AUTISM SPECTRUM DISORDER

KEY POINTS

- **Main characteristics include:**
  - **Difficulty relating to and communicating with others and**
  - **Restricted, repetitive behaviors, interests, and activities.**
- **Children with ASD have great range of abilities and traits.**
- **Seventy percent of children with ASD also have a co-occurring mental health disorder.**
- **Early detection and intervention is critical.**
- **Behavioral and cognitive-behavioral interventions provide the best outcomes.**

OVERVIEW

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disability that is typically diagnosed during childhood. According to the American Psychiatric Association (APA), the disorder is marked by two main characteristics: 1) persistent deficits in social communication and social interaction, and 2) restricted, repetitive, behaviors, interests, and activities. Symptoms and characteristics of ASD are varied, both in scope and severity. For instance, social communication and interaction deficits can include limited verbal (e.g., functional speech) and non-verbal (e.g., gestures) communication, responding inappropriately in conversations, misreading nonverbal interactions, or having difficulty building age-appropriate friendships. Behavioral characteristics can include an overdependence on routines, high sensitivity to changes in environment, or inappropriate focus. In addition, for an individual to be diagnosed with ASD, symptoms must be present in some form in the early developmental period, must cause clinically significant impairment in the individual's daily life, and cannot be explained by another disorder.

ASD is characterized as a spectrum because there is a great range of abilities and traits found in youth diagnosed with this disorder. Some children are very bright and do well in school, although they may have problems with school adjustment or require special education or related services. Other children may have more significant challenges, including cognitive, psychological, and behavioral challenges. The severity of ASD also varies widely from mild to severe. Many people with mild forms of the disorder can live independently when they are adults, have careers, get married, and have children, while individuals with more severe specifiers of the disorder may need lifelong supportive interventions.

Figure 1
Some Characteristics of Youth with ASD

Youth with ASD might:
• Not point at objects to show interest • Not look at objects when another person points at them • Have trouble relating to others or not have an interest in other people at all • Find eye contact uncomfortable and seek to avoid it • Have trouble understanding other people's feelings or talking about their own feelings • Prefer not to be held or cuddled, or might cuddle only when they want to, or even recoil at close physical contact • Appear to be unaware when people talk to them but respond to other sounds • Be very interested in people but not know how to talk, play, or relate to them • Repeat or echo words or phrases said to them, or repeat words or phrases in place of normal language • Have trouble expressing their needs using typical words or motions • Not play "pretend" games (for example, not pretend to "feed" a doll) • Not engage in typical back-and forth activities (e.g., pat-a-cake, peekaboo) • Repeat actions over and over again (e.g., hand-flapping, rocking) • Have trouble adapting or become distressed when a routine changes • Have unusual reactions to the way things smell, taste, look, feel, or sound • Lose skills they once had (for example, stop saying words they were using)

Source: Centers for Disease Control and Prevention, https://www.cdc.gov/ncbddd/autism/signs.html.

Signs, Screening, and Assessment

ASD is often discovered when parents become concerned that their child is not developing in the manner expected or achieving typical developmental milestones.[1] Challenges with social interaction, processing, sensory disturbances, communication, and behavior may be among the characteristics noticed by parents that would indicate the need for further evaluation.

Table 1
Some "Signs" That Indicate That a Child Should Be Screened for ASD

Domain	Signs and Symptoms Commonly Noted by Caregivers
Social Differences	• Doesn't smile when smiled at • Has poor eye contact • Seems to prefer to play alone • Gets things for themselves only • Is very independent for their age • Seems to be in their "own world"

[1] For more information about typical developmental milestones, refer to the Centers for Disease Control and Prevention website at https://www.cdc.gov/ncbddd/actearly/milestones-app.html.

	• Seems to tune people out • Is not interested in other children • Doesn't point out interesting objects by 14 months of age • Doesn't like to play "peek-a-boo" • Doesn't try to attract their parent's attention
Communication Differences	• Does not respond to their name by 12 months of age • Cannot explain what they want • Doesn't follow directions • Seems to hear sometimes but not other times • Doesn't point or wave "bye-bye" • Used to say a few words or babble, but now does not
Behavioral Differences	• Gets "stuck" doing the same things over and over and can't move on to other things • Shows unusual attachments to toys, objects, or routines (for example, always holding a string or having to put on socks before pants) • Spends a lot of time lining things up or putting things in a certain order • Repeats words or phrases over and over

Source: National Institutes of Health, https://www.nichd.nih.gov/health/topics/autism/conditioninfo/symptoms.

The American Academy of Pediatrics (AAP) recommends that all children be screened for ASD during regular well-child doctor visits at 18 and 24 months, but additional screenings may occur if symptoms are detected prior to 18 months or if the child is at high-risk (e.g., has a sibling with ASD). A diagnosis may be made by an individual clinician or, more preferably, by a multi-disciplinary team that may include a developmental pediatrician, a neurologist, a neuropsychologist, a speech/language therapist, a learning consultant, an occupational therapist, and/or other knowledgeable professionals.

Co-Occurring Disorders and Conditions

Approximately 70 percent of individuals with ASD may have at least one co-occurring mental disorder, and 40 percent may have two or more co-occurring disorders. Unfortunately, it is frequently assumed that behaviors associated with co-occurring mental health disorders are related to the ASD diagnosis. The assumption that all behaviors are related to ASD can leave underlying mental health concerns untreated and exacerbate symptoms. For this reason, accurate, reliable diagnosis of co-occurring mental health disorders is critical.

Table 2
Disorders and Conditions that Commonly Co-Occur with ASD

Category	Co-occurring Disorder or Condition
Neurodevelopmental disorders	• Intellectual Disability • Language Disorder • Attention-Deficit/Hyperactivity Disorder (ADHD) • Motor Disorders

	• Stereotypies (repetitive or ritualistic movements, postures, or utterances) and tics
Psychological disorders	• Obsessive-Compulsive and Related Disorders (OCRD) • Anxiety Disorders (including social phobia and specific fears or phobias) • Depressive Disorders • Trauma- and Stressor-Related Disorders
Medical conditions	• Epilepsy • Sleep Disorders • Constipation or other digestive disorders • Immune/metabolic conditions
Other conditions	• Self-injury • Aggression • Extreme and limited food preferences

Causes and Risk Factors

Although the causes of ASD are not yet known, it has been established that ASD is not caused by any psychological factors. The high recurrence risk for ASD in siblings and identical twins has provided strong support for the importance of genetic factors. In recent years, there has been a focus on searching for environmental and biological causal factors. A variety of risk factors, such as advanced parental age, low birth weight, or fetal exposure to valproate (an anticonvulsant and mood stabilizer used to treat seizures and bipolar disorder and to help prevent migraine headaches), may contribute to the risk of ASD. Pre- and peri-natal maternal infections and birth complications associated with ASD have also been reported.

There have been concerns among caregivers on a possible association between childhood immunizations and ASD. However, numerous scientific studies have shown that vaccines do not cause or contribute to the development of ASD.

GENERAL PRINCIPLES FOR INTERVENTION

Serving a child with ASD is determined by the child's individual needs. In order to improve outcomes for youth with ASD, lessen challenging behavior, and provide the child with maximum independence, a combination of three principles is required: early intervention, a family-centered approach, and educational intervention.

Early Intervention

Evidence from various diagnosis and intervention research suggests that early detection of ASD is key to improving developmental outcomes. Early detection leads to early intervention, and for youth with ASD, early

participation in specialized intervention programs can optimize long-term outcomes. Evidence has shown that both younger age and more intervention hours are associated with positive developmental outcomes.

Family Centered Approach

A multi-disciplinary and family focused approach, in which the service providers and the parents work in a collaborative manner to develop appropriate interventions for the child, is considered the most effective method of service delivery for children with ASD and their families. A family centered approach employs the expertise of the family regarding the strengths and needs of the child.

Educational Intervention

Children with ASD often have behavioral and communication challenges that interfere with learning. Therefore, many benefit from an Individualized Education Program (IEP), as provided for under Part B of the Individuals with Disabilities Education Act (IDEA). Children with a disability from birth through age three are also eligible for early intervention services under Part C of IDEA. In Virginia, parents with children between ages two and three can choose for their child to stay in Part C, early intervention services, or transition to Part B special education services.

Infant/toddler services under Part C of IDEA can be home-based, center-based, or a combination. The nature of the services is determined based on an assessment of the child and the family's priorities. The services provided in response to this plan may include the identification of appropriate assistive technology, intervention for sensory impairments, family counseling, parent training, health services, language services, health intervention, occupational therapy, physical therapy, case management, and transportation to services.

In Virginia, the Department of Behavioral Health and Developmental Services (DBHDS) is the lead agency that administers Part C of IDEA. Virginia's statewide early intervention system is called the Infant & Toddler Connection of Virginia. In Virginia, children from birth to age three are eligible for Part C services:

- If they have a 25 percent developmental delay in one or more areas of development
- If they have atypical development or
- If they are diagnosed with a physical or mental condition that has a high probability of resulting in a developmental delay

Once the child reaches the age of two, special education programs established by Part B of IDEA are available to eligible children. An IEP is developed based on team evaluation and parental input. This plan provides for academic, communication, social, and other learning objectives for the child to obtain within the school year. Extended year services may be available to students who require year-round services to prevent skill regression. Students with disabilities, including ASD, are required to be educated in the least restrictive environment, which often is in the general education classroom with appropriate supports. However, there is a continuum of placements that also includes special classes, special schools, home instruction, and instruction in hospitals and institutions.

VIRGINIA'S MEDICAID HOME AND COMMUNITY-BASED SERVICES (HCBS) WAIVERS

In Virginia, individuals with ASD may be eligible to receive services via Medicaid HCBS waivers. Medicaid HCBS waivers provide opportunities for individuals eligible for an institutional level of care to receive services in their own home or community rather than in an institutional setting. Eligible individuals are screened for the waiver by their local Community Services Board or Behavioral Health Authority. If the child is found eligible for the waiver, the parent would "waive" the child's right to receive services in an institution and choose instead to receive services in the community. Virginia's four HCBS waiver programs are described in Table 3. More information about Virginia's Medicaid waivers can be found on the DBHDS website.

Table 3
Medicaid Waiver Program in Virginia

Waiver		Description
Developmental Disability (DD) Waivers		
	Community Living Waiver (formerly ID Waiver)	Includes residential supports and a full array of medical, behavioral, and non-medical supports; available to adults and children; may include 24/7 supports for individuals with complex medical and/or behavioral support needs through licensed services.
	Family & Individual Supports Waiver (formerly DD Waiver)	Provides supports for individuals living with their families, friends, or in their own homes, including supports for those with some medical or behavioral needs; available to both children and adults.
	Building Independence Waiver (formerly Day Support Waiver)	Supports adults (18+) to live independently in the community; individuals own, lease, or control their own living arrangements and supports are complemented by nonwaiver-funded rent subsidies.
CCC Plus Waiver (formerly EDCD Waiver/Tech Waiver) Is transitioning to Cardinal Care		CCC Plus is a new statewide Medicaid managed care program. The CCC Plus Waiver is the community alternative to a nursing facility placement. Individuals on a DD Waiver receive their acute and primary care medical services through CCC Plus. CCC Plus Waiver service may be used while on a wait list for a DD Waiver.

Source: Virginia Department of Behavioral Health and Developmental Services.

ABOUT EVIDENCE-BASED INTERVENTIONS

There are two important resources that detail evidence-based practices and resources for children and adolescents diagnosed with ASD. Both initiatives were undertaken to provide information to clinicians, family members, and others because treatments for ASD are diverse and interventions with no scientific evidence were being recommended for children and adolescents with ASD. The consistent theme that emerges from both projects is the importance of selecting interventions that are sufficient in their intensity and that are individualized to meet the needs of the child and the family.

The National Professional Development Center on Autism Spectrum Disorders (NPDC) conducted an extensive review of the autism intervention literature published between 1997 and 2007 and identified evidence-based practices for children and youth with ASD.[2] The project utilized strict criteria relating to evidence-based practices. In 2014, the NPDC released findings from a follow-up review of studies from 1990-2011 and identified 27 practices that meet the criteria for evidence-based practice. The NPDC is currently developing online modules for each of the 27 identified practices.

The National Autism Center's National Standards Project has published two reports that detail evidence-based interventions for ASD based on behavioral and educational studies.[3] The second phase of the Project was launched in 2011 in order to provide up-to-date information on the effectiveness of a broad range of interventions for ASD. The Phase 2 findings were published in 2015 and identified 14 interventions for children and adolescents that have sufficient evidence of effectiveness.

Analysis of both resources conducted by the California Autism Professional Training and Information Network (CAPTAIN) has noted very little difference between the reviews conducted by these two initiatives. The NPDC lists interventions separately, whereas the National Standards Project discusses treatments as intervention strategies, or classes, that are clustered into packages. There is considerable overlap between the NPDC and the National Standards Project, with a majority of the interventions being included in both resources.

EVIDENCE-BASED INTERVENTIONS

The interventions outlined in the following paragraphs have been identified as established interventions (evidence-based) by the National Autism Center's National Standards Project, with the exception of Learning Experience: an Alternative Program. A summary of all interventions noted by the project is provided in Table 4. Please see the *Collection, 6th Edition* for more information about interventions listed under the "What Seems to Work" and "Not Adequately Tested" headings.

With many evidence-based interventions to choose from, it is important to select the most appropriate practice. Before beginning any new practice or intervention with a learner, parents/guardians should follow four general planning steps: identify the behavior, establish an observable goal, identify potential interventions based on research, and choose based on individual and family characteristics.

Behavioral Approaches:

Applied Behavioral Analysis (ABA)

Also known as *early intensive behavioral intervention* and *comprehensive behavioral treatment for young children*, applied behavioral analysis is a type of behavioral intervention that uses principles of learning theory to

[2] NPDC evidence-based practices for children and youth with ASD are available at https://autismpdc.fpg.unc.edu/evidence-based-practices.
[3] National Autism Center's National Standards Project reports are available at http://www.autismdiagnostics.com/assets/Resources/NSP2.pdf.

bring about meaningful and positive change in behavior. ABA techniques have been used to help build a variety of skills (e.g., communication, social skills, self-control, and self-monitoring) and help generalize these skills to other situations. These techniques can be used in structured (e.g., classroom), everyday (e.g., family dinnertime), and one-on-one or group instruction settings. ABA has also been used for individuals with ASD who also have an intellectual disability. Intervention is customized based on the individual's needs, interests, and family situation. ABA techniques are often used in intensive, early intervention (before age four) programs to address a full range of life skills.

A. Discrete Trial Teaching or Training (DTT)

DTT is just one example of a behavioral intervention that focuses on the principles of operant learning. In DTT, children learn appropriate responses to the presence of specific words and environmental stimuli. DTT involves using a basic process to teach a new skill or behavior and repeating it. Tasks are broken down into small components. DTT may also be called the ABC model, whereby every trial or task given to the child to perform consists of an antecedent (directive or request to the child to perform an action), behavior (response from the child), and consequence (reaction from therapist). Timing and pacing of teaching sessions, practice opportunities, and consequence delivery are designed precisely for each child's learning pace and style to help ensure success.

B. Pivotal Response Training (PRT)

PRT focuses on targeting pivotal behaviors related to motivation to engage in social communication, self-initiation, self-management, and responsiveness to multiple cues. Key to the delivery of PRT is parent involvement and implementation in the natural environment such as the home, community, and school setting. PRT is based on the theory that if improvements in functioning can be achieved in the areas that are most disabling to children (i.e., pivotal areas), then effects should extend to other areas. PRT is now considered one of the more effective and proven interventions for children with ASD.

Positive Behavioral Interventions

Positive behavioral interventions are the most effective type of intervention for children and adolescents with ASD. They are designed to provide alternatives to unwanted behaviors by first analyzing the cause of the behavior and how it is being reinforced, and then either modifying a triggering factor in the environment before a behavior occurs (antecedent interventions) or modifying a factor in the environment after a behavior occurs (consequent interventions). Antecedent interventions attempt to increase the likelihood of success or reduce the likelihood of problems occurring. Consequent interventions are designed to reduce challenging behavior and teach functional alternative skills through the application of basic principles of behavior change. Behavior intervention techniques are most effective if applied across multiple settings to promote generalization of skills.

Functional communication training (e.g., learning how to request breaks), noncontingent reinforcement (e.g., reinforcement delivered on a fixed time schedule), and extinction are types of positive behavioral interventions that can be used to reduce challenging behaviors (e.g., aggression, self-injury, task-avoidance) and to promote positive behaviors. Other examples of some simple behavioral interventions include:

- Setting boundaries
- Positive reinforcement of desired behaviors
- Activity schedules
- Task correspondence training

In order to effect an appropriate intervention, a functional behavioral assessment should be performed to determine when and why the behavior is occurring. Once this is determined, a positive behavioral intervention plan can be developed and implemented.

Modeling

The goal of modeling is to correctly demonstrate a target behavior to encourage imitation. Children can learn a great deal from observing the behavior of parents, siblings, peers, and teachers, but they often need to be taught which behaviors should be imitated. There are two types of modeling: live and video modeling. Live modeling occurs when a person demonstrates the target behavior in the presence of the child. Video modeling occurs when the target behavior is pre-recorded. Video modeling can be a great option for children and adolescents who have an affinity for television shows and movies, or who have an interest in seeing themselves on a monitor. Some children and adolescents may enjoy assisting in the production of the video.

Story-based Intervention

Story-based interventions identify a target behavior and involve a written description of the situations under which specific behaviors are expected to occur. Most stories aim to increase perspective taking skills and are written from an "I" or "some people" perspective. Stories can include pictures, words, and videos and should be used in addition to other treatments. One most well-known story-based intervention is Social Stories. Effective social stories are written from a positive standpoint and avoid using negatives. For example, to change a behavior, the story might state, "I will do ____ when I get home." It would not say, "I won't do ____ when I get home."

Self-Management

Self-management strategies have been widely used to promote independence with tasks in which adult supervision is not needed, accepted, or expected. Youth often evaluate and record their performance while completing an activity. Self-management is also used to help these individuals monitor social behaviors and disruptive behaviors and can involve rewards to reinforce positive behavior.

Psychological Approach:

Cognitive Behavioral Intervention Package

Cognitive behavioral therapy has long been an evidence-based intervention for individuals diagnosed with anxiety disorders and depressive disorders (i.e., without ASD). Some of these programs have been modified for youth and adolescents with ASD, such as The Coping Cat Program and Exploring Feelings. Modifications include adjusting materials (e.g., adding visual cues, role-play) or adjusting the structure of sessions. There are also

cognitive behavioral programs developed and individualized for specific purposes (e.g., to address anger management).

Developmental Approaches:

Language Training

Language training (production) targets the ability of the individual with ASD to communicate verbally (i.e., functional use of spoken words). It makes use of various strategies to elicit verbal communication such as modeling verbalizations and using music and positive reinforcement. Language training is just one of many interventions that can be used in combination to help children with ASD develop effective communication strategies. Other frequently used interventions are listed in the "What Seems to Work" section of Table 4.

Scripting

Scripting occurs when a youth with ASD is provided guidance on how to use language to initiate or respond in certain situations. These interventions involve developing an oral and/or written script about a specific skill or situation that serves as a model for the child. Scripts are usually practiced repeatedly before the skill is used in the actual situation.

Educational Approaches:

Naturalistic Teaching Strategies (NTS)

NTS are a compilation of strategies that are used to teach children skills in their homes, schools, and communities. The basic concepts include using materials in the environment and naturally occurring activities as opportunities to increase adaptive skills. These strategies are primarily child-directed.

Peer Training Package

Difficulty interacting appropriately with peers is a commonly reported characteristic of ASD, and children with ASD often rely on adults for prompting and guidance. Peer training packages train peers on how to initiate and respond during social interactions with a child with ASD. Peer tutors can not only provide support to learners with disabilities, but also strengthen their own skills and knowledge in the process. These programs have been used in school and community settings.

Learning Experience: An Alternative Program (LEAP)

LEAP is an example of a peer-based educational program that embraces the educational and therapeutic value of peer-mediated interventions. It provides classroom instruction, parent education (as needed), and the provision of speech and occupational therapy and other services within the classroom. The range of activities varies from quiet to active and from small group to larger group. Activities are child directed, where youths are actively involved in the curriculum as intervention agents.

Schedules

Schedules can be used for children with ASD to increase their independence and allow them to plan for upcoming activities. A schedule simply identifies the activities that must be completed during a given time period and the order in which these activities should be completed. Schedules can be written, pictorial, or a combination. Children with ASD may better handle transitions when they can predict what will happen next.

Social-Relational Approaches:

Social Skills Package

Social skills refer to a wide range of abilities, such as making eye contact appropriately, using gestures, reciprocating information, and initiating or ending an interaction. The challenges individuals with ASD face regarding social skills vary greatly. The general goal of any social skills package intervention is to provide individuals with the skills necessary to participate meaningfully in social environments.

Parent Training Package

Parent training focuses on the interventions in which parents act as therapists or receive training to implement various strategies. This intervention acknowledges the critical role that parents and caregivers play in providing a therapeutic environment for their family members with ASD.

Pharmacological Treatment:

While no drug therapies currently target the underlying causes or core manifestations of autism, pharmaceutical treatments can ameliorate some of the behavioral symptoms. The FDA has approved two medications for alleviation of symptoms for youth and adolescent with ASD. The first, risperidone, targets aggressive behavior, deliberate self-injury, and temper tantrums. The second, aripiprazole, treats irritability. There are risks of side effects. Medications should be prescribed and monitored by a physician. Medication is most effective in combination with other therapies.

Table 4
Summary of Interventions for ASD[4]

What Works	
Applied behavior analysis (ABA)	Uses principles of learning theory to bring about meaningful and positive change in behavior, build a variety of skills (e.g., communication, social skills, self-control, and self-monitoring), and help generalize these skills to other situations; also known as early intensive behavioral intervention and comprehensive behavioral treatment for young children (CBTYC).
Discrete trial teaching or training (DTT)	A behavioral intervention that uses operant learning techniques to change behavior. Also known as the ABC model (antecedent, behavior, consequence).
Pivotal response training (PRT)	Involves targeting pivotal behaviors related to motivation to engage in social communication, self-initiation, self-management, and responsiveness to multiple cues.
Positive behavioral interventions	Behavioral interventions analyze the cause of a negative behavior and how it is being reinforced, and then offer techniques targeted to promoting positive behaviors.
Modeling	Involves demonstrating a target behavior to encourage imitation.
Story-based intervention	Uses stories to increase perspective-taking skills.
Self-management	Strategies that involve teaching youth to track performance while completing an activity.
Cognitive behavioral intervention package	CBT modified for ASD youth.
Language training	Targets the ability to communicate verbally.
Scripting	Provides scripted language to be used as a model in specific situations.
Naturalistic teaching strategies (NTS)	Child-directed strategies that use naturally occurring activities to increase adaptive skills.
Peer training package	Involves training peers on how to behave during social interactions with a youth with ASD.
Schedules	Used to increase independence in youth with ASD.
Learning experience: An alternative program (LEAP)	A type of peer training program for peers, teachers, parents, and others.
Social skills package	Aims to provide youth with the skills (such as making eye contact appropriately) necessary to participate in social environments.

[4] Interventions are taken from the National Autism Center's National Standards Project. More information can be found at: http://www.autismdiagnostics.com/assets/Resources/NSP2.pdf.

Parent training package	Involves training parents to act as therapists.
What Seems to Work	
Augmentative and alternative communication devices	Communication systems designed to complement speech (pictures, symbols, communication boards, or other assistive technology, like tablets, text-to-speech programs, etc.).
Developmental relationship-based treatment	Programs that emphasize the importance of building social relationships by using the principals of developmental theory.
Exercise	Uses physical exertion to regulate behavior and help with social, communication, and motor skills. The value of exercise is not that stereotypic behaviors stop, but that stress, dysregulation, or feelings of being overwhelmed decrease as a result of physical activity.
Exposure package	Involves gradually exposing youth to the non-dangerous situations that they fear, with a focus on having them learn that their anxiety will decrease over time; at the same time, the use of maladaptive strategies used in the past is prevented.
Functional communication training (FCT)	Behavioral method that replaces disruptive or inappropriate behavior with more appropriate and effective communication.
Imitation-based intervention	Relies on adults imitating the actions of a child; promotes a "back-and forth" dynamic and the use of spontaneous language/vocalizations.
Initiation training	Involves directly teaching individuals with ASD to initiate interactions with their peers.
Language training (production and understanding)	Aims to increase both speech production and understanding of communicative acts.
Massage therapy	Uses deep tissue stimulation to induce physiological reactions in the body that have preventive, therapeutic, and relaxing effects.
Medication	Risperidone and aripiprazole are FDA-approved to target behavioral symptoms of ASD like aggression, self-injury, and irritability.
Multi-component package	Involves a combination of multiple treatment procedures that are derived from different fields of interest or different theoretical orientations.
Music therapy	Uses music to practice communication and social skills or behavioral goals.
Picture exchange communication system	Involves an alternative communication system designed to teach functional communication to youth with limited skills.
Reductive package	Relies on strategies designed to reduce problem behaviors without increasing alternative appropriate behaviors.

What Seems to Work (continued)	
Sign language instruction	Teaches sign language as a means of communicating.
Social communication intervention	Targets some combination of social communication impairments.
Structured teaching	Relies heavily on the visual organization, predictable schedules, and individualized use of teaching methods; can be used in educational, community, and home settings.
Technology-based intervention	Presents instructional materials using the medium of computers or related technologies.
Theory of mind training	Aims to teach youth to recognize and identify the mental states of others.

Not Adequately Tested

- Animal-assisted therapy (e.g., hippotherapy: the use of horseback riding as a therapeutic or rehabilitative treatment)
- Auditory integration training
- Concept mapping
- DIR/Floortime
- Gluten-free and/or casein-free diet
- Movement-based intervention
- SENSE theatre intervention
- Sensory intervention package
- Social-behavioral learning strategy
- Social cognition intervention
- Social thinking intervention

What Does Not Work	
Facilitated communication	A person with a disability is assisted by a facilitator in typing letters, words, phrases, or sentences on a keyboard.

RESOURCES AND ORGANIZATIONS

American Academy of Pediatrics
http://www.aap.org
American Speech-Language-Hearing Association
Autism Spectrum Disorder
https://www.asha.org/Practice-Portal/Clinical-Topics/Autism/
Autism Focused Intervention Resources and Modules (AFIRM)
http://afirm.fpg.unc.edu/selecting-ebp
Asperger/Autism Syndrome Education Network (ASPEN)
http://www.aspennj.org
Association of University Centers on Disabilities (AUCD)
http://www.aucd.org
Autism Research Institute (ARI)
https://www.autism.org/
Autism Society of America
http://www.autism-society.org/
Autism Speaks
http://www.autismspeaks.org
Autism Spectrum Connection
http://www.aspergersyndrome.org/
Centers for Disease Control and Prevention
Autism Spectrum Disorder (ASD)
http://www.cdc.gov/ncbddd/autism/index.html
Signs and symptoms
https://www.cdc.gov/autism/signs-symptoms/index.html
Developmental milestone information
https://www.cdc.gov/act-early/milestones/?CDC_AAref_Val=https://www.cdc.gov/ncbddd/actearly/milestones/index.html
Center for Parent Information and Resources
http://www.parentcenterhub.org/
Individuals with Disabilities Education Act (IDEA)
https://sites.ed.gov/idea/
National Autism Center
https://nationalautismcenter.org
National Standards Project
http://www.autismdiagnostics.com/assets/Resources/NSP2.pdf
National Association of the Dually Diagnosed (NADD)
http://thenadd.org/
National Institute of Child Health and Human Development
https://www.nichd.nih.gov/Pages/index.aspx
National Institute of Mental Health (NIMH)
Autism Spectrum Disorder
https://www.cdc.gov/act-early/milestones/?CDC_AAref_Val=https://www.cdc.gov/ncbddd/actearly/milestones/index.html
National Institute on Deafness and Other Communication Disorders
http://www.nidcd.nih.gov
National Library of Medicine
https://www.nlm.nih.gov
National Professional Development Center on Autism Spectrum Disorder
http://autismpdc.fpg.unc.edu/
Evidence-based practices
https://autismpdc.fpg.unc.edu/ebps/
Society of Clinical Child and Adolescent Psychology
https://sccap53.org/
U.S. Autism Association
http://www.usautism.org
U.S. Department of Education
U.S. Office of Special Education and Rehabilitative Services (OSERS)
https://www2.ed.gov/about/offices/list/osers/index.html
U.S. Department of Health and Human Services
Interagency Autism Coordinating Committee (IACC)
https://iacc.hhs.gov/
Wrightslaw
http://www.wrightslaw.com/

VIRGINIA RESOURCES AND ORGANIZATIONS

Autism Outreach, Inc.
http://autismoutreach.org/

Autism Society of America
Central Virginia Chapter
http://ascv.org

Commonwealth Autism
http://www.autismva.org/

Infant & Toddler Connection of Virginia
https://www.itcva.online/

Parent Educational Advocacy Training Center (PEATC)
http://www.peatc.org/

Partnership for People with Disabilities at Virginia Commonwealth University
https://partnership.vcu.edu/

Virginia Autism Council at Virginia Commonwealth University
https://autismtrainingva.vcu.edu/

Virginia Autism Project
http://www.virginiaautismproject.com/

Virginia Autism Center for Education
https://vcuautismcenter.org

Virginia Board for People with Disabilities
https://www.vbpd.virginia.gov/

Virginia Commonwealth University Autism Center for Excellence (VCU-ACE)
http://www.vcuautismcenter.org/projects/diagnosis.cfm

Virginia Department for Aging and Rehabilitative Services (DARS)
https://www.dars.virginia.gov/drs/autismservices.htm#gsc.tab=0

Virginia Department of Behavioral Health and Developmental Services (DBHDS)
http://www.dbhds.virginia.gov/

Virginia Department of Education
Office of Special Education
https://www.doe.virginia.gov/programs-services/special-education

Publications:

Autism Spectrum Disorders
https://www.doe.virginia.gov/programs-services/special-education/specific-disabilities/autism

Autism Spectrum Disorders and the Transition to Adulthood
https://www.doe.virginia.gov/home/showpublisheddocument/7946/638010947358970000

Guidelines for Educating Students with Autism Spectrum Disorders
https://www.doe.virginia.gov/home/showpublisheddocument/7942/638010930376470000

Models of Best Practice in the Education of Students with Autism Spectrum Disorders
https://www.doe.virginia.gov/home/showpublisheddocument/7944/638010947355330000

Virginia Department of Medical Assistance Services (DMAS)
https://www.dmas.virginia.gov/
Cardinal Care Virginia Medicaid Program
https://www.dmas.virginia.gov/for-providers/cardinal-care-transition/

Virginia Institute of Autism
http://www.viaschool.org

Virginia Tech Autism Clinic & Center for Autism Research
https://www.vtcar.science.vt.edu/

Virginia's Training/Technical Assistance Centers (TTAC)
http://ttaconline.org/

The Collection of Evidenced-Based Practices for Children and Adolescents with Mental Health Treatment Needs, 10th Collection

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