list (PCL) – Civilian Version for DSM-IV. (appendix 8.6)
* Has completed and signed the informed consent form.
* Is able to complete the Visual Analog Scale three times: prior to the first treatment and one week after the last treatment.

Exclusion:

* Traumatic brain injury.
* Neurodegenerative disease such as Parkinsons, ALS, Multiple Sclerosis, Rheumatoid arthritis.
* Any unstable medical conditions.
* Any acute pathology such as fractures or recent surgery.
* Current alcohol and/or substance dependence (prescribed medications excluded)
* Any patient who changes their current medication and / or therapy during the study.

3.7 Dependent Variable

Pain is the dependent variable as measured by the Visual Analogue Scale. The McGill Pain Scale was requested by Dr. MacDonald not to be used as it is too long and patient compliance would be an issue. In researching pain scales, this researcher found a study that compared The Visual Analogue Scale and McGill Pain Scale. Scrimshaw and Maher in 2001 used 75 subjects to compare the two scales. They advised that the VAS was the preferred scale when measuring pain in clinical trials. (2001, Scrimshaw and Maher)

3.4 Independent Variable

Osteopathic manual therapy.

3.5 Measuring & Data Collection Method

The Visual Analogue Scale to measure pain levels will be distributed by Dr. MacKinnon as well as this researcher and completed by the patients in both the control and experimental

groups (1) prior to their first session; and (2) one week after their last session. (appendix 8.7) This data will be kept confidential until the study is complete.

The osteopathic assessment and care, following the methodology of the CEO, provided to the treatment group will be documented after each treatment session. (appendix 8.4 & 8.5) Community standardized care provided by Dr. MacKinnon will be recorded after each treatment session of the control group. This data will be kept confidential until the study is complete.

3.6 Treatment Chronology

Treatment protocol for the experimental group will follow CEO methodology. An osteopathic assessment will be made by this researcher in the first session and reassessed during the last treatment. Treatment of lesions/restrictions will be completed in order of priority according to the CEO methodology:

Vitality / Compactions

Scars

Non physiological Without Respect to Axis

Non physiological With Respect to Axis

Physiological Lesions

Restrictions

Appendix B:

Approval From CEO of Changes to Thesis Protocol

Thesis Proposal – Halifax
March 09, 2011

CONSENSUS SHEET

Those are comments and recommendations made by the board of examiners regarding the thesis proposal of **Andrea MOUNCE-HALASZ**, 5th year student in Halifax. Your thesis advisor will make sure that the proposed recommendations are taken into consideration when you finalize your research project.

Comments and recommendations: Corrections to be made in thesis only. Protocole is accepted as is.

Please in thesis :

- Remain with original V.A.S as presented in protocol
- Consider adding V.A.S measures corresponding Chronologically with the experiment
- Revise last assessment timeline accordingly. eg today / 1 week ago, last mount.
- Do initial screening scale (DSM V4) for inclusion exclusion of subjects and demographic. determine the score of subjects that will be inclus
- add Charting of incident/events/medication changes during experimentation.

Verso →

Martine Nadon, D.O.

Denis Lanthier, D.O.

Geneviève Forget, D.O.

Done in Montreal, January 2011

- Set goals for treatments such as: achieving basic level in
  - ~~V~~itality
  - cranio-sacral mechanism
  - central chain
  - etc. . . .

have a framework or guideline for prioritizing your treatment

- On consent form add researchers or ressource person phone # + address.

- Exclusion criteron; add "Will not receive any other form of manual therapy."

- Specify randomization procedure

Appendix C:

Confirmation of Subject's PTSD Diagnosis

DR. HEATHER MACKINNON
PUBLIC GARDENS MEDICAL CLINIC
SUITE 200 NELSON PLACE
5675 SPRING GARDEN ROAD
HALIFAX, N.S. B3J 1H1
(P) (902) 425-5440 (F) (902) 482-6019

26 November 2012

Statement by Dr. Heather Mackinnon

Reference:
Thesis: The Effects of Osteopathic Care on Pain in Male Veterans Diagnosed with PTSD

By: Andrea Mounce-Halasz

All of the subjects who participated in the thesis research of Andrea Mounce –Halasz are patients in my medical practice who have been diagnosed with Post Traumatic Stress Disorder.

H. Mackinnon MD

Appendix D:

Confirmation of Data Analyses

Dr. Beth Bruce
RE:DESIGN
Research & Evaluation Consultant
42 Twilight Lane
Dartmouth, NS
B2X 2R9
beth@redesign-evaluation.com

Collège d'Études Ostéopathiques - Halifax
7400, St-Laurent bouvelard, #211
Montreal (Quebec) H2R 2Y1

February 26, 2013

RE: Data Analyses

To whom it may concern,

I am pleased to provide approval of the statistical analyses of this thesis. I can confirm that I completed the data analyses for this study conducted by Andrea Mounce-Halasz and that she is permitted to use the analyses.

If I may provide any further details, I would be pleased to do so.

Sincerely,

Beth Bruce

Beth Bruce, RN, BScN, MN, PhD

Appendix E:

Participant Information Sheet &

Informed Consent Form

Participant Information Sheet

Osteopathic Treatment of Post Traumatic Stress Disorder

Title of the Study:
The effect of general osteopathic treatment on pain in Veterans diagnosed with Post Traumatic Stress Disorder

Person Conducting the Study:
The researcher, Andrea Mounce-Halasz, has completed five years of post graduate study with the College d'Etudes Osteopathiques (Halifax). The completion of this thesis is the final requirement towards a Diploma of Osteopathic Manual Practice.

Selection Criteria:
Male Veterans ages 30-65 who have been diagnosed with Post Traumatic Stress Disorder and have pain symptoms.

What to Expect of Study:
You will be required to attend six, one hour osteopathic treatment sessions conducted by Andrea Mounce-Halasz over the course of approximately three months. These treatments are complimentary to those participating in this study. You will not be financially compensated for participating in this study.
Any and all information collected throughout this study will only be used for the study and will remain confidential. Two groups will be chosen by chance. One group will receive the osteopathic care sessions and the other group will receive their usual treatment plan. Osteopathic treatment sessions for that group will be offered at the conclusion of this study.

Osteopathic manual therapy involves assessing specific areas of the body that may have tension or pain. This is then followed by gentle mobilization of various areas of the body by the therapists' hands to reduce the tension or pain. You may feel pressure or slight tension in various tissues from gentle manual techniques. The subject is clothed at all times in shorts or light gym pants and a light tee shirt. We do not know for sure if taking part in this study will help you. You may feel better but you may also feel more tired or worse temporarily. We cannot predict your outcome but we will always give you the best possible care.

If you want to be in this study, you will be asked to complete the health questionnaire and consent form contained in this package.

For further information, please do not hesitate to contact:
Andrea Mounce-Halasz 902-275-8518
RR #1, Chester Basin, N.S. B0J 1K0 amouncehalasz@gmail.com

Informed Consent Form

This document represents consent for participation in the research study entitled:

The effect of general osteopathic treatment on pain in Veterans diagnosed with Post Traumatic Stress Disorder.

The research including Osteopathic treatment will be conducted by Andrea Mounce-Halasz, student of College d'Etudes Osteopathiques – Halifax campus as a thesis requirement for graduation.

I hereby agree and consent to:

1. Completing this consent form and health questionnaire and that all information on these forms is current, accurate and true.

2. Receiving osteopathic assessment and treatment consisting of a physical evaluation and manual treatment of parts of the body including, but not limited to, the head, spine, abdominal and thoracic organs, pelvis and extremities.

3. Not receiving any other form of manual therapy throughout the duration of this study.

4. Being available and attending all treatment sessions.

5. Informing the researcher: Andrea Mounce-Halasz and / or Dr. Heather MacKinnon should any criteria for inclusion and / or exclusion change at any time during this study while I am a study subject.

I, _____, understand that my participation in this research study is completely voluntary and I consent willingly to becoming a research subject.

Signature:_____

Witness: _____

Date: _____

Appendix F:

Health History Form

Health History Form Today's Date:_____

Your answers on this form will help for a better understanding of your condition(s). Please be truthful, accurate and current by informing us as to any changes in health as they occur that are not listed here today. All records are confidential unless otherwise requested with your authorization. Thank you.

Name:_____ ID #:_____

Birthdate:_____ Mailing Address:_____

_____ Postal Code:_____

Phone:_____ (H)_____(W)_____(C)

Email Address:_____

Current or Former Occupation:_____

Emergency Contact:_____Phone:_____

Family Doctor:_____ Phone:_____

I am currently receiving other treatment from:

_____

Please list all medications, vitamins and /or supplements, their dosage and their purpose:

_____

_____

_____

Please list all surgeries and / or procedures with approximate dates:

_____

_____

Please list all fractures and / or injuries including MVA with approximate dates:

_____

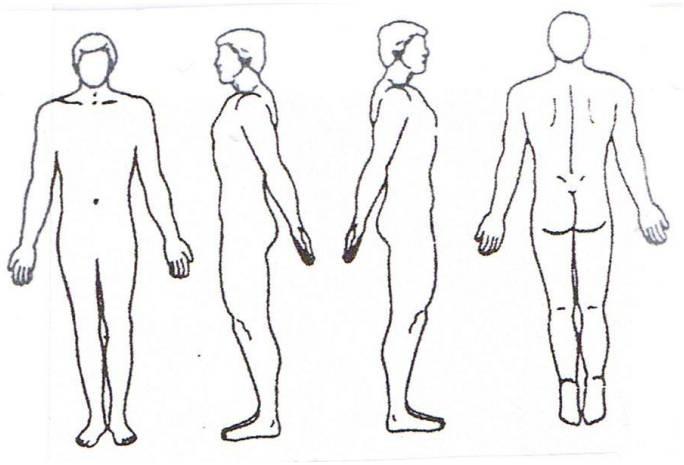
Health History Inventory

Name:_____ ID # _____ Date:_____

Please mark an X in the boxes below if you have ever experienced the following:

Head/Ear/Nose/Throat	**Musculoskeletal**	**Respiratory**
☐ Tension headaches	☐ Back pain or Sciatica	☐ Shortness of breath
☐ Migraine headaches	☐ Mid back pain	☐ Asthma, Emphysema or Bronchitis
☐ Cluster headaches	☐ Neck pain	☐ Tuberculosis or Pneumonia
☐ Concussion or head trauma	☐ Rheumatoid arthritis	☐ Frequent colds
☐ Jaw pain	☐ Osteoarthritis	☐ Chronic cough
☐ Hearing impairment	☐ Tendonitis or Bursitis	☐ Smoker
☐ Seizures or Epilepsy	☐ Carpal tunnel syndrome	
☐ Tinnitus (ringing in ears)	☐ Bone fracture	
☐ Sinus congestion/infections	☐ Pain in elbows, wrists or hands	
☐ Teeth grinding or clenching	☐ Pain in hips, knees or feet	
☐ Dizziness	☐ Injuries to tail bone	
☐ Visual impairment		
Digestive	**Genitourinary**	**Cardiovascular**
☐ Liver disease or hepatitis	☐ Urinary or bladder disorder	☐ Coronary/Artery disease
☐ Heartburn/Indigestion/Reflux	☐ Kidney disorder or stones	☐ Heart attack/chest pain
☐ Abdominal distension/bloating	☐ Premenstrual syndrome	☐ Stroke/Aneurism
☐ Diarrhea or loose stools	☐ Painful or irregular periods	☐ Pacemaker
☐ Constipation or dry stools	☐ Heavy flow	☐ High/Low blood pressure
☐ Gall bladder disorder or stones	☐ Menopausal (or pre/post)	☐ Varicose veins
☐ Irritable bowel syndrome	☐ Prostate or genital disorder	☐ High cholesterol
☐ Colitis/Crones/Celiac disease	☐ Pregnancies (#) _____	☐ Heart palpitations
☐ Hernia	☐ Children (#) _____	☐ Swelling in legs/ankles/feet
☐ Diabetes	☐ Currently pregnant (due date)	☐ Hemorrhoids
☐ Nausea		☐ Hemophilia
Endocrine	**Psychological**	**Dermatology**
☐ Thyroid disorder	☐ Attention deficit disorder	☐ Dermatitis, Eczema or Hives
☐ Menopause symptoms	☐ Panic, anxiety or phobias	☐ Allergies or hay fever
☐ Insomnia or poor sleep	☐ Depression or bipolar disorder	☐ Dry skin
☐ Hours of sleep per night ____	☐ Difficulty making decisions	☐ Psoriasis
☐ Eating habits (poor/fair/good)	☐ Poor memory	☐ Acne
☐ Night sweats	☐ Mental confusion	
☐ Exercise (___x per week) Mild, Moderate, Intense	☐ Bored or uninterested in things	
	☐ Thoughts of killing yourself	
	☐ Substance abuse	
	☐ Other_____	
Neurological	**Other**	Other not listed above:
☐ Multiple Sclerosis	☐ Anorexia or bulimia	
☐ Polio	☐ Chronic Fatigue Syndrome	
☐ Muscle tremors or tics	☐ Mononucleosis	
☐ Radiating pain	☐ Fibromyalgia	
☐ Tingling	☐ Lethargy, lassitude or tiredness	
☐ Numbness	☐ Aids or HIV	
☐ Paralysis	☐ Cancer	
☐ Parkinson's	☐ Shingles	
☐ Loss of Consciousness	☐ Overstressed	
	☐ Orthotics	
	☐ Significant Dental Work	

Pain Description and Location



Circle the areas where you are experiencing pain.
Describe the pain (e.g. burning, stabbing, aching, dull, sharp).
How long have you been experiencing this pain.

****

CLIENT RELEASE & CONSENT:

I _____ give my consent to be assessed, treated and / or instructed by Andrea Mounce-Halasz. I understand that I may stop or modify the assessment, therapy and / or exercise program at any time. I may ask questions at any time. I verify that the answers given reflect my current and past health status.

SIGNATURE OF CLIENT:_____

WITNESS:_____

DATE:_____

Appendix G:
Osteopathic Assessment and Treatment Plan Forms

Osteopathic Assessment & Treatment Plan:

Subject No:_____ **Date:**_____

Patient Issue (s):_____

BLAND:_____

Med Diagnostic Tests:_____

Surgery/Scars:_____

Standing General Observations:_____

_____

Typology: Anterior Posterior Neutral
Compensated Decompensated WtB_____

5 Spheres: Cranial Standing Flexion Sitting Flexion
Cervical
Thoracic
Lumbar
Pelvis

Gossip: R:_____ L:_____ **Side Bend**: R:_____ L:_____

Landmark Levels: ASIS_____ Iliac Crests_____ PS _____
Occ Condyle_____ PSIS_____ Pop line_____
Malleoli_____

Segments are checked for vitality, position, and mobility. Lesions and restrictions are listed, if not listed they were found normal.

CRANIAL / DURAL

CERVICAL: **Vertebral Artery Test:**	**THORACIC: VERTEBRAE/RIBS**
LUMBAR:	**PELVIS:**
LOWER EXTREMITY:	**UPPER EXTREMITY:**

DIAPHRAGMS:	**NEUROLOGICAL: UE: LE:** Myotomes:

	Dermatomes: Reflexes:
VISCERAL:	**ORGANS:**

TREATMENT PLAN:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Osteopathic Treatment Form

Subject No.:_____ **Date:**_____

SPECIAL SUBJECT CONSIDERATIONS:_____

TREATMENT GOAL:_____

1. COMPACTIONS / SCARS
2. NON PHYSIOLOGICAL WITHOUT RESPECT TO AXIS
3. NON PHYSIOLOGICAL WITH RESPECT TO AXIS
4. PHYSIOLOGICAL
5. RESTRICTIONS

Appendix H:

PTSD Checklist (PCL) – Civilian Version for DSM-IV

PTSD Checklist (PCL) – Civilian Version for DSM-IV

Subject No:_____ Date:_____

PTSD CHECKLIST (PCL) – CIVILIAN VERSION FOR DSM – IV

INSTRUCTIONS: Below is a list of problems and complaints that people sometimes have in response to stressful experiences. Please read each on carefully. Circle the response that indicates how much you have been bothered by that problem in the past month.

1. Repeated, disturbing *memories, thoughts* or *images* of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

2. Repeated, disturbing *dreams* of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

3. Suddenly *acting* or *feeling* as if a stressful experience were happening again (as if you were reliving it)?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

4. Feeling *very upset* when *something reminded* you of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

5. Having *physical reactions* (e.g., heart pounding, trouble breathing, sweating) when *something reminded you* of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

6. Avoiding *thinking about* or *talking about* a stressful experience or avoiding *having feelings* related to it?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

7. Avoiding *activities* or *situations* because *they reminded you* of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

8. Trouble *remembering important parts* of a stressful experience?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

9. *Loss of interest* in activities that you used to enjoy?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

10. Feeling *distant* or *cut off* from other people?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

12. Feeling as if your *future* will somehow be cut short?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

13. Trouble *falling* or *staying* asleep?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

14. Feeling *irritable* or having angry *outbursts?*

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

15. Having *difficulty* concentrating?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

16. Being *"super-alert"* or watchful or on guard?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

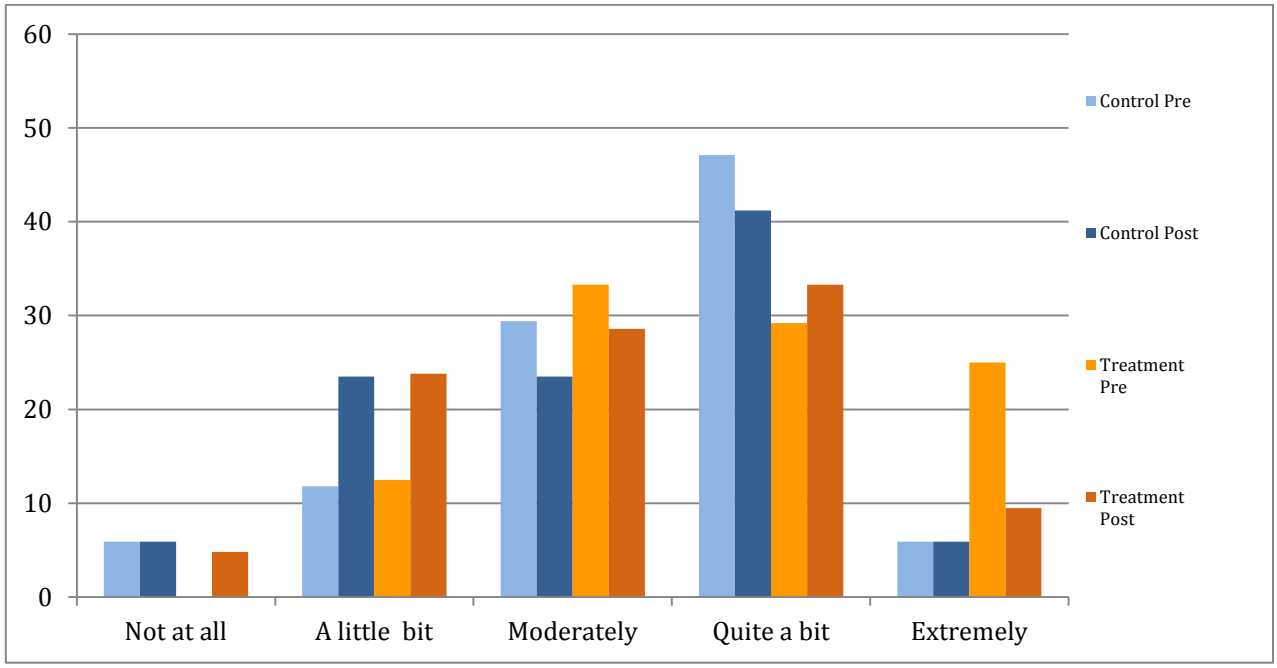
17. Feeling *jumpy* or easily startled?

1. Not at all 2. A little bit 3. Moderately 4. Quite a bit 5. Extremely

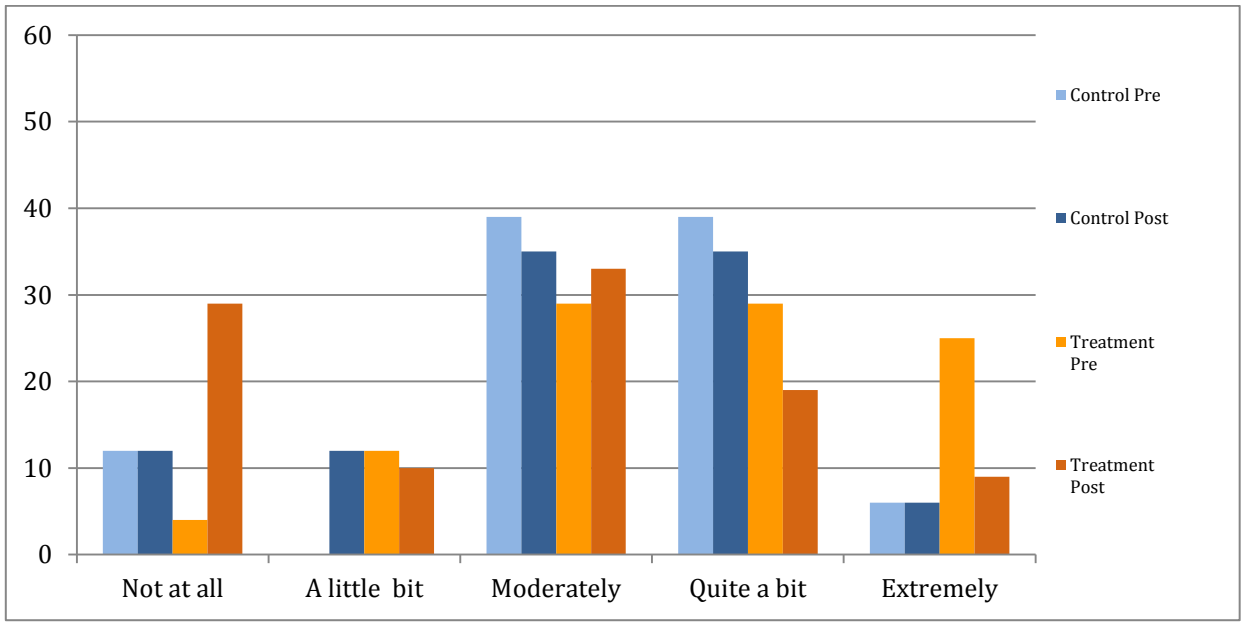
Appendix I:

PTSD Questionnaire: Response Graphs

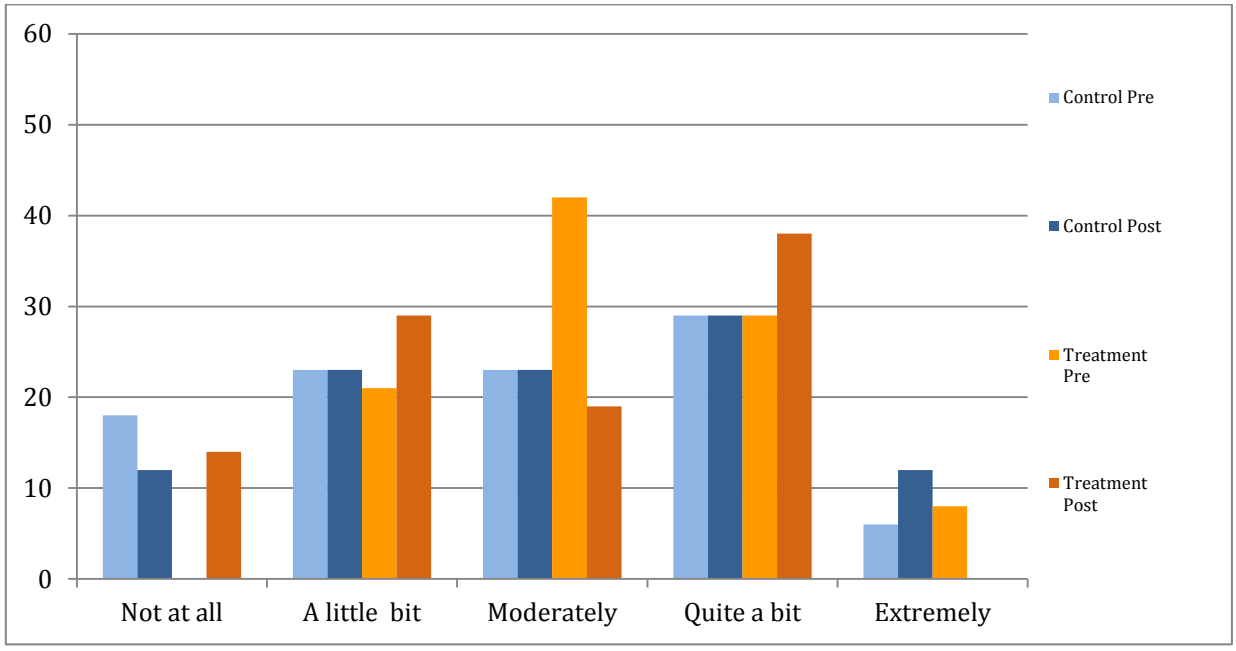
Graph I.1 Repeated Disturbing Memories



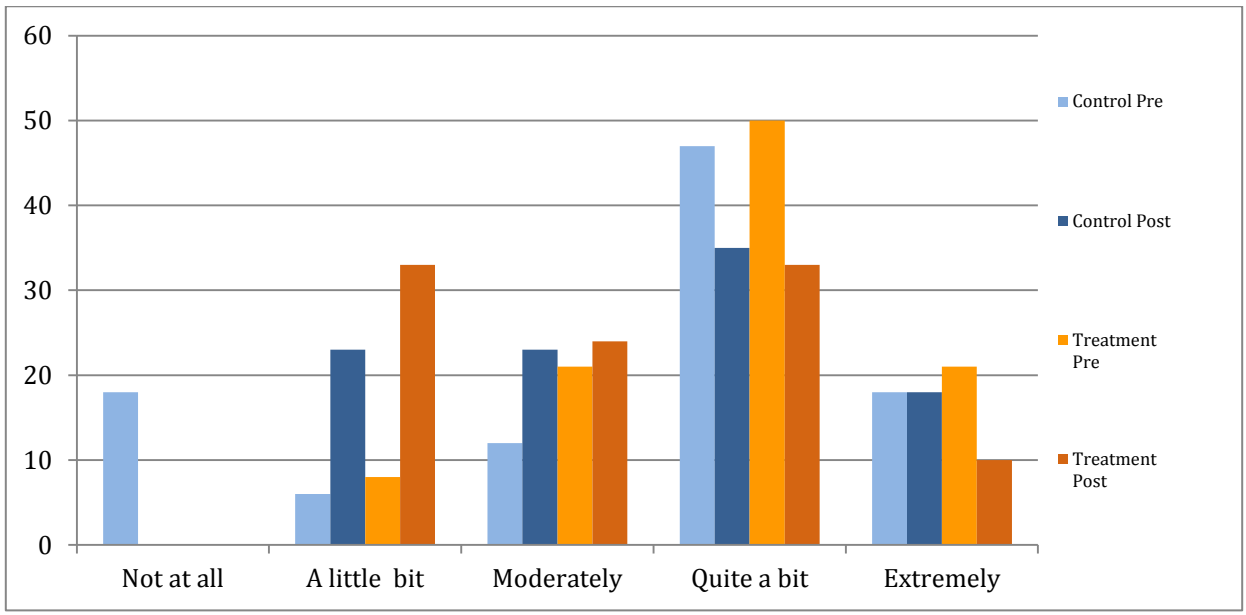
Graph I.2 Repeated, disturbing dreams of a stressful event



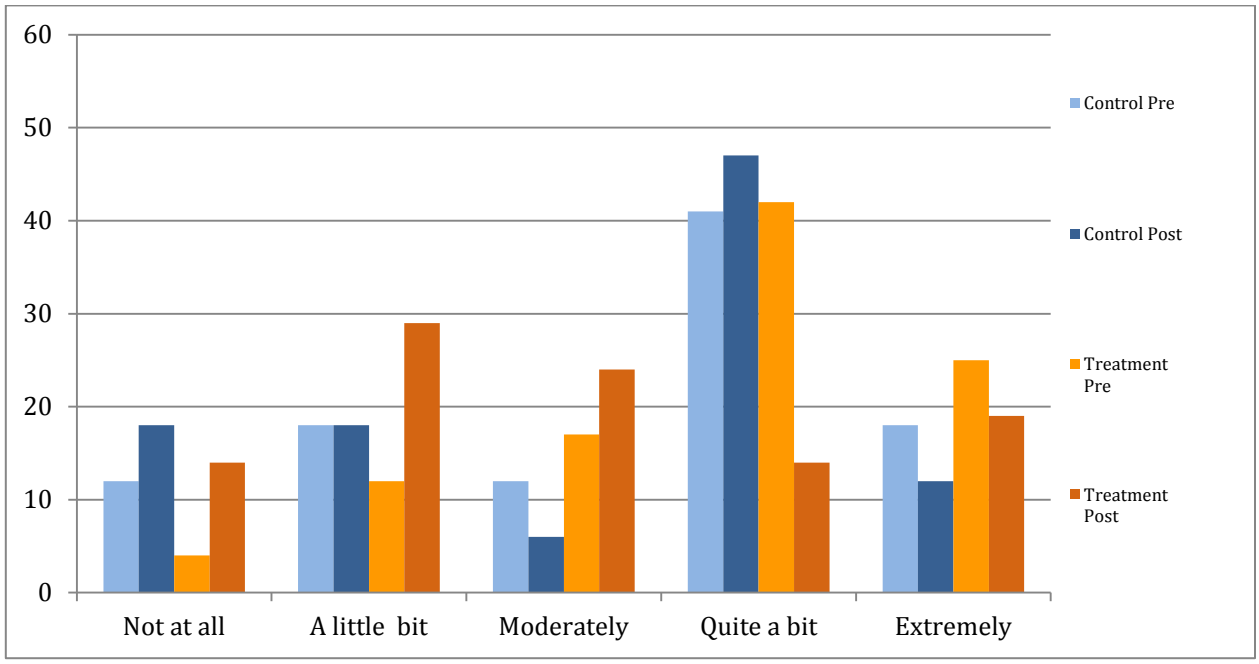
Graph I.3 Suddenly acting or feeling as if a stressful experience were happening again.



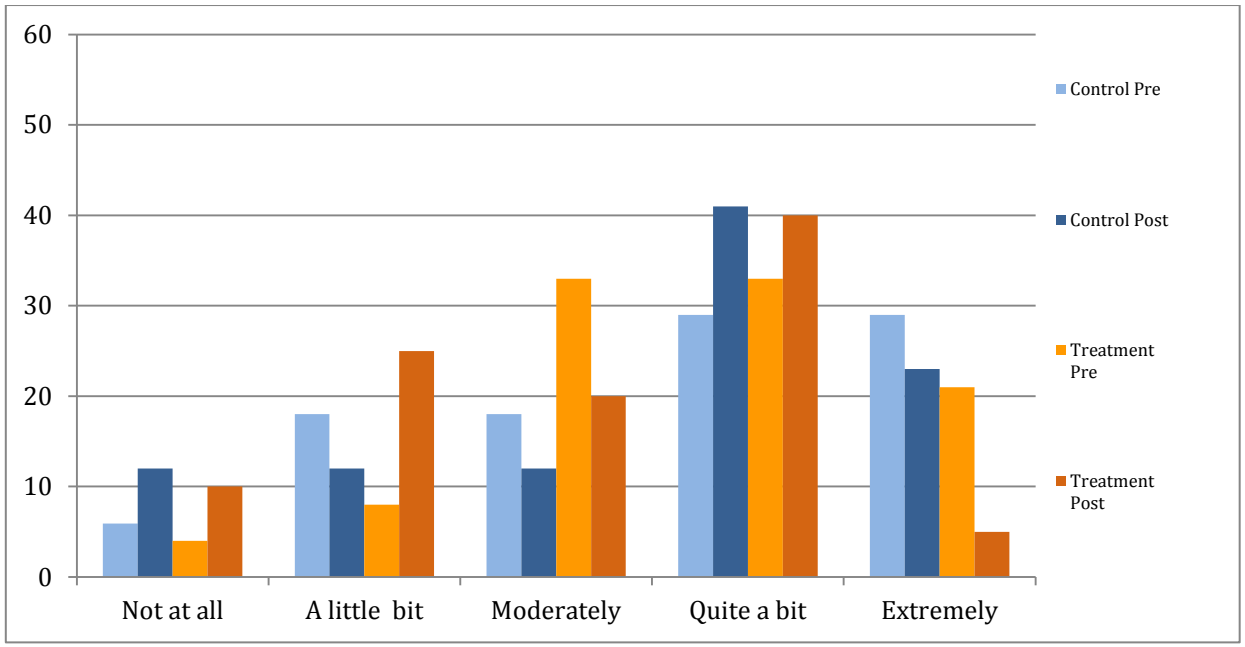
Graph I.4 Feeling very upset when something reminded you of a stressful event.



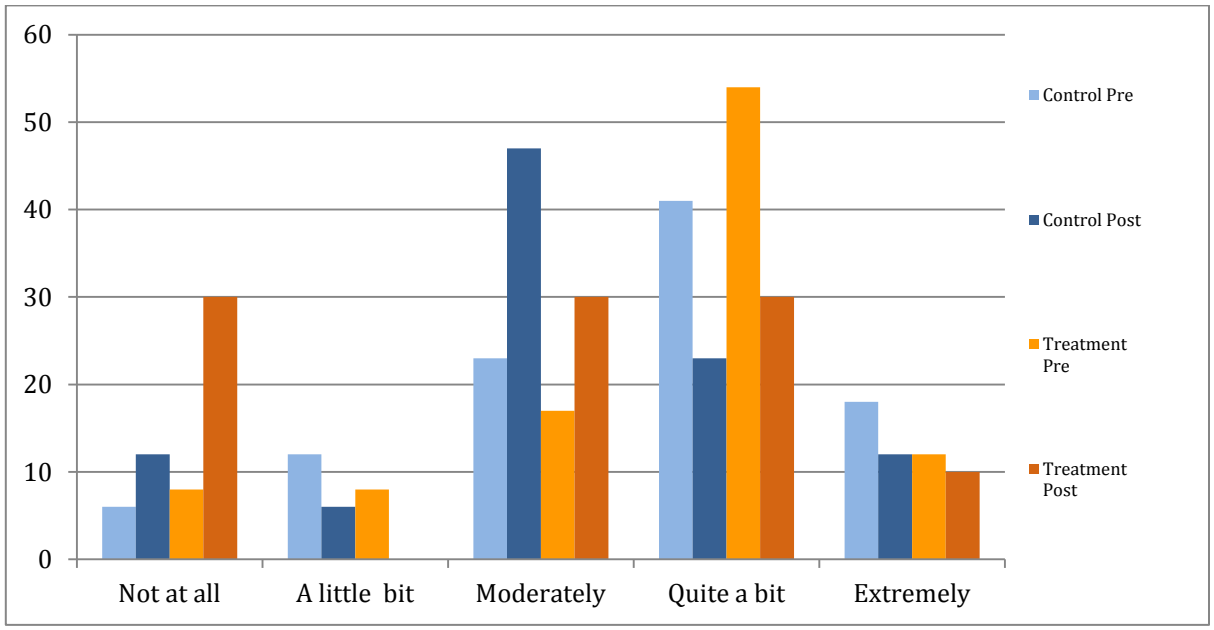
Graph I.5 Having physical reactions when something reminded you of a stressful event.



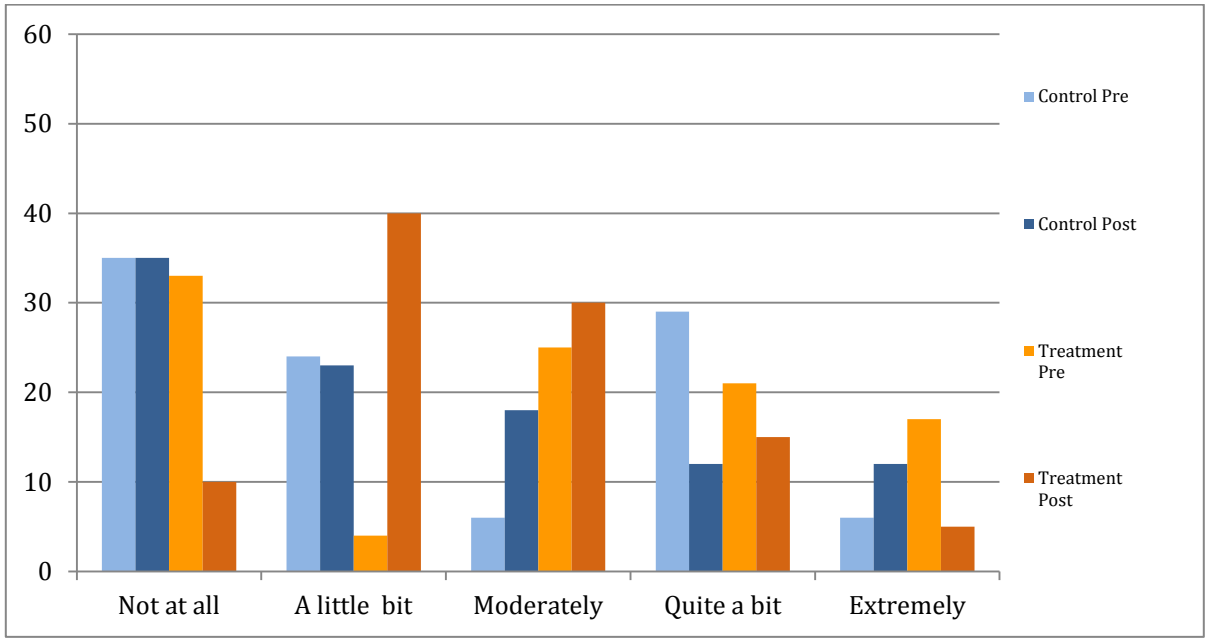
Graph I.6 Avoiding thinking about stressful experience.



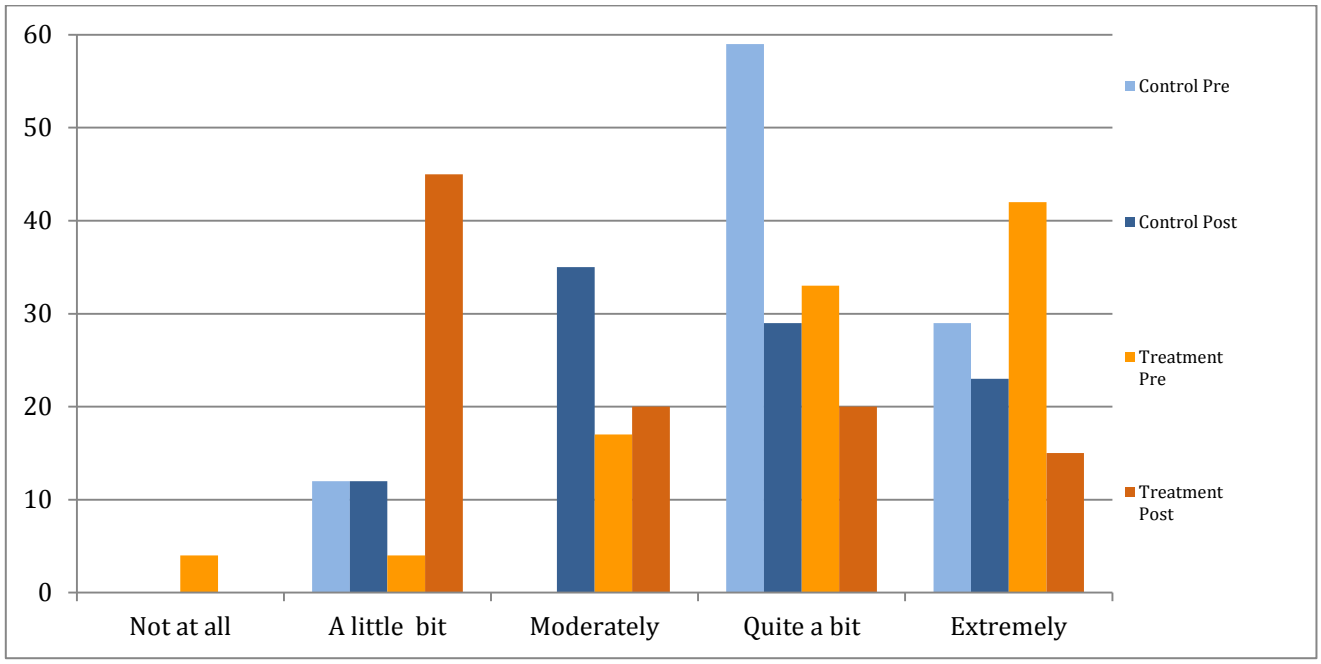
Graph I.7 Avoiding activities reminded you of stressful event.



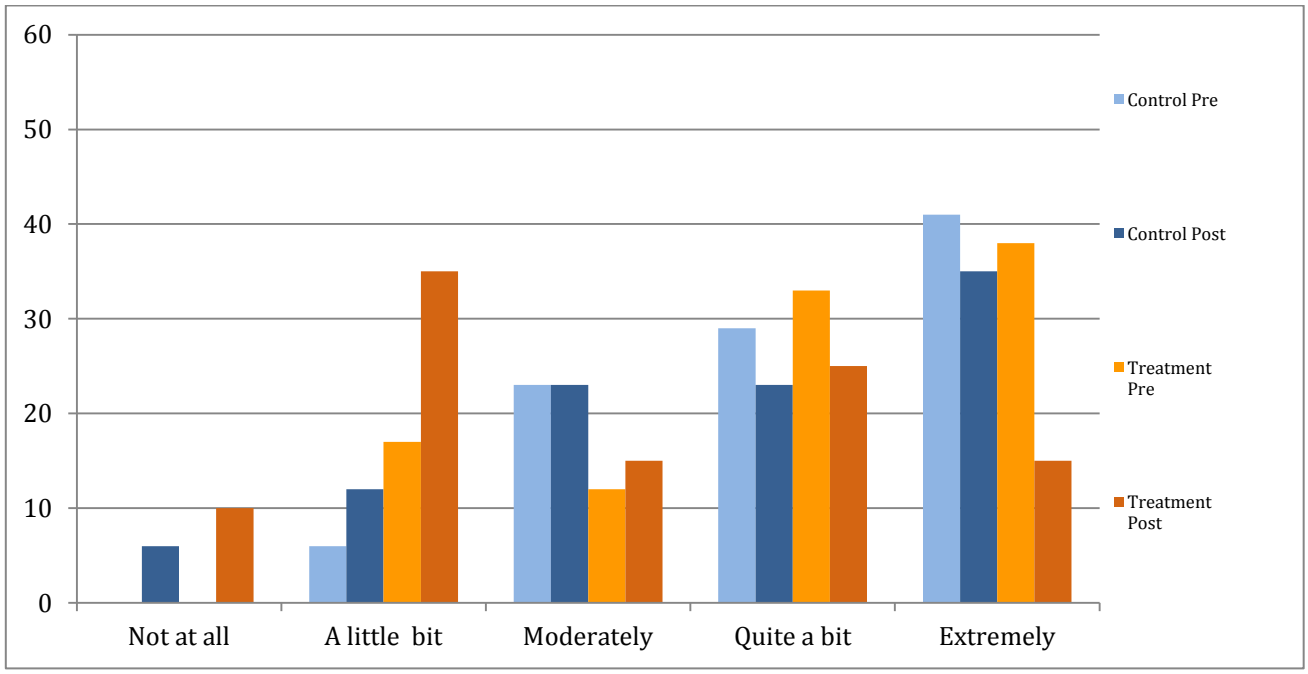
Graph I.8 Trouble remembering important parts of stressful event.



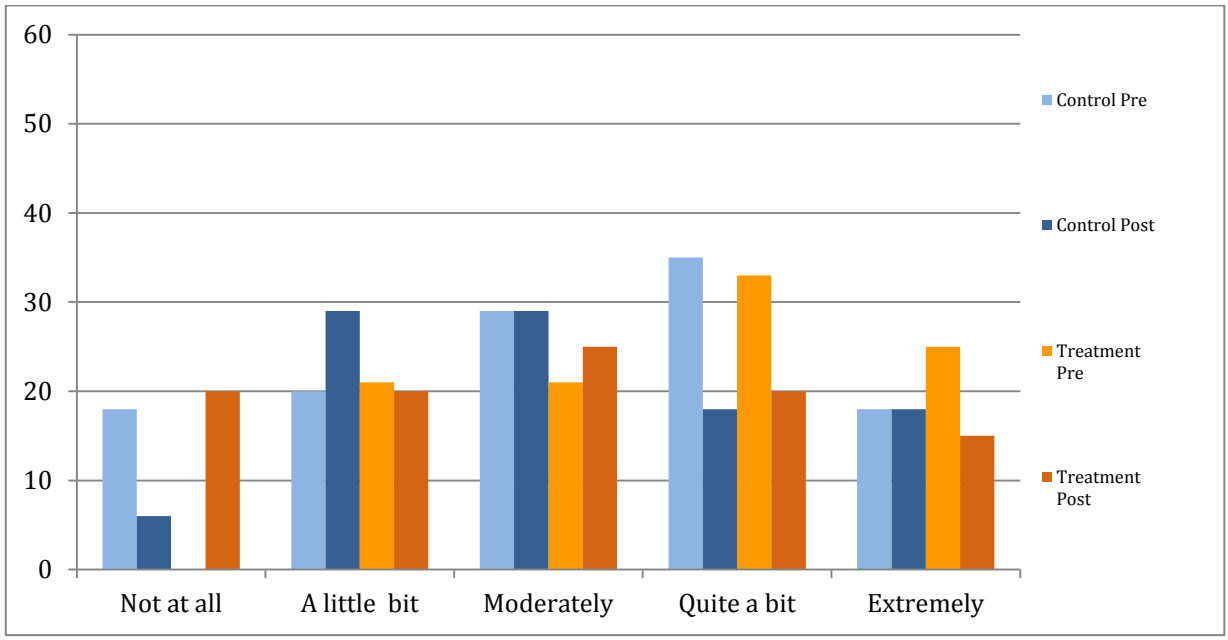
Graph I.9 Loss of interest in activities



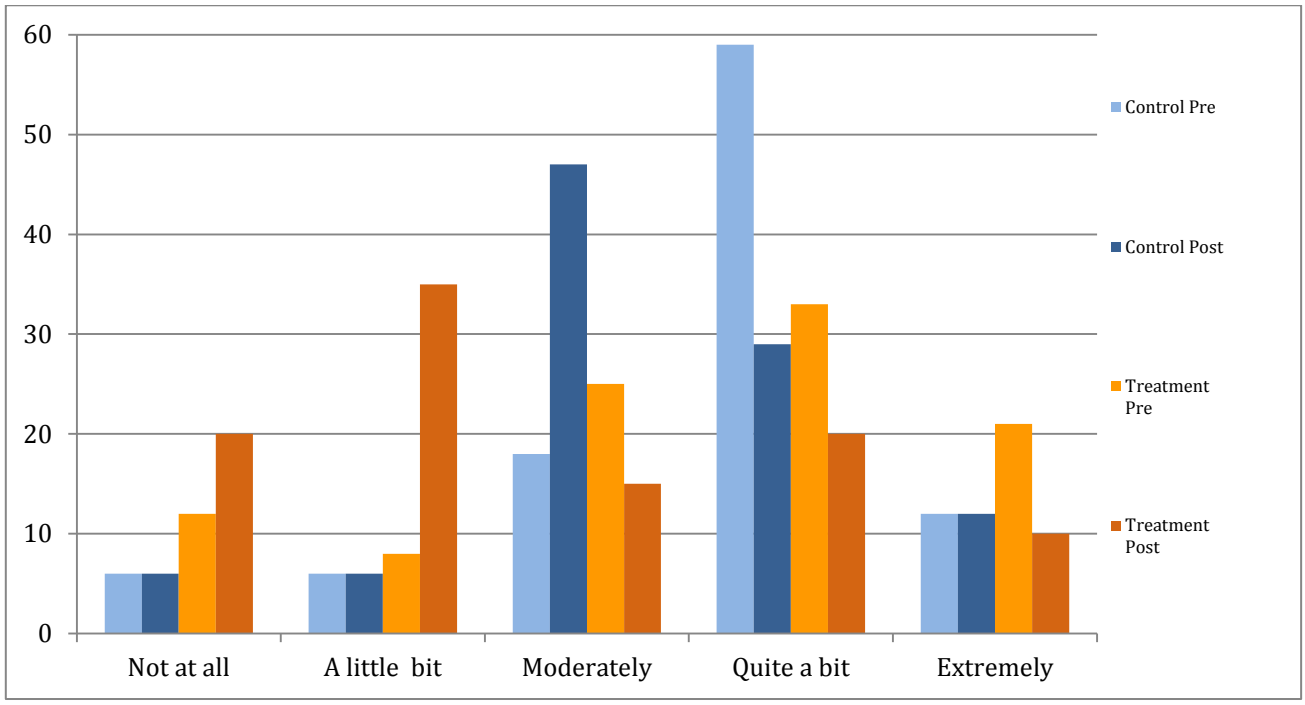
Graph I.10 Feeling Distant



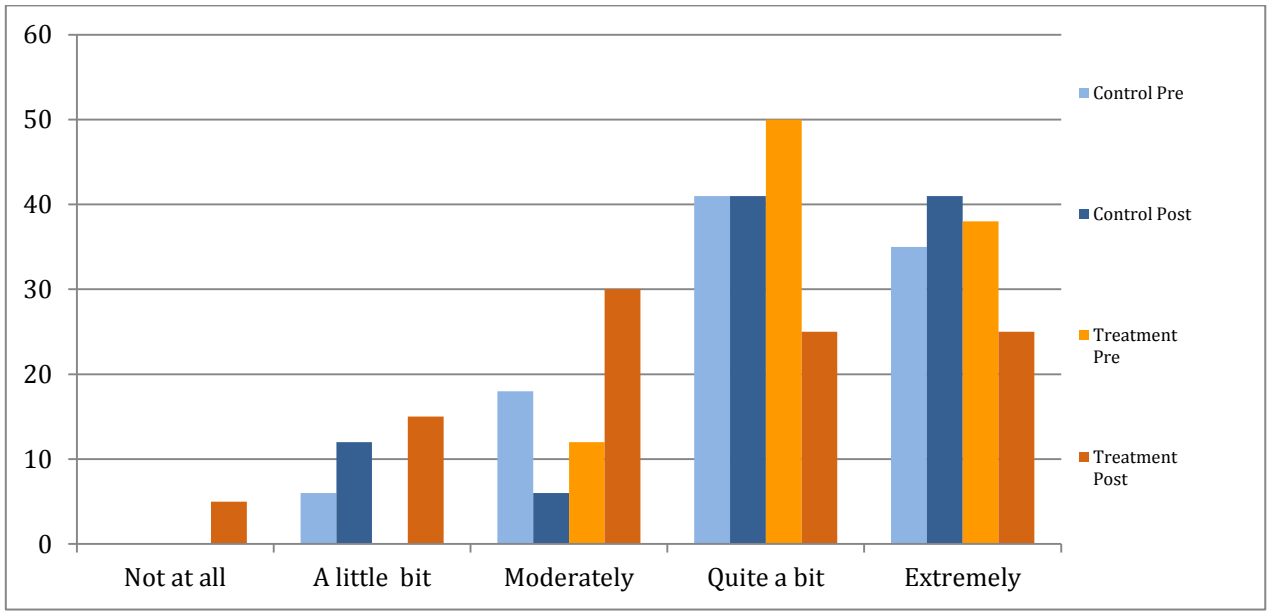
Graph I.11 Feeling emotionally numb.



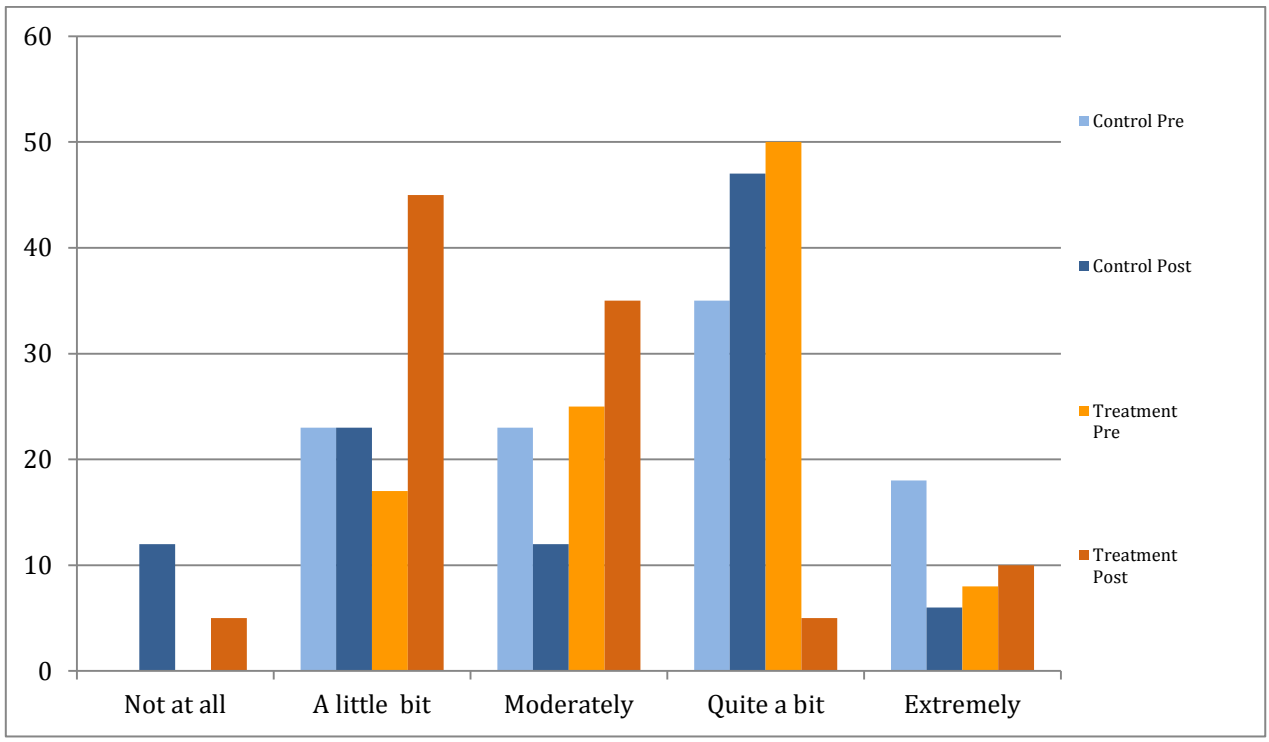
Graph I.12 Feeling as if future will be cut short.



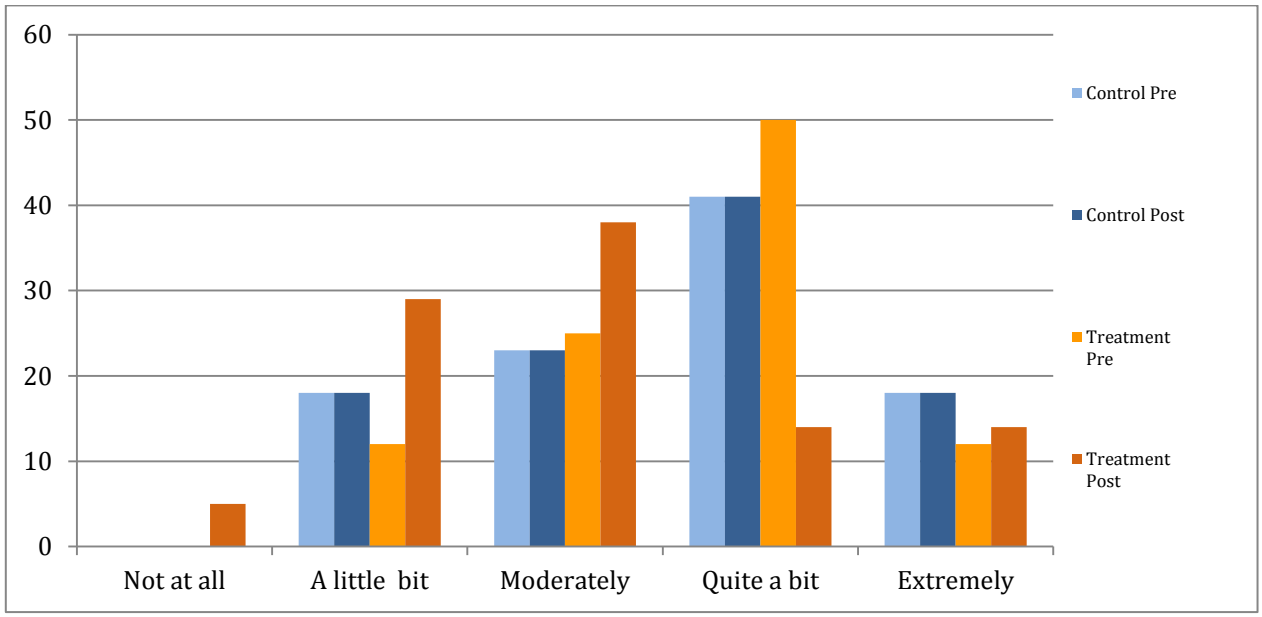
Graph I.13 Trouble falling asleep



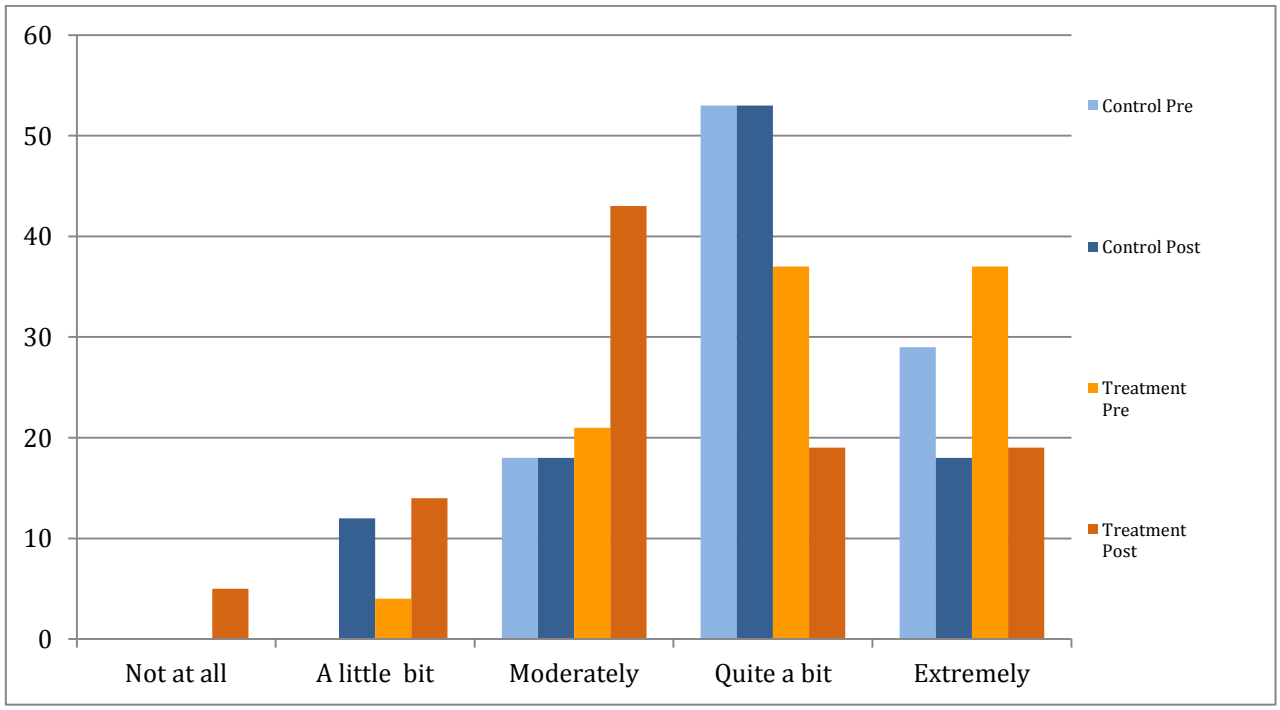
Graph I.14 Feeling irritable



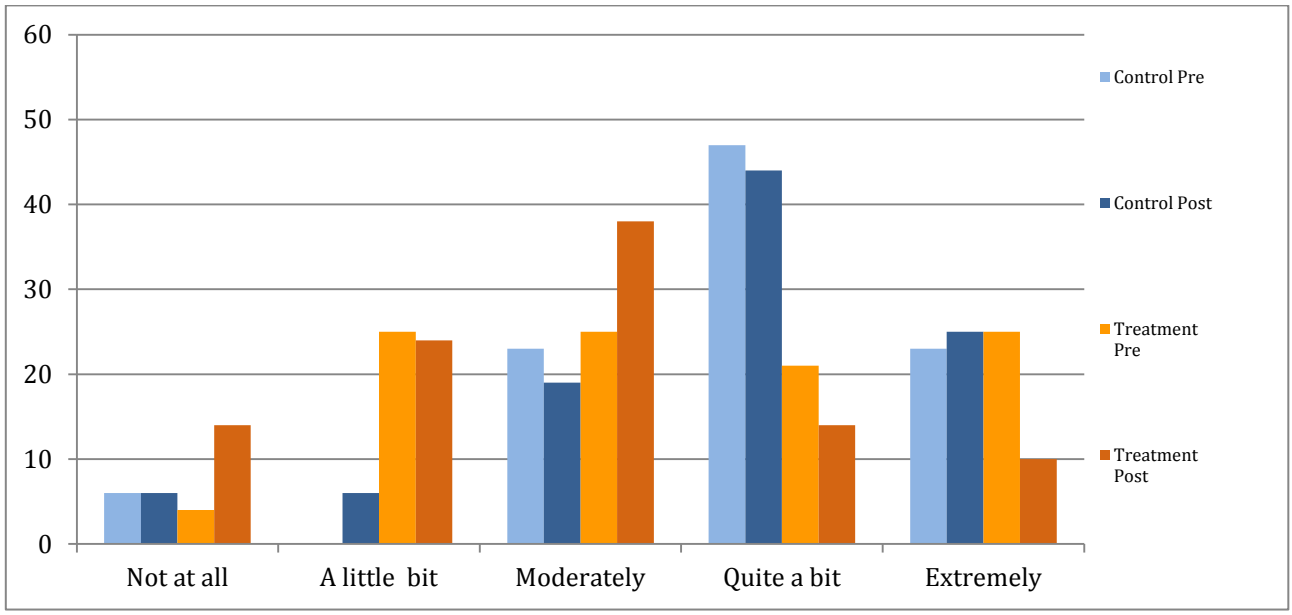
Graph I.15 Difficulty concentrating



Graph I.16 Being super alert



Graph I.17 Feeling jumpy



Appendix J:

Absolute Visual Analogue Scale (VAS)

Absolute Visual Analogue Scale (VAS)

Subject No._____ Date:_____

How is your pain today? Place a vertical mark on the line below to indicate your pain level today.

No pain **|**_____**|** Very severe pain

****

How was your pain one **week** ago? Place a vertical mark on the line below to indicate what your pain level was one **week** ago.

No pain **|**_____**|** Very severe pain

****

How was your pain one **month** ago? Place a vertical mark on the line below to indicate what your pain level was one **month** ago.

No pain **|**_____**|** Very severe pain

Appendix K:

Summary of Experimental Subject's Pain Symptoms

Summary of Subjects Physical Trauma

Table K.1 Experimental Subjects Reported Pain Symptoms

Subjects (n=21) Reported Pain Symptoms		
# Subjects	Percent	Area of Pain
19	90%	Low Back Pain
17	81%	Neck Pain
16	76%	Headaches
14	67%	R Knee Pain
13	62%	R Shoulder Pain
13	62%	L Knee Pain
11	52%	L Shoulder Pain
10	48%	Mid Back Pain
10	48%	L Foot Pain
8	38%	R Wrist Pain
7	33%	R Sciatic Pain
7	33%	L Wrist Pain
7	33%	R Foot Pain
6	29%	R Elbow Pain
6	29%	L Elbow Pain
6	29%	R Hip Pain
5	24%	L Sciatic Pain
5	24%	L Hip Pain
4	19%	Upper Back Pain
4	19%	R Ankle Pain
2	10%	R Hand Pain
2	10%	L Ankle Pain
1	5%	Sacrum and Coccyx Pain
1	5%	L Chest Pain
1	5%	R Groin Pain
1	5%	L Groin Pain
1	5%	L Hand Pain

Table K.2 Experiemental Group Summarized Trauma Health History

Experimental Group (n=21)

20	95%	Surgery
18	86%	Fractures
13	62%	Major Accidents (non MV)
12	57%	Motor Vehicle (MV) Accidents

Table K.3 Control Group Summarized Trauma Health History

Control Group (n=19)

15	79%	Fractures
12	63%	Surgery
5	26%	Motor Vehicle (MV) Accidents
1	5%	Major Accidents (non MV)

Appendix L:

Table L.3: Treated Lesions Summarized

Table L.4: Treated Lesions in the HEF Summarized

Table L.3: Treated Lesions Summarized

# of Lesions	% of Total Lesions	**Lesion Group**	**Subjects Treated**	**% Of Subjects**	**Occurrences of Lesion/Subject**
134	6.51%	Temporal	21	100%	6.4
116	5.63%	Sphenobasilar Symphysis	21	100%	5.5
101	4.91%	Occiput	21	100%	4.8
100	4.86%	Liver	21	100%	4.8
98	4.76%	Sacrum	21	100%	4.7
69	3.35%	Tibia	21	100%	3.3
87	4.23%	Cervical Vertebrae	20	95%	4.4
80	3.89%	Kidney	19	90%	4.2
77	3.74%	Iliac	19	90%	4.1
62	3.01%	Interosseous Membrane	19	90%	3.3
50	2.43%	Falx Cerebri	19	90%	2.6
29	1.41%	Vitality/PRM Low	19	90%	1.5
72	3.50%	Lung	18	86%	4.0
33	1.60%	Clavicle	18	86%	1.8
45	2.19%	Tentorium Cerebelli	17	81%	2.6
65	3.16%	Lumbar Vertebrae	16	76%	4.1
34	1.65%	Fibula	16	76%	2.1
38	1.85%	Femur	15	71%	2.5
38	1.85%	Ribs	15	71%	2.5
32	1.55%	Occipital Mastoid Suture	15	71%	2.1
40	1.94%	Metatarsals	14	67%	2.9
31	1.51%	Cuneiforms	14	67%	2.2
33	1.60%	Cuboid	13	62%	2.5
29	1.41%	Humerus	12	57%	2.4
24	1.17%	Radius	12	57%	2.0
22	1.07%	Ethmoid	12	57%	1.8
18	0.87%	Coxofemoral	12	57%	1.5
41	1.99%	Scars	11	52%	3.7
40	1.94%	Knee	11	52%	3.6
35	1.70%	Thoracic vertebrae	11	52%	3.2
23	1.12%	Calcaneus	11	52%	2.1
17	0.83%	Mesentery Proper	10	48%	1.7
15	0.73%	Talus	10	48%	1.5
12	0.58%	Pubic Branch	10	48%	1.2
17	0.83%	Frontal	9	43%	1.9
12	0.58%	Navicular	9	43%	1.3
11	0.53%	Hamate	9	43%	1.2
18	0.87%	Heart	8	38%	2.3
16	0.78%	Patella	8	38%	2.0
# of	% of Total	**Lesion**	**Subjects**	**% Of**	**Occurrences of**

Lesions	Lesions	**Group**	**Treated**	**Subjects**	**Lesion/Subject**
13	0.63%	Scapula	8	38%	1.6
13	0.63%	Ulna	8	38%	1.6
12	0.58%	Dura Restriction	8	38%	1.5
11	0.53%	Cervical Fascia	8	38%	1.4
10	0.49%	Prostate	7	33%	1.4
9	0.44%	Artery	7	33%	1.3
9	0.44%	Maxilla	7	33%	1.3
8	0.39%	Scaphoid	7	33%	1.1
9	0.44%	Pancreas	6	29%	1.5
8	0.39%	Parietal	6	29%	1.3
6	0.29%	Capitate	5	24%	1.2
5	0.24%	CV4	5	24%	1.0
5	0.24%	Solar plexus	5	24%	1.0
7	0.34%	Caecum	4	19%	1.8
6	0.29%	Cranial fluids	4	19%	1.5
6	0.29%	Lunate	4	19%	1.5
5	0.24%	Bladder	4	19%	1.3
5	0.24%	Pubic Symphysis	4	19%	1.3
5	0.24%	SBR	4	19%	1.3
5	0.24%	Trapezoid	4	19%	1.3
5	0.24%	Triquertrum	4	19%	1.3
4	0.19%	Pericardial Ligaments	4	19%	1.0
4	0.19%	Trapezium	4	19%	1.0
4	0.19%	Ureter	4	19%	1.0
6	0.29%	Pleural Dome Ligaments	3	14%	2.0
4	0.19%	Asterion	3	14%	1.3
4	0.19%	Piriformis	3	14%	1.3
4	0.19%	Pyloric sphincter	3	14%	1.3
4	0.19%	Temporomandibular Joint	3	14%	1.3
5	0.24%	Sciatic Nerve	2	10%	2.5
5	0.24%	Subtalar joint	2	10%	2.5
4	0.19%	Sigmoid Colon	2	10%	2.0
4	0.19%	Sternum	2	10%	2.0
3	0.15%	Ascending Colon	2	10%	1.5
3	0.15%	Coccyx	2	10%	1.5
3	0.15%	Pelvic Floor	2	10%	1.5
3	0.15%	Straight sinus	2	10%	1.5
3	0.15%	Zygoma	2	10%	1.5
2	0.10%	Cerebrum	2	10%	1.0
# of Lesions	% of Total Lesions	**Lesion Group**	**Subjects Treated**	**% Of Subjects**	**Occurrences of Lesion/Subject**
2	0.10%	Gall Bladder	2	10%	1.0

2	0.10%	Glenohumeral Joint	2	10%	1.0
2	0.10%	Ileocaecal Sphincter	2	10%	1.0
2	0.10%	Mastoid process	2	10%	1.0
2	0.10%	Sphincter of Oddi	2	10%	1.0
2	0.10%	Olecranon	2	10%	1.0
2	0.10%	Pisiform	2	10%	1.0
2	0.10%	Pterion	2	10%	1.0
2	0.10%	Sinuses	2	10%	1.0
2	0.10%	Testicular Scar	2	10%	1.0
2	0.10%	Fascia	1	5%	2.0
2	0.10%	Occipital Condyle	1	5%	2.0
1	0.05%	Balance 3 Diaphragms	1	5%	1.0
1	0.05%	Bronchi	1	5%	1.0
1	0.05%	Cardiac Sphincter	1	5%	1.0
1	0.05%	DJ Angle Sphincter	1	5%	1.0
1	0.05%	Esophagus	1	5%	1.0
1	0.05%	Femoral Nerve	1	5%	1.0
1	0.05%	Lacrimal	1	5%	1.0
1	0.05%	Lateral ventricle	1	5%	1.0
1	0.05%	Lumbar Spine	1	5%	1.0
1	0.05%	Mandible	1	5%	1.0
1	0.05%	Meniscus	1	5%	1.0
1	0.05%	Palatine	1	5%	1.0
1	0.05%	Plantar fascia	1	5%	1.0
1	0.05%	Quadratus lumborum	1	5%	1.0
1	0.05%	Sacrum 2-3	1	5%	1.0
1	0.05%	Sternoclavicular joint	1	5%	1.0
1	0.05%	Thoracic Diaphragm	1	5%	1.0
1	0.05%	Thumb	1	5%	1.0
1	0.05%	Vomer	1	5%	1.0

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Table L.4: Treated Lesions in the Human Energy Field Summarized:

Lesions in the Field by Group	Subjects	% of Total Subjects	Number of Treatments
Kidney	20	95.2%	29
Out of Body	20	95.2%	22
Temporal	15	71.4%	37
Occiput	14	66.7%	19
Tibia	14	66.7%	24
Liver	13	61.9%	23
Cervical Vertebrae	12	57.1%	22
Fibula	12	57.1%	22
Sphenoid	12	57.1%	18
Calcaneus	9	42.9%	15
Cervical Spine discs	9	42.9%	10
Iliac	9	42.9%	15
Sacrum	9	42.9%	16
Capitate	8	38.1%	22
Cuneiform	8	38.1%	15
Ethmoid	8	38.1%	9
Femur	8	38.1%	9
Humerus	8	38.1%	10
Lung	8	38.1%	14
Patella	8	38.1%	18
Thoracic vertebrae	8	38.1%	9
Clavicle	7	33.3%	14
Cuboid	7	33.3%	10
Heart	7	33.3%	7
Scapula	7	33.3%	8
Trapezium	7	33.3%	16
Metatarsals	6	28.6%	7
Navicular	6	28.6%	8
Pancreas	6	28.6%	6
Frontal	5	23.8%	7
Talus	5	23.8%	11
Trapezoid	5	23.8%	8
Triquertrum	5	23.8%	12
Ulna	5	23.8%	7
Hamate	4	19.0%	6
Lumbar Vertebrae	4	19.0%	5
Lumbar Spine Discs	4	19.0%	5
Parietal	4	19.0%	6
Radius	4	19.0%	5
Lacrimal	3	14.3%	4

Mandible	3	14.3%	3	
Nasion	3	14.3%	3	
Occipital Condyle	3	14.3%	6	
Prostate	3	14.3%	3	
Pubic Branch	3	14.3%	3	
Spleen	3	14.3%	3	
Bladder	2	9.5%	2	
Maxilla	2	9.5%	3	
Pisiform	2	9.5%	6	
Coxofemoral	2	9.5%	3	
Tentorium Cerebelli	2	9.5%	3	
Zygoma	2	9.5%	5	
Colon	1	4.8%	1	
Esophagus	1	4.8%	1	
Foot	1	4.8%	2	
Lunate	1	4.8%	1	
Meniscus	1	4.8%	1	
Sternum	1	4.8%	1	
				Total
			580	Treatments

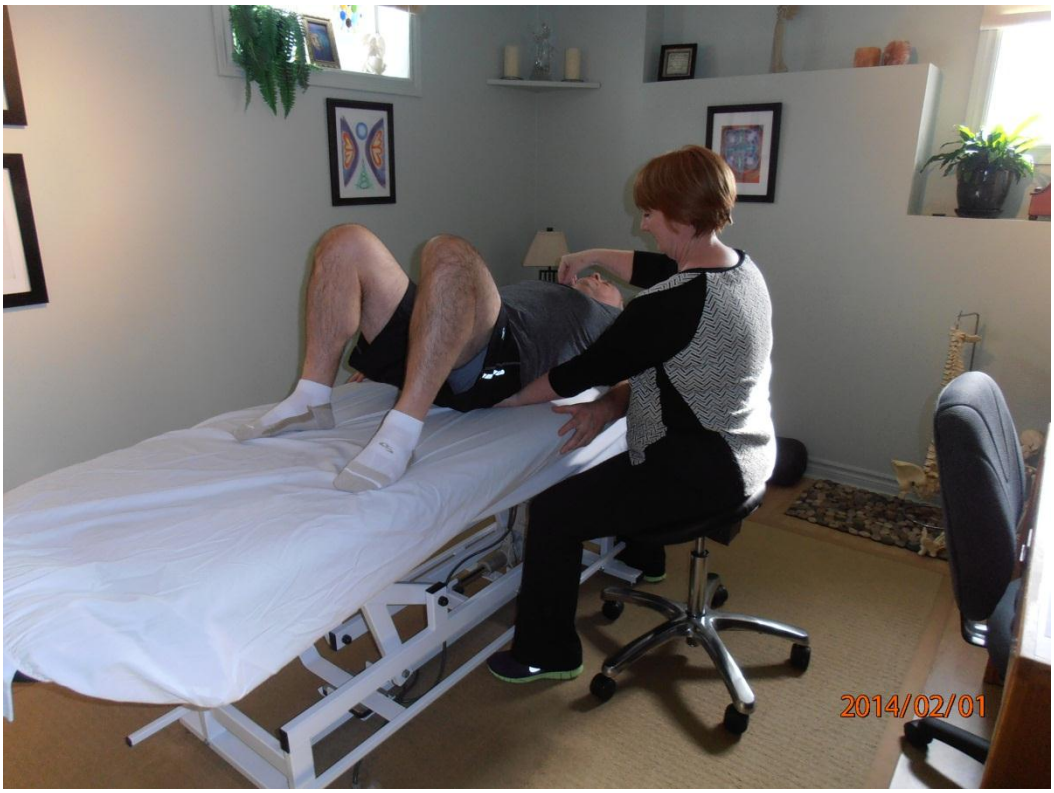
Appendix M:

Assessments and Techniques

Barral Test:

Purpose:	Fascia listening to determine the primary lesion.
Subject Position:	Supine with knees flexed.
Therapist Position:	Standing on either side of the subject.
Procedure:	Place one hand on the sternum. Follow the fascia until it the hand stops.
Comment:	If no movement, check to ensure patient's fulcrum in within their physical body by asking "Where are you living?" A draw to the subjects field indicates that their fulcrum is outside of the physical body.

Harmonisation of the organism around the central fulcrum by Phillipe Druelle D.O.:



Purpose: To allow the subject to recenter around its central fulcrum. "Putting the pilot back in the plane."

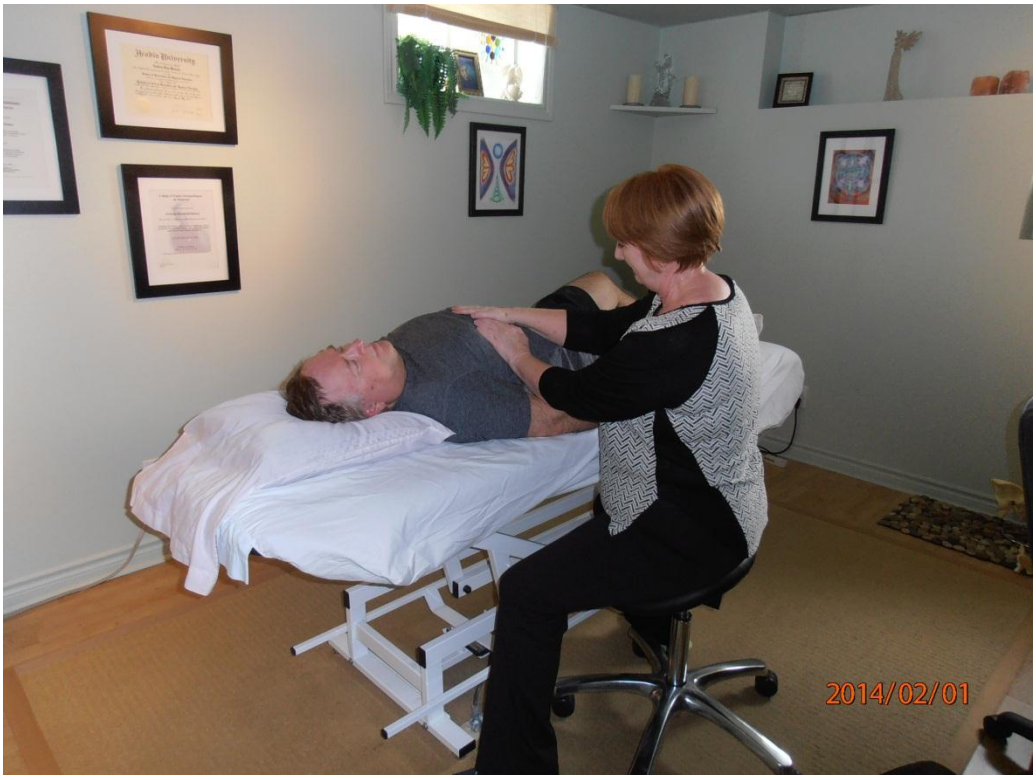
Subject Position: Supine with knees flexed or supported by pillow.

Therapist Position: Seated on left side of subject. Index & 3rd finger of cephalic hand provides an a/p axis for the heart balance point. (Angle of Louis) Caudal hand at sacrum. Index and 3rd finger in contact with Lippincott point while visualizing an a/p axis.

Procedure: Balance the overall pelvic volume around the reference point at the sacrum. Balance the overall thoracic volume around the reference point at the heart. Balance the two volumes, stillpoint, release and wait for return of PRM.

Tissue Expression of Consciousness In the Field: Assessment and Technique

Note: Liver is used for illustration purpose only. This technique is used for any tissue consciousness that is found in the field.



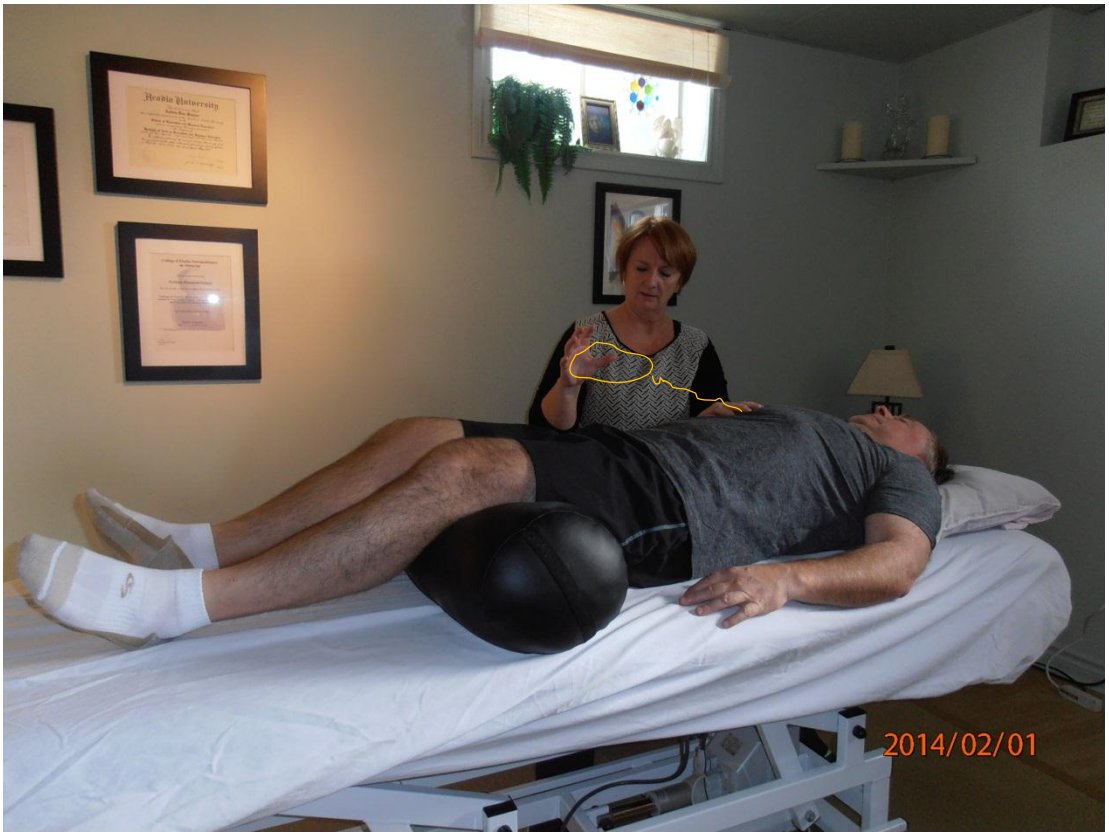
Purpose: To determine if the liver's consciousness is in the human energy field and to return it to the physical body.

Subject Position: Supine with knees supported.

Therapist Position: Seated on right side of patient with hands on liver.

Assessment Procedure: Listen and assess the PRM of the liver. If none present, ask Sutherland's question: "Where are you living?" The tissue will draw you to where its consciousness is expressing itself in the human energy field. To test if you have the correct position in the field place one hand on the liver's consciousness expressing

itself in the field while maintaining your other hand on the physical liver. Induce a motion: right or left rotation. If you are on the correct position of the liver's consciousness in the HEF, you will feel a movement in the physical liver.

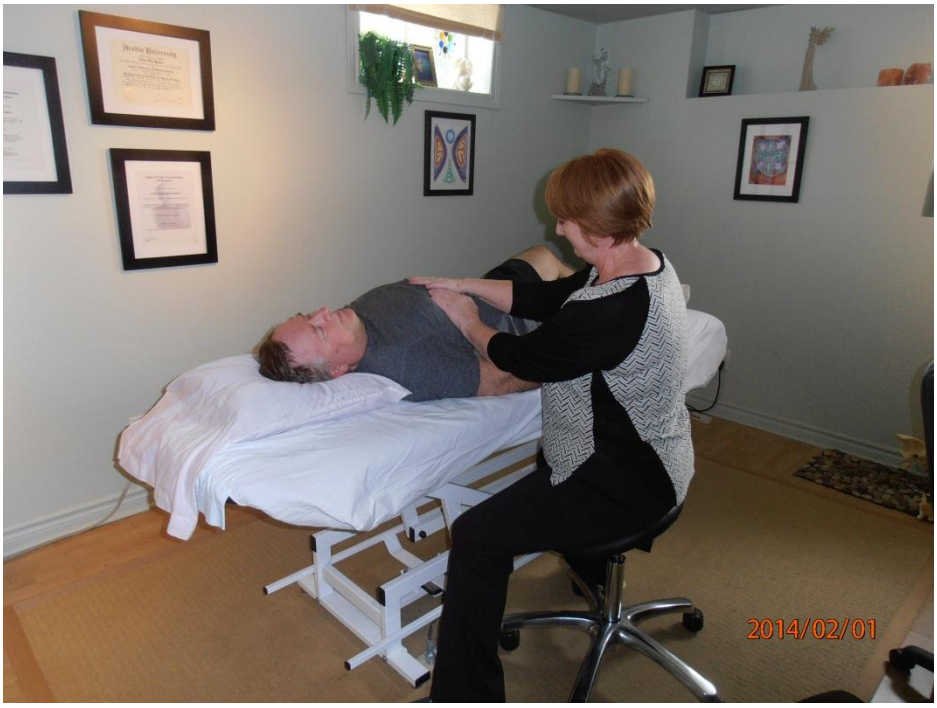


Technique Procedure: Look for the passage that the liver's consciousness took to leave the physical body. Holding the liver's consciousness in the field retrace the passage it took in leaving the physical body to return it to the physical body. If it returns you will feel normal PRM return to the liver or another lesion will present itself to be treated.

Comment: If this technique fails to return the tissue's consciousness to the physical body it may be because a foreign energy is occupying this space. In this case you need to perform the foreign energy release technique to clear that space for the tissue's consciousness to return.

Foreign Energy Release Technique:

Note: Liver is used for illustration purpose only. This technique can be used for foreign energies found in any tissue .



Purpose: To release a foreign energy (squatter) that is present in the liver.

Subject Position: Supine with knees supported.

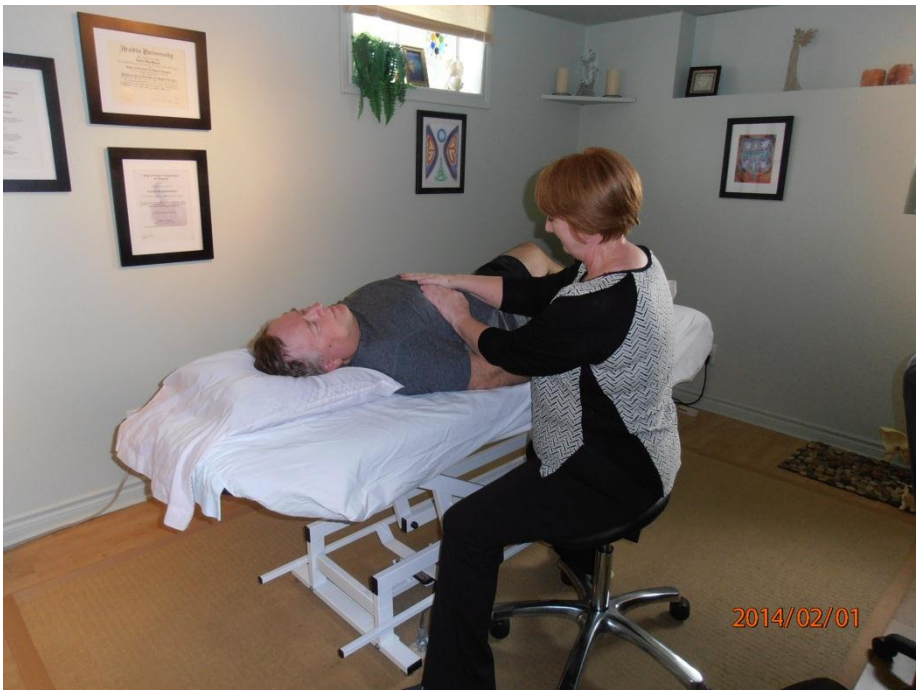
Therapist Position: Seated on right side of patient with hands on liver. Be centered and grounded.

Procedure: To eliminate the foreign energy in the liver, connect to the tissue and perceive its vibration. Raise this vibration and transmit light inside the tissue. “Raise its sunshine.” This lower foreign energy frequency cannot live in this new higher vibration and will leave.

Field Lesion Affecting Physical Presence of the Tissue

Assessment and Technique:

Note: Liver is used for illustration purpose only. This technique is used for any field lesion affecting the tissue.



Purpose: To release a lesion in the human energy field that is affecting the physical presence of the liver.

Subject Position: Supine with knees supported.

Therapist Position: Seated to the right side of subject with hands on liver.

Assessment Procedure: : Listen and assess the PRM of the liver. If none present, ask Sutherland's question: "Where are you living?" If the liver is in the physical body, the next

question is asked. “Where would you like to live?” The liver will show its normal PRM. The final question is then asked. “What is impeding you from living there?” There will be a draw to where the lesion or restriction is acting on the liver. This lesion can be in the physical body but it can also be in the human energy field. If in the HEF, it will feel like a chaotic energy pattern. To test if you have the correct position in the field; place one hand on the lesion (chaotic energy pattern) expressing itself in the field while maintaining your other hand on the liver. Induce a motion: right or left rotation. If you are on the correct position of the lesion in the HEF, you will feel a movement in the physical liver.

Technique Procedure: Once the field lesion (chaotic energy pattern) is found, the therapist detangles it. This is accomplished by raising and expanding the vibrational pattern of the lesion while maintaining the image of untangling a ball of yarn. Once the

pattern clears and returns the energy flow to normal, the liver in the physical body returns to normal PRM or an additional lesion will reveal itself.