AAC Intervention for People with Aphasia

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WVSHA 2018

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Disclosures

- WVSHA
  - I am being paid as an invited speaker to give this presentation; however, the views expressed are mine.

- Mine
  - Some of the information is related to multiple studies for which I am an author; some are published and others are in progress.

AAC and Aphasia

- Why AAC?
- AAC Strategies
- Aphasia AAC Assessment
- Designing Interfaces
- Multimodal Communication Program for Aphasia

What is AAC?

- Strategies, techniques, or devices intended to supplement or replace, either permanently or temporarily, insufficient or ineffective communication skills.

- Supports production as well as comprehension skills

- A combination of strategies and techniques to minimize barriers to communication
Frameworks

- Living with Aphasia: Framework for Outcome Measurement (A-FROM)
- CAPE Roberta Elman
  - C – connecting people with aphasia
  - A – augmentative and alternative communication
  - P – partner training
  - E – education and community resources

Compensation for Expression

- Spoken Expression
  - Gestures
  - Writing
  - Drawing
  - Written Choice Strategy
  - Communication Notebooks
  - Speech Generating Devices
- Written Expression

Gestures

- Must directly teach how & when to use them
  - Visual action therapy (Helm-Estabrooks, 2004)
  - Drill and practice
  - Imitation
  - Practice in real-life or simulated situations

- Review of Gesture in Aphasia Treatment
  - 18 studies used gesture compensation
    - All report positive outcomes following intervention
    - Variable designs (often not experimental) (Rose, 2006)

Writing

- Instructional Programs
  - Anagram and Copy Treatment (ACT)
    - Spelling by arrangement of component letters
    - Copying target words
  - Copy and Recall Treatment (CART)
    - Repeated copying of target words in the presence of pictured stimuli, followed by recall trials in the form of written picture naming
    - Weekly treatment and daily homework (Beeson, Rising, & Volk, 2003; Clausen & Beeson, 2003)
**Drawing**

- Copying
- Tracing
- Matching
- Listening to instructions
- Items, actions, scenes or cartoon strips
- Limited reports of carryover to everyday activities


**Written Choice**

- Partner-dependent
  - Benefit from redundancy in multiple modalities

  "Where do you live? Pennsylvania, Michigan, Nebraska, or somewhere else?"

- Live?
  - Pennsylvania
  - Michigan
  - Nebraska
  - Somewhere else

(Garrett & Beukelman, 1993; Garrett, 1993; LaRue, Hux, Garrett, McManus, & Eschfeld, 1997)

**Communication Notebooks**

- Purpose:
  - Convey basic wants and needs
  - Information sharing
  - Establish social closeness

- Remember:
  - Instructions to communication partners
  - Set up plan for updates
  - Not just basic needs or medical issues
  - Life experiences and personal narratives

(Fried-Oles, Daniels, Ettinger, Murray, Nance, & Thailand, 2006; Fried-Oles, Daniels, Ettinger, Murray, Nance, & Thailand, 2006)

**Speech Generating Devices (SGDs)**

- Mostly case reports & single-participant designs

(e.g., Abranovitz, Steele, & Wertz, 1997; Hough & Johnson, 2000; Johnson, Hough, Van, & Jaffe, 2000; Kau, Corvin, & Oyer, 2006; LaRue, LaFleur, & Kue, 2006; McCull, Stedmon, Weinhofer, & Coo, 2000; McKee, Evans, Hux, Weissling, & Beukelman, 2007; Lineberger, Romano, Park, Bartek, & Schwartz, 2008; Nicholas, Sinjerto, & Helm-Estabrooks, 2011; van de Sande, Keesker, Wingert, & Hardy, 2005; Wether, Evans, Brooks, & Carson, 1998)

(Fried-Oles, Daniels, Ettinger, Murray, Nance, & Thailand, 2006; Fried-Oles, Daniels, Ettinger, Murray, Nance, & Thailand, 2006)
Speech Generating Devices (SGDs)

- Successful use is influenced by:
  - Impairments in executive functions, semantic knowledge, and syntactic skills
  - Facilitator support
  - Instruction provided
  - Interface features
    - Personalization
    - Contextually relevant text

(n.e., Nicholas, Sinnot, & Helm-Estabrooks, 2011).

Speech Generating Devices (SGDs)

- Static displays might be most appropriate for:
  - Someone who has difficulty navigating a dynamic display
  - Acute care or early teaching of AAC strategies
  - Specific communication situations

Speech Generating Devices (SGDs)

- Dynamic display might be appropriate for:
  - Fairly independent communicators
  - People familiar with computerized devices

Written Expression

- Speech-to-text technology

- Word prediction software
  - Choices following 1st letter selection
  - Reduces number of key strokes

(Armstrong & MacDonald, 2000; Murray & Karcher, 2000; Ball, et al., 2009; Bruce et al., 2003; Dietz, Ball, & Griffith, 2011)
Compensation for Comprehension

- **Auditory & Reading Comprehension**

Auditory Comprehension
- Augmented Input (AI)
  - Strategies designed to supplement spoken speech & support auditory comprehension
  - Written keywords, visuographic images, or the use of prosodic emphasis or gestures
  - In combination with spoken utterances

Reading Comprehension
- People with aphasia often experience residual reading comprehension deficits
  - (Brennan, Worrall, & McKenna, 2005; Dietz, Ball, & C-W, 2011; Par; 1995, 2007; Rose, Worrall, Hux, & Hickson, 2011)

Aphasia Friendly Techniques
- Abundant white space
- Large and standard fonts (18pt)
- Simplified syntax and vocabulary
- Relevant pictures

- Rose et al., 2003; Dietz, Krol, Hux, & Brown, 2012; Dietz, McKelvey, Hux, Beukelman, & Weissling, 2009; Howe, Hux, & Hickson, 2004; Rose, Worrall, & McKenna, 2003
Text-to-Speech Applications

- Emerging research
  - People with TBI:
    - Increased reading rates and maintained comprehension
    - Preferred text-to-speech condition
  - Person with mild aphasia increased reading rate and maintained comprehension

(From Harvey, Hux, & Snell, 2013; Harvey, & Hux, Scott, & Snell, 2013)

- Zoom Reader
- Text Speaker
- Verbose Text to Speech
- Speech Text to Speech Reader
- NaturalReader
- Speech
- ZoomReader
- Macintosh platforms (e.g., Alex)
- Windows platforms (e.g., David)
- Kindle
- Noah
- Read and Write Software
- KNPB Reader

Text-to-Speech Applications

- Emerging research
  - Some people with aphasia understand some synthetic speech almost as well as digitized speech.
  - Some people with chronic aphasia perform best when reading and listening to synthetic speech as compared to reading or listening only.

Mobile Technology

- Types of AAC apps available
  - Single words or phrases that are topic specific
    - Lingraphica (some help with practice for apraxia)
  - Traditional Multi-level Grid Systems
    - Sounding board (Ablenet)
    - Proloquo2Go
  - Traditional apps used for AAC
    - Texting 1st letter, photographs, maps, weather, clock, calendar

A-FROM

- Severity of aphasia
- Tools
- Western Aphasia Battery-Revised
- Boston Diagnostic Aphasia Examination-3
- Boston Assessment of Severe Aphasia
- Communication Activities of Daily Living-2
### Communication and Language Environment

- Services, systems, and policies
- Attitudes of others to aphasia
- Communication supports
- Aphasia-friendly adaptations

#### Tools
- Craig Hospital Inventory of Environmental Factors – Short Form
- Interview (communication partners)
- Needs Assessment

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### Participation in Life situations

- Activities
- Roles and responsibilities
- Relationships
- Communication and conversation involvement

#### Tools
- Interview (self-report)
- Functional Assessment Communication Skills for Adults (ASHA FACS)
- LIV Cards

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### Personal identity, Attitudes, and Feelings

- Self-perception
- Feelings and emotions
- Perception of aphasia and living with aphasia

#### Tools
- Burden of Stroke Scale
- Comprehensive Aphasia Test: Disability Questionnaire

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### Addition: Cognition

- Cognitive Linguistic Quick Test (CLQT)
- Trail Test
- Design Memory
- Test of Everyday Attention – Map Search
Addition: Multi-modal Communication Screening Task for Persons with Aphasia

- Assesses communication with an external system: search pictures, categorize, combine symbols, combine communication modalities, and use symbols for story telling or to convey a message.

(http://aac.unl.edu/screen/screen.html)

Participation Model of AAC

- Operational competence – volume control, navigate among pages, create page sets
- Social competence – greeting, use etiquette, provide analysis
- Linguistic competence – combine words, use word prediction, grammatically correct
- Strategic competence – correct error, use humor, conduct interview

Based on research of Janice Light and DynaVox Dynamic AAC Goal Grid by Dynamic Therapy Associates, Norcross, GA

Visual Scene Displays

- Elements:
  - Episodic organization
  - Color
  - Full text in boxes
  - Contextual photographs
  - Speech buttons (high tech)
  - Navigation Ring (high tech)

High-Context Photographs

- Represent situations, places, or experiences
- Convey the “gist” of a situation or event
- Provide support for conversational exchanges

4 criteria:
1. Environmental context
2. Interaction
3. Personal relevancy
4. Clarity
High-Context Photographs

- Many Uses
  - Therapy stimuli — naming, pictures descriptions, Sentence Production Program for Aphasia
  - Communication notebooks
  - High technology AAC systems

- Show many examples prior to collection of photos

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Multimodal Communication Program

- People with moderate to severe aphasia learn to use alternative modalities in structured settings
  - BUT generalization is LIMITED!

- Traditional interventions teach a single modality for a single word/concept
  - People do not switch to other strategies
  - May relate to executive function impairments

(Purdy, 2011; Nathalia, Sinotte, & Helm-Estabrooks, 2011; Purdy, Duffy, & Coelho, 1994; Yoshihata et al., 1998)

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Multimodal Communication Program

- Teach multiple communication strategies for a single concept in an integrated manner
  - Linking the alternative modalities to the linguistic system
  - Facilitating switching automaticity

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Multimodal Communication Program

- Clinician: “How do you communicate this? Show me all the ways”
  - While holding up picture of target concept
- Clinician: Model each noun using all modalities
- Person with Aphasia: Imitate
- Clinician: Feedback
  - Direct: oral directions & hand-over-hand assistance
  - Cueing gradually fades
- Clinician: reviews & models each modality

- BEGIN NEXT TARGET WORD
AAC and Aphasia Summary

- Consider a system of AAC strategies to meet participation goals.
- Use guiding framework for assessment
- When it comes to strategy use – how we teach it may make all the difference.
  - Consider methods to promote and measure generalization.