Evidenced-Informed Massage Therapy:
The Research Supporting Massage Therapy is an Integral Component in the Affordable Care Act’s Essential Health Benefits

Project funded by American Massage Therapy Association-WA

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Introduction: Massage Therapy in Health Care

Massage therapy (MT) is defined as the intentional and systematic manipulation of the soft tissues of the body to enhance health and healing (Benjamin & Tappan 2004). MT is a profession with the intention of positively affecting the health and well-being of the client through a variety of touch techniques (American Massage Therapy Association Glossary of Terms). MT’s are trained in assessment, treatment planning, application of various massage techniques/modalities, communication/reporting with both patients and members of the health care team (Goldblatt 2009).

MT use is widespread in the US, and is increasingly viewed as part of integrative health care. This is due to a rapidly expanding evidence base (Moyer & Dryden 2012, Moyer et al. 2009) and MT’s popularity for treating common health complaints. A 2007 National Institute of Health (NIH) survey of US adults found that MT was the the number one out-of-pocket practitioner-based expense and the second most commonly used practitioner-based CAM therapy -- nearly equalling the volume of chiropractic/osteopathic care (Barnes 2008). A 2009 survey by the American Massage Therapy Association (AMTA Massage Therapy Industry Fact Sheet 2009) found 97% of recipients agreeing that MT should be considered a part of health care.

Studies show that patients frequently do not limit themselves to a single modality of care—they do not see conventional (allopathic) medicine as being mutually exclusive—and this pattern will probably continue and may even expand as evidence of therapies’ effectiveness accumulate (IOM 2005). Chiropractic, massage, acupuncture and Asian medicine, midwifery, and naturopathic medicine were in common use before national surveys documented their sizable footprint within the US health care delivery system (Goldblatt 2009).

In the state of Washington, MT has played a role in integrative health care since 1988, with massage therapists delivering care in numerous settings, including private practice, wellness centers, physicians’ offices, and hospitals, and receiving reimbursement through the Department of Labor and Industries and third party payers. Nationally, when patients discuss massage with their health care providers, 52% of physicians, 50% of chiropractors, 49% of physical therapists, and 26% of nurses strongly recommend massage (AMTA Massage Therapy Industry Fact Sheet 2012). MT is frequently used in conjunction with other health care professions, such as physical therapy and chiropractic care. (Cherkin et al 2002; Maiers et al 2010), and physicians in WA state prescribe MT for a broad variety of orthopedic, pain, and mental health conditions. Massage therapy codes typically reimbursed in WA include the CPT codes for physical medicine and rehabilitation: 97010, 97112, 97124, 97140 (AMA 2012). With the emphasis on group health care and community programs, this could expand to include: 97150. It is also important to grasp the broad scope that health care providers rely on massage therapists to treat. To best express that, attached is a list of all the diagnostic codes in rank order from one busy medical massage practice, Mayo Therapy Associates, listing the ICD-9 diagnostic codes included on physician and other health care prescriptions for massage therapy services (Appendix A).
The Affordable Care Act (ACA) supports the integration of MT into state-regulated insurance plans, both in its definitions of health care practitioners, and in its definition of Essential Health Benefits (EHBs). Two sections provide for MTs as practitioners:

- Section 2706: Non-discrimination with respect to licensed or certified providers acting within their scope,
- Section 3502: Establishing community health teams that include CAM practitioners (ABMP 2010)

Of the 10 EHBs specified in the Affordable Care Act, MT has shown substantial benefit in three primary categories:

“5. Mental health and substance use disorder services, including behavioral health treatment”

“7. Rehabilitative and habilitative services and devices”

“9. Preventive and wellness services and chronic disease management”

This document will summarize the high-quality evidence for MT’s effectiveness in treating medical conditions and populations pertaining to each EHB. These summaries were compiled primarily from systematic reviews, research syntheses, meta-analyses, research texts and larger clinical trials. Excluded were small trials, small pilot studies, case reports, protocol studies, and editorials. The only exceptions are studies cited in a recent scholarly textbook “Massage Therapy: Integrating Research & Practice” (Dryden & Moyer, 2012), which was treated as a research synthesis.

(For the Ecology of Massage Therapy Research in the United States, see Appendix B. For a list of citations for each section, see Appendix C, specific subheadings therein.)

(For a list of Introduction citations see 1-8 in Appendix C).

**EHB: “5. Mental health and substance use disorder services, including behavioral health treatment”**

- **Anxiety & Depression**
  
The effect of MT on anxiety has been researched more than any other outcome. MT has been shown to reduce both “State Anxiety” (current level of anxiety) and “Trait Anxiety” (the tendency to become anxious) in both adults and children (Moyer et al 2004, Dryden & Moyer 2012).

  Drawing from 21 randomized controlled trials (RCTs) and 1,026 adult subjects, Moyer et al. (2004) found a “small to medium” statistical effect on state anxiety from a single dose of MT. The same single dose appears to have a stronger effect in children, as seen across four RCTs using 81 total pediatric subjects, showing a “medium to large” statistical effect. In children, the single-dose effect also increased in strength with multiple doses, possibly due to increased comfort with the treatment environment and the practitioner administering treatment. The effect of multiples doses of MT on Trait Anxiety also appears to be strong, yielding a “medium to large” statistical effect across seven RCTs that studied 194 total participants (Moyer et al 2004, Dryden & Moyer 2012).
Depression is “consistently and substantially” reduced by multiple doses of MT, as seen in 10 RCTs totalling 249 participants, and showing that recipients of MT had a lower average post-treatment level of depression than 73% of control group participants. This was a “medium” statistical effect (Moyer et al 2004, Dryden & Moyer 2012).

The US Agency for Healthcare Research and Quality (AHRQ) found that in 2007, anxiety and mood disorders accounted for $36.8 billion in medical spending and affected 11.8% of adults ages 18 and older (Soni 2010). A 2007 study of US health care costs found “Depression/Anxiety” to be the 6th most costly disease from 2003-2007. (Harvard University 2007). The use of MT as an adjunct to counseling and medication may improve outcomes and reduce costs for these widespread and expensive conditions.

(For a list of Anxiety and Depression citations see 22-84 in Appendix C).

- Sexual Abuse Recovery & Post-Traumatic Stress
  Trauma from sexual abuse, and trauma disorders in general, involve symptoms of dissociation, avoidance behaviors, physical discomfort, and emotional stress (Dryden & Moyer 2012). Clinical research into trauma disorders emphasize the importance of re-connecting with the body (“dissociation reduction”) in creating positive health outcomes (Van der Kolk 2001 and 2006).

  Currently only a small number of studies (Field et al. 1997, Price 2005; Price 2006; Price 2007) have investigated MT as a treatment for sexual trauma, and all with women participants. These studies show reductions in anxiety and depression, dissociation, and physical symptoms, and (from high retention rates and qualitative interviews) suggest a high level of satisfaction with MT as a treatment option (Dryden & Moyer 2012).

  Briere and Eliot (2003) estimate that the childhood prevalence of sexual trauma is 14% for males and 32% for females. Kessler et al. (1995) report that approximately 1 out of every 10 women experiences sexual assault, and the rate for military women is 1 in 4 (Sadler et al., 2000). The prevalence of PTSD leads to tremendous societal costs, including increased risk of teenage childbearing, marital instability, unemployment, and dropping out of high school or college (Kessler 2000). Medical costs are also “remarkably high”. It is the most costly anxiety disorder to treat (Marciniak et al. 2005), reflecting, in part, the higher utilization of medical services by patients with PTSD (Tagay et al. 2005)” (Dryden & Moyer 2012).

  Future research is needed to determine the degree of benefit from MT, and to specify the best dosing and treatment parameters for different populations of trauma sufferers. The nature of sexual abuse recovery and trauma suggest that MT should be prescribed in tandem with other therapies for the safest and most effective treatment.

(For a list of Sexual Abuse Recovery and Post-Traumatic Stress citations see 85-124 in Appendix C)
Scars

Scars are the end product of certain tissue repair, caused by damage from mechanical trauma, surgical incision, burns, chemicals, or electricity. Scar tissue has different composition and behavior than surrounding tissue and can be associated with movement restriction, pain, chronic inflammation, and negative psychological state (Arabi et al. 2007; Edgar and Breeton 2004).

MT has long been used on scar tissue, with the intent of normalizing the tissue quality, mobilizing the scar, and decreasing pain/inflammation in the area. Several mechanisms for MTs effectiveness have been proposed, such as mobilizing/softening collagen, breaking down adhesions with underlying tissue layers, and displacing the fluid that caused the elevated scar. While plausible, these theories have not been rigorously tested (Dryden & Moyer 2012).

Only seven studies have directly investigated the use of MT on scars, and all have focused on burn scars. Four RCTs with 30 patients or fewer found positive effects on pain, pruritus (inflammatory itching) and anxiety/mood (Hernandez-Reif et al 2001; Palatino et al 1999; Field et al 1998; Silverberg et al. 1996). MT’s effect on tissue pliability and vascularity were inconsistent across the studies (Dryden & Moyer 2012).

The applicability of MT’s effectiveness on scars in general is limited, however, the positive effects on pain and anxiety/mood seen in other clinical domains of MT research are reinforced here, and may be an important component of scar treatment.

(For a list of Scar citations see 129-154 in Appendix C)

Athletic Injury and Post-exercise Recovery

MT for several orthopedic and pain conditions is summarized in other sections. However, it is worth addressing the role of MT in athletics in general, given the high and increasing popularity of this intervention (Galloway and Watt 2004). Reasons for seeking MT include pain reduction, improved flexibility, and facilitated recovery. However, many of these claims have yet to be confirmed in this domain (Callahan 1993), and the settings, applications, and intents of MT for athletes is so varied that research has yet to focus on these individually (Dryden & Moyer 2012).

A recent literature review by Howatson and van Someren (2008) states that MT is beneficial in alleviating delayed-onset muscle soreness (DOMS). The mechanism is not confirmed, though some combination of neural, mechanical, and chemical change post-MT has been proposed. Short-term muscle length and flexibility has been shown alterable by MT, but the advantage of increased muscle length on athletic performance and injury recovery depends on the specific demands of the sport and nature of the injury (Dryden & Moyer 2012).
Some limited evidence exists for the improvement of muscle performance post-exercise and MT. In a recent RCT of 52 adults, Brooks et al. (2005) took baseline, post-exercise, and post-intervention measurements of grip strength, and found MT to outperform both placebo and nonintervention in post-fatigue grip strength. The duration of this effect is unclear, and many more activity-specific MT studies are suggested (Brummitt 2008).

(For a list of Athletic Injury and Post-exercise Recovery citations see 155-216 in Appendix C)

● Post-Operative Recovery

Over 48 million inpatient surgical procedures are performed annually in the US (Fast Stats: Inpatient Surgery, Centers for Disease Control and Prevention, last updated May 2012). This does not account for less invasive procedures that allow patients to recover at home. Additionally, major surgical interventions are on the rise. Knee replacement surgeries, for example, are expected to increase by nearly 700% between 2005 and 2030 (Kurtz 2007). This increase is anticipated in part due to people living 25% longer and are more physically active, yet 20% heavier than decades ago (Crowninshield 2006).

Inpatient and outpatient surgical patients often experience pain, distress, anxiety, poor sleep quality, nausea and fatigue. Routinely, patients report mild to moderate pain even with the use of pain medications. More importantly, the unpleasantness of the pain persists, even though the level of pain itself is lessened (Mitchinson 2007).


Two recent studies have used a crossover design to investigate the use of focused MT in a post-operative rat model. Bove & Chapelle (2012a) showed that a blinded massage therapist can lyse and prevent post-operative organ adhesions in a rat model. The subsequent paper (2012b) also showed a reduction in post-operative ileus (digestive sluggishness), which is a widespread and costly ailment of abdominal surgical patients.

While the surgical procedures and the patient populations in these studies vary, the post-operative symptoms are similar and consistently unrelieved through conventional treatment. Pain and its unpleasantness persist, anxiety is prevalent, nausea and poor-quality sleep are commonplace. The evidence consistently points to the positive effects of MT, regardless of the surgical procedure or the population.
EHB: “9. Preventive and Wellness Services and Chronic Disease Management”

- Headache
  According to the Centers for Disease Control, about 10% of all men and almost 22% of all women experience a migraine or severe headache within a typical three month period (CDC MMWR Weekly December 3, 2010 / 59(47);1557). Headache is an expensive disorder: up to one-third of all neurologists’ consultations are because of headaches – more than any other complaint (World Health Organization Headache disorders Fact sheet N°277 March 2004).

  The research on MT as a treatment for headaches is somewhat limited; however “…the available studies show promising results for both tension-type and migraine headaches (Dryden & Moyer, 2012 pg. 120). The research has examined MT as an adjunct or multi-modal treatment option. Research texts have suggested focusing treatment on trigger points for both types of headaches, with specific application to the head, neck and shoulder anatomical regions of the body. The relaxation benefits of massage for the population that lives with headaches have also been noted as a valuable treatment approach. The evidence suggests that both immediate and “long-term benefits” have been observed from a series of MT treatments (Dryden & Moyer, 2012 pg. 122)."

- Neck and Shoulder Pain
  In a review of complementary and alternative medicine (CAM), Hurwitz et al. (2008) determined that massage therapy, among other CAM modalities were just as effective in treating neck pain as conventional (allopathic) medicine. An evidence-based clinical guideline that reviewed ten studies (Brosseau et al. 2012) concludes: “Therapeutic massage can decrease pain, tenderness, and improve range of motion for sub-acute and chronic neck pain.” Research provides evidence for the short term relief of neck and shoulder pain symptoms. Additionally, research suggests that MT may interrupt inflammatory processes contributing to neck or shoulder pain, and the reduction of anxiety from MT treatment may help with underlying symptoms of muscle tension and pain. “The best available evidence for treatment of neck pain includes...Massage Therapy (Dryden/Moyer, 2012, pg. 133).”

  Many multi-study reviews of MT for neck pain have been published recently (Rickards 2006, Harraldson et al 2006, Verhagan 2007), showing modest effects for treating neck pain. Individual studies point to MT’s effectiveness (Sherman 2009, Vassiliou et al. 2006). “Vassiliou and colleagues... found that the MT group significantly outperformed [neck pain improved] ...at the a 6-month follow-up Dryden & Moyer 2012 pg. 131-32).” These positive treatment effects are consistent with the conclusions reached in a Cochrane review by Furlan and colleagues (2009).

(For a list of Post-Operative citations see 217-235 in Appendix C)

(For a list of Headache citations see 509-573 in Appendix C)

(For a list of Neck and Shoulder Pain citations see 574-621 in Appendix C)
• **Low Back Pain**

Americans spend at least $50 billion each year on low back pain. It is the most common cause of job-related disabilities (NINDS Low Back Pain Fact Sheet, last updated September, 2012). The number one reason people seek CAM therapies including MT is for back pain (Barnes 2007).

A recent Cochrane review (Furlan et al. 2008) reviewed 13 trials of MT for low back pain (LBP). Two of these trials found MT to be more effective than a sham treatment on pain and function. Another had lasting effects at the one year followup. Furlan and colleagues concluded in the 2008 Cochrane review: “massage was superior for pain and function on both short- and long-term followups. Massage was...superior to joint mobilization, relaxation therapy, physical therapy, acupuncture and self care education.” In addition to the clinical effectiveness, MT for LBP has been found to be “a safe therapeutic modality with few risks or adverse effects (Dryden & Moyer 2012, pg. 140).”

The evidence shows that MT provided by trained massage therapists for chronic, subacute and nonspecific LBP will alleviate pain, reduce swelling and increase function (Dryden & Moyer 2012). The American Pain Society and the American College of Physicians (Chou & Huffman 2007) recommend MT as a nonpharmacological treatment for LBP. 

*(For a list of Low Back Pain citations see 622-674 in Appendix C)*

• **Fibromyalgia**

“Fibromyalgia Syndrome (FMS) is characterised by widespread muscle aches and pain lasting more than 3 months.” (Dryden & Moyer, 2012). Many other symptoms and conditions commonly accompany FMS, including difficulty with cognitive function, fatigue, depression/anxiety, and headaches to name a few. Fibromyalgia affects as many as 5 million Americans ages 18 and older. About 80-90 percent of people with fibromyalgia are women (Fibromyalgia Fact Sheet, Office of Women’s Health, U. S. Department of Health and Human Services, last updated June 2010).

Lemestra and Olszynski (2005) found that the massage group had less pain and depressed mood and an improved self-perceived health status, compared to the control group after the 6-week intervention period. Both connective tissue massage and manual lymph drainage improved symptoms, and the majority of these benefits were observed after the 15-month follow-up (Ekici et al. 2009).

Much of the research demonstrating MT as an effective treatment for FMS can be found in the areas of pain (Zautra et al. 2010), and depression/anxiety and central nervous system research (Mataran-Penarrocha et al. 2009).

*(For a list of Fibromyalgia citations see 675-756 in Appendix C)*

• **Cancer**

Research on cancer and MT has more than 60 studies that provide evidence for the safety and feasibility of massage treatment for both adults and children across the cancer experience spectrum (Dryden & Moyer 2012). Well-known cancer symptoms and side effects of treatments include pain, anxiety, fatigue, depression, sensitivity to touch, nausea, headaches, lightheadedness, muscle tenderness, and general malaise.
The Society for Integrative Oncology recommends massage as a treatment for cancer pain and anxiety, with precautions at certain anatomical sites. Many recommendations come from the research about how to modify the treatment application, intensity and duration. One example is MacDonald (2007) who suggests that working gently, with slow, light strokes for a shorter session time would benefit cancer patients with treatment side effect symptoms.

The strongest and most consistent evidence of symptom reduction is seen in anxiety and pain from single doses of MT given to adults (see anxiety section). Several longitudinal studies also report pain reduction over multiple doses of MT, and a reduction of analgesic use after receiving massage. Similar effects are seen in children, although the pediatric studies are few, and often have low statistical power (Dryden & Moyer 2012).

A 2007 study of health care expenditures estimated that Cancer costs the US between $62 billion in direct medical costs and up to $269 billion annually with the inclusion of indirect costs, such as work cessation and household assistance (Dryden & Myer 2012). MT may play a vital role in the reduction of symptoms, general support and in lowering indirect costs in patients with cancer.

Below is a table with recent studies that showed a positive effects of MT on the specified cancer symptom:

<table>
<thead>
<tr>
<th>Adults with Cancer</th>
<th>Positive Effect of Massage</th>
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<tbody>
<tr>
<td><strong>Symptom</strong></td>
<td></td>
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</tbody>
</table>
Fatigue


(Dryden & Moyer 2012)

Below is a table with recent studies that showed a positive effects of MT on the specified symptom:

<table>
<thead>
<tr>
<th>Children with Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptom</strong></td>
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</table>

(For a list of Cancer citations see 757-834 in Appendix C)

- **Temporomandibular Joint Disorder**
  
  Temporomandibular joint disorder (TMJD) is a group of conditions that impair the function of the the jaw and the muscles surrounding it, leading to popping, locking, and pain with chewing or speaking. TMJ disorders may affect over 10 million Americans; the conditions appear to be more common in women than men (TMJ (Temporomandibular Joint and Muscle Disorders), National Institute of Dental and Craniofacial Research, last updated January, 2012). Per Washington Administrative Code (WAC) massage practitioners with the intraoral endorsement have within their scope of practice to provide treatment to the intraoral musculature, an anatomical site often associated with TMJD.

  In a 2003 survey of TMJD patients, Debar and colleagues (2003) reported MT as the most frequently utilized and helpful treatment application. Kalamir and colleagues (2007) state that “recently has manipulative [soft tissue] therapy been considered by the wider medical field as a standalone treatment, or alternative to otherwise irreversible intra-articular lavage and surgical techniques (pg. 86).” Two studies showed significant success in the treatment of TMJD through combined muscle treatments such as massage, electro-physical therapies (EPT), mobilization, biofeedback and jaw exercise (Michelotti et al., 2000; van der Glas et al., 2000). Further, Nicolakis et al. (2001) reported that TMJD patients treated with “passive and active exercises, manual therapy, postural correction and relaxation techniques resulted in statistically significant improvements in pain, impairment and range of motion within the treatment group.” This group (2002) also reported on a long-term follow-up study that demonstrated continued success.

(For a list of TMDJ citations see 835-842 in Appendix C)
- **Osteoarthritis**
  
  By the year 2020 researchers estimate that more than 50 million Americans will have osteoarthritis (OA) (Elders 2000, Lawrence et al. 1998). Osteoarthritis will be the most prevalent chronic condition in the older adult population (Arden et al. 2006, Felson 2004). According to Kato et al. (2004), despite conventional treatment, OA often progresses and leads to chronic pain and disability. Another concern is the potential toxic effects of drugs used to treat OA (Matchaba et al. 2005, Naesdal & Brown, 2006).

  The evidence for treating OA with MT can be found in many areas of research including musculoskeletal conditions (Ernst 2002, Preyde 2000). In a seminal trial specifically studying the therapeutic effects of MT on OA, Perlman and colleagues (2006) found the group that received MT demonstrated significant improvements in the mean (SD) WOMAC pain, stiffness and functional scores and in the visual analog scale of pain assessment, range of motion in degrees and time to walk 50 ft. According to Perlman and colleagues (2006) “The total cost of OA was estimated at $60 billion in 2004” (pg. 2533) and this figure is sure to increase with the aging baby boomer population.

  *(For a list of Osteoarthritis citations see 843-857 in Appendix C)*

### Emerging Evidence with High Clinical Value

The evidence has not yet caught up with clinical experience in many areas, including but not limited to: fall prevention and balance, insomnia, constipation, and dementia in the older adult population, addiction, dosing, cost effectiveness, multiple chronic conditions, self-care compliance, therapeutic environment, and relational aspects of healing. Included in this section’s corresponding references are a few smaller studies and related literature that are beginning to address conditions and situations massage therapists face in regularly clinical practice.

For example, ankle flexibility is critical to balance and massage therapy has been shown to be effective in improving range of motion. Many cancer, post operative and studies investigating the older adult population use sleep as a measure. Massage therapy has been effective in improving restful sleep. Agitated behavior is a critical issue in dementia; massage therapy has emerging evidence of calming, reducing repetitive movements and wandering.

New to MT research is the inquiry into contextual effects and the benefits of practitioner-patient relationships and the clinical setting in which care is provided. Dan Cherkin, PhD, commented on the current discrepancy between patient values and measured outcomes:

> “Our analysis identified a range of positive outcomes that participants in CAM trials considered important but were not captured by standard quantitative outcome measures. Positive outcome themes included increased options and hope, increased ability to relax, positive changes in emotional states, increased body awareness, changes in thinking that increased the ability to cope with back pain, increased sense of well-being, improvement in physical conditions unrelated to back pain, increased energy, increased patient activation, and dramatic improvements in health or well-being” (Hsu et al 2010).”
Critical to this project is an understanding of the environment within which this data collection is possible. Massage therapy research, before the national surveys documented the extent of the use of CAM services by the US consumer, was limited. Further, massage therapists were not included in the studies as investigators, consultants, or practitioners providing the MT interventions. The findings of these surveys, especially the landmark study by David Eisenberg in 1993, documented that Americans were scheduling millions of office visits to CAM providers at a cost of tens of billions of dollars, most of which was paid for out of pocket, and confirming that the majority of these patients do not disclose or discuss the CAM use with their primary care providers (Goldblatt 2009). Since then, the number of studies on massage therapy is on the rise, and the study hypotheses address issues that efficacy is practical and meaningful to the practice of MT (effectiveness) in the role of integrative medicine (See Ecology appendix B).

(For a list of Emerging Evidence citations see 988-995 in Appendix C)

Conclusion: Massage Therapy and the Affordable Care Act

Massage therapy, according to the consumer, is an essential health benefit. As stated previously, massage is the number one out-of-pocket practitioner-based expense of all CAM therapies and the second most-used practitioner-based CAM therapy (Barnes 2008). While the evidence is catching up with what the consumer knows and the practitioners address on a daily basis, the insurance industry must decide what is effective, cost effective, safe, and non-invasive. Many health issues are addressed by massage therapy that result not only in improved quality of life, satisfied patients, but in reduced hospital visits, surgeries, and missed work. Massage therapy is a necessary component of health care and an essential health benefit as defined in the Affordable Care Act.

1. 724.5 Bachache, NOS 2,094
2. 723.1 Cervicalgia (Neck Pain) 1,971
3. 728.85 Spasm of Muscle 1,412
4. 847.0 Strain/Sprain, neck, whiplash injury 1,342
5. 729.1 Myalgia and myositis, unspecified 1,243
6. 724.2 Low Back Pain (lumbago) 663
7. 847.2 Lumbar Strain/Sprain 638
8. 724.1 Pain in thoracic spine 329
9. 739.1 Segmental/somatic dysfunction, cervical region 304
10. 739.2 Segmental Dysfunction, Somatic Dysfunction, Thoracic 257
11. 847.1 Thoracic Strain/Sprain 248
12. 719.41 Pain in Joint - Shoulder region 241
13. 846.0 Strain/Sprain: Lumbosacral Joint/Ligament 198
14. 729.5 Pain:Arm/Leg 150
15. 719.45 HIP PAIN 137
16. 355.0 Piriformis Syndrome 120
17. 724.3 Sciatica, neuralgia or neuritis of sciatic nerve 120
18. 840.8 Trap. strain 111
19. 307.81 Psychalgia - Tension Headaches 94
20. 722.10 Lumbar intervertebral disc w/o myelopathy 70
21. 715.90 CERVICAL DID 62
22. 724.4 Thoracic or lumbosacral Neuritis or radiculitis 61
23. 840.9 ST/SP USP Shoulder/Upper Arm 59
24. 719.49 PAIN IN JOINT MULTIPLE SITES 56
25. 739.3 Lumbar Region- Segmental/Somatic Dysfunction 53
26. 784.0 Pain: Fascial, head, hadache 53
27. 728.89 Other disorders of muscle, ligament, fascia (Inc ITB Synd4ro7me)
28. 723.3 Dx 43
29. 739.0 Dx 43
30. 784.92 DX 43
31. 726.10 Rotator cuff 26
32. 739.4 Segmental, Somatic Dysfunction, Sacral 26
33. 346.90 Migraine 25
34. 844.0 Knee sprain/strain 25
35. 721.0 Cervical spondylisis without myelopathy 24
36. 729.4 Laxity of ligament 22
37. 843.8 HAMSTRING STRAIN 22
38. 722.73 Disc disorder 21
39. 782.0 NUMBNESS 17
40. 726.1 Rotator Cuff Syndrome, shoulder 16
41. 847.9 BACK STRAIN 16
42. 874.2 Lumbar strain 16
43. 715.09 Dx 15
44. 719.46 Knee pain 14
45. 847.3 Sprain sacrum 14
46. 850.0 Concussion w/o loss of consciousness 14
47. 719.58 C/T/L JOINT STIFFNESS 13
48. 737.30 SCOLIOSIS 13
49. 844.9 ST/SP of Knee or Leg 13
50. 726.31 Enthesopathy of elbow - medial epicondylitis 11
51. 733.5 OSTEITIS CONDENSANS 10
52. 339.12 TENSION HEADACHE 9
53. 726.90 Tendonitis, elbow 9
54. 646.80 PREGNANCY 8
55. 524.60 TMJ 7
56. 723.5 TORSION 7
57. 724.79 COCCYDYNIA 7
58. 728.71 PLANTAR FACIITIS 7
59. 844.2 ACL TEAR TRAUMATIC 7
60. 648.73 Bone and joint disorders of back pelvis and lower limbs of 6mother antepartum
61. 719.55 Stiffness of joint - hip 6
62. 842.10 Sprain of unspecified site of hand 5
63. 719.50 Stiffness in Joint - NOS 4
64. 737.39 Scoliosis, Other 4
65. 722.0 Displacement of cervical intervertebral disc w/o myelopathy 2
66. 723.4 Brachia neuritis or radiculitis NOS (Cervical) 2
67. 839.20 Lumbar Vertebra, closed 2
68. V22.1 Pregnancy 2
69. 722.93 Disc disorder of; lumbar region 1
70. 780.52 INSOMNIA 1
71. V23.81 SUPERVISION OF HIGH RISK PREG 1
72. XXX1 First no show 1

*(count based on charge primary diagnosis)
Ecology of Massage Therapy Research in the United States

The profession as licensed, designated health care is still relatively in its early decades, and the profession’s knowledge leaders and educators have evolved into a substantially funded sector - career seekers experience greater opportunities for formalized education, and therapists can engage in higher-level training; both answering to increasing demands for evidence. This Appendix describes the most recent ecology of Massage Therapy research in the United States as provided by data extracted from PubMed for the years listed on the date listed (using KNALIJ, a visualization tool, see bottom).

The three sections are: 1) Number of Studies listed in PubMed, 2) General Categories of Studies published, and 3) Federal Funding Impact on the profession.

Number of Studies by Year

Number reported falling into the general category of Massage Therapy, 2006 to 2012: 875
Number reported by PubMed relating directly about Massage Therapy/Pain, 2012: 126
Number reported by PubMed relating directly about Massage Therapy, 2011: 233

General Categories

<table>
<thead>
<tr>
<th>Category, latest published year</th>
<th># of Studies*</th>
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<tbody>
<tr>
<td>Pain Management studies, 2011</td>
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<tr>
<td>Physical Therapy tie-in, 2011</td>
<td>40</td>
</tr>
<tr>
<td>Health Knowledge, Attitudes, Practices, 2010</td>
<td>30</td>
</tr>
<tr>
<td>Complementary Therapies, 2011</td>
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<td>Quality of Life, 2011</td>
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<tr>
<td>Attitude of Health Personnel, 2011</td>
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<tr>
<td>Patient Satisfaction, 2011</td>
<td>14</td>
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<td>Patient Relations, 2011</td>
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<td>Attitude to Health, 2010</td>
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<td>Nurses Role, 2011</td>
<td>12</td>
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<tr>
<td>Exercise Therapy tie-in, 2010</td>
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</table>

* Number of published studies limited to category with 10 or more available via PubMed.

Federal Funding Impact

<table>
<thead>
<tr>
<th>Federal Department, year</th>
<th># of Studies*</th>
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<tr>
<td>NCCAM, 2011</td>
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<td>NIMH, 2011</td>
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<td>NHLBI, 2011</td>
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<td>NCI, 2011</td>
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<tr>
<td>NCRR, 2011</td>
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<td>NICHD, 2011</td>
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<td>NIAMS, 2011</td>
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<tr>
<td>NIDDK, 2011</td>
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</tr>
<tr>
<td>PHS, 2011</td>
<td>17</td>
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<tr>
<td>AHRQ, 2011</td>
<td>14</td>
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<tr>
<td>NINR, 2011</td>
<td>12</td>
</tr>
</tbody>
</table>
* Number of studies limited to departments funding 12 or more available, as listed by PubMed. Note that these indicate only funded studies, and published findings are not necessarily available in PubMed or as yet available. For example, Dr. Perlman’s Massage Therapy/Osteoarthritis study funded by NCCAM has a Primary Estimated Completion date of 2015.

Disclaimer: data extraction from such a database has language and MeSH limitations, and this data may include multi-modal studies (massage and moxibustion) or may be missing studies of physical therapists doing soft tissue work allowed in their region/scope that are also a Massage Therapists’ scope.

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KNALIJ “is an exploration engine for all types of Internet information. KNALIJ is the next generation of knowledge discovery. It provides a dynamic visual interface for understanding and sharing the connections and relationships in large amounts of information.” KNALIJ was presented with the Most Innovation Award from the National Institutes of Health in Bethesda in November 2011.

The extraction tool groups the data based on pre-defined sets or user request, and contains such options as a timeline of published data or by sheer number or category.
Appendix C

List of Citations Displaying Evidenced-Informed Massage Therapy

Citations from Introduction

1. ABMP (2010). A comment on the prevention strategy of the national prevention, health promotion, and public health council.

Mental health and substance use disorder services, including behavioral health treatment


Anxiety & Depression

50. High blood pressure and associated symptoms were reduced by massage therapy. *J Bodyw Mov Ther*, 4, 31-8.

Sexual Abuse Recovery & Post Traumatic Stress


Rehabilitative and Habilitative Services


Scars


**Athletic Injury and Post-exercise Recovery**


21 | Page


Post-Operative Recovery


232. “Massage therapy is an effective technique for improving patient recovery from cardiopulmonary artery bypass graft surgery because it reduces fatigue and improves sleep.”


237. Anscher MS, Prosnitz LR. Postoperative radiotherapy for patients with carcinoma of the prostate undergoing radical prostatectomy with positive surgical margins, seminal vesicle involvement and/or penetration through the capsule. J Urol 1987;138:1407–12


Cardiac Autonomic Tone


337. Cha K et al. 1995 Multi frequency bioelectrical impedance estimates the distribution of body water. Journal of Applied Physiology 79: 1319

27 | Page
365. Harris R 1992 The Vodder method, an introduction to manual lymph drainage. Massage Therapy Journal 31: 1
385. Karges JR: Assessing the relationship between water displacement and circumferential measurements in determining upper extremity volume in women with lymphedema. krannert School of Physical Therapy, university of Indianapolis, Indianapolis, USA, 1996
441. Pillen NB, Harris R 2002 Objective measurement of the effectiveness of a single session of manual lymphatic drainage on primary and secondary lymphoedema of the lower leg. Lymphology 35(Suppl) : 289–292


Preventive and Wellness Services and Chronic Disease Management


490. “Studies of qigong, massage and tuina were demonstrated to have positive effects...”


495. “Chiropractic care was the least preferred option, whereas massage therapy was the most preferred (75% and 96%, respectively).”


498. “A beneficial role for massage therapy in pediatric asthma is suggested. It improved the key pulmonary functions of the children, namely, FEV1 and FEV1/FVC ratio.”


503. “There is some evidence to support the use of massage therapy to improve quality of life for people living with HIV/AIDS (PLWHA), particularly in combination with other stress-management modalities, and that massage therapy may have a positive effect on immunological function.”


506. “...the reduction in pain with massage was both statistically and clinically significant, and the massage-related effects on relaxation were sustained for at least 16-18 hours postintervention. ...Overall, results from this study support employing MT as an adjuvant to other therapies in improving bone pain management.”


Headache


516. "The RCTs suggest that massage therapy, physiotherapy, relaxation and chiropractic spinal manipulative therapy might be equally effective as propranolol and topiramate in the prophylactic management of migraine."


Neck and Shoulder Pain


Among Adults With Back and Neck Problems.


Low Back Pain


randomized controlled trial. Effects of myofascial release techniques on pain, physical function, and postural stability in patients with fibromyalgia: A qualitative and quantitative 1 year follow-up of a randomized controlled trial. 


"Myofascial release techniques improved pain and quality of life in patients with fibromyalgia." 


Fibromyalgia


694. “The results suggest that myofascial release techniques can be a complementary therapy for pain symptoms, physical function and clinical severity but do not improve postural stability in patients with fibromyalgia syndrome.”


30. "The reviews found some evidence of beneficial effects arising from acupuncture, homoeopathy, hydrotherapy and massage, whilst no evidence for therapeutic effects from chiropractic interventions for the treatment of FM symptoms was found." 


Cancer 


763. “...massage therapists routinely have the opportunity to examine high risk anatomic sites, such as the back or legs, on many patients...massage therapists can play an important role in the early detection of skin cancer.”


Osteoarthritis


Older Adults


Emerging Evidence & Conclusion