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Andrea Smith

How massage can improve quality of life
in persons with muscular dystrophy

AUTHOR:
ANDREA SMITH
andreasmith19@hotmail.com

CASE REPORT SUPERVISOR:
RANDY PERSAD, RMT

**UTOPIA ACADEMY OF
MESSAGE THERAPY**
220-181 Keefer Place
Vancouver, BC
V6B 6C1
Phone 604.681.4450

How Massage Therapy Can Improve Quality of Life in Persons with Muscular Dystrophy

ANDREA SMITH

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ABSTRACT

Objective: The case study assessed the affects of massage therapy on QOL through decreasing pain and increasing proprioception, strength, and active range of motion (AROM) in a client with facioscapuloumeral muscular dystrophy (FSHMD). The primary outcome of improving QOL in persons with MD is to enhance functional activities of daily living (ADL) by decreasing pain and increasing strength and ROM in the upper extremity. Secondary outcomes may include increasing proprioception and endurance. **Methods:** Ten treatments were performed that lasted from 60-75 minutes in duration, 3x/week in a period of 4 weeks. The treatment approach used a variety of techniques such as neuromuscular techniques (i.e.. PNF), myofascial release, and swedish techniques. **Results:** When referring to the baseline measurements of QOL the clinical outcomes are based on the client's journal,

measurement of strength, and improved functional ADL. Before the case study, the client was unable to walk for more than five minutes or even stand for prolonged periods of time without pain or becoming fatigued. After the third and fourth treatment, the client reported a decrease in musculoskeletal pain, an increase in endurance and improvement in posture and proprioception. In Treatment 3 there was a flicker of movement in the left hand during finger and wrist extension. This may suggest that massage therapy contributes to establishing neuromuscular connections and perhaps increase AROM with further treatments using PNF patterning. With Treatment 6, the client received iliopsoas work to increase her swing phase in walking gait. She reported a significant bowel movement 45 minutes post treatment and decreased hypertonicity in the hips. This may suggest that massage therapy may be helpful with improving digestive function. The QOL has improved

significantly in the 10 treatments concerning functional activities of daily living. Massage therapy may improve QOL through decreasing pain, increasing respiratory and digestive functions, strength and endurance. **Conclusion:** Over time, massage therapy may lead to a decrease the use of corticosteroids, aid in functional scar formation post surgery and may improve AROM in person's with FSHMD if further research is pursued. Clinical trials have suggested that "symptom improvement may be an important end point in itself" even if there is no difference in treatment outcome (Frost 2002) . Though the notion of QOL is given verbal support, more research is needed to improve the integration of QOL in a healthcare setting and massage therapy may be an integral component as a complementary therapy along with traditional management of FSHMD.

Keywords List

Massage Therapy, Muscular Dystrophy, Quality of Life

INTRODUCTION

Muscular Dystrophy (MD) is a group of genetic, hereditary disorders characterized by progressive muscle wasting, weakness and hypotonia. This group of MD disorders comprise the most common neuromuscular diseases of childhood and can affect all populations and range in severity depending on the location.

There are nine types of MD that present with a defect in the gene that encodes for the protein dystrophin found in skeletal and cardiac muscle cell membranes. There may also be a defect in an enzyme or glycosylation which is the addition of sugars to a protein that could also contribute to the cause of MD. Many types of MD such as Duchenne and Becker's are inherited in an X-linked recessive pattern and thus considered sex-linked. Considering that males carry one X chromosome, a mutation in one copy of the gene is sufficient to cause the condition. In females, who contain two X chromosomes, the

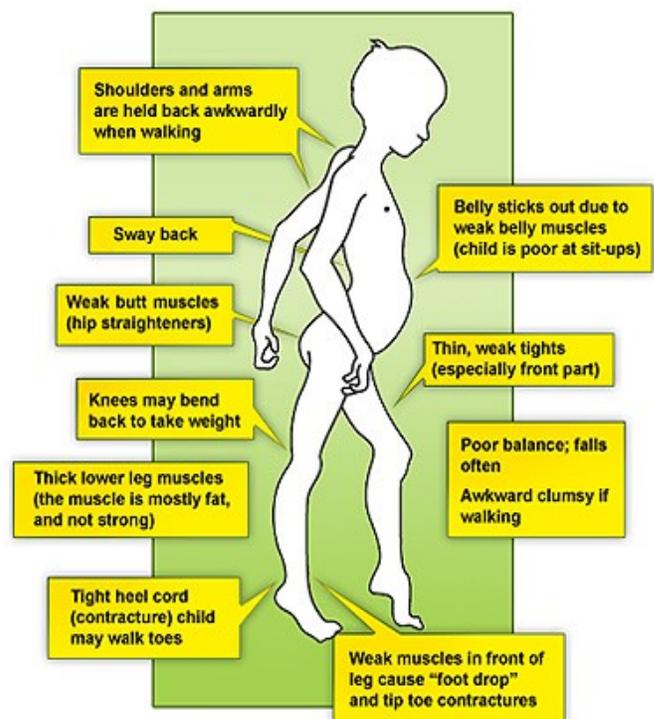


Figure 1: Clinical Manifestations of Muscular Dystrophy

mutation must be present on both copies of the gene to cause the condition. Therefore, many types of MD are most often seen in males and passed down maternally.

Most types of MD affect the lower body and present with distinctive symptoms such as fatigue, progressive muscle weakness, incoordination, difficulty with motor skills, waddling gait, muscle contractures, scoliosis, equinus (toe walking) and pseudohypertrophy (Figure 1). There may also be complications such as respiratory conditions, arrhythmias, cardiomyopathy, and in rare cases, non-progressive cognitive dysfunction.

Facioscapulothoracic muscular dystrophy (FSHMD) is the third most common form of MD that affects approximately 1 out of 20,000 people. It is an autosomal dominant disorder that affects men and women equally. Though many symptoms previously mentioned are characteristics of MD in general, FSHMD has some hallmark differences due to its location in the body. There may be a marked upper extremity weakness, scapular winging, sloping shoulders and a difficulty in raising one's arms due to muscle weakness (Figure 2). There may also be eyelid drooping, decreased facial expression, an inability to whistle and a difficulty pronouncing words. There may be progressive difficulty with walking, arrhythmias,

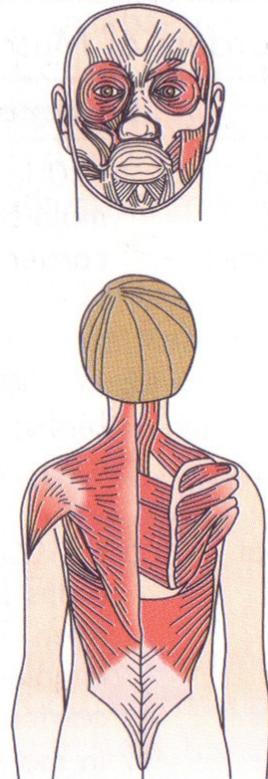


Figure 2: Muscles affected in FSHMD (Goodman)

hearing and vision loss, however, these presentations are rare.

Chronic pain is another common symptom associated with FSHMD due to inflammation and constant activation of the sympathetic nervous system. Neuromuscular conditions such as MD, stress and corticosteroid use have a toxic effects to the nervous system and affect the microcirculation of organ systems within the body. This physiological reaction is known as Sympathetic Inflammatory Response Syndrome (SIRS) and commonly manifests in the form of septic encephalopathy and critical illness polyneuropathy (Goris 1998). People with MD that are affected by SIRS may experience a variety of inflammatory symptoms that compromise immunity and may lead to a transient neuromuscular blockade, acute respiratory distress syndrome (ARDS) or multiple organ failure (Goris 1998).

People with FSHMD may have difficulty with functional ADL such as getting dressed, personal hygiene, domestic activities, walking, and limited dexterity such as picking up and holding objects. The primary outcome of this case study is to improve QOL through decreasing pain, increasing strength and AROM. Secondary outcomes include increasing proprioception and endurance. Quality of life (QOL) is a subjective measurement of well-being associated with the perception of 'meaning' that is central to the human condition (Frankl, 1963). Understanding the construct of QOL as a measurement is convoluted

and considered 'soft' in scientific literature. Despite its unmitigated philosophical importance, the significance of QOL in research outcomes remain undetermined in the healthcare setting (Frost 2002).

The importance of QOL is crucial in prognosis and may not be duly represented from physical and physiological measurements. According to a study of 77 adults with MD, presenting varying levels of impairment, the levels of QOL are not reflected according to the degree of disability. It is therefore suggested that clinical outcomes are relative to the baseline measurements and the relationship between the individual's present experience and their perception of 'happiness requirements' (McCall, 1975). QOL may be measured with a pain scale, a decrease in symptoms or an overall improvement of functional activities of daily living. Studies in oncology have hypothesised that QOL is second in importance only to survival (Frost 2002). Though it may be difficult without tangible clinical outcomes, it is imperative to create a baseline measurement for QOL considering its fluctuating subjectivity in an evidence-based practice.

Traditional management of MD includes drug therapy, surgical procedures, physical therapy, therapeutic massage and alternative therapies such as nutritional supplementation, herbs, and homeopathy.

Many drug therapies on the market are used to improve strength or delay muscle relaxation, depending on the type of MD (Ehrlich 2010). Prednisone is a

catabolic steroid that slows the loss of muscle degeneration and may also stimulate muscle protein production. Other examples of strength increasing drugs are Deflazacort, a milder form of prednisone that is known to have less severe side effects and Albuterol, an immunosuppressant drug used in inhalers for asthmatics (Kaneshiro 2010). Gentamycin is a new antibiotic on the market that allows dystrophin to be produced if the gene defect is due to a premature stop codon (Kaneshiro 2010). Creatine is a nutritional supplement that is also found naturally in the body. It is used for energy production in muscles and helps generate stronger contractions. Some examples of drugs used to delay muscle relaxation are Phenytoin, an anti-convulsant, Procainamide, an anti-arrhythmic, and Quinine, an anti-malarial drug used mostly to treat nocturnal leg cramping. It is important to consider the many side effects of corticosteroids such as an increase in blood pressure, the development of cataracts, weight gain, liver or kidney damage and psychological effects such as difficulty concentrating, mood swings, insomnia and depression to name a few (Kaneshiro 2010). It is also important to note that the long-term use of immunosuppressants can impair the body's ability to heal itself and may predispose the body to opportunistic infections (Ehrlich 2010).

Surgical procedures for FSHMD involve scapular fixation that can significantly enhance range of motion (ROM) in the upper extremity. To be successful, it is recommended that the client still has functional

Signs & Symptoms	Measure	How FSHMD affects QOL Before Massage Therapy	How FSHMD affects QOL After Massage Therapy
Spasticity	client journal, ROM	hypotonia, incoordination, ↓ROM, muscle contractures, difficulty with functional ADL, waddling gait, pseudohypertrophy (equinus),	↑ coordination ↑ proprioception ↑ functional ADL
Respiratory Problems	client journal, measure time able to walk	difficulty breathing, ↑sympathetic nervous system, anxiety, arrhythmia, cardiomyopathy, fatigue, difficulty walking, shortness of breath,	↑ respiration ↑ endurance ↓ pain with walking ↓ fatigue ↓ anxiety
Muscle Imbalance	Video AROM, postural assess, measure time AROM strength	postural imbalance, scapular winging, sloping shoulders, scoliosis, poor balance, ↑lumbar lordosis, getting dressed,	↑ AROM of upper extremity ↑ functional ADL
Atrophy	client journal, measure AROM strength	eyelid drooping, ↓facial expression, inability to whistle, difficulty chewing and pronouncing words, strength	↑ in upper extremity strength

Figure 3: Effects of Massage Therapy on Signs & Symptoms associated with FSHMD

mobility and strength in the upper extremities. In any case, outcomes for the surgery have not been clearly determined (Tawil 2007). Some complications of this procedure include a break in the wire that consequently leads to a loss of the functional gain and rarely, brachial plexus injuries (Tawil 2007).

Other forms of managing MD include ambulatory aids such as custom molded ankle-foot orthoses which is helpful for foot drop (Tawil 2007). There are also knee-ankle-foot orthosis for those with foot drop and knee extensor weakness (Tawil 2007). Bracing and casting may also be used, specifically in younger years to decrease the extent of contractures.

The economic burden of MD is difficult to determine depending on signs and symptoms, whether the per-

son can live independently and how they manage their condition i.e. corticosteroids, surgery, physiotherapy etc.. Also it is important to consider that many person's with MD cannot work and are eligible for subsidized housing and income assistance. The average person with FSHMD in B.C. receives between \$800-\$900 monthly including \$325 of rent supplementation if they are living independently.

The case study assessed the affects of massage therapy on QOL through decreasing pain and increasing proprioception, strength, and ROM in a client with facioscapuloumeral muscular dystrophy. Proprioceptive neuromuscular facilitation (PNF) patterns are based on the anatomy and neurophysiology of the body to restore or maintain normal functional movement with an interdisciplinary approach. PNF

patterns are a manual technique concerned with gross movements in attempt to establish neurological pathways that either facilitate or inhibit movement. By incorporating proprioception, cutaneous and auditory stimulus to PNF patterns, the client may increase strength, flexibility and ROM through autogenic inhibition, reciprocal inhibition or a stretch reflex (UA 2010). When working with PNF patterns, proprioceptors stimulate the response of the neuromuscular mechanism that maximally facilitates the progression of movement (UA 2010). As MD is a progressive neuromuscular condition, it is crucial to maintain functional strength and ROM through reinforcing and possibly creating new neural pathways.

Myofascial release (MFR) is another technique used to engage the soft tissue that decreases or removes inter-nodal fascial restrictions resulting in improved mobility between structures (UA 2010). Fascia is a type of connective tissue that is colloidal and attaches everywhere in the body. Fascia gives the human body shape and responds to stresses in a plastic and elastic manner. As a tensegrity model, fascia can maintain, adapt or compensate to the body's structural alignment (UA 2010). By engaging the fascia at the correct depth through stacking and loading, one can decrease fascial adhesions while increasing lymphatic circulation and intracellular communication. Many mechanoreceptors within the fascia decrease tone in motor fibers, inhibit sympathetic activity and improve kinaesthesia. In addition, MFR engages the parasympathetic nervous system that enables the body to re-establish

homeostasis. This is pertinent to the case study regarding proprioceptive feedback of pacini type II receptors found in investing muscular tissue (UA 2010).

If one considers the affects of massage therapy as a non-invasive tool to enhance QOL, it may be safer than taking corticosteroids when considering the influence of cyclic or tapering dosage cycles, withdrawal and other varying side effects. Corticosteroids may be helpful to decrease inflammation and increase strength initially; however, long term use may lead to tissue degradation (Kaneshiro 2010). Massage may also be more economical than surgery and may be as affective if not more regarding complications such as the formation of scar tissue. The primary outcome of improving QOL in persons with MD is to enhance functional activities of daily living (ADL) by decreasing pain and increasing strength and ROM in the upper extremity. Secondary outcomes may include increasing proprioception and endurance (Figure 3).

SUBJECT CASE HISTORY

The client is a 31 year old female who lives independently with a strong support network in times of need. She works between 16-40 hours per week as a mental health worker and travels 45 minutes to 1.5 hours by public transit to and from work. The client is also a make up artist with hobbies that include doing her nails, photography, writing and walking her

dog. She complains of overall muscle soreness, fatigue and inability to perform functional ADLs. The onset of pain coincided with the onset of FSHMD at 18 months of age. She experiences chronic pain daily that is diffuse and achy in nature. This pain is precipitated by the progressive degeneration of muscle tissue and causes the client to fatigue after approximately 5 minutes of walking or doing AROM beyond grade 3. The client presents with a right structural scoliosis in the thoracic spine with a right rib hump, sway back, head forward posture, scapular winging, pseudohypertrophy (equinus) and muscle contractures at the elbows with foot drop bilaterally. The client had tendon lengthening surgery at age 2 to decrease toe walking and increase dorsiflexion and supination bilaterally. The client also had weekly castings, (one arm at a time) for 6-8 months at age 12 to extend elbows (120 degrees) as a preventive measure for muscle contractures. This procedure was unsuccessful. Another orthopaedic surgery was performed at age 14 to increase dorsiflexion to the right foot by adding bone from the right ileum to the right talus. This operation was successful and established AROM of approximately 10 degrees. The other foot did not have surgery and the client has no ability to perform dorsiflexion actively. The client's physical limitations are in ROM of the entire body and limited dexterity in intrinsic hand muscles. The client is taking between 600mg-1200mg of Advil daily and takes Paroxetine, an anti-anxiety medication, at a tapered dose of 10 mg per day. Excessive movement and

strengthening associated with ADL are exasperating for the client. The pain is relieved with rest, Advil and massage. The client is also experiencing a decrease in hearing and requires hearing aids.

ASSESSMENT

The client had a postural assessment, video active ROM assessment of the upper extremity, and a timed assessment of glenohumeral (GH) joint strength in flexion (Figure 3). The client also kept a journal to record changes in pain, sleep, endurance as well as monitor functional ADL.

TREATMENT OF GOALS

The primary outcome of improving QOL in persons with MD is to enhance functional ADL by decreasing pain and increasing strength and AROM in the upper extremity. Secondary outcomes include increasing proprioception and endurance. Ten treatments were performed that lasted from 60-75 min. in duration, 3x/week in a period of 4 weeks. The treatment approach used a variety of techniques such as neuromuscular techniques (i.e.. PNF), myofascial release, and swedish techniques.

Each treatment began with myofascial techniques on the back to increase circulation and decrease myofascial adhesions. The back was treated with swedish kneading, petrissage, and scapulothoracic joint mobili-

sations. Depending on the client's chief area of complaint that day, the legs may or may not be treated with myofascial, kneading and pestrissage techniques.



Figure 4:
Subject displaying strength in GH joint flexion

In supine position, the PNF pattern Diagonal I Extension was consistent in every treatment bilaterally using verbal cues, getting the client to watch the moving limb and using the same predictable movement pattern. The movement patterns works distal to proximal and uses reciprocal inhibition (RI) which is the contraction of an agonist muscle to relax the antagonist (UA 2010). Light fingertip stimulatory stroking is performed with each movement in a distal to proximal direction. The client was unable to perform passive ROM so the treatment began with active-assisted ROM with finger extension and RI to the forearm flexors. The next movement was wrist

extension and ulnar deviation with the same RI followed by forearm pronation with RI of the supinator. The next sequence involves scapular depression and adduction movement with RI to rhomboids and latissimus dorsi followed by shoulder extension with RI of teres major. The final sequence is abduction and internal rotation of shoulder with the same RI as previous. An extra movement was added to increase extension of the elbow with RI to the triceps. The intention of these movements was to decrease contractures, increase strength and increase proprioception leading to an increase in ROM.

The treatment concluded with either stretching of hip flexors, low back or pectoralis major to improve muscle imbalances. There were some ischemic compressions to the inferior GH joint capsule to increase scapular retraction and Swedish anterior neck work to decrease head forward posture and increase AROM.

TREATMENT OUTCOMES

Date	Assessment	Treatment Goals	Reassessment	Remex
Treatment 1 30/07/2010	ROM @ shoulder complex ROM @ C-spine Dexterity of intrinsic hand Mm. Attempt to put on pants & wash hair Strength of triceps with RROM, failed to reach Gr. 3 AROM bilaterally	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs Strengthen intrinsic hand Mm, posterior neck & triceps brachii ↑ external rotation of Lf piriformis to restore normal pelvic tilt	Client was relaxed & felt less discomfort in back & shoulders with a SL↑ROM bilaterally Right latissimus dorsi still HT Shoulders depressed bilaterally with SL ↑ external rotation Left shoulder is SL more internally rotated with pain anteriorly HT piriformis Lf side ↓ but Lf hamstrings HT	Stretch: PROM extension of digits 1-5. Hold 30sec ea./3x day Strength: Triceps B 10x (2 soup cans in ea. bag) leaning against wall/1x day
Treatment 2 02/08/2010	ROM of shoulder complex Postural Assessment	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in pec major, platysma & right latissimus dorsi to maintain normal posture	Client feels looser, not thinking about relaxing but wondering if the treatment as a whole is effective. SL ↑ROM at scapulothoracic jt. bilaterally ↓ Adhesions in pec major, platysma & right latissimus dorsi	Stretch: PROM extension of digits 1-5. Hold 30sec ea./3x day Stretch: Inferior joint capsule stretch 45 sec. 3x day Strength: Shoulder flexion, hold 5 sec., 3 reps, 3x day
Treatment 3 07/08/2010	ROM @ shoulder complex Postural Assessment Dexterity of intrinsic hand Strength of triceps Mm unable to assess	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in low back, hips and hamstrings to↑ROM in functional ADLs ↑extension @ hips bilaterally	Client felt significant change in hip extension Felt flicker in Rt hand after PNF patterning D1-extension of MCPs ↓HT in low back, hips and hamstrings to↑ROM in functional ADLs SL↑extension @ hips bilaterally	Stretch: PROM extension of digits 1-5. Hold 30sec ea./3x day Strength: Shoulder flexion, hold 5 sec., 3 reps, 3x day Diaphragmatic breathing 10x/ 2x day AM & PM to ↓SOB
Treatment 4 11/08/2010	ROM of shoulder complex Postural Assessment Strength of GH joint in flexion: hold gr.3 @ 70 degrees for 15 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in low back, hips and hamstrings to↑ROM in functional ADLs ↑extension @ hips bilaterally	Client felt significant change in hip extension Felt flicker in Rt hand after PNF patterning D1-extension of MCPs ↓HT in low back, hips and hamstrings to↑ROM in functional ADLs SL↑extension @ hips bilaterally	See previous

Date	Assessment	Treatment Goals	Reassessment	Remex
Treatment 5 12/08/2010	ROM of shoulder complex Postural Assessment Dexterity of intrinsic hand Strength of GH joint in flexion: hold gr.3 @ ~70 degrees for 15 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↑scapular retraction to ↑ROM in functional ADLs & ↑ROM @ scapulothoracic joints bilaterally	Client felt significant change in inferior joint capsule SL scapular retraction bilaterally SL↑ROM @ ST joints bilaterally	See previous
Treatment 6 14/08/2010	ROM of shoulder complex Postural Assessment Strength of GH joint in flexion: hold gr.3 @ ~75 degrees for 17 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↑extension @ hips bilaterally	Client felt significant change in hip extension. * Felt flicker in Rt hand after PNF patterning D1-extension of MCPs ↓HT in low back and hips bilaterally SL↑ROM @ hip joints bilaterally	See previous
Treatment 7 18/08/2010	ROM of shoulder complex Postural Assessment Dexterity of intrinsic hand Strength of GH joint in flexion: hold gr.3 @ ~70 degrees for 17 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in back to ↑ROM in functional ADLs & ↑ROM @ C-spine	Client felt extremely relaxed SL ↓HT in back ↑ROM @ C-spine	See previous
Treatment 8 19/08/2010	ROM of shoulder complex Postural Assessment Strength of GH joint in flexion: hold gr.3 @ ~80 degrees for 15 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in back to ↑ROM in functional ADLs & ↑Scapular retraction	Client felt more flexible in chest SL ↓HT in back ↑Scapular retraction	See previous
Treatment 9 21/08/2010	ROM of shoulder complex Postural Assessment Dexterity of intrinsic hand Strength of GH joint in flexion: hold gr.3 @ ~80 degrees for 20 seconds	↓Pain associated with H/A ↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in back to ↑ROM in functional ADLs & ↑ROM @ C-spine	Client's H/A was gone SL ↓HT in back ↑ROM @ C-spine	See previous
Treatment 10 23/08/2010	ROM @ shoulder complex ROM @ C-spine Dexterity of intrinsic hand Mm. Attempt to put on pants & wash hair Strength of GH joint in flexion: hold gr.3 @ ~70 degrees for 20 seconds	↓SNS firing & HT in back, neck & shoulders to ↓myofascial adhesions Maintain ROM @ GH, HU, CMC, MCP, PIPs & DIP joints to maintain ADLs ↓HT in legs and hips to ↑ROM in functional ADLs ↑ROM @ C-spine	Client felt extremely relaxed ↓HT in legs and hips to ↑ROM in functional ADLs ↓pain @ C-spine	See previous

CONCLUSION & DISCUSSION

When referring to the baseline measurements of QOL, the clinical outcomes are based on the client's journal, measurement of strength, AROM and improved functional ADL. Before the case study, the client was unable to walk for more than five minutes or even stand for prolonged periods of time without pain or becoming fatigued. After the third and fourth treatment, the client reported a decrease in musculoskeletal pain, an increase in endurance, AROM in GH flexion and improvement in posture and proprioception. She also recalled she was not "hitting a wall at 3pm" or not feeling like her head is too heavy for her neck. Since massage therapy is known to increase the parasympathetic nervous system, it may also implicate a decrease in physiological stress and inflammation associated with SIRS and thus, a decrease in pain. One of the most profound

measurement was reported after Treatment 4 when the client reported they had walked for 20 minutes without pain or fatigue. There was also an increase in AROM between treatment 7 & 10 in GH flexion as seen in Figure 5 and 6. This suggests that massage therapy decreases pain associated with inflammation and may also increase strength, active ROM, endurance and respiratory function through encouraging homeostasis.

With Treatment 6, the client received iliopsoas work to increase her swing phase in walking gait. She reported a significant bowel movement 45 minutes post treatment and decreased hypertonicity in the hips. This may suggest that massage therapy may be helpful with improving digestive function.

Considering MD is a neuromuscular condition, the goal of using PNF patterning is to help initiate a neu-



Figure 5:
Subject performing AROM in GH joint flexion before Treatment 7



Figure 6:
Subject performing AROM in GH joint flexion before Treatment 10

romuscular connection in the body.

This modality was not expected to work immediately as there is no previous literature to support its effectiveness regarding MD; however, the treatment goal was to increase proprioception and ROM through stretching and strengthening in the DI Extension pattern. The client could not perform DI extension actively or resisted throughout the 10 treatments but could passively go through the gross movements with assistance. In Treatment 3 there was a flicker of movement in the left hand during finger and wrist extension. The client has also experienced a progressive increase in proprioception and balance. This may suggest that massage therapy contributes to establishing neuromuscular connections and perhaps lead to an increase ROM with further treatments using PNF patterning.

There were no adverse affects with the massage techniques or treatments as a whole. The QOL has improved significantly in the 10 treatments concerning functional ADL. Massage therapy may improve QOL through decreasing pain, increasing proprioception, strength, AROM, endurance, respiratory and digestive functions. The client experiences less pain and therefore can continue with treatment and remedial exercises. Over time, massage therapy may lead to a decrease the use of corticosteroids, aid in functional scar formation post surgery and may improve ROM if further research is pursued. Clinical trials have suggested that “symptom improvement may be an im-

portant end point in itself” even if there is no difference in treatment outcome (Frost 2002). Though the notion of QOL is given verbal support, more research is needed to improve the integration of QOL in a healthcare setting (Frost 2002). Considering these findings, it is suggested that integrating massage as a complementary therapy to traditional management may improve QOL in persons with MD.

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COPY OF CLIENT'S JOURNAL

Treatment 1

I wasn't really sure what to expect, & because I was wound up from being at work today I found it really hard to relax during treatment. because I'm used to swedish technique, and this was kind of uncomfortable but subtle, I kept waiting for it to "start." Then it was over. I guess I was excited, too? The whole idea of ten treatments is awesome, I just wasn't prepared for the exercises I'm to do on my own time, because I loathed that aspect of PT as a kid. Also, I feel really weird about the videos, I've never liked video footage of myself, & this was video focussing specifically on what I DON'T LIKE about video of myself.

Add: last night my pillow felt "wrong" and I had trouble sleeping even though I was dead tired.

Treatment 2

I felt like a blob after, and I was near asleep when the treatment ended. So relaxed. I struggle though, with the visualization process when you are treating my hands and arms. My mind totally wanders and I'm ticklish, and I don't entirely have faith in this method. I trust you though, that you have faith in it, so I don't want to disappoint you by not trying.

Add: My bed was so uncomfortable the last few night, I obviously have to change my pillows around and my "comfy" sleeping position is really not comfy.

Treatment 3

Note: I forgot to journal this one, sorry

Treatments 4, 5, 6

(Notes from my day book)

I have been noticing that I have so much more endurance throughout the day. I'm working near full-time these days, and I'm really surprised to find that I'm not hitting a wall at 3pm, or feeling achy at work (& then stretching in a way that feels good but is probably posturally incorrect).

I'm not felling like my head is too heavy for my neck, I'm feeling as "bent over"

Walking!!! Seriously. I don't walk ANYWHERE. I will walk if I have to, but I don't like to. I get flustered and out of breath because I'm using my stomach muscles

to hold my carriage, and my shoulders and neck cramp up from carrying my shoulder bag. Now I'm walking taller and maybe faster? I really feel like my posture is better.

At work I'm steadier on my feet and don't feel the need to lean something for support (or relief).

At home after work, I'm still energized enough to take my dog out, suffer through the banality of household chores, not the usual sit-in-front-of-the-internet and zone out.

My sleeping is kind of weird though, but I'm not as uncomfortable anymore. I tried to "train" myself to sleep on my back but I always wake up in a crampy little sweatball. Some nights I'm having trouble relaxing, and making my brain quiet down, ut I think that's mostly due to how engaged I am with work right now, and some days are REALLY chaotic.

A few nights I've hit the bed, zonked out, and not woken (or even moved) until my alarm goes off at 6:30am. Then I'm up like an automaton.

Even though this was not the original objective of the treatments, I would be perfectly fine with the resulting energy boosts they have given me. I'm not noticing the hugest difference in my arms and hands, but it is a bit easier to get my one arm up (using the shower wall as support) to wash my hair. I don't feel as tightly knit under my arm and down my side which was keeping me from lifting my arm high enough, even supported.

Add: I remember being pretty sick with a cough, but for some reason I didn't note it. it was such a nuisance during two consecutive treatments because I was so short of breath and kept choking, because I was trying to breathe deeply.

Treatments 7, 8, 9

(from datebook notes)

I need to learn how and when to breathe & I can't figure it out. I thought I was already doing deep breathing but I can't keep it steady.

I've actually walked to work from the skytrain (Granville to Seymour & Davie). This is new, I'm not even out of breath or cramped up when I get there. I've actually found myself thinking "it will be faster to walk than take the bus".

I've gone and run errands around downtown on my

hour breaks and really surprised myself with how little time it takes and I'm usually left with a half hour or so, so I just walk more (sometimes).

I had a REALLY stressful morning mid August and it really made me ache. I was so tense I felt like my shoulders were up around my ears, and if I was a cartoon my eyes would be spinning spirals and I would have fangs. I would be a velociraptor, actually. With acid reflux, too.

Anyway, I wasn't in the best mindset for a treatment that day but it did help. Also the breathing thing is starting to make sense.

Doing the two treatments at my house were good for relaxation because I wasn't thinking about how long it was going to take me to get home, etc. I think I've only fully relaxed for two treatments? Most times I'm very aware of what you're doing and how it's supposed to feel; if I'm feeling the right thing.

I can understand why we do the videos and I know they are viewed from a clinical perspective, but they make me very self conscious. It's jarring when I'm confronted with my own physicality and limitations. I don't think of myself as the person in the videos, I just do how I do and get on with it.

Treatment 10

I don't know if we've accomplished what we set out to do, but there has been such a noticeable change in my mobility & energy, it's made me really happy. I've kept with doing the exercises, even though I thought they were silly at first, but that obviously wasn't the right attitude. As you said to me "you have to do more than half the work!" SO TRUE. I'm really grateful for these treatments.

I'm hoping the effects are somewhat long lasting. In a few days I'm flying to California and dreading the sitting for two hours.

Add: the trip wasn't that comfortable because I changed planes in Seattle, so I got to get up and move around.

Add: I was worried about sleeping in a different bed because the last time I was visiting my friends, the guest bed was horrible. That sounds very Princess & the Pea, but it was really uncomfortable. New bed this time!!