



Soft Tissue Manipulation and Naprapathy: Origins and Current Practices

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Received: 12 Jan 2023

Revised: 7 Mar 2023

Accepted: 11 Apr 2023

Abstract

Naprapathy is an integrative medicine therapy that can aid in decreasing medical costs by assisting in pain management and improving overall function in individuals experiencing musculoskeletal pain and dysfunction. Naprapathy was developed in 1907 by Oakley Smith. Naprapathy treats musculoskeletal pathologies by using connective tissue tension found within the vertebral column and peripheral joints with an emphasis on ligamentous tension. Current scientific studies have emphasized the role of fascia and its importance to manual medicine. Fascia has many properties including assisting in venous return, dissipation of tensional stress, pain, proprioception, and coordination of movement. Fascial restrictions occur when there is lack of glide between the fascial layers. These restrictions can be released with the utilization of different methods of fascial manipulation. Compared to other manual therapies, naprapathy has its own set of diagnostic tools and protocols emphasizing the treatment of fascial restrictions, stretching of buckled ligaments and tracing tension to the musculoskeletal system. It includes within its scope of practice dietary counseling in conjunction with vitamin and mineral supplementation for assistance in decreasing pain and inflammation. Several organizations and schools throughout the U.S. and internationally promote the discipline of naprapathy with the goal of advancing the profession by preparing practitioners at the doctorate level, treating patients, and using evidence-based medicine providing support for the efficacy of naprapathy and its interventions.

Keywords: Chronic pain; Complementary and alternative therapies; Fascial manipulation; Integrative medicine; Ligament; Myofascial release; Oakley Smith

Soft tissue manipulation and naprapathy

In 2020 the United States health care spending grew approximately 9.7% reaching a total of \$4.1 trillion dollars averaging \$12,530 per person [1]. It is estimated that 100 million individuals suffer from acute or chronic pain within the United States alone [2]. Naprapathy is an over 100 years old manual therapy practice that treats pain utilizing specific manipulation techniques and interventions on connective tissue dysfunctions, controlling pain without the use of prescription drugs or opioid medications. Naprapathy can aid in decreasing medical costs by improving well-being in individuals experiencing musculo-

skeletal pain and dysfunction. In naprapathy, pain and disability are considered effects of shortened connective and soft tissues surrounding the spine and other joints (e.g., stretch and buckle ligament theory; see textbox 1).

The main focus of naprapathy is to correct these musculoskeletal dysfunctions by using specific manual soft tissue manipulations to stretch buckled connective tissue including ligamentous and fascial tension within the spinal column and its periphery, in conjunction with therapeutic and rehabilitative exercise as well as nutritional counseling [6]. Naprapathic treatments, specifically for neck and low back pain, can

Citation: Budagher-Marshall M, Alò D. **Soft Tissue Manipulation and Naprapathy: Origins and Current Practices.** Trad Integr Med 2023;8(3):316-325.

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Textbox 1

Connective tissue is responsible for providing internal support and structure; it includes fascia, osseous tissue, tendons, cartilage, and ligaments. Ligaments are a specialized form of connective tissue, responsible for the articulations between two bones. They loosen or tighten depending upon the demands placed by the body and its movement patterns [3–5].

The *stretch and buckle rule* refers to a naprapathic technique that stretches adhesions or scar tissue in the ligaments to relieve pressure on the nervous system allowing for improved function and the alleviation of symptoms [6].

Oakley Smith, the founder of naprapathy, in 1907 referred to these buckled and shortened ligaments as *ligatites* (or *ligatights*), and described them as scar tissue adjacent to the vertebral column and which he visualized under the microscope [7]. Here is his description:

“This tissue specimen represents a lengthwise section taken from the shorter of the two supraspinous ligaments illustrated in No. 21. In the very center of the field will be noted a “kink”, or “bend”, in the otherwise parallel fibers of the tissue. The tissue at that point appears to “double up on itself”. This loop is microscopic, not macroscopic. This bend of the fibers would materially shorten the particular strand of fibers to which this section of the ligament belongs. A ligament containing this definite shrunken element constitutes a ligatight” [8].

Naprapathy is separated from other integrative medicine practices because of its fundamental theory that the *ligatite* can be a major cause of pain and dysfunction.

Current imaging technologies are allowing to visualize more clearly pathological connective tissue structures. For example, ultrasound technology allows for visualization of scar tissue within the connective tissue layers. It permits to look at superficial and deep fascial layers independently as well as dysfunctional movement and structures [9]. Myofascial pain is associated with the inability of the fascial sublayers to glide on one another. For example, in a case study of a 30-year-old female with severe knee pain, post-surgical ultrasound allowed to visualize the scar tissue showing that, in the area of severe pain, the superficial and deep fascial layers had been fused [10]. Schleip et al. [11] examining the density of fascial tissue, described how the fascial web can shorten over time producing stiffness in multiple areas on the body. The authors relate it to pathological circumstances driven by myofibroblasts (MFBs), creating a fascial network contracture produced by incremental combinations of collagen cross-linking, cellular contraction, and matrix remodeling.

Ultrasound studies have been used recently to determine ligament structure at the cellular level. Ligaments have an interwoven appearance with a less uniform structure [3]. Ligament structure has been visualized microscopically using polarized light allowing to see collagen bundles aligned along the long axis of a ‘wavy’ ligament. This waviness is important because it plays a biomechanical role in the loading state of the ligament resulting in its ability to elongate without damage to the tissue [3].

be effective in obtaining both short- and long-term results. Naprapathic medicine has been shown as a good alternative to conventional allopathic treatments of non-specific chronic low back pain with improved function, participation in activities of daily living, and quality of life as well as decreased medical costs and missed workday [12].

The founder of naprapathy is Oakley Smith (1880-1967; see figure1).

During his childhood, Smith struggled with his own health, suffering from the long-term consequences of scarlet fever. His parents spent many years trying to find cures for his illnesses and exposed him to various types of medical interventions which influenced Smith’s own medical career and ultimately the development of naprapathy. In fact, during this process, Smith took exceptional notes regarding each intervention he experienced. Of particular importance it is the care he received from Still’s Osteopathic Infirmary in 1897 from Charles Still (1895-1955), son of the founder of osteopathic medicine, Andrew Still (1828-1917) [8]. In fact, A. Still was one of the very first physicians to describe the importance of fascia, defining it as a highly innervated covering that aids in gliding and fluid flow. He also suggested that fascia is intricately involved with respiration and the nourishment of all cells in the body [13]. As a result of the combination of osteopathic and chiropractic treatments, Smith became convinced that an individual’s health could improve substantially with manual therapies. At the age of 19, he enrolled in medical school at the University of Iowa studying and researching human anatomy and physiology including dissection, histology, and pathology. He continued his medical journey

studying under Daniel David Palmer, the originator of chiropractic medicine, and graduated with a doctoral degree in chiropractic medicine in 1901. After graduating, Smith worked alongside Palmer and wrote important chiropractic literature (e.g. *Modernizing Chiropractic Vol. I and II*) and later became the dean at The Langworthy American School of Chiropractic and Natures Cure in Cedar Rapids, Iowa. Smith continued his research by studying connective tissue and more specifically the ligaments and gradually started to shift away from the chiropractic theories, believing that physical ailments manifested differently than what was described as spinal misalignment from the chiropractors (i.e. subluxation theory). Throughout careful anatomical and microscopic scrutiny, Smith was able to observe adhesions within the connective tissue that affected the nerves after they emerged from the spine. He believed this constriction obstructed vital pathways including the nervous, vascular, and lymphatic systems leading to increased pain, muscle tension, numbness, and various other pathologies [6].

Smith [14] described fascial contraction and thickening as a means of dysfunction:

“A fascial contraction may involve fascia that lies between muscles or between the skin and muscle beneath. Palpation reveals a more or less cordlike contraction. The small width of these contracted bands will help distinguish superficial fascial contraction from broader and more rotund muscular spasm conditions. An overgrowth of connective tissue within a muscle may produce an apparent thickened condition of the muscle”.

Smith became increasingly interested in the Bohemi-



Figure 1. The timeline represents the historic moments regarding Oakley Smith and the development and growth of naprapathic manual therapy

an Thrust¹ (*also Bohemian napraviti*), traveled to the Czech Republic to further advance his understanding and knowledge in this type of manual medicine, and eventually incorporated these techniques when developing the specific treatments for the buckled ligaments found within the spine [7].

Smith's background in a multitude of fields, includ-

¹The Bohemians (Czechs) peasants used a massage practice and even walked upon each other's backs as a form of spinal adjustment. This technique was termed "Napravit". Napraviti is the Bohemian word for "fix" or "repair". Records show that Langworthy treated a man called Frank Dvorsky in 1903, who stated that he had been treated earlier in life for an infectious disease, near Prague, with a similar hands-on, spinal adjustment technique that made his bones 'crack', named "The Bohemian thrust" [7,61,62].

ing chiropractic medicine, osteopathy, and Bohemian napravits, ultimately led him to announce his own concept referred to as "the connective tissue doctrine" [15] and the foundation of naprapathy in the year 1907 [6]. This meant moving away from the chiropractor's vertebral subluxation theory, which tends to focus mainly on osseous manipulations with a focus on the spine [16,17]. Since 1907 and the development of naprapathy, there has been a slow increase in the number of research studies and articles published within the field of naprapathy (Figure 2).

Naprapaths have not been very aggressive in terms of advertising and marketing, therefore, the field has shown a slow progression compared to other alternative medicines [N. Meccia, December 2022, personal communication]. Oakley Smith believed that through

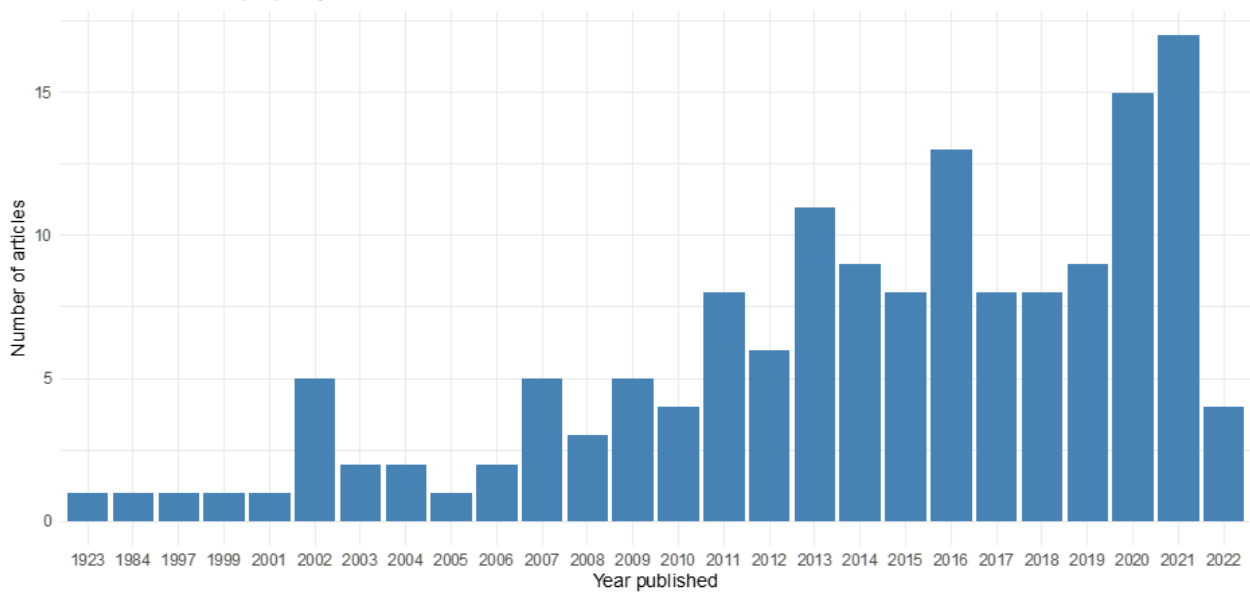


Figure 2. Number of published scholarly articles regarding naprapathy and its principles from 1920 to present

the relief of pressure on the vascular, nervous, and lymph system the body could regenerate and recover from disease. Because Oakley Smith's beliefs and approach were unconventional for his times, it is thought that he alienated himself and the field of naprapathy from allopathic medicine [P. Nuzzo, August 2022, personal communication].

Smith, perhaps influenced by Still's hypotheses on fascia, believed that the root of pain and dysfunction originated from the soft tissue rather than being of osseous origin [6].

Smith developed a systematic set of principles designed to diagnose and treat the spine naming it 'chartology'. The process of charting the spine allows the physician to visualize the connective tissue dysfunction and the line of pull created by this dysfunction (see figures 3a and 3b).

Charting the spine involves assessment of the tightness in the ligaments between each vertebra collectively referred to as the vertebrond. The practitioner uses the spinous and transverse processes as levers to test the tension and hyperesthesia of each vertebrond. Smith also developed a specific set of principles that determine the order in which to diagnose and treat the spine to alleviate as much buckled connective tissue as possible. In naprapathy, pain and dysfunction are often traced back to scar tissue within shrunk and twisted ligaments that pull on the surrounding tissues placing pressure on osseous, nervous, vascular, and lymphatic systems. Therefore, naprapaths use bones as levers to soften the tension of pulling ligaments and fascia [6].

Connective Tissue Research

Connective tissue is a continuous structure of mes-

odermal origin responsible for providing support, protection, and connection [18]. It consists of various cells (e.g. fibroblasts and macrophages) and interlacing protein fibers (e.g. collagen) embedded in a carbohydrate ground substance, that includes loose and dense forms (i.e. fascia, adipose tissue, tendons, ligaments, and aponeuroses) and specialized forms (i.e. cartilage and bone)[19]. Fascia is a specific structure of connective tissue that surrounds muscles, bones, nerves, blood vessels, and organs. The fascial system is designed to provide support as well as stability and protection. Tightening of the fascia is a physiologic response to trauma [20] which can cause adhesions (i.e. collagen becoming dense and fibrous) or neuromas [21] (i.e. regenerating nerve trapped in fibrotic scar tissue). Recent research has found the fascia to be a continuous structure, meaning that when there is a disruption within the fascia there are global repercussions. This disruption can place added stress on the surrounding structures leading to biomechanical dysfunctions (e.g. tensegrity model [22,23]).

The role of fascia in research changed through the years and the total amount of publications on the topic has increased [24] with awareness highlighted through a series of conferences (i.e. Fascia Research Society: "Fascia Research, Basic Science and Implications for Conventional and Complementary Health Care" [25]). Important insights and advances have been able to provide a specific definition for fascia, describing it as a complex organ system composed of a soft, three-dimensional matrix of connective tissue that envelopes and also separates muscles, organs and other soft body structures offering structural support. Additional classifications shed light on the de-



Figure 3. a) Charting the back of a patient for tension and hyperesthesia. Each mark represents different values of tension (as felt from the practitioner) and pain (i.e. hyperesthesia, as felt by the patient). This method was developed by Oakley Smith in 1907, and it is the first attempt of a quantitative measurement taken by manual practitioners. b) Completed charted thoracic and lumbar spine using naprapathic diagnostic techniques to evaluate the ligamentous tension and hyperesthesia found within the spinal column. The spinous processes, tension, and hyperesthesia are marked on the patient's spine with a removable, non-toxic wax pencil. Tension is determined through palpation of each vertebra and represented by parentheses of varying degrees (minimum, medium, maximum). Hyperesthesia is represented by a dash (superficial pain), circle (no pain), or vertical line (deep pain) and determined through the patient's feedback. Photos by Alexander Photography.

tails of the superficial, deep, muscular, and visceral fascia, each with its unique structure, properties, and function [26]. For example, the anatomical and pathophysiological properties of fascia have been described through magnetic resonance imaging and ultrasound, respectively. These technologies helped to understand the dynamic structure and alterations of the fascial tissue including stiffness, thickness, gliding, and relationships with other structures [27], supporting the idea that this continuous sheath of connective tissue and collagen allows the body to move fluidly and in a connected manner.

In the past, when studying the musculoskeletal system, most scientists only considered muscles and bones; whereas fascia was mostly regarded as a unit responsible for holding parts together. However, the essential functional role of fascia in musculoskeletal dysfunction and pain, as described by Oakley Smith and Andrew Still more than one hundred years ago is finally finding its recognition. For example, it has been shown that fascia plays a role in venous return and in the dissipation of tensional stress, pain, proprioception, and coordination of movement of limbs [28]. It has been discovered that different types of fasciae can adapt to the stress placed upon it to meet the demands of the body. Superficial fascia is found directly under the skin and adipose tissue and is described as made up of membranous layers with loosely packed inter-

woven collagen and elastic fibers [27]. Deep fascia, also known as the aponeurotic and epimysial fascia, provides a layer that surrounds muscles and provides a surface for broad muscles to insert. The visceral fascia refers to the fascial layer that surrounds the individual organs providing for their shape, their compartment within the body, as well as connecting the organs with the musculoskeletal system. The interconnected properties of fascia allow for the body to move fluidly with support to the musculature and visceral organs as well as interact and respond to a multitude of stimuli. The cells found in the fascia as well as the extracellular matrix have an important function. These cells and the extracellular matrix respond to and are affected by multiple stimuli including aging, exercise, and hormones [27]. Electrical stimulation of soft tissues in the lower back revealed that nociceptive innervation of fascia, muscles, and skin follows a distinct pattern. In fact, there are specific differences between the types of pain sensations depending on where the dysfunction is. For example, "deep pain" relates to muscle versus "heat pain" or "sharp pain" refers to fascia [29]. Previously, fascia has been thought to be a more passive contributor to biomechanical behavior. However, fascia may have an active role in musculoskeletal mechanics since lumbar fascia has contractile properties [11]. Additionally, deep fascia has a role in muscle tension and force, since a study found that approxi-

mately 70% of muscle tension is transmitted directly through the tendons whereas the remaining 30% of force was directed through the connective tissue, specifically the fascia [30].

Fascial dysfunctions can generate pain and stiffness, affecting posture and muscular mobility. There has been increasing interest in the role that fascia plays in individuals that experience non-specific low back pain. Dysfunction in the thoracolumbar fascia has been recognized as a contributor to non-specific low back pain [31]. Recent research has found that there is a significant amount of free and capsulated nerve endings, specifically Pacini and Ruffini's corpuscles, located in the thoracolumbar fascia. Due to this innervation, individuals can experience sensation and possibly pain from dysfunctional fascia [31].

Fascial manipulation

Fascial restrictions occur when there is a lack of glide between the fascial layers. These restrictions can be released with the utilization of different methods of *fascial manipulation* (see Textbox 2).

Fascial manipulation has been defined as a graded stretch of soft tissue restrictions applied by the practitioner and guided by the recipient's physical response to determine the direction of stretch, force, and duration [45]. *Fascial manipulation* is becoming increas-

ingly important in manual medicine practices and there are today many different types of interventions known to release fascial restrictions such as *myofascial release* (MFR), *fascial manipulation*® (FM), the *Rolf method of structural integration* (SI), *Active release technique* (ART), *Soft tissue release and Fascial unwinding* (FU).

There are also multiple techniques that include instruments as a modality for treating *myofascial adhesions* and scar tissue. These techniques are referred to as Instrument Assisted Soft Tissue Mobilization (IASTM). Practitioners use these instruments to have a mechanical advantage by allowing for deeper penetration and a more specific treatment of scar tissue and myofascial adhesions. IASTM can also relieve stress on the practitioner's hands [46]. Some of these techniques include the *Graston Technique of Soft-Tissue Therapy*® (GT), *Guasha*, *ERGON*®, *Hawk Grips*, *Fascial Abrasion*, and *Rock Tapes* [47].

Why naprapathy is different from other manual therapies

Similarly to the above-mentioned therapy modalities, naprapathy focuses on soft tissue manipulation, and additionally it has its own separate distinct set of diagnostic tools, protocols, approaches, and techniques.

Textbox 2

MFR describes a specific manual technique in which a practitioner palpates dysfunctional tissue to identify restrictions, denominated *myofascial trigger points* (MTP). A MTP can be described as a painful area within the skeletal muscle that is associated with a palpable nodule within a taut band of muscle fibers. These taut bands have been visualized with the use of ultrasound technology in combination with elastography multidimensional imaging [32]. Once a MTP is determined, the practitioner applies a sustained pressure directly on it for approximately 90-120 seconds. This specific amount of time allows for the tissue to have a histological change resulting in its lengthening and softening. Once there is a release in the first restriction, new MTPs are determined, and the process is repeated until there is a restoration of the tissue length and suppleness [20].

FM revolves around the idea that human's fascia is a three-dimensional continuum divided into 14 different segments, each served by six different myofascial units, and coordinated by a specific center [33]. Facilitators of FM utilize palpation to determine the dysfunctional center of coordination and treat it creating friction to increase the temperature of the tissue, affecting the deep fascial layers, facilitating a tensional adaptation, and returning the tissue to a state of physiological balance [33].

The *Rolf method of structural integration* (a.k.a. SI therapy) consists of fascial therapies in conjunction with motor re-education. The goal of SI therapy is to facilitate restoration of the human body through the use of biomechanics within the gravity field. The foundation of SI therapy is that the skeletal system is able to function based on the dynamic changes within the muscular, fascial, and nervous systems. SI therapy changes the structure and function of the soft tissue affecting their sensitive receptors [34].

ART is a manual intervention that uses compressive, tensile, and shear forces that are applied to repetitive strain injuries, cumulative trauma injuries, and constant pressure tension lesions with the goal of removing scar tissue and the restoration of soft tissue [35,36]

Soft tissue release is defined as an advanced massage technique designed to target muscle tension [37].

FU is an osteopathic technique used to release restrictions in the fascia. The technique involves a therapist who acts as a catalyst by passively facilitating movement to a specific area of the patient's body giving and receiving feedback according to the sensation of the movement. Movement then becomes active and completed by the individual allowing for the fascia to unwind on its own [38].

GT uses instrument assisted soft tissue mobilization or deep tissue massage [39]. The goal of the GT is to improve range of motion and decrease pain. GT utilizes a combination of stainless-steel instrument and a specific massage to stretch as well as relax the muscle tissue. The stainless-steel instrument assists in the identification of affected areas of dysfunctional tissue. GT reduces pain and restriction by breaking down scar tissue, decreases fascial restrictions and alleviates symptoms of trauma (e.g. muscle strain/tear or sprained ligaments [40]).

Guasha is a therapeutic modality used to treat musculoskeletal pain which utilizes a specific tool designed to rub the surface of the body with the goal of alleviate blood stagnation [41].

ERGON® technique describes an instrument assisted soft tissue mobilization with the intention of mobilizing the cross-links between connective tissue, stimulation of anabolic processes of soft tissue, and the reduction of scar tissue [42]

Hawk Grips describe one of many brands of instruments used for IASTM [43].

Fascial abrasion is unique in that the instrument used for fascial manipulation has a textured finish allowing for the surface of the tool to grip the surface of the tissue providing for deeper and more effective tissue mobilization requiring less direct pressure [44].

Overall, it is similar to myofascial release, but it goes beyond applying pressure to a singular area where tightness is felt. In fact, through palpation, naprapaths trace the fascial restriction and ligamentous tension back to the spine where the practitioners' hands are aligned with the patients' selected bony landmarks and deliver a direct force determined by the direction

in which the ligamentous tension is found. Naprapaths use the principle of the stretch and buckle rule (see textbox 1) with both the spine and the peripheral joints, searching for ligamentous tension and applying pressure with the hands in the direction where the maximum tension is felt. Naprapaths describe connective tissue interwinding as a twisting sensation

that can be felt at the superficial layer of fascia and traced back to the osseous attachments. This pressure is held until the connective tissue is stretched and the tension feels relieved. This is because the fascial restriction is believed to be intertwined with shortened ligaments that attach directly to osseous structures. These shortened ligaments may be bent due to trauma or scar tissue found within the ligaments and surrounding connective tissue altering the regularity of their mesh-like structure and against the principle of tensegrity, where tension and forces are to be distributed equally [48]. Additionally, chartology allows naprapaths to meticulously record the ligamentous tension found on the vertebral column and allow potential follow-up by a different practitioner to continue the same therapy, curbing subjectivity (Figure 3). Beside using manual therapy techniques, naprapaths include within their scope of practice dietary counseling as well as vitamin and mineral supplementation, emphasizing the importance of nutritional therapy to treat the underlying cause of inflammation, pain, and dysfunction [6]. In fact, there are many intrinsic and extrinsic factors that can lead to increased musculoskeletal pain and dysfunctional movement patterns. Nutrition has a significant impact on wellbeing including bone health, connective tissue structure, and the immune system. Lifestyle factors including smoking, obesity, and poor nutritional dietary intake, for example, have been linked to increased chronic musculoskeletal pain [49]. It has been proposed that one or a combination of factors can change the neuronal organization in the peripheral and central nervous system, leading towards increased sensitivity (i.e., central sensitization) in musculoskeletal pain conditions such as non-specific chronic lower back pain, osteoarthritis, fibromyalgia, and chronic fatigue syndrome [50]. Also, low levels of vitamin D intake have been linked to chronic lower back pain [51], whereas alkaline mineral and omega-3 polyunsaturated fatty acid supplementation showed pain relieving effects in patients with lower back pain and rheumatoid arthritis, respectively [50]. Naprapathic physicians combine manual therapy and nutritional counseling to improve well-being and quality of life in individuals experiencing musculoskeletal pain.

Naprapathic Education and Health Care

The *American Naprapathic Association* (ANA) was originally founded in 1907 in Illinois, U.S.A, and serves as a non-profit organization that is designed to protect, preserve, promote, and expand the discipline of naprapathy. It is the largest and oldest association of naprapaths with membership available to all who have received a doctoral degree in naprapathy or is a licensed naprapathic practitioner. ANA and its members are dedicated to the philosophy, and science of

manual medicine as originally conceived by Oakley Smith, emphasizing on exercise rehabilitation, postural ergonomics, and nutritional advice. Their goal is to advance the profession using evidence-based medicine that provides statistical support for the efficacy of naprapathy and its interventions [52]. The *National Association of Naprapathic Medicine* (NANM) is another organization that strives to establish specific guidelines for the quality of naprapathic care, set standards for post graduate naprapathic educational programs, encourage postgraduate training, promote education throughout the public, facilitate universally available and cost effective naprapathic medical care, and the promotion of continued research within the naprapathic and manual medicine field.

The *Naprapathic Research Foundation* (NRF) was founded in NM, U.S.A. 2021 with the goal of increasing public awareness and support evidence-based research on fascial manual treatments oriented at easing pain, improving various pathologies, and enhancing health and well-being, while avoiding the use of prescription opioids. NRF is dedicated to supporting the activities of naprapathic care providers by investing in non-partisan scientific research, education and informational activities dedicated to developing and establishing clinically proven methods, treatments, and modalities to increase knowledge on the benefits of manual therapy on the fascial system.

The first naprapathic school, the National College of Naprapathic Medicine was founded in 1908 in Chicago Illinois. It offers a doctorate level degree that is recognized by the Illinois Board of Higher Education. In the 1980's, in Northern Illinois alone there were approximately between 800 and 1000 licensed naprapaths [7]. In 1970 the Scandinavian College of Naprapathic Manual Medicine was founded by Björn J:son Berg. Since then, naprapathy has grown increasingly popular within Sweden, Norway, and Finland. Recently Finland has developed its own four-year naprapathic program. The naprapathic profession has been recognized as a part of the Swedish health care system since 1994 and is licensed by the national board of Health and Welfare with the goal of treating pain and disability within the neuromusculoskeletal system. According to the Scandinavian College of Naprapathic Manual Medicine [53], it is estimated that over 1.5 million naprapathic treatments are performed within Sweden each year. Licensing requirements in Sweden include a year-long, full time internship partly with a certified naprapath and partly with another registered health care provider on top of a four-year didactic program. In New Mexico, U.S., in 2004, the naprapathic practice act was signed into law, allowing for naprapaths to be licensed under the medical board and practice in New Mexico. The Southwest University of Naprapathic Medicine was opened in 2010 and it is

currently accredited by the distance education accrediting commission (DEAC).

Conclusions - Naprapathy as naturally anti-inflammatory and holistic medicine

Naprapathy is a type of manual medicine designed to alleviate musculoskeletal pain, inflammation, and dysfunction. Naprapathy specializes in restoring function by using specific hands-on techniques to assess each individual and provide appropriate intervention to decrease connective tissue restrictions [6,8,12]. Adhesions in the fascia and ligamentous tension increase pressure on the nervous, vascular, and lymphatic systems potentially creating inflammation, pain, and misalignment. Research on fascia and its properties has shown that its different layers may be responsible for connecting the elements between the joints, myofascial expansions, and retinacula (myofascial spirals). When the gliding of fascial layers is restricted, proprioceptive feedback is inhibited resulting in dysfunctional movement patterns that create joint inflammation and pain [54]. Naprapathic medicine reduces inflammation by acting on the lymphatic system. In particular, it facilitates homeostasis by removing metabolic waste from the myofascial units and allowing freedom of movement and glide between the fascial layers [55]. Physiologically the lymphatic vessels are responsible for draining tissues of interstitial fluid which contains metabolic waste products (e.g. cellular debris and toxic molecules [56]) reducing inflammation [55]. Naprapaths utilize myofascial release techniques in conjunction with naprapathic specific manipulations, corrective exercise, and balanced nutrition counseling to provide a comprehensive and effective treatment. Naprapaths take myofascial release one step further by tracing the myofascial spiral back to the spinal column at its origin. Naprapaths also advocate for the use of an anti-inflammatory diet and nutrition to aid in the body's ability to reduce and control inflammation. One of the main goals of naprapathy is to reduce the need for analgesics and pain medications. Opioids, in particular, have been used for many centuries as the primary avenue for pain management and have highly addictive properties which can lead to dependence over time [57]. As opioids are commonly prescribed by physicians in the treatment of various medical conditions that are associated with severe pain, the rate of opioid overdose in the United States is alarmingly high [2,58]. A common motto by current naprapaths is "Use Naprapaths, Not Opioids".

Conflict of Interests

None.

Acknowledgments

We would like to thank Patrick Nuzzo and Neil Mec-

cia for providing information regarding the history and evolution of naprapathy. A special thanks to Travis Mason for a complete charting of the spine to depict the ligamentous tension and hyperesthesia providing an example of the symbols used in naprapathy. Additional acknowledgments to the anonymous reviewers that contributed valuable comments to improve this manuscript. The authors declare no conflicts of interest.

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