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April 5<sup>th</sup>, 2019



Dear Dr. Urwatta,

The issue of injuries within sports has existed since the inception of sports, however, little has been done about them. Sports injuries can come from several different circumstances; self-induced injuries, however, have the most potential for possible prevention. ACL related injuries are especially known for their career-ending impact on countless athletes. Our team is dedicated to developing a brace to detect high-risk movements and prevent further injury to the player by allowing immediate treatment.

The purpose of our design is to keep players from worsening their injuries. To do this, we hope to detect the potential for an injury moments before or as it occurs. The ACL has the potential to stretch and tear partially or fully. Detection of excessive force on the ACL allows coaches to be aware of the stresses placed on players bodies to prevent irreversible damage. The design is non-invasive and lightweight while maintaining functionality of current knee braces athletes wear. The system created is not meant to replace current technology available for knee ligament protection but add features to increase real-time data transparency between medical staff and athletes.

Developed with flexible and thin material, the brace utilizes sensors and two small microcontrollers to monitoring input. The device detects dangerous movements and accelerations in the knee within the medial and lateral direction. We know this device will save countless careers and are awaiting supplies to begin production.

Warm regards,

Bilal Ayyache

Devin Catt

Monica Malek

Daniel Sherman

Trevor Smith