



# EVIDENCE

## 'APP' LENTY !

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Optimal SP

# OUTLINE

- Systematic Review



- And more!



# SYSTEMATIC REVIEW

- Where:
  - Liverpool brain injury rehab unit
- Who else:
  - Dr Grahame Simpson (Senior Research Fellow, Research Team Leader and Social Worker-Clinical Specialist)
  - Lauren Nguyen (Neuro-psychologist)
- Search:
  - Electronic database search and manual searches through known article references
- Evaluation:
  - RCT: PEDRO
  - Group: Downs & Black
  - Single: SCED
- What:
  - Experimental designs only



## OTHER SYSTEMATIC REVIEWS OUT THERE...

- de Joode et al., 2010
  - focused on the usability of assistive technology for patients with cognitive and memory deficits
- Morris & Reinson, 2010
  - focused on the usability of assistive technology for patients with memory deficits only
- Gillespie, Best, and O'Neil (2012)
  - Assistive devices that were and were not portable

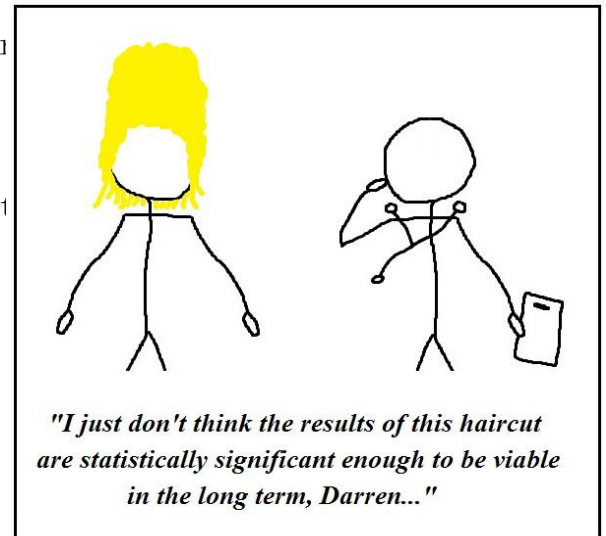
Missing Communication!!

Variable methodological quality rating systems



# SNEAK PEAK

- Participants: Mix of neurologically based brain injury
- Devices: PDAs (6) mobile/smartphone (6) voice memo (4) neuropage/pager (4) AAC (1) Combo (5)
- Training:
  - Range of clinicians (OT, SP, NP)
  - Environment: 14 in own home, 8 in rehab OP service
  - Training time: 30-180 min
- Cueing method:
  - mostly combo of visual and sound, some included tactile cues, some used single modality of visual or sound
- Goals:
  - Independence with ADLs (17), goal recollection (2), navigation (2), info recollection (1) AAC (1)
- Measures:
  - Participant: scales developed by research team , COPM, CHART-R
  - Carer: MCSI (modified carer strain index)
  - Clinician: field notes, memory function assessment, FIM, % com
- Outcomes:
  - 20/23 were positive.
  - PDAs, neuropage + smart phones: all positive
  - Voice memo, AAC + mobile phone: had a couple of neutral results
- Quality
  - 11 - group d&b - score out of 28 M= 19.18
  - 12 - single sced - score out of 10 M = 6
  - 3 - RCT PEDRO - scored under 6/10



Study	Rating	Device	Goal	Training	Outcome
Bowman '07	4	Mobile Phone	ADL Recall	1-2 hr daily, 3 wks. Home	☺
Bowman '10	3	PDA	Exercise & ADL Recall	NA Home	☺
Culley & Evans '10	3	Mobile Phone	Goal Recall	1 x session Home	☺
Dowds '11	2	PDA	ADL Recall	NA Home	☺
Evans '98	3	Neuro-page	ADL Recall	2-3hr Home	☺
Fish '07	4	Mobile Phone	Phone Call Recall	30 min NA	☺
Gentry '08	4	PDA	ADL Recall	3-6 x 90min Home	☺
Hart '02	2	Voice organiser	Goal Recall	3 x 1hr Day program	☺
Kirsch '04	4	Pager	Information Recall	NA Day program	☺
Kirsch '04b	4	PDA	Navigation	8 x 1hr Day program	☺
Laffont '07	4	Speech Synthesizer	AAC	10 x 1hr Home	☺

Study	Rating	Device	Goal	Training	Outcome
Sohlberg '07	3	PDA	Navigation	NA Home	☺
Stapleton '07	3	Mobile Phone	ADL Recall	1 wk Home	☺
Svoboda & Richards '09	4	Smart Phone	ADL Recall	8 x 1hr Home	☺
Svoboda & Richards '10	3	Smart Phone	ADL & Phone call Recall	8 x 1hr Home	☺
Thone-Otto & Walther '03	3	PDA + Mobile phone	Information & ADL Recall	5 x 60 min Clinic	☺
Van Den Broek '00	3	Voice organiser	Information & ADL Recall	3 wk Home	☺
Van Hulle & Hux, 2006	4	Wrist alarm + voice recorder	ADL Recall	1 x morning NA	☺
Wade & Troy, 2001	3	Mobile phone	ADL Recall	NA Home	☺
Wilson et al., 1997	3	Neuro-page	ADL Recall	2-3hr Home	☺
Wilson et al., 2001	2	Neuro-page	ADL Recall	2-3hr Home	☺
Wright et al., 2001	2	Pocket computer	ADL Recall	1 wk Home	☺
Yasuda et al., 2002	4	Voice message recorder	Diary writing and ADL Recall	1 wk-3mth Home	☺

## BARRIERS

- Deployment of devices: accessibility, ownership, lending
- Motivation to use technology
- Prior knowledge + acceptance
- Motor and sensory impairment
- Lots of 'childish' apps to sort through
- Pop up ads = distracting
- Cost for initial purchase then maintenance
- Accidental setting changes (eg volume, app deletion)
- Internet connection
- Privacy
- Infection control





## FOR THE FUTURE

- Stat analysis
- Validated outcome measures
- Inclusion of professional background of clinician
- Teaching + cueing strategies
- Larger participant numbers
- Control groups
- Randomisation + blinding strategies
- Goal/function : severity of aphasia
- Documenting adverse events
- Independent assessors



Fig. 3 A double-blind placebo-controlled clinical trial for CAM therapies.



## THEMES

- Majority of recent research is focused on:
  - App choice
    - Rapid rate of app development
  - Institution description of their methods
  - Single or small group case descriptions
- Broadening the EPAD scope:
  - Clinicians
  - Clinical populations
  - Types of devices
  - Functions and goals
  - Measurement tools





## ○ Szabo & Dittelman 2014

- Discussion of how 'apps' have been used in their treatment program and how they've accessed them
- Unspecified number of people with aphasia
- iPad used in group context for people with little exposure to mobile technology
- Patient centred goals worked in a rehab facility then home
- Apps: small talk aphasia, pictello and story creator for script development, photo editor, language therapy, dragon dictation, awesome memory
- Measures: subjective device rating scale
- Outcome: mobile and tablet devices can be used by people with aphasia as a daily communication and organisational tool.



## ○ Ramsberger & Messamer 2014

- 3 participants with severe aphasia
- iPad used in intensive program speech pathologist
- Patient centred goals
- Apps: dragon dictation, little story maker, notepad pro
- Measures: qualitative description of their approach to incorporating apps into therapy
  - Assessment of client strengths + goals
  - Assessment of apps/device motor + sensory requirements
  - Assess accessibility of the apps/device
- Outcome: incorporating smart phone and tablet technology should be done in a step-wise procedure incorporating client's strengths/weaknesses and goals, considering the device, app and accessibility.



## ○ Kurland, Wilkins & Stokes 2014

- 8 participants with mixed types and severities of aphasia
- Randomised into 2 groups (intensive language action therapy vs modified aphasic communication effectiveness) both with iPad use in home program
- Speech pathologist led program over 6 months
- Patient centred goals worked at home
- Apps: iBooks + GoToMeeting
- iPad used in individual, dyadic and group treatment with pre + post measures taken (IV)
- Measures: boston naming test, boston diagnostic aphasia examination
- Outcome: iPads are a promising tool to maintain and progress treatment goals attained in intensive aphasia therapy regardless of aphasia type and familiarity with tablet technology.



## ○ Hoover & Carney 2014

- 20 participants with mild-severe aphasia
- iPad used in intensive program with MDT
- Patient centred goals worked in a rehab facility then home
- Apps: proloquo2go, pictello, notes, maps, calendar, camera, small talk & skype
- iPad used in individual, dyadic and group treatment with pre + post measures taken (IV)
- Measures: stroke impact scale, ASHA FACS + % correct for target goal
- Outcome: preliminary evidence to support use of tablet technology in a range of client centred goals with scope for generalisation across environments



# RESEARCH DRIVEN APP SELECTION

Gosnell (2011)

1. Identify the person's strengths + weaknesses, ability to access the iDevice
2. Clinician should be knowledgeable about communication apps and iDevices
3. Clinician matches, compares and selects appropriate apps
4. Functional assessment of appropriateness

DeCurtis + Ferrer (2011) – child based but helpful principles

1. Prep: what is the rationale?
2. Participants: age and developmental appropriateness
3. Parameters: consider time effectiveness and appropriate environments
4. Purpose: what is the advertised purpose of the app
5. Positioning: client's ability to hold, position and access the device
6. Playtime (ADLs/leisure): how is the device incorporated into usual activities
7. Potential: how can it be used in more everyday activities





## CONT...

### Wakefield + Schaber (2012)

1. Frame a clinical question using PICO (population, intervention, comparison and outcome)
2. Find the evidence (eg about learning theories, methods etc)
3. Assess the evidence
4. Search the app store and consult the evidence
5. Make a clinical decision based on the app's features and the evidence to support or reject it

### Ramsberger & Messamer (2014)

1. Assess the client's speech + language as usual, develop evidence based + client centred goals
2. Assess motor, cognitive + sensory requirements of the device and apps under consideration
3. Assess the device + apps accessibility for the client in mind



# COCHRANE REVIEWS

## Mobile phone messaging reminders for attendance at healthcare appointments 2013

Gurol-Urganci , de Jongh, Vodopivec-Jamsek, Atun & Car

- Do SMS and MMS reminders improve attendance to appointments?
- 8 RCTs (up to 2012), 6615 participants
- Low-moderate quality evidence shows that SMS and MMS reminders do improve attendance compared to no reminder or a postal reminder.
- 2 Studies found that the SMS and MMS costs were less than a phone call
- Possible problems raised: loss of privacy, message delivery failure



## OTHERS OF INTEREST...

"Prospective memory intervention for adolescents with acquired brain injury: Developmental and psychosocial factors affecting outcomes"

Presented at the Brain Impairment. Conference: 9th Annual Conference of the Special Interest Group in Neuropsychological Rehabilitation of the World Federation for NeuroRehabilitation July 2012.

Rous, Adams, Fish, Manly & Adlam

### Multiple Case Studies

- 7 adolescents with acquired brain injury and prospective memory impairment
- Single case series with randomised alternating treatment
- Goal: making 3 phone calls/day prompted by randomly timed text cues
- Outcomes: better performance for cued than non-cued days with 5/7 participants generalising behaviour



QUESTIONS???



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