



Clinical Case Report Competition

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The combined effects of manual lymphatic drainage, massage therapy, salt exfoliation therapy, and full body steams on the treatment of a patient with fibromyalgia syndrome

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Very few studies have been done on either the effects of Manual lymphatic drainage (MLD), or the effects of Massage therapy (MT) on Fibromyalgia Syndrome (FMS). Though the mechanisms of effect on this syndrome are not quite clear partially due to the fact that the etiology of the syndrome is not always apparent and often patient specific. The few studies that have been done lean towards a positive effect of both MT and MLD (Brattberg, 1999; Field, Diego, Cullen, Herranden-Rief, Sunshine, Douglas, 2002; Aspund, 2003), but definitive statements of affect cannot be stated without further study. This study will discuss the use of multiple modalities such as MLD, MT, and Hydrotherapy treatments (full body salt exfoliation therapy, and full body steams) in treatment of an individual patient with FMS, and there effects of this individual.

Firstly, FMS is a non-articulating rheumatic condition of pain lasting at least 3 months duration; some of its characteristics are widespread muscular achiness and the palpation of at least 11 of 18 tender points (Rattray, Ludwig, 2000). It is a systemic disorder which can affect an estimated 2-6% of the adult population (arthritis society, 1998, as cited by Rattray, Ludwig, 2000). Though all of its causes are unclear, it is thought that a connection between immune abnormalities and a genetic predisposition can cause a neuroendocrine dysfunction (Rachlin, 1994, as cited by Rattray, Ludwig, 2000). Some of its symptom triggers can vary from over exersion, little or no exercise, increases in stress/anxiety/or depression, a lack of or poor quality of sleep, physical or emotional trauma, extremes of temperature, and illness. “ The prevalence of pain, fatigue, insomnia, and major depression range from 20-100% in patients with Fibromyalgia” (Littlejohn, 2001, as cited by Hughes, 2006, p.113). Other symptoms are generalized pain and stiffness, usually worse in the mornings and evenings, and moderate to sever fatigue levels (Rachlin, 1994, as cited by Rattray, Ludwig, 2000). As well, irritable bowel, arthritis, and headaches are frequently involved (Hodges, Smith-Rooker, Mungo, 2002; Millea, Holloway, 2000; Whitehead, Palsson, Jones, 2002, as cited by Hughes, 2006). Some other pieces of the symptom puzzle are significantly elevated levels of Substance P in the cerebrospinal fluid (Moldofsky, 1994; Russel, Orr, Littman, et al., 1994, as cited by Field, et al., 2002); three times higher of a level than in healthy

individuals (Goldenberg, Burchhart, Crofford, 2004). Substance P is a Neuro peptide released by neurons which transmit pain input from peripheral pain receptors to the central nervous system (CNS) (Tortora, Grabowski, 2003). The elevated Substance P levels may be caused by disturbances in stage 4 non-rapid eye movement (NREM) sleep (Moldofsky, 1994; Bennett, Clark, Campbell, et al., 1992, Juhl, 1998, as cited by Field, et al., 2002) which also causes a lowering of pain thresholds and a lowering of Insulin growth hormone-1 (IGH-1) affecting muscle homeostasis, mass, and function, while impairing thinking, and causes an intolerance to cold (Wolfe, Smyth, Yunus, et al., 1999; Bagge, Bengtsson, Carlsson, et al., 1992; as cited by Field et al., 2002). This disturbance in NREM sleep could be attributed to disturbances in the CNS serotonin pathways (Moldofsky, 1994; Bennett, et al., 1992, Juhl, 1998; Russell, Michalek, Vipraio, et al., 1992, as cited by Field, et al., 2002). Low levels of IGH-1 and melatonin can also attribute to a poor sleep cycle which results in fatigue (Bennett, Clark, Burchardt, Walczyk, 1995; Harding, 1998; Wiker, Hirsch, Wetterberg, Rojdmarm, 1998, as cited by Hughes, 2006) and an inability to maintain a usual routine (Clauw, 1995, as cited by Hughes, 2006). All of the above is just a very small piece of a very large puzzle of a very complex syndrome.

The patient being discussed in this study is a 54 year married mother of two who works as a teachers aid with disabled children. She was diagnosed with FMS at age 40, and has been in 3 Car accidents through her life, the last of which was the worst. She was 33 at the time and was hit from the rear while in the drivers seat. Her neck has not been the same since, and she believes this event to be the aggravating factor for her FMS. Her current Fibromyalgia pain resides mainly in her upper body, more specifically her shoulders and between her scapulas. Stress and sickness tend to make her pain worse and cause her to feel like her system is shutting down, when this happens her acid reflux gets worse, she gets light headed, dizzy, and off balance, and her muscles in her legs and arms begin to twitch. As well she gets reactions to extremes of cold and heat. She believes her negative reactions to heat are due to an often inability to sweat in hot situations. She now has difficulty performing many of her favourite activities of daily living (ADL's) without pain (horseback riding, volleyball, long walks, gardening,

swimming). Often she feels exhausted with little energy due to her troubles with falling or staying asleep when pain is present. Stress and acidic foods cause her acid reflux to flare up, and chewing gum, Tums, and Nexium medication (which she hadn't taken for 3 months prior to study) make it better. Another medication she was taking was a naturopathic liver/lymphatic/gastrointestinal detox prescribed by her Homeopathic Doctor; it had been helping with her acid reflux, her bowel movements, and had also been giving her more energy. As well she had been experiencing difficulty breathing due to a tight chest, and coughing with deep inhalation. Constipation and diarrhea often affect her and she bounces between the two. Her stress levels get high over family, work, money, and worrying about hers and her husbands health. Some of her past medical history is the removal of her appendix at age 7, acquired of Hepatitis A or B as a child, had Epstein barr disease for 6 months as a child, she battled on and off with Bilimia and Anorexia through her youth. More recently she had been developing Degenerative spondylosis affecting her entire body, she had a hysterectomy at age 52, her kidneys almost failed last year due to a viral infection, she is border line type 2 diabetic, and she has loss of her meniscus in both of her knees which will soon require a knee replacement for her left knee. As seen this patients body has been though quite a bit over the years, and it isn't a surprise that Fibromyalgia has developed over time.

The treatment plan for this patient was to decrease the pain and tension throughout her body, both that of which cause by her is FMS, and that which is cause by postural dysfunction. As well a decrease of tension in the chest is also a goal to make breathing easier, and a decrease in mental stress, sympathetic nervous system (SNS) firing, and an increase in the patients ability to relax are another goal as well. Over all, the main goal of the treatments were to remove or decrease the patients pain so as to make it easier for her to get a restorative nights sleep , and perform pain free exercise and ADL's. One of the problems with the treatment of FMS using straight MT is the inability to work into a patients deeper tissue because of there hypersensitivity to pain. This is why the first three of the five treatments focus was on providing non-invasive increasing of circulation to the body's superficial tissues. This was done in the hopes of reducing tension by bringing fresh fluids through those tissues and decreasing the waste

stuck with in them such as trapped pain neurotransmitters, and the desired affect is to make it easier and less painful to enter her tissues when later treating her postural dysfunction. The first two treatments began with a 30 minute application of salt exfoliation therapy to the entire body, followed by 1 hour of MLD to the submandibular lymph nodes, the anterior and posterior neck, the shoulders, and the upper/middle/ and lower back. The third treatment consisted of a 15 minute full body steam (short to test the patients reaction to this form of heat) and the use of a eucalyptus additive, and 1 hour of MLD to the right and left anterior/medial/ and lateral thigh/leg/ and foot. The last two treatments began with a 30 minute full body steam and the use of a eucalyptus additive, followed by 1 hour of MT techniques aimed at decreasing postural dysfunction and restoring proper tissue length/function/ and mobility. These treatments were performed on Monday and Thursday evenings between 6:30 and 8:30pm to allow the patient to reach a state of relaxation close to her time of sleep.

Originally the treatments were begun with full body salt exfoliation therapy. This hydrotherapy modality was chosen for its ability to bring much needed circulation and stimulation to the often deprived superficial connective tissue, as well as for the un-invasive qualities of the modality. The patient had also expressed previous positive results from this therapy. The first treatment resulted in hyperemia to the gluteal region, the lower back, the abdomen, and the arms. After the second treatment, hyperemia reached the posterior legs, abdomen, upper back, and neck showing an increase of circulation to many of her areas of pain and tension. No negative result came from this therapy, and the patient felt good post-treatment. The last three treatments were begun with a full body steam. During the chronic phases of FMS, heat often can relieve muscle soreness for short periods (Offenbacher, stucki, 2000). It can also reduce muscle tone that cold environment tends to produce (Samborski, Stratz, Sobieska, Mennet, Muller, Schulte-Monting, 1992), and is a great pre-treatment application to effect general relaxation of the patient (Ratray, Ludwig, 2000). One study by Piso, Guterbrunne, Genrke, (1998), as sited by Offenbacher, and Stucki (2000) showed that after 12 sauna treatments (over 6 weeks) the pain pressure threshold of the FMS tender points were significantly

increased. Though steams differ slightly from saunas, the application of heat may still apply in the same way. The first treatment resulted in the patient sweating which isn't a common occurrence with her and heat, and why she normally finds heat to be uncomfortable. She felt "great" post-treatment, like she had had a detoxification. Visual inspection showed full body hyperemia. The experience was similar for all three treatments with the only difference being the patients want to spend more time in the steam room. Like the salt exfoliation, no negative effects were experienced with this hydrotherapy modality either.

Manual lymphatic drainage is a "very light, completely pain free, rhythmical translation of the skin in the direction of lymph vessels" (Kasseroller, 1998, as cited by Asplund, 2003, p.192). It was also the keystone to the treatment of this patients FMS. Her previous history with MT had resulted in her preferring not to get anymore treatments because more often than not the therapist would go too deep causing a rebound of pain that would take a while to restore itself because of the FMS. This made the MLD important because of its light repetitive nature which can reduce pain, edema, and excess fibrin and metabolic products in the inflammatory process (Rattray, Ludwig, 2000). The long repetitive duration of the treatment also has a seditory effect which could be positive for the FMS chronic tension and pain. Fibromyalgia patients have been found to have low levels of oxytocin (Anderberg, Uvnas-Moberg, 2000, as cited by Asplund, 2003), which have an anti-nociceptor (nerve endings that detect painful stimuli) effect (Tortora, Grabowski, 2003). Low oxytocin levels have also been shown to be associated with sadness (Anderson, Uvas-Moberg, 2000; Turner, Altemus, Enos, Cooper, McGuiness, 1999, as cited by Asplund). Mattheson (2001) as cited by Asplund (2003) has stated that the stimulation of the mother's breast by an infants hands during feeding increases maternal oxytocin levels. This may partially explain the reduction of pain being produced by MLD (Asplund, 2003). In one study by Asplund (2003), patients with soft tissue pain unexpectedly described their experience with MLD to be more valuable for the pain relief rather than the edema reduction; every woman in this study completed the treatment program and had no reported side effects. Improvement in sleep, well being and reduction of

stiffness all occurred in parallel with the relief of pain; well being and stiffness were still experienced at the 3 month follow up, sleepiness also improved and remained beyond the 6 months follow up (Asplund, 2003). These benefits combined with the lack of side effects made MLD a great treatment to include in this patient's treatment plan. During her 1st treatment she felt slightly light headed while working on her neck, this subsided once the treatment moved to the back. She fell asleep during the treatment, and at the end of treatment she felt some tingling in her arms and legs, her lower back pain (LBP) had decreased, and her upper back pain (UPB) was almost non-existent. Before the second treatment started she was feeling a decrease in tissue tenderness. Her submandibular lymph nodes felt less swollen compared to the treatment previous, her breathing was feeling easier with less tension, and it was hurting less to exhale. She was feeling "really good" for a few days prior, and had been getting better sleep, as well as feeling more energy. Then she found out the day prior to treatment that a good friend was diagnosed with terminal cancer, and she had been feeling depressed and stressed since with an increase in her acid reflux causing a need to start taking Nexium again. Once the second treatment started she fell asleep on the table again, and at the end her throat was feeling dry. Prior to the third treatment she reported feeling well the day previous, but the day of, hot weather and the fact that she drank coffee (Increases Acid Reflux) had her not feeling well. Her back was feeling great, the skin over her shoulders and biceps were less sensitive to touch, and her submandibular lymph nodes were less tender to palpate. By the end of the treatment to her legs she informed that her urine was very yellow (even though she drank 3 glasses of water pre-treatment), and that prior to the beginning of her MLD treatments and the starting of her naturopathic detox. her urine had a very strong odour. Overall, the MLD showed great promise with this patient. Her tender point pains had a gradually but fairly significant decrease by the end of the MLD applications that continued on into the MT treatments, and she wants to continue with this treatment beyond this case study. This patient has had FMS for at least 14 years and it has been shown that the longer duration FMS has been present is also associated with greater improvement of pain from MLD treatment (Asplund, 2003), which could explain her results. Further studies most definitely

should be performed on its effects on FMS.

Massage therapy was performed in the last two treatments of this study in the hopes of decreasing postural dysfunction which was previously difficult to restore due to FMS rebound pain. This was addressed by first reducing the symptoms of FMS by using MLD and salt exfoliation therapy as a passive modalities to increase tissue circulation and decrease tension. The MT was then combined with pre-treatment steams to help increase tissue mobility and pliability. Some other benefits of massage to FMS patients is a lowering of anxiety, depression, and cortisol levels which occurs immediately after a treatment (Field, et.al., 2002). The less difficulty sleeping with less sleep activity could contribute to findings of decreased substance P levels after massage (Sunshine, et al., 1996, as cited by Field et al., 2002). As well, after several massage treatments a decline in plasma myoglobin has been found in correlation with decreases in muscle tension and pain (Danneskiold-Samsoe, Christiansen, Anderson, 1983, 1986, as cited by Brattberg, 1999). Brattberg's (1999) study on connective tissue massage and FMS showed positive effects on patient quality of life, pain intensity, depression, (the anti-depression effect was at its highest 3 months after treatment cessation), and the ability to manage ones own life. Connective tissue massage will also increase circulation which causes a warming effect, muscle relaxation, relief of pain, and an increase in mobility (Hamamm, Haschke, 1983; Muschinsky, 1984, as cited by Brattberg, 1999). This makes massage a good treatment for FMS; touch alone can affect a person emotionally causing a decrease in stress hormones, which will secondarily increase an individuals pain thresholds (Uvnas-Moberg, 1997, as cited by Brattberg 1999). Through the course of the patients massage treatments, her head forward posture, anteriorly rotated left inominant bone, breathing restriction, left knee meniscus degeneration, constipation, excess sputum production, and restricted viscera were all address in some form. Prior to her 1st massage treatment (treatment #4) she had received a vitamin-B shot, she was able to breath through both sides of her nose (wasn't able to pre-steam), her chest felt more open (and she was coughing up sputum), her Acid Reflux was good, she was feeling more energy and less stressed, she had been sleeping well (but a little restless due to remainder

of LBP), and she had been experiencing constipation for the past two days. Her treatment consisted of light muscle stripping to her intercostals, myofascial release of her abdominal peritoneum, tapotment over her lungs, muscular release of her diaphragm, visceral manipulation to her esophagus/stomach/liver (combined with the release of her diaphragm to help affect her acid reflux), massage of the large intestine, and fascial detachment of the ascending and descending colon away from iliopsoas (to help affect her constipation). As well, her left quadratus lumborum and iliopsoas were treated prior to performing a posterior rotation mobilization of the left innominate bone. Prior to her second massage treatment (treatment #5) the patient reported no negative effects from the previous treatment. Her back pain was barely remaining, she was feeling more energy, and her breathing was easier. She was now able to hold her breath under water for 48 seconds (former best was 30 seconds). Her acid reflux had also gone down, and she was feeling more hydrated. Her second treatment consisted of massage to her left knee and distraction of the knee joint. The neck was treated with focus on the sternocleidomastoid, suboccipital muscles, longus colli, and longus capitis, it was finished with a cervical distraction. The intercostal muscles and the diaphragm were once again treated, as well as the anteriorly rotated left innominate bone and the muscles surround. Over all, these massage treatments may have contradicted Rattray and Ludwig (2000) by not gradually addressing the patient's posture over several treatments so as not to overwhelm them. But great care was taken to avoid production of pain with any technique utilized, relaxing Swedish flushing was interspersed between these techniques, and the patient's pain threshold had very much risen from where it had once been. The main massage goals were to improve this patient's ability to exercise without knee and back pain. Also to provide a better night sleep unhindered by FMS and LBP. As well to increase the patient's ability to take in a full breath without feelings of restriction or discomfort. And finally to improve organ function hindered by connective tissue restriction and affecting Acid Reflux and normal bowel movements. All of which were achieved to some extent.

It has been shown that "80% of FMS patients are physically unfit as assessed by maximal oxygen

uptake” (Bennett, Clark, Goldberg, Nelson Bonafede, Porter, Spent, 1989, as cited by Offenbacher, Stucki, 2000, p.78). This is one of the reasons why maintaining this patient in a pain free exercise program is one of the main management goals for this case. “There is strong evidence that cardiovascular exercise is [an] effective treatment in FMS” (Goldenberg, Burckhardt, Crofford, 2004, p. 2391) and “is recommended for long term management of FM[S]” (Offenbacher, Stucki, 2000). An improvement in tender point pain pressure threshold, well being, and self efficacy was found in one trial using walking, strengthening, and flexibility (Martin, Nutting, Macintosh, Edworthy Butterwick, Cook, 1996, as cited by Goldenberg, et al., 2004). Though this patient does like to walk for exercise, her knee problems only allow her to perform them for short periods, and often requires large recovery times. This made swimming a good low impact exercise choice for her knees. As well, it has been shown that “eccentric exercise produces significantly greater symptoms of delayed muscle soreness” (Solomonov, D’Ambrosia, 1987, as cited by Offenbacher, Stucki, 2000) for FMS. This also made swimming a good choice as a low eccentric contraction exercise (Offenbacher, Stucki, 2000). When performing a suitable low impact loading exercise, a patient should experience a minimization of muscle microtrauma and decreased nociceptor firing (Clark, 1994, as cited by Offenbacher, Stucki, 2000). The patient was already in a swimming routine prior to the beginning of treatment, she liked to go approximately 4 times a week and swim 60 laps because it increases her energy and alertness while decreasing her stress and strengthening her knee. But more recently her knee pain, LBP, heaviness in shoulders, and her tightness in her chest had been dropping her down to not much more than 20 laps. This made a balance between achieving improvement with the exercise, and aggravation of the pain important (Rosen, 1994, as cited by Offenbacher, Stucki, 2000). The patient was asked to continue with her swimming routine, but to perform it at a slightly lower intensity and only up to the start of pain elevation or just prior to the beginning of that elevation. It was also suggested that she swim with the use of her legs in smaller increments and use just her arms for all or portions of her swims in the hopes of aggravating her knee and back pain to a lesser degree while still maintaining her knee strength. Through the course of her

treatment her LBP was treated by a posterior mobilization of her anteriorly rotated left inominant bone and showed improvement, but still had slight aggravation caused by the swimming after the end of the 5th treatment. Her shoulder tension and chest tension both showed improvement from the MLD and the MT, and her knee was treated with Swedish and distraction in the 5th treatment. Over all, pool exercise has been a positive activity in this patient battles with her Fibromyalgia symptoms prior to this study and will continue beyond it.

“More than 75% of patients with FMS report some type of sleep disturbance” (Shah, Feinberg, Kristian, 2006). This patient is no different in the way that her chronic pain prevents her from either falling asleep, staying asleep, or both, and waking rested. Several studies have shown a strong association between non-restorative sleep with the number of tender points a FMS patient has, their fatigue levels, their negative mood, and the decreases in their pain threshold (Shah, et al., 2006). This could be caused by an alpha-delta anomaly in stage 4 non-rapid eye movement (NREM) sleep (Shah, et al., 2006) in FMS patients. NREM sleep allows down time for the body to decrease its sympathetic nervous system firing, blood pressure, and heart rate; the opposite is true for Rapid Eye Movement (REM) sleep (Shah, et al., 2006). This lack of NREM sleep could be caused by serotonin pathway disturbances, and could cause a secondary homeostatic imbalance effecting many things in the body including substance P balance, and the balance of pain thresholds (Moldofsky, 1994; Bennett, et al., 1992, Juhl, 1998; Russell et al., 1992, as sited by Field et al., 2002). The importance of this information and its pertinence to FMS could be shown by one study discussed by Shah, et. al, (2006) in which healthy individuals deprived of stage 4 NREM sleep induced Fibromyalgia like symptoms, indicating that this sleep abnormality may be the primary cause of FMS in many patients. To combat this patients sleep disturbances massage therapy was used because of its ability to increasing serotonin levels (Ironson, et al., 1996, as sited by Field, et al., 2002). Both MLD and MT’s relaxing and sedating effects were also used in conjunction with the time of the treatments to allow the patient to become as relaxed as possible before there sleep time. Her sleep patterns started restless resulting a in an un-rested feeling in the

morning. This was also hindered by the stress of finding out about a friend's terminal cancer, and her LBP caused by the anteriorly rotated left iliac bone. Her sleep comfort greatly improved near to the end of her treatments with no restlessness mentioned. A guided sleep meditation cd with breathing exercises and guided imagining to promote releasing of tension and a restorative sleep was given to the patient at the first treatment. She was asked to listen to it as she was going to sleep and to continue using it if she found any benefit. The first 3 nights it was utilized, and she found that she fell asleep very fast, and didn't remember much of the CD playing. This could mean the CD worked well for her or it could just mean she was exhausted on those nights. Unfortunately she was unable to continue with this routine because her cd player discontinued working. Thought deprivation of sleep is not proven to produce FMS on its own (Alvarez-Lario, Teran, Alonso, et al. 1992, as cited by Shah, et al.,2006), it is still a very important part of the FMS symptom picture that is able to be treated through alternative therapy.

Another problem with this patient addressed by these treatments is her restricted breathing. This could also have an effect on the patient's ability to regenerate herself during sleep because in one community based rheumatology clinic 83% of their patients tested positive for Abnormal Hypopnea Index (AHI) which indicates sleep apnea (Shah, et al., 2006), which is a periodic cessation of breathing during sleep. This could disrupt the flow of oxygen and carbon dioxide into the body and result in cyanotic tissue, and a pH imbalance, which could affect the body in a multitude of ways. As well, with sleep apnea the homeostatic control of REM and NREM sleep is severely disrupted leading to instability of the autonomic nervous system (Shah, et al., 2006). This means that breathing dysfunction could lead to sleep apnea, which could cause an imbalance between REM and NREM sleep which could result in an inability for the body to restore its pain threshold, substance P levels, and produce insulin like growth factor-1, etc. Through the treatment course the patients breathing was treated with rib springing , resisted lateral costal and diaphragmatic breathing, release of the diaphragm, the intercostals, and other accessory respiratory muscles. Tapotement over the lungs was also performed to help clear trapped sputum, and the steams helped to loosen the sputum as well as open the nasal passage ways.

The results were an increase in the mobility of her rib cage between inhalation and exhalation. As well, her feeling of chest restriction and her need to cough with deep inhalation disappeared. This is a less researched approach for treating FMS, but its outcomes produced an intrigue to learn more on its effects on Fibromyalgia.

The homecare given to the patient consisted of stretches for the intercostal muscles and diaphragm to be performed with heat. Self resistance of diaphragmatic and lateral costal breathing using a towel wrapped around the rib cage as resistance was also given. Stretching for her iliopsoas, rectus abdominus, and quadratus lumborum were given as well. A modification to the iliopsoas stretch was needed due to her knee dysfunction. Plus a cold abdominal wash was suggested to be performed at 5 am with a return to sleep afterwards. This was done to help stimulate motility of the large intestine in the hopes of helping with her constipation. It did help her achieve a slight defecation release. In addition, a guided meditation CD was given to help the patient sleep with more ease, unfortunately the journal entries the patient was asked to keep produced un-usable information on the affects of the homecare. This was because the patient mistook the meaning of the homecare as meaning house cleaning.

The final results of testing were promising. The main testing for this study was the use of pain scales for each tender point to measure the changes in their pain pressure threshold. The pain scale was measured from 0-5 (0=none, 1=mild, 2=discomforting, 3=distressing, 4=horrible, 5=excruciating). "Approximately 4kgs of pressure" (Rattray, Ludwig, 2000, p.986) was used to assess each of the 18 tender points. The initial assessment (pre-treatment) resulted in the combined pain scales of all 18 tender points equally 37 (with a mean of 2.05). The second assessment resulted in an increase up to 39, but this could have resulted from a mis-palpation of the supraspinatus tender points. The third assessment decreased to 27, the fourth assessment (prior to the beginning of massage therapy which makes it a result of the MLD) decreased to 16. The fifth assessment (pre. second massage treatment) decreased to 9 (with a mean of 0.5). This equalled a drop of 27 pain points from the original assessment to the last. Unfortunately circumstances did not allow for a final assessment after the 5th treatment, but

the results are still apparent. Another assessment tool used during the study was rib mobility measurements at the axillary, mammillary, and xiphoid level to determine the differences between full exhalation and full inhalation (Costovertebral expansion test). For the axillary level the original measurement (pre-treatment) equalled 1.5 cm indicating restrictions (between 3.5 and 7 cm is normal). The last measurement prior to the last treatment equalled 5 cm which shows an increase of 3.5cm. The original mammillary measurement equalled 5cm, and the final measurement rose to 7cm showing an increase of 2 cm. The original xiphoid measurement equalled 3 cm, and the final measurement rose to 8.5cm showing an increase of 5.5cm. Heart Rate was also charted with an initial 62 beats per minute (BPM), this raised to 74 BPM by the last assessment. She also began the study with a very weak radial pulse, which became much stronger by the fourth assessment. Her blood pressure was at 115/85 at the initial assessment, and it slightly dropped to 110/78 by the final assessment. Her resting Breathing rate per-minute was recorded at 13. At the initial assessment, and was at 12 at the final assessment indicating little or no change, and she did not begin or end with hyperventilation (above 16). A journal was also kept by the patient to keep track of other concerns such as changes in sleep, pain, stress, depression, energy, acid reflux, breathing, exercises, etc. Seventeen questions were made up by the therapist and answered by the patient the before and the day after each treatment. Her LBP declined by the end of the treatments, and her UBP stopped. Her sleep patterns got more stable, her stress declined to none but may have raised originally due to her finding out about the friend with cancer. Her depression also declined to none but may have been elevated for the same reason. Her energy was raised to high levels, her acid reflux raised initially due to stress but needed medication (Nexium) to combat it, the Nexium use was discontinued at the studies midpoint which could indicate a drop in acidity levels and stress. Her breathing showed good improvement, and her exercise started at none for the first two entries but was performed at each of the 9 entries afterwards. To view more on these results there are charts included in this study.

In conclusion, though one of the short comings of this study was the lack of treatments

performed; the results still speak for themselves, and the short duration of the study make them all the more surprising. It shows that that lack of studies on the effects of MT and MLD are very unfortunate because the results are there to be discovered. The problem is that FMS is a common affliction, but it is also very patient specific with its causes and effects. There should never be a recipe for treating this syndrome, and that in part is what makes it so hard to study. Over all, the combination of MD, MLD, salt exploitation therapy, and full body steams worked well in the treatment of this patients FMS, and may be very helpful in the treatment of many others with this affliction. But the way they are applied must be gauged towards the individual's needs which can be assessed by an experienced therapist. Though there is "no cure for Fibromyalgia", (Edsall, 2000, as sited by Hughes, 2006, p. 112), there is definitely relief.

Tender Point Chart

Pain scale out of 5

Date:	July 17	July 21	July 24	July 28	July 31
Suboccipital Right	2	1	0	0	0
Suboccipital Left	3	1	0	0	0
Upper Trap Right	2	2	0	1	0
Upper Trap Left	2	3	0	0	0
Supraspinatus Right	0	2	1	1	1
Supraspinatus Left	0	3	2	1	1
Glute Medius Right	1	2	3	0	2
Glute Medius Left	2	2	3	2	2
G. Trochanter Right	2	1	1	0	0
G. Trochanter Left	2	0	0	0	0
Ant. TVP C5-7 Right	2	2	2	1	1
Ant. TVP C5-7 Left	2	2	2	1	0
2 nd Rib Costal Right	4	4	2	2	0
2 nd Rib Costal Left	4	4	2	2	0
Lat. Epicondyle Right(Distal to)	2	2	2	1	0
Lat. Epicondyle Left (Distal to)	1	3	2	2	1
MCL Right	3	3	2.5	0	0
MCL Left	3	2	2.5	2	1
TOTAL:	37 (mean=2.5)	39	27	16	9 (mean=0.5)

Costovertebral Expansion Test

Between 3.5 and 7 cm is considered normal

Date:	July 17	July 21	July 24	July 28	July 31	Difference:
Axillary	1.5	4	3	4	5	3.5
Mamillary	5	4.5	6	6	7	2
Xiphoid	3	5	7	7.5	8.5	5.5

Cardiac and Respiratory Tracking

Date:	July 17	July 21	July 24	July 28	July 31
Heart Rate	61 BPM	62 BPM	69 BPM	80 BPM	74 BPM
Blood Pressure	115/85	118/80	110/85	117/80	110/78
Respiratory Rate	13/min.	12/min.	11/min.	11/min.	12/min.

Journal Entry Charting

Scales (0-5) used for pain, stress, depression, and energy

Date:	July 18: Bad News	19	20	21	22	24	25	29	30	31	Aug. 1
Treat Dates:	July 17 MLD				July 21 MLD		July 24 MLD	July 28 MT			July 31 MT
1) Pain areas With Scale:	LB=3	LB=3 UB=2	LB=2 UB=1	LB=3 UB=1	LB=3 UB=1	LB Constipation	LB=4 Constipation	LB=1		LB=2 HA=1	LB=1 Left shoulder =1
2) Pain at worst:	Whole day	Morning	Morn. stiff	Morn.	Most of day UB	On/Off After long sit	On/Off		Certain Moves agitate		Swim, Long sit
4) Stress:	4=Bad News	1	1	1	1	1	0	0 Happy	0	2	1
3) Sleep:	Nightmare Not rested	8Hrs. Rested enough	9Hrs. Rested	8Hrs. Good sleep	Little rest-less	Good	Tossed + turned from LBP	Excellent	9Hrs. Comfort	9Hrs. Good	8.5 Hrs.
5) Depress:	5=Bad News	5	4	3	3	3	0	0	0	0	0
8) Energy:	3 more	3	4	4 Good	4 Main-tained	4	4	5	5 Great	5 tired Post treat	5
10) Acid (^)	Stress	Morning	Mild	Some (v)	Some (^)	Okay	Okay	None	Some at Night	after Lunch	After lunch
11) Breath:	Better Easier	Some restrict	Okay	Pretty good	Impr-oved	Much better	Get Better Able to nose breath	Very Good Much improve	Good! Much easier	Very good	Good
12) Exercise:	None	None	Swim Stretch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes LBP
17) Meds:	Tums	Nexium	Nex.	Nex.	Nex.		Vitamin-B shot		Flaxseed oil + Primrose	2 Tums	

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