

Student's knee sleeve design could prevent painful sports injuries

October 6 2016



How the sleeve looks when worn. Credit: Nottingham Trent University

A knee support sleeve that could stop painful, career-ending injuries has been designed by a student at Nottingham Trent University to prevent injuries before they even occur.

The design uses a prototype sleeve – knitted from elastane and nylon yarn – to apply compression to the knee, aiding [blood flow](#) to help reduce the risk of [anterior cruciate ligament](#) (ACL) injuries in sports professionals.

The injuries can take players out of action for over a year, and have been known to affect top sports professionals like Maria Sharapova and Michael Owen. They happen when a ligament in the knee becomes torn,

and in most cases sleeves are used after injury to help the muscle repair, but this product works to prevent damage to the knee from occurring.

Sean Keane, who studies MSc Advanced Product Design Engineering, designed the sleeve as part of his end-of-year project and has been looking at the opportunity to incorporate his designs into a pair of leggings to cater for the sports fashion market.

The product was made in collaboration with Carlos Oliveira, of the University's Advanced Textiles Research Group in the School of Art & Design, who assisted Sean to develop the final prototype. The end product was a 3D knitted structure produced on a flat knitting machine Stoll ADF3.

Sean, who found inspiration for his designs in his love of lacrosse, said: "I've seen players taken out of action because of ACL injuries; most players resort to using post-injury knee supports, but often complain that they are restrictive and uncomfortable to wear.



Sean Keane with his knee sleeve prototype. Credit: Nottingham Trent University

"The current knee supports available on the market use heavy materials that apply pressure to the knee. My design is made from an elastomer and nylon blend which is lightweight, comfortable, and can be worn to prevent injuries before it's too late."

He added: "Players are often conscious of wearing knee sleeves, because they don't want to appear as though they have been injured. A pair of leggings is fashionable and also allows the wearer to keep the knee sleeve hidden."

After studying at the university for five years, completing his undergraduate Product Design degree in 2014, he plans to pitch his design concepts to sports clothing manufacturers.

Sean's sports sleeve will be showcased as part of a celebration of work from postgraduate design students from the School of Architecture, Design and the Built Environment.

Open to the public, the exhibition will be a unique opportunity to view the innovative designs of students from a diverse range of courses, including a display of medical products, furniture, and interior architecture.

Martin Higginson, Senior Lecturer in Product Design said: "Sean's design uses lightweight materials while still providing a level of support to the knee. His innovative design could help prevent the painful injuries that ruin sports professionals careers."

"This exhibition highlights the work of our students and their pursuit for innovation in design. It is an accumulation of their hard work and a showcase of their understanding of context in design."

Provided by Nottingham Trent University

Citation: Student's knee sleeve design could prevent painful sports injuries (2016, October 6)
retrieved 25 April 2024 from
<https://medicalxpress.com/news/2016-10-student-knee-sleeve-painful-sports.html>

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