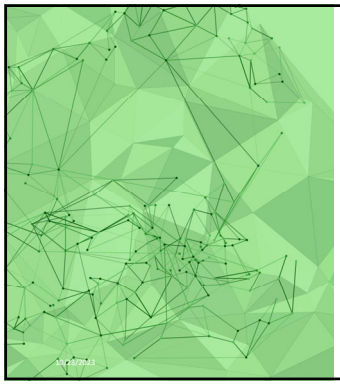


From Theory to Practice: Advancing AAC Assessment and Intervention for Adult Populations

2023 MSLHA Conference
Kay Chen, Ph.D., CCC-SLP
Department of Communication Sciences and Disorders
University of New Hampshire
10/27/2023

1

ASHA Presenter Disclosure

University of New Hampshire

- Financial: The speaker receives an honorarium from MSLHA for this presentation. She is an employee of UNH and receives a salary.
- Non-Financial: The presenter is an ASHA and ASHA sig. 12: AAC member
- *No financial or non-financial benefits from any AAC manufacturers. All information and examples in this presentation are solely for the purpose of instruction.*

2

Learner Outcomes

01 Describe the steps of AAC assessment

02 Describe three components of the match-person technology model

03 Apply AAC assessment and intervention guidelines in case studies

3

AAC is an area

- For individuals with notable disabilities impacting speech-language generation and comprehension.
- Emphasizes
  - Research
  - Clinical & educational practice
- Part of assistive technology.
- Aims to supplement or compensate, either temporarily or permanently.

(ASHA, nd; Beukelman & Mirenda, 2013; Elsahar et al., 2019)

4

The Goal of AAC

(Hill et al, 2007)

5

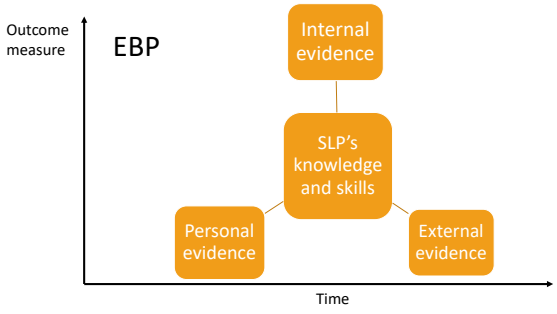
AAC myths and realities

	Myths
1	AAC is a “last resort”
2	AAC hinders or stops further recovery
3	People must have a certain set of skills
4	High-technology AAC is for people with intact cognition

6

AAC Assessment Principles

7



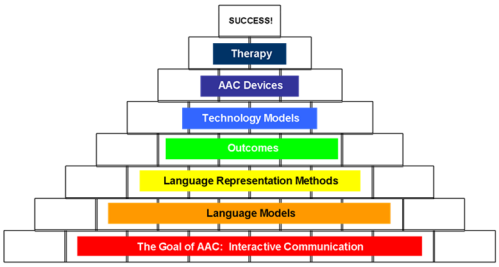
8

Assess First, Tech Later: Your roadmap to successful AAC communication.

9

Make AAC evaluation a part of your daily activities

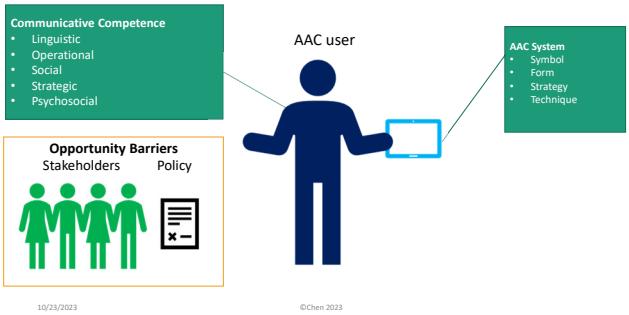
10



AAC Language Based Assessment and Intervention Model (*Hill, 1998)*

https://aacinstitute.org/wp-content/uploads/2014/12/Achieving-Success-In-AAC.pdf

11



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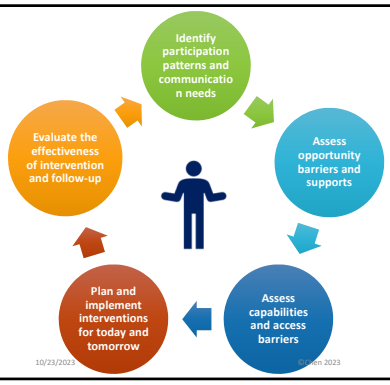


Basic components of the participation model

(Beukelman & Light, 2020)

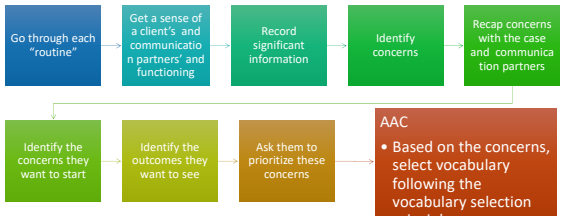
13

Principle 1 : Identify participation patterns and communication needs

- A client's life activities
- communication needs of those life activities
- Tools/strategies
  - Interview
    - E.g., Routine-based Interview (McWilliam, 2005)
  - Survey or checklist or tools
  - Create a participation inventories: who, what, where, when, how

14

Routine-based interview



15

Social Network

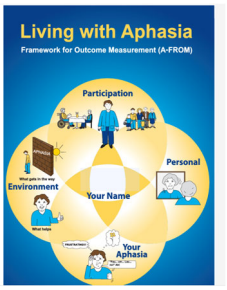
Blackstore & Berg (2012)

https://www.attainmentcompany.com/social-networks-package

16

Kagan et al (2008)

Figure 3. Living with Aphasia: Framework for Outcome Measurement (A-FROM). Reprinted with the permission of The Aphasia Institute.



https://www.aphasia.ca/shop/personal-a-from/?attribute_pa_format=digital-version

17

AAC specific assessment tools

- AAC Profile: A Continuum of Learning (Kovach, 2009)
- Checklist of Communication Competencies, Revised (Bloomberg, West, Johnson, & Iacono, 2009)
- Functional Communication Profile, Revised (Kleiman, 2003)
- Social Networks: A Communication Inventory for Individuals with Complex Communication Needs and Their Partners (Blackstone & Hunt Berg, 2012)
- The Test of Aided-Communication Symbol Performance (TASP; Bruno, 2010)

18

Principle 2: Assess opportunity barriers and supports

Policy | Practice | Attitude | Knowledge | Skill

19

Principle 3: Assess capabilities and access barriers (current communication)

Potential to increase natural ability

Potential for environmental adaptations

Potential to utilize AAC systems

20

A client's communicative competence

A client

Linguistic
knowledge and ability of using language(s) and linguistic symbols on an AAC system

Operational
Skills to operate AAC systems

Strategic
Skills to use accessible features of AAC systems

Social
Skills to use appropriate manners to communicate

Psychosocial
Abilities to manage psychosocial demands and challenges

(Bean et al 2023; Light et al., 2003; Light & McNaughton, 2014)

21

Communication outcomes measures in AAC studies

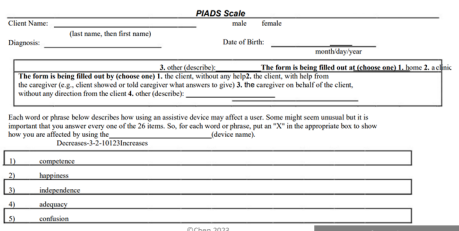
Linguistic	Operational	Strategic	Social	Psychosocial
62%	14%	4%	75%	18%

(Bean et al 2023)

22

Assessment tools for psychosocial competence

Psychosocial Impact of Assistive Devices Scale



PIADS Scale

Client Name: _____ male female
(last name, then first name)

Diagnosis: _____ Date of Birth: _____
month/day/year

The form is being filled out by (choose one) 1. the client, without any help **2.** the client, with help from the caregiver (e.g., client showed or told caregiver what answers to give) **3.** the caregiver on behalf of the client, without any direction from the client **4.** other (describe): _____

3. other (describe): _____ **The form is being filled out at (choose one) 1.** home **2.** a clinic

Each word or phrase below describes how using an assistive device may affect a user. Some might seem unusual but it is important that you answer every one of the 26 items. So, for each word or phrase, put an "X" in the appropriate box to show how you are affected by using the _____(device name).

Decreases-3-2-1012Increases

1) competence
2) happiness
3) independence
4) adequacy
5) confusion

Microsoft Word - PIADS_MANUAL__03b_[2].rtf

23

Case #1 Adult with Down's syndrome

- Tom, an 18-year-old with Down's syndrome, currently works at a local Goodwill store. While his enthusiasm is good, he faces speech intelligibility challenges that hinder clear communication in daily activities. Tom and his family approached a Speech-Language Pathologist (SLP) for a solution. This initiative aims to empower Tom, boosting his confidence and ensuring he engages effectively with colleagues and customers at work.

24

Principle 4: Plan and implement interventions for today and tomorrow

- Natural-Ability Interventions
  - Improve/develop vs maintain
- Environmental Adaptation Interventions
  - Space and location
  - Physical structure

(Beukelman & Light, 2020)

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Principle 4: Plan and implement interventions for today and tomorrow

- AAC intervention
  - Specific AAC strategies and techniques
  - The system for **today**
    - Accurate, efficient, and not fatiguing
    - Meet the immediate needs
    - Require minimum of training and practice
  - The system for **tomorrow**
    - Expansion or extension of the system
  - Training
    - AAC users
    - Communication partners

(Beukelman & Light, 2020)

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Select AAC systems- General Components

FORMS SYMBOLS STRATEGIES TECHNIQUES

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AAC Matching Person Technology (MPT) Model

Primary Components		
Language representation methods (LRM) • Single meaning pictures • Alphabet-based • Semantic compaction (SEM)	**Vocabulary** • Core • Extended (Fringe)	**Methods of Utterance Generation** • Spontaneous Novel Utterance Generation (SNUG) • Pre-stored sentences
Secondary Components		

User interface
• Symbols
  ○ Aided symbols
  ○ Graphics/pictures
  ○ Letters/words
  ○ Colored symbols
• Display
  ○ Size of symbols
  ○ Layout
• Automaticity- is there a motor plan to be learned?
• Human Factors
	Control interface- selection methods
	• Direct selection
	  ○ Keyboard
	  ○ Touchscreen
	  ○ Head pointing
	  ○ Eye Gaze
	  ○ Physiological (EMG, BCI, etc.)
	• Indirect selection
	  ○ Scanning
	  ○ Switch
	  ○ Partner-dependent
	• Physiological (EMG, BCI, etc.)
		Outputs
		• Speech
		  ○ Synthesized
		  ○ Digitized (Recorded)
		• Output displays (e.g., written words or symbols)
		• Electronic/infrared/ radio frequency (Bluetooth)*
		• Data logging

Tertiary Components		
Peripheral and integrated features • Mounting • Switches • Case • Electronic/infrared/ radio frequency to connect device to another non-speech related device*	**Manufacturer/Vendor Resources** • Caregiver training • Stakeholder training • Resources • Warranties Cost/funding support	**Clinical Service Delivery** • Trained & experienced AAC professionals • Evaluation & Treatment • Telerehabilitation capabilities

*Infrared/Bluetooth can be used both for speech related (secondary- output) and non-speech related purposes (tertiary- peripheral features), i.e., using Bluetooth to send a text from the speech device to a cell phone vs. connecting the device to a power wheelchair via Bluetooth.

 Adapted from (Hill, 2010; Hill & Corsi,2012) by Chen (2023)

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General rules of vocabulary selection

- Core vocabulary
  - refers to the approximately 200 words that make up 80% of an individual's spoken language
- Fringe (Extended) vocabulary refers to context-specific vocabulary and messages that are highly individualized (e.g., Trembath et al., 2007)
- Individualized vocabulary
- Variables to consider
  - Spoken vs Written
  - Age
  - Gender

29

Universal Core word 36 (Project Core, nd)

An Alphabetical List of The Universal Core Vocabulary

Website: http://www.project-core.com/communication-systems/

all	in	some
can	it	stop
different	like	that
do	look	turn
finished	make	up
get	more	want
go	not	what
good	on	when
he	open	where
help	put	who
here	same	why
I	she	you

30

Top 20 core words for adults

1	2	3	4	5	6	7	8	9	10
be	**I**	**you**	**it**	**the**	**not**	**do**	**have**	**and**	**a**
11	12	13	14	15	16	17	18	19	20
that	**to**	**they**	**yeah**	**he**	**get**	**she**	**oh**	**What**	**well**

(Shin et al, 2021)

31

Vocabulary selection: Literate cases or adults

- Personal Mental Dictionary (Fried-Oken, 2000)
  - Identify a conversation topic/categories
  - Write down 20-30 words that fit into the topic
  - Suggest pictures or icons that can present those words

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AAC Language Representation Methods (LRMs)

- Attributes
  - Size of the symbol set
  - Length of symbol sequences (number of keystrokes for words)
  - Training requirements
  - Ease of use at first encounter
  - Effective long-term use

(Hill et al., 2012)

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LRM 1: Alphabet-based Systems

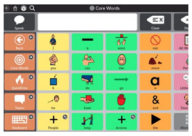
- Spelling one letter at a time
  - Simple concept
  - Requires spelling skills; slow
- Rate enhancements
  - Abbreviations or letter codes
    - Memory
    - Conflicts
  - Word Prediction
  - Orthographic Word Selection
    - Not a rate enhancement (counterintuitive)
    - Distracting

34

LRM 2: Single-meaning pictures (SMP)

- Each word requires a picture
- Easy concept to understand
- Most words are hard to present by pictures
  - Requires training (Try to use without words.)
- Organizational issues
  - (3-year-olds understand 1000 or more words, and say)

TouchTalk from Lingraphica



TD Snap Core First from Tobii Dynavox

35

Free Symbols

- http://www.arasaac.org/

36

LRM 3: Semantic Compaction or Minspeak

- **Multi-Meaning** Iconic encoding
- Originally single overlay, now more like dynamic display but still use multi-meaning icons
- Not obvious
  - Like single meaning pictures, requires training
- Patented (not universally supported)

Unity 84 sequence from PRC-Saltillo

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Adapted from (Hill, 2010; Hill & Corsi,2012) by Chen (2023)

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How many locations vs words to start with?

1	2	3	4
5	6	7	8

1					4			7
2			3			5		
							6	
								8

Dukhovny, E., & Zhou, Y. (2016)

39

Visual Scene Display

- Pictures, photographs, or virtual environments that represents an actual situation, place, or environment
- Messages are pre-stored and can be found once you select the picture/photograph

Beukelman et al., (2015)

40

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Adapted from (Hill, 2010; Hill & Corsi,2012) by Chen (2023)

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Assessment of individual from Diverse linguistic backgrounds

- Language difference
- Cultural difference
- Icon preferences that relates to clients' cultures

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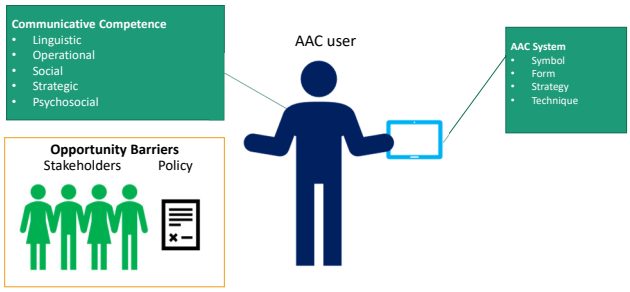
AAC intervention for bilingual aphasia

Facilitators
- User-Friendly Symbol Organization
- Personalized Words
- Ease of Programming

Barriers
- Lack of Cultural and Linguistic Competency in SLPs
- Hardware and Software Limitations
- Cultural and Language Content Gaps
- Resources Constraints

Hong et al. (2023)

43



44

AAC Intervention Principles

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ICF Model (WHO, 2001)

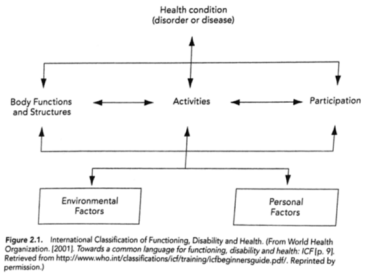

Figure 2.1. International Classification of Functioning, Disability and Health. (From World Health Organization. (2001). *Towards a common language for functioning, disability and health: ICF* [p. 9]. Retrieved from http://www.who.int/classifications/icf/training/icfbeginnersguide.pdf/. Reprinted by permission.)

46

Factors influence the acceptance of AAC systems

- The time since onset
- Acceptance of disability
- The person's attitude towards communication facilitators
- The perceptions about AAC systems

Pampoulou (2019)

47

Participatory, Person-centered design process

- Involve the individual who will be using the AAC system early in the process.
- Develop prototypes with a focus on human processes that impacts the individual to use the AAC system
- Continuously iterate and refine AAC prototypes
- Collect outcome data that is directly linked to the individual's performance, perceptions, and preferences.

(Fager et al,2019; Murray et al 2022)

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Suggested communication topics for adults (Fried-Oken et al., 2015)

1. Public events	8. Hobbies (collector)	15. Nationality	22. Passions	29. Investments
2. Media/film news (historical events)	9. Recreation games	16. Heritage	23. Family	30. Politics
3. Local life (museums, etc.)	10. Sports	17. Traditions & celebrations	24. Shopping	31. Eating/food
4. Travel	11. House & home (decorating, etc.)	18. Books	25. Social events (reunions, etc.)	32. Exercise/fitness
5. Holidays	12. Entertainment (movies, etc.)	19. Cultural events	26. Education	33. Volunteer work
6. Occupations	13. Music	20. Childhood games	27. Health	34. Getting around town
7. Fashions	14. Pets/animals	21. Spirituality/religion	28. History	35. Other

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Measures of communication needs vs Language

Communication Needs

- Environments
- Partners
- Activities and topics
- Vocabulary
- Messages
- Communication behaviors

Language

- Language use
- Measures of linguistic competence

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Aphasia

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Case #2-Adult with Aphasia

- Sarah is a 55-year-old female who experienced a stroke that resulted in aphasia two years ago. She has difficulty expressing herself and understanding others, and often struggles to find the right words. Currently, she can say one or two-word utterances to communicate with others, and she sometimes writes down keywords to facilitate her communication. She has become increasingly frustrated and isolated due to her communication difficulties, impacting her ability to participate in social activities and engage in meaningful conversations with family and friends. Her daughter also wants to improve the quality of communication between Sarah and the daughter. Sarah likes to talk about children, travel, and music with family and friends.

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Basic principles of intervention

Focus on identifying those cases who can use AAC and what type of AAC they need

Focus on overall quality of life, but not regaining skills only

People with aphasia need treatment to focus on how to use their AAC

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AAC-People with aphasia (Dietz et al 2020)

Not just for basic communication needs

Start AAC early. *Again, AAC is not the last resort*

Using AAC to Enhance natural abilities

- Improving discourse in people with aphasia (Dietz et al. 2018)
- Improving confronting naming and overall language performance (Chen et al, 2023)

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Life Participation Approach to Aphasia (LPAA)

- Start with the big picture: how is aphasia affecting this person's life?
- Consider participation-level of outcomes
- Identify factors that have the greatest influence on participation (and life with aphasia)
- Identify factors that are most amenable to change

(Simmons-Mackie et al, 2013)

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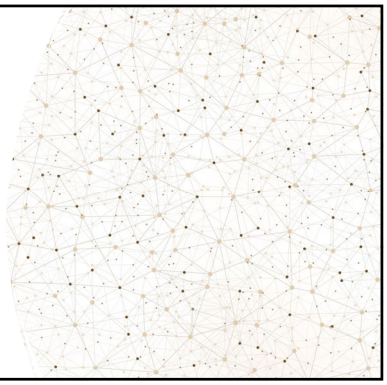
Amyotrophic Lateral Sclerosis (ALS)



10/23/2023

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Key points with assessment

- Current Speech/language functioning
- Most appropriate access method
- But need to remember that the condition is degenerative
- Changes may happen in language, cognition, and/or motor
- Need a flexible system to meet current and future needs and changes.
- **Monitor performances routinely**

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AAC intervention strategies

Early Phase	Middle Phase	Late Phase
• Monitor Speech Performance • Preserve Natural Speech Effectiveness • Educate About Augmentative and Alternative Communication	• Assess • Recommend • Implement	• Adapt and Accommodate

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Voice and Message Banking

- Voice Banking: Record an extensive inventory of your own speech to make a synthetic voice that approximates your natural voice.
  - Example: ModelTalker TTS system
- Message Banking: Digitally record and preserve words, phrases, sentences, unique sounds, or stories with your true voice and intonation.
  - http://www.mytobiidynavox.com/
  - Using Coughdrop
- Vocalid: https://www.vocalid.co/
- iPhone iOS 17

Costello (2016)

59

Low-tech AAC

https://www.childrenshospital.org/programs/als-augmentative-communication-program/protocol-assessment-considerations/quick-access-low-tech-tools

60

Degenerative Cognitive-linguistic Disorders

61

Dementia & Primary Progressive Aphasia

Dementia

- A broad term for conditions marked by a decline in memory, reasoning, and other cognitive functions.
  - Memory loss
  - Difficulty in problem-solving
  - Behavioral changes
  - Multiple causes including Alzheimer's disease, Vascular dementia, and more.

Primary Progressive Aphasia (PPA)

- A subtype of frontotemporal dementia where language abilities slowly and progressively deteriorate.
  - Struggle to find the right words
  - Grammatical errors
  - Speech sound mistakes
  - Challenges in understanding sentences

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Basic intervention strategies

- Person-centered
  - Communication needs
  - Social interaction needs
  - ADL needs
- Communication partner training
  - Hands-on training
  - Role play
  - Practice
  - Focus on
    - Recall
    - Interaction

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Early Stages (I, II) of Neurodegenerative Language Intervention Process

- Stage I: No noticeable changes in expressive language
  - Case: Education
  - Partner: Education
- Stage II: Detectable language lapses
  - Case: Behavioral strategies to support conversation
  - Partner: Learn guide & Adapt Conversation

 Fried-Oken (2008)

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Intermediate Stage (III)

- Reduction in language use
  - Case: Start to use AAC systems with training
  - Partner: Use Visual Aids to identify the mental dictionary

https://www.dementia.org.au/sites/default/files/0945-Bourgeois.pdf

 Fried-Oken (2008)

65

Advanced Stages (IV)

- Use of AAC tools and other techniques for expression
  - Case: Multi-modal Tools
  - Partner: Tool Operations & Visual Aids

Figure 1. CoChat app user interface.

- Customized Visual Scene Display for people with primary progressive aphasia (Mooney et al., 2018)

 Fried-Oken (2008)

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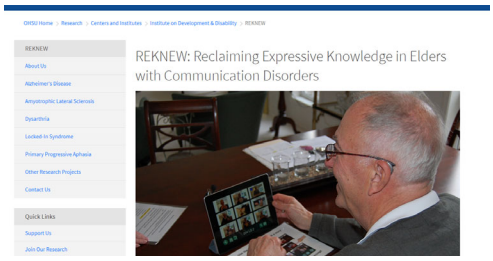
Late Stage (V)

- No functional language
  - Case: Simplify Tools; Family Training
  - Partner: Lead & Support Conversation

  Fried-Oken (2008)

67



http://www.ohsu.edu/xd/research/centers-institutes/institute-on-development-and-disability/reknew/

68

Final Words

- Start AAC early
- Assess case first, then select an AAC system
- Communication and language go together
- Be patient
- Be flexible

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