

Profeet One Step At a Time

Read any health or fitness magazine and the buzzword of the moment seems to be, biomechanics. So what are biomechanics in relation to the sporting world and what does it mean to us in day-to-day life?



Treadmill analysis

Biomechanics is the study of mechanical principles on living organisms and when this is used in the world of sports science, the laws of mechanics and physics are applied to human performance to enhance the way the body works.

SimplyHealth247 met up with an expert in the field of biomechanics and gait analysis (studying the way someone walks or runs), Hamish Wolfenden, at his specialist sports shop and orthotics lab in London. We discovered a little more about the technology he has developed to help correct alignment of the feet.

Hamish gained his masters degree in biomechanics and was determined to bring an innovative approach to the sportshoe market. He wanted to make what used to be a time and labour intensive method of producing and fitting orthotics into something that could be done easily and accurately in a one-stop shop.

We watched as one of Hamish's highly trained sports technicians analysed the running style of a keen amateur runner, William, and followed the diagnostic process right through to the moulding of the custom insoles.

After taking a short history and noting any injuries, William's running style was analysed using motion analysis software, filmed whilst running on a treadmill, both in his present footwear and barefooted.



Foot pressure mapping plate

SPORTS INJURIES

Sports injuries can be divided into two styles:

Collision and Impact: Common in sports such as rugby, hockey, boxing where injury is unavoidable due to collision with another player or a piece of equipment. Whatever your level of fitness or skill, these injuries are simply a risk of the game.

Overuse: In sports such as running, cycling, swimming, stair climbing, and walking, most injuries are not the result of sudden accidents but occur because of what is known as 'overuse'. This term 'overuse' is simply a way of saying that a key part of an athlete's body simply cannot stand up to the regular pressures of training

and competition and is not functioning the way it was designed to do so. The reasons for this can range from nutrition, poor coaching style, incorrect posture, ill-fitting equipment, subconscious technique imperfections.

'A staggering 85% of runners are wearing the wrong footwear for their running style. 64% of those runners will go on to develop injuries attributable to their footwear.'

Hamish Wolfenden – Founder and Technical Director

'Sadly we see many people that are simply in the wrong size or type of shoe for their running style. Ill fitting shoes are the largest contributing factor in running related injuries.'

Simon Bright – Footwear Laboratory Manager



Data analysis

This first dimension of the 3D system uses state of the art data capture systems and is another example of how dynamic collection of data in sports science, has removed the guess work element from analysis.

Pronation – the inward roll of the foot at each stride

Over pronation – when the roll is **too** far inwards

Underpronation (supination) where the feet do not roll inwards enough

The next part of the analysis, involved William running on a short piece of simulated track, over a foot pressure mapping plate and finally a stationary pressure scan reveals the distribution of weight onto the feet. On completion on the testing section, William spent time analysing the data with a Profeet technician. He was

shown how he struck the floor a little heavily with his heel on each stride and then had a tendency to 'overpronate,' that is where his slightly flat arches made the heel roll inwards, and then finally as his feet left the floor at the end of the stride, he had an outwards 'flip' motion that could lead to future injuries further up into his knees, thighs and hips. William was advised of a correct warming up and stretching procedure that would lessen his tendencies to overpronate.

In the next part of the 3d analysis, super lightweight, heat mouldable materials were used to create a custom fit insole and William was helped to place his feet and body into its optimum weight bearing position. Hamish Wolfenden used special materials when designing

the insole that would act as shock absorbers, control support and propulsive elements to improve both comfort and performance.

With the insole in place, William completed the third stage of the analysis and was fitted with the correct shoe for his foot and running style. He discovered his existing shoes were actually nearly two sizes too big and had not been giving the necessary support.

The first diagnostic stage was repeated with the insoles and running shoes in place and the difference in running style was marked. William felt an immediate difference in the way his body felt on the treadmill.

In terms of comfort and improved performance, it is not surprising that top-level sportspeople insist on gait analysis. Hamish has advised top-level players from London Saracens RFC and London Wasps RFC, Olympic gold medal cyclist Bradley Wiggins, cricketer Andrew Strauss and at Hamish's skiwear lab where the same procedures ensure the best fitting ski boots, even HRH Prince Charles and Princes William and Harry have had the Profeet analysis.

So do you have to be a top-level sportsperson to benefit from the analysis? "Absolutely not," says Hamish. "One of the things I'm really pleased with is the increasing number of recommendations we are getting from top orthopaedic doctors, who are sending their diabetic patients to us. Diabetes sufferers can often have poor circulation in the lower limbs and it is most important they do not develop pressure sores or ulcers from ill-fitting shoes. The insoles make sure all of the foot is supported and can help prevent serious foot problems."



Customised moulding of insoles

"We also help many customers who simply walk, ramble, or play golf as a hobby and just want to keep their feet comfortable and healthy. It gives me such a sense of satisfaction when I am able to help someone solve their footwear problems, whatever level they are at in the world of sport."

To find out more about Hamish Wolfenden and Profeet visit www.profeet.co.uk

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