



Medical Coverage Policy

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Intensive Behavioral Interventions

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Related Coverage Resources

- [Attention-Deficit/Hyperactivity Disorder \(ADHD\): Assessment and Treatment](#)
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Coverage Policy

Some states mandate coverage of intensive behavioral interventions and/or treatment of autism spectrum disorders (ASD) for benefit plans regulated under state law. For example, New York law requires regulated benefit plans to provide coverage for the screening, diagnosis and treatment of ASD, including applied behavioral analysis.

Please refer to the applicable benefit plan document to determine terms, conditions and limitations of coverage.

Medically Necessary

Criteria for Assessment for Applied Behavior Analysis (ABA)

An assessment for applied behavior analysis (ABA) is considered medically necessary when ALL the following criteria are met:

- A diagnosis of Autism Spectrum Disorder (ASD) made within the past 24 months (or reconfirmation of diagnosis if the initial diagnosis was made more than 24 months ago) per the diagnostic criteria for Autism Spectrum Disorder from Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and a recommendation that the child receive ABA.

- the assessment is being performed by a Board Certified Behavior Analyst (BCBA) or a mental health clinician licensed to practice independently who will be providing supervision/treatment planning for the individual
- the assessment includes the administration of a reliable and valid standardized assessment tool (e.g., Verbal Behavior Milestones Assessment and Placement Program [VB-MAPP], Vineland Adaptive Scales, Assessment of Basic Language and Learning Skills [ABLLS]) that measures the domains included in the diagnostic criteria for Autism Spectrum Disorder

Criteria for Initiation of Treatment with ABA

ABA is considered medically necessary when ALL the following criteria are met:

1. Diagnosis of Autism Spectrum Disorder (ASD) made within the past 24 months (or reconfirmation of diagnosis if the initial diagnosis was made more than 24 months ago) per the diagnostic criteria for Autism Spectrum Disorder from Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and a recommendation that the child receive ABA.
2. Completion of a full and comprehensive ABA assessment including all of the following:
 - A. Assessment of current functioning in the areas impacted by Autism completed by a pediatrician, neurologist, psychologist, Board Certified Behavior Analyst (BCBA), psychiatrist, or other independently licensed mental health clinician using reliable and valid standardized assessment tools.
 - B. A complete developmental history has been obtained including:
 - relevant co-morbid conditions
 - vision and hearing evaluations
 - current medications
 - C. Consideration of family/caregivers, including language or cultural factors that may impact treatment.
 - D. Evidence from the evaluation that the individual is capable of making behavioral and cognitive gains.
3. Individualized treatment plan has been developed including specific targeted behaviors/skills for improvement, along with clearly defined, measurable, and realistic goals for improving those behaviors/skills and addresses the following:
 - a) Baseline data has been obtained for all behaviors and skills identified for intervention across all settings (e.g., home, school, summer camp) where treatment will occur.
 - b) The planned intensity of treatment across all settings reflects the severity of the impairments, goals of treatment, response to treatment and specific individual variables.
 - c) If group treatment is planned, the treatment plan must include clearly defined, measurable goals for the group therapy that are specific to the individual and his/her targeted behaviors/skills.
 - d) Treatment goals are directly related to the core symptoms of ASD as defined by the DSM-5.
 - e) Treatment planning and supervision is performed by a Board Certified Behavior Analyst (BCBA) or a mental health professional that is licensed to practice independently. The amount of supervision and treatment planning must be consistent with the generally accepted practice standard of one to two hours per ten hours of direct treatment.
 - f) Direct supervision (BCBA face-to-face with the individual and either the Registered Behavior Technician [RBT] or the Board Certified Assistant Behavior Analyst [BCaBA]) delivering the direct treatment) time accounts for 50% or more of case supervision.
 - g) The treatment plan includes a measurable parent/caregiver(including teachers and other stakeholders as appropriate) goals to train them in the basic behavioral principles of ABA and to continue behavioral interventions in the home and community.
 - h) Parent/caregiver training will be conducted by a BCBA or a mental health professional licensed to practice independently.
 - i) The treatment plan includes a plan to ensure maintenance and generalization of skills.
 - j) The treatment plan includes clearly defined, measurable, realistic discharge criteria and transition plan across all treatment environments.

- k) There is a clear plan to coordinate care with other medical and mental health providers, and with government mandated/school services.

Criteria for Continued Treatment with ABA

Continued treatment with ABA is considered medically necessary when : (1) criteria number 1 from initiation of treatment section above was met at the time treatment was initiated; (2) ALL of criteria numbers 2 and 3 from initiation of treatment section above are currently met and (3) ALL of the following criteria are met:

- The individual's treatment plan has been updated to include clearly defined, measurable goals for addressing behaviors and ensuring maintenance and generalization of acquired skills.
- The data demonstrate progress toward mastering the treatment goals. Baseline, current and interim data has been obtained for all behaviors and skills identified for intervention.
- There is evidence of measurable and ongoing improvement in targeted behaviors/skills as demonstrated with the use of a reliable and valid standardized assessment instrument.
- The individual's parent/caregiver continue to actively participate in the treatment and is showing proficiency toward mastering the parent/caregiver goals.

Experimental, Investigational or Unproven

ABA is considered experimental, investigational or unproven for all non-ASD indications.

Intensive behavioral interventions other than ABA are considered experimental, investigational or unproven.

Overview

This Coverage Policy addresses intensive behavioral interventions for treatment of autism spectrum disorders.

General Background

Intensive behavioral interventions are comprehensive treatment programs that utilize a combination of interventions with the aim of improving cognitive and intellectual function, social and adaptive skill development and behavior problems. They have been proposed to treat autism spectrum disorders as well as other conditions that involve behavioral difficulties. The programs emphasize early intervention, individualization of treatment and an intensive approach. The programs may also be referred to as early intensive behavior intervention (EIBI), intensive behavior intervention (IBI) or early intensive behavioral treatment (EIBT). At times, the terms EIBI, IBI, EIBT are used interchangeably with applied behavior analysis (ABA), Lovaas therapy or Lovaas University of California Los Angeles (UCLA) Program. The programs are intensive and range from 15 to 40 hours per week, delivered over a long period of time. The intensive behavior programs focus on identifying behaviors that interfere with normal developmental processes, understanding the relationship between a behavior and the child's environment and modifying those behaviors in such a way so as to improve the child's functional capacity. Treatment goals focus on improving adaptive behavior, language/communication skills, decreasing problem behaviors, as well as improving cognitive/intellectual status and academic/developmental achievements.

There is a formal credentialing process of professional behavior analysts through the Behavior Analyst Certification Board® (BACB). The BACB credentials and recognizes practitioners at four levels:

- Board Certified Behavior Analyst–Doctoral™
- Board Certified Behavior Analysts® (BCBA)
- Board Certified Assistant Behavior Analysts® (BCaBA)
- Registered Behavior Technician™ (RBT)

Practitioners credentialed at the BCBA-D and BCBA levels are defined by the BACB as Behavior Analysts. The BACB requires that BCaBAs, or Assistant Behavior Analysts, work under the supervision of a BCBA-D or BCBA. RBTs must work under the supervision of a BCBA-D, BCBA, or BCaBA

The BACB provides clinical guidelines regarding the delivery of ABA services as a treatment for ASD.

The essential features of autism spectrum disorder are persistent impairment in reciprocal social communication and social interaction and restricted, repetitive patterns of behavior, interests or activities. These symptoms are present from early childhood and limit or impair everyday functioning. Manifestations of the disorder vary greatly depending on the severity of the autistic condition, developmental level, and chronological age, which leads to the term spectrum. Autism spectrum disorder encompasses disorders previously referred to as early infantile autism, childhood autism, Kanner's autism, high-functioning autism, atypical autism, pervasive developmental disorder not otherwise specified, childhood disintegrative disorder, and Asperger's disorder (American Psychiatric Association, 2013).

There are no medical interventions that are effective in achieving a cure for autism; however, the condition may be managed through a combination of behavioral, pharmacological and educational interventions.

Diagnostic criteria for Autism Spectrum Disorder from: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)
<p>A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, no exhaustive; see text of DSM-5)</p> <ol style="list-style-type: none"> 1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions. 2. Deficits in nonverbal communicative behaviors used for social interaction, ranging for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a lack of facial expressions and nonverbal communication. 3. Deficits in developing, maintaining, and understanding relationships, ranging for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers. <p>Specify current severity: Severity is based on social communication impairments and restricted, repetitive patterns of behavior.</p>
<p>B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, no exhaustive; see text of DSM-5):</p> <ol style="list-style-type: none"> 1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases). 2. Insistence on sameness,, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day). 3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests). 4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling, or touching of objects, visual fascination with lights or movement). <p>Specify current severity: Severity is based on social communication impairments and restricted, repetitive patterns of behavior.</p>
<p>C. Symptoms must be present in the early developmental period (but may not be fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life.</p>
<p>D. Symptoms cause clinically significant impairment in social, occupational or other important areas of current</p>

functioning.

E. These disorders are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnosis of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

The DSM notes that individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specific should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Literature Review

Hayes Directory Report: Hayes (2014; 2017) conducted a review of the literature to determine if ABA-based approaches (i.e., intensive behavioral intervention [IBI] or Early Start Denver Model [ESDM]) are effective for improving behavioral, intellectual, or academic outcomes in children with ASD. In addition the review examined if the ABA-based programs vary in effectiveness according to treatment parameters; the safety of the programs; and, if there are definitive patient selection criteria established for ABA-based programs for treatment of children with ASD.

The review included 26 studies with sample size of 15 to 332 children. The studies included children with ASD, autism, or pervasive developmental disorder not otherwise specified (PDD-NOS) with the interventions of IBI and ESDM. The comparisons included minimal treatment, eclectic therapies for autism, school-based services, and wait-list status. The outcome measures included: autism severity, IQ scores, measures of infant and child development, language skills, visual-spatial or nonverbal skills, adaptive behavior, and school placement and performance. Follow-up in the studies included treatment persisting two months to four years following treatment initiation; with two studies conducting follow-up at two and five years following the cessation of treatment. The review noted that there were major limitations in design and methodology present in most of the available studies, including lack of randomization and minimal control for confounders in most studies, small sample sizes and lack of power analyses to justify these sample sizes, and lack of independent and/or blinded assessors. In addition, there was variability in the type of control groups, which leads to difficulty in making comparison of results across studies.

The findings of this review included:

- Current evidence allows a reasonably confident conclusion that applied behavior analysis (ABA)-based therapies that are intensively applied (i.e., intensive behavioral intervention [IBI] or Early Start Denver Model [ESDM]) are superior to other interventions for improvement of intelligence/cognitive skills and language skills over the short term.
- There is positive evidence suggesting that IBI therapy is superior to other interventions for placement of children in regular classroom settings, but additional evidence is needed to confirm this conclusion and the conclusion could be refuted by future evidence.
- Conclusions regarding the benefit of ABA-based therapies on other outcomes such as adaptive behavior cannot be made at this time.
- The variation in results in some studies suggests that the cognitive benefits are particularly pronounced for a subpopulation of children and may be minimal in other children, but criteria to identify children likely to have a good response have not been identified.
- There is insufficient evidence to permit a conclusion about the minimum duration of therapy required for long-term benefits or if benefits persist after discontinuation of the therapy.
- No conclusions are possible regarding the impact of various treatment parameters on treatment effectiveness.
- No adverse outcomes or side effects have been reported with the use of ABA-based therapies, and there is no evidence that they cause harm or increase the severity of the disorder.

The Agency for Healthcare Research and Quality (AHRQ) published a comparative effectiveness review of the effects of available interventions on adolescents and young adults with ASD (ages 13 to 30) (Lounds, et al.,

2012). The review focused on the following outcomes: core symptoms of ASD (impairments in social interaction, communication, and repetitive behavior); medical and mental health comorbidities; functional behaviors and independence; the transition to adulthood; and family outcomes. The studies assessed interventions falling into the broad categories of behavioral, educational, adaptive/life skills, vocational, medical, and allied health approaches. The comparators included no treatment, placebo, and comparative interventions or combinations of interventions. Intermediate outcomes included changes in core ASD symptoms and in common medical and mental health comorbidities as well as effects on functional behavior, the transition process, and family outcomes. Long-term outcomes included changes in adaptive/functional independence, academic and occupational attainment or engagement, psychological well-being, and psychosocial adaptation. Harms were also assessed.

Across all categories of interventions, most studies (n=27) were of poor quality, and none was good quality. Five randomized controlled trials (RCT) were fair quality: four that investigated pharmacologic agents and one allied health study that assessed a leisure/recreation program. Although positive results may be reported in individual studies, the poor quality of the studies and the lack of replication of the intervention studies mean that the strength of evidence for the body of evidence around any specific intervention is currently insufficient. Findings for the interventions included:

Behavioral:

- Individual or group-based social skills training: Four poor-quality studies, with two reporting on manualized (i.e., has a published treatment manual) intervention. Some gains in social skills on largely parent-reported measures in short-term studies. Two studies lacked comparison groups; diagnostic approach, participant characteristics, treatment fidelity not clearly reported.
- Computer-based social skills training: Three poor-quality, short-term studies. Some improvements in emotion recognition in treated participants; no differences in measures of generalization. Systematic diagnostic approach not reported within studies; concomitant interventions and treatment fidelity not reported.
- Intensive behavioral treatment: One poor-quality case series with diverse participants. Some gains in adaptive behavior reported. Intervention not clearly described; treatment fidelity and concomitant interventions not reported; assessors not masked.

Adaptive/Life Skills:

- Specific life/transitional skills: Three, poor-quality, short-term studies assessing highly specific skills and unique interventions (e.g., shoe lacing, digital device use, rotating classroom schedule). Some gains seen in individual studies but most lacked comparison groups. Systematic diagnostic approach not reported within studies; participants often not clearly characterized; differences in concomitant interventions and treatment fidelity often not reported.
- Treatment and Education of Autistic and related Communication Handicapped Children (TEACCH)-based model: One poor-quality cohort study; desirability of living situation and use of programming rated more highly for TEACCH than other conditions; group homes rated more desirable than institutions. Nonrandom assignment to groups; systematic diagnostic approach not reported within study; inclusion/exclusion criteria not clearly stated; interventions not fully described; assessors not masked.

In 2014, the AHRQ published a systematic review that updated the behavioral intervention portion of the comprehensive review of therapies for children with ASD that was published in 2011 (Weitlauf, et al., 2014).

There have been several systematic reviews of intensive behavioral interventions for individuals with ASD (Reichow, et al., 2018; Roth, et al., 2014; Bishop-Fitzpatrick, et al., 2013; Strauss, et al., 2013; Reichow, et al., 2012; Warren, et al., 2011; Peters-Scheffer, et al., 2011; Virués-Ortega, 2010; Makrygianni, et al., 2010; Spreckley, et al., 2009; Seida, et al., 2009; Eldevik, et al., 2009; Howlin, et al., 2009; Reichow and Wolery, 2008). While the reviews do note that there are some limitations in the literature that includes small sample size, length of follow-up, and reliance on data from non-randomized studies, that overall the reviews report positive benefits of the treatment.

There are several published studies regarding children with ASD (Mohammadzaheri, et al., 2014; Fernell, et al., 2011; Zachor, et al., 2011; Smith, et al., 2010; Remington, et al., 2007; Ben-Itzhak and Zachor, 2007; Magiati, et al., 2007; Eikeseth, et al., 2007; Sallows and Graupner, 2005; Howard, et al., 2005; Sheinkopf and Siegel,

1998). Although many of the studies are limited by the small sample size and the length of time of treatment and follow-up time there is a demonstrated improvement in outcomes for improvements in functional and social adaptation, and cognitive skills including language and communication skills, intellectual function, or other measures for children with ASD.

Other Intensive Intervention Programs

Intensive intervention programs other than those that focus on behavior analytic treatment have also been developed. The published evidence is preliminary and does not support the efficacy of these programs. These include, but are not limited to:

- **TEACCH program:** The TEACCH program (Treatment and Education of Autistic and Related Communication Handicapped Children) is an educational intervention focused on improving motor coordination and cognitive skills and has been implemented in many special education programs for autistic children. It includes behavioral analytic approaches for some skills but uses other interventions as well.
- **Denver Model:** The focus of the Colorado Health Sciences program (Denver Model) is learning through play based on Piaget and object relations theories. Behavior analytic techniques are included for behavior management.
- **Rutgers program:** The Rutgers program is known as the Douglas Developmental Disabilities Center (based at Rutgers University), has three programs small-group segregated preschool, and integrated preschool and intensive home-based intervention, and uses ABA techniques and similarities to the Lovaas program. Families are trained in the program and provide the treatment when they are available and or hire staff trained in the program.
- **Learning Experiences and Alternative Program (LEAP):** LEAP program includes both a preschool program and a behavioral skill training program for parents, as well as national outreach activities. The program includes an individualized curriculum that targets goals in social, emotional, language, adaptive behavior, cognitive, and physical developmental areas.
- **Relationship Development Intervention (RDI):** RDI is a program designed to empower and guide parents of children, adolescents and young adults with ASD and similar developmental disorders to function as facilitators for their children's mental development (Gutstein, 2009). RDI is based on instructing the parents to have an important role in improving critical emotional, social and meta-cognitive abilities through carefully graduated, guided interaction in daily activities.
- **Floortime:** this is also referred to as DIR[®] (Developmental, Individual Difference, Relationship-based model), DIR[®] Floortime, or Greenspan Floor-Time Model. This is a developmentally-based, one-on-one treatment program delivered 10 to 25 hours per week. The primary intervention method used in this model is intensive interactive "floor-time" play sessions, in which an adult follows a child's lead in play and interaction. The program consists of three components: home-based play sessions, individual therapies, and early education programs.
- **Pivotal Response Therapy:** This is also known as Pivotal Response Treatment (PRT)[®], Pivotal Response Training[®], Pivotal Response Teaching[®] or Pivotal Response Intervention. It is a behavioral intervention model based on the principles of ABA. The treatment focuses on altering gateway/pivotal behaviors considered central to broad areas of functioning and in which improvements would lead to improvements in behaviors; pivotal behaviors include motivation to initiate or and respond to stimuli, self-direction of behavior, and responsiveness to cues/stimuli; typically involves extensive parent/family training components (Warren, et al., 2011).

Intensive Behavioral Interventions for Other Conditions

Although intensive behavioral interventions were developed initially to treat children with autism spectrum disorders (ASD) they have been proposed to treat children with other conditions, including Down syndrome, learning disabilities and Attention-Deficit/Hyperactivity Disorder (ADHD). There is a lack of scientific evidence to support the efficacy of the programs for other conditions.

ABA has been proposed to treat individuals with Down syndrome. The behavior and psychiatric problems associated with Down syndrome Assessment should include evaluation of the problem at school and at home, behavior management techniques, and medication as needed (Ostermaier [UpToDate], 2017). The role of ABA in treatment of this condition is unproven and not supported in the published medical literature.

Professional Societies/Organizations

American Academy of Child and Adolescent Psychiatry (AACAP): The AACAP updated their practice parameters for the assessment and treatment of children and adolescents with autism spectrum disorders. The guidelines include the following regarding treatment (Volkmar, et al., 2014):

The clinician should help the family obtain appropriate, evidence-based and structured educational and behavioral interventions for children with ASD (evidence base: CS).

The guidelines note that, "Structured educational and behavioral interventions have been shown to be effective for many children with ASD and are associated with better outcome. As summarized in the National Research Council (NRC) report, the quality of the research literature in this area is variable, with most studies employing group controls or single-subject experimental methods. In general, studies employing more rigorous randomized group comparisons are sparse, reflecting difficulties in random assignment and control comparisons. Other problems include lack of attention to subject characterization, generalization of treatment effects, and fidelity of treatment implementation. Despite these problems, various comprehensive treatments approaches have been shown to have efficacy for groups of children, although none of the comprehensive treatment models has clearly emerged as superior."

Regarding behavioral interventions, the guidelines note that, "Behavioral interventions such as Applied Behavioral Analysis (ABA) are informed by basic and empirically supported learning principles. A widely disseminated comprehensive ABA program is Early Intensive Behavioral Intervention (EIBI) for young children, based on the work of Lovaas et al. EIBI is intensive and highly individualized with up to 40 hours per week of one to one direct teaching, initially using discrete trials to teach simple skills and progressing to more complex skills such as initiating verbal behavior. A meta-analysis found EIBI effective for young children, but stressed the need for more rigorous research to extend the findings. Behavioral techniques are particularly useful when maladaptive behaviors interfere with provision of a comprehensive intervention program. In such situations a functional analysis of the target behavior is performed, in which patterns of reinforcement are identified and then various behavioral techniques are used to promote a desired behavioral alternative. ABA techniques have been repeatedly shown to have efficacy for specific problem behaviors, and ABA has also been found to be effective as applied to academic tasks, adaptive living skills, communication, social skills, and vocational skills. Because most children with ASD tend to learn tasks in isolation, an explicit focus on generalization is important."

*evidence base for practice parameters:

Recommendations for best assessment and treatment practices are stated in accordance with the strength of the underlying empirical and/or clinical support, as follows:

Clinical Standard (CS) is applied to recommendations that are based on rigorous empirical evidence (e.g., meta-analyses, systematic reviews, individual randomized controlled trials) and/or overwhelming clinical consensus.

American Academy of Pediatrics (AAP): A clinical report for the management of children with autism spectrum disorders (ASD) was published by the American Academy of Pediatrics (AAP) (Myers, et al., 2007). The report notes that, "Educational interventions, including behavioral strategies and habilitative therapies, are the cornerstones of management of ASDs. These interventions address communication, social skills, daily-living skills, play and leisure skills, academic achievement, and maladaptive behaviors." The AAP report notes that these programs may differ in philosophy and relative emphasis on particular strategies. The early childhood educational programs share many common goals. There is an increasing consensus that important principles and components of effective early childhood intervention for children with ASDs include the following (Myers, et al., 2007):

- An entry into intervention as soon as an ASD diagnosis is seriously considered rather than deferring until a definitive diagnosis is made
- A provision of intensive intervention, with active engagement of the child at least 25 hours per week, 12 months per year, in systematically planned, developmentally appropriate educational activities designed to address identified objectives
- A low student-to-teacher ratio to allow sufficient amounts of one-to-one time and small-group instruction to meet specific individualized goals

- An inclusion of a family component, including parent training as indicated
- A promotion of opportunities for interaction with typically developing peers to the extent that these opportunities are helpful in addressing specified educational goals
- An ongoing measurement and documentation of the individual child's progress toward educational objectives, resulting in adjustments in programming when indicated
- An incorporation of a high degree of structure through elements such as predictable routine, visual activity schedules, and clear physical boundaries to minimize distractions
- An implementation of strategies to apply learned skills to new environments and situations (generalization) and to maintain functional use of these skills
- The use of assessment-based curricula that address the following:
 - functional, spontaneous communication
 - social skills, including joint attention, imitation, reciprocal interaction, initiation, and self-management
 - functional adaptive skills that prepare the child for increased responsibility and independence
 - reduction of disruptive or maladaptive behavior by using empirically supported strategies, including functional assessment
 - cognitive skills, such as symbolic play and perspective taking
 - traditional readiness skills and academic skills as developmentally indicated

In regard to the efficacy of education interventions, the AAP report notes that the treatment “should be based on sound theoretical constructs, rigorous methodologies, and empirical studies of efficacy. Proponents of behavior analytic approaches have been the most active in using scientific methods to evaluate their work, and most studies of comprehensive treatment programs that meet minimal scientific standards involve treatment of preschoolers using behavioral approaches. However, there is still a need for additional research, including large controlled studies with randomization and assessment of treatment fidelity. Empirical scientific support for developmental models and other interventions is more limited, and well-controlled systematic studies of efficacy are needed.” (Myers, et al., 2007).

Technical Expert Panel (TEP) and HRSA Autism Intervention Research–Behavioral (AIR-B) Network: TEP published recommended guidelines and further research needs for nonmedical interventions for children with ASD based on evidence and the expert panel (Maglione, et al., 2012). The TEP included practitioners, researchers, and parents. The report notes that the strength of evidence of efficacy varied by intervention type from insufficient to moderate, with none reaching high strength. The evidence included studies with a sample size of at least 10; control group not necessary and observational studies were included. The scientific literature is not clear as to which individual participant characteristics are associated with success of various approaches. The TEP noted that:

- According to commonly accepted standards, the evidence that comprehensive intervention programs, often referred to as “intensive” interventions, are effective at improving core deficits of ASD is moderate strength. Even though controlled studies have been conducted, few have randomly selected their subjects or enrolled large samples. Several meta-analyses of programs based on applied behavioral analysis or the Lovaas method have been conducted to increase statistical power; they have found promising results in the areas of language, adaptive skills, and IQ.
- Evidence is insufficient to suggest the superiority of one behavioral curriculum over others. There is moderate evidence that greater intensity of treatment (hours per week) and greater duration (in months) lead to better outcomes.
- Regarding developmentally based intensive programs and environmental programs such as TEACCH, the strength of evidence is lower.
- Overall, autonomous social skills programs for high-functioning children and adolescents have a moderate strength of evidence of efficacy; however, our analyses could not determine which approaches, settings, and modalities were superior.
- For children with little or no verbal language, the Picture Exchange Communication System (PECS) has moderate strength of evidence of efficacy, and no controlled trials or uncontrolled observational studies of augmentative communication devices were identified.
- Auditory integration training was found ineffective in four of five.

The review identified future research priorities:

- There was significant heterogeneity in outcome measures used in trials of interventions for ASD. Research priority: assessment and monitoring of outcomes
- The needs of preverbal children may differ considerably from those of verbal children, but existing studies rarely focus on preverbal children (or minimally verbal or nonverbal). Research priority: understanding and addressing the needs of pre-verbal and nonverbal individuals with ASD.
- The appropriate intensity, duration and type of program for adolescents with ASDs cannot be determined from the current literature, since few studies report on interventions for this age group. Research priority: understanding and addressing the needs of adolescents and adults with ASDs.
- While some reviews found that applied behavioral analysis is a highly effective component of a comprehensive intervention in addressing IQ and communication skills, it is unclear which other components affect which specific core deficits. Research priority: Identifying the most effective strategies to impact the specific core deficits of ASDs.
- Comparative effectiveness studies of different intensities and durations of ASD interventions are relatively lacking from the existing literature, but are important. Research priority: Identification of the most effective dose and duration of interventions.

Use Outside of the US

National Institute for Health and Clinical Excellence (NICE): NICE published clinical guidelines for the management and support of children and young people on the autism spectrum. The guidelines include the following recommendations for specific interventions for core features of autism (NICE, 2013):

Psychosocial interventions

- Consider a specific social-communication intervention for the core features of autism in children and young people that includes play-based strategies with parents, carers and teachers to increase joint attention, engagement and reciprocal communication in the child or young person. Strategies should:
 - be adjusted to the child or young person's developmental level
 - aim to increase the parents', carers', teachers' or peers' understanding of, and sensitivity and responsiveness to, the child or young person's patterns of communication and interaction
 - include techniques of therapist modeling and video-interaction feedback
 - include techniques to expand the child or young person's communication, interactive play and social routines
- The intervention should be delivered by a trained professional. For pre-school children consider parent, carer or teacher mediation. For school-aged children consider peer mediation.

The guidelines note in a discussion section of intensive and targeted education for children that that extends beyond the remit of most parent training interventions, "Some parents seek a programme of intensive and targeted education for their children that extends beyond the remit of most parent training interventions, and which are often delivered in the home and sometimes in school settings. Such interventions are designed to teach new skills, to minimise the negative consequences of impairments and to assist in the generalisation of learning. These programmes are not routinely delivered within the NHS or social care services, and, when publicly funded, are usually supported from education budgets."

Academy of Medicine Singapore-Ministry of Health (AMS-MOH): this organization published clinical practice guidelines for autism spectrum disorders (ASD) in pre-school children. The guidelines include the recommendations for interventions for ASD (AMS-MOH, 2010):

- Every pre-school child diagnosed with ASD should have an individualized intervention plan that sets out the goals, type(s), frequency and intensity of intervention, in order to address particular developmental and educational needs. (Grade D, Level 4)
- An individualized intervention plan should consist of a variety of quality programs and activities. This includes attendance in comprehensive early intervention programs, programs targeting specific needs and also positive engagement with parents and/or caregivers. (Grade D, Level 4)

- All pre--school children with ASD should undergo early intervention as soon as significant developmental need is recognized by a trained professional because outcomes improve with early intervention. (Grade C, Level 2++)
- The intensity of intervention should be continually monitored and varied according to the child's changing need. (Grade D, Level 4)
- Early Intensive Behavior Intervention (EIBI) can be recommended as an intervention option for children with ASD. (Grade A, Level 1++)

Regarding applied behavior analysis, (ABA), the guidelines note, "Recent systematic reviews showed that EIBI was efficacious but had variable outcomes, suggesting that EIBI was not effective for all children with ASD." They note that, "No studies replicated the magnitude of efficacy reported by Lovaas (i.e., significant gains on intelligence tests and claims of 'recovery' as defined by a placement in mainstream schools without assistance)". The guidelines note that, "Parents should be informed that EIBI, in its original form, is an expensive intervention that may place significant financial strain on families."

Grade of recommendation:

A: At least one meta-analysis, systematic review of RCTs, or RCT rated as 1+ + and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1+ + or 1+

C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2+ +

D: Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+

GPP: (good practice points) Recommended best practice based on the clinical experience of the guideline development group.

Levels of evidence:

1+ +: High quality meta-analyses, systematic reviews of randomized controlled trials (RCTs), or RCTs with a very low risk of bias.

1+: Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias.

1-: Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

2+ +: High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+: Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2-: Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3: Non-analytic studies, e.g. case reports, case series

4: Expert opinion

Coding/Billing Information

Note: 1) This list of codes may not be all-inclusive.

2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

97151	Behavior identification assessment, administered by a physician or other qualified health care professional, each 15 minutes of the physician's or other qualified health care professional's time face-to-face with patient and/or guardian(s)/caregiver(s) administering assessments and discussing findings and recommendations, and non-face-to-face analyzing past data, scoring/interpreting the assessment, and preparing the report/treatment plan (Code effective
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	01/01/2019)
97152	Behavior identification-supporting assessment, administered by one technician under the direction of a physician or other qualified health care professional, face-to-face with the patient, each 15 minutes (Code effective 01/01/2019)
97153	Adaptive behavior treatment by protocol, administered by technician under the direction of a physician or other qualified health care professional, face-to-face with one patient, each 15 minutes (Code effective 01/01/2019)
97154	Group adaptive behavior treatment by protocol, administered by technician under the direction of a physician or other qualified health care professional, face-to-face with two or more patients, each 15 minutes
97155	Adaptive behavior treatment with protocol modification, administered by physician or other qualified health care professional, which may include simultaneous direction of technician, face-to-face with one patient, each 15 minutes (Code effective 01/01/2019)
97156	Family adaptive behavior treatment guidance, administered by physician or other qualified health care professional (with or without the patient present), face-to-face with guardian(s)/caregiver(s), each 15 minutes (Code effective 01/01/2019)
97157	Multiple-family group adaptive behavior treatment guidance, administered by physician or other qualified health care professional (without the patient present), face-to-face with multiple sets of guardians/caregivers, each 15 minutes (Code effective 01/01/2019)
97158	Group adaptive behavior treatment with protocol modification, administered by physician or other qualified health care professional, face-to-face with multiple patients, each 15 minutes (Code effective 01/01/2019)
0359T	Behavior identification assessment, by the physician or other qualified health care professional, face-to-face with patient and caregiver(s), includes administration of standardized and non-standardized tests, detailed behavioral history, patient observation and caregiver interview, interpretation of test results, discussion of findings and recommendations with the primary guardian(s)/caregiver(s), and preparation of report (Code deleted 12/31/2018)
0360T	Observational behavioral follow-up assessment, includes physician or other qualified health care professional direction with interpretation and report, administered by one technician; first 30 minutes of technician time, face-to-face with the patient (Code deleted 12/31/2018)
0361T	Observational behavioral follow-up assessment, includes physician or other qualified health care professional direction with interpretation and report, administered by one technician; each additional 30 minutes of technician time, face-to-face with the patient (List separately in addition to code for primary service) (Code deleted 12/31/2018)
0362T	Behavior identification supporting assessment, each 15 minutes of technicians' time face-to-face with a patient requiring the following components: administration by the physician or other qualified health care professional who is on site; with the assistance of two or more technicians; for a patient who exhibits destructive behavior; completion in an environment that is customized to the patient's behavior
0363T	Exposure behavioral follow-up assessment, includes physician or other qualified health care professional direction with interpretation and report, administered by physician or other qualified health care professional with the assistance of one or more technicians; each additional 30 minutes of technician(s) time, face-to-face with the patient (List separately in addition to code for primary procedure) (Code deleted 12/31/2018)
0364T	Adaptive behavior treatment by protocol, administered by technician, face-to-face with one patient; first 30 minutes of technician time (Code deleted 12/31/2018)
0365T	Adaptive behavior treatment by protocol, administered by technician, face-to-face with one patient; each additional 30 minutes of technician time (List separately in addition to code for primary procedure) (Code deleted 12/31/2018)
0366T	Group adaptive behavior treatment by protocol, administered by technician, face-to-face with two or more patients; first 30 minutes of technician time (Code deleted 12/31/2018)
0367T	Group adaptive behavior treatment by protocol, administered by technician, face-to-face with two or more patients; each additional 30 minutes of technician time (List separately in addition to code for primary procedure) (Code deleted 12/31/2018)

0368T	Adaptive behavior treatment with protocol modification administered by physician or other qualified health care professional with one patient; first 30 minutes of patient face-to-face time (Code deleted 12/31/2018)
0369T	Adaptive behavior treatment with protocol modification administered by physician or other qualified health care professional with one patient; each additional 30 minutes of patient face-to-face time (List separately in addition to code for primary procedure) (Code deleted 12/31/2018)
0370T	Family adaptive behavior treatment guidance, administered by physician or other qualified health care professional (without the patient present) (Code deleted 12/31/2018)
0371T	Multiple-family group adaptive behavior treatment guidance, administered by physician or other qualified health care professional (without the patient present) (Code deleted 12/31/2018)
0372T	Adaptive behavior treatment social skills group, administered by physician or other qualified health care professional face-to-face with multiple patients (Code deleted 12/31/2018)
0373T	Adaptive behavior treatment with protocol modification, each 15 minutes of technicians' time face-to-face with a patient, requiring the following components: administration by the physician or other qualified health care professional who is on site; with the assistance of two or more technicians; for a patient who exhibits destructive behavior; completion in an environment that is customized to the patient's behavior
0374T	Exposure adaptive behavior treatment with protocol modification requiring two or more technicians for severe maladaptive behavior(s); each additional 30 minutes of technicians' time face-to-face with patient (List separately in addition to code for primary procedure) (Code deleted 12/31/2018)

HCPCS Codes	Description
G9012	Other specified case management service not elsewhere classified

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