

IOC RESEARCH CENTRE  
FOR PREVENTION OF INJURY AND  
PROTECTION OF ATHLETE HEALTH

NATIONAL CENTRE FOR  
SPORT & EXERCISE MEDICINE  
WORKING FOR HEALTH & WELLBEING



# Injury prevention and protection of athlete health

at the National Centre for Sport and Exercise Medicine

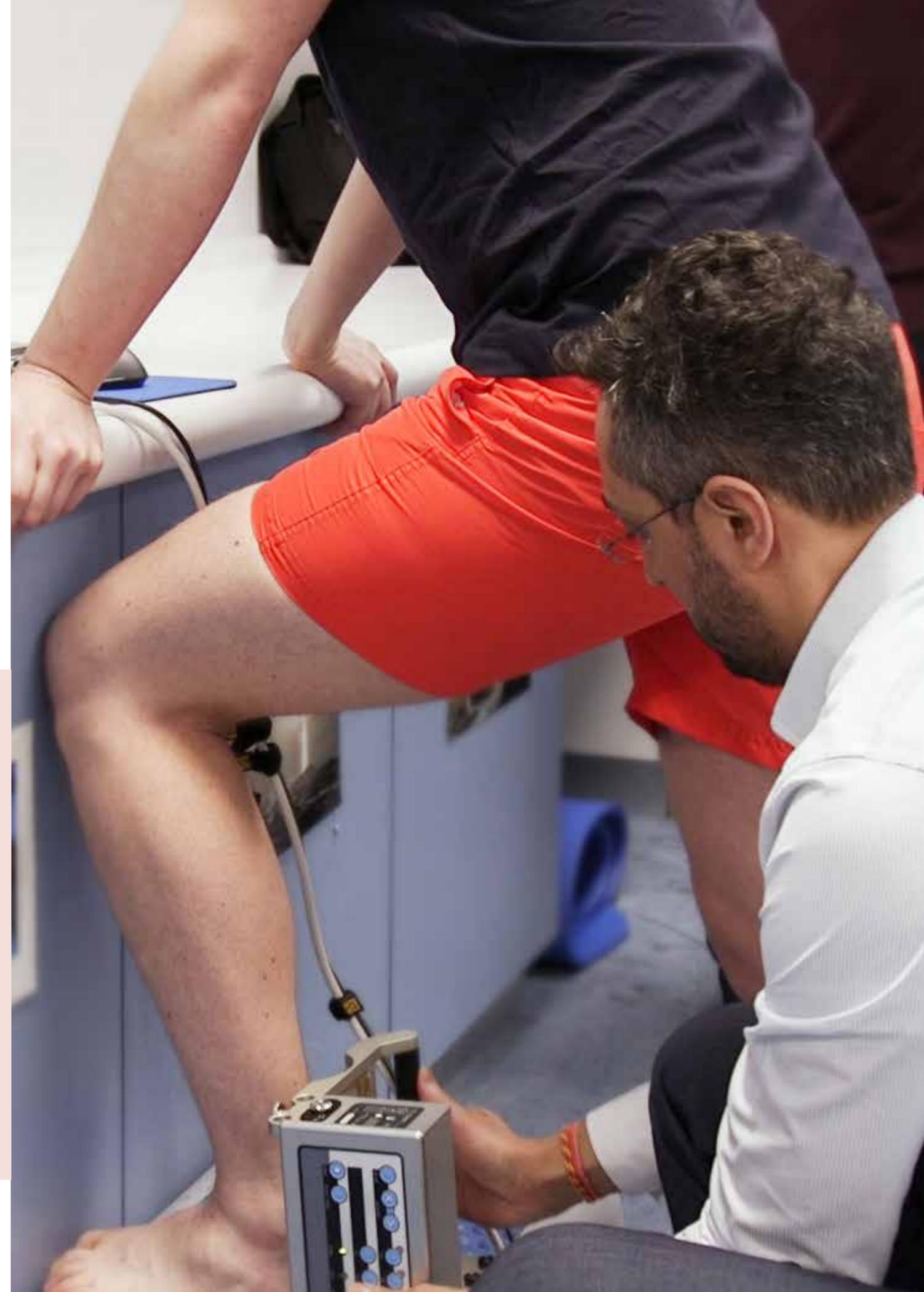
**National Centre for Sport  
and Exercise Medicine**  
Central Office  
Loughborough University  
Leicestershire LE11 3TU UK

T: +44 (0)1509 226 357  
E: S.J.Harris@lboro.ac.uk

# Introduction

**The National Centre for Sport and Exercise Medicine (NCSEM) has recently been awarded IOC Research Centre status.**

We are thrilled to have been recognised for our ongoing work in the prevention of injury and protection of athlete health. In this booklet you can find more information on some of the work our researchers are doing in this area. If you would like to find out more or discuss relevant collaborations, please get in touch using the contact details provided.



## National Tendinopathy Centre

Researchers at the Institute of Sport Exercise and Health (ISEH) are carrying out a long-term clinical and translational study of tendinopathy.

Tendinopathy is common, debilitating and often recurrent, causing significant functional, health and economic problems. Currently there is little understanding of the causes behind, and development of, tendinopathy.

The National Tendinopathy Centre is a multi-centre collaboration involving a number of growing partners, from primary and secondary care to elite sport and industry. They aim to investigate the causes of tendinopathy and identify preventative and treatment strategies, translating their findings to benefit all at risk.

**Contact:**

Dr Bhavesh Kumar  
T: +44 (0)20 3447 2800  
E: Bhavesh.Kumar@ucl.ac.uk

## Vertebral adaptation and stress fracture in elite cricket fast bowlers

Spinal injuries cause the greatest time loss in cricket and contribute to premature retirement, with the most common spinal injury being stress fracture in fast bowlers.

This collaborative project, funded by Loughborough University and the England and Wales Cricket Board, will quantify the vertebral adaptations to bowling and whether this differs according to age or gender and bowling biomechanics following stress fracture.

Most importantly it will examine which factors are related to injury risk. This research will inform guidelines on bowling to minimise injury risk.

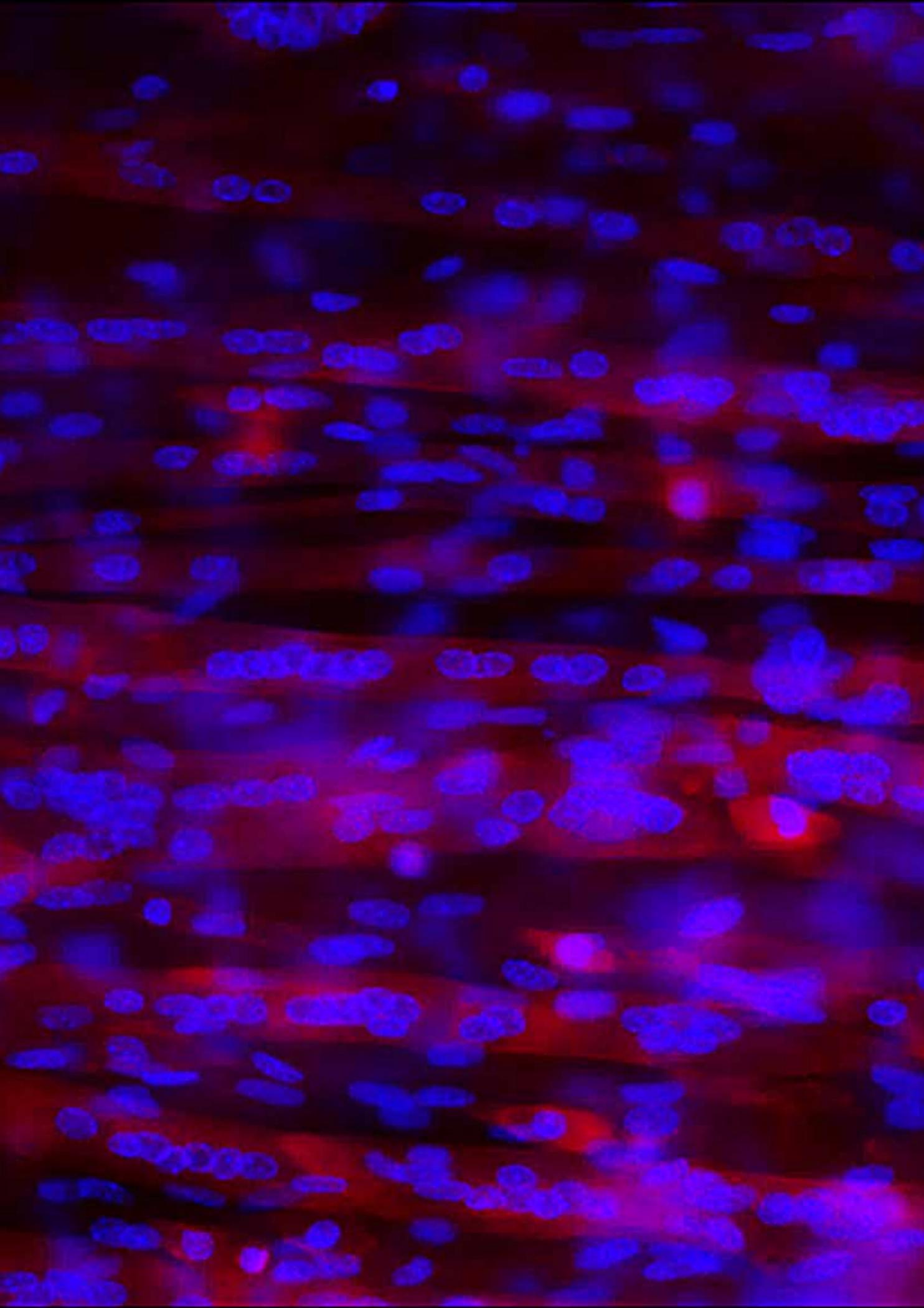
### Contact:

Dr Katherine Brooke-Wavell

T: +44 (0)1509 222 749

E: [K.S.F.Brooke-wavell@lboro.ac.uk](mailto:K.S.F.Brooke-wavell@lboro.ac.uk)





## Ankle sprain injury: prevention by muscle stimulation

This research uses a model-based image-matching motion analysis technique to investigate the mechanism of ankle sprain injuries from video footage.

It takes about 50ms for the ankle joint to reach maximum inversion during an injury, while the reaction time of the muscles resisting this is about 60 to 90ms. Therefore the muscles may not be fast enough to react to the motion.

Stimulating the lateral shank muscles may help to prevent injury, as the delay in stimulating these muscles is only 25ms, allowing the system another 25ms to correct the motion.

### Contact:

Dr Daniel Fong  
T: +44 (0)1509 226 381  
E: D.T.Fong@lboro.ac.uk

## Growing muscles and tendons in the lab

It is notoriously difficult to study the mechanisms that underlie the response of muscle and tendons to injury. Human studies are often limited by a lack of participants and avoidance of invasive techniques whilst animal studies are not always relevant to the human musculoskeletal system.

Over the past 15 years, this research has invented ways to 'grow' muscle and tendon tissue in the lab using various bioengineering strategies. These muscles are being used to create models of the development of muscle strain and muscle atrophy following injury.

This understanding will aid the development of novel physical and chemical interventions.

### Contact:

Professor Mark Lewis  
T: +44 (0)1509 226 430  
E: M.P.Lewis@lboro.ac.uk

## Hamstring anatomy and injury risk factors

Hamstring strains are the most common injury in a number of sports. Whilst some risk factors are known we have little understanding of why the incidence rate for these injuries is so high.

This study looks at the anatomy of the hamstring muscles and more specifically the proximal aponeurosis of the biceps femoris muscle; the hamstring muscle that is most commonly injured.

The size of the aponeurosis is highly variable between people, and as such individuals with a smaller aponeurosis may be at higher risk of a hamstring strain injury.

**Contact:**  
Dr Jonathan Folland  
T: +44 (0)1509 226 334  
E: J.P.Folland@lboro.ac.uk

## Efficacy of snowboarding wrist protectors

Snowboarders are highly susceptible to wrist injuries resulting from falls, with wrist injuries accounting for 35 to 45% of all snowboarding injuries.

At present there is no universally accepted performance specification for wrist protectors already on the market.

The Centre for Sports Engineering Research has developed mechanical tests and surrogates to simulate fall scenarios and understand the behaviour of the protective equipment.

This work has influenced international standards and will inform new product designs for wrist protectors.

**Contact:**  
Nick Hamilton  
T: +44 (0)114 225 2566  
E: N.Hamilton@shu.ac.uk

## Injury prevention in youth hockey players

Lower limb and back injuries are common in hockey players due to the strenuous playing position required. This can have significant long-term effects in young athletes.

However, there is little research for the strength and conditioning coach or healthcare professional to allow for an evidence-based approach to player management with youth hockey players.

The aim of this work is to optimise protocols used with youth hockey players to reduce the incidence rate of injury and to maximise the athlete's potential to maintain a long and healthy involvement with sport.

**Contact:**  
Dr Laura-Anne Furlong  
T: +44 (0)1509 223 059  
E: L.A.M.Furlong@lboro.ac.uk

## Immune function and spinal cord injury

A spinal cord injury leads to a reduced active muscle mass and neurological function loss, both of which can have a negative impact on the immune system.

This research looks at the benefits of exercise on immune function alongside the increased risk of infection, particularly during periods of heavy lifting.

The project focuses on the exercise related factors known to influence immune responses in the context of disability and disability sport, such as exercise intensity, training load, employed muscle mass or body temperature.

**Contact:**  
Dr Christof Leicht  
T: +44 (0)1509 226 306  
E: C.A.Leicht@lboro.ac.uk

## Shoulder health in wheelchair athletes

Wheelchair athletes have a high risk of developing shoulder injury due to the use of their upper body for participation in daily mobility, physical activity and sport.

The Peter Harrison Centre for Disability Sport is leading a multi-centre collaboration to profile the forces acting upon the shoulder during manual wheelchair propulsion.

The aim of the work is to identify athletes who may present an increased risk of shoulder injury.

### Contact

Professor Vicky Tolfrey  
T: +44 (0)1509 226 386  
E: V.L.Tolfrey@lboro.ac.uk



## Oral health and performance

Research in Olympic athletes and professional footballers has found consistently high levels of poor oral health and common self-reported impacts on performance.

This study aims to promote oral health in sport to improve performance, overall health and wellbeing in athletes.

This is delivered through high quality, cross-cutting research, knowledge transfer and training, and by engagement with athletes, sport and exercise medicine practitioners, sports organisations, funders, policy makers and industry professionals.

### Contact:

Professor Ian Needleman  
T: +44 (0)20 3456 2340  
E: I.Needleman@ucl.ac.uk

## National Initiative on Concussion Care

Concussion has become one of the most widely reported injuries in contact sport, yet the condition remains poorly understood.

The ISEH, in conjunction with the Football Association, Rugby Football Union, National Hospital for Neurology and Neurosurgery, and the Institute of Neurology, have created a comprehensive multi-disciplinary clinic catering for the specific needs of athletes that sustain concussion.

This working group tackles some of the key research questions on the diagnosis, treatment, management and long-term effects of mild traumatic brain injury in sport.

### Contact:

Dr Akbar de Medici  
T: +44 (0)7734 707 722  
E: Akbar.Medici@ucl.ac.uk



## Online injury survey for athletes

A pilot survey conducted at the 2016 UK Indoor Championships revealed that 44% of athletes had been affected by an injury which caused them to miss at least three weeks of competition or training in the previous 12 months.

The Sport Industry Research Centre has been commissioned by England Athletics to conduct a survey of current athletes and their coaches, looking into the incidence of injury and its impact on long-term athlete development.

To date 950 athletes and 231 coaches have completed an online questionnaire outlining training loads, competitive profiles and injury history.

**Contact:**

David Barrett  
T: +44 (0)114 225 2298  
E: D.Barrett@shu.ac.uk

## Knee joint preservation in sport

The knee is the most commonly injured joint in sport. This research at the ISEH looks at common injuries, their progression and interventions to prevent later damage and deterioration.

The programme includes work on meniscal repair or replacement, ligament stabilisation and cartilage resurfacing.

The team aims to keep people active and prevent joint deterioration, as such they hope to expand this work to allow for both patient and societal based benefits.

**Contact:**

Professor Fares Haddad  
T: +44 (0)20 7935 6083  
E: fsh@fareshaddad.net

## skeleWell

skeleWell is a suite of applications that is used by GB Skeleton to monitor the wellness, training and equipment use, or maintenance of, for their athletes.

The athletes enter their current wellness status using a bespoke app written for iOS and Android devices. This data is then stored in a secure web database.

The elite athletes on the GB Skeleton programme train in various remote locations across the world. skeleWell provides a centralised solution, so that coaches and practitioners can view the current wellness state of all of their athletes directly from their phone or PC.

**Contact:**

Dr Simon Goodwill  
T: +44 (0)114 225 4435  
E: S.R.Goodwill@shu.ac.uk

## The Significant Ankle Ligament Injury study

The Arthritis Research UK Centre for Sport, Exercise and Osteoarthritis has a significant interest in the ankle joint. Between 70 to 80% of ankle osteoarthritis develops after an injury, but we do not know who will be affected and in what time frame.

The Significant Ankle Ligament Injury (SALI) study is a longitudinal cohort study of patients presenting at A&E with ankle injuries severe enough to require an X-ray, but whose X-ray shows no fracture.

This patient group, recruited from Nottingham, Leeds and Edinburgh, will be studied for 15 years to help our understanding of who recovers well or recovers poorly, and why.

**Contact:**

Dr Laura A Wyatt  
T: +44 (0)115 823 1554  
E: Laura.Wyatt@nottingham.ac.uk

## Disordered eating in athletes

The incidence of disordered eating among athletes is much higher than in the general population.

Around 20% of female athletes and 8% of male athletes present with clinically significant eating problems, compared to just 2% of the general population.

This research intends to improve our understanding of why and how athletes develop disordered eating practices, and will lead to the development of new screening tools and resources to promote early intervention and prevention of clinical eating disorders.

**Contact:**

Dr Carolyn Plateau

T: +44 (0)1509 228 487

E: [C.R.Plateau@lboro.ac.uk](mailto:C.R.Plateau@lboro.ac.uk)





## Immune health and iron regulation in elite endurance athletes

Iron availability, vitamin D status, inflammation and hypoxia all represent challenges to the health of endurance athletes that can negatively affect performance.

This collaborative project with the English Institute of Sport complements established ongoing research aiming to optimise immune health and performance in athletes, focusing on interventions that athletes are regularly exposed to, such as iron and vitamin D supplementation and ischaemic pre-conditioning.

**Contact:**

Dr Nicolette (Lettie) Bishop  
T: +44 (0)1509 226 385  
E: N.C.Bishop@lboro.ac.uk

## Laceration injury risk in rugby

Studded footwear worn in field sports are often identified as the cause of laceration injuries.

The Centre for Sports Engineering Research is developing a method to assess the laceration risk of new and existing stud designs. The test method will include loading parameters derived from the measurement of stud-skin impacts during rugby game scenarios.

It is hoped the findings of this research will be used to inform a revision of the international rugby regulation on studded footwear.

**Contact:**

Bodil Oudshoorn  
T: +44 (0)114 225 2355  
E: B.Oudshoorn@shu.ac.uk