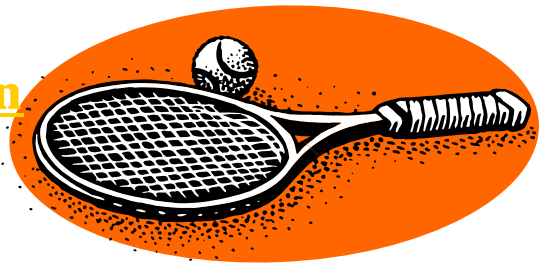
Health, Wellness, & Fitness Quarterly

Oakland PHYSICAL THERAPY, P.C.

Summer 2013

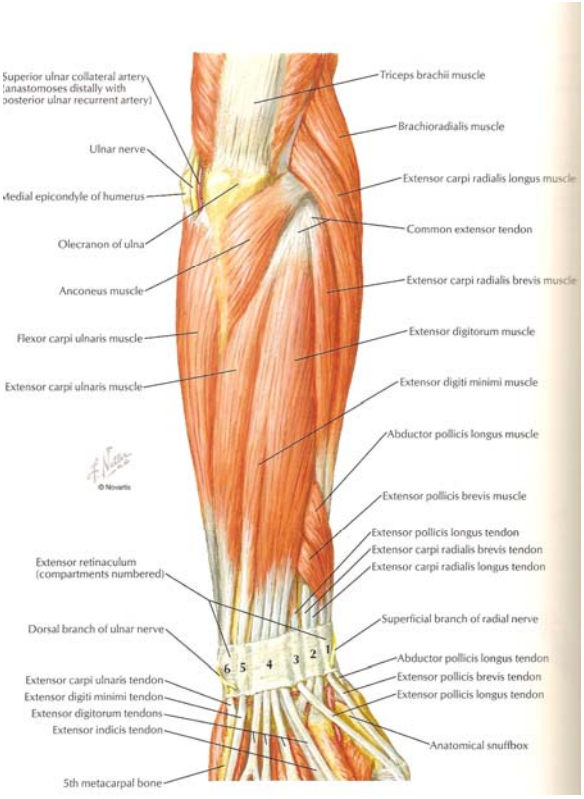
Planning for a Healthy Return to Tennis: Avoiding "Tennis Elbow" Pain



Linda Erickson, PT, MS, OMPT

As the weather warms and days lengthen, recreational tennis players head to the courts to take full advantage of the summer season. In their enthusiasm to begin playing, some players forego training and warm-up protocols which might prevent musculoskeletal injuries. Since playing tennis requires repetitive swinging of the racquet, there is a continuous high demand placed on the wrist extensor muscles of the forearm while gripping and controlling the racquet. Overuse injuries occur when the high muscular demand on the forearm muscles causes fatigue from repeated muscle contractions leading to microscopic tears in the tendon which creates the inflammation and pain known as "tennis elbow", lateral epicondylitis, or epicondylalgia.

Epidemiological data states that up to 40% of tennis players of all skill levels will experience lateral epicondylalgia at some point during their playing career. This lateral elbow pain can severely hinder playing performance and its effects can be prolonged.



There are both extrinsic and intrinsic factors contributing to lateral elbow pain. Extrinsic factors are external to the body. One of the primary extrinsic factors is having optimal equipment.[2] Choosing a mid-sized racquet and a lighter string tension can reduce the force, torque, and vibration on the arm and minimize strain to the muscles. It has also been suggested that the racquet's composition is important; graphite with nylon strings has been recommended to reduce torque on the arm. The size of the grip must also fit the player's hand. If the grip is too large, the player must exert more force to control the racquet. If the grip is too small, the player's fingers overlap causing increased tension through the forearm musculature. The second extrinsic contributor to elbow pain is training error. Training errors occur when too much physical activity happens in too short of a period of time. This might include playing too many hours of tennis at one time or playing daily without rest. The lack of rest, which healthy muscles require, causes depletion of oxygen and other nutrients needed for tissue repair at the cellular level. This in turn leads to the build-up of muscular waste products which are chemical stimulants that cause pain. Continued muscle use leads to the pathophysiological process which results in tissue breakdown. Another related factor is maintaining good overall cardiovascular health. A healthy cardiovascular system means good blood flow throughout the body. Tendons often have less than adequate blood flow because of their bony attachments. Therefore, the better one's overall cardiovascular health, the greater the blood flow will be to maintain muscle and tendon health. Another potential extrinsic cause of lateral epicondylagia is poor or incorrect technique. When beginning a new sport or activity, it might be wise to take a lesson from a professional to receive valuable feedback about swing mechanics. *(Continued on page 2)*

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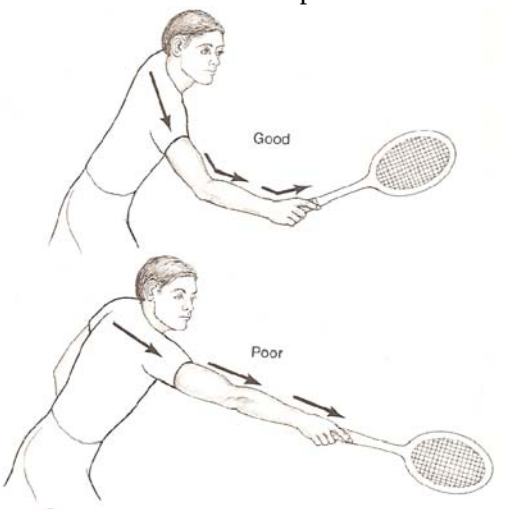
It is important to move through larger muscle groups when swinging a racquet. For example, to perform a backhand, the player engages shoulder blade muscles, shoulder muscles, elbow and wrist muscles to produce the motion with the racquet. Movement through smaller joints alone, such as the wrist, will lead to injury and should be avoided.



Transferring force through larger muscle groups of trunk and shoulder reduces force on forearm.

Intrinsic risk factors originate within the musculoskeletal system. These may include altered joint mechanics, muscle imbalances, or muscle weakness.[3] Grip strength weakness and generalized arm weakness have both been linked to individuals reporting symptoms of lateral epicondylagia. Much as a batter in baseball, when swinging a tennis racquet, energy is transferred from the powerful muscles of the legs, hips, and trunk through the shoulder blades, shoulder, and elbow to the rapidly moving wrist and hand which grips the racquet. Therefore, any muscle imbalance or weakness in the kinetic chain can place undue stress on another link in the chain. Often, it is the wrist extensor muscle group that is stressed and becomes painful, but it may be because of weakness or poor mechanics somewhere else in the chain which causes the pathophysiological breakdown.[4]

In a recent research study reported in the Journal of Orthopedics and Sports Physical Therapy, a group of 63 women were divided into three groups, tennis players with elbow pain, tennis players without elbow pain, and active women who were non-tennis players. Upper extremity strength testing was performed and analyzed for certain individual muscle groups and strength ratios for opposing muscle groups were analyzed in the scapular region, at the shoulder, elbow and wrist. The results of strength tests for the individual muscles showed wrist extensor muscle strength was significantly greater in the pain free group and the control group in comparison with the pain group. Also, the pain free group had greater strength in the lower trapezius muscle (which acts as a dynamic stabilizer for the shoulder blade in proper upper extremity functioning) than both the elbow pain and control groups.[5]

The analysis of the muscle strength ratios revealed that the tennis players in the pain group had a higher strength difference when comparing the upper trapezius muscle (shoulder "shrugger") to the lower trapezius muscle (scapular stabilizer), meaning that the lower trapezius was weaker. This strength difference is consistent with the results of other studies looking at shoulder pain such as rotator cuff tendinitis (impingement).[6] As in the study involving elbow pain, the strength ratio between the upper trapezius and lower trapezius seems to be related to shoulder pain also. It is the job of the dynamic stabilizers of the scapula (lower trapezius) to provide a stable base for the shoulder and arm through the arc of motion to create the power in the tennis swing. The rotator cuff muscles of the shoulder attach to the scapula and rely on the stable anchor for effective functioning.[7] Therefore, it is hypothesized that if the rotator cuff musculature requires the stable anchor of the scapula to function properly, then the wrist extensor muscles, though more distal along the kinesthetic chain, might also be dependent on scapular stability for maximal performance.[8, 9] Although the findings of this study cannot be generalized to all populations of tennis players, it does offer some implications for both prevention and treatment of tennis elbow or epicondylagia.[5] Unfortunately, overuse injuries are more likely to occur with increasing age regardless of technique or training. There are also certain medical conditions and medications that may also increase the risk of overuse or tendon pain and predispose a player to injuries.

Traditional physical therapy treatment for tennis elbow has included a variety of modalities and exercise regimens. Manual therapy in the form of soft tissue mobilization, which involves manual manipulation of the forearm muscles by a therapist, improves circulation and loosens adhesions. Gentle stretching facilitates muscle lengthening. Modality treatments for tennis elbow include cold packs, ice massage, heat, ultrasound or phonophoresis (ultrasound combined with anti-inflammatory medication), electrical stimulation, and iontophoresis. Ultrasound and phonophoresis use high frequency sound waves which cause heat production in the injured tissues. The heat results in increased blood flow which carries away the chemical stimulants which cause pain and improves the extensibility of collagen tissue.

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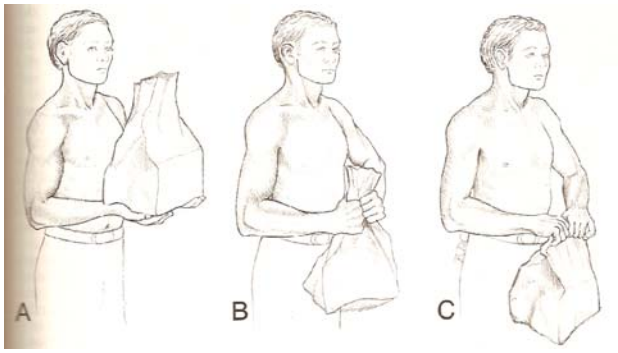
(Continued from Page 2) Iontophoresis also utilizes transdermal delivery of medication through electrode pads operated by a small battery pack. Electrical stimulation creates a gentle tingling or vibration in the muscle which helps to reduce pain, decrease swelling, improve circulation, and facilitate soft tissue healing. Taping can also be used for providing stability or reducing swelling.

In a 2011 article in the British Medical Journal, the authors report on some medical interventions for tennis elbow that have been under investigation. The article said that NSAIDS may be used for temporary relief of pain, but theoretically could be harmful over time. The article also quotes a study comparing cortisone injections, physical therapy treatment, and "wait and see" (no intervention). Patients did better with the cortisone injections in the short-term (6 weeks) but they were more likely to have a recurrence of tennis elbow later (3 months). The recommendation of the study was that cortisone injections should be avoided. Futhermore, patients receiving physical therapy had superior results to "wait and see" in the first 6 weeks, but by 1 year all benefits had equalized. Also, PT patients sought less additional treatment (NSAIDS) than the steroid or "wait and see" groups. Other treatments under investigation include glyceryl trinitrate patches (causing local systemic vasodilation), autologous platelet—rich plasma injections (platelet "bandage"), and peri-articular hyaluronan gel injections (normally used with osteoarthritis in joints). Because tennis elbow usually resolves within twelve months, surgery for severe cases is not recommended due to the lack of supporting research.[10, 11]

Once the pain begins to subside, strengthening exercises can be initiated. The patient must be instructed how to correct and maintain good postural alignment before beginning to exercise. Exercises start sub-maximally (below pain threshold) and increase gradually. Since both overloading and underloading are both detrimental for tendons, the goal is to load the tendon without exceeding limits. Eccentric exercises (lengthening) have been shown to decrease pain and improve function in Achilles tendonosis, and this type of exercise protocol has been adopted for tennis elbow patients as well. Using these lengthening exercises helps to repair the degenerated tissue and prepare it for future loaded exercise. For patients who do not reduce the amount of tennis that they play, the results of this regimen are not as good.[10]



Less stressful lifting and carrying techniques

There are many contributors to lateral elbow pain that might be minimized or avoided altogether by following some simple recommendations. If you are new to the game of tennis, try to take some lessons. Do some stretching exercises for your arms and legs before and after playing. Train and strengthen the muscles in your hips, abdomen, shoulder blades, shoulders, and wrists. A research article in JOSPT supplies evidence for including velocity-dependent training to reduce the risk of developing elbow pain. In the article their results indicated that rate of force development has a greater relationship to function than maximal strength produced.[12] In addition, be sure you have adequate rest periods during tennis training. Maintain a healthy weight and good cardiovascular health.

If you should experience pain in the elbow, apply ice or use a counterforce tennis elbow brace. Resting the muscles is extremely important. Avoid household chores that may worsen the symptoms (i.e. using keyboard, lifting a suitcase, gripping or carrying heavy objects, gardening, shaking hands with others) until the pain subsides. If you must lift objects, lift with the palm of your hand facing upward. If the pain is persistent, consult your physician. A referral to physical therapy will help reduce pain and dysfunction. At Oakland Physical Therapy our treatment approach includes pain management using modalities previously described, muscle stretching, strengthening of the proximal muscles of the spine and scapulae, core stabilization and abdominal strengthening exercises, and strengthening of the wrist and forearm musculature which are responsible for gripping the racquet. Our goal is to get you back to playing tennis in the shortest period of time!

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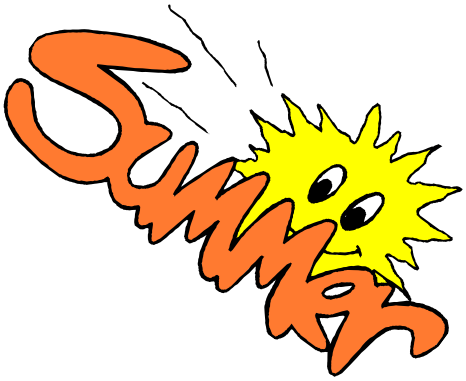
NEWS!

Oakland Physical Therapy is pleased to announce our physical therapist, Beth Burkel and her husband Joe welcomed their son, **Lincoln Joseph Burkel** on May 26, 2013! Lincoln was 9 lbs, 9 oz and 21 inches long. Mom, dad and baby are all doing well!

April 2013

On April 20, 2013 **Linda Erickson** attended a one day course hosted by Beaumont Hospital in Royal Oak. The course was entitled "Current Surgical Rehabilitation Trends in the Advances of Joint Arthroplasty" for the hip, knee, and shoulder. The course was given by John O'Halloran, PT, DPT, OCS, ATC, CSCS, cert MDT, a well know clinician, lecturer and educator from North Carolina. Dr. O'Halloran discussed all the latest types of surgical implants for the total joint replacements, surgical approaches, and trends in rehabilitation.



May 2013

Oakland Physical Therapy welcomed Kornelia Kulig, PhD, PT, FAPTA from the University of Southern California. Dr. Kulig is a respected professor from the Biokinesiology and Physical Therapy Department at the university and is the author of more than 50 peer-reviewed papers published in a broad range of respected professional journals. Dr. Kulig gave an in-service presentation of her research exploring tissue morphology, biomechanics, and physiology in relation to exercise, inactivity, aging, and degenerative processes in connective tissues and accompanying muscle activation and movement strategies.

May—July 2013

Dr. Kristie Kava attended three workshops for the application of the Gyrotonic Exercise System to shoulder girdle, neck and upper back; pelvic girdle and low back; and scoliosis (curvature of the spine) problems.

PAMA
Performing Arts Medicine Association

July 2013

Dr. Kristie Kava presented a one day workshop entitled "From Classroom to the Stage" regarding injury prevention and treatment for dancers and instrumentalists. The workshop was part of the Performing Arts Medicine Association Conference in Snowmass, CO.

Foot Health for Runners

Feet come in all different shapes and sizes and are prone to many problems, especially when running is involved. Physical therapists can provide a detailed analysis of your feet and running style to help you prevent and treat the foot problems that often result from running.

Essential functions of the Foot

- Feet provide your base— they play an important role in balance and support.
- Feet absorb shock— t heir flexibility helps to minimize impact when the foot hits the ground.
- Feet propel you forward— in addition to its role as a flexible "shock absorber", the foot stiffens at a certain point in the running cycle to help you move forward.

Common Foot Problems

Physical therapists often see foot problems related to the way in which a runner's foot is built:

- A very flat foot typically has too much mobility and not enough support. Individuals with flat feet (low arches) are often more at risk for pain in the tendons on the inside of the ankle, pain on the inside of the knee, or pain in the arch of the foot near the heel (plantar fasciitis).
- A foot that is too stiff usually has a high arch and is likely to e poor at absorbing forces from running. Pain in the arch and heel (heel spurs and plantar fasciitis) can result from poor shock absorption. If the foot is poor at absorbing shock then that shock often affects the individual's low back, knees, or hips.

Common Solutions

Proper shoe choice is important for the most efficient foot function:

- Individuals with poor shock absorption (stiff feet with high arches) typically need more cushion in their shoes.
- Those who have flexible feet (usually low arches) often require a stiffer shoe with more support and control.
- People who have more severe problems may be candidates for orthotics (shoe inserts designed to support weak or ineffective muscles or joints to provide necessary mobility) - either purchased over-the-counter or customized.

Other Reasons for Foot Pain

There are a variety of things you can do to reduce the risk of running-related foot pain:

- Start slowly and increase your runs in increments—both distance and speed.
- Address pain and discomfort as soon as it appears—with ice, rest, or by modifying your training program. Ignoring symptoms is a sure way to develop a permanent or recurring problem.
- Choose your running surface carefully. Hard surfaces, uneven terrain, and too many hills can lead to problems. Again, build up to them slowly if these surfaces are part of your running goal.
- Consider other types of endurance exercises to give your feet a rest and to provide a better balance to your fitness routine.
- Keep and eye on skin issues such as redness or blisters.

How a Physical Therapist Can Help

Physical therapists are experts at analyzing a body's structure, alignment, and movement. For foot pain, this involves a detailed examination of your foot and how it relates to the rest of your body. Many physical therapists have advanced skills in prescribing proper footwear and orthotics. A physical therapist can provide a detailed analysis of your running style—often using a treadmill with special video equipment. Recommended modifications to get back to running after an injury may include several exercises to improve strength and muscle balance as well as proper shoe choice.

(Reprinted from American Physical Therapy Association www.moveforwardpt.com)

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Elizabeth Burkel, DPT, OMPT
Kristen Decker, DPT
Nicole Widak, DPT
Cathy Jamrog, MPT

NEW Beginners Pilates Class starting in August!

Oakland Physical Therapy will be offering a new session of Beginners Pilates starting in August. The class will be held on **Wednesday mornings, at 7:00 am** . If you are interested in joining the class, please call the office for more information!

Oakland Physical Therapy Newsletter Produced by Grace Dzwonkowski, Office Manager

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