

Clinical Studies using GaitSmart



There are a number of studies that have been carried out using the gaitSMART system over the last 2 years. Some of this work has been carried out under formal clinical trials procedures, with ethics approval in place. Others have been in more of a general wellbeing environment, where consent has been obtained but ethics approval has not been sought.

Clinical trials – completed and on-going

Completed studies

Measurement of Knee Joint Angle Using An Inertia Measuring Unit And Its Use Clinically As An Outcome Measure

The results from our normal volunteers and study of the ambulatory knee device as an outcome measure for joint replacements are promising. The responsiveness of the device support the use of the device as an outcome measure in the clinic for ambulatory joint angle measurements. This will be a valuable objective assessment tool for the clinician and will not have bias. It is safe and easy to use, cheap, not time consuming and provides objective evidence to guide physiotherapy at the time of follow-up. This was published by the LKC at the IMechE Conference on Knee Arthroplasty: Early intervention to revision, May 2009.

Kinematics of Lower Limb Segment Movement during Gait in a Healthy Population aged 18 to 97 using Inertial Measurement Units

This work was a study of the gait characteristics of 128 healthy people over the age bracket 18-97 and was carried out by the RNOH London. The aim was to identify how gait parameters change with age. It also included the validation of the system against the optical gold standard. Published in the Journal of Aging and Physical Activity.

Using information on how a person walks to keep them healthy and active

The measurement of the gait profile of a person using inertial measurement units provides objective data, enabling the gait cycle to be broken down and quantified. The conclusion is that this new gait assessment could be used to help tailor an individual's exercise regime, in order to keep them healthy and active. This oral presentation has been given at the IFA conference in Prague in June 2012.

Kinematics of lower limb segment movement during gait in a healthy population aged 18 to 97 using inertial measurement units

The gait cycle of healthy people has been characterised and the variability defined for a number of discrete variables. An oral presentation was given at the WCAA in Scotland in August 2012 by the Royal National Orthopaedic Hospital.

Sports studies

These studies relate to the health and wellbeing of people of all ages. It encompasses studies with sports teams and healthy individuals, including the elderly interested in their wellbeing.

GaitSmart – New technology to keep athletes available for competition

This article describes a new sensor based gait monitoring system that can be used by sports physiotherapists to monitor injured players during training. It provides a brief background to the technology and then goes on to describe how it has been used by the head physiotherapist at the London Broncos. The results from a 5 minute test every week support the adaptation of training sessions where necessary, with the result that players are available for match games. This was published in Sportex, July 2012.

GaitSmart in football

A study is underway with a league team. Players are monitored and the gait report provided weekly to the head physiotherapist and players. The data is used to quantify the severity of specific problems for the different players. Baseline data when fit is used as the individual player's reference point. This work will be published in 2013.

Studies on the elderly

Longitudinal study on elderly people attending an exercise class

This study was carried on elderly people attending a weekly exercise class. The aim was to determine whether providing gait information to the elderly person and the teacher of the exercise class would improve their gait and hence prevent falls. Data collected over 20 months demonstrates that it is an effective approach and gait profiles improved and falls were prevented. This was published in Asian Hospital Healthcare in late 2012.

Internal Case Studies

ETB has produced a number of case studies:

Recovery after surgery to repair meniscus tear

Recovery after surgery for ACL reconstruction

The effect of a hyaluronan injection on knee kinematics

Longitudinal Case study of an elderly person who fell frequently

Longitudinal Case study of an elderly person following a stroke

Case study of a football player with an Achilles problem

Case study of a rugby player with knee osteoarthritis

Abbreviations:

RNOH – Royal National Orthopaedic Hospital

LKC – London Knee Clinic

IMechE – Institute of mechanical engineers

IFA – International Federation of Aging

WCAA – World Congress on Active Aging

ACL – Anterior cruciate ligament



**GaitSmart is revolutionising sensor based motion analysis,
allowing you to better understand the biomechanics of
mobility. Mobility is life.
GaitSmart is a product of ETB**

