ISRCTN16087935 https://doi.org/10.1186/ISRCTN16087935

Effect of head-mounted displays on the ability of individuals with poor eye sight to see and read

Submission date	Recruitment status	[_] Prospectively registered
14/01/2015	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
08/07/2015	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
19/04/2021	Eye Diseases	

Plain English summary of protocol

Background and study aims
Conditions that affect sight are more likely to result in partial blindness than in total loss of sight; the ratio of people with low vision to blindness is 10 to 1 in Europe according to the World Health Organization. The most common cause of blindness in the west is age-related macular degeneration, a condition that affects the central area of vision but not the peripheral (side) vision. Most people with visual impairment need some kind of vision aid to make best use of their residual vision. This aid can be an optical magnifier or, for stronger magnification and better field of view, an electronic magnifier connected to a computer monitor. These head-mounted displays (HMDs) are comprised of one or two small screens (monocular or binocular) placed close to the eyes, with lenses that make the display appear at a comfortable viewing distance. The screens can be opaque, like conventional monitors, or transparent. This study aims to gain further knowledge of the usefulness of HMDs for people who are partly sighted and compare two available models.

Who can participate?
Adults with partial sight.

What does the study involve?
Participants are allocated to one of two groups. Those in group 1 (intervention) wear the Epson Moverio BT-200 HMD. Those in group 2 (intervention) wear the Oculus Rift HMD. All participants wear the HMDs for around 45 minutes during the study, and ability to see the display and speed of reading is assessed.

What are the possible benefits and risks of participating?
The benefits are improvement in the ability to see and read.

Where is the study run from?
Princess Alexandra Eye Pavilion (UK)

When is the study starting and how long is it expected to run for?
September 2014 to June 2016

Who is funding the study?
Heriot-Watt University (UK)

Who is the main contact?
1. Mr H Moshtael (scientific)
2. Dr L Fu (public)
lfu@doctors.org.uk

Contact information

Type(s)
Scientific

Contact name
Mr Howard Moshtael

ORCID ID
https://orcid.org/0000-0001-6805-2710

Contact details
Scottish Microelectronics Centre, Kings Buildings
West Mains Road
Edinburgh
United Kingdom
EH9 3JF

Type(s)
Public

Contact name
Dr Lana Fu

ORCID ID
https://orcid.org/0000-0003-1959-9749

Contact details
Princess Alexandra Eye Pavilion, 45 Chalmers Street
Edinburgh
United Kingdom
EH3 9HA
+44 (0)1315361772
lfu@doctors.org.uk

Additional identifiers

Protocol serial number
2

Study information

Scientific Title
Effect of head-mounted displays on the ability of patients with macular disease to see and read: a pilot study

Study objectives
1. To gather data on the ability of patients with age-related macular disease to see and read from two head-mounted displays (HMDs); the results will inform the development of techniques to modify the presentation of text on the display in order to enhance patients' reading ability.
2. A pilot trial will measure the extent to which patients can see the displays and their ability to read from them.
3. A subsequent main trial will then test the efficacy of these techniques.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Health Research Authority, 07/01/2015, ref: 14/EM/1322

Study design
Single centre interventional study

Primary study design
Interventional

Study type(s)
Quality of life

Health condition(s) or problem(s) studied
Macular disease, particularly age-related macular degeneration

Interventions
The usefulness of the two kinds of HMDs for people with a central scotoma will be investigated:
1. Epson Moverio BT-200, a transparent glasses-like HMD.
2. Oculus Rift, an opaque and immersive HMD.

Intervention Type
Device

Primary outcome(s)
Extent to which patients can see the display, measured with a perimetry-style test.

Key secondary outcome(s))
Reading speed will be measured using the Radner reading chart at baseline, to be compared with reading speed using the head-mounted display.

Completion date
24/06/2016

Eligibility

Key inclusion criteria
1. Macular disease, including Stargardt's macular dystrophy and age-related macular degeneration
2. Not undergoing active treatment
3. Able to provide consent

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
10

Key exclusion criteria
1. Undergoing intravitreal therapy
2. Does not have mental capacity to consent or comply with the trial protocol

Date of first enrolment
02/02/2015

Date of final enrolment
20/03/2015

Locations

Countries of recruitment
United Kingdom

Scotland

Study participating centre
Princess Alexandra Eye Pavilion
Edinburgh
United Kingdom
EH3 9HA

Sponsor information

Organisation
Heriot-Watt University

ROR
https://ror.org/04mghma93

Funder(s)

Funder type
University/education

Funder Name
Heriot-Watt University (UK)

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication.

IPD sharing plan summary
Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		01/12/2019	25/03/2021	Yes	No
Book results	results	04/06/2016	22/03/2021	No	No
HRA research summary			28/06/2023	No	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes