Project Background

Homonymous visual field defects, such as hemianopia, involve partial blindness in both eyes which occurs following damage to the parts of the brain responsible for processing visual information. They are one of the most common and disabling consequences of brain damage (Ali et al., 2013), with the visual loss impacting on numerous everyday activities like crossing the street, avoiding obstacles, shopping, reading and driving. Furthermore, the reduced independence of such patients has a subsequent negative effect on their emotional and social functioning (Zihl & Kennard, 1996). There is currently no systematic rehabilitation strategy for such patients available on the NHS.

We have developed a computerised program to assist in the rehabilitation of hemianopia called Durham Reading and Exploration (DREX). The training is completed by patients in their own home, with minimal clinical input, and encourages them to adopt more effective eye-movements that allow them to compensate for their visual loss. The training has been validated in two trials as an effective rehabilitation tool for patients with homonymous visual field defects (Lane et al., 2010; Amoda et al., 2014).

The aim of the current project is to professionalise the DREX training and produce the necessary materials that will allow clinicians and patients to use the training with ease and confidence, but also minimal assistance and cost. Multiplatform versions of DREX will be developed that will enable the training to be used by a wider range of individuals with access to different technology such as I-Pads. Furthermore, outcome measures will be built into the program to enable patient improvement to be monitored. Also as part of the project the DREX program will be promoted within the NHS on a national scale, ensuring that clinicians are aware of the product and able to distribute it to patients who may find it beneficial.

Work undertaken to date

We are working with a software development company, Komodo Digital, to improve and professionalise the DREX training program ready for distribution. We are currently beta-testing the program and aim to have a version available for use within the next month. The first part of the product involves the training app for patients. This will be offered in various formats and languages, and available to download from app stores and also our website. The app includes assessment tasks to measure visual abilities, and also comprises our training tasks to improve their reading and their exploration skills.

There is also a webservice for clinicians. If patients want to do so they can share their data with their clinical practitioner (this service is optional), which allows the clinician the opportunity to then monitor the individual’s progress with ease. We will also collate anonymised data for research purposes.

Dr Stephen Dunne will be joining the project in November to maximise dissemination of the work to clinical practitioners throughout the NHS. He will also be on hand to offer technical assistance and support where needed, and to gather feedback from patient and clinical users on the implementation of the training to ensure that it is meeting their needs effectively.

Impact

- **Improving patient health with accessibility and ease**
  DREX has been shown to effectively assist in the rehabilitation of patients who currently receive minimal assistance, leading to improved functioning and quality of life. The new user-friendly, multiplatform program makes it a highly accessible and time efficient method since patients will train in their own home using their own computing device, thus lessening support requirements. The product is downloaded by the patient directly, meaning immediate and easier access to DREX.

- **Reducing rehabilitation costs**
  The improved DREX computer program will reduce costs associated with previous versions of the training (e.g., supervision costs, technical support, production and postage of training CDs). Being multiplatform means that patients can train using a device they already own which means that there is no need to buy specialist equipment. By improving patient functioning we also hope to impact the number of patients requiring carer support or who are returning to work for instance.

References


