

# AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) AND AUTISM

## Implementing Evidence Based Strategies in the Classroom



**Presented by,**

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CALIFORNIA**  
3 DIAGNOSTIC CENTERS  
CALIFORNIA DEPARTMENT OF EDUCATION




***DIAGNOSTIC CENTER,  
NORTHERN CALIFORNIA***

- o **Assessments**
  - o special education students ages 3-22 at no cost to the district/family
- o **Trainings**
  - UDL and the Common Core State Standards
  - Implementing iCommunication in the Classroom
  - Common Core State Standards and ASD
  - Assessing students with ASD
- o **Ask A Specialist**
  - [www.askaspecialist.ca.gov](http://www.askaspecialist.ca.gov)
- o **Special Projects**
  - AAC Assessment and Services Certification
  - Classroom Assistance



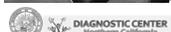
## TODAY'S AGENDA

- o What is AAC?
- o What is Autism??? (New DSM-5 Criteria)
- o Evidence Based Practice
  - What does it mean?
  - Why is it important?
  - How does it apply to AAC?
- o Research Regarding AAC and Autism
  - National Autism Center – National Standards Report
  - The National Professional Development Center on Autism Spectrum Disorders
  - Review of Current Research
- o Evidence Based Practice in the Classroom
  - Assessment
  - Implementation
  - Videos
- o Directions for Future Research
- o Questions?



## AAC IS:

**Any tool or strategy used to  
augment verbal speech**

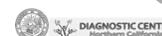



### AAC INCLUDES:

- Signs and Gestures
- Pictures
- Written Communication
- Voice Output Devices
- Speech Generating Devices
- Computer Aided Technology



### AUTISM REDEFINED



### Summary of New Diagnostic Criteria for ASD According to DSM-5



- The terms, '**Asperger's disorder**', '**childhood disintegrative disorder**' and '**PDD-NOS**' (pervasive developmental disorder not otherwise specified) no longer exist in DSM-5, only ASD
- **Two main areas of impairment instead of three:**
  - social communication and interaction
  - restricted, repetitive patterns of behavior, interests, or activities.
- Sensory behaviors are included in the criteria (i.e., stereotyped motor movements, hypo or hyperactivity to sensory input).



- A Diagnostic Criteria has been added: "**social (pragmatic) communication disorder**".
- The emphasis is not on providing a label, but rather on identifying specific needs of the individual.
- "Severity levels" have been identified which help determine level of support needed.



### SOCIAL (PRAGMATIC) COMMUNICATION DISORDER DIAGNOSTIC AND ASSOCIATED FEATURES

- Primary difficulty is with social (pragmatic) communication
- Commonly associated with delayed language development
- Can impact social relationships, academic achievement and occupational performance.
- Rare among children under the age of 4.
- Symptoms not attributable to medical or neurological conditions, intellectual disability or low abilities in word structure or grammar.



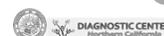
## EVIDENCE-BASED PRACTICE (EBP)

- What does it mean?
- How is it determined?

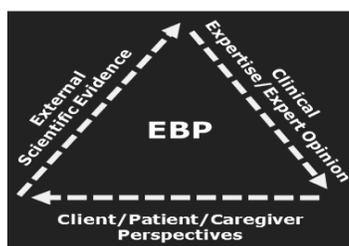


## INITIALLY A TERM USED IN THE MEDICAL FIELD

- "Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values." (Sackett D et al. Evidence-Based Medicine: How to Practice and Teach EBM, 2nd edition. Churchill Livingstone, Edinburgh, 2000, p.1)



## THE THREE COMPONENTS OF EVIDENCE-BASED PRACTICE (EBP), ACCORDING TO ASHA



## WHERE DO WE GET OUR EVIDENCE BASED RESEARCH REGARDING AUTISM?

- Two Sources:
  - National Autism Center, National Standards Project (NAC/NSP)
  - National Professional Development Center on Autism Spectrum Disorders (NPDC)



## NATIONAL AUTISM CENTER

- Located in Randolph, MA
- Serves children and adolescents with ASD
- Promotes best practices
- Offers comprehensive resources on ASD
- Publication: Evidenced Based Practice and Autism in the Schools: *a guide to providing appropriate interventions to students with autism spectrum disorders*
  - Reviewed studies conducted from 1983-2007 (24 yrs)



## NATIONAL PROFESSIONAL DEVELOPMENT CENTER ON AUTISM SPECTRUM DISORDERS

- Multi-university center, including:
  - FPG Child Development Institute at the University of North Carolina at Chapel Hill
  - M.I.N.D. Institute at University of California at Davis Medical School
  - Waisman Center at the University of Wisconsin at Madison.
- Promotes the use of EBP for children and adolescents with ASD
- Developed EBP Briefs, identifying 27 EBPs
- Provided on their website:
  - Comparison Chart of Findings; NSP vs. NPDC
  - Overview of EBPs
  - Implementation Guidelines and Checklists
  - Training modules for established treatments
- Literature Review is ongoing



**NATIONAL AUTISM CENTER**

Identified 11 *Established Treatments* and  
22 *Emerging Treatments*




***ESTABLISHED***  
**TREATMENTS**

- There is compelling scientific evidence to show that these treatments are effective, however;
- Improvements cannot be expected to occur for all individuals with ASD



***EMERGING***  
**TREATMENTS:**

- Studies suggest these interventions may produce favorable outcomes in improving verbal communication.
- Additional high quality studies are needed before we can be confident that these treatments are effective.
- The possibility that these treatments may be effective has not been ruled out.
- These treatments should be considered promising and warrant serious consideration if Established Treatments are deemed inappropriate by the decision-making team.



**THE NATIONAL AUTISM CENTER'S**  
**11 ESTABLISHED TREATMENTS:**  
**(AAC STRATEGIES IN RED)**

1. **Antecedent Package**
2. **Behavioral Package**
3. **Comprehensive Behavioral Treatment for Young Children**
4. **Joint Attention Intervention**
5. **Modeling**



**ESTABLISHED TREATMENTS,**  
**CONT'D:**

6. **Naturalistic Teaching Strategies**
7. **Peer Training Package**
8. **Pivotal Response Treatment**
9. **Schedules**
10. **Self-management**
11. **Story-based Intervention Package**



**THE NATIONAL**  
**AUTISM CENTER'S**  
**22 EMERGING TREATMENTS:**

1. **Augmentative and Alternative Communication Devices {14 studies}**
2. **Cognitive Behavioral Intervention Package {3 studies}**
3. **Developmental Relationship-based Treatment {7 studies}**
4. **Exercise {4 studies}**
5. **Exposure Package {4 studies}**
6. **Imitation-based Interaction {6 studies}**



7. **Initiation Training** {7 studies}
8. **Language Training (Production)** {13 Studies}
9. **Language Training (Production and Understanding)** {7 studies}
10. **Massage/Touch Therapy** {2 studies}
11. **Multi-Component Package** {10 studies}
12. **Music Therapy**
13. **Peer-mediated Instructional Arrangement** {11 studies}
14. **Picture Exchange Communication System** {13 studies}



15. **Reductive Package** {33 studies}
16. **Scripting** {6 studies}
17. **Sign Instruction** {11 studies}
18. **Social Communication Intervention** {5 studies}
19. **Social Skills Package** {16 studies}
20. **Structured Teaching** {4 studies}
21. **Technology-based Treatment** {19 studies}
22. **Theory of Mind Training** {4 studies}



### ESTABLISHED AAC TREATMENTS

- **Schedules**
  - Visual strategies used to communicate a series of activities as well as required steps for a specific activity
  - Also used to aid in transitions
  - May include written words, pictures or photographs
  - Found to be effective in increasing self-management skills and independence
- **Story Based Intervention Package**
  - Written stories depicting specific situations or events, describing expected behaviors
  - May include pictures/photos



### EMERGING AAC TREATMENTS

- **AAC Devices**
  - Interventions included high and low tech strategies, including pictures, photos, symbols used to facilitate communication
  - Based on evidence which supported *improvement in Verbal Communication*
- **PECS**
  - AAC strategy based on behavioral principles
  - Designed to teach functional communication skills
  - Based on evidence which supported *improvement in Verbal Communication and Interpersonal Skills*



### EMERGING AAC TREATMENTS CONTINUED

- **Sign Instruction**
  - Direct teaching of sign language to improve functional communication skills. Based on evidence which supported *increase in communication*.
- **Technology Based Treatment**
  - Use of computers and related technologies for instruction, including PDAs. Based on evidence which supported *increase in academic skills, communication, personal responsibility and self-regulation*.



### NPDC

- Originally identified 24 Evidence Based Practices
- Recently updated research review: now 27 EBPs

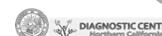


**NPDC'S 27 IDENTIFIED  
EVIDENCE BASED PRACTICES  
(AAC STRATEGIES IN RED)**

1. Antecedent-Based Intervention
2. Cognitive Behavioral Intervention
3. Differential Reinforcement
4. Discrete Trial Teaching
5. Exercise
6. Extinction
7. Functional Behavior Assessment



8. Functional Communication Training (FCT)
9. \*Modeling (MD)
10. Naturalistic Intervention
11. Parent Implemented Intervention
12. Peer-Mediated Instruction
13. Picture Exchange Communication System (PECS)
14. Pivotal Response Training



15. Prompting
16. Reinforcement
17. Response Interruption/  
Redirection
18. \*Scripting (SC)
19. Self-Management (SM)
20. Social Narratives (SN)



21. Social Skills Training
22. Structured Play Group
23. Task Analysis
24. \*Technology Aided Instruction  
and Intervention (TAII)
25. Time Delay
26. Video Modeling (VM)
27. Visual Supports (VS)



**THE NATIONAL PROFESSIONAL  
DEVELOPMENT CENTER ON  
AUTISM SPECTRUM DISORDERS**

- o Identified the following **Nine AAC** Strategies as Separate **Evidence Based Practices**:



1. **Functional Communication Training** - (replacing unconventional communicative behaviors with conventional behaviors, including AAC strategies. Usually includes an FBA)
2. **\*Modeling** (demonstration of a desired target behavior, including the use of AAC tools and strategies)



3. **PECS** – Picture Exchange Communication System (AAC system based on behavioral principles designed to teach functional communication)
4. **Self-Management** (promotes independence in behavior regulation using strategies such as video modeling and visual supports)
5. **Social Narratives** (describes social situations, behavioral expectations, routines in a story format using visual aids, including pictures and text)



6. **\*Scripting** (provides verbal or visual models to assist student in participating in a specific activity)
7. **\*Technology-Aided Instruction and Intervention** (includes SGDs, smart phones, computer assisted instruction)
  - ◆ Speech Generating Devices (SGDs) and Computer Based Instruction no longer separate EBPs – now subsumed under this category.



8. **Video Modeling** (uses video recording/ display to model targeted behaviors or skills.)
9. **Visual Supports** (visual tools/strategies which assist students in transitioning and completing activities throughout the day. May include schedules, maps, organization systems containing text, photos, pictures or objects.)



### NPDC CONCLUSIONS RELATED TO SGDS

- Looked for evidence to support an increase in *functional communication*, not solely verbal communication.
- Speech Generating Devices (SGDs) are effective in increasing expressive language for learners with ASD who struggle with verbal speech.



### NPDCs POSITION ON USE OF SGDS

- For successful implementation of SGDS professionals must consider many factors, including:
  - Motivating vocabulary
  - Symbol size and number
  - Accessibility/ease of use across environments
  - Providing environments and opportunities that encourage communication
  - Training of communicative partners



**Table 8. Matrix of Evidence-Based Practices by Outcome and Age (years)**

EBP	Social		Language			Fine Motor			Play	Cognitive	Class. Behavior		Academic	Motor	Adaptive	Functional		Overall Health
	1-2	3-5	1-2	3-5	6-12	1-2	3-5	6-12			1-2	3-5				6-12	1-2	
ES1																		
ES2																		
ES3																		
ES4																		
ES5																		
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ES = Evidence-Based Practice; Social = Social Interaction; Language = Language; Fine Motor = Fine Motor Skills; Play = Play; Cognitive = Cognitive Skills; Class. Behavior = Classroom Behavior; Academic = Academic Skills; Motor = Motor Skills; Adaptive = Adaptive Skills; Functional = Functional Skills; Overall Health = Overall Health.

## UNESTABLISHED TREATMENTS AND PRACTICES

- o Academic Interventions
  - Use of traditional teaching methods to improve academic performance
- o Auditory Integration therapy
  - Retraining auditory system to improve hearing and/or reduce sound sensitivity
- o Facilitated Communication
  - Providing support of hand or arm of an individual to assist them in communicating using keyboard or symbol board
- o Gluten and Casein Free Diets
  - Restricting these proteins from the diet
- o Sensory Integrative Package
  - Using sensory based techniques to reduce overstimulation or understimulation caused by environmental factors



Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD	Evidence-Based Treatments Identified by the National Standards Project (NSP)										Comprehensive Behavioral Treatment for Young Children	Joint Attention Intervention	
	Antecedent Package	Behavior Package	Story-based Intervention Package	Modeling	Relational Teaching Strategies	Peer Training Package	Parent Response Treatment	Schedules	Self-management				
Priming	X			X									
Individualized-Based Interventions	X												
Time delay	X												
Reinforcement		X											
Task analysis		X											
Discrete Trial Training		X											
Functional Behavior Analysis		X											
Discreet Communication Training		X											
Response Interim/Reduction		X											
Differential Reinforcement		X											
Social Narratives			X										
Video Modeling			X		X								
Naturalistic Interventions					X								
Peer Mediated Interventions						X							
Practical Response Training							X						
Visual Supports								X					
Classroom Work Systems								X					
Self-Management									X				
Parent Implemented Intervention	The NSP did not consider parent implemented intervention as a category of evidence-based practice. However, 24 of the studies reviewed by the NSP under their intervention categories involved parents implementing the intervention.												
Social Skills Training Groups	Social Skills Training Groups (Social Skills Package) was identified as an emerging practice by the NSP.												
Speech Generating Devices	Speech Generating Devices (Augmentative and Alternative Communication Device) was identified as an emerging practice by the NSP.												
Computer Aided Instruction	Computer Aided Instruction (Technology-based Treatment) was identified as an emerging practice by the NSP.												
Picture Exchange Communication	Picture Exchange Communication System was identified as an emerging practice by the NSP.												
Extinction	Extinction (Reductive Package) was identified as an emerging practice by the NSP.												

## CURRENT RESEARCH



### o Schlosser and Wendt (2008) Effects of Augmentative and Alternative Communication Intervention on Speech Production in Children With Autism: A Systematic Review. *American Journal of Speech-Language Pathology, Vol. 17*

- Reviewed studies written between 1975-2007
- A total of 76 studies were used
- AAC interventions included:
  - o SGDs
  - o PECS
  - o Manual Sign
- None of the studies reported a decline in speech production as a result of AAC intervention.
- Most studies reported an increase in speech production with AAC intervention.
- Concluded that AAC interventions do not impede speech production.



### o Calculator & Black (2009) Validation of an Inventory of Best Practices in the Provision of Augmentative and Alternative Communication Services to Students with Severe Disabilities in the General Education Classrooms *American Journal of Speech Language Pathology, Vol. 18*

- Severe disabilities defined as severe-profound ID and associated challenges with adaptive behavior
- Comprehensive review of literature from 1976-2009
- Included one study which specifically looked at AAC and autism
- Resulted in an inventory of possible Best Practices
- Practices were reviewed by a panel of 8 experts (*members had 15-30 years of experience in the field of AAC*)
- Developed inventory of 91 Best Practices within 8 categories



## CALCULATOR AND BLACK (2009)

### A review of their “Best Practices Inventory”

### To Summarize:



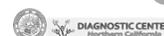
### 1. PROMOTING POSITIVE VALUES

- Foster friendships
- Train teachers and staff
- Allot time for IEP team meeting/ planning
- Be sensitive to cultural values and beliefs



### 2. COLLABORATION BETWEEN GENERAL AND SPECIAL EDUCATORS

- Allow time for routine meetings to discuss curriculum.
- Clearly define role of general education staff.
- Develop a clear understanding of what the child is expected to learn.



### 3. COLLABORATION BETWEEN EDUCATORS AND RELATED SERVICE PROVIDERS

- SLP may play primary role in AAC program, but implementation is shared by many
- SLP consults with teacher and staff regarding instructional and related communication goals and objectives
- Consultative role of SLP is supported by administrators, teachers and parents



### 4. FAMILY INVOLVEMENT

- Ideas, concerns and priorities of family are incorporated in the AAC program.
- AAC instruction is coordinated between home and school
- Family plays important and active role in assessment process



### 5. CHOOSING AND PLANNING WHAT TO TEACH

- Implementation and content of AAC program is motivating and reinforcing for student.
- Teachers, staff and peers understand the relationship between communication and behavior.
- AAC program attempts to replace problematic behaviors.
- AAC goals address functional communication needs in a variety of environments.
- Future communication needs are considered.
- Program targets both receptive and expressive language skills.



### 6. SCHEDULING, COORDINATING AND DELIVERING INCLUSIVE SERVICES

- Classmates/peers are taught how to communicate effectively with AAC user.
- AAC instruction is integrated into relevant activities throughout the day.
- Communication objectives are integrated into the general ed curriculum, rather than working on communication in isolation.



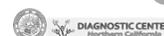
## 7. ASSESSING AND REPORTING STUDENT PROGRESS

- AAC progress is examined in relation to:
  - IEP Goals and Objectives
  - development of friends and social acquaintances
  - development of functional life skills.
  - meaningful participation in general ed curriculum
- Communication needs are monitored and reassessed regularly since they may change over time.



## 8. INSTRUCTIONAL STRATEGIES

- Service providers and teacher work collaboratively to address multiple skills concurrently.
- Peers, teacher and staff receive direct instruction on how to use AAC effectively.
- AAC user learns to communicate through multiple means, utilizing a combination of no-tech, low-tech and high-tech strategies.
- IEP team understands that AAC needs will change over time, as well as available technology.
- Teachers and staff make appropriate modifications to increase communication opportunities.
- Classmates/peers provide modeling of AAC systems.
- There is little evidence of rejection/abandonment of AAC system by user.



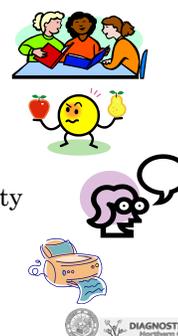
## BEST PRACTICES GUIDELINES PRESENTED TODAY ARE BASED ON:

- NPDC and NAC Research Reviews
- Review of Current Literature
- Betsy's Clinical Expertise and Professional Judgement
- *Common Sense!!*



## WE WILL DISCUSS AAC BEST PRACTICES RELATED TO:

- 1. Assessment
- 2. Selection of AAC Tools/Strategies
- 3. Vocabulary/activity selection
- 4. Implementation



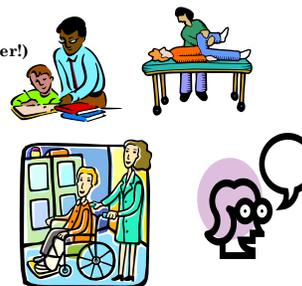
## 1. BEST PRACTICES FOR AAC ASSESSMENT

- Assessment should always include:
  - Interviews
  - Observations
  - File Review
  - Formal and Informal Assessment
  - Trials with a variety of tools and strategies
  - Collaborative, team approach!!



## ASSESSMENT TEAM MEMBERS MAY INCLUDE:

- IEP Team:
  - SLP (key player!)
  - Teacher
  - OT
  - PT
  - APE
  - VI
  - OM
  - Parent
  - Para-educators



### Other Assessment Team Members:

- Family
- Friends
- Peers
- Physician
- Nurse
- DHH Teacher
- Behaviorist



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### BETSY'S HIERARCHY OF SKILL SETS FOR BEGINNING AAC USERS

- Does student realize that an action has a consequence? (i.e., cause/effect)
- Does student show an understanding of symbols (that they represent objects or actions –also known as *iconicity*)?
- Can student discriminate between two or more symbols? (i.e., choice-making)
- Does student use symbols meaningfully to communicate (e.g., requesting)?
- Can student identify basic categories (search for symbols by category)?
- Can student combine symbols to generate phrases/sentences?

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### KEY ASSESSMENT CONSIDERATIONS:

- AAC ASSESSMENT IS AN ONGOING, DYNAMIC PROCESS!!
- BEST WHEN DONE WITHIN NATURAL CONTEXTS ACROSS A VARIETY OF SETTINGS (NO "DRIVE-BYS")
- ASSESSMENT SHOULD ALWAYS INCLUDE:
  - Interviews
  - Observations
  - File Review
  - Formal and Informal Assessment
  - Trials with a variety of tools and strategies
  - Collaborative, team approach!!
- MOST OFTEN RELY ON "INFORMAL" or "ALTERNATIVE" METHODS

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### ALTERNATIVE/INFORMAL ASSESSMENT STRATEGIES:

- Choice Making Activities
- Picture Books
- Adapted Toys and Switches
- Matching Games/Activities
- Communication Boards/Books
- Adapted Computer Software
- Observation Checklists
- Assessment process should never start with Device Trials!!

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### 2. SELECTION OF AAC TOOLS AND STRATEGIES

- Consider:
  - Skill Sets (those that are acquired and those that need to be taught)
  - Mobility (consult with OT/PT)
  - Fine and gross motor skills (consult with OT)
  - Visual Impairments (consult with VI Specialist)
  - Access mode (direct select/scanning)
  - Accessibility across environments
  - Motivation of student
  - Family support

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- Conduct trials with a variety of tools/ strategies
- Determine a Feature Match
- Offer student options:
  - Color
  - Size
  - Voice
  - Symbol Set/Pictures

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### VISUAL SCHEDULES/ SUPPORTS

- o Aid in transitions
- o Reduce anxiety - student knows what to expect
- o Can be used for choice-making across environments
- o Give students a sense of control
- o Lead to independence!!!



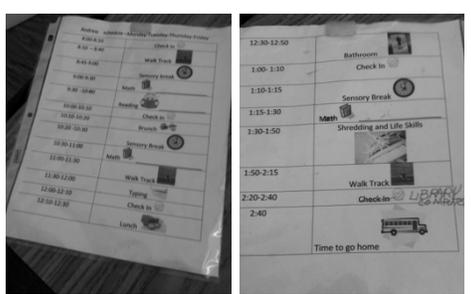
### OBJECT SCHEDULE




### FIRST/THEN SCHEDULE



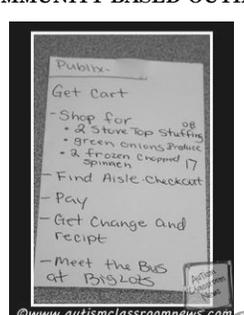

### DAILY SCHEDULE FOR HIGH SCHOOL STUDENT




### TASK (EMBEDDED) SCHEDULE




### TASK SCHEDULE FOR COMMUNITY BASED OUTING

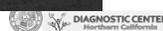



### SYMBOL BASED COMMUNICATION SYSTEMS TRUE OR FALSE:

1. A symbol based communication system can be as simple as two objects
2. PECS means picture communication system
3. Students with ASD should always start with PECS if they are not functional verbal communicators
4. PECS employs a standard protocol which should be overseen by a Certified PECS Implementer
5. Picture communication systems should always be velcroed, laminated and stored in 3 ring binders



### YES SHE HAS A PECS BOOK BUT SHE NEVER USES IT!!!

### HOW ELSE CAN VISUAL SUPPORTS/ SYMBOLS BE USED TO HELP STUDENTS WITH ASD?

- ◆ Vocabulary enhancement
- ◆ Word retrieval
- ◆ Sentence formulation
- ◆ Conceptual knowledge
- ◆ Social skills
- ◆ Literacy development
- ◆ Encourage verbal speech!!



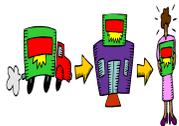
### TECHNOLOGY-AIDED INSTRUCTION AND INTERVENTION

- Allows for access to curriculum related activities at the student's instructional level
- Provides independent practice and learning of skills
- Increases engagement for students with ASD
- Decreases reliance on adult support (i.e., hand over hand assist, verbal prompting)



## AAC IS...

**A Process!**



**Not a Tool!!!**




## FOCUS

On The Student



Not the Technology!




### DIRECTIONS FOR FURTHER RESEARCH



- More research needed to support evidence of AAC use and the increase/decrease of:



- Functional communication skills (verbal and nonverbal)



- Problem Behaviors



- Personal Responsibility/Independence



- Self-Regulation



### AS WELL AS:



- Enhancing Social Skills



- Vocabulary Expansion



- Sentence Formulation Skills



- Academic Performance



### WHERE WILL THIS RESEARCH COME FROM?

- High quality research typically requires:
  - Extensive funding
  - Subjects who are followed over a lengthy period of time
  - Frequent interaction with subjects
  - Careful data analysis



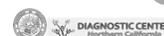
PRACTICAL, REALISTIC SOLUTION PROVIDED BY  
MARILYN A. NIPPOLD

- Combine efforts of school-based SLPs and University Faculty/Graduate Students:
  - SLPs/School Staff provide intervention and keep data
  - Graduate students and university faculty collect and analyze data
  - Finished document submitted for publication in professional journal
- Everyone benefits!
  - Graduate students expand knowledge
  - Faculty members conduct valuable research
  - SLPs directly contribute to research process
  - EBPs are established with the support of an abundance of research



FINAL THOUGHTS AND CONSIDERATIONS:

- AAC is not an exact science:
  - Strive to implement interventions that are “**established treatments**” according to the National Standards Report and/or “**evidence-based practices**” according to the National Professional Development Center on Autism.
  - Consider “emerging” treatments and practices also if appropriate.
  - Rely on your clinical judgment, and the individual needs/preferences of the AAC user.
  - Encourage all forms of functional communication - whatever is most efficient for the situation/ environment



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