

National University of Medical Sciences

The importance and advantages of Osteopathic Treatment for athletes

Quang Nguyen – C190940
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In the 1800s, Andrew Taylor Still, a physician and surgeon, found out that the key to a healthy body lies within the functioning harmony of all body parts (Seidenberg et al., 2008). At the time, medical treatments were not developed enough, if not immensely ineffective and sometimes harmful; therefore despite being a son of a surgeon, his aim was to mitigate as much medicine and surgery as possible in the procedure of restoring and achieving the best health form. This was the beginning of osteopathy. The practice of osteopathy revolves around the philosophy that the human body can innately and naturally heal and regulate on its own, which makes it a principle for practitioners to treat the body as a whole because any change can have an overall impact (Seffinger et al., 2002). In order to practice this drug-free and non-invasive manual medicine, practitioners need to focus on a wide array of techniques from stretching, mobilization, manipulation to various forms of therapy on the joints, muscles and spine.

Gone are the days when sports are only associated with young energetic people while the mid-aged settle with a sedentary lifestyle. Recent years have witnessed the increase of not only youngsters but also adults and even seniors who express and take up an interest in improving their health through energetic pursuits (Euromonitor, 2008). More people are signing up memberships in gyms, purchasing sports equipment, protein supplements and while this thriving demand is a positive sign for human life span, it also brings certain damage if lack caution. To be more specific, rotator cuff tendinopathy, knee injuries, Achilles tendonitis, tennis elbow, pulled hamstrings and so on are some of the most common conditions that can occur to professional and non-professional athletes. An evident illustration for this is strength training with weights. It is believed that lifting can support trainers in reducing anxiety levels, control blood sugar and prevent diabetes. However, this increasingly demanding sport also comes with inevitable injuries such as wrist, ankle, shoulder sprain or dislocation, shin splint, tendinitis, muscle pull and so on. To this end, osteopathy has obtained traction within high-level training and dedicated itself as a crucial role in strength and conditioning for existing and potential injuries.

In order for the source of injury to be identified, osteopath practitioner will perform a thorough assessment process that includes:

- **Postural analysis:** A person's posture indicates many signs about the natural state of their tissues. Via this analysis, practitioners can locate strained areas and which muscle groups are the roots of the pain. It is vitally important to get this step done accurately because when the body is in incorrect postural alignment, its mobility becomes uneven and its weight distributes inappropriately, which distorts the overall adjustment.
- **Palpation:** By using fingers, hands and suitable degree of pressure, practitioners can examine the size, consistency, texture, location, tenderness of an irregularity suggestive of condition and assess the severity of pain. Though athletes may respond better to palpation compared to normal people because their muscles are trained to be firmer, this step cannot be overlooked as further pains and injuries may occur during treatment.
- **Gait analysis:** According to O'Connor (2008), many people can walk with asymmetrical gait patterns for a long period of time without encountering any symptom or difficulty. However, once they undergo an injury or accident, it alters their normal gait and leads to more severe health problems and impacts their living over both short and long term. A

few examples include musculoskeletal problems and cardiovascular health issues. This is where gait analysis comes in useful. This method offers versatile application in the clinical practice setting for athletes. By examining how a person moves about, practitioners can determine the person's unique way of walking, identify abnormal gait patterns and decide which implementation is appropriate to correct those abnormalities.

- Muscle strength testing: This is a necessary component of the physical exam that enables practitioners to be aware of patients' neurologic deficits. The purpose of manual muscle testing is to assess weakness and differentiate balance deficiency from poor endurance, mostly when there are indications of neurologic disease in patients suffering from spinal cord injury, amyotrophic lateral sclerosis and other neurologic conditions. Certain groups of muscles are focused in this testing (shoulder abductors; elbow, finger, hip, plantar flexors; knee, wrist, elbow extensors and several more) in order for the spinal nerve roots to be evaluated systematically (Ciesla et al., 2011). With that being said, other muscles can be tested as well to assess individual peripheral nerves.
- Joint restricting testing: With or without regular exercise, stiffness is still one of the most common conditions seen in joints. Manual testing and treatments can evaluate the joint's compliance, laxity as well as resistance by applying direct external force to opposing joint areas. From there, practitioners can select appropriate treatment and manipulation.

The nature of sports is so frantic and extreme that injuries are unavoidable. Moreover, the nonchalant attitude also contributes to athletes constantly finding themselves in accidents and sudden physical breakdowns. Especially those who have been in the game for a long time tend to neglect early signs of health alert thinking they know their body and there is no need to make a fuss about one or two minor incidents. To address this, osteopathy provides a wide range of advantages to cure and prevent such unfortunate events from happening or repeating. The first benefit is declining restriction and enhances mobility. Sports players often strive their best to push their limit and this results in pull, strain, splint, tear in muscles and displacement of joints which is demonstrated through a range of common sports injuries, especially including:

- Plantar fasciitis: this is a painful inflammatory process of the plantar fascia - the thick fibrous band of connective tissue that originates from the calcaneus bone (heel bone) and extends along the sole towards the five toes. This condition is most commonly seen in dancers, runners, soccer players, rock climbers, and other sports that require constant movement and pressure of the foot. Patients of plantar fasciitis suffer from severe heel pain, knee pain and decreased dorsiflexion.
- Ankle sprain: similar to plantar fasciitis, ankle sprain occurs especially when there is sudden and rapid side to side movements, for example tennis, badminton, basketball, soccer, handball, skiing and so on. Moreover, deltoid and anterior talofibular ligament is the most commonly injured ligament followed by calcaneofibular ligament. Patients usually experience pain, swelling, bruise, walking difficulty, joint instability, tenderness and decreased ROMs.
- Rotator cuff tendinitis (shoulder impingement syndrome): the most common cause of this condition is overuse of the tendons, which means sports that require moving the arm over the head repeatedly like tennis, baseball, volleyball, swimming, gymnastics and weight lifting. It causes athletes to suffer from pain, weakness and muscle wasting.

- Runner's knee: this condition is due to an irritation and side-to-side movements of the kneecap (patella) on the groove in the femur and most commonly seen in runners, soccer players, cyclists, rowers and many more. It causes the knee cap to slip back into the groove, which is why we hear clicking, cracking or crunching sound when the knee is bent or straightened and therefore causes much pain and instability.
- Fracture, or more widely known as broken bone and causes extreme pain, swelling, deformity, muscle spasm, bleeding and syncope.

More often than not, patients can opt for taping, therapeutic exercises, bracing, physiotherapy and massage therapy before resorting to surgery. Regular osteopath treatments can reduce joint resistance, reduce pain and recover injuries using soft tissue therapy and mobilization or manipulation where the pain occurs. For instance, by raising the patient's awareness of the joint's movement and position, combined with simulation of smooth joint function and small passive movements, practitioners can manually work the joints through a gentle level of resistance which then reduces the pain and increases range of motion in this area where soft tissue surrounds. Another advantage manual osteopathy provides for athletes is strengthening muscles and ligaments. It goes without saying that sports people are among the highest number of individuals who work with these two components the most. While regular exercise brings their muscles and ligaments to the strongest state, it is still possible they over-do it and injure themselves while training. To be more specific, whether it is mild intensity sports such as yoga, table tennis or high intensity fitness activities like weightlifting, marathon running, athletes can easily cause themselves sciatica, accentuated lumbar lordosis, muscle tear and inflammation when they put too much pressure on the body. Not to mention, during training and competing, athletes subconsciously raise pressure throughout the vertebral facets of the lumbar spine and intervertebral discs which causes hyperlordosis (Fryer, 2009). In conjunction with therapeutic exercises and mobilization techniques to reduce pain, myofascial release is part of the methods to address those problems. This therapy relaxes contracted muscles, enhances stretch reflex muscles and also improves blood and lymphatic circulation. Speaking of which, manual osteopathy also offers improvement in blood flow and lymphatic drainage. The osteopathic medical profession has come up with lymphatic pump techniques (LPT) to encourage the lymph flow and support the immune system in suppressing and eliminating pathogens (Hodge, 2013).

The effect of manual osteopathy treatment not only cures musculoskeletal disorders but also extends to improving mental well-being (Selby, 2016). Everyone suffers from stress and anxiety from time to time, if not every day, but research shows that the majority of athletes struggle with psychological, emotional and behavioural problems more than the rest of the population (Mann, et al., 2007). This is due to physical, psychological, environmental demands, high expectation to be on top, significant pressure to perform at their best and competitiveness (Reilley and Williams, 2003). Athletes who undergo extreme stress or anxiety and do not seek methods to mitigate it will soon have issues that will eventually reflect on their behaviour. Sports psychologists have found that prolonged and intense stress during competition can easily lead to disappointing performance and dropout (Hann, 2000). For that, Soft Tissue Therapy is considered to be a useful method to aid stress management. According to scientific studies, upper back and neck massage can support the reduction of stress and migraine attacks (Noudeh et al., 2012). A research conducted by Swansea Academy of Health and Well-being in 2014 shows positive results of the impact of osteopathy (Edwards et al., 2018). For 5 consecutive years, therapists of the academy had been giving patients questionnaires throughout the treatment about

their mental health relating to their chronic pain and data showed significant reduction in anxiety and distress. As a result, incorporating massage and therapy into treatment can greatly ease the patient's mind and improve their overall performance.

One of the biggest concerns athletes have after encountering injury is how long it is going to take before they can get back in the game. The recovery time relies largely on the nature of the injury, the athlete's health status at the time and also previous health records. Professional athletes who receive quality care usually bounce back quickly from initial injury; that said, repetitive force on past injured tissues will cause major problems and needs to be under watchful treatment in order to remain in peak form, even for the most resilient bodies. Post-workout osteopathic treatment can help athletes maintain aligned spinal structure, strengthen their muscles and keep their joints healthy. More specifically, muscle energy technique can be performed to improve tight or weak muscles, joint mobilization techniques concentrating on the spine can support correcting the body's posture, cranial sacral therapy alleviate dysfunctions and enhance the body's self-correcting function while myofunctional release techniques corrects muscle imbalances, improve joint range of motion as well as relieve muscle soreness and joint stress (Burns & Wells, 2006). For instance, foam rolling is an effective way to reduce recovery time. After a workout, waste products like lactic acid will build up which causes soreness to muscles and joints (commonly known as delayed onset muscle soreness). By applying force to connective tissue, new blood is recruited and the acid is washed away from fatigued muscle groups and therefore it takes a shorter time to retrieve the patient's normal state. All in all, comprehensive manipulation and treatment before and after injury will fasten the recovery time for athletes.

Osteopathic evaluation and treatment of musculoskeletal framework is associated with a statistically dramatic decline in the incidence of sports injury and increase in performance ability. To shed light on the positive impact of osteopathy on athletes, a retrospective cohort study was conducted among football players of Virginia Polytechnic Institute and State University during two consecutive football seasons (Brolison et al., 2012). Board-certified osteopathic physicians were assigned to provide pre-competition treatment to the cervical, thoracic, lumbar and sacral sections of the selected athletes' spines using soft tissue, muscle energy, low velocity, and high amplitude for about 5 to 10 minutes each session. After each game, the coach, without knowing which players received prior manipulation, will grade the players' performance based on a standard algorithm.

Results showed positive correlation between the pre-competition osteopathic manipulation and athletic performance (Appendix I). Players who received treatment illustrated higher test scores of agility, power, speed and reaction time compared to those who did not. Because of the practical advantages manual osteopathy has proven to provide in various real-life setting studies, it has been chosen as standard medical care to competitors in major international multi-sport games such as the Olympic Games (Sandell et al., 2008).

Another study provided by European Journal of Applied Physiology in 2018 also showed remarkable results of osteopathic assistance after one single session. It was with the purpose of determining whether one session of spinal manipulation can enhance cortical drive of the lower limb (soleus muscle) for a group of taekwondo athletes that this study was carried out. The study used a randomized controlled crossover design to record the plantar flexors' H-reflex. MVC (Maximum Voluntary Contraction) and V-waves of 11 Taekwondo athletes (Appendix II). To evaluate between each group of athletes, the conductors utilized multifactorial repeated measures

ANOVA based on time and session. Results show enhanced muscle strength and corticospinal excitability to ankle plantar flexor muscles. Also, The increased maximum voluntary contraction force lasted for half an hour and the corticospinal excitability increase persisted for at least an hour.

Most research papers focus more on the effects of osteopathy from a medical profession stand point while very few of them highlight whether not this practice is testified by athletes claiming it actually brings substantial outcomes to the table. For this reason, a group of medical authors examined collegiate athletes' perception of OMT using a cross sectional survey with a sample size of 592 collegiate athletes from two universities in the midwestern United States during August-September 2019. The participants were asked to complete a survey which consists of 12 questions regarding pain, pain medication and mental issues relating to injuries and their overall satisfaction. Results show 94.4% of participants who are familiar with OMT reported a reduction in pain killer medication and 83/3% claimed their stress and anxiety had decreased considerably. Moreover, 33.33% expressed interest in having OMT as their treatment option for injury and a large proportion manifested general satisfaction to osteopathic treatment. Overall, the benefit, importance and also interest for this medical approach is demonstrated within the scope of this study. As more people, especially athletes, opt for alternative pain treatment that does not involve medicine or surgery, it is fair to say more research should be conducted to better develop osteopathy.

Pursuing an active and healthy life is by no means an easy path, but is extremely rewarding once we see ourselves exceeding all the limits we never thought our body can handle. For that, we should not let pain and injury hinder our motivation. Regular physical therapy check-ups will help determine early issues and provide specific stretches or exercises for athletes to practice in the convenience of their own home. It is recommended that athletes set aside time in their schedule to attend osteopathic treatment at least once every other week to limit physical injuries and alleviate emotional symptoms.

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Appendix I

Table 2.
Performance Scores^a of Virginia Tech Athletes
During 2 Consecutive Football Seasons

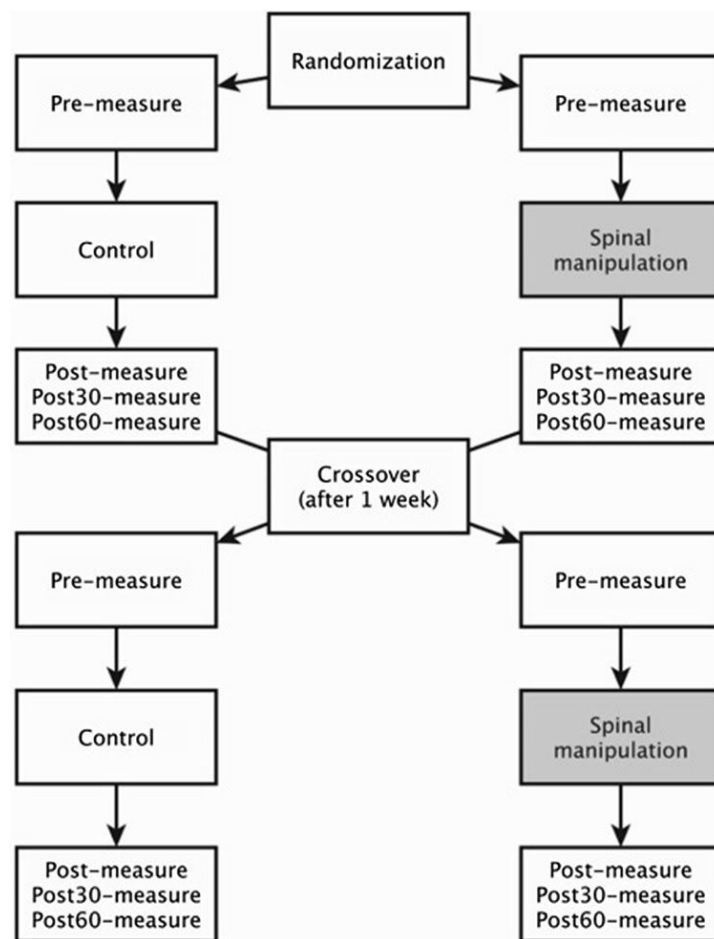
Opponent	Offensive Players		Defensive Players	
	n ^b	%, Mean (SD)	n ^b	Mean (SD)
Season 1				
Opponent 1	25	80.8 (12.1)	25	8.1 (10.6)
Opponent 2	19	83.1 (8.9)	18	16.0 (13.4)
Opponent 3	22	84.8 (7.2)	16	23.4 (16.3)
Opponent 4	18	73.2 (26.8)	15	16.9 (11.2)
Opponent 5	20	79.7 (20.1)	16	14.1 (8.6)
Opponent 6	20	74.8 (21.5)	17	17.3 (14.4)
Opponent 7	21	75.0 (20.4)	15	15.8 (13.4)
Opponent 8	21	78.9 (27.4)	14	13.9 (10.8)
Opponent 9	18	76.8 (21.8)	14	16.9 (12.7)
Opponent 10	22	76.5 (20.9)	14	27.1 (14.1)
Opponent 11	21	71.5 (30.6)	13	16.5 (13.6)
Average Performance	21	79.0 (10.5)	16	10.7 (11.2)
Season 2				
Opponent 1	19	76.4 (21.3)	18	16.7 (15.0)
Opponent 2	31	80.6 (16.7)	26	9.0 (8.7)
Opponent 3	20	73.9 (26.4)	14	18.0 (15.7)
Opponent 4	21	77.9 (19.1)	16	25.6 (17.5)
Opponent 5	18	78.7 (20.2)	18	15.2 (10.8)
Opponent 6	29	83.5 (8.7)	29	11.5 (10.6)
Opponent 7	19	74.9 (27.0)	19	14.1 (9.4)
Opponent 8	21	74.6 (23.0)	18	14.9 (9.1)
Opponent 9	28	85.7 (9.0)	23	14.5 (8.6)
Opponent 10	30	84.0 (18.2)	24	17.5 (16.1)
Opponent 11	30	87.4 (18.9)	24	12.9 (10.7)
Average Performance	24	82.8 (12.9)	21	10.6 (9.8)

^a Offensive players received a percentile score (0% to 100%), and defensive players received a numeric score (>30, very good).

^b Number of players for each game.

Table demonstrating data of Virginia Tech Athletes' performance scores during 2 consecutive football seasons.

Appendix II



Flow of subjects through the study of Taekwondo athletes