AAC Interventions to Maximize Language Development for Young Children

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- Children with significant communication disabilities are at risk in all aspects of development
  - Functional communication
  - Language development
  - Cognitive development and learning
  - Literacy development
  - Social participation
  - Quality of life
- Early intervention is critical

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The challenge

- To provide children with complex communication needs access to the magic and power of language and communication at an early age
  - AAC interventions offer the potential for enhanced communication and language development for children
  - To date, the potential has not been fully realized for young children

Goals of the presentation

- To share results of research to enhance language and communication for young children who require AAC
- To discuss implications for practice to improve outcomes for young children

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- For more information http://www.aac-rerc.com or Janice Light JCL4@psu.edu

Effects of AAC Interventions with Young Children

(Light, Drager, Curran, Hayes, Kristiansen, Lewis, May, Page, Panek, Pendergast, & Witte, in progress)

- Longitudinal study
  - investigate impact of AAC intervention on language development and communication of young children with complex communication needs
- 7 participants to date
  - 16-36 months old
  - Significant communication disabilities
  - All minimally symbolic at baseline
    - <25 symbols expressively
  - Longitudinal data

AAC interventions

- Develop and implement appropriate AAC systems
  - Ensure children have the tools to communicate
- Provide appropriate intervention to build language and communication skills
  - Ensure children learn the skills to support effective communication
- Work with parents and other facilitators
  - Ensure children have meaningful opportunities to communicate
- Intervention scheduled 1x week for 1 hour

Goals of AAC Interventions

- Maximize language and communication
  - Increase participation and build social interaction/ turn taking
  - Express range of communication functions
    - Social interaction, needs and wants, sharing information/ joint attention
  - Develop breadth of semantic concepts to support more diverse communication
  - Build greater complexity of language structure to support more complex communication
    - Semantic-syntactic development
    - Morphological development
  - Build phonological awareness / foundations for literacy development

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Steps in AAC Interventions

1. Identify meaningful contexts for communication

2. Develop appropriate AAC systems

3. Work with parents /facilitators to ensure appropriate scaffolding support

4. Infuse communication into all activities

5. Monitor progress /Evaluate outcomes

Identify meaningful contexts for communication

- Select contexts as priorities
  - Interactive
  - Motivating to the child
  - Meaningful /familiar
  - High frequency
  - Valued by child & family
  - High impact / greatest need

- Start with contexts that:
  - provide opportunities for sustained social interaction
    - E.g., shared reading activities, songs, play activities
  - not just the expression of needs and wants
- Infuse opportunities for communication into all activities

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Develop appropriate AAC systems

- Systems must be:
  - Versatile
  - Appealing
  - Dynamic
  - Easy to use

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AAC systems must be versatile

- AAC systems must be versatile
  - Must meet needs in various contexts
  - Must be flexible
  - Must provide growth potential
- Use multiple modes to maximize language and communication
  - Speech
  - Unaided – e.g., signs, gestures
  - Aided - e.g., light tech and high tech

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AAC systems must be appealing

- Many AAC systems
  - Reflect adult perspectives
  - Do not have strong appeal for young children
- If AAC systems are appealing
  - Young children will be more apt to use them
  - Peers will be more apt to interact

Systems must be appealing
(Light, Drager, & Nemser, 2004; Light, Curran, Page, & Pitkin, 2005)

- Suggestions to increase the appeal
  - Infuse motivating activities
  - Incorporate popular characters
  - Incorporate sound effects, songs, musical instruments, laughter, voices
  - Use multiple bright colors; add decorations
  - Allow child to choose
  - Have fun!

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AAC systems must be dynamic

- Typically developing preschoolers learn more than 5 new words a day
- Children who require AAC can only learn new words if we provide them with access to the vocabulary
    - Signs
    - Aided symbols
- Add vocabulary regularly!!
- Make sure that AAC systems are available at all times

Select appropriate vocabulary

- Be sure to include a range of concepts
  - people, actions, objects, places, social words, relational concepts, questions, etc.
- Check to make sure that the vocabulary is
  - Individualized
  - Motivating / fun
  - Functional
  - Developmentally appropriate
  - Culturally appropriate
  - Supports language learning
- Choose appropriate wording for each concept
  - Kids should sound like kids!
- Model concepts the child knows as well as new concepts

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AAC systems must be easy to learn

- Current AAC technologies reflect the conceptual models of nondisabled adults
  - These models are not congruent with young children's conceptual models
  - As a result, AAC systems are difficult for children to learn to use

AAC systems must be easy to learn

- Reduce the learning demands of AAC systems for young children by using appropriate designs
  - Representations of language concepts
  - Layout, organization, and navigation
  - Selection of these concepts
  - Output

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Representation of language

(Lund, Millar, Herman, Hinds & Light, 1998; Light, Drager, Burki, D'Silva, Haley, Hartnett, Kristiansen, Worah, & Hammer, 2004)

- Young children's learning of concepts
  - Embedded in context
  - Differs from adult concepts
- Current AAC symbol sets
  - Represent adult conceptual models
  - Often incorporate parts of objects and people
  - May require metalinguistic skills
  - May not be meaningful to young children
  - May take time for young children to learn

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Use appropriate representations
(Lund, Millar, Herman, Hinds & Light, 1998; Light, Drager, Burki, D'Silva, Haley, Hartnett, Kristiansen, Worah, & Hammer, 2004)

- Use representations that reflect child's understanding of concept
- Use symbols that represent meaningful contexts /experiences in the child's life
  - Digital photos of the child /family in meaningful activities
  - Line drawings that represent children's understanding
  - Avoid isolated parts of objects or events
- Teach symbols in context
  - Introduce symbols in context
  - Link the symbol to the concept explicitly

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Organization, layout & navigation

- Once there is more than one language concept,
  - they must be organized in some way
  - they must be displayed in some way
  - the user must navigate the system
- The organization, layout and navigation affects:
  - ease of learning
  - ease /accuracy of use

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Use appropriate organizations

- Use personalized schematic organizations
  - Organize vocabulary according to familiar events /activities (Fallon, Light & Achenbach, 2003)
- Organize vocabulary in small groups
  - build "page" organizations from small groups (Fallon, Light & Achenbach, 2003)

Use appropriate layout

- Types of layouts
  - Traditional grid layout
  - Visual scene display
  - Hybrid displays

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Traditional grid layout

- Vocabulary represented by separate AAC symbols in "boxes"

- Language is taken out of context

- "Decontextualized"

- Concepts are separate

- Imposes greater processing demands

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Use appropriate layout

- Visual scene layout
  - "Graphic metaphor" (Shane, 1998)
  - Vocabulary embedded under "hot spot" in visual scene
  - Vocabulary presented in meaningful context
  - Concepts linked visually and conceptually

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Use appropriate layouts

- Very young children are more accurate using visual scene layouts than traditional grid layouts (Drager, Light, Fallon, Jeffries, & Speltz, 2003)
- Transition to use various layouts over time
  - Visual scene displays
  - Hybrid displays
    - Visual scene displays with some items presented in a grid-type layout
  - Traditional grid displays

Reduce navigational demands

- It is difficult for young children to learn navigation to locate language concepts
- Traditionally we have reduced navigational demands by reducing number of language concepts available
- Do NOT hold back language development
- Reduce navigational demands
  - Appropriate design
  - Partner scaffolding

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- Use explicit menus that make options visible
  - Use screen shots of actual vocabulary pages as choices on menu pages (Drager, Light, Larsson, Pitkin, & Stopper, 2004)
- Provide scaffolding support to help child locate page initially
- As child develops competence,
  - Model use of menu page and navigational tools to find page
  - Teach organization of system

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Implement AAC systems

- It is challenging for young children to use AAC systems
    - They must coordinate attention to
        - Themselves
        - The partner
        - The ongoing activity
        - The AAC symbols
- Provide scaffolding support to reduce the demands by
    - Positioning the partner appropriately
    - Infusing the AAC symbols into the activity
    - Infusing the activity into the AAC system

Position the partner

- Ensure that the partner is closely aligned with
  - The AAC system
  - The activity
- Maximize attention to
  - Partner
  - AAC system
  - Activity

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Integrate AAC systems and play

- Children's language learning & communication is infused in play and daily activities
- Too often aided AAC systems
    - sit "outside" of children's lives/ activities
    - decontextualize language & communication
- Re-design AAC systems
    - Infuse AAC symbols into play activities
        - Construct AAC symbols with velcro on back
        - Bring the symbols into the activity; link symbols to the referents explicitly; use them in play
    - Infuse play activities into AAC systems

Working with parents to maximize communication & language

- Implement AAC in meaningful contexts in natural environment
- Identify opportunities for communication within these contexts
- Model AAC + speech
- Wait
- Respond to the child
- Monitor progress/ Evaluate outcomes

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Identify opportunities for communication

- Within each context, identify opportunities for communication
  - Meaningful
  - Motivating
  - Numerous
  - Varied
  - Fun

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- Clearly mark the opportunity
- Wait and allow the child time to communicate
  - Use expectant delay
  - Focus attention on child; maintain eye contact
  - Use expectant body posture
  - Wait

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- **If the child attempts to communicate, respond immediately**
  - Fulfill the intent
  - Expand on the child's message
    - Model AAC + speech
  - Continue the activity
  - Continue to set up meaningful opportunities for child to communicate

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- **If the child does not attempt to communicate,**
  - Model an appropriate turn
    - use AAC + speech
  - Use a third party model if available
    - Parent, sibling, aide
  - Present the opportunity again

- ■ Always
  - ■ Model AAC + speech
  - ■ Expose the child to more vocabulary/ more complex messages than he/she currently uses
    - ■ Model AAC as a means to communicate
    - ■ Provide opportunities for child to learn new concepts & new structures

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Results – Case #1

- Boy with severe CP, trach
- Baseline (age: 25 months)
  - No vocalizations, gestures, or signs
  - Uses <25 digital photos of toys
  - Participates minimally
    - Expresses 1 concept or less per 20 minute interaction
  - Expresses requests for objects only
  - Communicates in single telegraphic messages

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Results – Case #1

- **After 12 weeks of intervention (age: 28 months)**
  - Expresses >480 words via light tech and high tech AAC
  - Increased vocab by >5 words per day
  - Active participant in interaction
    - Expresses >48 concepts per 20 minute interaction
    - Increase of approximately 50 x rate of baseline
  - Communicates in 1-2 word messages
  - Expresses range of semantic relations
    - agent, action, object, locative, demonstrative, possessor, quantifier, instrument, questions, etc.

Results – Case #1

- **After 9 months of intervention (age: 34 months)**
  - Expresses >1,000 words via light tech and high tech AAC
  - Continues to Increase vocab by >5 words per day
  - Active participant in interactions
    - Expresses approx 50 concepts per 20 minute interaction
    - Increase of approximately 50 x rate of baseline
  - Communicates in 1-4 word messages
  - Expresses wide range of semantic relations
    - agent, action, object, locative, demonstrative, possessor, quantifier, instrument, questions, etc.
  - Beginning to include grammatical markers e.g., present progressive, plurals, possessive, past tense
  - Learning phonological awareness skills, letter-sound associations, early literacy skills

Results – Case #1

- After 12-14 months of intervention (age: 37-39 months)
  - Has acquired several thousand words via light tech & high tech AAC
  - Continues to Increase vocab by >5 words per day
  - Participates actively in interactions with adults and peers
    - Sustained rate of communication 40-50 turns per 20 min. interaction
    - Increase of approximately 50 x rate of baseline
  - Communicates in multiword messages
  - Expresses wide range of semantic relations
  - Uses grammatical markers as required
    - e.g., present progressive, plurals, possessive, past tense
  - Demonstrates early literacy skills
    - E.g., phonological awareness skills (initial phoneme segmentation, sound blending)
    - letter-sound associations
    - decoding single words (cvc) in isolation and shared reading

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Results – Case #2

- Boy with Down Syndrome, otitis media
- Baseline (age: 29 months)
  - Says <10 spoken word approximations
  - Has < 10 signs
  - Participates minimally
    - Expresses <1 concept per minute in interaction
    - Expresses < 20 words/concepts in 25 minutes
  - Only expresses object concepts
  - Requests preferred items

- After 7 months of intervention (age: 36 months)
  - Expresses >1,210 words via speech, signs, light tech and high tech AAC
  - Increased vocabulary by >5 words per day
  - Active participant in interaction
    - Expresses >10 words per minute
    - Expresses >250 words in 25 minutes
    - Increase is 10 x rate of baseline
  - Expresses wide range of semantic relations
    - agent, action, object, locative, demonstrative, possessor, quantifier, instrument, questions, etc
  - Requests items, comments, interacts socially, asks questions, etc.

Results to date

- All children have demonstrated significant increases in their rate of turn taking
- All children sustain interactions with others for significantly longer
- All children participate in interactions that involve
  - Social routines
  - Play activities
  - Not just expression of needs and wants

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- Children use their AAC systems independently for play & learning as well
- Some of the children use their systems as contexts for interaction with peers
  - Shared books
  - Shared singing
  - Play

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- All children have acquired a range of semantic concepts
- All but one child has learned to combine concepts to communicate more complex meanings

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- All children have been able to use scene displays on initial introduction once use is modeled
  - seem to be more interested & motivated when scene displays are used to integrate AAC & play, book reading, music
- All children have learned to use other displays
  - Hybrid displays
 - Grid displays

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- Children move through different stages
  - Increase participation and build social interaction
  - Develop breadth of semantic concepts /vocabulary to support more diverse communication & conceptual development
  - Build greater complexity of language structure to support more complex communication
  - Build phonological awareness skills and foundations for literacy development

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The future

To realize the magic and power of language and communication for young children with complex communication needs so that they can achieve their full potential

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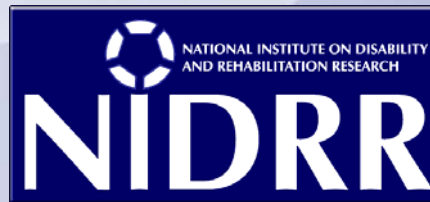
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