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J Med Sci Tennis 2010;15(1):18-22

The Role of Massage Therapy in Tennis Medicine

The benefits of sports massage therapy are numerous and affect every system of the body. As the sport of tennis involves all body systems, incorporating this modality into the overall training strategy is relevant for reaching tennis goals. The effects of massage therapy fall into one of three categories: physical, psychological, and emotional.¹ Physical responses to massage techniques occur in two ways. The first is a direct result of the manipulation of tissues from components such as pressure, range of motion, pushing, pulling, lifting, compressing, and twisting of the tissue. The second response is reflexive and is the result of tissue changes directed through the nervous system.² While these responses are discussed separately, they are closely related and often occur simultaneously. Psychologically, massage therapy calms the nervous system, reduces anxiety, which improves sleep, and enhances the general well being of the individual. Lastly, the emotional effects include satisfying the need for touch and caring.¹ All three of these categories are extremely important in the overall health and well-being of the tennis athlete.

Massage Therapy at the Tour Level

To meet the healthcare needs of the tennis athlete, the Sony Ericsson WTA Tour has developed a comprehensive sport sciences and medicine program which includes different specialties and disciplines working together to focus on the whole athlete. Sport massage therapy is one area of that comprehensive care. All of the massage therapists working on the Sony Ericsson WTA Tour, whether they are a Tour massage therapist or a qualified local massage therapist, have additional education and experience working with athletes, good clinical reasoning skills, and understand the demands of the sport. The collaboration of the massage therapists with the other health care practitioners on the Tour, the Primary Health Care Providers (qualified sports physiotherapists) and Tournament Physicians, results in a better level of service for the tennis athlete.

Sony Ericsson WTA Tour athletes are educated in the strategic use of massage therapy services during the different phases of training and competition. Massage therapy on the WTA Tour is most commonly applied in four key areas:

1. *Practice or match preparation massage* is typically done within 90 minutes of activity, is of short duration (10-

15 minutes), quicker pace, and uses lighter pressure than other types of massage. It prepares muscles for activity by increasing blood flow to the area and stimulating the nervous system. It can reduce the onset of perceived exertion and increase pliability of the muscle.³

2. *Injury treatment* involves a variety of specific massage techniques, which can be applied at any time throughout the rehabilitation process. Early in the process of injury recovery, light techniques such as lymph drainage or superficial effleurage can be applied to help with swelling or pain. As the athlete's healing progresses, techniques such as friction can be used to minimize excessive scar tissue formation.⁴ During the exercise phase of rehabilitation, deeper techniques are used to remove fascial and muscular restrictions to improve range of motion and muscle function and enhance the effectiveness of the exercises.
3. *Preventative health care and maintenance* is an important area where massage therapy is used. Underlying dysfunction in muscles and connective tissues of the body such as restrictions in motion, improper posture, and old injuries contribute to excessive loading and injuries of the musculoskeletal system. When applied skillfully, massage can remove restrictions in the muscle, compression on nerves, changes in movement patterns, and referred pain from the tissues. Massage can continue to correct soft tissue imbalances and prevent them from returning. Keeping the body mobile and free from restrictions will help prevent the little aches and pains from becoming a more involved injury.
4. *Facilitating recovery* is a vital role of massage therapy in tennis. The nature of the sport requires athletes to practice good recovery strategies in order to remain at their peak performance. Recovery massage techniques flush out substances such as excess tissue fluid, bradykinin, serotonin, and histamine that cause Delayed Onset Muscle Soreness (DOMS), helping to reduce pain.⁵ It also helps improve the subjective feeling of recovery, calms the nervous system, relaxes the athlete, helps muscle endurance and power output when playing multiple matches, reduces muscle fatigue, and improves blood flow, helping muscle recovery.^{3,6} Ideally, recovery massage is performed 1-3 hours after competition in conjunction with other recovery strategies such as contrast baths, refueling, and hydration.⁶

Sports Massage Therapy Techniques Used in Tennis

The sports massage therapy techniques used in tennis are inherently similar to techniques used in other types of sports massage work. However, the application of those techniques on the tennis athlete is more specific and is based on how, when, and where to employ particular strokes.

Manual Lymphatic Drainage

Manual lymphatic drainage (MLD) is a gentle massage technique recognized as a key component of decongestive therapy. MLD aims to encourage fluid away from congested areas by increasing activity of normal lymphatics and bypassing ineffective or obliterated lymph vessels.⁷ MLD is used to treat athletes with edema, acute or chronic, and fluid retention in extremities. There are a number of different MLD techniques with several aspects in common:

- ♦ Performed for up to an hour daily
- ♦ Performed with athlete in the lying position, (except lymphoedema of head and neck)
- ♦ Starts with deep diaphragmatic breathing
- ♦ Treats unaffected lymph nodes and regions of the body first
- ♦ Moves proximal to distal to drain the affected areas
- ♦ Movements are slow and rhythmical
- ♦ Uses gentle pressure, (if pressure is too hard it stimulates blood flow encouraging more fluid to the tissues)
- ♦ Ends with deep diaphragmatic breathing



Connective Tissue Massage

Connective tissue massage includes a variety of styles applied for different reasons. All connective tissue massage applications focus on the same tissue; therefore, more than one style may fit a particular condition. One of the principal uses of this technique is to elongate connective tissue that may be restricting motion. Because connective tissue has the ability to modify its structure based on the demands placed on it, constant repetitive movement patterns create lines of stress and tension in the muscles and can lead to things such as adaptive shortening and compensation patterns.⁸ Tennis requires the athlete to assume postures and perform repetitive movements which often lead to tissue restrictions. As these restrictions develop, other structures become compressed, inhibited, and congested, affecting everything from the exchange of nutrients and waste products at the cellular level to the functioning of different structures within the body. This massage technique changes the consistency of the matrix and redistributes the fascia to its original position, thereby creating more space within the tissue. Restoring this space allows all aspects of the body to function properly, from tissue metabolism to the uninhibited movement of the muscles and joints. Because connective tissue is integral to the function of the body, it must be addressed first to allow the other body tissues to expand as they are treated. When fascia is ignored, other treatments become less effective.

Trigger Point Release

The documented existence of myofascial trigger points has been around for some time, but the understanding and treatment of them continues to evolve.² Trigger points typically arise as the result of three types of muscle overload:



- ♦ *Acute*: excessive or unusual activity
- ♦ *Sustained*: postural stresses, structural abnormalities, a muscle left in a shortened position for an extended period of time
- ♦ *Repetitive*: repeated movement, especially with biomechanical faults

Typically, trigger-point formation starts with an inactive point in healthy tissue, which evolves over time into a latent trigger point. As acute, sustained, or repetitive stress continues, the trigger point eventually becomes active. Trigger points can revert to inactive or latent status with rest and the removal of the perpetuating factors.⁹ This cycle can repeat itself for years.

Some of the physical findings and symptoms of trigger points include:

- ♦ Increased muscle tension
- ♦ Decreased range of motion
- ♦ Discomfort with lengthening
- ♦ Decreased force production

Various massage therapy techniques may assist with reducing these symptoms and breaking the cycle through the release of the muscle (sarcomere) contraction. The non-invasive manual pressure release technique begins by locating the point and applying pressure to a tolerable level for the athlete. The pressure is maintained in 30 to 90 second intervals until the tissue releases or softens; then increased to reach the next tolerable level. This is repeated until the

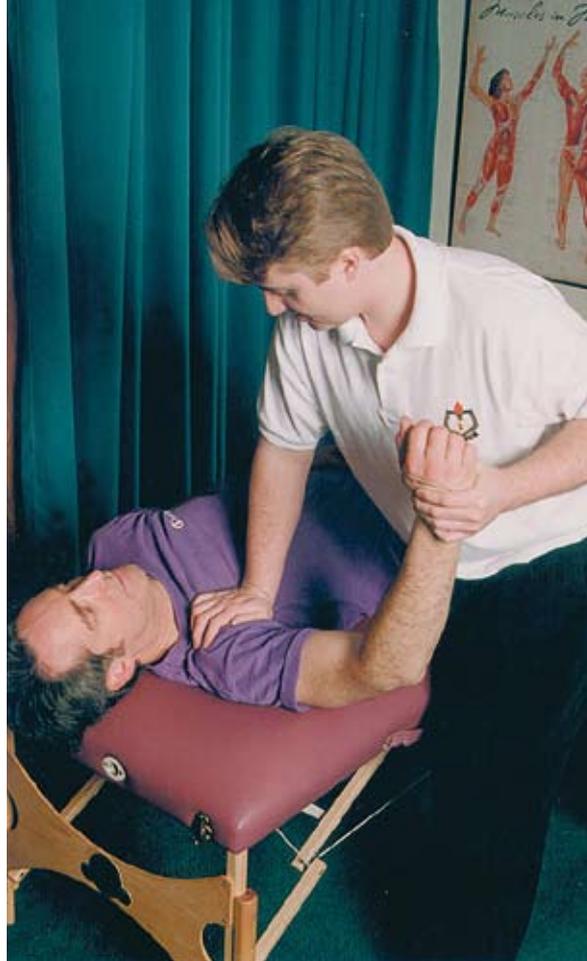
nodule is no longer palpable or the complaints have diminished. As trigger points may consist of multiple fibers, the angle of pressure is adjusted to ensure all involved fibers are addressed. The pressure flattens out the contraction allowing the sarcomeres to return to their original length thus breaking the cycle and allowing the fibers to relax.¹⁰

Active Movement Re-Education

The pain associated with musculoskeletal disorders is a challenging problem for any health care practitioner. The incorporation of movement into the massage techniques is a powerful treatment tool. Musculoskeletal dysfunction can occur for a variety of reasons and is identified by the following characteristics:

- ♦ As pain increases, motor-unit discharges decrease.
- ♦ Synergistic muscles related to the dysfunctional muscle demonstrate decreased motor-unit discharge.
- ♦ Endurance levels decrease: as muscles fatigue, the load is shifted to unaffected muscles, increasing their burden.
- ♦ EMG activity decreases.
- ♦ Blood vessels can be compressed with a muscle contraction of only 30% of maximum force.
- ♦ Proprioceptive functioning decreases.
- ♦ Adaptive shortening causes stretch weakness.
- ♦ Muscle imbalances lead to changed motor pro-





gramming in the central nervous system.

- ♦ The pain-spasm-pain cycle perpetuates. (reference for all of these points)

When pain occurs in the body, after a period of time, the brain shuts off communication with the affected area to avoid the sensation; however, faulty movement patterns created as a result of the original dysfunction remain. Incorporating passive and active movement with massage strokes reconnects the communication between the nervous system and the muscle.² When the link is reconnected, movement re-establishes its correct pattern, causing the body to facilitate a new neuron pathway and remove the dysfunction.

Other benefits of incorporating movement in massage include:

1. Shortening a muscle during a stroke can help desensitize a trigger point or reduce the restriction created by the tension when it is lengthened; thereby, improving the athletes comfort level and making the treatment more effective.
2. Passively lengthening a muscle under the pressure of a stroke will mobilize connective tissue at a controlled speed thus maintaining the pain threshold more effectively.
3. Deep fascia is mobilized better and more quickly because heat is generated internally and externally, which helps the matrix change to a fluid state faster subsequently improving muscle pliability.¹¹

Areas of Tension Encountered in Tennis

The body is susceptible to injury from a variety of sources ranging from physical trauma to psychological stress. Regardless of the source, however, the body reacts to musculoskeletal injury the same way: through compensation. While compensation makes sense in the short term, the long-term effects of improper mechanics can be as damaging as the original injury. The balance of efficient dynamic movement is much more complex than the simple production of force by the muscles. There is a precisely coordinated interaction between synergistic groups of muscles, as well as interaction with antagonistic groups. While injury is the most common initiation of a breakdown in the kinetic chain, repetitive behavior can also play a major role. Overusing one particular muscle or movement pattern can result in muscle imbalances or connective tissue restrictions that can start a cascade of dysfunction. The results of these patterns can include increased injury recurrence, possible degenerative changes, and the perpetuation of global imbalances. Understanding the process of compensation will help health care providers view the body as a whole entity and subsequently address all areas involved. Due to the nature of tennis, Sony Ericsson WTA Tour massage therapists observe that certain areas are predisposed to developing dysfunctions. In the upper torso, the pectoralis major



and minor along with the rotator cuff commonly develop issues. While in the lower torso, the hip complex, including the iliopsoas and gluteals, are most often involved in compensation. Employing a variety of massage techniques such as those previously noted is an effective way to address these areas susceptible to injury and compensation.

A comprehensive sports medicine program is essential in maintaining the health and wellness of the tennis athlete. Sports massage therapy plays a very important role in the Sony Ericsson WTA Tour's Sport Science and Medicine department's athlete care program and helps the women players maintain their optimal level of performance.

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Steve has over 16 years of experience as a massage therapist and athletic trainer and specializes in sports massage therapy. Throughout his career, Steve has had the opportunity to work in some exciting and challenging settings including the NFL, US Soccer, various other professional sports, and the collegiate setting. He has also taught in the profession, serving as the director of a Massage Therapy Program as well as being an adjunct faculty member in the Physical and Occupational Therapy programs at the Medical University of South Carolina. Hoping to pass on the information he has gained through his endeavors, Steve has published a textbook on clinical massage therapy with McGraw-Hill. In 2008, Steve relocated to St. Petersburg, joining the Sony Ericsson WTA Tour as the Director of Massage Therapy.

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