

Complete Resolution of Migraine Headache While Receiving a Combination of Torque
Release Technique and Cranial Nerve Auricular Stimulation: A Case Report

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Abstract

OBJECTIVE: The objective of this case study is to provide data on the resolution of debilitating migraine headaches with the use of Torque Release Technique (TRT) and Cranial Nerve Auricular Stimulation (CNAS). *Clinical Features:* Forty nine year old female teacher suffering with debilitating migraine headaches that ranged from mild to severe (on a severity scale through none, mild, moderate, severe to unbearable), and associated symptoms which were present from sometimes to always (on a scale through never, rarely, sometimes, often to always). In association to the headaches were complaints of upper neck soreness and tenderness. Patient described her head pain as pressure behind the eyes with an associated visual flickering in the eye. Patient also experienced bouts of nausea and vomiting associated with the migraine headaches. Patient's lifestyle was affected with impaired driving, sleep and missing work days. *Intervention and Outcomes:* Eight chiropractic visits involving adjustment of primary subluxation utilizing TRT as well as CNAS and Myofascial Release Technique (MRT). Patient's functional status pre-care were assessed using digital postural assessment software (PosturePro by Ventura Designs), spinal range of motion measurement software (VROM by Ventura Designs), heart rate variability analysis (emWave hardware and software by HeartMath), Torque Release Technique diagnostic criteria as well as a headache symptom severity and regularity questionnaire (developed by the principal author). *Conclusions:* Complete resolution of patient's migraine headaches which had been ongoing for a six month period.

Keywords:

Migraine Headaches, Torque Release Technique (TRT), Integrator, Cranial Nerve Auricular Stimulation (CNAS), Postural Analysis, Heart Rate Variability, Range of Motion.

Introduction:

A true migraine headache has at least two of the following characteristics: unilateral location, pulsating quality, moderate or severe intensity, and aggravation by routine physical activity.¹ Because of the episodic nature of the migraine disorder, and because migraine is frequently underreported and undertreated, it can be difficult to pinpoint the age of migraine onset or to retrospectively assess its incidence. As a result, migraine incidence has been assessed in few longitudinal studies and research evaluating migraine incidence is less common than prevalence studies.^{2,3} Despite the marked variation in migraine prevalence among the 24 population based studies, 70% of the variation was accounted for by gender, age and case definition. Migraine was more prevalent in females than males, and varied strikingly with age, peaking between 35 and 45 in both gender groups.⁴ Migraine is a public health problem of enormous scope that has an impact on both the individual and society.⁵ Quantitative evidence also shows that migraine and other headache sufferers experience substantial decreases in functioning and productivity, which in turn translates into significant health-related quality of life (HRQoL) burdens on individuals and financial burdens to employers.⁶⁻⁸ The American Migraine Study II estimates that 28 million US residents have severe migraine headaches.⁹ Improved diagnostic and treatment strategies could reduce the economic cost of migraine headaches.¹⁰ In the United States, \$6 to \$17 billion dollars are spent each year on health care because of decreased productivity because of migraines.¹¹

Review of the Literature:

In the United States, migraine remains a substantially under diagnosed and undertreated condition. Although it is a remarkably common cause of temporary disability, many persons with migraine, even those with disabling headache, have never consulted a physician for the problem.¹² When consulting a physician, migraine diagnoses starts by determining whether the patient has an aura or not. If the patient has an aura, then at least 5 attacks must fulfil the following criteria: A) Headache lasting 4-72 hours B) Headache that is unilateral, pulsating, moderate-to-severe intensity or aggravated by walking up stairs or similar. C) During headache there is presence of nausea or vomiting or photophobia or phonophobia. If the patient has no aura, then at least 2 attacks must fulfil the following criteria: A) At least 3 of the following characteristics: One or more completely reversible aura symptoms, at least 1 aura symptom last >60 minute or headache follows aura in <1 hours B) No evidence of organic cause of headache.¹³ When a patient is then diagnosed with a migraine it is advised to use over the counter analgesics or NSAIDS, since these are considered to be safe and effective. If the patients symptoms continue without improvement then the second step would be a combination of ergot derivatives, dopamine antagonists or triptans should be considered.¹⁴ When patients not responding or tolerating prophylactic medication or wish to avoid medication for other reasons, they can be referred to massage therapy, physical therapy, or chiropractic, neurobiofeedback and/or clinical nutrition advice as these treatments are safe with few adverse reactions.¹⁵⁻¹⁷ Studies have shown that by restoring muscle relation and normal joint function in the neck and upper back area, manipulation has a prophylactic effect.¹⁸ Chiropractic treatment has also been reported to reduce the frequency and intensity of migraines.¹⁹ For example, one trial showed the mean number of migraines reduced from 7.6 to 4.9 episodes per month after treatment with manipulation.²⁰ Some researchers argue that the cervical spine is not a causative factor.²¹ Then others state that the cervical spine can

be a source of migraine pain because of the intracranial vascular changes that may be effected by cervical dysfunction.²²⁻²⁴ This case study shows how chiropractic care including Torque Release Technique (TRT) adjustments with the Integrator, Cranial Nerve Auricular Stimulation (CNAS) and myofascial release technique (MRT) resolved a case of debilitating migraines.

TRT is described as a tonal subluxation centred chiropractic analysis and adjusting technique^{25,26}. TRT was initially developed during the research design process of a prospective randomized placebo-controlled research project by principal investigator Dr Jay Holder²⁷. The intent of the examination of the indicators of subluxation is to rule in the potential location of the primary subluxation most needing to be adjusted at any given point in time. The differential diagnosis of the site and vectors of the primary subluxation is then made using advanced functional leg length reflex (FLLR) testing²⁸ combined with skin contact pressure testing of vertebral contact points with suspected correctional vectors. The premise of this system is based on a neurological model of subluxation seeing dysfunction in the piezoelectric and neuropeptide state of the central nervous system that is observed as biomechanical dysfunction via the dural attachments between the spinal cord and vertebrae²⁹. Adjustments can be delivered by hand or via Integrator instrument. The preferred method is the Integrator which was developed as part of the original research project due to statistical confounding of using the hands to adjust and the lack of reproducibility in pre-existing instruments. The Integrator surpasses the specifications of the Toggle Recoil adjustment, delivering a pre-loaded thrust in 1/10,000th of a second at 64 Hz with recoil and left or right torque included in the correctional thrust, when the instrument has been loaded, placed on the appropriate contact point and the correct amount of pressure is applied firing independently of the practitioner. The Integrator is patented for the adjustment of subluxation and is the first chiropractic device to hold FDA 510K and CE clearances³⁰.

TRT has previously been published to be associated with positive outcomes including but not limited to addiction and compulsive disorders recovery³⁰⁻³⁴, traumatic brain injury³⁵, infertility³⁶⁻³⁹, infant health⁴⁰, autism⁴¹, ADHD^{42,43}, brain EEG and P300 brain wave^{32,44,45}, anxiety, reduced nursing station visits^{30,31}, depression^{30,31,46}, battered wife syndrome⁴⁷, functional assessments^{32,35,38,41,44,48}, quality of life^{32, 35,46,48} and state of wellbeing measures^{30,32,49}.

Since Migraine has been suggested to have central nervous system etiology⁵⁰⁻⁵², it is proposed that TRT adjustments could play an important role in improving outcomes by augmenting the dorsal horns of the spinal cord with proprioceptive input from the correctional vector with intent⁴⁹.

Case Report:

Patient History:

A forty nine year old female teacher presented complaining of debilitating migraine headaches that ranged from mild to severe (on a severity scale through none, mild, moderate, severe to unbearable), and associated symptoms which were present from sometimes to always (on a scale through never, rarely, sometimes, often to always). In association to the headaches were complaints of upper neck soreness and tenderness. Patient described her head pain as pressure behind the eyes with an associated visual flickering in the eye. Patient also experienced bouts of nausea and vomiting associated with the migraine headaches. Patient's lifestyle was affected with impaired driving, sleep and missing work days.

The following symptoms were self-rated as 7/8 in combined severity and regularity: Blurry vision, throbbing pain, squeezing pain, pain in neck, pain in shoulder, stiffness of neck movements. The following symptoms were self-rated as 6/8 in combined severity and regularity: Reduced energy or concentration, nausea/sick feelings in tummy, vomit/throw up, see spots, flashes and/or halos, pain on back of head, pain on top of head, pain behind eyes.

The following symptoms were self-rated as 5/8 in combined severity and regularity: Didn't attend work/school, performance at work/school reduced, performance at home reduced, performance at sport/recreation reduced, and feel depressed, angry and/or upset.

The medications she was taking for pain relief included Panadol (paracetamol), Panadeine Forte (paracetamol with codeine) and Codeine.

The patient had a previous history of occasional headaches. She had previously received chiropractic care for symptomatic relief. Old injuries which still troubled the patient included her right shoulder (rotator cuff) and elbow.

Other health problems noted were poor sleep quality, tiredness and lethargy, and she was concerned about taking too many medications to relieve her pain. Questioning regarding past illnesses was unremarkable except for regular colds. Systems history review revealed no abnormalities. Previous surgery included a Laparoscopy years ago. She has two children, nineteen and twenty four years old, and one grandchild.

She rated her current health as 2/10 but would like to achieve 10/10. She self rated her emotional state as 3/10 and she rated herself 10/10 for her ability to deal with stress lately.

Her worst physical strain recently had been her shoulder. Current emotional stress was feeling depressed because of her headaches. Her most significant mental demand was being worried about her ability to function properly at work as a teacher.

The patient expressed a desire to quit smoking.

She had consulted the treating chiropractor for a number of reasons: Pain relief, to fix a health problem, to achieve a better level of health, to be able to perform at her best, and to live a long and healthy life.

Chiropractic Examination

Pre-care the practice member was assessed for signs of subluxation using functional outcome measures including digital postural assessment, spinal range of motion analysis, heart rate variability and a rating system of the TRT Indicators of Subluxation.

The patient was assessed “pre-care” and “post-care” utilizing a self rated headache symptom severity and regularity questionnaire.

Digital Postural Assessment:

Postural analysis was performed prior to commencement of care. This was quantitatively assessed utilising Posture Pro Digital Assessment Software designed by Ventura Designs. Red marker stickers were placed on standard anatomical landmarks (AP: Level of ears, centre of shoulder joints, ASIS, centre of patellae, centre of ankle joints, episternal notch and umbilicus. Lateral: EAM, centre of shoulder joint, greater trochanter, centre of knee joint, and just anterior to lateral malleolus.) AP and Lateral static posture photos were taken using a digital camera. The images were imported into Posture Pro and then the postural analysis is performed by clicking on the appropriate anatomical markers according to the software’s protocol. The software then calculates degrees of forward head posture, pelvic tilt; head, shoulder, pelvic, knee and ankle unleveling; and head and pelvic list. For this study a calculated number called “Total Deviation” being the total of all the above data was utilised to rate subluxation severity. The spinal column is a complex mechanical structure. Alterations in the biomechanical alignment of this structure over time, as seen with abnormal asymmetrical posture, results in degenerative changes in the muscles, ligaments, and bony structures.⁵³⁻⁵⁸ Asymmetrical posture may also be directly or indirectly responsible for spinal pain syndromes.⁵⁹

Spinal Range of Motion Assessment:

Spinal ranges of motion for neck and trunk were measured using VROM software developed by Ventura Designs. Photographs were taken of the subject at ends of range of motion for neck flexion, extension, left and right lateral flexion and left and right rotation, trunk flexion, extension, left and right lateral flexion and left and right rotation. These photos were imported into the VROM software and using goniometry within the software ranges of motion were measured and compared to American Medical Association norms.⁶⁰

emWave Heart Rate Variability:

Heart Rate Variability Coherence Ratio Analysis was performed utilising Heart Math emWave hardware and software. This system monitors heart rate variability and calculates a coherence ratio which divides the percentage of time spent in high, medium and low coherence states. For the purpose of this study the subject was attached to the emWave in a relaxed seated position, for 5 minutes and the severity of dysfunction rated based on the percentages of time spent in low, medium and high coherence.

TRT Indicators of Subluxation:

TRT is a model that utilizes the multi-factorial approaches pioneered in the following techniques: Thomson Terminal Point, Van Rumpft, D.N.F.T., DeJarnette, S.O.T., Logan Basic, Toftness, Palmer Upper Cervical and Network Chiropractic Spinal Analysis to utilize a neurologically-based analysis that incorporates non-linear time sequence adjusting priorities.⁶¹ A scoring system was developed by the principal author to rate the severity of the prone indicators of subluxation as compiled by TRT's founder Dr Jay Holder: Breathing Movement (Rated 0-5), Achilles Tension (Rated 0-5 left and right), Abductor Tendency (Rated 0-5 left and right), Foot Flare (Rated 0-5 left and right), Foot Pronation/Supination (Rated 0-5 left and right), FLLR (Rated in mms), Cervical Syndrome Test (Rated as 0 for

negative and 2 for positive or a positive “wrong-un” finding), Bilateral Cervical Syndrome Test (Rated as 0 for negative and 2 for positive) and Derefield Test (Rated as 0 for negative and 2 for positive).

Headache Symptom Severity and Regularity Questionnaire:

A questionnaire was designed by Dr Nick Hodgson based on the most common symptom list of headache and migraine, which included a rating scale for severity and regularity of symptoms. The questionnaire was completed prior to commencement of care and after the initial course of adjustments. The rating system allowed pre and post comparison of each individual symptom, each of the two groups of symptoms and all symptoms combined.

Treatment:

Subluxation level and correctional vectors were determined with the TRT differential diagnosis for primary subluxation. Chiropractic adjustments were delivered utilising the Integrator Instrument. The Integrator is designed to administer a “toggle recoil” thrust at 1/10,000th of a second, providing for a three dimensional impulse.²⁵ No more than three primary subluxations were adjusted on each visit. Specific MRT was performed on soft tissues related to each primary subluxation. CNAS was delivered by diagnosing and treating active cranial nerve points on the surface of the ear based on the Nogier somatotopic model of point distribution utilising the Stimplus Pro 103F microcurrent device which provides specific hertz frequencies based on nerve innervation.

Examination Findings:

1) Postural Assessment: (Figure 1)

The initial postural assessment can be seen to demonstrate forward head posture of 11 degrees, forward pelvic tilt of 7 degrees and head unleveling of 3 degrees, with a total postural deviation of 25 degrees. Achieving a total deviation of 10 degrees or less would result in significant reduction in biomechanical strain to the spinal column and nervous system.

2) Spinal Range of Motion: (Figure 2 + 3)

The following spinal movements were moderately reduced: Left and right cervical lateral flexion worse to the left, left and right trunk lateral flexion worse to the right. The following movements were mildly reduced: Cervical flexion, left and right cervical rotation worse to the left, trunk extension.

One of the many observed outcomes of TRT is to improve spinal range of motion with the goal being impairment scores less than 10 degrees of restriction of movement.

These postural and flexibility findings are consistent as physical signs of Subluxation – static spinal misalignment, and functional motion unit disturbance at least in the cervical spine and to a lesser degree in the lower spine.

3) Heart Rate Variability: (Figure 4 + 5)

Heart rate variability analysis demonstrated 14% low coherence, 18% medium coherence, and 68% high coherence. While headaches and migraines are commonly linked with stress physiology, these HRV findings suggest that this particular individual was actually demonstrating healthy physiological coping with acceptable balance between sympathetic and parasympathetic systems. Heart rate variability data shows subjects with active migraine have a lower heart rate variability characterized by sympathetic hyperactivity.⁶¹ Therefore

showing an increase in heart rate variability could be yet another significant outcome assessment tool in the resolution of migraine headaches.

4) TRT Indicators of Subluxation:

The following prone indicators are rated in severity from 0 to 5, 0 being an absent finding, 5 being a severe indicator. Pre-care the patient exhibited the following findings: Breathing motion = 3, Left Achilles Tension = 1, Right Achilles Tension = 2, Left Abductor Tendency = 1, Right Abductor Tendency = 0, Left Foot Flare = 1, Right Foot Flare = 0, Left Foot Pronation/Supination = 0, Right Foot Pronation/Supination = 1.

Functional Leg Length Reflex is rated in millimeters discrepancy. Pre-care the patient exhibited the following finding: Discrepancy of 4mm.

The following prone indicators are rated as either positive (a score of 2) or negative (a score of 0): Pre-care the patient exhibited the following findings: Cervical Syndrome = 2, Bilateral Cervical Syndrome = 0, Derefield = 2.

The individual scores are then added to produce a “Tonal Tension Score” (TTS). Pre-care the patient exhibited the following finding: TTS = 17. One of the goals of TRT is to achieve a score at least less than 10.

Chiropractic Care:

TRT, CNAS and MRT were utilized on each visit. The subluxations were found using the TRT tonal model of analysis. All adjustments were given using the Integrator, a tool designed for the delivery of the TRT adjustment, which utilizes toggle style recoil with the option of right, left or no torque. After adjusting no more than three primary subluxations MRT was performed followed by CNAS.

Visit 1, Day 1: Adjustments: 1 – C5 RPS, 2 – C7 RPS, 3 – C2 RPI. MRT – Levator Scapulae, Rhomboids, Upper Trapezius, C2, 5 & 7 intrinsic muscles. CNAS: Left ear – Throat, lung, master zero, master autonomic, master allergy, shoulder, neck, master cerebral, master thalamus, Right ear – Throat, stomach, master zero, master autonomic, master allergy, shoulder, neck, master cerebral, master thalamus.

Visit 2, Day 3: Patient observed that she was sleeping better. Adjustments: 1 – C1 LPI, 2 – C2 LPI, 3 – S2 LLI. MRT – Upper Trapezius, C1 & 2 intrinsic muscles, piriformi, sacroiliac ligaments. CNAS: Left ear: Throat, pituitary, master zero, liver, shen men, master allergy, thoracic and cervical autonomic, master endocrine, Right ear: Throat, pituitary, master zero, stomach, master shen men, master allergy, thoracic and cervical autonomic, master endocrine. Exercise prescribed: Tightly rolled towel to be placed under lordosis of neck with focus on shoulder retraction while in supine position for five minutes.

Visit 3, Day 8: Adjustments: 1 – Sacrum – RLS, 2 – C2 RPS, 3 – C7 RPS. MRT – Upper Trapezius, Rhomboids, C2 and C7 intrinsic muscles, piriformi, sacroiliac ligaments. CNAS: Left ear: Throat, master zero, lung, stomach, master shen men, master allergy, master shoulder, master endocrine, master thalamus, Right ear: Throat, master zero, stomach, small intestine, master shen men, master allergy, thoracic spinal cord, master endocrine, master thalamus .

Visit 4, Day 18: Adjustments: 1 – SI – LP, 2 – C2 LPI, 3 – C7 LPI. MRT – Upper Trapezius, Rhomboids, C2 and C7 intrinsic muscles, piriformi, gluteals, sacroiliac ligaments. CNAS: Left ear: Master zero, lung, liver, small intestine, sacral spine, master shen men, master autonomic, master allergy, master endocrine, master sensorial, Right ear: Master zero, lung, spleen, bowel, sacral spine, master shen men, master autonomic, master allergy, master endocrine, master sensorial.

Visit 5, Day 30: Adjustments: 1 – C2 – LPI, 2 – SI RP – twice, 3 – C7 RPS. MRT – Upper Trapezius, Rhomboids, C2 and C7 intrinsic muscles, piriformi, gluteals, sacroiliac ligaments. CNAS: Left ear: Master zero, stomach, spleen, bowel, sacral spine, master shen men, master autonomic, master allergy, master endocrine, master sensorial; Right ear: Master zero, lung, liver, bowel, sacral spine, master shen men, master autonomic, master allergy, master endocrine, master sensorial.

Visit 6, Day 44: Adjustments: 1 – C2 – RPS, 2 – Sacrum RAI, 3 – C7 RPS. MRT – Upper Trapezius, Rhomboids, C2 and C7 intrinsic muscles, piriformi, sacroiliac ligaments. CNAS: Left ear: Master zero, liver, bowel, sacral spine, master autonomic, master allergy, master shoulder, master endocrine, pineal, R: Master zero, stomach, bowel, sacral spine, master autonomic, allergy, master shoulder, master endocrine, pineal.

Visit 7, Day 58: Suffered severe migraine 1/7 ago – dull H/A today. Adjustments: Right TMJ: A Mandible, 1 – Sacrum RAI, 2 – C2 RPS, 3 – C7 RPS. MRT – Upper Trapezius, Rhomboids, C2 and C7 intrinsic muscles, piriformi, sacroiliac ligaments. CNAS: Left ear: Master zero, throat, liver, sacral spine, master shen men, master allergy, master shoulder, master endocrine, master tranquiliser, Right ear: Master zero, throat, liver, sacral spine, master shen men, master allergy, master shoulder, master endocrine, master tranquiliser.

Visit 8, Day 72: Adjustments: 1 – C1 LLI, 2 – Ilium LPIN, 3 – C2 LPI. MRT – Upper Trapezius, C1 and C2 intrinsic muscles, piriformi, gluteals, sacroiliac ligaments. CNAS: Master zero, cervical spine, bowel, sacral spine, master autonomic, master allergy, cervical autonomic, shoulder, master endocrine, master sensorial, Right ear: Master zero, lung, cervical spine, bowel, sacral spine, master autonomic, master allergy, cervical autonomic, master endocrine, master sensorial.

Outcomes:

There were dramatic decreases in the Headache Questionnaire in both categories of regularity and severity. All questions were decreased to zero except pain behind the eyes which went from a regularity and severity of three to regularity and severity of one. The attached Headache Questionnaire (Table 1) demonstrates in detail the dramatic improvement in severity and regularity of the patient's headache and migraine symptoms. Upon phone follow up twelve months later the condition had not recurred.

Discussion:

Case studies are not the highest level of scientific data, but they do offer significant data in a case by case approach. This case is yet another that demonstrates the effectiveness of complementary therapy on the resolution of migraines. Migraines are a common and debilitating condition; yet because they have an uncertain etiology, the most appropriate treatment regime is often unclear.⁶² Previous etiological models described vascular causes of migraine, where episodes seem to be initiated by a decreased blood flow to the cerebrum followed by extracranial vasodilatation during the headache phase.⁶³ However, other etiological models seem connected with vascular changes related to neurologic changes and associated serotonergic disturbances⁶⁴. Therefore, previous treatments have focused on pharmacological modification of blood flow or serotonin antagonist block.⁶⁵ The association of the spine, especially the cervical spine in relation to migraine prevalence is much less documented when compared to pharmacological studies. This case study is intended to broaden this topic and suggests the possibility that the combination of TRT, MRT and CNAS may be an effective treatment of migraines. Doctors of Chiropractic should consider the use of Specific MRT and CNAS in addition to chiropractic care alone. Chiropractors could also educate their patients on the importance of posture, heart rate variability and normal range of motion in maintaining proper function of the spine and maintaining the reduction of the vertebral subluxation complex. Education tools such as Posture Pro and VROM by Ventura Designs and/or emWave by HeartMath can be used to give the patient a visual of their current state and progress throughout their Chiropractic care.

Conclusions:

This paper documented the case of a forty nine year old female suffering with debilitating migraine headaches with measurable signs of spinal subluxation, who attended a private practice for a course of only eight chiropractic visits receiving a combination of TRT adjustments for primary subluxation, MRT, and CNAS during which time the migraines which had been present for greater than six months completely resolved. Signs of subluxation were objectively demonstrated. The dramatic reduction in severity and regularity of headache and migraine symptoms were demonstrated with a self-rated symptom questionnaire. It would be an exaggerated claim to extrapolate that every person suffering from migraine would also receive such dramatic benefits from this combination of TRT, MRT and CNAS, but it supports other papers that propose a positive clinical benefit for these conditions after Chiropractic care.⁶⁶⁻⁷²

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Tables

Table 1: Self Rated Headache Questionnaire

HEADACHE QUESTIONNAIRE

08 06 2011

10 08 2011

	<u>REGULARITY</u>	<u>SEVERITY</u>	<u>REGULARITY</u>	<u>SEVERITY</u>
	Never = 0	None = 0	Never = 0	None = 0
	Rarely = 1	Mild = 1	Rarely = 1	Mild = 1
	Sometimes = 2	Moderate = 2	Sometimes = 2	Moderate = 2
	Often = 3	Severe = 3	Often = 3	Severe = 3
	Always = 4	Unbearable = 4	Always = 4	Unbearable = 4
Didn't attend work/school	2	3	0	0
Performance at work/school reduced	2	3	0	0
Performance at home reduced	2	3	0	0
Performance at sport/recreation reduced	2	3	0	0
Reduced energy or concentration	3	3	0	0
Feel depressed, angry and/or upset	2	3	0	0
Nausea/sick feelings in tummy	3	3	0	0
Vomit/throw up	3	3	0	0
See spots, flashes and/or halos	3	3	0	0
Blurry vision	4	3	0	0
Throbbing pain	4	3	0	0
Squeezing pain	4	3	0	0
Unusual sensations in hand/s and/or arm/s	0	0	0	0
Unusual sensations in feet and/or leg/s	0	0	0	0
Pain on <u>back</u> of head	3	3	0	0
Pain on <u>top</u> of head	3	3	0	0

Pain on <u>one side</u> of head	2	2	0	0
Pain on <u>both sides</u> of head	2	2	0	0
Pain on <u>front</u> of head	2	2	0	0
Pain on face	2	2	0	0
Pain behind eyes	3	3	1	1
Pain behind nose and/or cheek bones	1	1	0	0
Pain in neck	4	3	0	0
Pain in shoulder	4	3	0	0
Stiffness of neck movements	4	3	0	0
SUBTOTAL	64	63	1	1
TOTAL		127		2

Figures and Legends

Figure 1: Postural Analysis.



Figure 2: Range of Motion Analysis.



Figure 3: Range of Motion Analysis continued.



Figure 4: Heart Rate Variability Analysis.

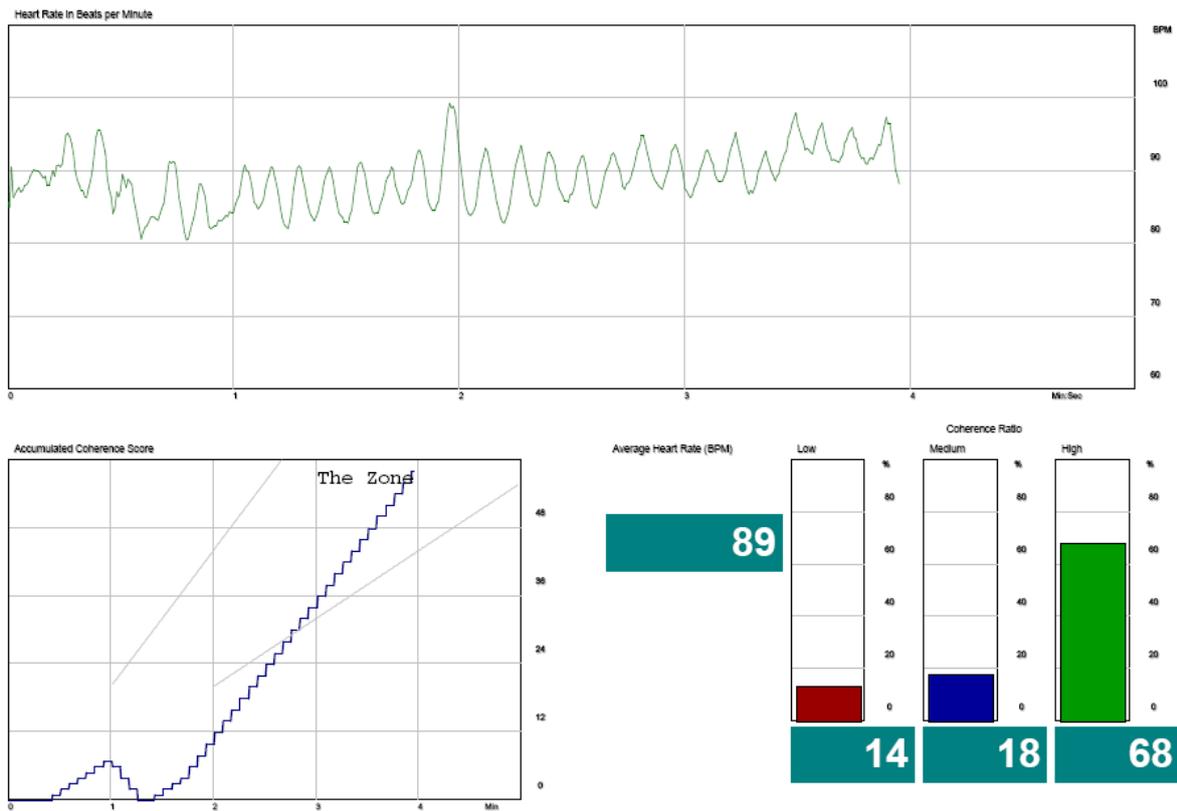
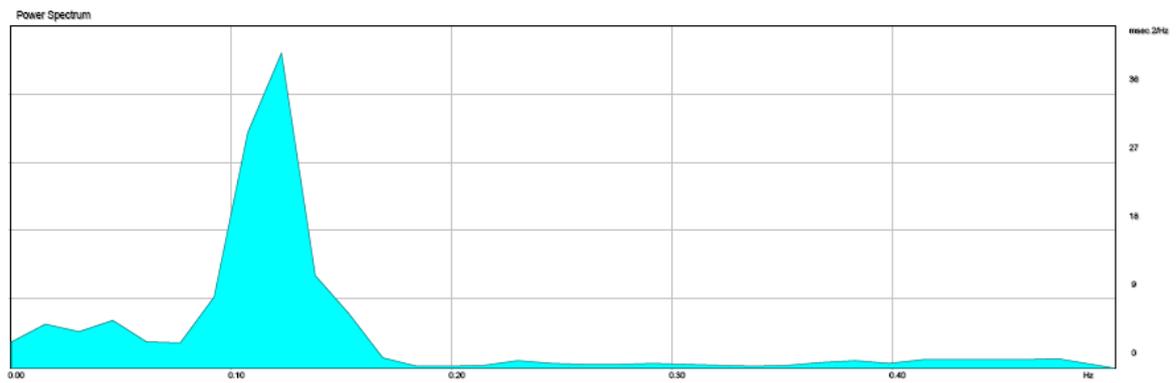


Figure 5: Heart Rate Variability Power Spectrum Analysis.



Cover Letter

This is an original work and has not been published previously nor is it in consideration by another publication.

_____ Nick Hodgson __/__/2012

_____ Jared Brown __/__/2012