Mobile Apps for Managing Memory Impairment after Brain Injury

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Disclosure Statement

Neither presenter has any financial or nonfinancial relationships relevant to the content of this presentation.

Goals

- ✓ Discuss evidence
- ✓ Demonstrate & describe different types of memory aid apps
- ✓ Describe training & implementation

Impact of Memory Deficits

- Loss of independence
- Reduced safety
- Loss of ability to perform self care routines
- Changes in social relationships
- Inability to perform work tasks
- Poor performance in school

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Keys to Success

Assistive Technology for Cognition

- Understand the literature
- Understand patient values & preferences
- Feature match to function, needs & abilities
- Know available products
- Provide systematic training
- Monitor & assess impact

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Practice Guidelines/Standards
MEMORY

- Academy of Neurological Communication Disorders and Sciences (ANCDS)
- American Congress of Rehabilitation Medicine (ACRM)
- Institute of Medicine (IOM)
- European Federation of Neurological Sciences (EFNS)

ANCDS

Practice Guideline: ANCDS recommends "the use of external aids in the treatment of memory impairments as a rehabilitation practice guideline for adults with memory impairment following TBI."

(Sohlberg et al., 2007)

ACRM

Practice Standard: use of internal strategies and external compensations for treatment of mild memory impairments from TBI

Practice Guideline: use of external compensations for people with more severe memory impairments after stroke or TBI, with direct application to functional activities

(Haskins, 2011)

IOM

Report on Cognitive Rehabilitation Therapy for Traumatic Brain Injury: Evaluating the Evidence

- found no studies that investigated the benefit of using external memory aids for patients with mild TBI
- found modest evidence of the effectiveness of external memory aids to reduce everyday memory failures for patients with mod-severe TBI

(Institute of Medicine 2011)

EFNS

Practice Guideline:

"electronic external memory devices such as computers, paging systems or portable voice organizers" are recommended as "probably effective aids for improving TBI or stroke patients' everyday activities."

(Cappa et al., 2005)

Evolution of the Evidence

- Neuropage
- DataLink watch
- PDAs
- Smartphones
- Tablets

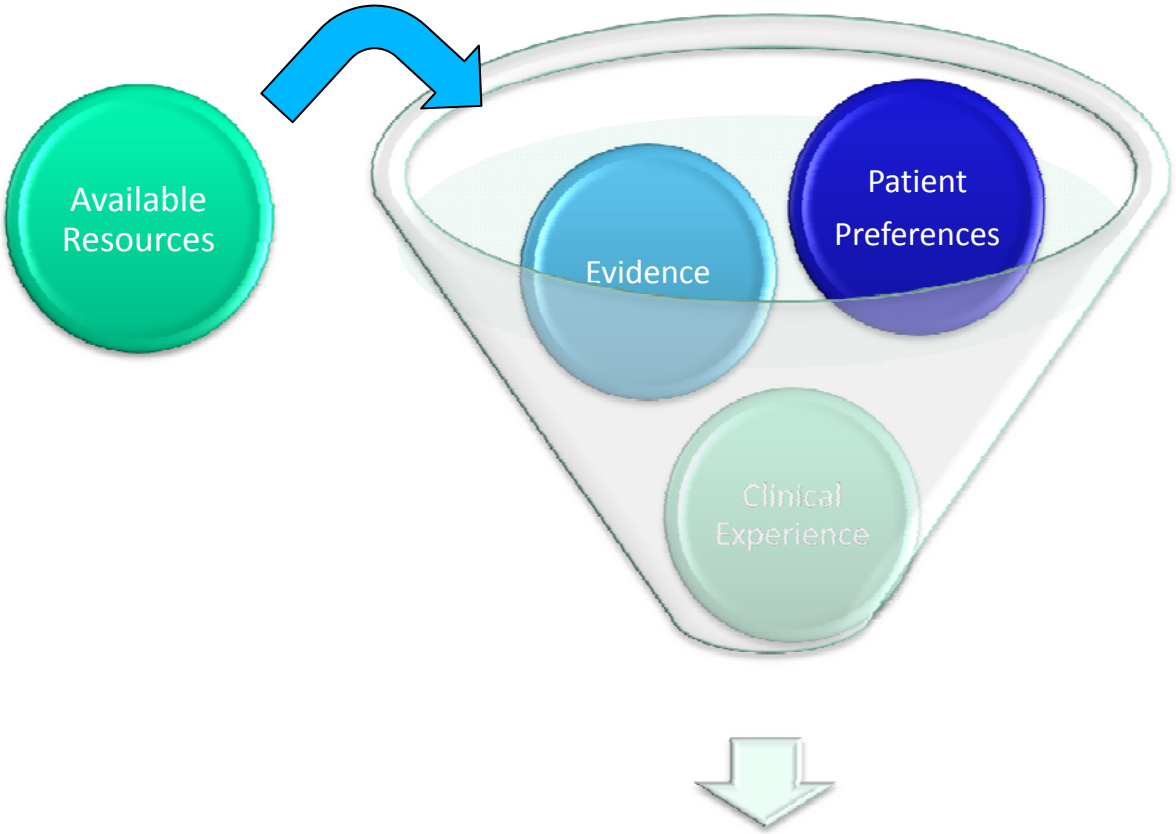
Summary of Evidence

There is universal evidence that external aids can help people with memory problems BUT…

- What variables impact successful use of external memory aids?
- What are the best methods for device selection & training?
- What is a typical dose and duration of treatment?
- Do patients use aids long-term? How do we monitor?

Ideal Candidate

- Awareness of memory problem/need
- Prior experience with technology
- Interested in technology
- Needs & Abilities can be matched
- Support



Evidence Based Decision-Making

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Patient/Family Centered Care

Focus on the patient's (and caregiver's):

- Priorities – functional needs
- Perspectives – perception of need
- Preferences – type of external aid
- Previous experiences
- Participation in selection/design

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App Selection

- Needs assessment
- Identify patient's strengths/weaknesses (team approach)
- Match features to needs & abilities
- Identify potential aids & strategies
- Include the patient in the choice

Patient Abilities

- Education & Work History
- Cognitive
- Communication
- Physical
- Sensory
- Emotional & Behavioral
- Support

Functions

- Recall facts
- Remember to do future things
- Remember something that already happened
- Remember instructions or steps
- Route finding or locate if lost

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Know available products

You will know your options best if you:

- Know which device/platform your patient has or plans to purchase
- Stay current on what apps may help memory
- Are familiar with the accessibility features & apps that come built-in on mobile devices
- Keep track of the features of useful apps

How to find apps for memory

App Marketplaces for Major Operating Systems

- App Store in iTunes
- Google Play (formerly, Google Marketplace)
- Windows Store
- Blackberry App World

How to find apps for memory

Other sources*:*

- Yahoo Apps
- Google Search
- ASHA SIG 2 or 12
- Blogs & Listservs
- You Tube

App Features

- Input:
  - keyboard, voice/ speech to text, drop box, scroll/wheels, written, picture, finger or stylus
  - ability to review, modify, delete and check off info
  - word prediction
- Output:
  - picture, words, voice/ text to speech
- Amplification or Magnification

App Features (cont.)

- Cloud Synchronization
- Alarms
  - vibrating/visual/auditory alarms /voice
  - simultaneous message display
  - regular intervals repeating daily, weekly, monthly
  - snooze/nag
- Push Notifications
  - preferences set by user, for automatic information delivery

Keeping Track of Apps: App Matrix

			INPUTS				OUTPUTS				ALARMS/REMINDERS								MAINTENANCE			
App	Cost	Description/Function	Text Input	Dials/Drop Down Input	Voice/Speech to Text	Video or Picture Input	Text Output	Voice Output	Voice or Voice Playback	Image or video output	Customized audio alarms	Vibrating alarm	Visual alarm	Nag/Snooze, Multiple Alerts	Email reminders/alerts	Text Reminders	Push Notifications	Alert to multiple devices	Repeating programming	Simple programming	Sync to computer	Sync to cloud (backup)
NATIVE iOS FUNCTIONS																						
Native iOS - Notes	Free	Simple notetaker; cannot check-off items; no alerts; VoiceOver output	•		•		•	•	•											•		
Calendar	Free	Day, week, month & yearly planner with audio and visual alerts	•	•			•					•	•			•	•		•			
NOTETAKERS, LISTMAKERS																						
Evernote	Free	Notetaker - notes, photos, to-do lists, voice reminders - all searchable	•		•	•	•	•	•	•				•				•		•	•	•
PicList	$1.99	Easy to use list creator/manager, with easy attachment of photos	•	•	•	•	•			•	•		•							•		
MEDICATION REMINDERS																						
Pillboxie	Free	Easy medication manager. Intuitive. Easy to set times, snooze, nag.	•	•		•	•							•								
Pill Time	$0.99	Tracks medication & sends reminders	•	•							•			•	•		•		•	•		
LOCATION/WAY FINDERS																						
Family Tracker (Lite)	Free		•				•										•					
Around Me	Free																					
EMERGENCY COMMUNICATIONS AND SUPPORT																						
Unus Tactus	Free	Simple directory for 1-touch emergency contact	•																			

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Training

- Train awareness
- Systematically train procedures using evidence-based methods
- Develop a routine for use
- Plan for generalization
- Plan for adaptation/ future needs
- Train caregivers

Training Methods

Evidence supports:

- Systematic Instruction
- Errorless Learning
- Spaced Retrieval
- High rate of practice
- Distributed practice
- Metacognitive skills

EB Training (Svoboda et al., 2012)

Baycrest Neuropsychology & Cognitive Health Program

- Use of Smartphones & PDAs by people with moderate to severe memory impairment (calendar app)
- Trained using errorless learning + fading of cues
- All 10 participants acquired skills needed to independently use the technology to support their everyday memory functioning

EB Method for Training

Systematic Instruction + Strategy Based Training = TEACH-M (Ehlhardt et al., 2005)

T = Task Analysis

E = Errorless Learning

A = Assess

C = Cumulative Review

H = High rates of correct practice trials

M = Metacognitive strategy training

Develop a Routine

- Include the patient and caregivers
- Identify a location
- Plan for device maintenance/prevent loss
- Identify a planning or maintenance time
- Develop a plan for reviewing or accessing the information
- Develop support cues

Plan for Generalization

- Role play
- Trial in multiple environments
- Trial in functional environment
- Train caregivers
- Get feedback from patient & caregivers

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Monitor & Assess Impact

- Get feedback about success
- When possible, track whether they continue to use it (maintenance)
- Evaluate your practice decision – was it effective, is the patient happy, what did you learn?

Memory Tools and Apps

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iOS Tools and Preloaded Apps

- Clock
- Calendar/Schedule
- Address book
- Notes/Reminders
- Camera/picture viewing/video
- Global Positioning System (GPS)
- Find My iPhone
- Siri

Downloaded Apps - Demo

Notes and lists

- Evernote
- PicList

Calendar

- VoCal

Medication Reminders

- Pillboxie

GPS/Location Finding

- AroundMe
- Google Latitude

Case Presentations

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Case Presentations

3 people share the following characteristics:

- young
- had iPhone
- memory problem following BI
- interest in technology
- interest in being more independent
- interest in remembering things to do

Used different apps depending on their:

- needs
- abilities
- preferences

Case Presentation #1

- 20 year old
- Student at the University of Florida
- 2.5 months post TBI secondary to scooter accident
- Self reported goals:
  1. Improve Memory
  2. Return to School

Alarm: Note-taking

- Goal 1: Take session notes during therapy to recall information and communicate to caregivers
- Used alarm reminders on cell phone to cue him to take notes – repeat alarm with text reminder message
- Chosen because of simplicity and previous experience using alarm function
- Trained to hit snooze until completed w/ errorless learning & spaced retrieval
- 1 session + caregiver training

Alarm: Look at daily schedule

- Goal 2: Remember to look at daily schedule (in day planner) hourly to do planned items as well as once weekly to do the planning
- Transitioned alarm reminder from taking notes to reminding to look at his day planner to remember what he planned to do each hour of the day
- Snooze until completed skills transferred
- Systematic Instruction using errorless learning in 4 sessions with caregiver included in training during final session

Case Presentation #2

- 24 year old
- Financial Analyst
- 6 months post TBI & SCI secondary to motorcycle accident
- Self reported goals:
  - Increase independence
  - Return to work
  - Reduce boredom

Pocket Informant

- Goal: Increase recall of planned daily events including recurring events such as taking medicine and performing weight shifts
- Systematic Instruction for learning a routine to set a schedule each week in Google Calendar
  - Routine included written instructions & activity banks for home tasks, therapy exercises and leisure tasks
- 6 sessions including one session with primary caregiver

Case Presentation #3

- 19 year old
- Nanny & Nursing Student
- 4 months post TBI secondary to MVA
- Significant visual deficits
- Self reported goals:
  - Increase independence
  - Use phone to help memory

Voice Over

- Goal 1: Use external aid for orientation to time
- Voice Over in the Accessibility features of iPhone allows you to touch the screen to hear a description of the item under your finger
- Double-tap, drag or flick to control
- 1 session

VoCal

- Goal 2: Remember to do things at certain times including follow through with structured schedule
- Systematic Instruction for learning a routine to set a schedule each day and complete items from a to do list.
- Provided with written instructions & activity banks for home tasks, therapy exercises & leisure tasks
- 4 sessions

Future Exploration

We plan to…

- Use goal attainment scaling to measure patient's progress & improved functioning
- Track number of sessions and prompts/supports required to recall procedures for using aids
- Measure success based on goal attainment scaling and quality of life indicators

Questions?

Contact Us

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