

Athletes in Pain:
The Efficacy of Myofascial Treatment Programs

Emily Andriko
Youngstown State University

Have you ever been running and found yourself in so much pain that your vision goes white and you can't see anything? Or maybe you have been on a treadmill and have nearly collapsed because your knee just stopped holding your weight. Being unable to bear weight is a common problem and rarely stems from the area targeted by pain. Normally, the pain is located in the muscles surrounding inflamed joints and then spreads throughout the body. In general, after an injury or painful encounter as described above, athletes will be reluctant to see a doctor. They may be told to slow down, change their exercise regime, or told they have to sit out the rest of the season. Athletes do not want to hear that they must stop participating in physical activity so they just do not say anything. Athletes are exceptional at pushing through pain; the problem is, at some point they build a tolerance and when the pain gets worse, they don't notice. Professionals in the field and those close to the athlete must all understand when to get him/her to the doctor and must recognize the warning signs. An increase of pained facial expressions while working out, more time holding an ice pack, or limping off the field or line are just a few of these signs.

What if there was a way to avoid the injury getting worse, assuming the athlete steps up and admits he/she is in pain? A therapy method is needed that is effective, fast-acting, and non-invasive. This therapy is needed so that the athlete can be healed in a faster and more effective way. By using myofascial release quickly after the athlete is injured can increase the efficacy of the treatment and the treatment works so quickly that scar tissue does not have time to form. Myofascial release is the effective therapy that has been sought after by athletes and therapists alike. According to John F. Barnes, PT, myofascial release (MFR) is a hands-on therapy that, "involves applying gentle sustained pressure" within tissue that joins different parts of the body together. MFR is meant to decrease or eliminate pain as a non-surgical and non-evasive therapy.

Knowing what myofascial release is and why it is used is very important. This paper will not only address the importance but also will explore cases in which MFR was productive in patients' lives. This paper will focus predominately on myofascial treatment programs for athletes that use myofascial release as a primary source of treatment. In addition to explaining and supporting myofascial treatment plans and MFR, alternative options will be offered and their disadvantages will be laid out to encourage the making of an informed decision.

JoEllen Sefton, MS, ATC wrote a three-part guide for athletic trainers on what MFR is and how it should be administered. MFR is a therapy that focuses on softening and stretching the fascia of the body. Fascia is a structure that "wraps around and through all of the muscles of the body" in many directions. Fascia allows movement of joints and when disturbed and overstressed it hardens. Many concerns with muscles, soft tissue, and acute and chronic pain can be adjusted and dealt with using MFR. A very crucial and little known fact about myofascial release is that it can be used as a rehabilitative therapy and a precursor to activity. Used as a precursor to activity, myofascial release becomes a preventative therapy. By administering MFR before activity, the muscles and fascia are loosened and softened and are more susceptible to movement without pain. Using MFR preventatively or as a rehabilitative measure can benefit athletes and others in many ways. Used in a training room or field setting, myofascial release can greatly benefit athletes who are in pain and get them up and moving in as little as minutes (Sefton, 2004, pp. 48-49).

Manual therapies are being used in many settings and many physical therapists specialize in manual therapy. In fact, Kenneth Learman, PhD, PT, OCS, FAAOMPT, Associate Professor in the Department of Physical Therapy at Youngstown State University, is a specialist in manual therapy. Of course each manual therapist does not use every therapy and each has his/her

preferences. Dr. Learman, for example, does not use myofascial release but uses other forms of therapy that he finds to be beneficial. He explained in an interview that he does not have a specific preference of manual therapy but he strongly believes that manual therapy must remain hands-on. To him, manual therapy is any treatment that uses the hands. Those treatments include stretching, soft tissue treatments, mobilization techniques, and manipulation therapy. One very important point that Dr. Learman continually expanded on was that manual therapy is extremely effective but cannot work effectively on its own. Realistically, the effects of manual therapy only last somewhere between five to twenty minutes. This period in which the effects of the therapy are noticeable allows time for the patient to exercise in a heightened neurophysiological state that enhances the efficacy of the exercise (Learman, 2012).

One very common form of myofascial treatment utilized is myofascial trigger point release. Trigger points are found in muscles and fascia and can be the location of acute and chronic pain. These trigger points do not exist in everyone as they are specifically caused by strain in the muscles from poor posture, poor body mechanics, and misalignment. Therapists can use manual therapy to treat trigger points in their patients. There are two common treatments for trigger points. The first is active release which involves the stretching and contracting of the muscles in which the trigger points are located. The second treatment is passive release in which pressure is applied to the location of the trigger points to work out the knots that form in the muscles as a direct result of the trigger points (Ambrose Lo, 2010, pp. 23-26).

Although some therapists may disagree that trigger point release is effective, there have been many studies conducted that show and prove the efficacy. Wai-Leung Ambrose Lo, Physiotherapist, brought together the results of several studies that were conducted to determine the efficacy of myofascial trigger point release. The conclusion drawn by Ambrose Lo was that

the ideas and theories behind the treatment of trigger points were spot on. It has also been proven that these techniques do efficiently reduce pain that patients associate with trigger points. Also, because of the therapy on the trigger points, patients have reported lower sensitivity levels in those areas (Ambrose Lo, 2010, pp. 27).

Trigger point release has not been thoroughly studied until quite recently. Now there are multiple studies being released attempting to find some connection between manual therapy and the decrease in pain and sensitivity related to myofascial trigger points (MTrPs). MTrPs cause pain in many athletes and they are commonly found in the posterior knee and quadriceps area. MTrPs can also cause severe shoulder pain at many times, including when the shoulder is completely still. Because of this problem, therapists have been pressured for a solution. In a study conducted by Bron et al, MTrPs were used to help patients with chronic shoulder pain. The results of the study concluded that MTrPs are very effective in reducing the pain the patients do experience. The therapy is also very effective at increasing shoulder range of motion after administration (Bron, de Gast, Dommerholt, Stegenga, Wensing, Oostendorp, 2011, pp.1-14). Having a non-evasive procedure that can greatly increase range of motion and reduce pain and sensitivity has not been researched as it should have been until recently but now that we have a therapy that is effective, therapists and other professionals can use it to help patients tremendously. Myofascial trigger point release will always be very effective as long as it is continually followed up by a therapeutic exercise. Without an exercise plan, the therapy will not be beneficial as the effects of the therapy alone only last about twenty minutes (Learman, 2012).

Manual therapy is not the only thing used on patients despite its efficacy. Another very popular form of therapy is known as Neuromuscular Electrical Stimulation (NMES). NMES targets the nerves as well as muscles within the affected area of the body. This therapy has been

said to be essential in physical therapy due to its ability to hit hard-to-reach areas within the body. NMES is different than manual therapy because it, “uses an electrical current to cause a single muscle or group of muscles to contract...Contracting the muscle via electrical stimulation helps strengthen the affected muscle...Along with increasing muscle strength, the contraction of the muscle also promotes blood supply to the area that assists in healing” (Inverarity, 2005).

NMES can reach some areas of the body that cannot be easily touched by manual therapy, but the overall efficacy of NMES is unsubstantial when compared to the efficacy of manual therapy.

One very interesting fact to note about NMES is that it can do a job that normally requires many separate devices or techniques. Many studies have been conducted using NMES and many physical therapists use it, but no conclusive evidence has yet to be found that proves that NMES is effective on its own. In fact, therapists will often use both therapies (NMES and manual) together in a clinic to reach the optimum performance from patients. Therefore, NMES is not always effective alone but if paired with a manual therapy technique before an exercise regime, these therapies will produce the best results for each patient.

The combination of therapy techniques or each technique on its own is intended to treat cases of myofascial pain syndrome. Myofascial pain syndrome is a very serious problem and many patients, especially athletes, suffer from it. A revolutionary theory was developed that changed how manual therapy was viewed. This theory is known as the gate-control theory and says that the pain receptors in the body travel a certain path to the brain. By applying pressure to the location of the pain, the receptors are essentially rewired. The body then receives pressure signals instead of pain (Aronson, 2002, pp. 8-9). The gate-control theory occurs naturally in our body. Think for a moment: When you smack your thumb with a hammer, what do you do? You grab it with your other hand and apply pressure and it lessens the pain. This theory is used by

therapists and athletic trainers alike. By applying pressure to places in pain, such as MTrPs, the body interprets the signals as pressure.

The gate-control theory is a basic and simplistic overview of how parts of the body respond to a stimulus and is a model of how the brain and spinal cord perceive pain. The interpretation of pressure, pain, and rubbing sensations by the body is due to multiple factors. Each sensation travels through the nervous system, the spinal cord, and into the brain along the same pathways. When an area of the body is painful, therapists change this feeling by applying pressure or by rubbing the affected area. The feeling of pain is changed because, according to the theory behind gate-control, the brain and spinal cord receive sensations as an average input. If 100,000 parts of pain are coursing through the body from one point and then 500,000 parts of pressure are applied to the same spot, the brain will only receive the pressure sensations. The reason the brain only feels pressure is because the pressure cancels out the pain. The same idea works if a therapist or patient were to rub a sore spot. If an area is rubbed repeatedly, the brain translates the feelings as rubbing and no pain. Just as explained earlier, however, this input reading from the brain only lasts a short matter of time and exercise must take place before the sensations wear off (Learman, 2012).

Other theories for manual therapy exist as well. The central-biasing theory builds onto the gate-control theory. It exists on the premise that an athlete's perception of pain can depend on many underlying causes. Aronson wrote that: "The central-biasing mechanism explained by Melzack and Wall also has motivational-affective influences. An internal drive or external stimulation can have a strong influence on thought processes and, therefore, the affect or perception of pain." This theory is demonstrated by athletes when they get hurt in a game and refuse to stop because of their determination. Pain tolerance and perception can be influenced by

many factors and that is why some athletes are considered tougher than others (Aronson, 2002, pp. 10). The central-biasing theory was clearly demonstrated in the example given in the introduction of this paper. When athletes are afraid of losing the ability to play or participate in something they love, they can trick their brains into believing that they are not experiencing the pain so they can keep competing.

These two theories within manual therapy open up new doors for research and development within the field. Each theory stems from the physiology of pain. A clinical review written by Angela Jacques explains the basics of pain perception and the physiology behind it. Pain is perceived and acts differently in different people. In fact, there are many psychogenic influences on pain and vary among the population. Each individual feels pain differently because of meaning associated with the pain that stem from past experiences. Anxiety can have a big effect on pain too as those who are afraid, anxious, or depressed can feel an increased pain sensation. Interestingly, patients' personalities can have an effect on their pain perception. It has been shown that those who have a more outgoing personality complain more about pain and feel less of it than those who are introverted (Jacques, 1994, pp. 607-610).

Through the studying of the physiology of pain, many therapies have been discovered to reduce pain perception. These many therapies include electrical stimulation, distraction, psychotherapy, physiotherapy, acupuncture, reflexology, and most importantly massage therapy. The use of these therapies paired with the knowledge possessed by physical therapists about pain perception has allowed patients to have a significantly higher quality of life. An important point to always remember about pain is that, "Although people have the same basic anatomy, they may perceive pain in a totally different way." Jacques calls upon health care professionals to understand that the patient always knows the pain they are in and to not attempt to minimize or

over exaggerate the pain (Jacques, 1994, pp. 610). Understanding the patient and what he/she feels is important in all circumstances, not only in a medical setting. If people began to see that others were in pain and believed the severity expressed by the patients, more would be helped and the help would be administered more effectively.

A decrease in pain sensations has been proven to be a direct result of manual therapy. Other forms of therapy, such as NMES, claim to decrease pain and increase strength in certain muscle groups. Palmieri-Smith et al said, “Neuromuscular electrical stimulation (NMES) has demonstrated efficacy in improving quadriceps muscle strength (force-generating capacity) and activation following knee replacement and ligamentous reconstruction” (Palmieri-Smith, Thomas, Karvonen-Gutierrez & Sowers, 2010, pp. 1441). The problem with the previous statement is that NMES was only beneficial in post-surgery patients. If NMES was administered to patients that had not undergone serious orthopedic surgical procedures, it was no longer effective. The biggest problem in this field is that there are so many effective treatments for patients post-surgery but what about patients that do not need surgery? Are they to be punished with a non-effective treatment because their condition is not yet severe enough to need surgery? Not allowing the patient a therapy that can be used without being subjected to surgery is not right. Without manual therapy to treat musculoskeletal problems as a preventative measure, more patients would need surgery because their pain was never thoroughly addressed. If professionals in the field do not start utilizing myofascial treatment programs more often and more effectively, NMES will become crucial because it is so effective post-surgery and more patients will need the surgery. That scenario that is completely preventable by using these myofascial treatment programs.

Myofascial treatment programs are utilized in many specialized areas. Because it can be used in those areas, myofascial treatment programs are not simple but are very effective. One very important field of knowledge is that of basic anatomy. Without basic anatomical knowledge, a professional cannot successfully work on a patient. Visualization is the key in myofascial release and the ability to visualize comes with knowledge. It is very important to be able to visualize muscles because “knowing their attachments and the direction of the fibers will help you to understand what you are feeling.” By knowing the muscles in the body, where they are located, and how they are supposed to work, the therapist is able to successfully and effectively administer myofascial treatments (Sefton, 2004, pp. 52-53). Therapists need to know the anatomy of the human body so they can improve the quality of life of all patients with which they come in contact.

With knowledge of basic anatomy comes the ability to fix the many afflictions with which patients are affected. Injuries and inflammation of the Iliotibial Band, for example, can be fixed by use of myofascial release. By applying pressure to trigger points, using a deep friction massage and PNF stretching, therapists can soften and stretch the fascia to decrease pain and inflammation. PNF stretching allows patients to be able to work out their tightness and inflammation on their own (Sefton, 2004, pp. 40).

Inflammation can be reduced in many other injuries as well. Inflammation reduction is very useful for patients with hamstring injuries. Hamstrings have a strong tendency to scar and must be worked out efficiently. The therapist must return the muscle to its original function before the scarring becomes severe. The work done using myofascial release starts with loosening tightness in the calf and the applying pressure to the painful muscle as the patient's knee is bent. Continued pressure along areas where muscles spasm will result in diminished pain

and faster healing. This treatment is effective because it is fast-acting and can be done outside of the clinic to get an athlete back to participating and performing to his/her highest potential (Sefton, 2004, pp. 40-41).

In addition to these aforementioned treatments, many other myofascial treatments are effective. Before and after administration of myofascial release, the therapist or trainer should perform certain tasks. Heat packs are used to prep the area to be treated by beginning to, “warm the area and relax the muscle.” By applying heat, the muscles are more susceptible to the manipulation occurring through myofascial release. After treatment has been administered, patients are asked to do a series of stretching to maintain longevity of treatment (Sefton, 2004, pp. 41).

Longevity of treatment is vital in physical therapy. In fact, without this success, physical therapists would be out of their jobs. The goal of physical therapy is to increase quality of life, not maintain a large patient base. If a therapist has a large patient base that returns regularly, he/she is not doing the job correctly. According to Rand et al, “The ultimate goal of any physical therapy intervention is to improve long-term function of the patient...” This long-term function can correspond with many ideas but eventually points to the idea that manual therapies are beneficial for improving function. Improving the range of motion, elasticity and flexibility, and decreasing pain all are vital within the realm of physical therapy (Rand, Goerlich, Marchand, Jablecki, 2007, pp. 1661).

Myofascial release is becoming increasingly vital in physical therapy. Any method that can quickly reduce pain and inflammation and do so effectively is rare. Myofascial release is able to achieve this preferred result. In fact, “myofascial release can be a valuable addition to your arsenal of treatment methods...it can be a quick and effective treatment for many

muscular/fascia disorders, both on the field and in the athletic training room” (Sefton, 2004, pp. 41). The versatility of myofascial treatment programs have allowed many aspects of sport and everyday life to be changed. Instead of an athlete being out for multiple games from a pulled muscle, pinched nerve, a tight calf, or a knot in the muscle he/she can return to the game almost immediately if the team physical therapist or athletic trainer has knowledge of myofascial treatment programs. Because myofascial treatment programs work so quickly, the athlete is able to return from minor injuries almost immediately and is able to perform in a heightened neurophysiological state because of the treatment.

The heightened neurophysiological state is what enhances and hastens healing. Even if a patient has a more severe injury, such as patellar tendonitis in the knee, he/she is able to return to regular activity within a few weeks. Not only can he/she return to activity but the return to activity is also accompanied by reduced pain. The athlete that has his/her knee give out while running is able to return to running without the fear of collapsing again. Athletes face a fear of injury every day and having a treatment that can quickly begin the healing process lessens the fear of being out of commission. Myofascial release and myofascial treatment programs are effective because they are non-invasive, can be self-administered with the correct knowledge base, produce an enhanced physiological state in which to exercise, get athletes and patients back to regular activity, and most importantly, significantly improve the quality of life for patients. The underlying purpose of physical therapy is to improve quality of life. By implementing these treatment programs, quality of life will be improved infinitely. Myofascial release and other treatment programs are the most important techniques a physical therapist can learn. Seeing warning signs in athletes and acting to correct them using myofascial treatment programs can and will change physical therapy as it currently is and the change will be for the better. Every

physical therapist needs to know how to administer and teach myofascial release. When every physical therapist begins using myofascial treatment programs, overall quality of life will improve significantly. Physical therapists are in the profession to increase the quality of life for their patients. By using the techniques for myofascial treatment programs therapists are able to make life easier and better for their patients. Myofascial treatment programs are becoming increasingly effective as more is learned and with continued research, the efficacy can only increase.

Neuromuscular electrical stimulation is going to be able to get patients up and moving after surgery but the patients that haven't had surgery need a therapy that is effective as well. NMES, though not invasive on its own, follows a very invasive procedure. Patients and athletes are searching for a procedure that will heal them with little to no down time. Myofascial treatment programs are versatile enough to be used on the patient with a sore quadriceps muscle or the athlete, as in the intro, endured trauma so great that he/she could not bear weight with the injured leg. Athletes and non-athletes all experience pain. Those persons in pain need an effective therapy and now myofascial release has been exposed as a helpful treatment. Encouraging the use of myofascial treatment programs will eliminate fear of collapsing at the treadmill and losing the chance to participate and that will change the way activity and physical therapy is viewed from the general population.

References

- Ambrose Lo, W. (2010). The role of myofascial trigger points in muscular pain. *SportEX Dynamics*, 26(Oct), 23-27.
- Aronson, P. (2002). Pain theories—A review for application in athletic training and therapy. *Athletic Therapy Today*, 7(4), 8-13.
- Barnes, J. (n.d.). Myofascial release: Definition. Retrieved from http://www.myofascialrelease.com/fascia_massage/public/whatis_myofascial_release.asp
- Bron, C., de Gast, A., Dommerholt, J., Stegenga, B., Wensing, M., & Oostendorp, R. (2011). Treatment of myofascial trigger points in patients with chronic shoulder pain: A randomized, controlled trial. *BioMed Central*, 9(8), 1-14. Retrieved from <http://www.biomedcentral.com/1741-7015/9/8>
- Inverarity, L. (2005, May 01). *Electrical stimulation*. Retrieved from <http://physicaltherapy.about.com/od/abbreviationsandterms/g/ESTim.htm>
- Jacques, A. (1994). Physiology of pain. *British Journal of Nursing*, 3(12), 607-610.
- Learman, K. (2012, April 16). Interview by E. Andriko [Personal Interview].
- Palmieri-Smith, R., Thomas, A., Karvonen-Gutierrez, C., & Sowers, M. (2010). A clinical trial of neuromuscular electrical stimulation in improving quadriceps muscle strength and activation among women with mild and moderate osteoarthritis. *Physical Therapy*, 90(10), 1441-1452.
- Rand, S., Goerlich, C., Marchand, K., Jablecki, N. (2007). The physical therapy prescription. *American Academy of Family Physicians*, 76(11), 1661-1666.
- Sefton, J. (2004, January). Myofascial release for athletic trainers, part 1: Theory and session guidelines. *Athletic Therapy Today*, 9(1), 48-49.

Sefton, J. (2004, March). Myofascial release for athletic trainers, part 2: Guidelines and techniques. *Athletic Therapy Today*, 9(2), 52-53.

Sefton, J. (2004, May). Myofascial release for athletic trainers, part 3: Specific techniques. *Athletic Therapy Today*, 9(3), 40-41.