Early Intervention and AAC—Making Communication a Priority

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In the fall of 2016, 372,896 children were enrolled in Early Intervention Services in the United States.
3.12% of infants and toddlers were receiving Early Intervention Services
Retrieved: 8/19/19 http://ectacenter.org/partc/partcdata.as

IDEA Part C

Assistive Technology is an Early Intervention Service listed under IDEA Part C

"Assistive technology device means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of an infant or toddler with a disability."

Services provided in natural environments.
Retrieved: 8/19/18: https://sites.ed.gov/idea/regs/c/a/303.13

A survey of early intervention in 2006 indicated that EI providers typically did not initiate AAC options until a child was over two. (Dugan 2006)

Why? AAC Myths

Myth #1: “If a child is given a communication system it will hinder their speech development.”

Talking
True

AAC research has consistently proven that this is not true! Use of AAC does not inhibit speech production and may increase speech production.

In 2006 Millar, Light & Schlossler’s review of published studies after AAC intervention 89% of the participants demonstrated increases in speech production and none demonstrated a decrease in speech production.

Myth #2: “A child must exhibit certain specific cognitive pre-requisites before being able to learn to use AAC”:

- Everyone communicates. Assume the child has something to say and respond to initiation. AAC system is used as both a receptive language teaching and output for expressive communication.

Myth #2: “A child must exhibit certain specific cognitive pre-requisites before being able to learn to use AAC”:

- Everyone communicates. Assume the child has something to say and respond to initiation. AAC system is used as both a receptive language teaching and output for expressive communication.

Why Early Communication?
Research suggests based on observations of “late talkers” that they may be “more serious, more depressed/withdrawn and less interested in play.”

Julia R Irwin · Alice S Carter · Margaret J Briggs-Gowan; Dec 2002 · Journal of the American Academy of Child & Adolescent Psychiatry

Why Early Communication?

- Can make it challenging for caregiver and child to develop relationship without communication.
- Mothers of late talkers report their relationship with their child as highly stressful.

Julia R Irwin · Alice S Carter · Margaret J Briggs-Gowan; Dec 2002 · Journal of the American Academy of Child & Adolescent Psychiatry

Late talkers typically have the same gestural abilities as their peers. Imagine what not having communication may mean for our kids who may not have gestures or the ability to lead their caregivers physically?
If communication system isn’t in place before school begins:
- The child has missed years of communication opportunities
- The child may have become withdrawn, demonstrate increased behaviors and have developed passivity.
- Focus often becomes
Finding a communication system instead of academics

Benefits of Conversational Turn Taking
- Back and forth conversation with caregivers more important for language development than just inputting language.
- Number of conversational turns demonstrated increases in grammar, vocabulary and verbal reasoning.

Learning Opportunities

<table>
<thead>
<tr>
<th>Learning opportunity for children</th>
<th>Just listening to words (e.g. watching TV or videos, or just listening to an adult talk)</th>
<th>Participating in a conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hear a variety of words they may use on their own later on</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>Learn to pay attention to someone else</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>Learn how to start an interaction</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Learn how and when to take a turn in an interaction</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

If children require conversational turns for language development - and a typical 2 year old has 275 words .... What long term impact is there for toddlers who have limited vocabulary at 2 or are only given choices between two?
Why early communication?

- A review of studies of AAC use with infants and toddlers under 36 months indicated 97% improved communication and caregivers learned to provide more communication opportunities.
- D. Branson and M. Demchak; The Use of Augmentative and Alternative Communication Methods with Infants and Toddlers with Disabilities: A Research Review 2009

Why Early Communication?

“Communication is the essence of human life” ASHA, 1991

- Communication allows us to
- make contact with other people
- establish relationships
- express our personality
- demonstrate and share our knowledge
- ensure that our needs are met and our wishes are considered (Porter and Kirkland)

AAC Myths

- Myth #3: Representational hierarchy

Very Young Children Can Understand Abstract Symbols As Long as they are Presented in a Consistent, Meaningful Pattern

Speech is Abstract

Representational Hierarchy Myth in AAC

- True for easier recognition of nouns without any prior learning
- Nothing to do with language development
- Can not represent the early core language concepts that are not nouns: more, done, help, me, stop, uh oh, etc.

The field of AAC historically looked at the representational hierarchy as a process to teach language, however, this is very limited in terms of long term outcomes in language development
Miss-use of Representational Hierarchy for Language

• The individual may begin to see communication as passive - waiting for others to offer choices
• May limit the development of autonomous generative communication
• May limit the development of a wide range of pragmatic functions
• May limit the development of syntax

No individual is too “low” too “young” too “severe” or too anything to be exposed to a robust language input in a form that he/she may be able to learn to use as a means of expressive communication

AAC Myths

• Myth #4: “A child should spontaneously use an augmentative communication system as soon as they get it.”

• The device alone doesn’t make a competent, proficient communicator” (Beukleman, 1991).

What is Language? (Not just speech)

• An agreed upon set up symbols and rules that enables a community of people to interact and communicate with each other
  • Spoken – verbal communication
  • Unaided – using body – including sign
  • Aided language – use a communication aid of some type

What is Communication?

• Connection
• Interaction
• Understanding
• A relationship with another person

Varied communication functions

greet          manipulate          relate information
agree / disagree  ask and answer questions
instruct others  ask for things   joke
express an opinion  share information
express feelings   protest
describe          "MAKE SOCIAL CONTACT"  bargain
discuss interest
### Young Children - How many words do they use?

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year old</td>
<td>about 1-3 words</td>
</tr>
<tr>
<td>18 month old</td>
<td>about 20 words</td>
</tr>
<tr>
<td>2 year old</td>
<td>about 275 words</td>
</tr>
<tr>
<td>3 year old</td>
<td>about 900 words</td>
</tr>
<tr>
<td>4 year old</td>
<td>about 1,500 words</td>
</tr>
<tr>
<td>5 year old</td>
<td>more than 2,000</td>
</tr>
</tbody>
</table>

Based on Smith (1926) as cited by Dale (1976) & Retherford (1996)

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### How Do Children Learn Language?

Typical children learn language by being immersed in a native language learning environment, where they can freely interact with, and try out their developing skills.

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### Theories of language development

- **Nativist tradition** (Chomsky, 1968, 1988; Fodor, 1983)
- **Behavior analytic tradition** (Skinner, 1957)
- **Emergentism / Connectionism tradition** (Elman et al, 1996; Plunkett et al, 1997)
- **Constructivist approach** (Piaget, 1977)
- **Social constructivist tradition** (Vygotsky, 1962, 1978)

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### Language Immersion

Receptive and Expressive with Conversational Interaction

- All theories imply that there is an environment of language users and that the quality of the environment is related to the behavior of these language users to a greater or lesser extent.

- Children acquiring spoken language
  - Are surrounded by a community of speakers
  - Influences are usually not planned

Gayle Porter
Receptive Input

- Aided language stimulation (Goossens’, Crain & Elder, 1992)
- System for Augmenting Language (Romski & Sevcik, 1992) later: Partner Augmented Input
- Natural Aided Language (Cafiero, 1998)
- Aided language modeling (Brogger et al, 2006)
- Aided AAC Modeling (Binger and Light, 2007)
- AAC Modeling (Sennott et al, 2016)
- Augmented Input (Allen et al, 2017)

Modeling Language: general receptive input with no expectation that the child will say anything particular at that time. Model ideas of what to say - kid talk. This is very different from a Mand Model.

Creating an Aided-Language Learning Environment

Children most effectively learn to use augmentative communication through the same methods that typical children learn to use verbal communication - through modeling in natural and functional contexts.
Teaching AAC requires the teacher/therapists/families to be more fluent in the child's language system than the child.

Talking to the Child with his system:
- Validates the child's means of communication
- Gives the partner a good perspective on what the child is facing

Use AAC to expand upon any efforts by the child to communicate

Selecting an AAC System (Dynamic Assessment)
- Hardware
- Software
- Language Organizational System
- Implementation Plan

Selecting a Communication Aid
- **Hardware**
  - Paper, dedicated device, PC, tablet, iPad
  - Size, shape, display, battery, memory, processor speed, Bluetooth, IR, WiFi, mounting, stand, durability, LOOK
  - Possible access methods
  - touchscreen, keyguards, auditory/visual scanning, eye-gaze
  - Computer access / other programs / cool stuff!
- **Software program**
  - Options to support communication and language,
  - Vocabulary organization, navigation, symbols, word prediction, rate enhancement, word morphology, coding, etc
  - Options to support access / layout, e.g. button spacing
  - Customization and programming options
  - Language organization / page set(s)

Language Organizational System
- How is the vocabulary organized?
- Robust language system? - a means to communicate a full range of communicative functions?
- Process to expand with the individual's language development over time?
Language Organizational System

• Possible navigational strategies used (pragmatic organization, natural branching vs. meta-cognitive structure)
• Built-in ease for partners using Aided-Language Stimulation and modeling of language and conversation

Plan for Implementation and Training Communication Partners

• The AAC system does not teach language, it is a tool for learning language
• Language is learned through interaction in a language learning environment

What is a Robust Language System?

• Enables expression of a full range of communicative functions
• Includes both core and content vocabulary
• Has a clear pattern of organization for navigating to needed vocabulary
• Access to the alphabet
• Allows for growth without changing the whole system

Plan for Implementation and Training Communication Partners

• Create an Aided-Language Learning Environment
• Train communication partners to model AAC and support acquisition in natural contexts

It is not possible to rely on a High-tech device as the only option for communication

All people who use aided AAC require a light (paper) tech option

Gayle Porter
**Electronic Options**

- Speech Output
- Larger vocabularies without adding weight
  - Dynamic displays
  - Encoding options, e.g. Minspeak (iconic encoding)
- Cost, breakdown, charging time
- Limited environments
- Operational requirements
  - Computer operating system - only responds to programming
  - 'Cost of learning'

**Non-Electronic Options**

- Adding vocabulary increases size/weight/number of displays
- No charging / less breakdown
- Wider range of environments and positions
- 'Smart-partner operating' system

**Advantages of Smart Partner Operating System**

- Human Partners can:
  - Observe and problem solve
  - Read variable body movements
  - Use contextual cues (I, me, my, mine)
  - Provide extra processing time before changing levels in a Dynamic Display
  - Support focus onto interaction

**Learning Patterns May be Easier to Learn 'Light Tech' Before 'High Tech'**

- Early babbling 'light tech' may be learning cause/effect with a person responding, which encourages interaction
- Early babbling 'high tech' may be just a cause/effect toy to some children with focus only on the device and may not focus on the interaction

WeSpeakPODD
Facebook and Youtube

**Learning Language**

- "From the moment a baby is born, they hear and respond to the spoken word. We bombard that infant with language for the first 12-18 months of their lives. During that time, we do not expect that they will utter a single understandable word."

WeSpeakPODD
Facebook and Youtube
AAC Competency Takes Time

The average 18 month old child has been exposed to 4,380 hours of oral language at a rate of 8 hours/day from birth. A child who has a communication system and receives speech/language therapy two times per week for 20-30 minutes sessions will reach this same amount of language exposure in 84 years (Korsten, J.)

http://atto.buffalo.edu/registered/ATBasics/Populations/aac/consider.php

Who might benefit from an AAC referral in Early Intervention?

Expressive Language Group

Speech motor dysfunction (CP, Dysarthria), gap between expressive and receptive language

Goal:
provide means to indicate wants and needs, show interests and personality; give opinions; actively participate in activities
Von Tetzchner & Martinsen (2006)

Case Study 1

• Referred 30 months old; multiple medical conditions including CVI and CP

• Previously using Big Mack
• Beginning to touch “yes” and “no” cards for yes and pick from a field of two
Communication Autonomy

- Being able to say what you want - when you want
- Not the same as making choices!

What would you like to do?

After Initial Referral

Provided consults in natural environment in the home
Conducted parent interview, collaborated with other therapists that were part of his EI team and received reports

Considerations for CVI

- CVI is caused by damage to brain in the areas that process vision
- Visual abilities can grow and change as the child learns to make sense of what he is seeing
- Use the CVI Range by Dr. Christine Roman-Lantzy to determine current visual abilities and appropriate adaptations and strategies

Effective Intervention Strategies

- Not “vision therapy”
- Customized environmental adaptations to the child’s natural routine and materials
- New connections are formed when the child uses her eyes and meaning can be attached to what she is looking at
• Need to adapt both:

• Physical environment: includes adaptations to the environment to increase access - physical access - position, adapted equipment, visual and auditory complexity, competing sensory stimuli: noise, vestibular, tactile, and postural security

• Cognitive environment: includes speed of presentation, wait time, observation of attention, familiarity of activity / balanced with moderate differences to increase curiosity, affect of partner, relationship to partner, context, internal communicative drive

Strategies used with Alex

• Highly color saturated symbols with low complexity to increase looking

• Movement and light to focus visual attention

Strategies used with Alex

• Position of book in relation to his best visual field and distance

• Auditory plus Visual scanning to support vision without holding back communication

Introducing communication book with partner assisted scanning

Trained family and other team members on Aided Language Stimulation

Worked towards motor skills of universal head nod for “yes” and shaking head for “no”

Taught method of initiation and modeled language
While in parallel teaching motor skills for possible future use of SGD with step scanning with fun motivating games and songs

Transition to Preschool
School Team came and observed Linda working with the family in the home prior to transition
AT; SLP had attended system trainings. Supported the rest of the school team in learning to model and use the system.

Supportive Language Group
• Moderate motor speech dysfunction, problems with speech and language, speech may not be intelligible, but may develop more intelligibility (Down Syndrome, Apraxia, etc.)

Alex was able to communicate his own autonomous ideas on his first day of preschool!

Goal:
• provide a bridge for development of speech and language and a means to enhance participation and communicative competency
• Von Tetzchner & Martinsen (2006)

Case Study #2
B - referred for speech services at 28 months
- Had been receiving social emotional services secondary to self injurious behavior
- At the start of SLP services B was extremely shy, had difficulty separating from his mother and was not engaging in pretend play.
B was able to produce two vowel sounds and shook his head for “yes” and “no” occasionally.

- Mom had been trying to teach sign language for a long time without success.

- Introduced Communication Book in Therapy and made topic specific boards

- Introduced 12 location communication book in therapy services and after initial modeling B began using expressively during sessions.

- B demonstrated increased engagement; eye contact and interest in play based activities. Decreased behavior.

- Began using spontaneously shortly after sessions began to initiate and referent items/activities in environment; began to imitate some signs

- B began producing a variety of communicative functions throughout routines of day

Next Steps
- Introduced a 40 location communication book; more vocabulary and smaller and easier for him to carry

- Continued to work on multi-modal communication; signs developed and began signs in conjunction with communication book/device. At this point produced approximately 20 signs.

- Verbalizations increased but less than 10 verbal approximations including animal and environmental sounds
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• Introduced electronic AAC system in conjunction with non-electronic system.

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• B continued to develop his communication skills multi-modally. Went to Early Childhood assessment able to demonstrate understanding of pre-academic concepts - shapes; colors and numbers.

• During assessment B was able to communicate his desires, opinions and share and relate information.

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Case Study 3

• B started preschool and was excited to meet new friends!
• He was able to communicate with his peers multi-modally and share with them his fun ideas and engage in pretend play!

- Referred just after second birthday for speech
- Producing less than 10 intelligible words; not imitating single words and resistant to attempts at family to try to have him imitate
- Introduced 12 location PODD book and signs in sessions; immediately began using PODD book expressively during play based activities
- Over few weeks began trying to produce words while pointing to symbols and actively engaged in play based activities using a variety of parts of speech in system

- Introduced 40 location PODD book with more vocabulary and easy to carry; continued to increase his expressive language
- Observed at Montessori 30 months; communicating a lot at home; teacher said not talking at school ......

- Intelligibility increased and by 3rd birthday did not qualify for speech-language services in preschool

Alternative Language Group

- Who
  - limited verbal speech & difficulty in understanding language (Autism, auditory processing, severe cognitive impairments, etc.)

Goal:
assist in understanding and learning language, increase social/interaction skills, increase opportunities for expressive language
Case Study #4

T - referred for speech-language therapy services at 30 months.
- Was receiving developmental therapy services previously as the primary service provider
- Appeared to be a highly visual learner. Was able to label objects, pictures, letters, colors, shapes - anything he could see.

- Not engaged in play based activities and not following directions consistently.
- Initial sessions were very challenging
- Lined up toys and enjoyed being outside and sensory based activities
- T was diagnosed with Autism at 32 months

Learning Language Through Symbols

Began modeling language with symbols including pragmatic branches in routine activities and preferred play based activities; cars; playdough; pretend food; etc.

- Demonstrated increased engagement and began using verbs and pronouns in play “crash car”; “stop truck”; “go fast dump truck”

Modeled robust language in symbols. Began requesting for highly preferred items “I want....” more often instead of becoming frustrated and using other branches such as “Let’s go”.

- Continued to increase use of play based language; continued to increase variety of communicative functions and began to ask questions.
- Transitioned to preschool with significant growth in language skills
Case Study 5

• Alex; 20 months; referred for SLP services
• Four year old brother diagnosed with ASD who did not begin talking until after 3

Alex is showing some red flags for ASD but has not been assessed
• Alex is not responding to his name or responding to directions during the day

Alex occasionally produces a “gee” sound; smiles and laughs but is not producing other vocalizations; pointing or producing signs.

Begin focusing on joint attention; engagement; introduced some signs Family had experience with PECS so introduced PECS in conjunction motivating topic boards and 9 location PODD book

Next Steps
Modeled language with topic boards and PODD book; family attempted to use PECS for requesting but was challenging as Alex was not using functionally and chewed on the laminate

Appeared to watch and pay attention to topic boards and modeling in PODD book but had not developed a point and was not using expressively

Parallel Learning
• Mom begins trying to teach him to motor plan pointing through play based iPAD applications
• Initially Alex takes his mom’s hand and directs her hand but begins to start to play games functionally with his finger
• Is not generalizing this movement to pointing to objects or picture symbols
Since Alex is able to select on the iPAD, introduce AAC application. Family wants to start with two locations due to Alex’s limited success with strategies so far. Compromise on 4 locations with some play-based pages built out with 6 locations.

Teach family to continue to provide Aided Language Stimulation throughout the day.

Alex begins using to request using branches “I want”; “Let’s Go”; requests “more”; “help” and indicates when “all done”;

Beginning to occasionally initiate using “I feel” and “I like it”;

Variety of pragmatic branches and communicative functions are modeled throughout the day.

Alex appears to be responding to vocabulary modeled with symbols on his device but is still not responding to only verbal speech;

Alex begins to make some verbal approximations and begins saying “Hi”;

More vocabulary is needed to expand language and for receptive input and modeling of 20 location Word Power is introduced.

28 months; Transitioned to 20 location Word Power;

Able to produce all of the communication functions he used on previous page set.
• Expanding vocabulary and beginning to use more verbs in play and during day “crash car”; “eat pancakes”; beginning to verbally produce “I wa” when selecting “I want” on his device

• Family learned how to provide aided language stimulation which helped support Alex and his brother

• Catch 22: How can we trial communication systems or assess them for readiness without teaching them first?

Life is like a confused teacher...first she gives the test and then teaches the lesson
Drake

Augmentative Communication Assessment - Dynamic Assessment Process

• Goal of AAC- To support children with communication disorders to develop skills to meet current communication needs and to prepare them for future needs

The Juggling Act and Working Memory

Juggling Sensory, Motor, Language and Cognitive skills

Children with Significant Motor Challenges - May Require a Great Deal of Cognitive Effort to Move and Stabilize themselves

When child needs to focus on movement and stabilizing, then there is very little working memory left for attention to the play, language or cognitive task
Always Balance Cognitive and Motor Difficulty

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Always Balance Cognitive and Motor Difficulty

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Juggling Explains Inconsistency of Performance

129

Juggling Explains Inconsistency of Performance

130

Focus on one component or skill within each activity, or part of activity

131

Focus on one component or skill within each activity, or part of activity

132

Always Balance Cognitive and Motor Difficulty

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128

Juggling Explains Inconsistency of Performance

129

Juggling Explains Inconsistency of Performance

130

Focus on one component or skill within each activity, or part of activity

131

Focus on one component or skill within each activity, or part of activity

132

- Need to take successes and move on, as opposed to requiring repetition of the task over a given number of trials

- Provide opportunities for repetition/practice within natural contexts with variation and natural motivation

- Reduce motor load for difficult cognitive or language tasks

- Reduce cognitive load for motor learning tasks

- Reduce motor and cognitive load for vision tasks

- Teach access as a separate but parallel skill to language learning
Vision Development for CVI

- CVI Range (Roman-Lantzy)
- Appropriate adaptations
- Reduce motor, cognitive, and language demands

Developing Motor Control and Active Positioning

- Reduce vision load
- Reduce communication load
- Reduce cognitive load

Language and Communication Development

“Light Tech” Non-Electronic Communication Book

- Reduce vision load
- Reduce motor load

Fun Play Activities to Develop Pointing Skills

- Reduce communication load
- Reduce cognitive load

Switch Play to Develop Motor Skills for Switch Access

- Reduce communication load
- Reduce cognitive load
- Reduce vision load

Play to Develop Eye-Gaze Motor Skills
Eventually: Combine Motor and Language Skills to Operate a Communication Device

Team Planning and coordination is Critical
Everyone needs to be moving in the same direction - long term

- Everyone needs to know enough from other team members to:
  - Understand and use the individual’s means of communication
  - Know how the person is learning to move and recognize helpful vs harmful positions and movements
  - Know what facilitates use of vision for this person
  - Recognize and address dysregulation - know how to address sensory needs on the spot
  - Incorporate what best facilitates learning for each individual (processing differences, learning needs)

Transition to Part B/Preschool Services

- Part C requires that the IFSP has a transition conference and plan at a minimum of 90 days before the child’s 3rd birthday; unless the child was referred to Early Intervention later that this timeline.

"Developing and Implementing the IEP by Third Birthday for Child Eligible under Part B – In order to ensure a smooth and effective transition for children with disabilities who received Part C services and are eligible for Part B preschool services, the State must have policies and procedures in place to ensure that an IEP, or if consistent with IDEA sections 614(d)(2)(B) and 636(d), an IFSP, has been developed and is being implemented by the child's third birthday. (IDEA section 612(a)(9) and 34 CFR §§300.101(b) and 300.124(b))" IDEA Part C Grant Application Technical Assistance Checklist Early Childhood Transition Agreements; November 2011

What does a “smooth and effective transition” include for a child who uses an AAC System?

- Transition plan in place
- School team trained on communication system and feeling comfortable beginning modeling
- School team trained on method of initiation
• Team problem solving how to establish habit and have system with them at all times throughout the day
• School team trained in Partner Augmented Input
• Enough staff to support modeling in the classroom
• Peers who learn and model system during the day

Takeaways:

It’s important for everyone: including young children to have a way to communicate and have access to robust communication

The system and access method may look different based on the needs of the child

Early Implementation; Aided Language Stimulation and Dynamic Assessment are keys to establishing communication when entering preschool

Everyone communicates!

Handout will be at:

www.Lburkhart.com