ViPerform™

ASSESSING THE IMPACT OF RUNNING SHOES ON AN ATHLETE'S RUNNING STYLE WITH ViPerform

The Problem

An athlete wanted to find the optimal running shoe that would maximize his running performance and reduce the risk of injury. He was interested in finding out how a shoe's weight, structure and support affected his ability to achieve an optimal running style. To help him select the right running shoe, ViPerform was used.

ViPerform Running Live Training

Using ViPerform's Running Module, the athlete ran on a treadmill for two minutes in three different types of running shoe. Shoe 1 had a lot of structure and support, Shoe 2 was a neutral shoe and Shoe 3 was a lightweight racing shoe. During his treadmill run the athlete ran at 10 mph and the data was recorded using ViPerform's Live Training assessment.

Results

After the athlete performed a ViPerform Running assessment with each shoe, the data was collected and analyzed. The table below lists the results of the athlete's ViPerform Running assessment.

SHOE	STRIDE	ASI[a]	MEAN GRF[b]	IPA[c] (LEFT / RIGHT)	GCT[d]
Shoe 1	171st/m	10%	1590N	5g / 7g	231ms
Shoe 2	173st/m	3%	1663N	6g / 6g	226ms
Shoe 3	177st/m	5%	1622N	6g / 7g	225ms

ViPerform RUNNING ASSESSMENT RESULTS

Discussion

As the runner changed from a structure and support running shoe (Shoe 1) to a lightweight racing shoe (Shoe 3), his stride frequency increased and his biomechanics improved. As stride frequency increased, his tibia landed more vertically and producing a mid / forefoot landing as opposed to a heal strike pattern. Furthermore, his ground contact time reduced slightly. This indicates an improvement in running mechanics as he is making better use of the stiffness in the lower limb and elastic recoil mechanism of the soft tissue to help increase his speed.

Of particular interest was the athlete's feedback; his preferred shoe was that which produced the most symmetrical running patterns according to the ASI results (Shoe 2). However, the preferred shoe produced the highest average GRF values compared to the lightweight racing shoe (Shoe 3), which indicates more loading force on the lower limb. This may have been due to an improvement in gait efficiency produced by wearing the lightweight racing shoe over the preferred shoe.

Conclusion

ViPerform wearable sensor technology is able to identify sensitive changes in running symmetry, GRF, IPA, stride frequency and ground contact time during an individual's run. This is information is crucial for runners who want to improve technique, maximize performance and reduce the risk of injury from running.

To learn more about ViPerform visit us.dorsavi.com/viperform

GLOSSARY

[a] Absolute Symmetry Index: Percentage of asymmetry between GRF values of left and right legs.
[b] Ground Reaction Force: Average vertical force applied to the ground during the mid-stance phase of the gait cycle.
[c] Initial Peak Acceleration: Vertical acceleration and loading rate through the tibia when the foot strikes the ground at initial contact.
[d] Ground Contact Time: Period of time that the subject's foot is in contact with the ground between initial contact and toe-off phases of the gait cycle.

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