Case Report

Therapeutic Massage on Symptoms following consumption of Statin Medication, Rosuvastatin (Crestor): A Case Report

Abstract

**Background:** Statin class medications have become one of the most commonly used and prescribed drugs in the US, this is due to Cardiovascular Disease being the leading cause of death in the US. Some individuals taking statin drugs have a predisposing risk factor which can lead to a variety of adverse reactions. The most common adverse reactions associated with statin use are those that affect the musculature of the human body.

**Purpose:** The objective of this case report is to make public the outcomes of therapeutic massage therapy on one patient presenting with chronic pain and other unexplained symptoms following statin class medication, Rosuvastatin (Crestor), consumption.

**Participant:** The subject is a 51-year old male previously diagnosed with hypothyroidism, hyperlipidemia, hypertension and identified as statin intolerant. Now reporting constant tension headaches; pain in the upper thoracic, cervical and shoulder region; numbness and tingling in the upper extremity bilaterally; and a decrease of physical endurance in running and resistance circuit training over the past 9 months, this client disclosed having no previous bouts with chronic physical symptoms.

**Intervention:** Sessions lasting 1 hour and 30 minutes in duration, consisted of 2 treatments per week over a 5 week period applied by a massage student. Perceived pain and change scales were completed by the patient followed by a postural evaluation performed by the therapist prior to massage techniques. Cross fiber friction, pin and stretch, and longitudinal gliding strokes were applied to specific musculature considered to be significant in symptom expression and observed postural asymmetries.

**Results:** Numerical rating scale results; raw change score; 22 and percentage change score; 75%. Global impression of change results; 6. Physical symptoms ceased and/or decreased significantly, emotional and behavior components showed improvement as well. Unexpected, unpredicted and unintentional; benefits to vision were reported.
**Conclusions:** Therapeutic massage therapy intervention showed to be clinically significant in its ability to palliate pain thought to be triggered by statin consumption a statin intolerant individual.

**Keywords:** Statin Intolerance; Massage; Hypothyroidism; Pain; Headaches; Adverse Reactions; Statin; Rosuvastatin; Crestor; Cognitive Effects

**Introduction**

Used for lowering cholesterol, specifically LDL-C (1), Statin medication has become one of the most commonly prescribed drugs in the US as elevated levels of blood cholesterol has been identified as a major risk factor for Cardiovascular Disease (CVD), the leading cause of death in the US as of 2013 (fig.1). Evidence is inconclusive addressing the risk-to-benefit ratio, studies report that the cardiovascular benefit of lowered LDL-C is substantial enough to warrant continued usage (2, 3, 4) while others suggest that the benefits may be limited (5-7) and increased the risk of cancer (7).


Literature on statin-related adverse events (AE) is not scarce (3, 4); in a meta-analysis of 18 trials representing 71,108 persons, and 301,374 person-years of follow-up, statin medication was determined to increase the odds of AEs and serious AEs when compared to placebo (3). Although the prevalence of adverse reactions is unknown, clinical studies suggest that myopathy associated with statin use is thought to affect 1 - 5% (8, 9) while observational studies report a
much higher rate of incidence of 11 - 29% (9), there are in fact warnings put out by the U.S. Food and Drug Administration (FDA) to the usage of statins for those with predisposing factors and conditions that would put an individual at higher risk (10). These risk factors are limited for the expression of myopathies; including myalgia, and rhabdomyolysis (9,10).

Hypothyroidism is a very common, chronic condition in which the thyroid gland does not produce enough of it’s respective hormones which disrupts all metabolic processes. Diagnosed by blood test, there are more than 3 million cases in the U.S. alone. The FDA lists hypothyroidism (Fig.2,10) as one of these risk factors with several studies supporting the FDA’s conclusion (11,12). In fact, Robison et al. found Hypothyroidism to be a risk factor for being identified as statin-intolerant (13).

This manuscript is a prospective case study which outlines a case involving a 51-year-old male with hypothyroidism whose primary goal is to reduce medically unexplained pain and other symptoms. Suggestions for managing statin related myopathies is dominated by guidelines for lowering dosage, frequency or changing to a different statin (9,14,15,16). As alternatives do exist for lowering risk of CVD (17,18,19,20), little attention is given to considering other routes and none for massage therapy to palliate ongoing symptoms following statin therapy. The principal investigator applying treatment hypothesized that, due to evidence supporting massage therapy for pain relief (54 - 58, 59,60), there would be a clinically significant change in overall symptoms.

Case Presentation

Client Information

The client is a 5 foot 11 inch, 190-pound, 51 year old male previously diagnosed (~ around 2007) hyperlipidemia, hypothyroidism and hypertension. Both of the latter conditions being
treated with medication, lthyroxine and diovan respectively, along with exercise. In 2010 the client relocated to California and a new family physician was sought. This physician prescribed Lipitor and subsequently Zocor. Both medications produced unwanted effects for this client. Prior to the introduction of Crestor, this patient, “was a strong and healthy man.” The client reported there have not been previous cases of headaches, arm or neck pain, tingling in arms, neck or legs, or of having a loss of energy during the day. Upon relocation to Florida the clients new general practitioner recommended that he try a course of statin-medications, Rosuvastatin, according to the general practitioner, due to its hydrophilic nature, would be less likely to express symptoms. This is inconsistent with supporting literature stating that Crestor is comparable to other statins (21, 22, 23).

Upon introduction of Crestor, the client experienced severe symptoms which progressively worsened (A detailed breakdown and presentation of symptoms is provided in the Timeline section). Eventually medical attention was sought when a stroke was suspected by the client. The decision was eventually made, by the client, to cease taking Crestor. At this time, cognitive function began to return but the pain did not subside.

After the complications the client reported having experienced, the client did try alternative approaches for a short duration that consisted of chiropractic and general massage therapy. The client felt some resolution. It was reported, however, that the effects of this intervention did not last. In the clients first assessment (see assessment procedures section) a moderate to high pain level with mild emotional discomfort was reported on the Numeric Rating Scale administered. The postural assessment found some abnormalities concerning positioning of the cranium. An x-ray revealed an inflare of the right innominate bone in pelvic obliquity. No diagnoses were able to be determined by the clients diagnostic testing.

Hyperthyroidism is not contraindicated for massage as long as modifications are made for the clients vitality unless a skin condition is present (24, 25). Hypertension is not contraindicated for massage when the condition is controlled and mild or moderate (25, 26). No literature was found for high cholesterol being contraindicated for massage (25, 26). However, there was one study suggesting that massage therapy can lower LDL-C. (27)

Upon electing inclusion in this case report the client reported that he would like to have more energy, to have more endurance, to think more clearly, to be more focused and to be free of pain.

**Diagnostic Assessment**

When medical attention was sought, the client was examined 4 physicians; their General Practitioner, a Neurologist, a Clinical Psychologist and a Cardiologist, who administered a wide array of tests and requested imaging to detect causation. (for a report on all tests performed refer to Table 1.)
Few suggestions were made (Table 1.) and general associations were considered however no evidence correlated strongly enough to indicate causation leading to a diagnosis. The client was identified as statin intolerant.

**Clinical Findings**

In the initial postural assessment, the client presented with lateral shear of the cranium to the right and rotation of the cranium to the right. Palpation of the C1 vertebrae found a rotation to the left and lateral tilt to the right. Other less severe postural asymmetries were noted. (Fig. 3, Description and procedures of postural assessment in Assessment Measures section below)
Examination of the radiological x-ray image, no clinically relevant leg length inequality was found, but a significant inflare of pelvic obliquity was seen in the right innominate bone (fig. 4).

[Figure 4. X-Ray image of pelvis, pelvic inflare denoted by 71.1mm length on R innominate and 91.1mm on L innominate]

Reviewing a cervical MRI ordered by the neurologist and provided by the patient. No significant anomalies were seen. A slight enlargement of tissue, possibly the thyroid gland, was seen on the right side when compared to the left. This enlargement slightly displaced the esophagus to the left. (fig. 5)

[Figure 5. Cervical MRI, displaying difference in tissue size]
**Assessment Measures**

**Bournemouth Questionnaire (BQ)**

Based on the Biopsychosocial model of pain, the Bournemouth Questionnaire (BQ) (fig.6) is a 7-question, 11-point numeric rating scale (NRS) with a selection range of 0 - 10, 0 being the least severe, 10 being the most severe. It is used to collect individual subjective quantitative data, note degree of change from the clients perspective and to determine clinical significance. The BQ has been validated for use in patients with back \(^{28}\) and neck pain \(^{29}\). Hearst and Bolton \(^{30}\) determined, based on sensitivity and specificity, that a clinically significant score necessitates a raw change score of 14 or greater and a percentage change score of 47% or greater for lower back pain. For neck pain, the values determining clinical significance were lower; a raw change score of 9 or greater and a 34% percentage change or greater. Similarly, Farrar et al \(^{31}\) showed a percentage change of ~30% or more on an 11-point NRS was ideal for determining clinical significance in chronic pain patients. In order to determine raw change, follow up scores were subtracted from baseline scores (follow up - baseline). Percentage change was determined by the raw change score divided by the baseline scores and multiplied by 100 (raw change/baseline X 100).

[Figure 6. Bournemouth Questionnaire]
Patient's Global Impression of Change (PGIC)

A Global Rating of Change (GRC) scale, the PGIC (fig.7) scale was chosen as an easily interpretable data point by patient and practitioner that offers flexibility in allowing the patient to consider other factors that other scales, such as a visual analog scale or NRS, may be limited in (47). In addition, it provides a sensitive to change, reliable, repeatable, quick platform for obtaining information (47). Previously the “gold standard” for determining clinical significance (30), GRC scales were found to be limited in validity the longer a course of intervention was carried out (disambiguation: as opposed to individual session time) (47). Yielding a score of ≥5 determines if the intervention could be considered clinically significant (30).

Since beginning treatment at this clinic, how would you describe the change (if any) in ACTIVITY LIMITATIONS, SYMPTOMS, EMOTIONS and OVERALL QUALITY OF LIFE, related to your painful condition? (tick ONE box).

No change (or condition has got worse) □ 1
Almost the same, hardly any change at all □ 2
A little better, but no noticeable change □ 3
Somewhat better, but the change has not made any real difference □ 4
Moderately better, and a slight but noticeable change □ 5
Better, and a definite improvement that has made a real and worthwhile difference □ 6
A great deal better, and a considerable improvement that has made all the difference □ 7

[Figure 7. Patients Global Impression Scale]

Radiological Imaging

A radiological x-ray image of the pelvis (32, fig. 9) was recommended in order to determine structural differences of the patients femurs (known as lower limb length inequality; LLLI), innominate bones and sacral position which could identify potential structural perpetuants to symptoms (32, 33, fig. 8).
Postural assessment and charting

Examination of posture has been widely taught and used throughout the massage industry to identify potential muscle imbalances (34), compensatory mechanisms, perpetuants of a condition (32, 33) and possible sites of stress on physical structures (32, 33, 34, 35) as an intervening and preventative model. Recent research has provided that global postural display may even be a way to identify pain in an individual (36). Although the notion is supported (35, 37, 38) there is conflicting evidence (38) in just how significant postural assessments are in clinical settings.

As no method of recording posture in a clinical, medical or research setting has been widely established or universally accepted and used, the method of postural documentation used for this manuscript was created by and used with permission from NAME WITHHELD FOR PEER REVIEW SEE APPENDIX A(2) in collaboration with Clark, Jones and St. John (48). The chart chosen has been extensively used in the professional clinic associated with the school the principal investigator is currently enrolled in. It is used for it’s ability to provide a platform for detailed assessment by specifying anatomical landmarks to be examined comparatively by using extended thumbs or fingers in a manner resembling palpation. The postural chart also has lined spaces for notes and updates collected on how symptoms are progressing from patients perspective. (see fig. 3 for example in clinical findings section above.)

In this case, postural assessment and recording served to identify symmetry-asymmetry, to guide treatment planning, facilitate inter-practitioner collaboration and to monitor changes. Asymmetries are recorded and indicated by making a visual marking with a felt tip pen (see fig. 3 for example in clinical findings section above.) Repeatability was ensured by using a plumb
line to align the 2nd metatarsal to the point ~1” medial of the anterior superior iliac spine upon each assessment.

Assessment Procedures

The following assessment procedure was established at the first session and remained the same throughout the intervention;

1. BQ and PGIC administered,
2. Interview conducted,
3. Postural assessment performed.

This procedure was always completed prior to hands-on therapy.

Therapeutic Intervention/Treatment Plan

Overview

The principal investigator conducting the intervention is a massage therapy student enrolled in an accredited, 1278-hour program in the final months before graduation. Serving as the clinical supervisor, safety and code of conduct of was provided by an experienced massage therapist holding an undergraduate degree in Biology. The training that the student received during the program was clinically oriented, specializing in teaching massage protocols and techniques for pain treatment. The setting was in a well-lit, open (curtains providing privacy), student clinic while various downtempo genre(s) of music were played.

The intervention was designed to be implemented over a 5 week period, treating the patient every Tuesday and Friday for a total of 10 sessions. 30 minutes was allotted for assessment procedure while 1 hour was allotted for hands-on therapy.

The main objective of the intervention was to address the clients pain, tension, headaches, tingling and other physical sensations. As presented above, in addition to being free of pain the client stated that he would like to have more energy, have more endurance, be more focused and think more clearly; however, in searching for the ability of massage therapy to regulate or improve these conditions, little to no evidence was found suggesting that it is directly modifiable by massage. However, there is evidence suggesting that posture and pain (42, 43) are associated with changes neural structure (44, 45, 46) and cognitive faculties, especially when related to behavior, communication, mood and emotion (29, 40, 41, 42, 43) which therefore, may be appropriate goals for massage therapy if the treatment is designed to palliate pain and enhance posture.
Taking these two pieces of information into consideration, improving the clients cognitive faculties was considered to be a secondary objective if not coincidental.

**Procedures and Techniques**

The following sequencing was established upon the first session and remained the same for the remaining sessions; greet client, administer assessment procedure listed in assessment procedures section, begin hands-on work, conclude session, escort patient to lobby, thank them for their participation and bid a farewell for the evening/day.

Techniques and procedures selected were those from manuals (48, 49, 50, 51) and textbooks (52, 53) provided to the student, by the school and further taught by the instructors. Additional trigger point (TrP) protocols followed recommendations from Travell, Janet et al (37).

The hands-on bulk of the hands on work was treatment to various and specific musculature primarily located proximal to the spine above the level of T12 to the upper extremity and cranium as a majority of his symptoms resided in these areas. Comparatively, Lower extremity and below T12 was administered sparingly to aid in postural correction and to palliate symptoms in these areas. TrPs were identified by cross-referencing sources of referred pain (37, pain felt in a location other than the one being treated) to the patients perceived pain when referred pain and autonomic phenomena (37, an involuntary, physical reaction produced by the nervous systems, such as a twitch or sweat) arose.

Techniques used consisted of cross-fiber friction, static compression, compression with opposition, longitudinal strokes with the hands as well as friction and compression with massage tools to thoroughly address the clients anatomy. TrPs were treated using ischemic static compression (37). Joint mobilization and tractioning techniques were used periodically to further palliate symptoms. Used less than 5% of the total intervention, details of stretching did not weigh heavily enough to be included in this manuscript.

**Informed Consent**

An informed consent for publication of this manuscript was signed and obtained from the client. The client consenting to sharing any past medical history, a detailed account of his intervention and other relevant information. It was made clear that no personal identification was to be shared.
Timeline

<table>
<thead>
<tr>
<th>Timeline (Summarized)</th>
<th>Significant Events (As described by client)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Connecticut - Diagnosed with hypothyroidism and elevated cholesterol; Began taking Livalo for Cholesterol; Began L-Thyroxine for Thyroid; Experienced leg pain and weakness after one week on Livalo; Stopped Livalo after three weeks; Continued with L-Thyroxine to current date</td>
</tr>
<tr>
<td>8/1/2010</td>
<td>California – new family physician; After a routine physical, Dr prescribed Lipitor; Lipitor produced side effects of ED within the first month; Stopped Lipitor in month 2</td>
</tr>
<tr>
<td>10/1/2010</td>
<td>Changed to Zocor; One week after starting Zocor, experienced flushed, shortness of breath, and chest pains; Went to ER; patient admitted for two days of tests including stress test; Diagnosis was esophageal ulcer brought on by Zocor. Was prescribed medication for stomach; Discontinued Zocor after hospital stay</td>
</tr>
<tr>
<td>11/1/2010 - 5/14/2014</td>
<td>Took no cholesterol medication for 2 years; Started an exercise regiment</td>
</tr>
<tr>
<td>5/14/2014 (Physical Health)</td>
<td>Normal Weight and Height; no physical limitations; Trained an hour a day, jogged 14 miles a week, cardio and weight training. Did not experience headaches ever; Had no arm pain; Had no neck pain; Had no tingling in arm, neck, or legs; Did have muscle tightness in legs; Had no issues being tired during the day; Worked a full day 9-10 hours, in a highly technical job as a Commercial Manager; Managed a race team for 7 years, every weekend, plus weeknights; Performed all property maintenance work</td>
</tr>
</tbody>
</table>

[Table 3. Summarized Timeline. Thumbnail; left click for interactivity]

Results

In the assessment procedure of the 3rd treatment, the client reported having a reduced intensity and frequency of numbness and tingling in the upper extremity, an improvement in vision, specifically his night vision, and general energy levels. The clients wife also expressed at this point that her husbands mood had improved; this was the first time that questions from the BQ for anxiety and interference reduced, by 4 points and 1 point respectively. Upon conclusion of the 3rd treatment, the client reported having a complete cessation of numbness and tingling. These improvements steadily improved throughout the course of intervention with two reports of a setback during interview of the 6th and 8th treatment. Pain in the clients lower back and down the leg subsided. Upon completion of the final treatment the client reported only having pain proximal to the mastoid process.

Palpative findings revealed that distortions noted in the first cervical vertebrae had been normalized as well as general tissue tone. The "knot," suspected to be hypertonicity of the rectus capitis posterior major, diminished. Cranial rotation and lateral shear of the showed improvement. Range of motion and range of motion without pain in the cervical spine and cranium improved.

Calculated by baseline subtracted from outcome (baseline - outcome) analysis of the BQ showed a raw change of 22. Percentage change was 75.862%, calculated raw change divided by baseline multiplied by 100 (rawchange/baselineX100). PGIC score was 6. (See Table 3. and 4. for breakdown of all fields)
The client was pleasant and cooperative throughout the duration of the intervention. The dates and times agreed upon were adhered to tightly for all 10 sessions.

**Discussion**

**Summary of outcomes**

In this case massage therapy utilizing specific therapeutic techniques and clinical procedures were able to greatly benefit for a client with unexplained pain and symptoms thought to be triggered by statin use. BQ clinical significance was determined by considering what Farrar and Bolton et al found as a reliable measure; the cut offs were ~30% change (Farrar) and 34% change (Bolton et al).
change for neck and 47% \(^{(31)}\) change for back (Bolton). The percentage change yielded, in total, in this case was 76.826% change and therefore falls into clinically relevant. The PGIC score recorded at the end of the trial was 6. As anything better than a score of 4 was found to be clinically relevant \(^{(30, 47)}\), this marker met the cutoff. In this trial, clinically significant results were achieved and held evident by two markers, the BQ and PGIC. Not only were specified goals reached, minus the remaining pain near the mastoid, we saw an unintentional improvement in vision. No clear speculation is made to why this may have occurred as physiology is broadly interesting in its ability to take in a stimulus, process it and make something of it. As attempts to mediate the effects of myopathies with ubiquinone (Coenzyme Q10, CoQ10) have been largely unsuccessful \(^{(61, 62, 63)}\) It may be beneficial for medical facilities to consider massage therapy as an option to palliate symptoms associated with continued use or rehabilitating from adverse effects of statin use.

**Authors comments**

It was a great pleasure to work with this particular client. Frustrated with the courses of action taken during his most recent experience with medical care, it seems poignant that practitioners stay up to date with warnings and contraindications regarding statin medication as in this case as it seemed as if many indicators pointed to the usage of statin medication was inappropriate for this person. It may be viable in regards to overall care for a client and client centered care that practitioners and/or facilities to have available, in some respect, alternative options such as those mentioned in brief previously in this manuscript in order to prevent the amount of incidents such as these from occurring (if the medication was indeed the trigger or cause) or, if anything, the individual receiving treatment requests it.

It is discouraging to hear when individuals feel as if they are test subjects. This is not to suggest that we coddle individuals but simply to take strides towards receptivity. Many of our patients/clients may be facing more turbulent times due to a manifestation of medical interest, as health providers and professionals, it may be within our interest to use care rather than intervention as a principle.

**Patient’s Perspective**

“I have been suffering from extreme muscle degradation and skeletal pain for the past year and nothing but time has provided any improvement. I had spent the entire year having tests and exams from many doctors and hospitals and they have been unable to offer me any assistance whatsoever. It is believed that my condition was caused or triggered by a reaction to statin intake and it in my belief that if the damage is not permanent then it is at least going to take many years to recover from. I had given in to that diagnosis and decided to just try and cope with my situation. \((\text{PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW})\) offered to help me and I agreed. As a new patient with \((\text{PRINCIPAL INVESTIGATORS NAME})\)
I really did not know what to expect or have any idea if there would be any true impact on my condition. Upon starting treatments I noticed that some of the discomfort was being reduced and although they deep skeletal pain remained the muscular tightness and the overall area of pain was being reduced. The larger percentage of my problem areas had been reduced to a more focused area in my neck and the back of my head rather than my entire upper back shoulders and head. I was having large knots at the base of my skull and those have been almost completely eliminated. We cannot conclude that every issue that I suffer from is a result of the statin trial and some things had improved after just a few treatments. For example I have had difficulty seeing distance for years, especially when driving at night and strangely enough that improved drastically around my fifth treatment. I had constant tingling in my arms and that was eliminated very early on in my trial. My headaches appear to be very rare now where they were a constant everyday problem. I am able to exercise more regularly and my overall energy level is improved. (PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW) was able to correct some of my postural alignment problems as well. It is clear to me that the treatments have made a noticeable difference in my recovery. Although the core damage may remain for a long time, the therapeutic benefits to this treatment have greatly improved what was a very debilitating condition. I can't thank (PRINCIPAL INVESTIGATORS NAME OMITTED FOR PEER REVIEW) enough for dedicating his time and knowledge toward my continued recovery.

**Confounding factors**

Interrater reliability, user subjectivity, bias and transference/counter transference that occurs within a therapeutic relationship is always a concern when obtaining data for scientific dissemination and inclusion. While confident, it is always possible that results are skewed even if marginally by these areas. Additionally, although considered an important part of care, it is also possible that some of the benefit yielded was due to psychosomatic processing rather than mechanical and/or sensory interfaces.

**Research directions**

As massage therapy is well tolerated by most individuals, clinical trials into the efficacy of therapeutic massage therapy on adverse effects associated with medication is suggested.

Investigation on how implementation of massage therapy utilizing techniques and procedures for clinical applications impacts client/patient care is suggested in addition to how those methods fit into a medical paradigm is suggested.

Further, as massage therapy is a broad field in which many forms are practiced and modalities offered for different reasons, the current state of massage standards in regards to licensure and titling is not appropriate and lacks clarity. Benefitting the massage industry, those receiving and
those applying massage therapy, separate titles and standards for different intentions (e.g. medical/clinical and relaxation/spa) is highly warranted. This is not to suggest hierarchy but rather to provide clarity of options for those seeking and ensure competency of those treating with clinical intent for conditions and symptoms massage therapy are appropriate to treat.

Conflicts of Interest

No conflicts of interest.

References:


**APPENDIX A**

1. *(FIG. 3)* Neurosomatic Educators LLC

2. Neurosomatic Educators LLC

3. Acknowledgements (Left click)
APPENDIX B

Figures:


[Figure 3. Example of chart and how clinical findings from initial postural assessment were recorded. Muscles in noted by red indicate significance and treatment. See assessment measures section for further description. Used with permission from Neurosomatic Educators LLC.]

[Figure 4. X-Ray image of pelvis, pelvic inflare denoted by 71.1mm length on R innominate and 91.1mm on L innominate]
Figure 5. Cervical MRI, displaying difference in tissue size
Figure 6. Bournemouth Questionnaire

Q1 Over the past few days, on average, how would you rate your pain on a scale where '0' is 'no pain' and '10' is 'worst pain possible'?

Q2 Over the past few days, on average, how has your complaint interfered with your daily activities (housework, washing, dressing, lifting, walking, reading, driving, climbing stairs, getting in/out of bed/Chair, sleeping) on a scale where '0' is 'no interference' and '10' is 'completely unable to carry on with normal daily activities'?

Q3 Over the past few days, on average, how much has your painful complaint interfered with your normal social routine including recreational, social and family activities, on a scale where '0' is 'no interference' and '10' is 'completely unable to participate in any social and recreational activity'?

Q4 Over the past few days, on average, how anxious (upright, tense, irritable, difficulty in relaxing/concentrating) have you been feeling, on a scale where '0' is 'not at all anxious' and '10' is 'extremely anxious'?

Q5 Over the past few days, how depressed (down-in-the-dumps, sad, in low spirits, pessimistic, lethargic) have you been feeling, on a scale where '0' is 'not at all depressed' and '10' is 'extremely depressed'?

Q6 Over the past few days, how do you think your work (both inside the home and/or employed work) have affected your painful complaint, on a scale where '0' is 'make it no worse' and '10' is 'make it very much worse'?

Q7 Over the past few days, on average, how much have you been able to control (help/reduce) and cope with your pain on your own, on a scale where '0' is 'I can control it completely' and '10' is 'I have no control whatsoever'?
Since beginning treatment at this clinic, how would you describe the change (if any) in activity limitations, symptoms, emotions and overall quality of life, related to your painful condition? (tick ONE box).

- No change (or condition has got worse) □ 1
- Almost the same, hardly any change at all □ 2
- A little better, but no noticeable change □ 3
- Somewhat better, but the change has not made any real difference □ 4
- Moderately better, and a slight but noticeable change □ 5
- Better, and a definite improvement that has made a real and worthwhile difference □ 6
- A great deal better, and a considerable improvement that has made all the difference □ 7

[Figure 7. Patients Global Impression Scale]

Figure 8.; Postural adaptation due to anatomical right lower limb difference, and Figure 9.; x-ray beam height, displaying proper x-ray of the pelvis. Retrieved from 32. Simons,J. Travell & Simons' Myofascial Pain And Dysfunction. 2nd ed. Vol. David G et a2
## APPENDIX C

### Tables:

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<tr>
<th>Tests Performed (Summarized)</th>
<th>Physician Ordering, Performing and Reporting</th>
<th>Results</th>
<th>Early roof suggestion (Summarized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic resonance imaging (Brain)</td>
<td>Family Nurse Practitioner (ANMP)</td>
<td>No Acute intracranial abnormality. A faint white matter focus increased the signal possibly due to chronic small vessel ischemic changes. Possibility of demyelinating disease is not excluded. Recommend clinical correlation; Mild chronic left maxillary sinusitis.</td>
<td>All-cause no diagnosis made. Suspected Chronic inflammatory demyelinating polyneuropathy (CIDP). Allergy to Statins.</td>
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<tr>
<td>Cognitive Assessment</td>
<td>Clinical Psychologist</td>
<td>Decline in areas of processing speed and executive functioning. Evidence of encoding disorder affecting verbal mediated information. Visual memory scores were much less affected, although they did reveal a pattern of retrieval deficits rather than encoding deficits. Deficits appear to represent</td>
<td></td>
</tr>
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</table>

[Table 1. Diagnostic Assessment. Thumbnail only; left click for interactivity]

<iframe src="https://docs.google.com/spreadsheets/d/1w1LfuLDRd48qS4zEEuZlNQsRcnhUr6nEr8G2QRII/pubchart?oid=1480420419&amp;format=interactive"></iframe>

<table>
<thead>
<tr>
<th>Pre-intervention (Baseline)</th>
<th>Post-intervention (Outcome)</th>
<th>Raw change</th>
<th>Percentage change score</th>
</tr>
</thead>
<tbody>
<tr>
<td>BQ total score range 0-70 (0 = least severe, 70 = most severe)</td>
<td>29</td>
<td>7</td>
<td>22</td>
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<tr>
<td>BQ subcategories range 0-10 (0 = least severe, 10 = most severe)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>6</td>
<td>2</td>
<td>4</td>
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<tr>
<td>Interference with ADLs</td>
<td>3</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Interference with social or recreational activity</td>
<td>3</td>
<td>1</td>
<td>2</td>
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<td>Feelings of anxiety</td>
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<td>5</td>
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<tr>
<td>Feelings of depression</td>
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<td>0</td>
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<tr>
<td>Perception of how work affected symptoms</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Ability to control (help/reduce) and cope with pain</td>
<td>8</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

[Table 2. BQ results]
Table 3. PGIC results

<table>
<thead>
<tr>
<th>Timeline (Summarized)</th>
<th>Pre-intervention (Baseline)</th>
<th>Post-intervention (Outcome)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>8/1/2010</td>
<td>California – new family physician; After a routine physical, Dr. prescribed Lipitor. Lipitor produced side effects of ED within the first month. Stopped Lipitor in month 2.</td>
<td></td>
</tr>
<tr>
<td>10/1/2010</td>
<td>Changed to Zocor; One week after starting Zocor, experienced rashes, shortness of breath, and chest pains. Went to ER; patient admitted for two days of tests including stress test. Diagnosis was esophageal ulcer brought on by Zocor. Was prescribed medication for stomach. Discontinued Zocor after hospital stay.</td>
<td></td>
</tr>
<tr>
<td>1/1/2010 – 5/14/2014</td>
<td>Took no cholesterol medication for 2 years. Started an exercise regimen</td>
<td></td>
</tr>
<tr>
<td>5/14/2014 (Physical/Health)</td>
<td>Normal Weight and Height, no physical limitations. Trained an hour a day, jogged 14 miles a week, cardio and weight training. Did not experience headaches ever. Had no arm pain. Had no neck pain. Had no tingling in arm, neck, or legs. Did have muscle tightness in legs. Had no issues being tired during the day. Worked a full day 9-10 hours, in a highly technical job as a Commercial Manager. Managed a race team for 7 years, every weekend, plus weeknights. Performed all property</td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Summarized Timeline. Thumbnail only; left click for interactivity

<iframe src="https://docs.google.com/spreadsheets/d/1Hw11PufLDRd48qS4zEEuZINQrsRcnhUr6mEr8G2QRIIl/pubchart?oid=746217602"&amp;amp;format=interactive"></iframe>