Electronic vision enhancement devices and the NHS

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p-EVES

Power source + Camera + Display Screen
English Low Vision Clinics:

- Conventional optical magnifiers can be loaned to patients (MREH no deposit)
- Funded by NHS
- Most require more than one optical aid
- Often require replacement (broken handles and lights, loss etc)
Welsh Low Vision Service:

Loan magnifiers in the same way but this also includes one pEVES: Optelec Compact+
Types of optical LVAs:

- Illuminated Hand Magnifiers
- Illuminated Stand Magnifiers
Spectacle mounted telescopes

Monoculars

Max TV
Electronic Low Vision Aids:

Desktop mounted CCTVs
Examples of pEVES...
<table>
<thead>
<tr>
<th>Device</th>
<th>Picture</th>
<th>Size</th>
<th>RRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>eMag 43</td>
<td><img src="image1.png" alt="eMag 43" /></td>
<td>4.3”</td>
<td>£399</td>
</tr>
<tr>
<td>Compact+</td>
<td><img src="image2.png" alt="Compact+" /></td>
<td>4.3”</td>
<td>£245</td>
</tr>
<tr>
<td>Mobilux Digital</td>
<td><img src="image3.png" alt="Mobilux Digital" /></td>
<td>3.4”</td>
<td>£399</td>
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<tr>
<td>Compact 4HD</td>
<td><img src="image4.png" alt="Compact 4HD" /></td>
<td>4.3”</td>
<td>£545</td>
</tr>
</tbody>
</table>
Research Project:

‘The effectiveness of portable electronic visual enhancement systems (EVES) in comparison to optical magnifiers for near vision activities in visual impairment - the pEVES study’

A research project led by Christine Dickinson (UoM), being conducted in the Optometry department at MREH
The pEVES Study....

-Two-arm randomised cross-over study

-To determine the effectiveness and acceptability of portable Electronic Vision Enhancement System (p-EVES) devices and conventional optical low vision aids (LVAs) for near tasks.
Hypothesis:

In comparison to optical aids, the p-EVES aids can:

1. be used for longer duration (since not so tiring to use),

2. be used for a wider range of tasks than a single optical aid (ie, could potentially replace a number of different devices) and/or enable users to do tasks that they were not able to do with optical devices

3. allow faster performance of instrumental activities of daily living (IADL)

4. allow faster reading
Research Study Plan

- Funded by NIHR
- Single-site study at MREH
- Focus group
- Participants (n=100) recruited from the Low-Vision Clinics at MREH
- Study: 24 months, each participant 4 months
- 2-arm randomised cross over study
  - Group 1: 2 months with p-EVES, then 2 months with optical
  - Group 2: 2 months with optical, then 2 months with p-EVES
Taken collectively, the outcome measures:

- Questionnaires
- Reading tests
- Performance of everyday activities

will allow us to investigate whether $p$-EVES offer real benefit to visually impaired people in comparison to existing optical magnifiers for near vision activities.

If $p$-EVES found to be effective → the research will provide evidence that can inform any future decisions by NICE to allow $p$-EVES devices to be provided through NHS clinics.
ELVES clinic

- Electronic low vision enhancement service
- Specialist clinics provided by Stephen Golding
- Small groups of patients plus family/friends
- Access to various different devices
- iPad and kindle
iPad and Kindle

- Download books
- Back-lit devices (improves contrast)
- Can increase font sizes
HENSHAWS iPad and iPhone courses- how to adjust settings/download apps
MDev_Reader app: enables eBook text to be scrolled in a single line. Designed to help those who use eccentric viewing and/or steady eye technique for reading.
A special thank you to Dr Robert Harper, Professor Chris Dickinson, Dr Jake Taylor and the p-EVES study team. Also to the optometrists at MREH for all of their hard work on the p-EVES study so far.

Thank you for listening
References

- www.rnib.org.uk
- http://www.ccf.nihr.ac.uk/RfPB/Pages/home.aspx/
- http://www.macularsociety.org/
Questionnaires

- **Addenbrooke’s Cognitive Examination (ACE III)**
  - Evaluates 5 cognitive domains (attention, memory, verbal fluency, language, and visuo-spatial abilities)
  - Included to evaluate whether a certain cognitive ability is required to benefit from p-EVES devices

- **Manchester Low Vision Questionnaire (MLVQ)**
  - Captures low vision aid (LVA) usage data (frequency/length/ease of use) and task specific use (which tasks the LVA’s are used for and how helpful the LVA is for the task)

- **Near Vision Visual Function Questionnaire (NV VFQ-15)**
  - Asks the participant to rate the difficulty they experience doing 15 near vision tasks

- **WHO-5 Well being Index**
  - 5-item questionnaire used to evaluate depression

- **Quality of Life questionnaires**
  - EQ-5D-5L (Generic quality of life measure) and VisQoL (designed to evaluate the impact of visual impairment on quality of life)
Reading Tests

- **MNRead Acuity Charts**
  - Designed to measure reading acuity and reading speed
  - Continuous-text reading acuity charts (3 lines of text, 60 characters at each acuity level)
  - Using 4 charts (commercially available) at high contrast (≈ 90%) for repeat measures
  - Using 4 charts (custom designed) at reduced contrast (≈ 50%)
  - To investigate the *contrast enhancement* feature available on p-EVES devices

- **The International Reading Speed Texts (IReST)**
  - Designed to measure reading speed over a longer duration (paragraph of ≈ 160 words)
  - May provide evidence of “fatigue” with using devices (comparison of reading speed over first 10 words with reading speed over last 10 words)
  - May show evidence of how easy/difficult people find “keeping their place” while reading across a long paragraph
Timed Activities of Daily Living (5 TIADL)

- 5 Activities of Daily Living that visually impaired people find difficult

- Finding a number in a phone book
- Writing a phrase
- Reading ingredients on tins of food
- Finding items on a shelf
- Reading information on medicine bottles

- Each assessed in terms of time taken for the task and accuracy in performing the task