### Evidence-Based Practice Project Evidence Table

**Evidence Table Topic:** The Efficacy of Assistive Technology for Individuals with Brain Injury  
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<table>
<thead>
<tr>
<th>Author/Years</th>
<th>Study Objectives</th>
<th>Level/Design/Participants</th>
<th>Intervention and Outcome Measures</th>
<th>Results</th>
<th>Study Limitations</th>
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| de Joode et al. (2009) | To determine the efficacy of portable electronic aids for patients with cognitive deficits | Level IV: Systematic review of 28 relevant articles describing 25 studies  
The total number of participants was 423 | The interventions reviewed included electronic aids  
Outcome Measures:  
- Cognitive performance  
- Occupational performance  
- Level of participation in daily life | Most papers described case reports and only one randomized control trial was identified.  
The efficacy of assistive technology is not sufficiently studied in randomized control trials | Minimal randomized control trials have been conducted  
There is insufficient evidence to draw conclusions on the value of electronic aids. |
| Dowds et al. (2011) | To determine the effects of personal digital assistants (PDA) as a compensatory memory tool for task completion | Level III  
Multiple cross-over design study  
N = 36 Adult participants  
Mean age: 42.1 (19 females and 17 males)  
Inclusion criteria: between ages of 18 and 64, sustained a TBI, memory impairment, and adequate visual acuity. | Participant’s assigned memory tasks under four conditions: utilized usual approach (baseline), paper memory aid, and two conditions using PDA.  
Outcome measures:  
- Task completion was determined by participant’s completion of call-in tasks. | When comparing MOS PDA versus baseline, rates were significantly higher for the MOS condition (P < .001).  
When comparing the POS condition versus baseline, task completion rates were significantly higher for POS condition (P < .005).  
When comparing the MOS PDA and POS PDA yielded significant results (p < .005). | Small sample  
Participants received compensation for participation  
Researchers did not investigate continuation of devices after study  
The electronic memory aid did not required participants to input information while the paper planner system required inputting information. |
| Genry et al. (2008) | To determine the effects of using a PDA on participant’s perception of occupational performance. | Level III: A quasi-experimental study with pre-post assessment design  
N – 23 Adults | Participants received PDA with one-on-one training to utilize device for 8 weeks. | Significant improvement on all subscales of the COPM and on cognitive independence and mobility on the CHART-R. | Small sample  
The investigators did not track how often the participants used the device  
PDAs are nearly obsolete. |

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<td>McDonald et al. (2011)</td>
<td>To determine the effects of using the Google Calendar as a memory aid for individuals with memory impairments.</td>
<td>Level III Randomized control crossover within-subjects design</td>
<td>Participants received 3 phases of interventions for 5 weeks: no memory aid, Google calendar, and standard diary.</td>
<td>Significant difference between group’s average memory performance at baseline and during intervention phases (p &lt;.001). A significant difference between performance using Google Calendar and standard diary (P&lt;.001).</td>
<td>Small convenience sample Researchers did not follow up with participants to see if they continued using memory aid The participants specific memory deficits were not indicated in study The family members may not have witnessed or accurately recorded the completion of tasks.</td>
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<td>Sohberg et al. (2007)</td>
<td>To determine the effects an assistive device with four prompt modes as a navigation tool for community traveling</td>
<td>Level III A within-subject comparison study</td>
<td>Participants received route-based directions on a pocket PC. Four routes were selected using four different prompting modes.</td>
<td>Best performance when cued via speech-based audio directions.</td>
<td>Small convenience sample Researchers did not follow up on carryover of device Researchers were not blinded from study but were responsible for determining scores.</td>
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| Stapleton et al. (2007) | To determine the effects of using the reminders function on a mobile phone as a memory aid for individuals with brain injury | Level III: Single case ABAB design  
N = 5 participants  
Median age: 34 (5 male, 0 female)  
Inclusion criteria: > 16 years of age at time of injury, everyday memory problems and lived with a carer | Cell phone: individual reminder messages  
Outcome Measures:  
- Pre and post measurements  
- Personal questionnaire to identify target behaviors  
- Daily measures for memory successes | There was an increase in the number of target behaviors achieved independently by two of five participants when using mobile phone.  
Three participant’s memory successes did not change when mobile phone was initiated. | The device is not commonly used or available for purchase.  
Small sample  
No follow up of participants  
Participants did not have a similar level of cognitive impairment and independence.  
Researchers did not measure responses of the carers to participants |
| Van Hulle et al. (2006) | To determine the effects of a written reminder and two AT devices on medication management. | Level III: Single case ABA(CA) alternating design  
N = 3 male participants  
JW = 30 year old male  
BG = 33 year old male  
DG = 25 year old male  
Inclusion criteria: a score of 93.8 or higher on the Aphasia Quotient portion of the WAB and a memory impairment indicated by the CVLT-II SF | The interventions included medication schedule cards and two AT devices: the WatchMinder or the Voice Craft digital voice recorder.  
Outcome Measures:  
- Pre- and post-measurements on % independent medication requests | Two of the three participants treatment was terminated after demonstrated 100% independence for multiple days after the written reminder phase.  
One participant continued to be dependent on staff for medication management after receiving all four phases of treatment. | Small sample  
1 participant withdrew from study  
The participants received daily cues to use device and were not responsible for remembering to utilize device  
The participants did not all receive the same interventions |

Abbreviations Defined: COPM = Canadian Occupational Performance Measure; CHART-R = The Craig Handicap Assessment and Reporting Technique Revised
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**References**


