

NIKE FREE GLOBAL MEDIA LAUNCH

MAY 18 – 19, 2004.

University of Sport Campus,

Cologne, Germany.

**Lecture 1. Barefoot Training
Gerard Hartmann**

Lecture 2. Training with Nike Free

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NIKE FREE CONFERENCE

University of Cologne, Germany.

Wednesday 19th May 2004. Guest Speaker: Gerard Hartmann.

LECTURE 1

I am delighted to have been invited here by Nike to share with you my views on athletic footwear and in particular to expand on the practical application of Nike Free.

On the top of a pencil there is a rubber there for good reason - to rub out mistakes. - Most athletic footwear has too much rubber under the heel and that in my view solves one problem but presents another.

The focus by the athletic footwear industry in particular in running shoe design in the past 25 years in treating the foot as a weak-link that needs to be packaged, cushioned, controlled in motion by anti-pronation devices with high tech gadgets has its limitations.

To understand where I draw my practical experience and views from entails going back in time.

In 1975 when I started competitive athletics in Limerick Ireland I was fortunate to have a coach who was a national

senior 800m champion in the 1960s and a man with great practical knowledge. P.J. O'Sullivan advocated to me and the dozen athletes in his group to run barefoot on grass three days each week to strengthen our feet. On a regular basis the group trained on sand dunes doing repetitions up a steep hill and again we ran barefoot.

I won my first Irish National title at 800m as a junior in 1978 and also the national record at steeplechase. In 1979 I accepted a running scholarship to the Uni of Arkansas in the USA and the running marathon boom had taken off and I witnessed firsthand the evolution of the cushioned running shoe. My exploits on the track never reached international level. With PB's of 3,45 1,500m; 14.14 5km, 29.47 10km.

In 1984 I won the first of 7 national triathlon titles and I competed at international level in triathlon and Ironman events until 1991 finishing 14th in World Championship in 1986.

In 15 years of competitive sport I only witnessed one injury. Maybe I was lucky. No, I believe running barefoot on grass regularly in fact strengthened my feet and protected me from overuse injury. Right through my triathlon career I ran 10 miles once a week barefoot on a golf course.

Many of you are familiar with my work as a sports injury therapist. In short I have had the opportunity to work with so many of the great stars of athletics, some 43 Olympic medal winners, numerous world champions and record holders.

The deconditioned musculature of the foot is the greatest imbalance resulting in injury that I see in my practice. Mankind by relying only on the athletic shoe to control and protect the foot has allowed the foot to become weak and deconditioned.

Structure governs function. A weak structural foot cannot function optimally.

I can honestly say that in my view the Nike Free concept is the greatest advance in athletic shoe innovation that I have witnessed. Nike Free is a quantum leap forward in footwear design. The focus before Nike Free was designing shoes to cushion, protect, control the foot. The shoe was controlling the motion of a weak structure - that structure became a weaker structure and injuries develop.

Nike Free looks at the foot becoming a structurally stronger unit. In effect the shoe allows the foot to work freely with each

joint working in harmony.

I am not suggesting for a moment that athletic footwear is inadequately wrong.

No, present day sports shoes especially those developed for specific sports are excellent.

There is no doubt about it, Nike is the World leader when it comes to sports specific shoes. The best track and field spikes, the best road racing shoes, the best football, basketball and court shoes. Nike Free has its place not as a sport specific shoe but as a foot specific shoe. Its use is in the training environment to develop structural strength and integrity of the foot and as a training aid in developing proprioception, speed, agility and quickness.

Modern running shoes generally reduce sensory feedback, apparently without diminishing injury.

The shoe with more ie, corrective devices, cushioning devices etc., in my opinion can cause problems while the shoe with less, ie, no high tech devices may be healthier for the foot.

My hypothesis is that the foot that is shod in footwear which

are too rigid and control or limit normal movement results in a high injury frequency.

The modern running shoe diminishes sensory feedback without diminishing the injury inducing impact, a dangerous situation.

A paradox exists with lower extremity fragility associated with the wearing of protective footwear and relative resistance to injury in the barefoot or unprotected state. There exist adaptations associated with barefoot activity that provide impact absorption and protection against running - related injuries.

An adaptation involving foot arch deflection on loading is hypothesized to be an important adaptation providing impact absorption. In contrast it is hypothesized that the known rigidity of the shod foot may explain the reported high injury frequency in European and North American runners.

A number of reports indicate an extremely low running - related injury frequency in barefoot populations in contrast to reports about shod populations.

My experience is that lower extremities ie, foot - ankle are

strong in people who grew up ambulating in a barefoot state ie, Kenyans, Ethiopians etc., and are relatively de-conditioned in athletes who have worn shoes from a young age.

The deconditioning of the musculature of the foot is the single greatest imbalance resulting in injury that I see in my practice. The opinion that the lower extremities are inherently fragile goes against the understanding of the concept of natural selection.

The paradoxical low incidence of similar injuries reported in barefoot populations implies that modern footwear may produce injuries that normally would not be present without their use.

In effect by wearing shoes constantly from a young age athletes have become dependent on the footwear to protect the foot resulting in disuse of the intrinsic musculature leading to a functionally deficient structure. It is well known that restrictive footwear, particularly ill-fitting shoes, cause most of the ailments of the human foot. It is no coincidence that in my experience I witness most European and North American athletes over tightening their shoe laces to add more binding protection whereas most African athletes tie their shoe laces

loosely.

Many of the African athletes I have worked with (over 100 elite since 1990) never wore shoes until their late teens. They have few foot defects. The range of their foot motions are remarkably great, allowing for full foot activity. Subsequently I witness in my clinic so many foot defects in persons who have worn shoes from a young age and especially in athletes who wear running shoes designed with anti-pronation devices. Foot defects such as Hallux Valgus, hallux rigidus, hypomobile subtalar joints, poor flexion - extension capability of the toes etc., all result due to being restricted in footwear.

(Orthotic Demo)

Ankle sprains are the most frequently reported acute sports injury and 90 - 95% of these are inversion injuries causing partial or complete rupture of the anterior talofibular ligament and occasionally of the calcaneofibular ligament.

It is claimed that footwear increases the risk of such sprains, either by decreasing awareness of foot position provided by feedback from plantar cutaneous mechanoreceptors in direct contact with the ground, or by increasing the leverage arm and consequently the twisting

torque around the sub-talar joint during a stumble.

Running shoes reduce proprioceptive and tactile sensitivity.

Around the ankle joint exists nerve endings named Ruffini end organs which are proprioceptive organs responsible for keeping balance in check. In feet housed in footwear from a young age and over protected by excessively supportive running shoes the ruffini end organs become de-conditioned.

(Demo Balance)

I advocate doing barefoot balance exercises in unilateral stance with the eyes closed and jogging, running, striding, side running barefoot on grass for short periods 5 to 20 min to re-educate the ruffini end organs, thus improving proprioception and increasing Kinesthetic awareness. Therapeutic exercises for strengthening the foot using thera-band is indicated to recoup strength in the intrinsic musculature around the ankle - foot.

The Nike Free running shoe is a major advance which when used as a training tool can help develop the structural component of the foot as a functional unit.

Before lunch I will expand on the use of Nike Free in Run

training and also expand on its relevance in different sports disciplines.

To conclude this session I will clarify a few points:

- 1. The foot is the contact point with the ground. By being immobilised in a rigid shoe the functional element of the foot as a dynamic unit compromising the sub-talar, midtarsals, metatarsals is reduced.**
- 2. Restricting the arthokinematic function of the foot will have a knock on debilitating effect on the rest of the Kinetic chain. ie, ankle, knee, hip, sacro-iliac, lumbo-sacral joints.**
- 3. For every hypomobile segment there is a segment above or below which will be hyper-mobile.**
- 4. The deconditioning of the musculature of the foot is the single greatest imbalance resulting in injury that I see in my practice.**

- 5. Structure governs function. If structure is off then function is compromised. Structural weaknesses or imbalances lead to structural - functional breakdown.**
- 6. Standing barefoot in unilateral stance with eyes closed it is apparent how deconditioned most peoples foot is. The intrinsic muscles of the foot have to work excessively to maintain neutral stance.**
- 7. NIKE FREE shoe - a shoe which allows the foot to work freely with each joint working in harmony.**
- 8. Pronation is a normal function of locomotion. Adverse biomechanical problems are caused by structural imbalances - underdeveloped musculature, inflexibility, poor proprioception and poor kinaesthetic awareness.**
- 9. Features of footwear such as arch supports, dual density, medial anti pronation devices, straight last, orthotic liners, may interfere with shock - moderating behaviour and hinder the shock - absorbing downward deflection of the medial arch on landing. Their benefit is certainly not necessary for runners with healthy feet.**

- 10. If you try to stop pronation, the result is blocking of the subtalar joint and a knock on effect into the tarsals - metatarsals and up the kinetic chain ie, ankle, knee, hip, SI.**

Pronation? If the intrinsic musculature about the foot was sufficiently developed the rate of pronation would be controlled by eccentric muscular activity ie, tibialis anterior, tibialis posterior.

- 11. Achilles tendon: This tendon can store great amounts of energy in its elastic tissue (stored elastic component). It works best when it gets stretched to maximum. (If it is adapted to take a load)**

Why then do we shorten it with footwear that has raised heels. There is a higher incidence of Achilles tendon problems due to a high heel in sports shoes which places the Achilles in a shortened anatomical position.

- 12. One weak link in the Kinetic chain will lead to gross breakdown of the human locomotive system.**

13. The foot is the contact point with the ground; it should be the strongest link.

Thank you.

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LECTURE 2

The solution to the problem of athletic - related injuries should be as simple as promoting barefoot activity. It is not as simple as that. The shoe industry for the past twenty years has advocated athletes to use footwear with cushioning and anti-pronation devices which look at the foot as an inflexible lever which is delicate and thus requires packaging.

Arch supports, dual density medial supports interferes with the downward deflection of the medial arch on loading.

To suddenly advocate that runners change to barefoot running all of a sudden would be disastrous.

The solution is to correct the underlying problem of a structurally deconditioned foot and to strengthen the weak link within the Kinetic chain by:

(1) Use NIKE FREE shoes in everyday life initially to establish a better foot to ground connection, improve proprioception,

Strength - Step Downs

Eccentric Heel Drops

Theraband - dorsiflexion, inversion, eversion.

Dynamic exercise program:

Explain Paula Radcliffe

Bunny Hop, Zig Zag bunny hops

Side Bunny hops

Single leg hops

Zig zag hops

Box jumps

Step up test.

At this stage I wish to summarise

(1) The foot is the contact point with the ground. By being immobilised in a rigid shoe the functional element of the foot as a dynamic unit is compromised.

(2) The deconditioning of the musculature of the foot is the single greatest imbalance resulting in injury that I see in my practice.

(3) Nike Free - a shoe which allows the foot to work freely with each joint working in harmony.

(4) Nike Free - a shoe which improves proprioception, kinaesthetic awareness, strength and functional capability.

(5) Nike Free shoes, use in everyday life first to establish a

Better foot to ground connection, improve proprioception, increase kinesthetic awareness, improve intrinsic strength.

(6) Progress to using Nike Free shoes for running and run drills, taking into account the principle of progressive adaptation.

(7) Use Nike Free Lateral Shoe for dynamic exercise programme to enhance proprioception, increase kinesthetic awareness and develop dynamic strength and use in speed, agility and quickness training.

To conclude I would like to praise Nike for their leadership in innovation. Nike Free is the single greatest advance in athletic footwear that I have witnessed.

Nike Technology has challenged the concept of shoe controlling the foot to foot working naturally in harmony with the shoe.

It's a revolution and I am glad to be involved and witnessing this evolution.

Thank you.

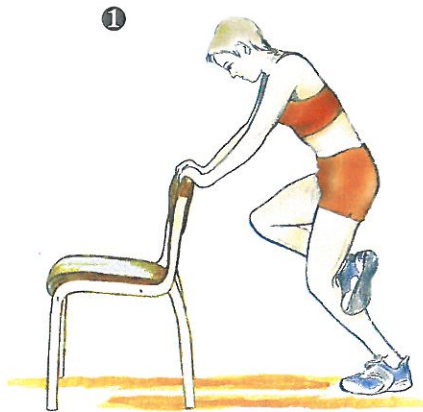
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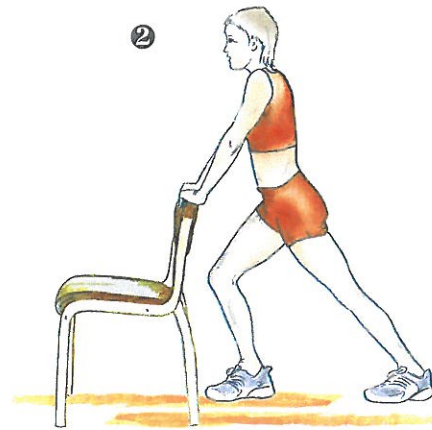
PREVENTION

The following exercises, designed by Gerard Hartmann, should be done 3 to 5 times per week to prevent injury. The first 2 exercises are stretches to keep the soleus, Achilles tendon and gastrocnemius healthy. Exercise 3 is for improved proprioception, i.e. balance. Exercise 4, 5, 6 is designed to strengthen the intrinsic musculature supporting the foot.

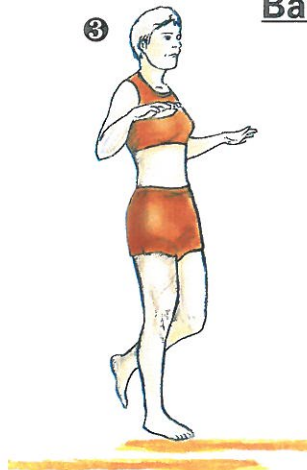


Bent knee calf (muscles stretched: Achilles tendon, soleus)
Stand on bent left leg.
Place right foot behind left calf to assist stretch to left leg.
Hold this stretch eight to 10 seconds.
Keep heel on ground.

Stretching



Straight leg calf (muscles stretched: gastrocnemius)
Lean against a wall, car, tree or other support.
Keep left leg straight and heel on ground. Hold stretch 8 to 10 seconds.
To increase this stretch place forefoot on book or two inch timber block and lean gently into a deeper stretch.

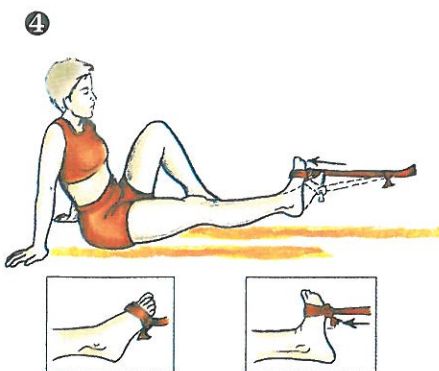


Balance Work

With shoes off, stand on one foot, bend the opposite leg, and try to balance for 1 minute.

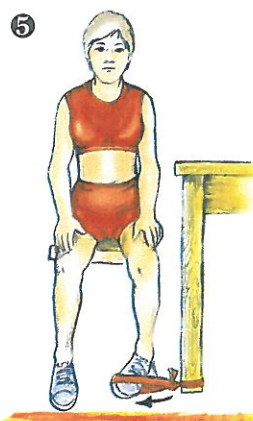
If that's easy, do it with eyes closed.
As you get better, stand on a softer surface.

Strength Work



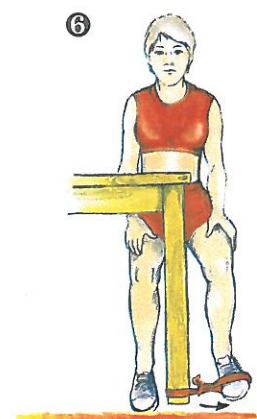
Ankle Dorsiflexion

1. Assemble elastic tubing to table and foot as shown.
2. Pull foot back towards body i.e. ankle dorsiflexion.
3. Hold 3 seconds. 3 x 10 repetitions.



Ankle Inversion - Elastic Tubing

1. Sitting in a chair, assemble elastic tubing to table and your foot as shown.
2. Without moving your hip or knee, turn the bottom of your foot inward toward your body.
3. Hold 3 seconds. 3 x 10 repetitions.



Ankle eversion - elastic tubing

1. Sitting in chair, assemble elastic tubing to table and your foot as shown.
2. Without moving your hip or knee, tip the bottom of your foot outward away from your body.
3. Hold 3 seconds. 3 x 10 repetitions.