Aphasia & AAC – Increasing Functional Communication

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Overview

• History of AAC in Aphasia
• Previous Research
• Study Design
• Study Methods
• Study Results
• Clinical Implications
• Practical Implementation
• Hands-On Practice
• Interdisciplinary Considerations
• Case Studies
• Future Research
Historical Use of AAC in Aphasia Populations

- Difficult to assess due to the rapidly changing nature of technology use in this area
- Timeline:
  - 1969: Prentke-Romich produces first communication device
  - 1980s: Initial use of AAC: basic communication boards
  - 1981: Medicare begins covering speech generating devices (SGDs)
  - 1982: Prentke-Romich develops first device with synthesized speech
  - 1983: Students at Carnegie-Mellon University develop EyeTyper
  - 1993:
    - GoTalk first launched with stand alone devices
    - DynaVox develops the DigiVox, combining recorded speech with changeable paper overlays
Timeline Continued

– 2000:
  • Assistive Ware develops KeyStrokes (virtual keyboard)
  • Prentke-Romich develops touch screen device
– 2001: Medicare begins covering AAC devices
– 2006: BlinkTwice develops hand-held Tango SGD
– 2008-2009: Eye gaze systems developed (ECOPoint, EyeMax)
– 2010:
  • First generation iPad
  • First version of ProLoQuo2Go app
– 2011: First version of GoTalk app
– 2015:
  • National Coverage Determination (NCD) issued by Medicare
  • Steve Gleason Act signed into law
Research: Positive Factors for AAC Use

- General increase in amount of research since early 2000s
- Generally positive impact in most studies
- Portability and touch screens
- Improved modalities
- Active role of communication partners
Research: Negative Factors for AAC Use

• Negligible difference low tech vs. high tech
• General paucity of data
• Lack of carry-over
• Participant frustrations
• Perception of AAC
Research: Other Considerations

- Employment factors
- Crime and abuse
- Access
- Chronic nature of aphasia
- Nursing considerations:
  - Known factors
  - Time factors
  - Clinical implications
Study Design, Recruiting and Screening, Inclusion/Exclusion Criteria

• Recruiting
  – Flyers posted in the community
  – SLP Referrals of current and previous clients with aphasia

• Telephone Screening
  – Determine whether participant met inclusion/exclusion criteria
  – Inclusion
    • At least three months post onset of aphasia
    • At least one functional communication impairment resulting from aphasia
      – Communicate vital personal information? (name, address, condition)
      – Ask for things he/she wants or needs?
      – Understand and follow directions?
      – Make comments and describe things?
      – Inform caregivers of pain and other medical needs?
      – Participate in social interactions?
Study Exclusion Criteria

– Exclusion
  • Degenerative diagnosis such as dementia
  • Motor impairments that preclude use of a touch screen
– Additional information for evaluation preparation
Pre-Testing

- **Outcome Measures**
  - Pre- and post-testing with the WAB Part 1
  - Communication satisfaction questionnaire
  - Communication success questionnaire
  - Session tracking log
Study Methods

• Final demographics
  – 16 participants
  – Age range from 30 to mid-80s
  – Time since diagnosis ranged from 12 months to >8 years

• Therapy/Intervention
  – 6 free one-hour treatment sessions with an SLP
  – iPad lending library; provision of free AAC application
  – Each participant’s needs were targeted with individual curriculum
  – Participants and primary communication partners trained in the use of the iPad program
  – Home program provided each session
Study Results

**Western Aphasia Battery (WAB)**

- **Total**
  - All categories of the WAB had a positive mean difference
  - Increase in spontaneous speech statistically significant (Paired T-test; p=0.0330)

- **Subgroup analysis**
  - Omitting global aphasia: Statistically significant increase in both spontaneous speech and total WAB score (Paired T-test; p=0.0361, p=0.0494)
  - Individuals with Broca’s aphasia demonstrated the greatest effect size for spontaneous speech improvement (Paired T-test; p=0.0093)
  - Global aphasia: No statistically significant increases for WAB; anecdotally noted that functional communication still improved
Study Results Cont.

**Questionnaires**

- Communication Satisfaction
  - Total score (Paired T-Test; p=0.0352)
  - Communicating needs to a physician (Paired T-Test; p=0.0234)

- Communication Success
  - Total score (Paired T-Test; p=0.0332)
  - Communication of medical information (Paired T-Test; p=0.0059)
Clinical Implications

• Overall, subjective improvements with AAC devices noted throughout study. Facilitated speech for patients with aphasia as seen in WAB scoring during before and after scoring.
• Improved Functional Communication
  – Doctor-patient interaction
  – Routine outings
  – Home environment
  – Meeting daily needs
• Facilitates acquisition of speech
  – Patients with Broca’s aphasia demonstrated significant improvements in spontaneous speech
  – All other types of aphasia demonstrated changes in facilitation of word finding and naming.
Clinical Implications Cont.

- Effective for non-verbal global aphasia patients
  - Facilitated functional messages through multi-modal domains such as visual cuing, auditory reinforcement, and tactile repetition
  - Increased patient participation in everyday conversations
- Integration of video models with AAC
  - Provided visual feedback for verbalization of words/phrases
- Potential for continued benefits for patients with aphasia 5 years post
- Improvement of general skills for use of electronic devices
- Increased potential for use of AAC device in acute care setting.
Practical Implementation Across Settings

• General use of AAC in Inpatient Settings
• Low-tech communication boards in hospital settings
  – Easily accessible and easily made
  – Difficulties with candidacy and education
• Acute Hospital
  – Probably not the ideal setting to introduce AAC
Practical Implementation Across Settings

- Acute Rehab
- Positive factors:
  - Longer length of stay
  - Increased potential for interaction with MDs/ nurses
  - Increased potential for family interaction in therapy sessions
  - If set up correctly could be an economy of scale
- Negative factors:
  - Needs a clinical pathway that at this time does not really exist
  - Requires greater training of nursing staff
  - Cannot leave hospital issued iPad with patient
  - Need a library of iPads for use by staff
Practical implementation Across Settings

• Post-acute Rehab
  – Generalization possible with associated factors:
    • Greater potential with longer length of stay
    • More opportunities for community outings
• Outpatient/ Home Health
  – Chronic lack of in home speech services
  – At this point, patients/ clients would need their own device
  – Insurance may not cover it
Hands On!

- Divide into 3 groups
- Each group will rotate through all stations – everybody will get a chance to try every application

Ellen: Dynavox & Sonoflex
Stefan: GoTalk
Camila: ProLoQuo2Go
Choosing a Device

- Practical Advice
  - Budget
  - Complexity
  - Choosing an established application
Interdisciplinary Consideration

- There are several considerations to have when integrating AAC devices/programs:
  - Hemiplegia
    - Point of access
    - ROM for upper extremities
    - Considerations for neglect
  - Motor skills (fine/gross)
    - Direct selection: Fine motor ability to extend/isolate a finger to interact with a touch screen device
    - Indirect selection: Stylus, switch input, etc.
  - Age
    - Coincides with level of success rate
    - Considerations re: medical stability
    - Considerations for differing needs within age ranges
Interdisciplinary Considerations Cont.

• Technical knowledge use
  – Level of integration and participation with device in everyday use.
  – Learning gap and increased time investment needed for those with less technological experience.

• Cognitive compromises
  – Static display
  – Dynamic display

• Communication partner integration level
  – Ease of setup

• Language compromises
  – Visual/written stimulus points
Case Study 1: Broca’s Aphasia

- Over 5 years post-onset
- Former computer engineer
- Learned to program application independently
- Increased verbal communication from single words and short phrases to sentences and familiar conversation topics
- Decreased frustration significantly
- Able to self-cue using AAC when having difficulty word-finding
Case Study 2: Global Aphasia

- Stereotypic utterance only
- Over 2 years post-onset
- Not interested in targeting “wants and needs”
- Brought in family photos and photos of past work experiences
- Used “hotspots” to tell stories about family, work, etc.
- Increased participation in conversation, decreased frustration
- Also able to communicate medical history independently
Case Study: Apraxia of Speech

- Severe apraxia of speech in addition to aphasia – no intelligible verbalizations
- 2 years post-onset
- Recorded videos of mouth saying functional words and phrases (e.g. children’s names, I need help, etc.)
- Pt able to watch video and listen with headphones, then repeat phrases verbally with at least 75% intelligibility
- Ultimately returned to regular therapy to use a combination of MIT and video imitation practice to increase verbal communication significantly
- Able to relay entire medical history and medication routine to new caregiver
Future Research

During this study we were able to determine the need for further studies in:

• Point of access
• Multi-disciplinary integration (PT and OT)
• Means to determine the best and fastest ways for providing AAC services to people with complex communication needs
• Programs for increasing public awareness
• Longitudinal studies of consistency and improvement of daily AAC use
• Effectiveness of AAC interventions by studying users of a variety of ages
• Application of AAC in a wider range of environments and situations
References:

References:

Questions?
THANK YOU!

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