VKTRY®

Korey Stringer Institute
University of Connecticut
Preventing sudden death in sport

VKTRY Injury Protection Research Results

May 2020

VKTRY Injury Protection
KSI Research Results

"After an extensive 6-month research study by the Korey Stringer Institute at the University of Connecticut, it is clear that ***VKTRY Insoles improve lower body biomechanics, stability of the ankle and knee during running, and shock absorption during landing****. These improvements can help safeguard athletes by providing injury protection."*

- Dr. Douglas Casa, PhD, ATC, Professor of Kinesiology, CEO of KSI

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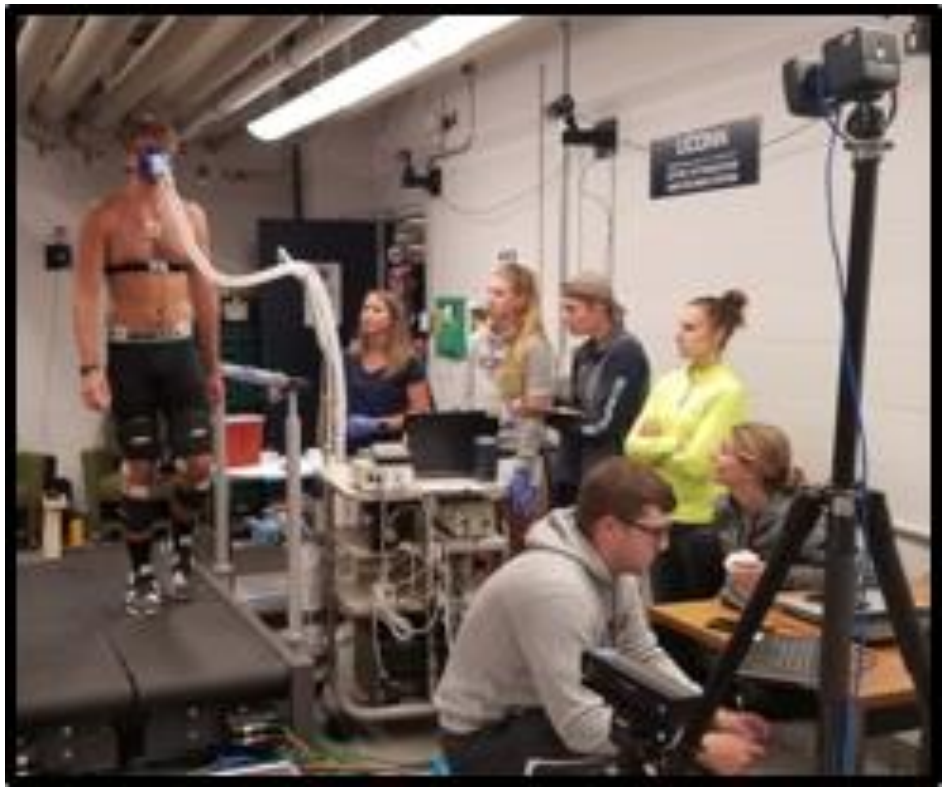
VKTRY Injury Protection KSI Research Results



Testing Resources: A 12-camera 3-D motion capture system operating at 240 Hz was synchronized with a force-plate embedded treadmill at 1200 Hz to quantify three-dimensional biomechanical data. Lower limb joint rotations were defined based on three-dimensional coordinates of 37 precisely located retro-reflective markers. EMG signals were collected in order to assess alterations in muscle activity. Kinetic outputs were normalized to participant's body height and mass and represented as internal moments.

- Since 2016, VKTRY has received evidence that our insoles help to reduce injuries - and also help athletes recover more quickly from injuries.
- In 2019, VKTRY pursued clinical research to prove this theory.
- 6-month, PhD-led, independent clinical study by The Korey Stringer Institute.
- KSI is a highly respected medical research institution specializing in studying athlete safety and hired by companies such as Gatorade, Mission, Camelbak & Whoop.
- This study by KSI, scientifically confirms VKTRY's injury protection claims.

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Why VKTRY Injury Protection Research is important & relevant

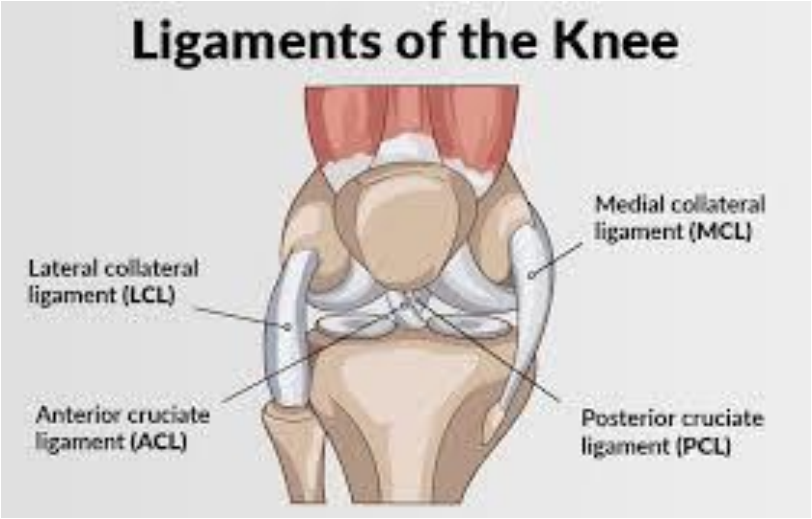
- Most people agree: physical activity improves health and quality of life
- Injuries can counteract the benefits of exercise, leading to significant health care costs and long-term disabilities
- 54% of all injuries involve the lower extremity (knee, ankle foot)

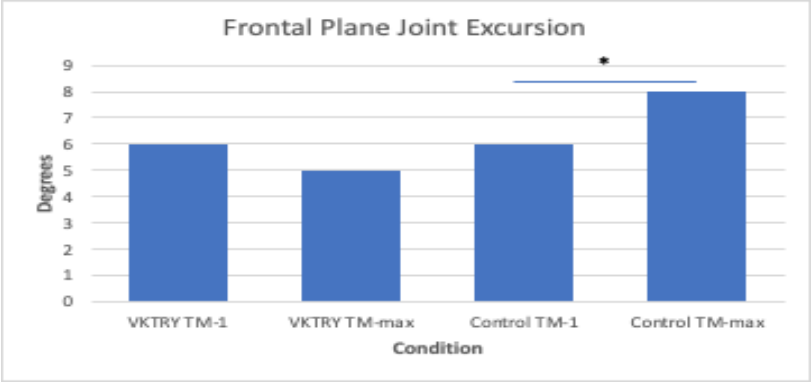
VKTRY Injury Protection KSI Research Results

VKs Improve Alignment to Reduce Stress & Load on the Knee

1. The knee is considered especially vulnerable in the lower extremity kinetic chain. VKs decreased frontal plane knee joint excursion (lateral movement) with test subjects.
2. Less joint excursion equates to improved alignment during running and reduces abnormal knee joint load.
3. Even a small variation in knee alignment can result in stress on the ligaments and degenerative damage to the knee.

SIGNIFICANCE: ***VKTRY insoles improve alignment & stability during running. This reduces stress and load on the knee and decreases the chance of knee injuries.***

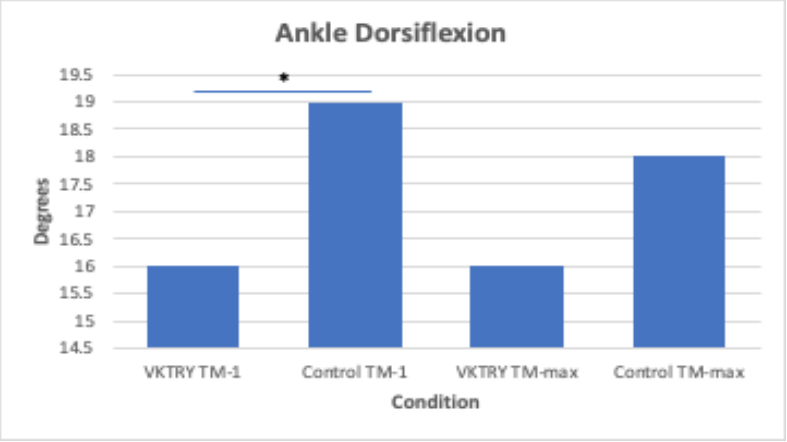




VKTRY Injury Protection KSI Research Results

VKTRY Insoles Improve Biomechanics to Protect Against Shin Splints

1) VKTRY Insoles allowed the test subjects to decrease the degree of dorsiflexion (loading up) in order to perform the necessary work in plantar flexion (push-off)
2) This allows the tibialis anterior tendon to work less thereby reducing the chances of shin splints, tibial stress syndrome and anterior compartment syndrome.
3) VKs allowed the test subjects to "load up" at the ankle less… yet generate more force. Essentially… less risk, more reward.

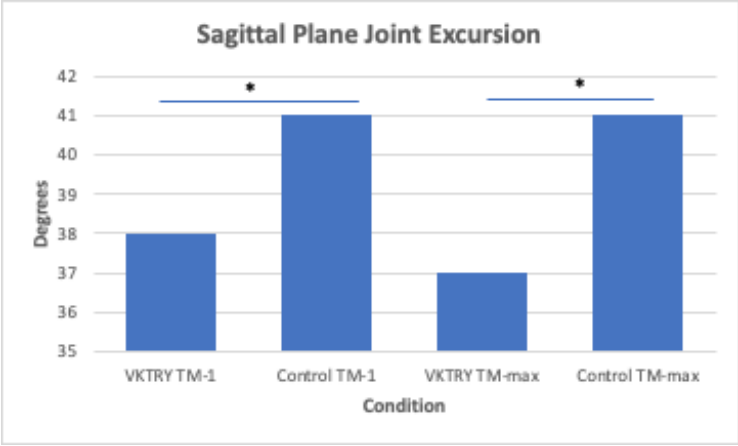


<u>Significance</u>: ***VKTRY Insoles provide added stability and protection for the ankle joint, increase energy efficiency and protect against shin splints.***

VKTRY Injury Protection KSI Research Results

VKs Improve Biomechanics to Protect Against Plantar Fasciitis

1. VKs reduced the degree of ankle plantarflexion necessary for running test subjects to exert a measured ground force.
2. VKs better control ankle eversion (rolling) resulting in improved joint stability reducing the risk of ankle injury.
3. By decreasing ankle excursion (lateral movement), VKs keeps the bones & joints of the foot within the normally accepted range of motion resulting in reduced stress on the Plantar Fascia.

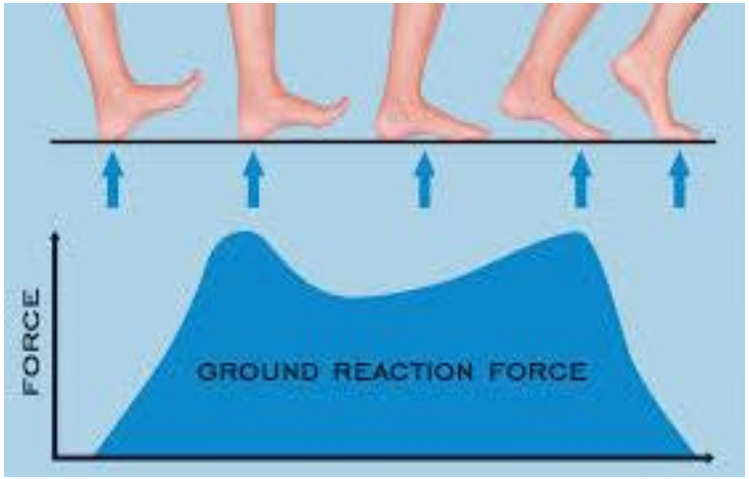


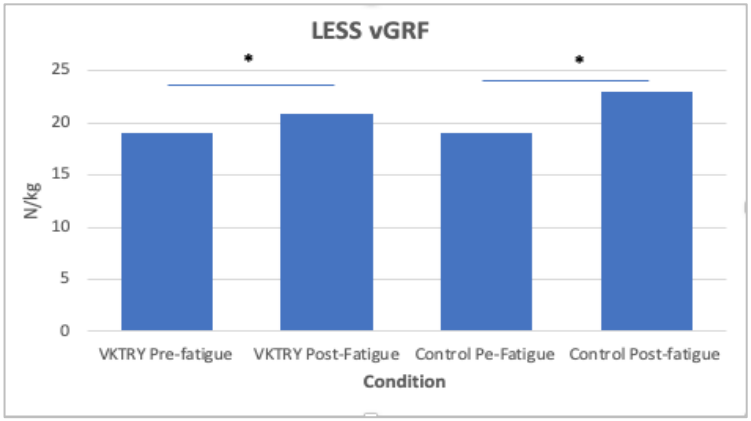
<u>Significance</u>*: By better controlling lateral ankle motion when athletes apply downward force, VKTRY Insoles reduce the risk of ankle injuries and increase protection against plantar fasciitis (currently 4M cases per year in the U.S.)*

VKTRY Injury Protection KSI Research Results

VKs Provide Shock Absorption to Reduce Stress & Load on the Body

1. Whether walking, running or jumping, athletes experience ground reaction forces (GRF)
2. Test subjects experienced significantly less GRF with VKTRY Insoles (10%), especially once the athlete was fatigued .
3. This indicates that VKs were able to absorb more shock and distribute the ground forces more evenly for the athlete.





<u>SIGNIFICANCE</u>: ***VKTRY Insoles provide a "spring-like" effect to improve shock absorption and reduce the load and stress on the athlete's body.***

VKTRY Injury Protection KSI Research Results

Other research findings of interest that may require more study

VKs increased stride lengths of the test subjects by 5-6 inches which would result in less steps needed to cover the same distance (so less pounding on the body) and possibly faster times. Runners may need time to adapt to the change in stride length in order to see true benefits in running economy.

Test participants had a ***lower Rate of Perceived Exertion (RPE)*** when wearing VKTRY insoles. They reported lower perceived fatigue and additionally felt like they:

- Had more shock absorption
- Experienced increased propulsion
- Could perform better while jumping

Injury Protection with VKs

KSI Provides Clinical Support to Help Explain Field Research Results

VKTRY Field Research:

- In 2017, VKTRY worked with four D1 football programs to study the injury protection aspect of our insoles.
- 263 athletes in total were provided with VKs and told to wear them for all practices and games that season.
- After the season, the Athletic Training staff from each school provided VKTRY with the results from 2017 compared to the last 3 years of injury history.
- Medical staffs in the study reported ***41% less foot/toe injuries and 22% less lower leg injuries*** (knee/ankle) and they attributed that improvement to VKTRY Insoles.

Injury Protection with VKs

How VKs Help Athletes Avoid Injuries & Better Recover from Injuries

KSI Research Summary:

- VKs improve alignment & stability during running. This reduces stress and load on the knee and can ***decrease the chance of, and help in recovery from, knee injuries*** (ACL, MCL, Meniscus tears, Bursitis, Tendinitis, Osteoarthritis, etc.)
- Improved biomechanics with VKs reduces the stress on the tibialis anterior tendon, which is responsible for dorsiflexion, resulting in ***decreased risk of shin splints, tibial stress syndrome, stress fractures, and anterior tibialis tendinitis***.
- By better controlling ankle motion when applying downward force, VKs can ***reduce ankle injuries and increase protection against plantar fasciitis.***
- ***VKs increase shock absorption (+10%)*** which reduces the pounding on the entire body and may help in recovery from all lower leg injuries.

NOTE: Because all athletes and injuries are not alike, when considering VKTRY Insoles as an adjunct for treatment or recovery from an injury, we highly recommend consulting your physician.

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Preliminary Report Findings:
4/1/2020

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SPORT OPTIMIZATION AND REHABILITATION

To ask any questions regarding this study or to receive the full report, please contact us at Info@VKTRYgear.com