

CAN RESEARCH HALT A MILLION AMPUTATIONS A YEAR?

- Diabetes complications are a leading cause of lower-limb amputation worldwide
- Led by Staffordshire University, international DiaBSmart project is developing innovative approaches to protect the feet of diabetes patients
- Staffordshire University's £30m Science and Technology Centre is helping an EU-funded project to deliver world-class research

Every 30 seconds, the complications of diabetes result in a foot or lower limb amputation somewhere in the world. More than a million such operations take place each year, and the majority of them are preventable, with better-fitting footwear identified as one factor that could greatly reduce the risk of foot amputation.

DiaBSmart, an international project headed by Staffordshire University, aims to create diabetic footwear that can be fitted to each patient using a newly developed assessment system. Co-ordinator Nachiappan Chockalingam, Professor of Clinical Biomechanics, says: "Many people have issues with the foot which cause ulceration, leading to amputation. If we prevent ulcers from happening, we'll avoid amputations."

Addressing this issue could have a sizeable socio-economic impact. As well as improving outcomes for diabetes sufferers, it could greatly reduce the financial burden on overstretched health services.

The first stage of the project involved the development and testing of an integrated system of foot assessment for clinics, which will allow the needs of diabetes patients to be quickly and reliably diagnosed.

Professor Chockalingam says: "At present, diabetes patients may be told by their GP to go and have their eyes checked every three months, but perhaps no one will regularly be checking their feet." By contrast, the protocol developed by the DiaBSmart researchers can identify foot damage before it is visible to the human eye or detectable in a physical examination.

At Staffordshire University, the project was taken on by the Biomechanics team in the Faculty of Health Sciences, which has an excellent track record of achieving real-world impact through collaborative research projects. As one of the major partners in HEELLESS, another EU-funded project, it developed mathematical models to evaluate the cushioning properties of footwear, going on to inform the innovative design of a running shoe that reduces repetitive strain for athletes.

Professor Chockalingam says, "At the moment we are working on insoles within shoes, but ultimately we'd want to develop the footwear itself. The aim is that someone could walk into a clinic, have a foot assessment and walk out with a prescription for the material and shape of the footwear needed."

He adds: "It's important to stress that all of our other work in this area is about prevention, not treatment. We want to offer patients prognosis, and then the prevention of complications."

To find out more about Professor Nachiappan Chockalingam and the DiaBSmart project, read the case study in full at: www.staffs.ac.uk/amputations

Or you can hear more from Professor Chockalingam by finding him in our Expert Explains Series. www.staffs.ac.uk/expertexplains



NACHIAPPAN CHOCKALINGAM

Professor of Clinical Biomechanics

After completing his degree in Electronics and Instrumentation Engineering in India, Nachiappan went on to get his Masters in Biomedical Engineering Science in Dundee.

As well as being a Professor at the university, he is a Chartered Engineer, a Chartered Scientist and a member of various professional organisations, from the Institute for Physics and Engineering in Medicine to the International Society of Biomechanics.

Specialising in musculo-skeletal biomechanics and gait analysis, his world-leading work has been published countless times in studies and journals, whilst he's also known for his work in several commercially funded enterprises. To find out more about Nachiappan's work, search for his profile at www.staffs.ac.uk/staff/profiles

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