Orthopaedic Observations

A Matter of Medicine…

TM Pending

"It Hurts When I Run"

By Michael DeChello, MS, PT

I see it every year around the time the frost leaves and the signs of spring are evident. The same pattern starts to emerge. Patients start showing up with pains that are all too common. *"I have pain in my heel, my knee hurts or my hip hurts. "* This is usually about the time when the serious runner is starting to feel the effects of their training to prepare for a competitive running event. Weather it is a seasoned marathon runner trying put another completed marathon under their belt or the beginner who wants to do their first New Haven Road Race. They have been training for several months and progressing their training regime and as the event get closer the symptoms start to intensify until it effects their training and usually leads to necessary rest causing them to drop out of the event or wait until the next one.

Running for many is an important part of their lives, it helps define who they are and often is carried out like an obsession. We have known for a long time the positive physical health benefits of running and equally as important the psychological well being from running. However, there are intrinsic and extrinsic risk factors that can lead to the development of symptoms progressing to injury. The reduction of these risk factors can ward off some of the common injuries associates with running.

Considering the biomechanics of running, a factor that is often forgotten is that running is a one legged sport. The runner is only on one foot and leg at a time. This occurrence leads to significantly higher forces on the weight bearing extremity. These high forces combined with the degree of repetition when running and underlying risk factors can increase the likelihood of an injury. Some of the **extrinsic factors** that need evaluation are, but not limited to, *footwear, running surface and training schedules*. **Intrinsic factors** that need to be examined and many times more difficult to control are as follows; *increased inward angle at the knee, weak or inefficient medial quadriceps muscle, hyper mobility of the patella, ligamentous laxity, abnormal joint mobility, abnormal pronation of the foot, other lower extremity malalignment and weak hip musculature* to name the most common. Identifying these risk factors by someone trained to do so can make appropriate recommendations to correct as much as possible.

The **top five injuries** associated with running due to intrinsic and extrinsic factors are; **patellofemoral pain/ iliotibial band syndrome, achilles tendonitis, stress fractures, medial tibial stress syndrome (shin splints) and plantar fascitis.** The following is a brief overview of the cause and treatment of each. This should not be taken as a way to diagnose or a comprehensive treatment plan and continued plan should be evaluated by your doctor.

Patellofemoral Pain Syndrome – the patellofemoral complex is comprised of multiple structures that stabilize the patellofemoral joint, the joint between the patella and femur. The quadriceps act as active stabilizers, the ligaments and retinaculum acts as passive stabilizers and the joint surfaces act as static stabilizers. An imbalance between any of these structures causes the tracking of the patella on the femur to be abnormal causing excessive stress on one of the structures leading to pain and dysfunction. A carefully designed lower extremity strengthening and stretching program is very important. Correcting any malalignments in the foot and knee via an custom orthotic for the shoe is necessary. Hip abductor weakness has recently been found to be associated with patellofemoral pain and should be addressed. Core strengthening exercises are also recommended for stabilization of the spine which allows for more efficient movement of the extremities.

Iliotibial Band Syndrome – the iliotibial band is an extension of the tensor fascia lata muscle in the hip as a thickening of the fascia of the upper leg. The ITB fans out distally to insert on the lateral aspect of the patella and lateral retinaculum of the knee. Functionally it helps with abduction at the hip. Keeping in mind again that running is a one legged exercise and when the weight bearing limb hits the ground the hip musculature has to be strong enough to maintain a level pelvis. If not and the hip drops it causes excessive strain and pulling on the ITB which increases the stretch tension relationship. This leads to in-

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increase in compression forces on the lateral aspect of the knee. Specific stretching and strengthening exercises of hips and ITB will help better stabilize the hip during running reducing the compression forces.

Achilles Tendonopathy – the achilles tendon is the continuation of the gastrocsoleus complex of muscles and inserts on the calcaneous or heel. The gastrocsoleus originates above the knee making it a multi joint mover. It has a direct impact on the knee, ankle and subtalar joint in the foot. Recently the term tendonopathy has become the lump-all category for tendon pathology. This term includes early stage tendonitis, paratendonitis and later stage chronic tendonitis. Chronic tendon pain usually does not have inflammatory changes in the affected tendon, but rather degenerative changes. Achilles tendon disorders are divided into three zones: 1) non-insertional 2) tendon insertion and 3) at the muscle tendon interface or junction which is more proximal. The approach to treatment is conservative initially with rest to decrease the strain on the tendon. In some cases a walking boot may be required. The use of modalities such as ultrasound, electric stimulation, cross friction massage, heel lifts and ice may be helpful. After pain is reduced, a gradual return to activities while monitoring symptoms is necessary, progressing to strengthening exercises. In some cases custom fit orthotics may be helpful as a prevention option.

Medial Tibial Stress Syndrome (shin splints) – the term shin splints is gradually being used less because of the generality of the term. More recently the term medial tibial stress syndrome is coming into use. This term is appropriate to use in the absence of stress fracture or compartment syndrome. Medial tibial stress syndrome includes periostitis, traction peristalgia, tendonopathy and fatigue failure of the connective tissue connecting muscle to bone. Medial tibial stress syndrome occurs at the posteriomedial aspect of the tibia. There is usually no pain at rest and a palpable tenderness. Pain is usually brought on by exercise and can be sharp or dull in nature. Pronation or the lack of control at the midstance phase of running is usually associated with MTSS. Treatment approach includes rest as the most important. Training alterations needs to be considered. Biomechanical evaluation should be performed, and shoe and custom orthotics may be indicated to control pronation. Calf stretching and core strengthening should be included in a comprehensive exercise program. Alternative low impact exercise should be given during the rest period to help maintain overall cardiovascular conditioning. Gradual return to activity and incrementally building up distance and intensity should facilitate a smooth return to normal exercise.

Plantar Fascitis – plantar fascitis is the most common cause of heel pain. The plantar fascia is the thick tough connective tissue which runs from the heel to the base of the toes. The condition develops when this tissue becomes inflamed specifically where it attaches at the heel. The progressive pull of the tissue results in painful covering of the bone and the tissue itself. Over time this can cause micro tearing of the tissue. The tissue attempts to heal forming small areas of scar tissue. Each time the tissue is stretched it results in further tearing. This effect can lead to a chronic condition. The most common compliant is burning, stabbing or aching pain in the heel. Most often the symptoms are described by pain with the first few steps in the morning and/or after sitting for any length of time upon standing. The most commons causes of plantar fascitis are tight calf muscles and biomechanical abnormalities such as flat feet or high arches. As we age the resiliency of the tissue lessens making us more prone to this problem. Traditional physical therapy and conservative measures in most cases can help reduce the symptoms. These measures include modalities like ultrasound, electric stimulation, deep friction massage, stretching and iontophoresis. Anti inflammatory medication and local cortisone steroid injections may also be helpful. Controlling the symptoms is important however, addressing the underlining problem is the key to long term success. Proper stretching to maintain the flexibility of the tissue is vital and correcting the biomechanical abnormalities is also necessary. This can be achieved with proper fitting custom orthotics.

Many of the problems mentioned above can be managed with proper diagnosis and treatment by an experienced medical professional. Early intervention to many of these problems can prevent them from becoming chronic in nature which makes it more difficult to manage and may lead to more involved treatment regime. **For more information regarding these injuries and treatment programs please contact Michael DeChello MS, PT at The Orthopaedic Group, LLC at 203-315-6780 or visits our website @www.proptct.com.**

Mr.DeChello received his Bachelor of Science degree in Physical Therapy from Quinnipiac College in 1987 and his Master of Science degree in Allied Health from The University of Connecticut in 1998. He has over 20 years experience in outpatient rehabilitation. Mr. DeChello has been with The Orthopaedic Group, LLC since its start in 1998 and is the Physical Therapy Director for their ProPT division. He has extensive experience in working with all aspects of non-operative and post-operative orthopedic rehabilitation. He has worked closely with the physicians of The Orthopaedic Group, LLC to develop comprehensive rehabilitation protocols. Mr. DeChello has traveled around the country for teaching engagements for other rehab clinicians. Mr. DeChello is an active member of the American Physical Therapy Association and Connecticut Physical Therapy Association.