AFIRM

Autism Focused Intervention Resources & Modules

AAC

EBP Brief Packet: Augmentative & Alternative Communication

UNC Frank Porter Graham Child Development Institute
Autism Focused Intervention Resources & Modules
Nowell, S., Sam, A., Waters, V., Dees, R., & AFIRM Team, 2022

The National Professional Development Center on Autism

The National Clearinghouse on Autism Evidence & Practice
NCAEP • BRIDGING PRACTICE AND SCIENCE

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

Overview of Content

1. **Table of AAC Contents:** This list details the specific AAC resources that apply to Augmentative & Alternative Communication.
2. **What is AAC:** A quick summary of salient features of Augmentative & Alternative Communication, including what it is, who it can be used with, what skills it has been used with, and settings for instruction.
3. **Evidence-base:** The evidence-base details the National Clearinghouse on Autism Evidence and Practice (NCAEP) criteria for inclusion as an evidence-based practice and the specific studies that meet the criteria for Augmentative & Alternative Communication.
4. **Planning Checklist:** This checklist details the steps for planning for Augmentative & Alternative Communication, including what prerequisite learning of practices are needed, collecting baseline data of the interfering behavior if needed, and what materials/resources are needed.
5. **Other Resources:** Other resources may include decision trees, checklists, and/or template forms that will support the use of Augmentative & Alternative Communication.
6. **Step-by-Step Guide:** Use this guide as an outline for how to plan for, use, and monitor Augmentative & Alternative Communication. Each step includes a brief description as a helpful reminder while learning the process.
7. **Implementation Checklist:** Use this checklist to determine if Augmentative & Alternative Communication are being implemented as intended.
8. **Monitoring Progress Checklist:** Use this form as a method for collecting and analyzing data to determine if the learner on the spectrum is making progress towards the interfering behavior.
9. **Tip Sheet for Professionals:** Use this tip sheet, intended for professionals working with learners on the spectrum, as a supplemental resource to help provide basic information about Augmentative & Alternative Communication.
10. **Parent Guide:** Use this guide intended for parents or family members of learners on the spectrum to help them understand basic information about Augmentative & Alternative Communication and how it is being used with their child.
11. **Additional Resources:** This list provides additional information for learning more about Augmentative & Alternative Communication as well as resources.
12. **CEC Standards:** This list details the specific CEC standards that apply to Augmentative & Alternative Communication.
13. **Glossary:** This glossary contains key terms that apply specifically to Augmentative & Alternative Communication.
14. **References:** This list details the specific references used for developing this AAC module in numerical order.

Table of Contents

AUGMENTATIVE & ALTERNATIVE COMMUNICATION

WHAT IS AAC?

Augmentative and alternative communication (AAC) are interventions that use a system of communication that is not verbal/vocal including aided and unaided communication systems. Methods of teaching AAC use are also included in this practice (e.g., Aided Language Modeling) and may include other EBPs such as prompting, reinforcement, visual supports, and peer-mediated interventions.

EVIDENCE-BASE:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), this practice is a focused intervention that meets the evidence-based practice criteria with 47 single case design studies. Augmentative & Alternative Communication has been effective for early intervention (0-2 years), preschoolers (3-5 years), elementary school learners (6-11 years), middle school learners (12-14 years), and high schoolers (15-18 years) on the spectrum. Studies included in the 2020 EBP report (Steinbrenner et al., 2020) detail how this practice can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, behavior, communication, joint attention, motor, play, and social.

HOW IS AAC BEING USED?

Augmentative & Alternative Communication can be used by a variety of professionals, including teachers, special educators, therapists, paraprofessionals, and early interventionists in educational and community-based environments. Parents and family members also can use Augmentative & Alternative Communication in the home.

Suggested Citation:
Nowell, S., Sam, A., Waters, V., Dees, R., & AFIRM Team. (2022). *Augmentative & Alternative Communication*. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, Autism Focused Intervention Resources and Modules. https://afirm.fpg.unc.edu

EVIDENCE-BASE

The National Clearinghouse on Autism Evidence and Practice has adopted the following criteria to determine if a practice is evidence-based. The 2020 EBP report (Steinbrenner et al., 2020) provides more information about the systematic review process.

Efficacy must be established through high-quality, peer-reviewed research in scientific journals using:

- At least 2 randomized or quasi-experimental group design studies, or
- At least 5 single subject/case design studies, or a
- Combination of evidence of 1 randomized or quasi-experimental group design study and 3 single subject/case design studies

OVERVIEW:

Based upon the 2020 systematic review conducted by the National Clearinghouse on Autism Evidence and Practice (NCAEP), this practice is a focused intervention that meets the evidence-based practice criteria with 47 single case design studies. Augmentative & Alternative Communication has been effective for early intervention (0-2 years), preschoolers (3-5 years), elementary school learners (6-11 years), middle school learners (12-14 years), and high schoolers (15-18 years) on the spectrum. Studies included in the 2020 EBP report (Steinbrenner et al., 2020) detail how this practice can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, behavior, communication, joint attention, motor, play, and social.

In the table below, the instructional outcomes identified by the evidence base are shown by age of participants.

Age	Academic	Behavior	Communication	Joint Attention	Motor	Play	Social
0-2			Yes	Yes		Yes	Yes
3-5	Yes	Yes	Yes	Yes		Yes	Yes
6-11	Yes	Yes	Yes	Yes		Yes	Yes
12-14			Yes				
15-18			Yes		Yes		Yes

EARLY INTERVENTION (0-2 YEARS):

***Barlow, K. E., Tiger, J. H., Slocum, S. K., & Miller, S. J. (2013). Comparing acquisition of exchange-based and signed mands with children with autism. *Analysis of Verbal Behavior, 29*, 59-69. https://doi.org/10.1007/bf03393124**

***Lerna, A., Esposito, D., Conson, M., & Massagli, A. (2014). Long-term effects of PECS on social-communicative skills of children with autism spectrum disorders: A follow-up study. *International Journal of Language & Communication Disorders*, *49*(4), 478-485. https://doi.org/10.1111/1460-6984.12079**

***Lerna, A., Esposito, D., Conson, M., Russo, L., & Massagli, A. (2012). Social-communicative effects of the Picture Exchange Communication System (PECS) in autism spectrum disorders. *International Journal of Language & Communication Disorders*, *47*(5), 609-617. https://doi.org/10.1111/j.1460-6984.2012.00172.x**

***McDuffie, A. S., Lieberman, R. G., & Yoder, P. J. (2012). Object interest in autism spectrum disorder: A treatment comparison. *Autism*, *16*(4), 398-405. https://doi.org/10.1177/1362361309360983**

PRESCHOOL (3-5 YEARS):

Agius, M. M., & Vance, M. (2016). A comparison of PECS and iPad to teach requesting to pre-schoolers with autistic spectrum disorders. *Augmentative and Alternative Communication, 32*(1), 58-68. https://doi.org/10.3109/07434618.2015.1108363

***Almirall, D., DiStefano, C., Chang, Y.-C., Shire, S., Kaiser, A., Lu, X., Nahum-Shani, I., Landa, R., Mathy, P., & Kasari, C. (2016). Longitudinal effects of adaptive interventions with a speech-generating device in minimally verbal children with ASD. *Journal of Clinical Child & Adolescent Psychology, 45*(4), 442-456. https://doi.org/10.1080/15374416.2016.1138407**

***Barlow, K. E., Tiger, J. H., Slocum, S. K., & Miller, S. J. (2013). Comparing acquisition of exchange-based and signed mands with children with autism. *Analysis of Verbal Behavior, 29*, 59-69. https://doi.org/10.1007/bf03393124**

***Carnett, A., Bravo, A., & Waddington, H. (2017). Teaching mands for actions to children with autism spectrum disorder using systematic instruction, behavior chain interruption, and a speech-generating device. *International Journal of Developmental Disabilities, 65*(2), 98-107. https://doi.org/10.1080/20473869.2017.1412561**

*Carr, D., & Felce, J. (2007). The effects of PECS teaching to phase III on the communicative interactions between children with autism and their teachers. *Journal of Autism and Developmental Disorders*, *37*(4), 724-737. https://doi.org/10.1007/s10803-006-0203-1

***Chang, Y.-C., Shih, W., Landa, R., Kaiser, A., & Kasari, C. (2018). Symbolic play in school-aged minimally verbal children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 48*(5), 1436-1445. https://doi.org/10.1007/s10803-017-3388-6**

Cook, J. L., Rapp, J. T., Burji, C., McHugh, C., & Nuta, R. (2017). A simple intervention for stereotypical engagement with an augmentative alternative communicative device. *Behavioral Interventions, 32*(3), 272-277. https://doi.org/10.1002/bin.1478

Dogoe, M. S., Banda, D. R., & Lock, R. H. (2010). Acquisition and generalization of the picture exchange communication system behaviors across settings, persons, and stimulus classes with three students with autism. *Education and Training in Autism and Development Disabilities*, *45*(2), 216-229.

Drager, K. D., Postal, V. J., Carrolus, L., Castellano, M., Gagliano, C., & Glynn, J. (2006). The effect of aided language modeling on symbol comprehension and production in 2 preschoolers with autism. *American Journal of Speech-Language Pathology*, *15*(2), 112-125. https://doi.org/10.1044/1058-0360(2006/012)

Ganz, J. B., Goodwyn, F. D., Boles, M. M., Hong, E. R., Rispoli, M. J., Lund, E. M., & Kite, E. (2013). Impacts of a PECS instructional coaching intervention on practitioners and children with autism. *Augmentative and Alternative Communication, 29*(3), 210-221. https://doi.org/10.3109/07434618.2013.818058

Ganz, J. B., Hong, E., Gilliland, W., Morin, K., & Svenkerud, N. (2015). Comparison between visual scene displays and exchange-based communication in augmentative and alternative communication for children with ASD. *Research in Autism Spectrum Disorders, 11*, 27-41. https://doi.org/10.1016/j.rasd.2014.11.005

Ganz, J. B., Hong, E., & Goodwyn, F. D. (2013). Effectiveness of the PECS phase III app and choice between the app and traditional PECS among preschoolers with ASD. *Research in Autism Spectrum Disorders, 7*(8), 973-983. https://doi.org/10.1016/j.rasd.2013.04.003

Genc-Tosun, D., & Kurt, O. (2017). Teaching multi-step requesting to children with autism spectrum disorder using systematic instruction and a speech-generating device. *Augmentative and Alternative Communication, 33*(4), 213-223. https://doi.org/10.1080/07434618.2017.1378717

Gevarter, C., O'Reilly, M. F., Rojeski, L., Sammarco, N., Sigafoos, J., Lancioni, G. E., & Lang, R. (2014). Comparing acquisition of AAC-based mands in three young children with autism spectrum disorder using iPad applications with different display and design elements. *Journal of Autism and Developmental Disorders, 44*(10), 2464-2474. https://doi.org/10.1007/s10803-014-2115-9

***Greenberg, A. L., Tomaino, M. A. E., & Charlop, M. H. (2012). Assessing generalization of the Picture Exchange Communication System in children with autism. *Journal of Developmental and Physical Disabilities, 24*(6), 539-558. https://doi.org/10.1007/s10882-012-9288-y**

Jurgens, A., Anderson, A., & Moore, D. W. (2009). The effect of teaching PECS to a child with autism on verbal behaviour, play, and social functioning. *Behaviour Change*, *26*(1), 66-81. https://doi.org/10.1375/bech.26.1.66

***Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., Murphy, S., & Almirall, D. (2014). Communication interventions for minimally verbal children with autism: Sequential multiple assignment randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 53*(6), 635-646. https://doi.org/10.1016/j.jaac.2014.01.019.**

King, M. L., Takeguchi, K., Barry, S. E., Rehfeldt, R. A., Boyer, V. E., & Mathews, T. L. (2014). Evaluation of the iPad in the acquisition of requesting skills for children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 8*(9), 1107-1120. https://doi.org/10.1016/j.rasd.2014.05.011

***Kodak, T., Paden, A., & Dickes, N. (2012). Training and generalization of peer-directed mands with non-vocal children with autism. *The Analysis of Verbal Behavior, 28*(1), 119-124. https://doi.org/**

***Lerna, A., Esposito, D., Conson, M., & Massagli, A. (2014). Long-term effects of PECS on social-communicative skills of children with autism spectrum disorders: A follow-up study. *International Journal of Language & Communication Disorders*, *49*(4), 478-485. https://doi.org/10.1111/1460-6984.12079**

***Lerna, A., Esposito, D., Conson, M., Russo, L., & Massagli, A. (2012). Social-communicative effects of the Picture Exchange Communication System (PECS) in autism spectrum disorders. *International Journal of Language & Communication Disorders*, *47*(5), 609-617. https://doi.org/10.1111/j.1460-6984.2012.00172.x**

Lorah, E., & Parnell, A. (2017). Acquisition of tacting using a speech-generating device in group learning environments for preschoolers with autism. *Journal of Developmental & Physical Disabilities, 29*(4), 597-609. https://doi.org/10.1007/s10882-017-9543-3

***Lorah, E. R., Parnell, A., & Speight, D. R. (2014). Acquisition of sentence frame discrimination using the iPad as a speech generating device in young children with developmental disabilities. *Research in Autism Spectrum Disorders, 8*(12), 1734-1740. https://doi.org/10.1016/j.rasd.2014.09.004**

Lorah, E., Tincani, M., Dodge, J., Gilroy, S., Hickey, A., & Hantula, D. (2013). Evaluating picture exchange and the iPad as a speech generating device to teach communication to young children with Autism. *Journal of Developmental & Physical Disabilities, 25*(6), 637-649. https://doi.org/10.1007/s10882-013-9337-1

Mancil, G. Richmond, L., Elizabeth R., & Whitby, P. S. (2016). Effects of iPod touch technology as communication devices on peer social interactions across environments. *Education and Training in Autism and Developmental Disabilities, 51*(3), 252-264.

***McDuffie, A. S., Lieberman, R. G., & Yoder, P. J. (2012). Object interest in autism spectrum disorder: A treatment comparison. *Autism*, *16*(4), 398-405. https://doi.org/10.1177/1362361309360983**

***McLay, L., Schafer, M. C. M., van der Meer, L., Couper, L., McKenzie, E., O'Reilly, Mark F., Lancioni, G. E., Marschik, P. B., Sigafoos, J., & Sutherland, D. (2017). Acquisition, preference and follow-up comparison across three AAC modalities taught to two children with autism spectrum disorder. *International Journal of Disability, Development & Education, 64*(2), 117-130. https://doi.org/10.1080/1034912X.2016.1188892**

***McLay, L., van der Meer, L., Schafer, M. C. M., Couper, L., McKenzie, E., O'Reilly, M. F., Lancioni, G. E., Marschik, P. B., Green, V. A., Sigafoos, J., & Sutherland, D. (2015). Comparing acquisition, generalization, maintenance, and preference across three AAC options in four children with autism spectrum disorder. *Journal of Developmental and Physical Disabilities, 27*(3), 323-339. https://doi.org/10.1007/s10882-014-9417-x**

***Still, K., May, R. J., Rehfeldt, R. A., Whelan, R., & Dymond, S. (2015). Facilitating derived requesting skills with a touchscreen tablet computer for children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 19*, 44-58. https://doi.org/10.1016/j.rasd.2015.04.006**

***Strasberger, S. K., & Ferreri, S. J. (2014). The effects of peer assisted communication application training on the communicative and social behaviors of children with autism. *Journal of Developmental and Physical Disabilities, 26*(5), 513-526. https://doi.org/10.1007/s10882-013-9358-9**

Thiemann-Bourque, K., Brady, N., McGuff, S., Stump, K., & Naylor, A. (2016). Picture exchange communication system and pals: A peer-mediated augmentative and alternative communication intervention for minimally verbal preschoolers with autism. *Journal of Speech, Language, and Hearing Research, 59*(5), 1133-1145. https://doi.org/10.1044/2016_jslhr-l-15-0313

Thiemann-Bourque, K. S., McGuff, S., & Goldstein, H. (2017). Training peer partners to use a speech-generating device with classmates with autism spectrum disorder: Exploring communication outcomes across preschool contexts. *Journal of Speech Language and Hearing Research, 60*(9), 2648-2662. https://doi.org/10.1044/2017_JSLHR-L-17-0049

ELEMENTARY SCHOOL (6-11 YEARS):

*Ali, E., MacFarland, S. Z., & Umbreit, J. (2011). Effectiveness of combining tangible symbols with the Picture Exchange Communication System to teach requesting skills to children with multiple disabilities including visual impairment. *Education and Training in Autism and Developmental Disabilities*, *46*(3), 425-435.

***Almirall, D., DiStefano, C., Chang, Y.-C., Shire, S., Kaiser, A., Lu, X., Nahum-Shani, I., Landa, R., Mathy, P., & Kasari, C. (2016). Longitudinal effects of adaptive interventions with a speech-generating device in minimally verbal children with ASD. *Journal of Clinical Child & Adolescent Psychology, 45*(4), 442-456. https://doi.org/10.1080/15374416.2016.1138407**

Alzrayer, N. M., Banda, D. R., & Koul, R. (2017). Teaching children with autism spectrum disorder and other developmental disabilities to perform multistep requesting using an iPad. *Augmentative and Alternative Communication, 33*(2), 65-76. https://doi.org/10.1080/07434618.2017.1306881

Angermeier, K., Schlosser, R. W., Luiselli, J. K., Harrington, C., & Carter, B. (2007). Effects of iconicity on requesting with the Picture Exchange Communication System in children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *2*(3), 430-446. https://doi.org/10.1016/j.rasd.2007.09.004

***Barlow, K. E., Tiger, J. H., Slocum, S. K., & Miller, S. J. (2013). Comparing acquisition of exchange-based and signed mands with children with autism. *Analysis of Verbal Behavior, 29*, 59-69. https://doi.org/10.1007/bf03393124**

Boesch, M. C., Wendt, O., Subramanian, A., & Hsu, N. (2013). Comparative efficacy of the Picture Exchange Communication System (PECS) versus a speech-generating device: Effects on requesting skills. *Research in Autism Spectrum Disorders, 7*(3), 480-493. https://doi.org/10.1016/j.rasd.2012.12.002

Brady, N. C., Storkel, H. L., Bushnell, P., Barker, R. M., Saunders, K., Daniels, D., & Fleming, K. (2015). Investigating a multimodal intervention for children with limited expressive vocabularies associated with autism. *American Journal of Speech-Language Pathology, 24*(3), 438-459. https://doi.org/10.1044/2015_ajslp-14-0093

***Carnett, A., Bravo, A., & Waddington, H. (2017). Teaching mands for actions to children with autism spectrum disorder using systematic instruction, behavior chain interruption, and a speech-generating device. *International Journal of Developmental Disabilities, 65*(2), 98-107. https://doi.org/10.1080/20473869.2017.1412561**

*Carr, D., & Felce, J. (2007). The effects of PECS teaching to phase III on the communicative interactions between children with autism and their teachers. *Journal of Autism and Developmental Disorders*, *37*(4), 724-737. https://doi.org/10.1007/s10803-006-0203-1

***Chang, Y.-C., Shih, W., Landa, R., Kaiser, A., & Kasari, C. (2018). Symbolic play in school-aged minimally verbal children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 48*(5), 1436-1445. https://doi.org/10.1007/s10803-017-3388-6**

Choi, H., O'Reilly, M., Sigafoos, J., & Lancioni, G. (2010). Teaching requesting and rejecting sequences to four children with developmental disabilities using augmentative and alternative communication. *Research in Developmental Disabilities*, *31*(2), 560-567. https://doi.org/10.1016/j.rasd.2010.08.005

Conallen, K., & Reed, P. (2012). The effects of a conversation prompt procedure on independent play. *Research in Autism Spectrum Disorders, 6*(1), 365-377. https://doi.org/10.1016/j.rasd.2011.06.010

***Greenberg, A. L., Tomaino, M. A. E., & Charlop, M. H. (2012). Assessing generalization of the Picture Exchange Communication System in children with autism. *Journal of Developmental and Physical Disabilities, 24*(6), 539-558. https://doi.org/10.1007/s10882-012-9288-y**

Haq, S. S., Machalicek, W., Garbacz, S. A., & Drew, C. (2017). Employing a fixed-lean multiple schedule in the treatment of challenging behavior for children with autism spectrum disorder. *Behavior Modification, 42*(4), 610-633. https://doi.org/10.1177/0145445517743206

Howlin, P., Gordon, R. K., Pasco, G., Wade, A., & Charman, T. (2007). The effectiveness of Picture Exchange Communication System (PECS) training for teachers of children with autism: A pragmatic, group randomised controlled trial. *Journal of Child Psychology and Psychiatry*, *48*(5), 473-481. https://doi.org/10.1111/j.1469-7610.2006.01707.x

***Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., Murphy, S., & Almirall, D. (2014). Communication interventions for minimally verbal children with autism: Sequential multiple assignment randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 53*(6), 635-646. https://doi.org/10.1016/j.jaac.2014.01.019.**

***Kodak, T., Paden, A., & Dickes, N. (2012). Training and generalization of peer-directed mands with non-vocal children with autism. *The Analysis of Verbal Behavior, 28*(1), 119-124. https://doi.org/**

***Lorah, E. R. (2016). Comparing teacher and student use and preference of two methods of augmentative and alternative communication: Picture exchange and a speech-generating device. *Journal of Developmental and Physical Disabilities, 28(*5), 751-767. https://doi.org/10.1007/s10882-016-9507-z**

***Lorah, E. R., Parnell, A., & Speight, D. R. (2014). Acquisition of sentence frame discrimination using the iPad as a speech generating device in young children with developmental disabilities. *Research in Autism Spectrum Disorders, 8*(12), 1734-1740. https://doi.org/10.1016/j.rasd.2014.09.004**

***Lorah, E. R., Karnes, A., & Speight, D. R. (2015). The acquisition of intraverbal responding using a speech generating device in school aged children with autism. *Journal of Developmental and Physical Disabilities, 27*(4), 557-568. https://doi.org/10.1007/s10882-015-9436-2**

***McLay, L., Schafer, M. C. M., van der Meer, L., Couper, L., McKenzie, E., O'Reilly, Mark F., Lancioni, G. E., Marschik, P. B., Sigafoos, J., & Sutherland, D. (2017). Acquisition, preference and follow-up comparison across three AAC modalities taught to two children with autism spectrum disorder. *International Journal of Disability, Development & Education, 64*(2), 117-130. https://doi.org/10.1080/1034912X.2016.1188892**

***McLay, L., van der Meer, L., Schafer, M. C. M., Couper, L., McKenzie, E., O'Reilly, M. F., Lancioni, G. E., Marschik, P. B., Green, V. A., Sigafoos, J., & Sutherland, D. (2015). Comparing acquisition, generalization, maintenance, and preference across three AAC options in four children with autism spectrum disorder. *Journal of Developmental and Physical Disabilities, 27*(3), 323-339.** https://doi.org/10.1007/s10882-014-9417-x

Smith, J., Hand, L., & Dowrick, P. W. (2014). Video feedforward for rapid learning of a picture-based communication system. *Journal of Autism and Developmental Disorders, 44*(4), 926-936. https://doi.org/10.1007/s10803-013-1946-0

***Still, K., May, R. J., Rehfeldt, R. A., Whelan, R., & Dymond, S. (2015). Facilitating derived requesting skills with a touchscreen tablet computer for children with autism spectrum disorder. *Research in Autism Spectrum Disorders, 19*, 44-58. https://doi.org/10.1016/j.rasd.2015.04.006**

***Strasberger, S. K., & Ferreri, S. J. (2014). The effects of peer assisted communication application training on the communicative and social behaviors of children with autism. *Journal of Developmental and Physical Disabilities, 26*(5), 513-526. https://doi.org/10.1007/s10882-013-9358-9**

van der Meer, L., Kagohara, D., Achmadi, D., O'Reilly, M. F., Lancioni, G. E., Sutherland, D., & Sigafoos, J. (2012). Speech-generating devices versus manual signing for children with developmental disabilities. *Research in Developmental Disabilities, 33*(5), 1658-1669. https://doi.org/10.1016/j.ridd.2012.04.004

MIDDLE SCHOOL (12-14 YEARS):

*Ali, E., MacFarland, S. Z., & Umbreit, J. (2011). Effectiveness of combining tangible symbols with the Picture Exchange Communication System to teach requesting skills to children with multiple disabilities including visual impairment. *Education and Training in Autism and Developmental Disabilities*, *46*(3), 425-435.

***Carnett, A., Bravo, A., & Waddington, H. (2017). Teaching mands for actions to children with autism spectrum disorder using systematic instruction, behavior chain interruption, and a speech-generating device. *International Journal of Developmental Disabilities, 65*(2), 98-107. https://doi.org/10.1080/20473869.2017.1412561**

***Lorah, E. R. (2016). Comparing teacher and student use and preference of two methods of augmentative and alternative communication: Picture exchange and a speech-generating device. *Journal of Developmental and Physical Disabilities, 28(*5), 751-767. https://doi.org/10.1007/s10882-016-9507-z**

***Lorah, E. R., Karnes, A., & Speight, D. R. (2015). The acquisition of intraverbal responding using a speech generating device in school aged children with autism. *Journal of Developmental and Physical Disabilities, 27*(4), 557-568. https://doi.org/10.1007/s10882-015-9436-2**

***Strasberger, S. K., & Ferreri, S. J. (2014). The effects of peer assisted communication application training on the communicative and social behaviors of children with autism. *Journal of Developmental and Physical Disabilities, 26*(5), 513-526. https://doi.org/10.1007/s10882-013-9358-9**

HIGH SCHOOL (15-18 YEARS):

Hughes, C., Bernstein, R. T., Kaplan, L. M., Reilly, C. M., Brigham, N. L., Cosgriff, J. C., & Boykin, M. P. (2013). Increasing conversational interactions between verbal high school students with autism and their peers without disabilities. *Focus on Autism and Other Developmental Disabilities, 28*(4), 241-254. https://doi.org/10.1177/1088357613487019

Kagohara, D. M., van der Meer, L., Achmadi, D., Green, V. A., O'Reilly, M. F., Mulloy, A., Lancioni, G.E., Lang, R., & Sigafoos, J. (2010). Behavioral intervention promotes successful use of an iPod-based communication device by an adolescent with autism. *Clinical Case Studies*, *9*(5), 328-338. https://doi.org/10.1177/1534650110379633

Notes: * denotes the study has participants in at least two age ranges
Bold denotes new studies since 2011 (2012 till 2017)

Augmentative & Alternative Communication Types

Unaided communication systems: Does not use any materials or technology, only a motion of your body (e.g., sign language and gestures)

- **Conventional gestures:** Communicative gestures used and understood by most members of a social group. In the United States, these include actions such as shoulder shrugging, head nodding/shaking, pointing, thumbs up/down, and high fives.
- **American Sign Language (ASL):** A complete natural language comprised of facial expressions and hand/finger movements with the same linguistic characteristics of spoken language, often used by the deaf/hard of hearing community.
- **Informal sign use (for example, "Baby signing"):** A set of simple hand gestures and movements designed to enhance communication for children who do not use much or any spoken language. May contain single word signs from ASL but not grammatical aspects of that language. May also include gestures that are unique and only understood by the child and their common communication partners.

Low-tech aided communication systems: Aided systems that use some type of material or device. They include low-tech systems (e.g., exchanging objects/ pictures or pointing to letters) and extend to mid-tech and high-tech speech generating devices (SGDs) and applications that allow other devices (i.e., phones, tablets) to serve as SGDs.

- **Picture Exchange Communication System (PECS):** a formal evidence-based system of augmentative communication using picture exchange of standard images that represent words.
- **Communication books & boards:** Object choice board, choice board using photographs of objects/events, communication book using photographs, simple communication board using photographs, or complex communication book using symbols and letters.

Speech generating aided communication systems: Aided systems that use some type of material or device. They include low-tech systems (e.g., exchanging objects/ pictures or pointing to letters) and extend to mid-tech and high-tech speech generating devices (SGDs) and applications that allow other devices (i.e., phones, tablets) to serve as SGDs.

- **Communication buttons/switches, Speech generating keyboard, Speech generating communication boards, Speech generating device, Speech generating application on a tablet**

DATA COLLECTION: OBSERVATIONS

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Collect data observations on the learner's communication behaviors.

Date	Activity	Communication Partner	Observation Notes
		❑ Teacher ❑ Para ❑ Peer ❑ Other:	
		❑ Teacher ❑ Para ❑ Peer ❑ Other:	
		❑ Teacher ❑ Para ❑ Peer ❑ Other:	
		❑ Teacher ❑ Para ❑ Peer ❑ Other:	
		❑ Teacher ❑ Para ❑ Peer ❑ Other:	

FAMILY CONSIDERATIONS

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Skill/Goal/Behavior: _____
Directions: Use this sheet to guide discussion about AAC during a family meeting.

CONSIDERATIONS:

1. What are your hopes for the AAC device and your child's communication? Can we set some goals together and work on them both at home and at school?

2. Who is with the child most while they are at home? What types of activities does the child participate in outside of school? Who would be the best person to be trained to program the device for home use? Who interacts with the child and will need basic training on what to expect?

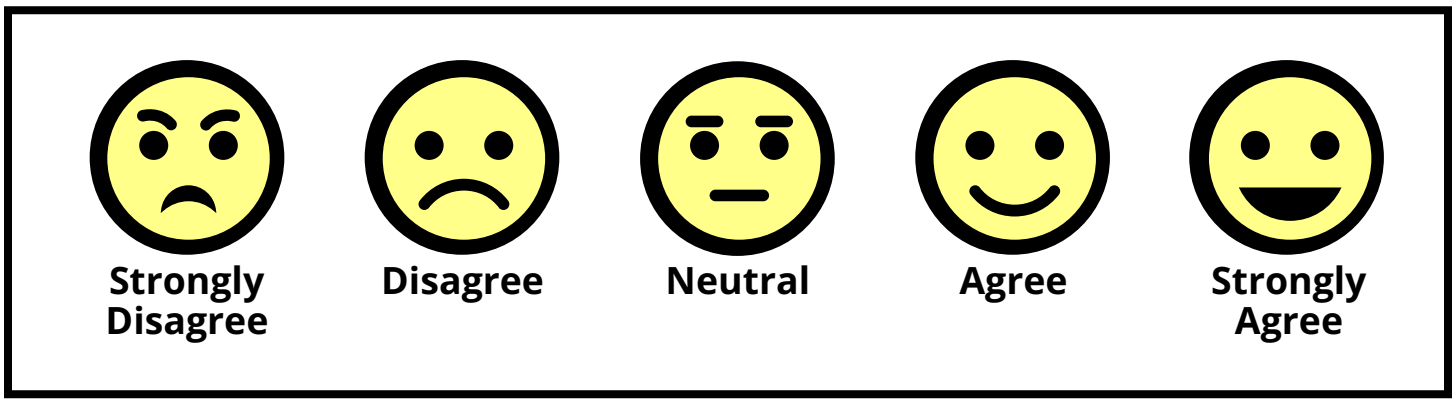
3. What kinds of technology do you use in your home? Who uses these devices? Who does not use them? Are there people who are more/less comfortable with technology and how can we make sure all of them can communicate with the child?

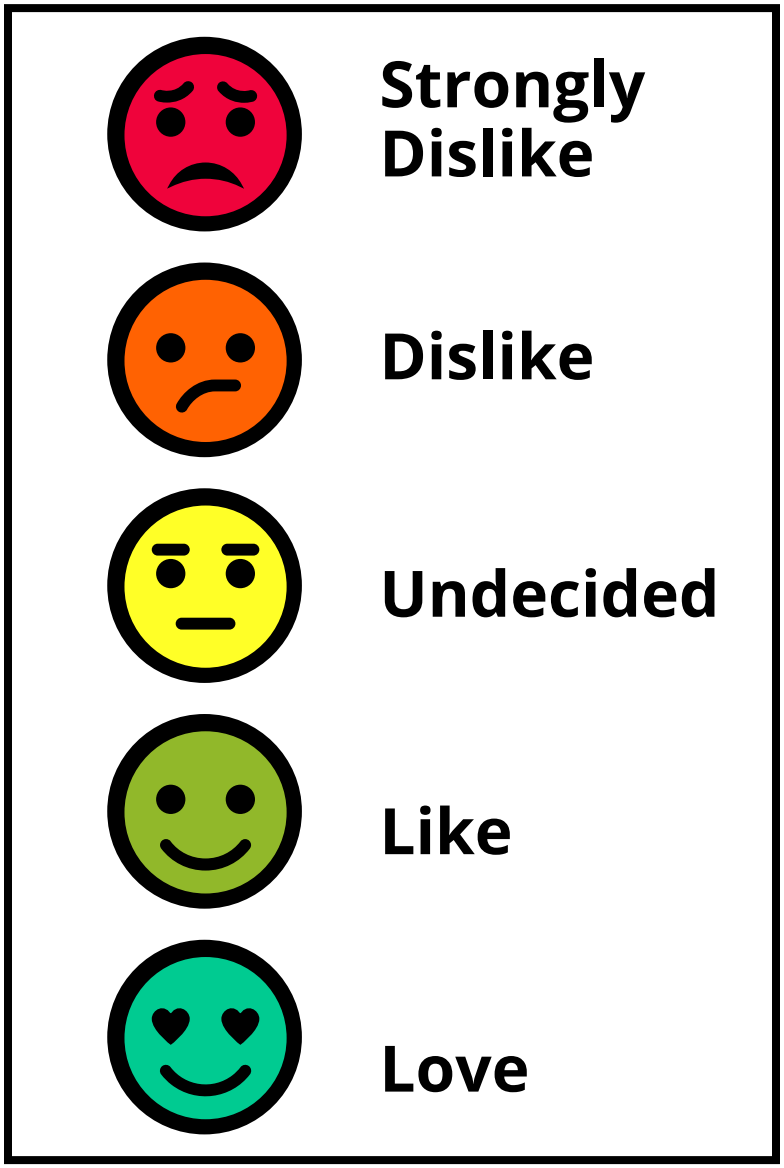
4. Do you have rules about screen time and technology use at home? Can we talk about parental controls on the device and other ways to ensure your child is not misusing the device and still following your house rules? Can we troubleshoot ways to tell the other children in your home that the AAC device is different than screen time?

5. Can you think of a good place in your home to store and charge the device when it is not being used? Is this place safe from pets and other potential hazards?

6. What are your biggest concerns about the AAC device? Can we troubleshoot those concerns together and come up with a plan?

Visual Supports: Feelings





Prompting Hierarchy

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Interfering Behavior: _____
Directions: Use this checklist to determine order of prompts based on the learner's needs and the target skill.

PROMPTS:

- **Gestural** – a physical movement that provides the learner with information about how to perform the target skill/behavior
- **Independent** – the learner can perform the target skill/behavior without assistance or support from others
- **Model** – demonstrating the correct way to perform the target skill/behavior for the learner
- **Physical** – hands-on assistance given to the learner to support them to perform the target skill/behavior
- **Verbal** – any spoken words direct to the learner to help them perform the target skill/behavior
- **Visual** – a picture, icon, or physical object used to provide the learner with information on how to perform the target skill/behavior

Level	Prompt	Instructions
Level 1	Independent	
Level 2		
Level 3		
Level 4		
Level 5		
Level 6		

REINFORCER SAMPLING & CHECKLIST

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Interfering Behavior: _____
Directions: Use this worksheet and checklist to identify and select reinforcers/rewards based on the learner's preferred items, interests, and activities for **Positive Reinforcement** and **Token Economy**.

CONDUCT A REINFORCER SAMPLING:

1. Sit in front of the learner and hold up two items. Ask the learner to "Pick one."
2. Wait 10 seconds for the learner to indicate selection in manner that is appropriate for the learner (e.g., verbalization, pointing, using an augmentative communication device).
3. Place the selected object in a container for learner's selection and non-selected item in the not selected container.
4. Repeat steps 1 through 3 until half of the objects presented are selected.

Item 1	Selected?	Item 2	Selected?
	Yes No		Yes No
	Yes No		Yes No
	Yes No		Yes No
	Yes No		Yes No
	Yes No		Yes No
	Yes No		Yes No
	Yes No		Yes No

LIST SELECTED REINFORCERS:

LIST POTENTIAL REINFORCERS:

AGE APPROPRIATE?

1. What natural reinforcers could be used?

   Yes No

2. What activities, objects, and/or foods does the learner select independently?

   Yes No

3. What phrases or gestures seem to produce a pleasant response from the learner?

   Yes No

4. What does the learner say they would like to work for (if appropriate)?

   Yes No

5. What reinforcers were identified by parents/family members and/or team members as being successful in the past?

   Yes No

6. Does the learner require additional adaptations/ modifications/supports? Such as visual supports or a communication device?

   Yes No

7. Have reinforcers/rewards for the learner been identified based on the learner's interests/preferred items and/or activities?

   Yes No

8. Are additional materials and/or resources for using Functional Behavior Assessment ready and available?

   Yes No

FOODS FOR SNACKS/MEALTIME ROUTINES:

- ❑ Cheese
- ❑ Chicken Nuggets
- ❑ Chips
- ❑ French Fries
- ❑ Fruit
- ❑ Goldfish
- ❑ Ice Cream
- ❑ Pizza
- ❑ Pretzels
- ❑ Other:
- ❑ Other:
- ❑ Other:

GAMES FOR PLAY/RECESS ROUTINES:

- ❑ Burrito games with a blanket
- ❑ Chase
- ❑ Pat-a-Cake
- ❑ Peek-a-Boo
- ❑ Tickles
- ❑ Other:
- ❑ Other:
- ❑ Other:
- ❑ Other:

TOYS FOR PLAY/RECESS ROUTINES:

- ❑ Books
- ❑ Cars/Trains/Trucks
- ❑ Computer
- ❑ Doll house
- ❑ Legos
- ❑ Noisy toys
- ❑ Phones
- ❑ Puzzles
- ❑ Remote controlled toys
- ❑ Other:
- ❑ Other:
- ❑ Other:

SPECIAL INTERESTS FOR ACTIVITIES/ROUTINES:

- ❑ Book Character:
- ❑ Book:
- ❑ Cars, Trains, Trucks
- ❑ Computers/Technology
- ❑ Dinosaurs
- ❑ Letters
- ❑ Movie Character:
- ❑ Movie:
- ❑ Music
- ❑ Numbers
- ❑ Real-Life Person:
- ❑ TV Show Character:
- ❑ TV Show:
- ❑ Video Game:
- ❑ Other:
- ❑ Other:
- ❑ Other:

Communication Goals Plan

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Identify communicative goals for the learner and plan for which setting(s) and communication partner the learner will work on these goals in/with.

Goal	Activity	Communication Partner
		❑ Teacher ❑ Para ❑ Peer ❑ Other:
		❑ Teacher ❑ Para ❑ Peer ❑ Other:
		❑ Teacher ❑ Para ❑ Peer ❑ Other:
		❑ Teacher ❑ Para ❑ Peer ❑ Other:
		❑ Teacher ❑ Para ❑ Peer ❑ Other:

PLANNING CHECKLIST

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Skill/Goal/Behavior: _____
Directions: Complete this checklist to determine if AAC is ready to use with the learner on the spectrum.

CONDUCT LEARNER ASSESSMENT:

- ❑ Is the learner making little progress toward communication goals during academic or social parts of the school day?
- ❑ Is the learner showing frustration or other negative behaviors when there are communication demands placed on them during the school day?
- ❑ Do the learner's teachers, family, and/or peers have a hard time understanding the learner's current communication or spoken language?
- ❑ Does the learner seem interested in participating in activities or communicating with others but lack the language to do so effectively?
- ❑ Does the learner show little engagement in daily activities or seem withdrawn?
- ❑ Has the learner's family mentioned communication concerns or the desire for the student to have more effective communication?
- ❑ Does the learner seem to have matured beyond their current AAC system?

Note: If you checked off any of these questions, then the learner may need a more thorough assessment with your school speech-language pathologist or assistive technology specialist.

SELECT ADDITIONAL EBPS:

- ❑ Modeling
- ❑ Peer-Based Instruction & Intervention
- ❑ Prompting
- ❑ Reinforcement
- ❑ Time Delay
- ❑ Video Modeling
- ❑ Visual Supports
- ❑ Other:

PLANNING:

- ❑ Has the target goal/behavior/skill been identified?
- ❑ Is the target goal/behavior/skill measurable and observable? Does it clearly state **what** the target goal/behavior/skill is, **when** it will occur, and **how** team members/observers will know it has been mastered?
- ❑ Has baseline data and/or a functional behavior assessment been collected through direct observation of the learner?
- ❑ Have the family's preferences for AAC and technology been considered?
- ❑ Have available AAC resources been identified?
- ❑ Does the learner have needed prerequisite skills/abilities?
- ❑ Have times and settings been identified for AAC use?
- ❑ Have reinforcers/rewards for the learner been identified based on the learner's interests/preferred items and/or activities?
- ❑ Are additional materials and/or resources for using this selected practice ready and available?
- ❑ Have team members been identified and trained?
- ❑ Is Augmentative & Alternative Communication appropriate for the learner's target goal/behavior/skill?

DATA COLLECTION: FREQUENCY

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Collect data on the frequency and setting of the learner demonstrating the target goal/behavior/skill to determine if the learner is making progress.

Activity	Communication Partner	Notes on Opportunities/Tally	Total Tally	Support/Prompts Needed
	❑ Teacher ❑ Para ❑ Peer ❑ Other:			
	❑ Teacher ❑ Para ❑ Peer ❑ Other:			
	❑ Teacher ❑ Para ❑ Peer ❑ Other:			
	❑ Teacher ❑ Para ❑ Peer ❑ Other:			
	❑ Teacher ❑ Para ❑ Peer ❑ Other:			

Prompt Key: VB = Verbal; VSP = Prompt to use Visual Support; G = Gestural; M = Model; P = Physical; I = No prompts needed/Independent; IS = Independent with support (VS = Visual Support; VM = Video Modeling; SN = Social Narratives)

ANECDOTAL NOTES:

DATA COLLECTION: ACROSS SETTINGS

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Goal/Behavior/Skill: _____
Directions: Collect data on the use of the AAC device across settings.

Setting	AAC Used?	Notes
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	
	❑ Yes	

Troubleshooting Guide

Learner is only communicating when prompted
- Use time delay to reduce prompt reliance.
- Interpret the learner's nonverbal communication and use modeling to demonstrate use of the device. For example, teacher says, "I see you reaching. You want that. Here's how you can tell me." This method teaches the learner the power of their communication.
- Model symbolic representations throughout the school day to increase receptive understanding. For example, the teacher may model bead patterns during math and say which beads are the same/different as the one before while pointing to the words on the learner's device to make this abstract concept symbolically represented.

Learner is only communicating in one context
- Think of what is so motivating in that context and see if it can transfer to another setting.
- Increase use of reinforcement for communicating in other settings.
- Check in with teachers in other contexts to make sure they are using and reinforcing AAC.

Learner is only communicating with adults
- Train peers to prompt and reinforce the student for communicating.

Learner is refusing to use their device
- Reduce the number of word choices displayed. Simplify the demands placed on the student.
- Use motivating reinforcers.
- Monitor other reasons why the student may resist the device – think about sensory components like how heavy it is, what sounds it makes, etc.

Communication device is not working
- Make sure the device is charged and all software is updated.
- Power down the device for a few minutes and try again.
- Call the tech support specialist for the device or the local device representative.

Learner is using the device for purposes other than communication
- Use reinforcement or other EBPs to promote appropriate use of the device for communicating.

MONITORING PROGRESS CHECKLIST

Learner's Name: _____ **Date/Time:** _____
Observer(s): _____
Target Skill/Goal/Behavior: _____
Directions: Complete this checklist to determine if the learner is making progress with using Augmentative & Alternative Communication.

REFLECTION:

1. How do you think that went?

2. At which points did you see strategies working?

3. What could you have done differently?

❑ Did you encounter any challenges implementing AAC or other EBP strategies?

❑ Did you feel comfortable implementing the AAC strategies?

❑ Did the learner respond positively to naturally occurring reinforcers?

❑ Did the learner seem to enjoy the activities?

MONITORING PROGRESS:

❑ Has data been collected to determine if the learner is making progress?

❑ Has the learner achieved the target goal/behavior/skill?

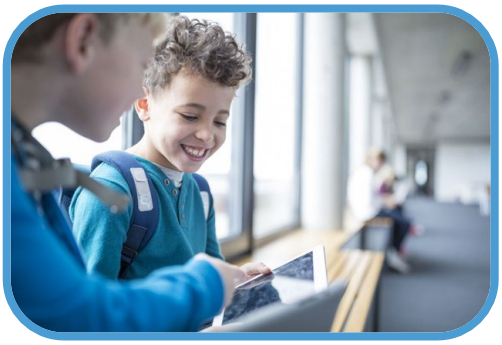
❑ Is the target goal/behavior/skill measurable and observable? Does it clearly state **what** the target goal/behavior/skill is, **when** it will occur, and **how** team members/observers will know it has been mastered?

❑ Are all team members using/supporting AAC in a consistent manner?

❑ Was TA implemented with fidelity (see Implementation Checklist)?

STEP-BY-STEP GUIDE

This step-by-step practice guide outlines how to plan for, use, and monitor Augmentative & Alternative Communication.



BEFORE YOU BEGIN…

Each of the following points is important to address so that you can be sure Augmentative & Alternative Communication is likely to address the target goal/behavior/skill of your learner on the spectrum.

HAVE YOU FOUND OUT MORE INFORMATION ABOUT…?

- ❑ Identifying the behavior…?
- ❑ Collecting baseline data through direct observation…?
- ❑ Establishing a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered…?

If the answer to any of the above questions is 'No,' review the process of how to select an appropriate EBP (https://afirm.fpg.unc.edu/selecting-EBP).

For more information about Augmentative & Alternative Communication, please visit https://afirm.fpg.unc.edu/ .

Keep in mind that **Augmentative & Alternative Communication** can be used to increase student communication, socialization, and engagement while reducing interfering behaviors.

STEP 1: PLANNING FOR AAC

The planning step details the initial steps and considerations involved to prepare for using Augmentative & Alternative Communication with a learner on the spectrum.

1. **Determine if an assessment for AAC is needed**
   If the learner does not yet verbally communicate or has limited spoken language, using AAC may be appropriate. The learner may need a thorough assessment with a speech-language pathologist or assistive technology specialist.
   Use the **Planning Checklist** as a guide when planning for AAC.

2. **Conduct an AAC assessment**
   Typically, a speech-language pathologist takes the lead on conducting a formal AAC assessment. Other team members contribute valuable information to inform the assessment process.
   Use the **Data Collection: Observation** sheet to document observations on the learner's communication behaviors.

3. Discuss tech and AAC preferences

The learner's family and the learner are important members of the AAC team. Discussing their technology and AAC preferences allows the team to plan for appropriate AAC use across school and home settings.

- Use the **Visual Support: Feelings** sheet to determine the learner's feelings about various AAC devices.
- Use the **Family Considerations** sheet as a discussion guide during a family meeting about AAC.

4. Identify available AAC resources

The learner may need to borrow or purchase an AAC device. Speech-language pathologists who provide AAC services will be familiar with available funding options.

- Low tech systems can be created by the SLP and typically do not need funding.
- High tech systems are considered durable medical equipment (DME) and may be covered by insurance.
- If the learner's IEP indicates the need for an AAC device, the school system may cover the cost of the device.

5. Select EBPs for teaching use of the AAC system

The following evidence-based practices may be needed to teach a learner to use their AAC system.

- Modeling (MD)
- Peer-based instruction & intervention (PBII)
- Prompting (PP)
- Reinforcement (R+)
- Time delay (TD)
- Visual supports (VS)

6. Plan opportunities for learner to use AAC

Carefully review the learner's daily activities and social interactions to plan opportunities for them to use their AAC system. The goal is for AAC learning and opportunities to be happening all day, every day.

- Use the **Communicative Goals Plan** guide to determine times and communicative goals for the learner.

7. Identify and train team members

Once the AAC system is ready for use, train the learner, their communication partners and team members on the use of the device. Set up the school environment for success by preparing everyone at school who interacts with the student to support the use of the AAC device.

8. **Prepare materials**
   Prepare materials for either low tech or high-tech systems. Also prepare the data collection form, prompting hierarchy and reinforcers.
   - Low tech systems:
     - Select objects or print symbols or photos used on switches or in communication books
     - Select the format for a communication book
     - Organize communication book, board, switches with the correct vocabulary for each class or activity
   - High tech devices:
     - Device case and screen protector
     - Tracking application in case device is lost
     - Program the device
     - Vocabulary selection to meet the student's needs throughout the day

   Use the **Planning Checklist** to determine if you are ready to use AAC.

STEP 2: USING AAC

This step details the process of implementing Augmentative & Alternative Communication with a learner on the spectrum.

1. **Teach the learner to use the AAC system**
   When teaching the learner to use the AAC system, keep in mind:
   - the whole team should collaborate to ensure the AAC system teaching is consistent across settings
   - the teaching environments noted on the Communicative Goals Plan
   - the EBPS selected to support the learner's goals

2. **Understand formalized AAC teaching approaches**
   In addition to using identified EBPs, a speech-language pathologist may also use a formalized AAC teaching approach. Not all approaches are recognized as evidence-based practices but may have some evidence to support them.

3. **Reinforce the learner for using their AAC device**
   Some learners may benefit from reinforcement for communication goals that are less motivating. Remember the basic rules of reinforcement.
   - Be consistent with the schedule of reinforcement.
   - Remind the student what they are working toward.
   - Provide reinforcement immediately when the student uses the target skill (or after the token reinforcement goal is reached).
   - Vary the types of reinforcers used.

4. **Ensure consistent device usage**
   The learner's AAC system must travel with the student wherever they go to ensure it is used across contexts. The device should be portable, available at all times, and other people in the environment should be aware of its use.

STEP 3: MONITORING AAC

The following step details how to monitor the use of Augmentative & Alternative Communication with a learner on the spectrum and how to determine next steps based on the data.

1. **Collect and analyze data**
   Collect and analyze data on the student's use of AAC by goal. Be sure to monitor:
   - The number of opportunities to communicate
   - Who the communication partner is
   - How much support the learner needs to use the device

   Use the **Data Collection: Frequency form** (includes space for anecdotal notes) to monitor behaviors.

2. **Monitor use of the AAC system across settings**
   Collect information from the learner's family, peers, other teachers, or the student to monitor AAC use across the day.

   Use the **Data Collection Form: Across Setting** to collect data on the use of the AAC system across settings.

   Use the **Monitoring Progress Checklist** to support your understanding of collected data and determine learner progress.

3. **Troubleshoot issues**
   Use the data you have collected to troubleshoot issues with using AAC. Data from across contexts can be helpful to the SLP when planning next steps for the learner's use of AAC.

   Use the **Troubleshooting Guide** to address issues with using AAC.

4. **Determine next steps based on learner progress**
   Collecting data will help team members decide about the effectiveness of using Augmentative & Alternative Communication and whether the learner on the spectrum is making progress. If a learner is making progress based upon data collected, team members should continue to use the selected strategies.

   If team members determine that the learner is not making progress, consider the following:
   - Has data been collected to determine if the learner is making progress?
   - Has the learner achieved the target goal/behavior/skill?
   - Is the target goal/behavior/skill measurable and observable? Does it clearly state what the target goal/behavior/skill is, when it will occur, and how team members/observers will know it has been mastered?
   - Is the target goal/behavior/skill too difficult/complex? Does it need to be broken down into smaller steps?
   - Has enough time been devoted to using this practice (frequency, intensity, and/or duration)?
   - Does the learner need additional supports?
   - Are all team members using/supporting AAC in a consistent manner?
   - Was TA implemented with fidelity (see Implementation Checklist)?

   If these issues have been addressed and the learner on the spectrum continues not to show progress, consider selecting a different evidence-based practice to use with the learner on the spectrum.

Implementation Checklist

BEFORE YOU START, HAVE YOU…?

- ❑ Identifying the target goal/behavior/skill…?
- ❑ Collecting baseline data through direct observation…?
- ❑ Establishing a target goal or outcome that clearly states when the behavior will occur, what the target goal or outcome is, and how team members and/or observers will know when the skill is mastered…?

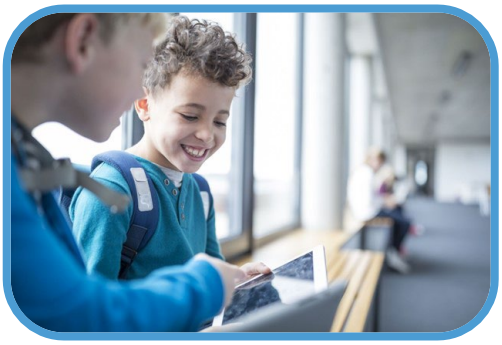
If the answer to any of the above questions is 'No,' review the process of how to select an appropriate EBP (https://afirm.fpg.unc.edu/selecting-EBP).

	Observation:	**1**	**2**	**3**	**4**	**5**
	Date:					
	Observer's Initials:					
	STEP 1: PLANNING					
1.1	Determine if an AAC assessment may be appropriate for a learner					
1.2	Conduct an AAC assessment					
1.3	Discuss technology and AAC preferences with family and learner					
1.4	Identify available AAC resources					
1.5	Select additional EBPs for teaching use of the AAC system					
1.6	Plan opportunities for the learner to use AAC					
1.7	Identify and train team members					
1.8	Prepare and have materials ready and available					
	STEP 2: USING					
2.1	Teach learner to use AAC device					
2.2	Understand formalized AAC teaching approaches					
2.3	Give reinforcement					
2.4	Ensure consistent use of AAC across settings					
	STEP 3: MONITORING					
3.1	Collect and analyze data					
3.2	Monitor use of AAC across settings					
3.3	Troubleshoot issues (if needed)					
3.4	Determine next steps based on learner progress					

Tip Sheet for Professionals

AUGMENTATIVE & ALTERNATIVE COMMUNICATION …

- A system of communication that is not verbal/vocal including aided and unaided communication systems
- Used to increase a target goal/behavior/skill and/or to decrease an interfering/inappropriate behavior



WHY USE WITH LEARNERS ON THE SPECTRUM?

- AAC provides an alternate means of expressive communication when a learner has limited words or verbal communication.
- AAC uses visual supports to make abstract social and communication concepts more concrete for learners.
- The technology used in AAC devices may be motivating to learners.

INSTRUCTIONAL OUTCOMES:

The evidence-base for Augmentative & Alternative Communication supports its use to address the following outcomes, according to age range, in the table below:

TIPS:

- Work with your entire team lead by an SLP, to conduct an AAC assessment to identify the learner's present level of communication and the best AAC device for their skills and goals.
- Involve the learner and the learner's family in discussing tech and AAC preferences.
- Explore funding options in your area for acquiring an AAC device.

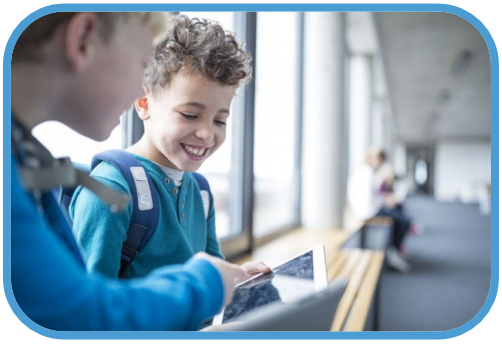
Age	Academic	Behavior	Communication	Joint Attention	Motor	Play	Social
0-2			Yes	Yes		Yes	Yes
3-5	Yes	Yes	Yes	Yes		Yes	Yes
6-11	Yes	Yes	Yes	Yes		Yes	Yes
12-14			Yes				
15-18			Yes		Yes		Yes

STEPS FOR IMPLEMENTING:

1. **PLAN**
   - Determine if an AAC assessment may be appropriate for a learner
   - Conduct an AAC assessment
   - Discuss technology and AAC preferences with family and learner
   - Identify available AAC resources
   - Select additional EBPs for teaching use of the AAC system
   - Plan opportunities for the learner to use AAC
   - Identify and train team members
   - Prepare and have materials ready and available

2. **USE**
   - Teach learner to use AAC device
   - Understand formalized AAC teaching approaches
   - Give reinforcement
   - Ensure consistent use of AAC across settings

3. **MONITOR**
   - Collect and analyze data
   - Monitor use of AAC across settings
   - Troubleshoot issues if needed
   - Determine next steps based on learner progress



Augmentative & Alternative Communication AAC

This sheet was designed as a supplemental resource to provide basic information about Augmentative & Alternative Communication for professionals working with learners on the spectrum.

For more information about this selected evidence-based practice, please visit https://afirm.fpg.unc.edu/.

PARENT'S GUIDE

WHAT IS AAC?

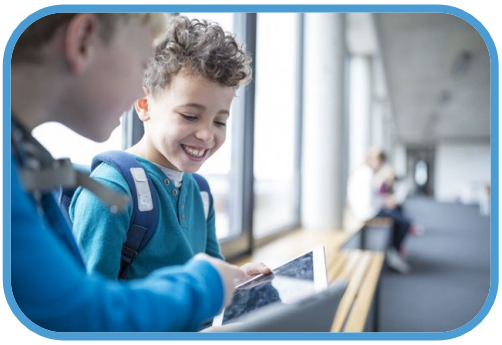
- AAC is a system of communication that is not verbal/vocal
- Unaided communication systems do not use any materials or technology (e.g., sign language and gestures)
- Aided communication systems use some type of material or device and can include low-tech systems (e.g., exchanging objects/pictures) or high-tech systems (e.g., battery powered speech output devices)
- AAC is used to increase a target goal/behavior/skill and/or to decrease an interfering/inappropriate/challenging behavior

WHY USE THIS AAC WITH MY CHILD?

- Communication is a basic human right that is essential for student success in academic and non-academic settings.
- AAC uses visual supports to make abstract social and communication concepts more concrete for learners with autism.
- AAC can support communication across the school setting and at home.

WHAT ACTIVITIES CAN I DO AT HOME?

- Encourage use of the AAC system during all daily routines, including extra-curricular activities, on errands and to visits with friends and family.
- Use the AAC system to support choice-making at home, for example during mealtimes or leisure time.
- Use the AAC system to allow your learner to respond to questions throughout the day.



Augmentative & Alternative Communication AAC

This parent introduction to AAC was designed as a supplemental resource to help answer questions about Augmentative & Alternative Communication.

To find out more about how this AAC is being used with your child, please talk with:

_____

For more information about this selected evidence-based practice, please visit https://afirm.fpg.unc.edu/.

Additional Resources

APPS:

	Developer	Name	Available	Pricing
	Cboard org	*Cboard*	App Store Google Play	Free
	Digital Scribbler, Inc.	*Quick Talk AAC*	App Store Google Play Store	$24.99
	Prentke Romich Company	*LAMP Words for Life app*	App Store	$299.99
	Prentke Romich Company	*TouchChat HD*	App Store	$299.99
	Prentke Romich Company	*Dialogue AAC*	App Store	$99.99

BOOKS:

Ganz, B., & Simpson, R. L. (2018). *Interventions for individuals with autism spectrum disorder and complex communication needs: Supports and Intervention Strategies (AAC).* Brookes Publishing.

McNaughton, D. B., & Beukelman, B. R. (2010). *Transition strategies for adolescents and young adults who use AAC.* Brookes Publishing.

Mirenda, P., & Iacono, T. (2008). *Autism Spectrum Disorders and AAC.* Brookes Publishing.

WEBSITES:

American Speech-Language-Hearing Association. (November 2021). *AAC.* https://www.asha.org/njc/aac/

AT3 Center. (2016). *Welcome*. https://www.at3center.net/

Project Core. (n.d.) *Communication Systems.* http://www.project-core.com/communication-systems/

CEC STANDARDS

INITIAL PRACTICE-BASED STANDARDS FOR EARLY INTERVENTIONISTS/EARLY CHILDHOOD (0-5 YEARS; CEC, 2020)

Standard 4: Assessment Processes

4.1 Candidates understand the purposes of formal and informal assessment, including ethical and legal considerations, and use this information to choose developmentally, culturally, and linguistically appropriate, valid, reliable tools and methods that are responsive to the characteristics of the young child, family, and program

Standard 5: Application of Curriculum Frameworks in the Planning of Meaningful Learning Experience

5.1 Collaborate with families and other professionals in identifying an evidence-based curriculum addressing developmental and content domains to design and facilitate meaningful and culturally responsive learning experiences that support the unique abilities and needs of all children and families.

Standard 6: Using Responsive and Reciprocal Interactions, Interventions, and Instruction

6.1 In partnership with families, identify systematic, responsive, and intentional evidence-based practices and use such practices with fidelity to support young children's learning and development across all developmental and academic content domains.

6.2 Candidates engage in reciprocal partnerships with families and other professionals to facilitate responsive adult-child interactions, interventions, and instruction in support of child learning and development.

6.3 Candidates engage in ongoing planning and use flexible and embedded instructional and environmental arrangements and appropriate materials to support the use of interactions, interventions, and instruction addressing developmental and academic content domains, which are adapted to meet the needs of each and every child and their family.

6.4 Candidates promote young children's social and emotional competence and communication, and proactively plan and implement function-based interventions to prevent and address challenging behaviors.

6.5 Candidates identify and create multiple opportunities for young children to develop and learn play skills and engage in meaningful play experiences independently and with others across contexts.

6.7 Candidates plan for, adapt, and improve approaches to interactions, interventions, and instruction based on multiple sources of data across a range of natural environments and inclusive settings.

Standard 7: Professionalism and Ethical Practice

7.2 Engage in ongoing reflective practice and access evidence-based information to improve own practices.

INITIAL PRACTICE-BASED STANDARDS FOR (GRADES K-12; CEC, 2020):

Standard 2: Understanding and Addressing Each Individual's Developmental and Learning Needs

2.1 Apply understanding of human growth and development to create developmentally appropriate and meaningful learning experiences that address individualized strengths and needs of students with exceptionalities.

Standard 3: Demonstrating Subject Matter Content and Specialized Curricular Knowledge

3.2 Candidates augment the general education curriculum to address skills and strategies that students with disabilities need to access the core curriculum and function successfully within a variety of contexts as well as the continuum of placement options to assure specially designed instruction is developed and implemented to achieve mastery of curricular standards and individualized goals and objectives.

Standard 4: Using Assessment to Understand the Learner and the Learning Environment for Data-Based Decision Making

4.1 Collaboratively develop, select, administer, analyze, and interpret multiple measures of student learning, behavior, and the classroom environment to evaluate and support classroom and school-based systems of intervention for students with and without exceptionalities.

4.3 Assess, collaboratively analyze, interpret, and communicate students' progress toward measurable outcomes using technology as appropriate, to inform both short- and long-term planning, and make ongoing adjustments to instruction.

Standard 5: Supporting Learning Using Effective Instruction

5.1 Candidates use findings from multiple assessments, including student self-assessment, that are responsive to cultural and linguistic diversity and specialized as needed, to identify what students know and are able to do. They then interpret the assessment data to appropriately plan and guide instruction to meet rigorous academic and non-academic content and goals for each individual.

5.2 Candidates use effective strategies to promote active student engagement, increase student motivation, increase opportunities to respond, and enhance self-regulation of student learning.

5.6 Candidates plan and deliver specialized, individualized instruction that is used to meet the learning needs of each individual.

Standard 6: Supporting Social, Emotional, and Behavioral Growth

6.2 Candidates use a range of preventive and responsive practices documented as effective to support individuals' social, emotional, and educational well-being.

Standard 7: Collaborating with Team members

7.2 Candidates collaborate, communicate, and coordinate with families, paraprofessionals, and other professionals within the educational setting to assess, plan, and implement effective programs and services that promote progress toward measurable outcomes for individuals with and without exceptionalities and their families.

GLOSSARY

Augmented Input (Aided Language Modelling) - a receptive language training approach in which the communication partner provides spoken words along with AAC symbols during communication tasks

Assistive technology specialist - Professional who provides services that are designed to assist people with disabilities to choose, acquire, or use assistive technology devices

Augmentative & Alternative Communication (AAC) - Interventions using and/or teaching the use of a system of communication that is not verbal/vocal which can be aided (e.g., device, communication book) or unaided (e.g., sign language)

Baseline data - data collected on current performance level prior to implementation of intervention

Core Vocabulary Approach - an AAC teaching strategy that uses a board with commonly used vocabulary words that can be applied across settings

Expressive Communication - one's ability to communicate thoughts and feelings through words, gestures, or facial expressions

Fidelity - how well and how often the implementation steps for an evidence-based practice are followed

Frequency system - data collection system, appropriate when the frequency of the behavior needs to be increased or decreased

Functional Behavioral Assessment (FBA) - A systematic way of determining the underlying function or purpose of a behavior so that an effective intervention plan can be developed.

Functional Communication Training (FCT) - A set of practices that replace an interfering behavior that has a communication function with more appropriate and effective communication behaviors or skills.

Generalization - when the target skill or behavior continues to occur when the intervention ends, in multiple settings, and with multiple individuals (e.g., peers, teachers, parents)

High-tech AAC system - an aided-communication system or device that relies on technology such as speech-generating devices (SGDs) and applications that allow other devices (e.g., phones, tablets) to serve as SGDs

Implementation checklist - the specific steps needed to accurately follow an evidence-based practice.

Individualized intervention - an intervention that is planned and implemented in a way specific to the learner receiving the intervention

Interfering behavior - a behavior that interferes with the learner's ability to learn or safety

Language Acquisition Through Motor Planning (LAMP) - an AAC teaching strategy in which the learner selects works and builds sentences on a voice output device using consistent motor plans to access vocabulary

Low-tech AAC system - an aided-communication system, material or device that requires minimal technology such as exchanging objects/pictures or pointing to letters

Modeling (MD) - Demonstration of a desired target behavior that results in use of the behavior by the learner and that leads to the acquisition of the target behavior.

Peer-Based Instruction & Intervention (PBII) - Intervention in which peers directly promote autistic children's social interactions and/or other individual learning goals, or the teacher/ other adult organizes the social context (e.g., play groups, social network groups, recess) and when necessary provides support (e.g., prompts, reinforcement) to the autistic children and their peer to engage in social interactions.

Pragmatic Organization Dynamic Display (PODD) - a system of organizing and selecting words or symbol vocabulary on a low-tech or high-tech AAC system

Prompting (PP) - Verbal, gestural, or physical assistance given to learners to support them in acquiring or engaging in a targeted behavior or skill.

Receptive communication - one's ability to understand thoughts and feelings expressed by others through words, gestures, or facial expressions

Reinforcement (R) - The application of a consequence following a learner's use of a response or skills that increases the likelihood that the learner will use the response/skills in the future.

Speech-generating device (SGD) - a high-tech AAC option that allows a person to communicate using a computer that generates an electronic voice

Target behavior - the behavior or skill that is the focus of the intervention. Behavior may need to be increased or decreased.

Team members - includes the parents, other primary caregivers, IEP/IFSP team members, teachers, therapists, early intervention providers, and other professionals involved in providing services for the learner with autism

Time Delay (TD) - A practice used to systematically fade the use of prompts during instructional activities by using a brief delay between the initial instruction and any additional instructions or prompts.

Total Communication (TC) - a holistic approach to communication that promotes the use of all modes of communication including sign language, spoken language, gestures, facial expression, and environmental cues such as pictures and sounds

Visual Supports (VS) - a visual display that supports the learner engaging in a desired behavior or skills independent of additional prompts

REFERENCES

1. ASHA (2021). Augmentative and Alternative Communication (AAC). **https://www.asha.org/public/speech/disorders/AAC/**
2. Lüke, C., & Ritterfeld, U. (2014). The influence of iconic and arbitrary gestures on novel word learning in children with and without SLI. *Gesture*, *14*(2), 204-225.
3. Romski, M., Sevcik, R. A., Adamson, L. B., Cheslock, M., Smith, A., Barker, R. M., & Bakeman, R. (2010). Randomized comparison of augmented and nonaugmented language interventions for toddlers with developmental delays and their parents. *Journal of Speech Language and Hearing Research, 53*(2), 350-364.
4. Wright, C. A., Kaiser, A. P., Reikowsky, D. I., & Roberts, M. Y. (2013). Effects of a naturalistic sign intervention on expressive language of toddlers with Down syndrome. *Journal of Speech Language and Hearing Research, 56,* 994-1008.
5. Romski, M., Sevcik, R. A., Barton-Hulsey, A., & Whitmore, A. S. (2015). Early intervention and AAC: What a difference 30 years makes. *Augmentative and Alternative Communication, 31*(3), 181-202.
6. Binger, C., & Light, J. (2007). The effect of aided AAC modeling on the expression of multi-symbol messages by preschoolers who use AAC. *Augmentative and Alternative Communication, 23*(1), 30-43.
7. Harris, L., Doyle, E. S., & Haaf, R. (1996). Language treatment approach for users of AAC: Experimental single-subject investigation. *Augmentative and Alternative Communication, 12*(4), 230-243.
8. Brady, N. (2000). Improved comprehension of object names following voice output communication aid use: Two case studies. *Augmentative and Alternative Communication*, *16*(3), 197-204.
9. Drager, K. D., Postal, V. J., Carrolus, L., Castellano, M., Gagliano, C., & Glynn, J. (2006). The effect of aided language modeling on symbol comprehension and production in 2 preschoolers with autism. *American Journal of Speech-Language Pathology.*
10. Almirall, D., DiStefano, C., Chang, Y.-C., Shire, S., Kaiser, A., Lu, X., Nahum-Shani, I., Landa, R., Mathy, P., & Kasari, C. (2016). Longitudinal effects of adaptive interventions with a speech-generating device in minimally verbal children with ASD. *Journal of Clinical Child & Adolescent Psychology, 45*(4), 442-456. https://doi.org/10.1080/15374416.2016.1138407
11. Agius, M. M., & Vance, M. (2016). A comparison of PECS and iPad to teach requesting to pre-schoolers with autistic spectrum disorders. *Augmentative and Alternative Communication, 32*(1), 58-68. https://doi.org/10.3109/07434618.2015.1108363
12. Ali, E., MacFarland, S. Z., & Umbreit, J. (2011). Effectiveness of combining tangible symbols with the Picture Exchange Communication System to teach requesting skills to children with multiple disabilities including visual impairment. *Education and Training in Autism and Developmental Disabilities, 46*(3), 425-435.
13. Alzrayer, N. M., Banda, D. R., & Koul, R. (2017). Teaching children with autism spectrum disorder and other developmental disabilities to perform multistep requesting using an iPad. *Augmentative and Alternative Communication, 33*(2), 65-76. https://doi.org/10.1080/07434618.2017.1306881
14. Chang, Y.-C., Shih, W., Landa, R., Kaiser, A., & Kasari, C. (2018). Symbolic play in school-aged minimally verbal children with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 48*(5), 1436-1445. https://doi.org/10.1007/s10803-017-3388-6
15. Choi, H., O'Reilly, M., Sigafoos, J., & Lancioni, G. (2010). Teaching requesting and rejecting sequences to four children with developmental disabilities using augmentative and alternative communication. *Research in Developmental Disabilities, 31*(2), 560-567. https://doi.org/10.1016/j.rasd.2010.08.005
16. Carr, D., & Felce, J. (2007). The effects of PECS teaching to phase III on the communicative interactions between children with autism and their teachers. *Journal of Autism and Developmental Disorders, 37*(4), 724-737. https://doi.org/10.1007/s10803-006-0203-1

11. Hughes, C., Bernstein, R. T., Kaplan, L. M., Reilly, C. M., Brigham, N. L., Cosgriff, J. C., & Boykin, M. P. (2013). Increasing conversational interactions between verbal high school students with autism and their peers without disabilities. *Focus on Autism and Other Developmental Disabilities, 28*(4), 241-254. https://doi.org/10.1177/1088357613487019
12. Kodak, T., Paden, A., & Dickes, N. (2012). Training and generalization of peer-directed mands with non-vocal children with autism. *The Analysis of Verbal Behavior, 28*(1), 119-124.
13. Lerna, A., Esposito, D., Conson, M., & Massagli, A. (2014). Long-term effects of PECS on social-communicative skills of children with autism spectrum disorders: A follow-up study. *International Journal of Language & Communication Disorders, 49*(4), 478-485. https://doi.org/10.1111/1460-6984.12079
14. Lerna, A., Esposito, D., Conson, M., Russo, L., & Massagli, A. (2012). Social-communicative effects of the Picture Exchange Communication System (PECS) in autism spectrum disorders. *International Journal of Language & Communication Disorders, 47*(5), 609-617. https://doi.org/10.1111/j.1460-6984.2012.00172.x
15. Mancil, G. Richmond, L., Elizabeth R., & Whitby, P. S. (2016). Effects of iPod touch technology as communication devices on peer social interactions across environments. *Education and Training in Autism and Developmental Disabilities, 51*(3), 252-264.
16. Lorah, E. R., Karnes, A., & Speight, D. R. (2015). The acquisition of intraverbal responding using a speech generating device in school aged children with autism. *Journal of Developmental and Physical Disabilities, 27*(4), 557-568. **https://doi.org/10.1007/s10882-015-9436-2**
17. Lorah, E., & Parnell, A. (2017). Acquisition of tacting using a speech-generating device in group learning environments for preschoolers with autism. *Journal of Developmental & Physical Disabilities, 29*(4), 597-609. **https://doi.org/10.1007/s10882-017-9543-3**
18. Conallen, K., & Reed, P. (2012). The effects of a conversation prompt procedure on independent play. *Research in Autism Spectrum Disorders, 6*(1), 365-377. **https://doi.org/10.1016/j.rasd.2011.06.010**
19. Haq, S. S., Machalicek, W., Garbacz, S. A., & Drew, C. (2017). Employing a fixed-lean multiple schedule in the treatment of challenging behavior for children with autism spectrum disorder. *Behavior Modification, 42*(4), 610-633. https://doi.org/10.1177/0145445517743206
20. Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). Evidence-Based Practices for Children, Youth, and Young Adults with Autism. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team. **http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/imce/documents/2014-EBP-Report.pdf**
21. Rowland, C. (2004). Communication matrix. *Oregon Health & Science University*. **https://documents.nationaldb.org/products/Parent-Comm-Matrix-Final.pdf**
22. Kangas, K., & Lloyd, L. (1988). Early cognitive skills as prerequisites to augmentative and alternative communication use: What are we waiting for?. *Augmentative and Alternative Communication*, *4*(4), 211-221.
23. Zangari, C., & Kangas, K. (1997). Intervention principles and procedures. *Augmentative and alternative communication: A handbook of principles and practices*, 235-253.
24. Drager, K., Light, J., & McNaughton, D. (2010). Effects of AAC interventions on communication and language for young children with complex communication needs. *Journal of Pediatric Rehabilitation Medicine*, *3*(4), 303-310.
25. Millar D.C., Light J.C., Schlosser R.W. (2006). The impact of augmentative and alternative communication intervention on the speech production of individuals with developmental disabilities: a research review. Journal of Speech Language and Hearing Research; 49(2): 248-264.
26. Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., Murphy, S., & Almirall, D. (2014). Communication interventions for minimally verbal children with autism: Sequential multiple assignment randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry, 53*(6), 635-646. https://doi.org/10.1016/j.jaac.2014.01.019.

27. Mirenda, P. (1997). Supporting individuals with challenging behavior through functional communication training and AAC: Research review. *Augmentative and Alternative Communication*, *13*(4), 207-225.
28. Robinson, L., & Owens, Jr, R. (1995). Clinical notes: Functional augmentative communication and positive behavior change. *Augmentative and alternative communication*, *11*(4), 207-211.
29. Assistive Technology Act of 1998, Pub. L. No. 108-364, §2432, 112 Stat. 3627.
30. Individuals with Disabilities Education Improvement Act of 2004. Pub. L. No. 108-446.
31. Patient Protection and Affordable Care Act of 2010, Pub. L. No. 111-148, 124 Stat. 119 (2010). **https://www.congress.gov/111/plaws/publ148/PLAW-111publ148.pdf**
32. Houghton, J., Bronicki, G. B., & Guess, D. (1987). Opportunities to express preferences and make choices among students with severe disabilities in classroom settings. *Journal of the Association for Persons with Severe Handicaps*, *12*(1), 18-27.
33. Light, J., Collier, B., & Parnes, P. (1985). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part II—Communicative function. *Augmentative and alternative communication*, *1*(3), 98-107.
34. Geist, L., Erickson, K., Greer, C., & Hatch, P. (2021). Initial evaluation of the Project Core implementation model. *Assistive Technology Outcomes and Benefits, 15*, 29-47. **https://www.atia.org/wp-content/uploads/2021/03/V15_Geist_etal.pdf**
35. Sennot, S.C., Light, J.C., & McNaughton, D. (2016). AAC modeling intervention research review. Research and Practice for Persons with Severe Disabilities, 41, 101-115.
36. Johnston, S. S., Reichle, J., Feeley, K. M., & Jones, E. A. (2012). *AAC Strategies for Individuals with Moderate to Severe Disabilities*. Brookes Publishing Company. PO Box 10624, Baltimore, MD 21285.
37. Denton, D. M. (1976). *The philosophy of total communication*. British Deaf Association.
38. Nunes, D. R. (2008). AAC interventions for autism: A research summary. *International Journal of Special Education*, *23*(2), 17-26.
39. ASHA (2021). Facilitated Communication: Position Statement. **https://www.asha.org/policy/ps2018-00352/**