Manual Osteopathy Treatment:

Natural Analgesic Pain Management for the Reduction of Prescription Painkiller Dependency

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Author Note:
On my honor, I assert that this paper is submitted solely with my preparation for it, and I further assert that the content and analysis is my original work, and supporting research is properly documented and formatted using APA citations and references.

Abstract:

Background: There are worldwide variations in the clinical use of manual osteopathic treatment methods and guidelines continuing to advance the profession and be proven scientifically on an empirical basis that is not widely known to the general public that often rely on western medicine as a first line of defense in chronic pain management. These western interventions for pain management may have addictive qualities, debilitating effects, may be invasive and can cause increasingly more pain and harm to the human body, affecting its natural state of homeostasis. Osteopathy applies natural science and medicine to treat the entire human body's frame, which includes the joints, muscles, and spine in order to achieve a state of homeostasis for the nervous, circulatory, and lymphatic systems through traditional medicine and noninvasive therapies. The human body is capable of achieving a balance of safe pain management, natural healing, and restoration from many illnesses through Manual Osteopathic Treatment (MOT) that stimulates the release of natural neurotransmitters and other chemicals that have powerful, pure, and natural analgesic effect that can mitigate the need for invasive procedures and potentially harmful pharmaceuticals, preventing patient addiction and/or managing chronic pain in patients with histories of addiction.

Study Design: This thesis provides a Systematic Qualitative Research Review of meta-analysis studies and statistics that assesses the efficacy of MOT's natural analgesic ability as a non-narcotic pain management protocol for the treatment of pain in the human body's frame to achieve a pain free state of homeostasis for the body's nervous, circulatory and lymphatic systems to prevent patient addiction and/or manage chronic pain in patients with histories of addiction.

Methods: A computerized literature search, citation tracking, and hand search were carried out up to December 2015. Eligible studies were metadata studies, published and peer reviewed studies, and randomized-controlled trials describing patients recovering from pain symptoms that involved MOT treatment.

Results: Empirical scientific data exists to demonstrate the efficacy, fiscal, physical, professionalism, psychological, and safety of Manual Osteopathic Treatments (Manual/ European) in treating pain to avoid addiction and/or help manage pain in clients with histories of addiction.

Conclusion: Manual Osteopathic Treatment is a very safe, effective, and practical protocol to manage chronic pain for patients, especially those with histories of addiction, fear of addiction, or contraindication of painkiller medication(s) in their treatment plan.

Keywords: *Manual Osteopathic Therapy, Manual Osteopathic Treatment, MOT, Osteopathic, osteopath, osteopathy, osteopathic model of pain management, non-prescription pain management, human analgesic ability, osteopathy for addiction, evidence based osteopathic manual pain management,* β-endorphins, adenosine, endocannabinoids, endogenous opioids, oxytocin, serotonin, and vasopressin.

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Overview

Despite increased access to medicine in the United States with the Patient Protection and Affordable Care Act (PPACA), and the Canadian Health Insurance Act of 1984 which provides socialized health insurance access in Canada; pain management in North America is still poorly managed as one in four (1 in 4) Americans (NCHS, 2006) and one in five (1 in 5) Canadians (Lynch, 2011) suffer from chronic pain. The estimated medical costs from the two (2) most common cases of chronic pain: back and neck increased by sixty-five percent (65%) between 1997 and 2005, to $86 billion a year (IOM, 2011). Lower back pain is also estimated to impact the economy at an annual direct medical cost of $30 billion in the United States, not including $100-200 billion in lost wages and work place productivity (Martin et al., 2008). In addition to the monetary costs, the American Society of Anesthesiologists estimates that at least ten percent (10%) of the worlds population (60 million people) suffer from chronic pain resulting in a large increase in opiate, narcotic, and benzodiazepine prescriptions worldwide with high increases in overdoses and mortality (Jackson, Stabile, & McQueen, 2014). Manual Osteopathic Treatment (MOT) offers a holistic and cost effective approach that benefits the nervous, circulatory and lymphatic systems without introducing extremely addictive and dangerous ***"painkillers"*** (CDC, 2014) such as benzodiazepines, narcotics, and opiates and benzodiazepines into the body, or subjecting the body to unnecessary invasive surgical procedures.

The actual patient's and the work force/economic costs associated with pain management have been mismanaged by a health insurance industry that excludes non-traditional alternative medicine practitioners which is often very effective as a front line defense that can prevent health conditions (especially chronic pain) from advancing to stages requiring more invasive and complex treatments that cost even more for patients and insurers. Non-traditional medicine, or Complementary Alternative Medicine (CAM) includes European Osteopathic Medicine (Manual Osteopathic Treatment/ Osteopaths), Naturopaths, Physiotherapists, Acupuncturists, Doctors of Medicine in Alternative Medicine (M.D.-A.M.), Massage Therapists, Chiropractors, and other professionally trained, educated, and experienced practitioners treating patients. Western Medicine or Mainstream Medicine often excludes these practitioners forgetting these important philosophical and historical concepts:

1. Pharmaceuticals with analgesic properties of painkillers for management of pain symptoms have high addictive traits and propensities that can lead many people with addictive personalities into a destructive life path of addiction (Jackson, Stabile, & McQueen, 2014; Ballantyne, & LaForge, 2007; Isbell & Fraser, 1950).
2. The father of Osteopathy, Andrew T. Still was a Medical Doctor, M.D., who intended Osteopathy to be limited in the scope of pharmaceutical drugs utilized for patients,

thus deepening the connection between Western Medicine roots, Osteopathy, and CAM (Still, 1910; Hulett; 1903). Dr. Still was deeply concerned about the over use of drugs in medicine and founded Osteopathy to use the human body's very own healing properties to restore itself back to a natural state of homeostasis (Still, 1910).

3. Samuel Hahnemann, a Medical Doctor (M.D.) founded homeopathy, and Benedict Lust, another Medical Doctor (M.D.) who graduated from the Universal College of Osteopathy in New York, and the New York Homeopathic College founded Naturopathy, and was licensed as an Osteopathic physician in New York and a Medical Doctor in Florida (Haehl, 1922; Cook, 1981; Natural Medicine, 2008), further strengthening the roots of CAM, Manual Osteopathy, and Western Medicine.
4. CAM practices such as Manual Osteopathic Treatment (MOT), Chiropractic, massage, and naturopathy, are what the classification calls it "Complementary Alternative Medicine", it ***compliments*** medicine and offers ***alternatives*** to Western medicine when alternatives are available that are in the best interest of the patient, which embraces the **non-malfeasance** concept ("do no harm") used in Western medicine, and ensures that **beneficence** is being provided to patients giving them the safest best practices possible, making the patient's needs the center of focus. Additionally CAM provides a sense of **autonomy** respecting the patient as a whole, being non-judgmental in a safe therapeutic environment to heal where the patient makes decisions based upon the best information available complementing their health with therapies of their choice. Lastly, **fidelity** is remaining committed to our client with honesty, integrity, and their best interest as the practitioner's first priority.
5. Western Medicine and CAM (Chinese acupuncture, Western acupuncture, homeopathy, herbalism, massage, etc.) share many core concepts, roots, and values, in each other, and have shaped each other and helped to evolve each other over the years (Tovey, Chatwin, & Broom, 2007; Bown, 2013 p. 88).

The integration of CAM practices into patient treatment allows Western Medicine and CAM (which the WHO actually considers to be "traditional" (WHO, 2010) medicine) to provide patients with best "clinical" practices of what works from a proven approach, while maintaining a cost effective, balanced, and natural approach to health restoration.

Recognition and Validity of Manual Osteopathy:

The World Health Organization (2010) states that eighty percent (80%) of Germany and seventy percent (70%) of Canada have used traditional medicine under the official classification of complementary and alternative medicine, which includes Manual Osteopathy Treatment. In 2003, the World Health Organization (WHO) endorsed traditional medicine through resolution WHA56.31 *urging all WHO member nations* (of which the United States and Canada are members of) to create policies and regulations to create a national system of credentialing, licensing, and integration of traditional medicine (including MOT) into national health care systems to provide more care and options for their populations (World Health Organization, 2010). Additionally, the WHO established benchmarks or standards of care to ensure consumers (patients) are cared for properly and to guide governmental regulatory agencies on establishing rules, regulations, and

standards for care, education, training, licensing, and practice (WHO, 2010). The American Osteopathic Association published a study evaluating foreign-trained osteopaths MOT techniques concluding that they demonstrated "***efficacy***" and "***Osteopathic manipulative therapy may be preferred over other treatment modalities and may benefit patients who have adverse effects to medications or who have difficulty complying with pharmacologic regimens"*** (Rolle et al., 2014).

Pain Management

Pain can be from minor injuries, traumatic injuries, unhealed or improperly treated injuries, life span development (getting older), body damage, nutritional issues, neurological dysfunctions, or for no reason at all (idiopathic). Pain is classified as acute lasting for a short period no longer than three (3) months, from an injury or tissue damage (Conn, 2005), or chronic lasting at least twelve weeks (12) in duration from onset due to an existing or unknown injury (Merskey & Bogduk, 1994). Acute pain is typically much simpler to manage and chronic pain can be very complex and difficult to manage due to unknown pathology and many coexisting factors that can exist such as disease, infection, failure to heal, and degeneration (Merskey & Bogduk, 1994; Conn, 2005; Turk & Melzack, 1992; Gatchel, 1996; Linton, 2000). ***Pain management*** is a systematic process of alleviating or minimizing acute or chronic pain signals transmitted in the central nervous system that patients suffer from on a persistent basis in order for the individual to continue with everyday functioning and abilities that they had before the disability and pain manifested.

Contributing to pain can be many factors besides the injury or obvious disabilities. Malleson, Connell, Bennett, & Eccleston (2001), found there to be two (2) types of factors that contribute to pain, and will determine how pain manifests, is experienced, and reported by the patient including how it is aggravated: *intrinsic* and *extrinsic* factors. Some of these factors are psychosocial, some are bio-medical but it is important to understand that these factors contribute to the pain experienced by the patient and to their experience during the healing process when determining the appropriateness of various pain management treatments (MOT, Western, CAM, etc.)

Intrinsic Factors Contributing to Pain	**Extrinsic Factors Contributing to Pain**	**Factors Contributing to Addiction**
Pain Threshold- high or low Gender (different hormones) Mobility (hyper v. hypo) Poor Coping Skills Maladaptive Pain strategies Temperament - relaxed, difficult, anxious, anger, etc. Open-mindedness	Prior pain experience Social deprivation Prior physical or sexual abuse Parental Modeling of Pain Social Learning of Pain Sleep Disturbance Decreased Fitness Economics – Social Strain	Child abuse/neglect ** (physical or sexual)* Socioeconomic Status Education Level Deviant Relationships ADD/ADHD PTSD Depression/ Anxiety
(Malleson, Connell, Bennett, & Eccleston, 2001)		(Brown M, 2013)

Western Medical Model of Chronic Pain Management

The common response to pain management, especially chronic idiopathic pain in North American society has been to treat pain symptoms with the reassurance of modern western medicine principles and advances through the patient education on the advances of medicine and technology, analgesic pain killing pharmaceuticals, and then to treat for any reactivation of pain or injury. When medication treatment is prescribed (typically analgesics such as narcotic opiates and benzodiazepines) the medicinal compounds inside the pharmacological agents only temporarily calm the nerves down, rarely giving them time to heal or become less inflamed (Paulozzi, Mack, & Hockenberry, 2014). Narcotics and other analgesics have a great propensity to cause addiction for those who use them, whether prescribed legitimately, fraudulently for false pain, or those bought on the streets and are now considered by many sociological and addictions experts to be the "Gateway to Heroin" (Carey, 2014). The Western Medicine community began creating this heroin and opioid epidemic in a healthcare system that has become overly dependent on pharmaceutical substances to manage pain in a monopolistic system of pain management that caused Americans suffering from chronic pain to consume more than 99% of the hydrocodone supply and 80% of the oxycodone supply in the world by the year 2010 (Gounder, 2013; Carey, 2014).

Western medical treatment often involves pharmaceutical therapies, invasive therapies (nerve blocks), and alternative therapies that have no consensus on optimal treatment protocol or industry standard for managing chronic pain without pharmaceuticals that have the effects that alter the human body's mind and motor skills, impairing patient judgment, which can lead to accidents, further injuries to the original injury, new injuries, or to substance abuse or misuse (addiction) from the over stimulation of neurotransmitters with the pleasure-pain reward principle and the growth of controlled substance tolerance. There have been many problems with Western Medicine's overuse and overreliance of prescription analgesic painkillers for patient chronic pain culminating into the American addictions epidemic (Gounder, 2013):

- From 1998 to 2008, the drug treatment admissions for pain reliever/ painkillers abuse increased by more than 400% (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010).
- Prescription painkillers (a controlled substance by the DEA) became a major contributor to drug related deaths from misuse, abuse, addictions, and overdose (SAMHSA, 2010 [2]).
- It was estimated in 2011, that approximately 100 million Americans suffered from some form chronic pain that impacted their daily lives (Institute of Medicine [IOM], 2011, p.5).
- Chronic Pain has a ***direct annual cost*** of approximately $560-$635 billion annually to patients, insurers, and employers (IOM, 2011, p.5).

A list of the commonly prescribed pain management medications used by Western Medicine is listed below; note the contraindications and side effects of the medications that can prompt new issues for the patient:

Pharmaceutical Compound	Indications	Contraindications
Celebrex/ Celecoxib	• Rheumatoid Osteoarthritis • Acute Pain • Menstrual Pain	Risks of stomach bleeding, stroke, cardiac arrest. Possible harm to liver, kidneys, stomach, digestive tract.
Demerol	• Chronic Pain • Acute Pain • Palliative Care	Very serious side effects can include: • addiction (substance abuse/ dependence) • respiratory depression
Fentanyl (Fentora, Duragesic, Actiq)	• Chronic Pain • Acute Pain • Palliative Care Note: This is strong enough for shrapnel in war & cancer patients.	• Overdose typically comes form respiratory depression. • Death has occurred from handling exposures.
Hydrocodone (Lorcet, Lorcet Plus, Lortab, Norco, Vicodin, Vicoden ES, Vicodin HP)	Opiate classification: natural and synthetic opiates, Considered to be the MOST powerful class.	This is a highly addictive and can be very harmful to the liver. Very serious side effects can include: • addiction (substance abuse/ dependence) • respiratory depression • Acetaminophen in the ingredients harmful to stomach, liver, kidneys, and other organs.
Hydromorphone hydrochloride (Palladone, Dilaudid)	Very comparable to morphine	Very serious side effects can include: • addiction (substance abuse/ dependence) • respiratory depression
Morphine Sulfate (MS Contin, RMS)	4th Most Powerful drug available.	Very serious side effects can include: • addiction (substance abuse/ dependence) • respiratory depression
Oxycodone (Percocet, Percodan, Oxycontin)	Very powerful, very effective	Very serious side effects can include: • addiction (substance abuse/ dependence) • respiratory depression
Ultram/ Tramadol	Moderate Pain	Addictions, constipation, dizziness, drowsiness, headache, nausea, respiratory depression, and vomiting.
Ref: (Invanz, 2012; Porter, Kaplan, & Merck & Co., 2011; Hodgson & Kizior, 2013)		

Addiction in Western Pain Management:

Rosenblun et al., found that thirty-seven percent (37%) of patients in methadone maintenance treatment and twenty-four percent (24%) of patients being treated for an addiction suffered from severe chronic pain that affects normal daily functions causing functional impairment and quality of life. The American Society of Addiction Medicine below defines addiction as:

> "*A primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors. Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships, and a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death"* (American Society of Addiction Medicine, 2015).

This definition is very important as the National Institute on Drug Abuse (NIDA) estimates that approximately 116 million people are suffering from chronic pain in the United States, with up to forty percent (40%) being addicted to prescription medication because of poor medication management, poor invasive procedure outcomes, and primary physician inability to assess substance abuse and addiction (NIDA, 2014).

The NIDA also states "the development of effective, non-addicting pain medications is a public health priority", however the Food and Drug Administration (FDA) in 2014 approved Zohydro for chronic pain management which has five (5) times the immediate analgesic painkilling ability of hydrocodone (Rubin, 2014). The FDA also approved Hysingla, a pure hydrocodone product with 120 milligrams of hydrocodone, despite the FDA's very own clinical warnings that doses of 80 milligrams or higher ***should not*** (not shall not, but should not) be given to patients who have not taken opioids previously, and against the FDA's own ***internal medical review expert committee*** that voted ***against*** the drugs approval (Rabin, 2014). It is important to note "shall" is not used in the warning, which in legal terminology would mean mandatory or compulsory giving medical practitioners some "wiggle room" from litigation avoidance (Black's Law, 2015). Targiniq was also approved in 2014 for pain management in which the main pharmaceutical compounds or active painkilling ingredients contain oxycodone and naloxone, which the FDA, manufacturer, and medical community reported could not be abused due to the naloxone (Narcan) blocking the euphoric effects. It was discovered that when injested orally Targiniq's euphoric blocking component of naloxone doe not infact block the euphoric effects of oxycodone as had in clinical trials when properly administered intravenously into the bloodstream or taken intra-nasally (Fiore, 2014). These are the safe new developments in Modern Western Medicine Pain Management, which if Manual Osteopathy/ European Osteopathy or other CAM specialties proposed to use would have legal sanctions from the FDA for patient endangerment and unsafe patient pain

management practices. Instead of moving away from addictive and harmful properties in pharmaceutical products, the pharmaceutical industry and Western Medicine continues to stay with them attempting to enhance the products with more analgesic properties, and safe guards that can be easily circumvented by abusers afflicted with addiction.

Manual Osteopathic Model of Pain Management & Addictions

The Osteopathic profession has long recognized addiction since A.T. Still's concerns with the American obsession with painkillers that existed in his time (1828-1917) prompting his founding and developing Osteopathy with little or no pharmaceutical intervention to allow natural healing and restoration to homeostasis. Dr. Charles Hulett an early Osteopath, student, nephew, and mentee of Dr. A.T. Still (Still, 1896; Still, 2015), discussed in his book "***Principles of Osteopathy"*** how *"narcomania*" (Hulett, 1903, p.170) was becoming alarmingly observable as a cultural norm in American society with over prescription of drugs, and normal drug use and abuse of substances that included morphine, cocaine, chloroform, tobacco, and other substances. Hulett quoted Dr. A.P. Grinnell an Osteopath colleague also concerned with the narcomania epidemic to describe the socio-political effects: *"sooner or later the reformers of the world have got to divert some of their feverish antipathy to alcoholic stimulants and consider calmly and intelligently the drug evil. The deleterious influence on the individual of all forms of drug addiction and the consequent effect on society"* (Hulett, 1903, p. 170). This early concern of Osteopathic practitioners of addiction from painkillers moved from recognition of the social problem to concern and combatting addiction in society with a preventative model and pain management model for those who suffer from chronic pain. Osteopathy has since advanced their techniques but often forgets about the psychological and sociological abilities to treat the patient suffering with a coexisting disorder (dual diagnosis) of chronic pain and addiction, thus managing the root cause of the patient's psychopathology.

Manual Osteopathy is a natural scientific evidence-based model of approaching, diagnosing, for managing pain and health imbalance that manifest as illness, which in the case of this model chronic pain. It provides a systematic pathological approach based upon the patients complaints, presentation, and symptomology with a comprehensive detailed physical examination that seeks the root cause of the pain or illness to eliminate the cause holistically but ***individually designed*** for each patient's particular case. Manual Osteopathic Therapy procedures effectively treat somatic pain dysfunction from injuries, impaired functioning, or altered functioning and ability from: cerebral, skeletal, joint, myofascial, circulatory/ vascular, lymphatic, and neurological pathologies. Manual Osteopathic Therapy (MOT) works by eliciting a natural stimulation or neurophysiological response of analgesic effects from the central nervous system that assist with easing pain naturally that is not fully understood by researchers but has been validated in numerous clinical studies (Lindgren et al., 2012; Melzack & Wall, 1967; Vigotsky, & Bruhns, 2015). The elicited analgesic responses from MOT include neurotransmitters from the Gate Control that regulates the suppression of pain that include adenosine, endocannabinoids, endogenous opioids, oxytocin, serotonin, and vasopressin (Vigotsky, & Bruhns, 2015). ***β-endorphins*** are also stimulated through Manual Osteopathic Treatment which present a natural response similar to morphine that is actually between ***18-33% much more potent***

demonstrating the potential to effectively manage pain naturally for patients with addictive personalities, concerns of addictions, or who desire to retain their full mental and motor skill faculties that are not compromised by pharmaceuticals with addictive properties, effect motor and sensory skills and expensive pharmaceutical industry prices (Loh, et al., 1976; Gerrits, Lesscher, & VanRee, 2003; Degenhardt, et al., 2007; Vigotsky, & Bruhns, 2015).

In 2000, a comparative clinical study was performed evaluating the patient satisfaction levels with General Practitioners and Osteopaths (European/Manual) treating patients in the United Kingdom after invasive surgical procedures for pain management. The results were that patient satisfaction for both types of practitioners were high, however Osteopaths scored significantly stronger for manual osteopathic treatment, including bedside manner communication with the patient, therapy skills level competency, and patient expectations (Pincus, Vogel, Savage, & Newman, 2000). Efficacy scored lower, despite patients being overall satisfied in treatment experience, and the score might be explained by the following hypotheses:

- Patients just completed an invasive surgical procedure affecting neurotransmitters and receptors, expectations may not have been clear to them.
- Patients may have had a cultural mindset that pain medication was needed as a part of cultural norms and social learning through out their lifespan.
- If patients had started with MOT they may not have needed the invasive procedure, thus avoiding the pain all together.

An updated related clinical study, believed to be the first analyzing patient attitudes in an osteopathic training clinic in the United Kingdom was released in 2007, using an interpretive phenomenological approach, with the majority of the sixty-two percent (62%) of respondent patients (n= 292 of targeted patients) were found to be satisfied by the osteopathic care received at an osteopathic training clinic (Strutt, Shaw, & Leach, 2008). Addressed in the survey were the major themes of the doctor-patient relationship providing a positive environment of hope in health restoration, open and direct communication between patients and practitioner, the level of respect between patient and practitioner, and mutual trust in managing the patient's health (Strutt, Shaw, & Leach, 2008). Areas noted for practices to work on improving were ensuring privacy concerns for undressing and gender related. This patient concern area can be possibly considered a cultural view depending upon where the European style Osteopathic practitioner was trained considering various European cultures have different attitudes toward nudity and various levels of dressing or privacy (Dreher, 2012; Story, 1984; Story, 1984; Story; 1987; Miller, 2010).

Empirical evidence is now available to suggest with confidence that MOT is the ideal model of pain management given the high prevalence of addiction facing our society today (Edme, 2013), and when "*comparing manual therapy with pharmaceutical agents, adverse events were significantly less likely within manual therapy treatment groups*" (Carnes, Mars, Mullinger, Froud, & Underwood, 2010, p. 5). It is deeply disturbing that despite the growing evidence to support MOT, osteopathic medical physicians who are licensed to

practice manual treatment in Western Medicine have shown a growing disinterest in the use of MOT along with a diminishing emphasis in osteopathic medical schools in retaining their rich core history of MOT modalities (Paul & Buser, 1996; Aguwa, & Liechty, 1999; Meyer, 1992).

Osteopathic Treatment Methods

"When all parts of the body are in line we have health. When they are not the effect is disease" (Seffinger et al, 2003). In managing chronic pain, it is important for Osteopathic practitioners to understand that they may be treating coexisting disorders: chronic pain and addiction (Daley, 2013; Bailey, Hurley, & Gold, 2010). The target organ for both pain management, and in treating addiction is the brain. If the brain is not receiving correct neurological signals from its transmitters and receptors because of poor pain management protocol, an ineffective pain management program, or because of addiction to painkillers, the target organ is not being reached which means the pain management from physical pain, emotional pain, or the distress from both is not being managed appropriately and the imbalance is not being restored to homeostasis.

All patients receive a standard diagnostic evaluation, and an in-depth focused evaluation of the injury or area causing the pain, checking for visible and non-visible deformities, abnormalities, irregularities, any pathologies, and to ensure treatments are appropriate before any treatment is recommended. Full biosocial and medical histories are taken during the patient intake process to also ensure practitioners are not providing treatment that has contraindications that would be harmful to the patient and any other treatment the patient is receiving. Once the patient is cleared from the intake process, initial diagnostic evaluations, and determined that MOT is a correct fit for them, they are educated on what treatments are appropriate for their diagnosis, and consent for treatment is obtained be for MOT can begin. Once all of the documentation process is completed for the above the practitioner can begin helping the patient to find serenity as they approach the path to a state of homeostasis with MOT.

Manual Osteopathic Treatments (MOT) can include spinal manipulation, but also the following techniques that are very unknown in the western medicine environment (Lesho, 1999) but very common in the CAM realm: cranial osteopathic manipulative treatment, doming of the diaphragm high velocity low amplitude (HVLA), Laser Therapy Treatments, Lymphatic Drainage, Muscle Energy Techniques (MET), Strain-Counterstrain (SCS), Soft Tissue Therapy, Transcutaneous Electrical Nerve Stimulation (TEMS), Trigger Point Therapy, and Ultrasound Therapy (UST). All of these therapies are discussed through this research submission along with the documentation/ citations of their being able to activate the human body's natural analgesic pain management stimuli response system (Lindgren et al., 2012; Melzack & Wall, 1967; Vigotsky, & Bruhns, 2015; Line & Embase, 2010, p, 7; Campbell, Winkelmann, & Walkowski, 2012) that can prevent a person with a propensity towards addiction, past addiction history, or the desire to live a life free of, or with minimal mind and body altering pharmaceuticals and invasive procedures allowing their body to heal naturally back to a state of homeostasis.

Specific Conditions & Pain Management

Arthritis

Arthritis, be it degenerative (Osteoarthritis) or inflammatory (Rheumatiod) often causes much chronic pain and discomfort for patients including neck, lower pack, hip, swelling, generalized pain, stiffness, and decreased range of motion or mobility. Arthritis is typically considered by researchers to be an autoimmune disease that targets bones and joints manifesting with loss of mobility, loss of function, swelling, heat from the joints, redness, tenderness, and pain. Western medicine will typically treat with physical therapy, exercise, and prescriptions including non-steroidal anti-inflammatories, corticosteroids, and painkillers. Manual Osteopathic Therapy treatments often include soft tissue treatment, Springing Treatment, Muscle Energy Technique, and Myofascial release treatment. Empirical evidence that these manual therapies with types of arthritis are very beneficial for patients have been proven in studies (Cameron, 2002). When combined with other therapeutic methods including other forms of CAM, such as naturopathy the outcomes have been noted as "superior" in treating the hip, knee, and hand for managing Arthritis pain (Vernon, 2013).

Back Pain

Lower Back is one of the most commonly treated afflictions by Osteopathic Manual Treatment Practitioners, Massage Therapists, Chiropractors, Acupuncturists and Western Medicine. A study released in 2013 by the University of North Texas Health Science Center found that Osteopathic Manual Treatment "equaled or surpassed criteria" that the Cochrane Back Review Group established for safety and back pain improvement (Licciardone et al., 2013). In this double-blind, sham-controlled, randomized study evaluating Osteopathic Manual Treatment and Ultrasound Treatment, sixty-three percent (63%) of the participants (n=145) reported improvement in their back pain compared to participants in the "sham" Osteopathic Manual Treatment group (n-103) that reported a fourty-six percent (46%) improvement (Licciardone et al., 2013). In the Ultrasound treatment section fifty-five percent (55%) (n=128) of participants that received Ultrasound Treatments compared to fifty-four percent (54%) (n=120) of participants that received "sham" Ultrasound Treatments had similar results displaying Ultrasound was not efficacious (Licciardone et al., 2013). The end result was that traditional Osteopathic Manual Treatment worked best, and had the most effective pain relief, and potential cost savings considering invasive treatments, disability costs. Additionally, the study concluded, "Patients receiving OMT used ***prescription drugs for low back pain less frequently*** during the twelve (12) weeks than did patients in the sham OMT group… relieving chronic low back pain. It was safe, parsimonious, and well accepted by patients" (Licciardone et al., 2013).

A second study conducted by the American Osteopathic Association (AOA) which culminated in the development of the AOA's Guidelines for Osteopathic Manipulative Treatment with a ninety-five percent (95%) confidence interval (accuracy) of 525 patients with lower back pain found that significant pain reduction was achieved with

manipulative treatment (Licciardone, Brimhall, & King, 2005; Licciardone et al, 2003 Line & Embase, 2010). This study also investigated scientific data that found analgesic painkilling effects were created by Osteopathic Manual Treatment that were very comparable to ***anti-inflammatory/ non-steroidal treatments*** regimes over a three to twelve (3-12) month period stating "for low back pain may eliminate or reduce the need for drugs that can have serious adverse effects" (Line & Embase, 2010, p. 7).

The Strain-Counterstrain Technique (SCS) was studied for effectiveness and found to be effective and found to be consistent with other studies that have been evaluated for lower back and hip abductor pain management. In the SCS technique, the patient is extended and abducted while lying prone which stimulates the muscles, increases circulation, and lowers muscle tissue stress and tension, thus prompting *"the resolution of the inflammatory response"* (Vohra, & Jaiswal, 2014, p. 5). These three studies, the University of North Texas, the AOA Guidelines on *Osteopathic Manipulative Treatment* and SCS demonstrate reasonable medical evidence to ensure confidence in osteopathic manual therapy for the management of lower back pain, providing quality, proven, scientific and empirical data that MOT works for pain management, and stimulates natural analgesic stimuli release.

Succinct scientific clinical reviews of spinal manipulation/mobilization was found to be effective in adults for acute, subacute, and chronic low back pain, as well as thoracic manipulation/mobilization was found to effective for acute/subacute neck pain (Bronfort, Haas, Evans, Leininger, & Triano, 2010). In managing both chronic low back pain and chronic neck pain, Bronfort et al., (2010) found that massage (soft tissue therapy) worked very effectively as well offering additional treatment modalities for resolving pain issues for the patient.

Carpal Tunnel Syndrome

Neuropathy from Carpal Tunnel Syndrome (CTS) can be a very difficult source of pain for patients to live with today. Carpal Tunnel Syndrome patients experience the manifestation of numbness, tingling, and chronic pain that ranges from minimal to severe because the median nerve is damaged and becomes compressed, irritated, and sometimes traumatized resulting in sharp pains that can be difficult to manage. Western medicine typically treats it with non-steroidal anti-inflammatory drugs, corticosteroids, diuretics, and invasive surgical procedures. Following the Western model of medicine, carpal tunnel syndrome not including lost wages from time off, can be very costly as "the average cost of the procedure, therapy and other related expenses can average around $29,000" (Carpal Tunnel Head Quarters, n.d.), with another source stating that complications from surgery can include the following: nerve damage, infection, scarring, pain, stiffness, loss of wrist strength (in ten to thirty-three percent (10%-33%) of cases) and an average surgical effectiveness of seventy percent (70%) from the first surgery, sometimes requiring additional surgeries to correct or complete treatment goals (Simon, 2013; Carpal Tunnel Head Quarters, n.d).

In an American Osteopathic Association published study, it was noted that manual therapy is underused by Osteopathic Physicians, "the application of osteopathic manipulative medicine (OMM), including an osteopathic structural examination and osteopathic manipulative treatment can be invaluable in diagnosing and managing CTS. On the basis of our experience, OMM is underused in the treatment of patients with CTS" (Siu, Jaffe, Rafique, & Weinik, 2012) however internationally, Manual Osteopaths have had great results over the years. In a recent pilot study manual therapy reduced tissue adhesion and increased wrist mobility for patients relieving carpal tunnel syndrome pain, the presenting symptoms, and maintaining results at the follow up stage determining the efficacy to be a valid conservative, noninvasive treatment for carpal tunnel syndrome (Burke et al., 2007).

Many Osteopaths, Chiropractors, and Naturopaths will recommend to patients with carpal tunnel syndrome to take vitamin B^6 (pyridoxine) supplements, which moderately improved patient pain in past clinical studies (Ryan-Harshman, & Aldoori, 2007). Significant in the etiology of carpal tunnel syndrome is the deficiency of vitamin B^6 (pyridoxine) which found in a clinical study that after a patient was treated with 100 mg/day for a period of time, along with manual treatments became asymptomatic and did not need invasive surgery (Folkers, Ellis, Watanabe, Saji, & Kaji, 1978). To support this adjunctive procedure, Kasdan and Janes (1987) learned that 100 mg B^6 (pyridoxine) twice-daily complimenting treatments alleviated the symptoms by sixty-eight percent (68%) for their patients (n=994), however it is important to note is that any patients taking B^6 (pyridoxine) for a long period of time should be monitored for any physiological changes.

Dermatological Disease

Dermatological Diseases that are nerve based (dysesthesia syndromes, stasis dermatoses, scrotodynia, analdynia, and hyperhidrosis) have been shown to be positively responsive to manual osteopathic treatment. As manual osteopathic treatments are applied to the human body the vascular, lymphatic, and neural systems affected by dermatological diseases results have shown promise for normal physiological functions to return (Burns & Wells, 2006). Many dermatological diseases cause increased muscle tonicity, painful sensations, burning, and trigger points that can be managed with manual osteopathic treatments mitigating the need "***for invasive procedures or drugs with an adverse side effect***" (Campbell, Winkelmann, & Walkowski, 2012).

Diaphragm & Respiratory Pain Management

Manual Osteopathic Treatments of the diaphragm have improved respiratory functioning, lymphatic system, and venous circulatory flow increases (Degenhardt & Kuchera, 1996; Hruby; 2003). The abdominal diaphragm has an important anatomical role in breathing however it also affects posture, blood circulation, and lymphatic flow, all of which when not in alignment can cause pain for patients (Hruby, 2003). This can be a source of acute or chronic pain for patients that ultimately may lead to long-term dysfunctions of the

diaphragm, respiratory system, spine, pelvis stabilization (Chaitow, Bradley, & Gilbert, 2002), and lymphatic system (Stone, 1999; Towns, 2003). This support system of the human body relies on the musculoskeletal system, which comprises seventy-five percent (75%) of the body (Towns, 2003), and failing to properly manage it, allowing it to slip into disarray can become a source for respiratory illness developing in the future including COPD and asthma (Galobardes et al., 2008; Courtney, 2009) ultimately leading to a dependence on multiple medications to manage daily including prescription opiate, narcotic, or barbiturate painkilling medications. Manual Osteopathic Techniques applied to patients with diaphragm associated musculoskeletal dysfunctions can experience an alleviation of pain with no invasive procedures and zero painkilling prescriptions (Chaitow et al., 2002; DiGiovanna, Schiowitz, & Dowling, 2005; Greenman, 2003; Parsons & Marcer, 2005; Stone, 1999).

Practitioners have used two manual techniques: ***high velocity/low amplitude (HVLA) thrust*** and the ***doming of the diaphragm***. In using a ***high velocity/low amplitude or HVLA*** thrust, an osteopathic practitioner uses a joint mobilization technique to the thoracolumbar vertebra to assist the upper lumbar vertebrae and intervertebral discs that affect breathing through the diaphragm to become realigned back into a natural functioning state, thus removing pain experienced in the diaphragm from discomfort. The ***doming of the diaphragm*** relaxes the diaphragm by stretching it resulting in a decrease of the hypertonicity (DiGiovanna et al., 2005; Chaitow et al., 2002; Ettlinger, 2003). A possible side effect hypothesized by some Osteopathic researchers has been that a decreased efficiency in respiratory functions may occur, despite the other benefits of the toned diaphragm (DiGiovanna et al., 2005; Ettlinger, 2003). Both of these procedures can help assist a patient experiencing discomfort and pain in the diaphragm to experience relief.

Fibromyalgia Syndrome:

Fibromyalgia Syndrome, a chronic pain disorder with a mysterious and unknown etiology, causes intense widespread pain for patients over a period of at least three (3) months, typically presenting with widespread musculoskeletal pain, fatigue, cognitive disturbance, mood affect, headache, sleep disturbances/insomnia, and lethargy in activity from the pain. While the pathology is unknown it is suspected to be a genetic condition causing central nervous system disturbances such as neuropathy, generalized pain, and both autonomic and peripheral nervous system dysfunctions. There has been little research done on MOT and fibromyalgia, but the use manual treatments has found to be favorable and economical in multiple studies in treating patient pain related to fibromyalgia syndrome. Manual Osteopathic Treatment has been found to improve pain symptoms and quality of life for patients with Fibromyalgia. Manual techniques including Muscle Energy Techniques (MET), Balance Ligamentous Tension (BLT), myofascial release, soft tissue therapy, strain- counterstrain of Fibromyalgia tender points, facilitated positional release, trigger point therapy of Fibromyalgia tender points (Simons, & Travell, 1999; Kalichman, L., 2010; Vohra & Jaiswal, 2014; Hersh, OMS, & Yao, n.d.; Paul, & Berkowitz, 2014).

In a clinical study conducted by Castro-Sánchez et al. (2010) patients that received myofascial release therapy reported almost immediate improvements in "anxiety levels, quality of sleep, pain, and quality of life", and these improvements continued through months 1 and 6 of a 20 week study (Castro-Sánchez et al., 2010). Another clinical study by Gamber et al., (2002) determined the use of manual osteopathic treatment to be effective in managing patient pain levels, increasing functional abilities, and increasing daily life routines. When Western Medicine and Manual Osteopathic Treatments were integrated together into the treatment plan, the clinical outcomes were "***more efficacious***" to combat fibromyalgia's debilitating affects than with Western Medicine treatment alone (Gamber et al., 2002).

Headaches

Manual osteopathic treatment has been very beneficial in decreasing the incidence of various types of headaches and also decreased patient reliance on prescription medications including analgesic painkillers associated with high dependency risks, potential harmful side effects, and additional health complications (Seffinger & Hruby, 2007, p. 197). Andrew T. Still, Osteopathy's very own founding father first documented the use of manual osteopathic treatment on himself in curing his very own pain and suffering as documented in his personal journal:

> "*In all continued or periodic headaches I have found the shut-off in the bones of the neck at their union with the head and in the other joints as far down as the fourth dorsal and even as far as the lumbar, sacrum and coccyx. I have found abnormal positions of both bone and muscle resulting in the production of such effects*" (Still, 1910).

Primary, secondary, tension headaches, and migraines can benefit with some of the following manual osteopathic treatments regimes:

- Soft Tissue Therapy (Lintonbon, 2011);
- Myofascial Trigger Point Therapy (Spinaris & DiGiovanna, 2005*);*
- Muscle Energy Techniques (Lintonbon, 2011);
- Manual Lymphatic Drainage (Wittlinger & Wittlinger, 2004);
- Osteopathic Manipulative Therapy (Bronfort, et al.2001; Bronfort et al., 2010).

An additional study was released in 2014 prompting more support for MOT in managing tension headache pain by Espí-López et al., citing manual treatments provided "statistically significant improvements" while soft tissue treatments produced "less significant results" but had positive outcomes (Espí-López et al., 2014). The American Osteopathic Association published a study to evaluate foreign-trained osteopath (also known as *European* or *Manual Osteopaths*) MOT techniques for tension headaches and pain relief finding the techniques demonstrate "***efficacy***" and "***Osteopathic manipulative therapy may be preferred over other treatment modalities and may benefit patients who have adverse effects to medications or who have difficulty complying with pharmacologic regimens"*** (Rolle et al., 2014).

In the treatment of pain from migraine type headaches the Department of Neurology of Ancona's United Hospital conducted an efficacy study comparing MOT techniques, pharmaceutical interventions, and sham-placebo interventions. The results concluded that there was a "significant difference" between the MOT group compared to drug and sham therapy groups, suggesting that MOT can be considered a "valid procedure" for the management of patients with migraine (Cerritelli et al., 2013). Interestingly, the pharmaceutical group and the sham-placebo group "was not statistically different" from each other, where as the MOT group was "statistically different" from both the pharmaceutical and the sham-placebo group, prompting more credibility in MOT than pharmaceutical interventions in relieving pain from migraines (Cerritelli et al., 2013).

Menstruation & Related Conditions

Dysmenorrhea, a very painful severe cramping and difficult menstruation women suffer with, presenting in the lower back or lower abdomen has two forms: Primary and Secondary. Primary is from normal biological menstruation processes and manifests one to two (1-2) years after the first menstruation cycle and may cease after giving birth to the first child. Secondary is a pain radiating from the female reproductive organs. Many cramps are caused by uterus contractions cutting off blood or oxygen circulation to the muscles of the uterus causing intense pain. Manual Osteopathic Practitioners have used heat therapy, soft tissue massage of the lower back and abdomen along with manual pelvic manipulation treatments to successfully alleviate pain for patients (Kenyon & King, 2015).

Pregnancy and post pregnancy back pain was evaluated by Schwerla et al., (2015) and found that a over the course of eight (8) weeks, the application of four (4) clinical Manual Osteopathic Therapy treatment yielded positive results in the reduction of pain and restoration of normal functioning postpartum for female patients. Manual Osteopathic Therapy has also shown significant reduction in alleviating peri-menopausal symptoms for women (Bone, 2012). There is much good that Manual Osteopathic Therapy treatment can do to assist in women's health and helping the body achieve rebalance and a state of homeostasis.

Myofascial & Musculoskeletal Pain

Myofascial Pain affects the skeletal muscles in the human body and can also cause Musculoskeletal Pain. Skeletal muscles amount to around four hundred (400) muscles in the muscular system culminating into approximately fifty percent (50%) of the body's weight that can cause clicking, pain, popping, stiffness, range of motion limits, tightness, and soreness brought on by stress, poor posture, injuries, or muscle and skeletal damage (Simons & Travell, 1999; Dorsher; 2009). The following treatment methods have been found to be effective in managing pain and discomfort with trigger points when applied per proper MOT protocol:

- Soft Tissue Therapy (Lintonbon, 2011; Gam AN et al., 1998; Smith, 2009, p. 538);
- Ultrasound Therapy (Srbely et al., 2008; Ay et al., 2010; Rayegani et al., 2011);

- Laser Treatments (Rayegani et al., 2011);
- Transcutaneous Electrical Nerve Stimulation (TEMS) (Lee, Chen, & Lee, 2008; Maayah & Al-Jarrah, 2010).

Many manual osteopathic practitioners typically will use a combination of treatments for muscle therapy to provide the best possible clinical outcome for their patients.

Neck Pain

The growing incidence of inactive lifestyles, poor posture/ ergonomics, work injuries, and automobile crashes in society are making neck and cervical pain a major public health problem (Feyer et al., 2006). There are many treatment options ranging from Manual Osteopathic Treatment (MOT), chiropractic manipulative treatments, acupuncture, massage, and Western Medicine's pharmaceuticals. MOT treatments for neck and cervical pain has been increasing as a common practice as empirical evidence has been found in numerous studies to be an effective practice for pain management and resolving underlying issues (Bronfort, Haas, Evans, Leininger, & Triano, 2010). MOT has been able to demonstrate decreases in disability, increases in range of motion and function, and pain reduction through the use of manipulation, mobilization, massage (Bronfort et al., 2004; Gross et al., 2004), and Transcutaneous Electrical Nerve Stimulation (TEMS) also known as electrotherapy stimulation treatment which has been associated with highly significant improvements in pain reduction and symptoms in multiple clinical studies (Maayah & Al-Jarrah, 2010).

In clinical studies, three (3) forms of MOT were analyzed with six (6) treatments over a period of three (3) weeks, Spinal Manipulative Therapy (SMT), Muscle Energy Technique (MET) and Proprioceptive Neuromuscular Facilitation (PNF) and found to produce comparable results, however the PNF treatment did produce improved range of motion results much quicker for patients (Roodt, 2009). In a later meta-analysis study of seventeen (17) clinical trials MOT was found to alleviate pain, providing significant pain reduction and improved quality of life for patients (Miller et al., 2010). The results were noted as short term, however the studies evaluated were themselves only short term clinical trials demonstrating additional research being needed for studying more clinical longevity possibilities for long-term treatment solutions. The evidence from analyzing the studies suggests that pain management for neck and cervical pain is very achievable with traditional MOT, and in many cases addictive narcotic and barbiturate prescriptions (painkillers) that alter the human body's mind and physical functioning abilities can be avoided.

Psychological Benefits of Manual Osteopathic Treatment

As Osteopathic Manual Medicine is practiced in the environment of the biopsychosocial model of illness, there is a sociological and psychological component to both Osteopathy in general, and Manual Osteopathic Treatment (MOT) for Pain Management. The engagement and provision of care to the patient, along with the alleviation of pain and suffering provides great psychological benefits. The community of those engaged in

traditional medicine provides psychosocial benefits as well as they engage members of the community who also use MOT for traditional treatment or primary healthcare as described by the WHO Osteopathy Benchmarks (WHO, 2010). Additionally psycho-education is provided cognitively through the educational outreach of the Osteopathic Practitioner when they educate their patients on interrelationships of the human body including the joints, muscles spine, and mind in order to achieve the ideal state of homeostasis for the nervous, circulatory, lymphatic, and psycho-emotional systems for healthy living and homeostasis rehabilitation.

Studies have found conclusive evidence that MOT has many psychological outcomes in addition to the physical outcomes including patients having a better understanding of the functioning of the human body, the reduction of fear and anxiety in receiving MOT and of re-injuring themselves, and in fostering positive cognitive behavioral principles of mental conditioning that encourages exercise and promotes an active lifestyle rather than sedentary (Williams, 2007). Negativity and irritability due to pain factors or anxiety from a new practitioner appointment can affect the outcome as well and should be mitigated early in the intake process, before treatment to maximize the outcome and the natural analgesic effects of the human body (UK BEAM Trial Team, 2004; Bialosky et al., 2011; Lislevand, 2014). Education of the patient and establishing a good rapport can assist with this very easily, along with the placebo affect's psychological ability to ease anxiety and tension of the hypno-analgesic effects produced from the patients instructional or educational orientation and the MOT being employed releasing the nervous systems natural analgesic chemicals to help manage the ailments causing chronic pain (Bialosky et al., 2011). It has been onserved that patients who seek pain treatment with a negative outlook or expectation towards forms of MOT or other alternative/ traditional medicine have a greater chance of having less benefit from treatments, meaning the more positive psychology employed by practitioners, and the more positive environment fostered, the more positive results will be yielded by the patient (Bialosky et al., 2008).

The bottom line is if Manual Osteopathic Practitioners take away distressing pain and anxiety caused by an imbalance in the body's homeostasis, and assist patients to restore the body back to health, the physical and psychological outcomes are great, resulting in more resiliency the patient will have to be able to use their natural analgesic ability to not rely on mind and body altering pain management pharmaceuticals, but to reply on their own body and mind to manage pain. Evidence exists that MOT modules do create improved psychological outcomes for patients as pain is relieved, however more research is needed in this area.

Financial Benefits of Manual Osteopathic Treatment

In considering the staggering costs of injuries including invasive surgeries, pharmaceuticals, lost wages, other economic losses (tax revenue and consumer spending), incidental related costs, and the potential for additional harm from painkilling medication that alters your mind and perception with a high propensity for addiction (Lintzeris, 2009; Højsted & Sjøgren, 2007; Holmes, 2002) as outlined in the

Overview Section, Manual Osteopathic Treatment (MOT) has been proven to be more cost efficient for patients, employers, and insurance carriers (Scarrott, 2009), along with being safer than Western medicine's traditional pharmaceutical response. Outcomes of MOT for chronic low back pain according to a baseline pain severity clinical trial called the "Osteopathic Trial" found that severe lower back pain was dramatically improved (greater than fifty percent (50%) pain reduction) in a treatment regime of six (6) MOT's within the National Institute for Health and Clinical Excellence Guidelines (2009) of nine (9) MOT's over twelve (12) weeks as compared to the standard chiropractic treatment plan of a minimum of six to twelve (6-12) treatments over four to six (4-6) weeks, which could last up to thirty-six (36) treatments over twelve (12) weeks (Globe et al., 2008) demonstrating that MOT as more cost effective, least restrictive on the patient's schedule, and least invasive when applying a front line defense to lower back pain before heading to more expensive, invasive, and risky forms of treatment that could lead to additional pain, addictions, infections, or further injuries later if the procedures do not correct the root cause of the chronic pain (Licciardone, Kearns, & Minotti, 2013).

Compared to other manual practitioners and complementary alternative medicine providers, Manual Osteopathic Treatment Providers in New Zealand were found to have the lowest propensity of visits per client (65% having four (4) or less visits) compared to physiotherapists (46% having four (4) or less visits), chiropractors (33% having four (4) or less visits), and acupuncturists (31% having four (4) or less visits), and the least instances (1%) of "extreme" practitioner visitations of seventeen (17) or more visits (Scarrott, 2009). This study presents a testament to a best practices approach in manual treatments, and demonstrates the Osteopathic philosophy of doing only what is needed to solve the root cause of illness that Osteopathic Medicine holds so close to heart, keeping the best interests of the patient in mind.

Multidisciplinary Approach: DO & DC Treating Pain Management in Recovery

Chiropractic and Osteopathic Practitioners are very similar in philosophies of holistic healing and the body's natural ability to heal (Pourgol, 2013). There is more research on Chiropractic manual therapy for addictions oriented pain management than Osteopathic, and the research has been very positive. Dr. Pourgol (2013) notes that Chiropractic and Osteopathic Practitioners often work together as a multidisciplinary team that can truly compliment each disciplines common and diverse perspectives to offer the best care possible for patients.

In 2001, Jay Holder, D.C. published the results of his 18-month study on the effects of manual treatments on patients in a residential drug addiction program suffering from chronic pain. The group receiving only "standard-care" (i.e.: therapy, psychotherapy and medical care) had a fifty-six percent (56%) completion rate for the program, whereas the placebo plus standard care group had a seventy-five percent (75%) completion rate for the program (Holder, Duncan, Gissen, Miller, & Blum, 2001). The third group receiving standard care plus manual treatments from a Chiropractic Practitioner had a rehabilitation completion rate of ***100%*** and also presented with less anxiety through

treatment, with nine percent (9%) less visits to the nursing staff for ailments compared to the placebo group at fifty-six percent (56%) and the standard care only group at forty-eight (48%) (Holder et al,, 2001). Dr. Robert C. Duncan, professor of epidemiology and public health at the University of Miami School of Medicine believes the success was because of the major reduction of anxiety for patients improving the state of well being through out the therapeutic process, thus demonstrating the psychological connection of manual treatments discussed earlier (Holder, et al., 2001).

Dr. Herby Bell (2012), a Chiropractor using Manual Treatments for helping people with addictions recover provides a synergistic mind-body-spirit approach to pain management that utilizes human compassion to help correct dysfunctional neurological signals from the brain through out the entire body. Bell's addiction treatment protocol for the first ninety (90) days of treatment found that chiropractic manual therapy has had the following positive outcomes:

- Removes interference from normal nerve function;
- Reduces anxiety and depression;
- Better sleep patterns;
- Decreases use of chemical pain relievers and psychiatric drugs;
- Greater sense of well being;
- Increases energy levels;
- Decreases stress levels;
- Decreases joint and muscle pain.

Chiropractic Practitioners are much advanced in the treatment of addiction disorders and pain management as evidenced by the formation of the American College of Addictionology and Compulsive Disorders (ACACD), which provides credentialing, and board certification in addictions and compulsive disorders to chiropractors and other allied health care professionals. As teachers, advocates, and healers Manual Osteopaths have an obligation to learn from fellow practitioners of other disciplines to better provide the best possible clinical outcome for patients.

Conclusion

Manual Osteopathic Therapy has been evolving and striving to demonstrate the evolution, increased professional standards, and scientific research that have been yielding documented and better results without painful invasive procedures and pharmacological intervention. Manual Osteopathic Therapies can effectively treat many painful somatic dysfunctions from skeletal, joint, and myofascial structures, and the vascular, lymphatic, and neurological systems in a balanced and holistic fashion where Western medicine has clinical gaps. By integrating Manual Osteopathic Practitioners in pain management, healthcare systems can remedy the under-referral to non-surgical manual therapy professionals and ineffective pain management approaches currently being used by insurance and healthcare systems that give patients the propensity to addictions, additional injuries, pain and suffering.

Manual Osteopathic Practitioners have demonstrated through many scientific clinical trials that their integration into the healthcare system for pain management could help reduce the number of patients addicted to painkillers, saving patient lives, and also saving patients,

health networks, hospitals, and insurance companies money from litigation, expensive surgeries, rehab stays, sepsis or other post-surgical infections, thus freeing medical doctors from additional litigation and allowing them to focus more on their "routine practice".

Additional Research is needed in the physiology of natural human analgesics produced by the brain and the rest of the central nervous system. This will help practitioners of all disciplines better understand pain management concepts and lessen society's dependence on synthetic and controlled substance analgesics that can have harmful affects on the human body and produce dependency. If humans could better channel their own analgesic abilities they could potentially manage their own physical and emotional pain eliminating a dependency on pharmaceuticals amounting to more than 4.3 billon prescriptions costing $374 billon dollars in 2014 (Sifferlin, 2015).

It has been over 100 years since the founding of Osteopathy, which evolved into two paths: Osteopathic Physician and Osteopath Practitioner (Manual Osteopath/ European Osteopath). The Osteopathic Physician has become integrated with mainstream Western medicine, and in some cases abandoned it roots and core values. The Osteopath Practitioner has remained segregated in an island of it's own and has not made many strives to advance the profession until the last few years. Education and outreach are apart of the Osteopath's role, as such the integration of other proven disciplines with Osteopathy that can bring about best practices of care for optimal patient outcomes should be explored and evaluated in the areas of complimentary treatment practices such as addictions, counseling methods, research methods, hypnotherapy, mental health, naturopathy, and nutrition.

As indicated earlier psychological, sociological, and educational theories all apply to the work of the Osteopath, and the patient success outcomes of the Osteopath's work deeply depend on these as well. A post-Doctor of Osteopathy (D.O.) degree program providing a PhD in Osteopathic Psychology, formulating an eclectic, comprehensive, and Osteopathic oriented approach toward holistically counseling patients in a way that embraces social, behavioral, and humanistic psychology in the interrelated disciplines of addictions, hypnosis, mental health, naturopathy, nutrition, pain management, and stress management for Osteopaths desiring to take the profession to a higher level that will truly and holistically treat the root cause of pain and imbalance to restore the "whole patient" to homeostasis. As the costs of healthcare continues to rise, Osteopaths need to work on educational outreach for the general public, employers, employee assistance programs, medical physicians, other manual therapist and insurance carriers to educate them on the efficacy of manual treatment for pain management, including cost efficiency, and the professional education of the Manual Osteopath to progress the profession across North America. As injuries increase, a large number patients will self medicate with painkillers or other psychoactive drugs, and Manual Osteopaths should work with Substance Abuse Treatment Centers to create Multidisciplinary Pain Management Teams that can better manage patient pain and addiction to treat the whole patient.

The options to grow and professionalize the field of Osteopathy, and increase patient outcome success for healthy living is endless, Osteopaths just need to be open minded, continue their quest for knowledge, and remain true to the core traits and morals of Osteopathy, always remembering A.T. Still's words that "Osteopathy is the expression of natural law in human form not framed by human hands".

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