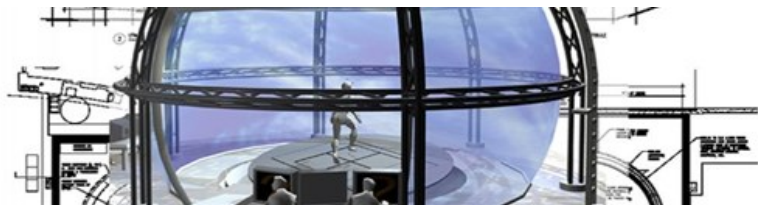


Retrain the Brain: life after stroke and injury



There are more than a quarter of a million new cases of brain injury in the U.K. every year, whether as a result of stroke or head trauma.

Stroke accounts for over 53,000 deaths a year in the U.K. - the third highest cause of death after heart disease and cancer - and over 450,000 people are severely disabled as a result of strokes.

In addition, the effects of ageing will become an increasing concern as the number of elderly people accelerates dramatically over the next few decades.

We are addressing the physical and emotional effects of ageing so that our population can live longer in good health. Our new Centre for Virtual Reality (VR) Learning and Rehabilitation will transform lives by ensuring that once-debilitating injuries and disorders can be overcome, one step at a time.

Dr Michael Grey, Senior Lecturer in Neurorehabilitation "The research we do will help to develop more successful training and rehabilitation methods for disorders of movement and balance, thus improving quality of life more quickly."

When people suffer brain injuries, it can be too traumatic or dangerous to be adequately treated in the real world - a world of moving traffic, uneven surfaces, physical obstacles, and unseen but immense psychological and emotional pressures. The new VR Centre will allow people to be treated in a fully controlled environment and will provide important research that underpins treatment all over the world.

Our Centre for Virtual Reality Learning and Rehabilitation, a new build, will be the only one of its kind in Europe, and one of only three such facilities in the world. It will include an immersive, multi-sensory dome in which we can study and develop effective rehabilitation methods in safe and entirely controllable, virtual reality environments. Here patients can perform complex motor activities under the supervision and guidance of our neurological experts, safely taking the first steps in their recovery, from virtual to reality.

To support this innovative and impactful development, [give today \(/alumni/giving/givenow.aspx\)](#) or contact [Matthew Mangan \(mailto:m.a.mangan@bham.ac.uk\)](mailto:m.a.mangan@bham.ac.uk) [+44 (0) 121 414 8640].

See how it works...

[Open all sections](#)

The centre will include a high-end Motek CAREN (Computer Aided Rehabilitation Environment) system - the most advanced of its kind. This includes a moving platform and state-of-the-art motion capture equipment that can be used for investigation and rehabilitation of balance control. A split-belt treadmill will be mounted on the platform to allow the investigation and training of gait. The patient is then enclosed in a 300 degree hemispherical dome (7m radius) within which an active virtual environment can be projected. This allows the patient to be completely immersed in a versatile, multi-sensory, real-time virtual environment. On top of this, the Centre will also eventually have a driving simulator as well as a flight simulator.

Play the video to see how the Motek CAREN works.



<http://www.adobe.com/go/getflashplayer>

To see more of the CAREN system in use, click the links for Motek Medical's videos, including: rehabilitation exercises for **walking** (<http://www.youtube.com/watch?v=NKhh3Q2zYDA>) and **balance** (<http://www.youtube.com/watch?v=T3x42fCQvF0>), and an explanation of how the system **captures information** (<http://www.youtube.com/watch?v=WWZcSLfQ-jQ>) about the human body.

Who will benefit?

The Centre for Virtual Reality Learning and Rehabilitation will allow us to develop safe, innovative treatments for a range of injuries. These include target groups of military and civilian survivors of physical and psychological trauma, the elderly, and elite athletes.

The VR environment can be used to help patients who suffer from a variety of conditions, including amputations, vestibular deficits, traumatic brain injuries, visual impairment, post-traumatic stress disorder, stroke, and athletic injury.

Birmingham's successes in rehabilitation...

Birmingham already has a dedicated research team in the field of rehabilitation which focuses on musculoskeletal and neurological rehabilitation. We also undertake significant research in the rehabilitation of sports injuries in our top-rated School of Sport and Exercise Sciences.

With the virtual reality development, Birmingham is poised to become an international leader in neurorehabilitation. Important partnerships already involve the University, Queen Elizabeth Hospital, and the Royal Centre for Defence Medicine. The recently launched £20 million Trauma Centre at the Queen Elizabeth Hospital will develop

collaborations with the Department of Health and the Ministry of Defence for the benefit of civilian and military patients.

Your support for the *Circles of influence* campaign has already helped to establish the **Centre for Computational Neuroscience and Cognitive Robotics** (<http://www.birmingham.ac.uk/research/activity/cncr/index.aspx>) (CN-CR). The Centre for Virtual Reality Learning and Rehabilitation is another example of how you can change people's lives by supporting the use of cutting-edge technology to address real world problems.

We would like to acknowledge Motek Medical, who have allowed us to use their image and video of the Computer Assisted Rehabilitation Environment (CAREN) system

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