



# WPI

# Preventing Non-Contact ACL Injuries

## Specially Constructed Shoe Absorbs Stress

### TITLE

Self-Recovering Impact-Absorbing Footwear

### INVENTORS

Christopher Brown  
Michael R. Doyle  
Jessica S. Shelsky  
Nicholas D. Workman

### PATENT

13/860,877

Filed April 11, 2013

### LICENSING STATUS

Worldwide rights available

### CONTACT

**Todd Keiller, Director**  
Technology Transfer  
Worcester Polytechnic Institute  
100 Institute Rd  
Worcester, MA 01609  
tkeiller@wpi.edu



### SUMMARY

- Axiomatically designed athletic shoe mitigates the injurious loads in the knee during athletic activity.
- Shoe supports and provides for normal performance of the athlete when loads are under injury threshold.
- Mold for the prototype was modeled in SolidWorks then created using CNC machining.
- Prototype was tested using a force plate; analyzed using Netforce software for data acquisition and Bioanalysis software for gait, balance and power; and subjected to a uniaxial tensile test on an Instron machine.

### BACKGROUND

The occurrence of non-contact ACL tears is extremely high in athletes. The reduction of such tears would keep more athletes on the field participating in their respective sports.

We have designed a device that mitigates the forces associated with non-contact ACL tears. This device is integrated into the soles of athletic shoes that have been demonstrated to reduce the incidence of ACL injuries.

### ADVANTAGES

Through testing, the prototype exhibited characteristics that would reduce the occurrence of ACL injuries.

Unlike knee braces that support the ACL after an injury has occurred, the shoe works to prevent injuries..

Preventing ACL injuries saves money on medical treatment and rehabilitation equipment.

This design applies the absorption of the forces directly into the shoe, which maintains the athlete's performance and adds very little weight to the shoe itself.

**Video:** [www.youtube.com/watch?v=UrqZPwlhxoU&feature=g-rec-u](http://www.youtube.com/watch?v=UrqZPwlhxoU&feature=g-rec-u)