

## **SPORTS INJURIES**

### **Prevention, treatment and rehab of common injuries seen in runners.**

\*\* This discussion will focus on 3 primary injuries; hamstring “pulls”, plantar fasciitis and shin splints. It should be noted however, that most other soft tissue injuries can be treated using the techniques that will be discussed.

### **THE LOWER EXTREMITY KINETIC CHAIN**

**“ The knee bone's connected to the.....”**

**PREVENTION:** A good pre-season screening program is an invaluable tool in keeping athletes on the track . Though we can't eliminate all injuries, we certainly can decrease the number of injuries. The following are areas make up an effective screen:

**History:** many athletes are dealing with injuries from fall and winter sports! Don't take for granted that these injuries are 100%.

**Visual Inspection:** bow-legged, knock kneed, pronation, supination , sway back, etc.

**Flexibility:** Supine SLR, Sit'n Reach, Achilles/ gastroc , quadriceps, hip flexor

**Strength:** Ham/quad ratio, Lt vs RT, vertical jump etc.

**Gait Analysis:** Gait scan

Use screening to put together pre-season and in season training

Stretching, strength training, custom orthotics, address old injuries either with trainer or out source.

**TREATMENT OPTIONS** (general): from passive to active therapies (etc).

***Ice, ice baths, NSAIDS, self massage, rollers etc.***

***Aggressive soft tissue treatments: Graston, ART, MRT ,fascial release techniques.***

***Kinesiotape-*** great for acute injuries, rehab and for support during performance.

***Chiropractic, physiotherapy and rehabilitation:***

***Platelet Rich Plasma Therapy-*** cutting edge therapy being used on pro and elite athletes  
Involves using an athletes own blood and injecting into the site of an injury. The plasma is loaded with growth factors which has been show to speed recovery dramatically.  
Downside: \$

**SURGERY:** Sometimes a necessity....season ender.....\$.

## **SHIN SPLINTS: (pain in the lower leg)**

Micro-trauma to the anterior and posterior tibialis, fascia and periosteum.

2 types: antero-lateral felt at heel strike and postero-medial felt at toe off!  
Determines the taping technique to some degree.

Common causes: overpronation, flat and excessive arches, muscle imbalance (weak tib. anterior and posterior) tight achilles (antero-lateral), increasing mileage too quickly, hills, hard surfaces, tight turns on indoor tracks.

**RED FLAG !:** If pain persists after a prolonged period of rest need to rule out a possible STRESS FRACTURE

### **Spin Splint Prevention:**

1. History .... returning athletes that have had shin splints in the past, get screened.
2. Screening: A visual and computerized gait analysis is performed. Also check flexibility in the gastroc/ achilles.
3. Depending on findings recommend taping or custom orthotics.
4. Implement strengthening program for weak peroneals, tibialis post and anterior.
5. Gradually increase mileage, alternate between track and turf, post-workout ice baths.

### **TREATMENT if athlete has developed SHIN SPLINTS:**

1. REST..... or at least decrease mileage
2. Ice, ice baths, NSAID's.
3. PT modalities ...ie ultrasound, electric stim, micro-currents, cold laser.
4. Cross train to minimize deconditioning
5. Graston, ART and other fascial release techniques.
6. Kinesiotaping techniques.
7. Custom Orthotics
8. AGAIN IF THEY DON'T IMPROVE .....RULE OUT STRESS FRACTURE!

## **PLANTAR FASCIITIS**

Pain in the heel and/or bottom of the foot.

Due excessive and repetitive stresses causing micro-trauma to the plantar fascia.  
Over extended time the fascia thickens and loses its flexibility and strength.

Frequently worse in the a.m.  
See in both overpronators and over supinators.  
In both pes planus and pes cavus.  
Overweight individuals at greater risk.  
Most common cause is tight calf muscles.

### **Prevention of plantar fasciitis:**

1. Again SCREENING is key! It's all about determining those at risk by identifying biomechanical weaknesses. Gait analysis, structural screening.
2. Again....implementation of an individualized stretching program.....especially gastroc/achilles.
3. Taping of the arches in the foot.
4. Self fascial release with a golf or tennis ball.
5. Proper footwear for the individual is a must.

### **Treatment of Plantar Fasciitis**

1. Control Inflammation: Ice, NSAIDs,  
2 . PT modalities: ultrasound, E-Stim, cold laser, micro-currents
3. Taping
4. Night splints, Skogsborg Sock
5. Custom Orthotics
6. Injections- cortico-steroids
7. Surgery is last option! SEASON OVER!!!

## **HAMSTRING STRAINS**

“The Potential SEASON-ENDER”

\*due to the extended time off from training it is important to do all possible to PREVENT  
***THE PULLED HAMSTRING!***

***THIS BEGINS MONTHS PRIOR TO THE SEASON!***

\*always in the weaker hamstring!

\*weakness in eccentric load on hamstrings and concentric load on hip extensors

\*due to *poor strength ratio* between the quad and hamstring

\***poor lower extremity flexibility** ....*not just in the hamstrings* but in the  
antagonist muscles:  
(the quads, hip flexors and ITB)

\*history of previous “hammy” increases risk due to scar tissue

\***poor sprint mechanics**.....failure to pull the the leg down under the center of  
gravity in the stance phase results in increased work in hip extensors and hams  
to pull the body over the leg!

\*THERE IS **NO** ESTABLISHED CONSENSUS ON GUIDELINES OR CRITERIA for  
safe return to competition

\*the *closer to the ischial tuberosity the longer the recovery time* (less blood supply)

\*in a study of 18 elite level sprinters with hammy pulls .....the primary injury site in  
**all 18** was at the **free tendon of head of the biceps femoris** \*

## **HAMSTRING PREVENTION PROGRAM**

### **Prevention:**

1. History.....identify those with previous injury!
2. Strength test right hamstring vs. left. The weaker nearly always the leg that will pull. Work to strengthen hamstrings to achieve equal strength!
3. Assess quad strength vs. hamstring. The closer to 1:1 ratio the better. Elite sprinters are at least 80% hamstring to quad. The average person is about 50%-60% relative to the quad.
4. Assess flexibility in the hamstring, quad, ITB, hip flexors.
5. While strength training make sure to use eccentric training of the hamstrings. (Russian leg curls, glute-ham are great eccentrics) I also like Romanian Dead Lifts (both single and double leg) Avoid seated and prone leg curls.....NOT very functional.
6. Effective warm-up procedures.
7. Both static and dynamic stretching.
8. Have athletes use foam rollers and other self massage techniques.
9. Those with previous injury consider finding a Graston or ART therapy provider to break up old scar tissue.
10. Compression Shorts (Skins®)
11. Consider chiropractic to assess and treat faulty lumbo-pelvic mechanics.
12. Teach proper sprint mechanics! A-Skip , B-skip Drills

## **WHEN AN INJURY OCCURS: DO NOT UNDERESTIMATE ANY HAMSTRING INJURY!**

**Even those minor “pulls” can have a significant effect on performance.**

1. MINIMIZE hematoma- ASAP..... use compression wrap and ice.
2. Restrict activity to allow for initial phase of healing (even crutches)
3. Use kinesiotape: lymphedema technique in early phase of healing.
4. Ultra-sound/ electric stim/gentle massage
5. As injury progresses in healing use supportive Kinesiotaping Techniques.
6. Introduce gentle ROM and stretching (pain free)
7. Fascial release techniques critical in assisting in optimal scar tissue deposition/ remodeling..
8. Begin with isometric training progressing to isotonic and if available isokinetic.

## **RETURN TO PERFORMANCE: there are no established criteria for return, this becomes LARGELY A JUDGEMENT CALL OF ATHLETE, TRAINER, DOCTOR AND COACH**

1. Pain free ROM is a must!
2. The injured hamstring should be a minimum of 90 % strength relative to none injured leg before *easing* back into sprint training. Though at this point coach needs to be very careful not to bring athlete back too soon.
3. Athlete needs to feel confident.
4. Kinesiotape/ Wrap to provide support/ compression shorts (Skins®).
5. Very thorough warm-up and cool down.
6. Continue with fascial release techniques.

### **Sources:**

**Hamstring Muscle Strains in Sprinters: Swedish School of Sport and Health Science and the Dept. of Molecular Medicine and Surgery, Karolinska Institute, Stockholm, Sweden. 2008**

**JOSPT August 2008 Volume 38, No. 8: Strength deficits Identified with concentric action of the Hip Extension and Eccentric Action of the hamstrings Predispose to Hamstring Injury in the elite sprinter.**

**Eccentric Training to Reduce Hamstring Injuries in Sprinters; Jason Brummitt, MSPT, SCS, ARC, CSCS**

**HAMSTRING INJURIES IN SPRINTERS by MICHAEL HEYMAN**

**Clinical Therapeutic Applications of the KINESIOTAPING Method: Kenzo Kase**