



Medical Coverage Policy

Effective Date.....12/15/2021
Next Review Date.....12/15/2022
Coverage Policy Number 0447

Autism Spectrum Disorders/Pervasive Developmental Disorders: Assessment and Treatment

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Overview

This Coverage Policy addresses services for the assessment and treatment of autism spectrum disorders and pervasive developmental disorders.

Coverage Policy

A number of states have coverage mandates that require regulated benefit plans to cover services related to an autism spectrum disorder (ASD) or pervasive developmental disorder (PDD). For example, New York law requires regulated benefit plans to provide coverage for the screening, diagnosis and treatment of ASD/PDD.

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

Coverage for speech generating devices varies across plans. Refer to the customer's benefit plan document for coverage details. Many benefit plans exclude coverage for "aids or devices that assist with nonverbal communications". When this language is present in the benefit plan, speech generating devices that use prerecorded messages (HCPCS codes E2500-E2506) are not covered. However, unless specifically excluded, speech generating devices that use synthesized speech are covered if criteria are met. When covered, coverage for speech generating devices is subject to the terms, conditions and limitations of the applicable benefit plan's Durable Medical Equipment (DME) benefit and schedule of copayments.

Services provided by a psychiatrist, psychologist or other behavioral health professionals may be subject to the provisions of the applicable behavioral health benefit.

Assessment and treatment for comorbid behavioral health and/or medical diagnoses and associated symptoms and/or conditions may be covered under applicable medical and behavioral health benefit plans.

Coverage of medications related to the treatment of Autism Spectrum Disorder (ASD) may be subject to the pharmacy benefit portion of the applicable benefit plan.

Assessment

The following services are considered medically necessary for the assessment of a suspected or known ASD:

- audiological evaluation
- behavioral health evaluation including psychiatric examination
- electroencephalogram (EEG) when there is suspicion of a seizure
- evaluation by speech and language pathologist
- lead screening
- medical evaluation including history and physical examination
- autism-specific developmental screening (Current Procedural Terminology [CPT] code 96110, e.g., Checklist for Autism in Toddlers [CHAT], Pervasive Developmental Disorder Screening Test-II) and CPT codes 96112, 96113, e.g., Autism Behavior Checklist [ABC], Childhood Autism Rating Scale [CARS])
- neuroimaging studies when the child is a candidate for specific interventions such as epilepsy surgery
- occupational and/or physical therapy evaluation when motor deficits, motor planning or sensory dysfunction are present
- quantitative plasma amino acid assays to detect phenylketonuria

when ANY of the following criteria are met:

- any loss of any language or social skills at any age
- absence of babbling by 12 months
- absence of gesturing (e.g., pointing, waving bye-bye) by 12 months
- absence of single word speech by 16 months
- absence of 2-word spontaneous (not echolalic) phrases by 24 months

Treatment

Behavioral health treatment (e.g., behavior modification, family therapy, cognitive behavioral therapy or other forms of psychotherapy) for ASD is considered medically necessary when ALL of the following criteria are met:

- individual meets criteria for ASD in the Diagnostic and Statistical Manual of Mental Health Disorders, Fifth Edition (DSM-5)
- services are appropriate in terms of type, frequency, extent, site and duration
- treatment is being provided by an appropriate behavioral health care professional
- meaningful and measurable improvement is expected from the therapy

Please refer to the Medical Coverage Policy on Intensive Behavioral Interventions for specific medical necessity criteria for applied behavior analysis (ABA).

Please refer to the Medical Coverage Policies on Neuropsychological Testing, Speech Therapy, Occupational Therapy, Physical Therapy and the Cigna/ASH Medical Coverage Policy for Sensory and Auditory Integration Therapy - Facilitated Communication for specific coverage criteria for these services.

Speech Generating Device

A speech generating device for ASD is considered medically necessary when ALL of the following criteria are met:

- The individual has a permanent and severe expressive speech impairment.
- A speech evaluation, conducted by a speech-language pathologist, has documented the severity of the individual's disability, specific to their primary language.
- Speaking needs cannot be met using natural communication methods.
- Other forms of treatment have failed, are contraindicated, or are otherwise not appropriate.
- A speech generating device is available in the individual's primary language
- A speech generating device is being requested for the sole purpose of speech generation.

Not Medically Necessary Services

Services that are considered primarily educational or training in nature or related to academic or work performance are not covered under many benefit plans. The following services for the assessment and/or treatment of ASD are considered primarily educational and training in nature and not medically necessary:

- education and achievement testing, including Intelligence Quotient (IQ) testing
- educational interventions (e.g., classroom environmental manipulation, academic skills training and parental training)

Multi-purpose, general consumer electronic devices such as personal digital assistants (PDAs), computers, tablet devices (e.g., iPads®), smart phones, electronic mail devices and pagers, are not medical in nature and thus are considered not medically necessary.

Experimental, Investigational or Unproven

The following procedures/services for the assessment and/or treatment of ASD are considered experimental, investigational or unproven for this indication:

Assessment:

- allergy testing (e.g., food allergies for gluten, casein, candida, molds)
- blood metabolite testing (e.g., NPDX ASD test)
- celiac antibodies testing
- central carbon metabolites tests (e.g., NPDX ASD test)
- erythrocyte glutathione peroxidase studies
- event-related potentials (i.e., evoked potential studies)
- hair analysis
- heavy metal testing
- immunologic or neurochemical abnormalities testing
- intestinal permeability studies
- magnetoencephalography (MEG)
- micronutrient testing (e.g., vitamin level)
- mitochondrial disorders testing (e.g., lactate and pyruvate)
- provocative chelation tests for mercury
- stool analysis
- urinary peptides testing

Treatment:

- acupuncture
- art therapy
- auditory integration therapy
- chelation therapy
- cognitive rehabilitation
- craniosacral therapy
- dietary and nutritional interventions (e.g., elimination diets, vitamins)
- EEG biofeedback/neurofeedback
- equestrian therapy (hippotherapy)
- facilitated communication
- holding therapy
- hyperbaric oxygen therapy
- immune globulin therapy
- music therapy
- recreational therapy
- secretin infusion
- social skills training
- Theory of Mind cognitive model
- vision therapy

General Background

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)

The precise etiology of ASD is unknown, although there appears to be a high heritability associated with it. The etiology can be identified for between 15% and 20% of individuals with autism; in the others the cause remains unknown (Miles, et al., 2003/2010). This is a field of active research.

Associations between ASD and a number of medical conditions have been proposed. Several other disorders are associated with ASD. These include:

- Epilepsy or seizure disorder
- Tuberous sclerosis
- Fragile X syndrome
- Intellectual disability

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 functioning.</p>
<p>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-</p>

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.

CDC surveillance data published in 2014 revealed that white, non-Hispanic children were approximately 20% more likely to be identified with ASD before the case review than were non-Hispanic African American children and were about 50% more likely to be identified with ASD than were Hispanic children. Recent prevalence data reveal increasing rates of ASD in Hispanic and African American children. This may reflect more widespread awareness of the symptoms among parents, schools, and health care providers and improved rates of screening in health supervision care. Studies examining the effects of race and ethnicity on age at diagnosis are conflicting, but earlier diagnosis of ASD is associated with higher socioeconomic status and access to services. African American and Hispanic children diagnosed with ASD by age 4 years were more likely to have coexisting intellectual disability than were white, non-Hispanic children, suggesting that some African American and Hispanic children with ASD and average to above-average intelligence may not have been identified (Hyman, et al., 2020).

Assessment

It has been suggested that early identification and initiation of early interventions results in improved management for most children with ASD. Routine developmental surveillance should be conducted by all providers at every well-child visit. Indications for immediate evaluation of ASD include (Filipek, et al., 2000/2014):

- no babbling or pointing or other gesture by 12 months
- no single words by 16 months
- no two-word spontaneous (not echolalic) phrases by 24 months
- any loss of any language or social skills during the preadolescent years

The evaluation for ASD often requires a multidisciplinary team approach and will be dependent on the impairments that are present. The team may include a pediatrician, psychiatrist, psychologist, neurologist, speech therapist, occupational therapist, and social worker. There is no specific test that can confirm a diagnosis of ASD. The evaluation must include the following (Tuchman, 2003; Filipek, et al., 2000/2014):

- Clinical history: This includes parental report, family history, pregnancy, neonatal and developmental history of the child. Use of standardized questionnaires may be used.
- Clinical examination

The evaluation may include the following (Tuchman, 2003; Filipek, et al., 2000/2014):

- audiologic evaluation
- communication assessment performed by speech and language pathologist
- assessment by occupational or physical therapist if there are motor deficits, motor planning or sensory dysfunction present
- lead screening should be performed, particularly when pica is present
- magnesium screening
- cognitive assessment

There is consensus that the following tests are not needed for the evaluation of ASD; however, they may be considered appropriate for the evaluation of associated conditions:

- Genetic tests may be performed to detect a syndromic condition such as fragile-X or other genetic etiology.

- Metabolic tests may be needed if the history or examination suggest.
- Neuroimaging studies are indicated only if the child is a candidate for specific interventions (e.g., epilepsy surgery).
- Electroencephalogram (EEG) may be performed if there is suspicion of a seizure.

The American Academy of Neurology (AAN) and Child Neurology Society (CNS) have developed evidenced-based practice parameters for the screening and diagnosis of autism. These parameters include the following developmental and assessment screening instruments that may be used in the evaluation process (Filipek, et al., 2000/2014):

- The Ages and Stages Questionnaire
- The BRIGNACE® screens
- The Child Development Inventories
- The Parents' Evaluation of Developmental Status

The AAN/CNS practice parameters also note that screening for autism should be performed on all children failing routine developmental surveillance procedures and may include these tools (Filipek, et al., 2000/2014):

- Checklist for Autism in Toddlers (CHAT): This test is used for children 18 months of age.
- Autism Screening Questionnaire: This test is used for children four years of age and older.

The AAN/CNS practice parameters noted that the Denver II (formerly the Denver Developmental Screening Test-Revised) is not recommended as a developmental screening tool for autism (Filipek, et al., 2000/2014). It is also noted in the practice parameters that, "There is insufficient evidence to support the use of other tests such as hair analysis for trace elements, celiac antibodies, allergy testing (particularly food allergies for gluten, casein, candida and other molds), immunologic or neurochemical abnormalities, micronutrients such as vitamin levels, intestinal permeability studies, stool analysis, urinary peptides, mitochondrial disorders (including lactate and pyruvate), thyroid function tests, or erythrocyte glutathione peroxidase studies" (Filipek, et al., 2000/2014). The practice parameters note that recording of event-related potentials and magnetoencephalography currently are research tools and there does not appear to be evidence of routine clinical utility.

The American Academy of Pediatrics (AAP) guidelines for identification, evaluation, and management of children with autism spectrum disorder (ASD) recommends screening all children for symptoms of ASD through a combination of developmental surveillance at all visits and standardized autism specific screening tests at 18 and 24 months of age in their primary care visits because children with ASD can be identified as toddlers, and early intervention can and does influence outcomes (Hyman, et al., 2020). Earlier diagnosis of ASD may lead to earlier treatment. In children 18-30 months of age, the M-CHAT is the most studied and widely used tool for screening toddlers for ASD, and the Modified Checklist for Autism in Toddlers, Revised with Follow-Up (Questions) (M-CHAT-R/F) eliminates three questions from the previous version.. Children who do not pass ASD screening tests or who score as at risk for a diagnosis should be referred for both diagnostic assessment and intervention services. At present, for children older than 30 months, there are no validated screening tools available for use in pediatric practice, nor are there current recommendations by the AAP for universal screening for ASD in that age group (Hyman, et al., 2020).

The U.S. Preventive Services Task Force (USPSTF) published a recommendation statement for screening for ASD in young children (USPSTF, 2016). For children aged 18 to 30 months, the USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for ASD in young children for whom no concerns of ASD have been raised by their parents or a clinician.

Metabolomics or blood metabolites has been proposed as a method to be used in the assessment of the diagnosis of autism. The NPDX ASD test (Stemina Biomarker Discovery, Madison, WI) is a blood panel that measures metabolic subtypes (or metabotypes) associated with ASD. According to the product website the NPDX ASD test is a blood panel that measures metabolites in the blood of children with differences in metabolism and compares them to specific metabolic imbalances that are associated with autism spectrum disorder (ASD). The test results will include a positive or negative result compared to data from the CAMP study.

It is purported that the test can identify a subset of children with autism spectrum disorder (about 30%) who have a metabolic imbalance that is associated with ASD.

Smith et al. (2019) reported on a study that based on evidence that dysregulation of branched-chain amino acids (BCAAs) may contribute to the behavioral characteristics of ASD, tested whether dysregulation of amino acids (AAs) was a pervasive phenomenon in individuals with ASD. The study reports on the results from the Children's Autism Metabolome Project (CAMP), a large-scale effort to define autism biomarkers based on metabolomic analyses of blood samples from young children. Dysregulation of AA metabolism was identified by comparing plasma metabolites from 516 children with ASD with those from 164 age-matched typically developing children recruited into the CAMP. The ASD subjects were stratified into subpopulations based on shared metabolic phenotypes associated with BCAA dysregulation. Groups of AAs with positive correlations were identified that were, as a group, negatively correlated with BCAA levels in ASD. Imbalances between these two groups of AAs identified three ASD-associated amino acid dysregulation metabolotypes. The combination of glutamine, glycine, and ornithine amino acid dysregulation metabolotypes identified a dysregulation in AA/BCAA metabolism that is present in 16.7% of the CAMP subjects with ASD and is detectable with a specificity of 96.3% and a positive predictive value of 93.5% within the ASD subject cohort.

There is insufficient evidence in the published peer-reviewed medical literature to support provocative chelation tests for mercury in the assessment of ASD. There has been interest in the relationship of heavy metals, in particular mercury and the etiology of ASD. Testing for heavy metals (e.g., arsenic, barium, beryllium, bismuth, antimony, and mercury) is not supported by evidence in the peer-reviewed medical literature.

Treatment

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.

The Agency for Healthcare Research and Quality (AHRQ) published a comparative effectiveness review of therapies for children with autism spectrum (Warren, et al., 2011). The review included 159 unique studies with thirteen studies determined to be good quality, 56 fair quality and 90 trials poor quality. The treatments in the review included behavioral, educational, medical, allied health, and complementary and alternative medicine (CAM) interventions. The CAM interventions included acupuncture and massage. The comparators included no treatment, placebo, and comparative interventions or combinations of interventions. The outcomes included changes in core ASD symptoms and in commonly associated symptoms. The findings of this review included:

- Behavioral interventions:
 - There were 78 unique behavioral studies. Early intensive behavioral and developmental intervention may improve core areas of deficit for individuals with ASDs; however, few randomized controlled trials (RCTs) of sufficient quality have been conducted, no studies directly compare effects of different treatment approaches, and little evidence of practical effectiveness or feasibility exists.
 - Within the behavioral category, the studies of UCLA/Lovaas-based interventions report greater improvements in cognitive performance, language skills, and adaptive behavior skills than broadly defined eclectic treatments available in the community. However, the strength of evidence is currently low. Further, not all children receiving intensive intervention demonstrate rapid gains, and many children continue to display substantial impairment. Although positive results are reported for the effects of intensive interventions that use a developmental framework, such as the Early Start Denver Model (ESDM), evidence for this type of intervention is currently insufficient because few studies have been published to date.
 - Less intensive interventions focusing on providing parent training for bolstering social communication skills and managing challenging behaviors have been associated in individual studies with short-term gains in social communication and language use. The current evidence base for such treatment remains insufficient, with current research lacking consistency in interventions and outcomes assessed.
 - Although all of the studies of social skills interventions reported some positive results, most have not included objective observations of the extent to which improvements in social skills generalize and are maintained within everyday peer interactions. Strength of evidence is

insufficient to assess effects of social skills training on core autism outcomes for older children or play- and interaction-based approaches for younger children. Several studies suggest that interventions based on cognitive behavioral therapy are effective in reducing anxiety symptoms. The strength of evidence for these interventions, however, is insufficient pending further replication.

- Educational interventions: There were 15 unique studies in this category. Most research on the Treatment and Education of Autistic and Communication related handicapped CHildren (TEACCH) program was conducted prior to the date cutoff for the review (before 2000). Newer studies continue to report improvements among children in motor, eye-hand coordination, and cognitive measures. The strength of evidence for TEACCH, as well as broad-based and computer-based educational approaches included in this category, to affect any individual outcomes is insufficient because there are too few studies and they are inconsistent in outcomes measured.
- Medical and related interventions: There were 42 unique studies found, of which 27 were RCTs. Although no current medical interventions demonstrate clear benefit for social or communication symptoms, a few medications show benefit for repetitive behaviors or associated symptoms. The clearest evidence favors the use of medications to address challenging behaviors. The antipsychotics risperidone and aripiprazole each have at least two RCTs demonstrating improvement in a parent-reported measure of challenging behavior. A parent-reported hyperactivity and noncompliance measure also showed significant improvement. In addition, repetitive behavior showed improvement with both risperidone and aripiprazole. Both medications also cause significant side effects, however, including marked weight gain, sedation, and risk of extrapyramidal symptoms (side effects, including muscle stiffness or tremor, that occur in individuals taking antipsychotic medications). These side effects limit use of these drugs to patients with severe impairment or risk of injury. The strength of evidence was rated as high for the adverse effects of both medications, moderate for the ability of risperidone to affect challenging behaviors, and high for aripiprazole's effects on challenging behaviors.
- Allied health: There were 17 unique studies that reported on varied interventions. The research provided little support for their use. Specifically, all studies of sensory integration and music therapy were of poor quality, and two fair-quality studies of auditory integration showed no improvement associated with treatment. Language and communication interventions (Picture Exchange Communication System [PECS] and Responsive Education and Prelinguistic Milieu Training [RPMT]) demonstrated short-term improvement in word acquisition without effect durability, and should be studied further. No other allied health interventions had adequate research to assess the strength of evidence.
- CAM: Evidence for CAM interventions (i.e., acupuncture and massage) is insufficient for assessing outcomes

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). The review focused on behavioral treatments for children ages two through twelve with ASD and children younger than age two at risk of a diagnosis of ASD. The study designs included randomized controlled trials, prospective and retrospective cohort studies, and nonrandomized controlled trials. The 65 new studies include 48 randomized controlled trials (RCTs) and 17 nonrandomized trials or cohort studies (19 good, 39 fair, and 7 poor quality).

The studies in the review were assigned a strength-of-evidence designation. The maximum strength of evidence possible was established based on criteria for each domain: study limitations, consistency in direction of the effect, directness in measuring intended outcomes, precision of effect, and reporting bias. Then the number of studies and range of study designs for a given intervention-outcome pair was assigned and the rating was downgraded when the cumulative evidence was not sufficient to justify the higher rating.

The possible grades for strength of evidence in this report include:

- High: High confidence that the evidence reflects the true effect. Further research is unlikely to change estimates.
- Moderate: Moderate confidence that the evidence reflects the true effect. Further research may change confidence in the estimate of effect and may change the estimate.
- Low: Low confidence that the evidence reflects the true effect. Further research is likely to change confidence in the estimate of effect and is also likely to change the estimate.

- Insufficient: Evidence is either unavailable or does not permit a conclusion.

The AHRQ report includes the following key questions and findings (Weitlauf, et al., 2014):

- Effects of Behavioral Interventions on Core and Commonly Associated Symptoms in Children With ASD:
 - Studies of Early Intensive Behavioral and Developmental Interventions: the review included 25 new studies that addressed these interventions. The studies included five RCTs of good quality, six of fair quality, and one of poor quality. Individual studies using intensive University of California, Los Angeles (UCLA)/Lovaas-based interventions, the Early Start Denver Model (ESDM), the Learning Experiences and Alternate Program for Preschoolers and their Parents (LEAP) program, and eclectic variants reported improvements in outcomes for young children. The improvements were seen mostly in cognitive abilities and language acquisition, with fewer improvements seen in adaptive skills, core ASD symptoms severity, and social functioning. Evidence for the impact of early intensive intervention on core ASD symptoms is limited and mixed. The symptom severity often decreased during treatment, but these improvements often did not differ from those of children in control groups. The better quality studies reported positive effects of intervention on symptom severity, but multiple lower quality studies did not. There was improvement noted in cognitive functioning and language skills in young children receiving high-intensity applied behavior analysis (ABA)-based interventions over extended time frames (i.e., 8 months–2 years) relative to community controls. It was noted that the magnitude of these effects varied across studies and that the variation may reflect subgroups showing differential responses to particular interventions. It is not clear how the intervention response is likely moderated by treatment and child factors and the report notes that even with multiple studies of early intensive treatments, intervention approaches still vary substantially, which makes it difficult to distinguish what these unique treatment and child factors may be. The long-term impact of these early skill improvements is not yet clear, with many studies not following the children beyond late preschool or early school years.
 - Social Skills Studies: the review included 13 studies that addressed interventions for social skills including 11 RCTs (two good and 10 fair quality). The interventions varied widely in terms of scope and intensity. A few studies replicated interventions using the Skill streaming model, which uses a published treatment manual to promote a consistent approach. Other studies incorporated peer-mediated and/or group-based approaches, and others described interventions that focused on emotion identification and Theory of Mind training. There was varied intensity, with most consisting of 1–2 hour sessions/week for approximately 4–5 weeks. There were some group-based approaches that lasted 15–16 weeks. Most studies reported short-term gains in either parent-rated social skills or directly tested emotion recognition. However, the confidence or strength of evidence in that effect is low and limited by the diversity of the intervention protocols and measurement tools (i.e., no consistent outcome measures used across studies). In addition, the studies included only participants considered high-functioning and/or with IQ test scores >70, which limits generalization of results to children with more significant impairments. The maintenance and generalization of these skills beyond the intervention setting are inconsistent, with variability in performance across environments.
 - Play-/Interaction-Focused Studies: The review includes 11 RCTs of good and fair quality and suggests that joint attention interventions may be associated with positive outcomes for toddler and preschool children with ASD, in particular when joint attention skills are targeted as well as related social communication and language skills. Although joint attention intervention studies demonstrated changes within this theoretically important domain, the data is more limited regarding the ability to improve broad developmental skills (e.g., cognition, adaptive behavior, and ASD symptom severity) beyond direct measures of joint attention and related communication and language gains over time.
 - Studies of Interventions Targeting Conditions Commonly Associated With ASD: Six RCTs (five good, one fair quality) of interventions addressing conditions commonly associated with ASD identified for the current update measured anxiety symptoms as a primary outcome. Five studies reported significantly greater improvements in anxiety symptoms in the intervention group compared with controls. Two found positive effects of cognitive behavioral therapy (CBT) on the core ASD symptom of socialization, and one reported improvements in executive function in the treatment group. The one RCT that did not find a significant benefit of CBT compared it with

social recreational therapy rather than with treatment as usual or a wait-listed control group. The studies examining the effects of CBT on anxiety had largely consistent methodologies. Six studies provided follow-up data reflecting treatment effects that lasted beyond the period of direct intervention. Due to the nature of CBT, (language intensive and requires a certain level of reasoning skills to make abstract connections between concepts) most studies included only children with IQs much greater than 70. These studies report positive results regarding the use of CBT to treat anxiety in children with ASD. They also report some positive results in socialization, executive function, and communication; however, less robust results, and unclear in some studies if the improvements exceeded improvements related to the impact of improved anxiety itself.

- Other Behavioral Studies: Two RCTs (one fair, one poor quality) examined neurofeedback and found some improvements on parent-rated measures of communication and tests of executive function. Three fair-quality RCTs reported on sleep-focused interventions, with little positive effect of a sleep education pamphlet for parents in one, improvements in sleep quality in treatment arms in another, and some improvements in time to fall asleep in one short-term RCT of sleep education programs for parents. One poor-quality study of parent education to mitigate feeding problems reported no significant effects.
- Modifiers of Treatment Effects: Among the potential modifiers or moderators of early intensive ABA-based interventions, younger age at intake was associated with better outcomes for children in a limited number of studies. Greater baseline cognitive skills and higher adaptive behavior scores were associated with better outcomes across behavioral interventions, but these associations were not consistent. In general, children with lower symptom severity or less severe diagnoses improved more than participants with greater impairments. Many studies (e.g., social skills, CBT) restricted the range of participants' impairment at baseline (e.g., recruiting only participants with IQs >70), which limits understanding of intervention impact on broader populations. Regarding intervention-related factors, an inconsistent effect was found for duration of treatment. Overall, the report found that most studies were not adequately designed or controlled to identify true moderators of treatment response.
- Treatment Phase Changes That Predict Outcomes: The studies offered little suggestions about what specific early changes from baseline measurements of child characteristics might predict long-term outcome and response.
- Treatment Effects That Predict Long-Term Outcomes: Few studies assessed end-of-treatment effects that may predict outcomes.
- Generalization of Treatment Effects: The majority of the social skills and behavioral intervention studies targeting associated conditions attempted to determine outcomes based on parent, self, teacher, and peer report of the targeted symptoms at home, at school, and in the community. While these ratings outside of the clinical setting may suggest generalization in that they improve outcomes in the daily context/life of the child, in most cases, these outcomes are parent reported and not confirmed with direct observation.
- Treatment Components That Drive Outcomes: there were no studies that met inclusion criteria that addressed this question.
- Treatment Approaches for Children Under Age 2 at Risk for Diagnosis of ASD: In the studies addressing interventions for younger children, children who received behavioral interventions seemed to improve regardless of intervention type. Most outcome measures of adaptive functioning were based on parent report, and the effect of parental perception of treatment efficacy on perception of child functioning was generally not explored.

Limitations of the Evidence Base: the AHRQ report notes that despite improvements, the existing literature has significant methodological concerns that in many ways continue to limit the strength of the conclusions. Evidence for the impact of intensive ABA-based interventions on cognitive, language, and adaptive skills and ASD symptoms emphasizes the important limitations of current treatment modalities. Children who demonstrate clinically significant improvements in these areas often continue to display substantial impairment in these and other areas over time and not all children receiving intensive ABA-based intervention showed robust improvements in these domains. Therefore, it remains challenging to predict long-term functional and adaptive outcomes on an individual level. While children who receive early intensive developmental and behavioral intervention may display substantial improvements, the magnitude of these effects varies across studies and

may indicate subgroups showing variable responses to particular interventions. The intervention approaches still vary substantially, which leads to difficulty in determining what the unique treatment and child factors may be. Provider type and qualifications are variably reported, and the impact of this on treatment outcomes is unclear. Study sample sizes are typically small (range from 11 to 284 for studies in the current review, median=40), with some studies considered pilots for larger studies that may respond to questions about intervention intensity and moderators of effects. The report notes that presently the evidence is insufficient to adequately identify and target the children who are most likely to benefit from specific interventions.

In conclusion, the report notes that a growing evidence base suggests that behavioral interventions are associated with positive outcomes for some children with ASD. However, the report concludes that even with improvements in the quality of the included literature, there remains a need for studies of interventions across settings and continued improvements in the methodologic rigor and that substantial scientific advances are needed to improve the understanding of which interventions are most effective for specific children with ASD and to determine the elements or components of interventions most associated with effects.

The AHRQ report found for early intensive behavioral and developmental intervention that is ABA based a moderate effect for strength of the evidence in the areas of IQ/cognitive and language/communication. In the area of IQ/cognitive, it was found that approaches across the studies varied substantially and not all the improvements were maintained at long-term follow-up. In the area of language/communication, it was found that most studies found a positive effect of treatment on language/communication, however the specific domain of improvement (e.g., receptive vs expressive language) varied across studies and some of the initial between-group differences were not present at long-term follow-up. In addition, in this area of language/communication some studies utilized direct testing, while others used parent-reported measures. The review found a low effect for strength of the evidence in the areas of adaptive behavior, symptom severity, and social skills/social behavior. The intervention approach varied across studies and there is uncertainty regarding which intervention will affect and benefit which sub-group of children with ASD.

The 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.

Medical

- Antipsychotics: Two fair-quality RCTs and one poor quality crossover study. Improvements in aggression, irritability/agitation, repetitive behavior, sensory motor behaviors, and overall behavioral symptoms in participants receiving risperidone. Treatment adherence not reported in two studies; assessors not masked and participants not clearly characterized in one study.
- Opioid receptor antagonists: One poor-quality crossover study. Significant increase in stereotypy in treated participants. Participants not clearly characterized; adherence and differences in concomitant interventions not reported.
- Serotonin reuptake inhibitors: Two fair-quality RCTs, three poor quality case series. Studies had inconsistent results: RCT of fluvoxamine reported decreases in repetitive behavior, aggression, autistic symptoms, and language usage. Case series addressing sertraline, fluoxetine, and clomipramine reported some benefits, while a crossover study of clomipramine vs. placebo reported no significant differences in autistic symptoms between groups. Lack of comparison groups in three studies; treatment adherence not reported; assessors not masked in some studies.

Allied Health

- Facilitated communication: Two poor-quality case series. Facilitated communication did not increase participants' communication or literacy abilities over their independent abilities. No comparison groups; differences in concomitant interventions not reported; assessors not masked.
- Music therapy: Two poor-quality case series. Some gains in social skills reported using unvalidated and largely subjective measures. No comparison groups or measures of treatment fidelity; participants not clearly characterized; assessors not masked; differences in concomitant interventions not reported.
- Leisure/recreation program: One fair-quality RCT. Positive effects on stress and quality of life in leisure group participants compared with controls. Attrition and treatment fidelity not reported; randomization method not clearly described; differences in concomitant interventions not reported.

Pharmacologic Treatment: Pharmacological treatments may be useful in the treatment of ASD. Pharmacologic intervention should be targeted toward specific behaviors that significantly interfere with daily functions (Filipek, et al., 2006). In October 2006, the U.S. Food and Drug Administration (FDA) approved Risperdal® (Janssen, L.P., Titusville, N.J.) (risperidone), an adult antipsychotic drug, for the symptomatic treatment of irritability in autistic children and adolescents. The medications used in the treatment of ASD may include, but are not limited to, the following groups:

- Selective serotonin reuptake inhibitors (SSRIs): This is a group of antidepressants. They may be used to reduce the frequency and intensity of repetitive behaviors; decrease irritability, tantrums and aggressive behavior; and improve eye contact.
- Tricyclics and other antidepressants: Tricyclics tend to cause more side effects than the SSRIs; however, they may be more effective in certain individuals. Newer antidepressants that may be an alternative to tricyclics include, but may not be limited to, serotonin norepinephrine reuptake inhibitors (SNRIs).
- Antipsychotics: This group may be used to help control symptoms seen with ASD, including reducing self-injurious behaviors.

- Psychostimulants: This group of medications may be useful in increasing focus and decreasing hyperactivity in people with autism.
- Antianxiety drugs: This group can help relieve anxiety and panic disorders.

Secretin: Secretin has been proposed as a treatment for autism. Secretin is a hormone produced by the small intestine that assists in digestion. Secretin currently is approved by the U.S. Food and Drug Administration (FDA) for a single dose only for use in diagnosing digestive problems.

A Cochrane review (Williams, et al., 2012) that reported on intravenous secretin for ASD, an update of a 2005 review concluded that there is no evidence that single or multiple dose intravenous secretin is effective and as such currently it should not be recommended or administered as a treatment for ASD. A systematic review (Krishnaswami, et al., 2011) of seven randomized trials found a lack of effectiveness of secretin for the treatment of ASD symptoms including language and communication impairment, symptom severity, and cognitive and social skill deficits.

Acupuncture: Acupuncture is a procedure where specific body areas the meridian points, are pierced with fine needles for therapeutic purposes. It is theorized that by stimulating various meridian points acupuncture may be able to correct the disharmony and dysregulation of organ systems, which might be involved in various dimensions of ASD, relieve symptoms and restore the mind and body (Cheuk, et al., 2011).

Wang et al. (2021) conducted a systematic review and meta-analysis to summarize the effectiveness and safety of acupuncture in the treatment of autism spectrum disorder (ASD) through literature analysis and evaluation. The review included 16 studies were included, five of which were in English and 11 were in Chinese with 1,332 patients. While the authors noted that the findings suggested that acupuncture could effectively treat ASD, it was noted that acupuncture methods and prescriptions at this stage remain heterogeneous, and acupuncture treatment operations require standardization. Studies using rigorous and standard research designs are needed to draw stronger conclusions about the advantages of using acupuncture to treat children and adolescents with ASD. Lee et al. (2018) conducted a systematic review of 27 RCTs with 1736 participants, to evaluate the efficacy of acupuncture for children with ASD. The study found that acupuncture as a complementary therapy improved the total Childhood Autism Rating Scale (CARS) and Autism Behavior Checklist (ABC) scores, which are tools for measuring the key symptoms of ASD, but could not specifically determine the symptoms that improved and due to the heterogeneity of the acupuncture methods used in each study, the authors could not draw any other conclusions.

A Cochrane review was conducted to determine the effectiveness of acupuncture for ASD (Cheuk, et al., 2011). The review included 10 randomized and quasi-randomized controlled trials that involved 390 children with ASD with duration of treatment from four weeks to nine months. The limitations included the trials were few in number and included only children; six trials were at high risk of bias; they were heterogeneous in terms of participants and intervention; they were of short duration and follow-up; inconsistent and imprecise results were reported, and due to carrying out large numbers of analyses they were at risk of false positivity. The authors concluded that the current evidence does not support the use of acupuncture for treatment of ADS and that there is no conclusive evidence that acupuncture is effective for treatment of ADS in children. Further high quality trials of larger size and longer follow-up are needed.

Art Therapy: Art therapy, or the therapeutic use of art making, has been proposed to address the symptoms of individuals with ASD. The effectiveness of this therapy has not been demonstrated in the published peer-reviewed scientific literature.

Auditory Integration Training (AIT): AIT refers to listening to music that has been computer-modified to remove frequencies to which an individual demonstrates hypersensitivities and to reduce the predictability of auditory patterns. A special device is used to modify the music for the treatment sessions. Auditory thresholds are determined via audiograms. The audiogram is then reviewed for evidence of hyperacusis (i.e., an abnormal sensitivity to sound). A clinical history of sound sensitivities and behavior is also reviewed. Audiograms are repeated midway and at the end of the training session to document progress and to determine whether further treatment sessions are necessary. AIT is usually provided by a speech-pathologist or audiologist. This treatment has been proposed for improving abnormal sound sensitivity in individuals with behavioral disorders, including

autism spectrum disorders. Evidence supporting the use of this technique is limited, thus the role of AIT in the treatment of ASD has not been established.

A comparative effectiveness review of therapies for children with autism spectrum disorders was published by the Agency for Healthcare Research and Quality (AHRQ), prepared by the Vanderbilt Evidence-based Practice Center (Warren, et al., 2011). Among the allied health therapies in the review were sensory and auditory integration therapy and it was found that the research provided little support for their use. Specifically, two fair-quality studies of auditory integration showed no improvement associated with treatment.

A Cochrane review was conducted with the objective of determining the effectiveness of AIT or other methods of sound therapy in individuals with autism spectrum disorders (Sinha, et al., 2011). Six randomized controlled trials of AIT were identified, including one crossover trial. The reviewers concluded, "Further research is needed to determine the effectiveness of sound therapies. In the absence of evidence, the treatment must be considered experimental and care must be taken not to risk hearing loss".

Several professional organizations have determined that evidence is insufficient regarding the efficacy of AIT. The American Speech-Language-Hearing Association (ASHA) prepared an evidenced-based technical report regarding AIT treatment (ASHA, 2004). They noted that, despite approximately one decade of practice, this method has not met scientific standards for efficacy and safety that would justify its inclusion as a mainstream treatment for a variety of communication, behavioral, emotional and learning disorders. The American Academy of Audiology (AAA) has published a position statement regarding AIT (AAA, 1993). The statement notes that, "that there are no published results of peer-reviewed studies using controlled populations and using scientific methods that demonstrated whether this auditory training program provides significant improvement in any dimension for any population." It is also noted that the organization believes this training to be entirely investigational, and further research is needed to demonstrate the efficacy. The Educational Audiology Association (EAA) issued a position statement regarding AIT (EAA, 1997). They stated that "Auditory integration therapy has not been proven to be a viable treatment for any disability. Only inconsistent, uncontrolled anecdotal evidence has been provided to support claims of changes in auditory performance." In addition, the position statement noted that without controls to protect against excessively loud auditory stimuli, AIT may cause harm to the auditory system.

Augmentative and Alternative Communication: Augmentative and alternative communication (AAC) includes all forms of communication (other than oral speech) that are used for expression. AAC includes unaided communication systems which rely on the user's body to convey messages—examples include gestures, body language, and/or sign language. Aided communication systems require the use of tools or equipment in addition to the user's body. Aided communication methods can range from paper and pencil to communication books or boards to devices that produce voice output (speech generating devices or SGD's) and/or written output. Electronic communication aids allow the user to use picture symbols, letters, and/or words and phrases to create messages. A Picture Exchange Communication System (PECS) uses picture symbols to teach communication skills with the individual taught to use picture symbols to ask and answer questions and hold a conversation.

A speech evaluation is performed in order to determine the severity and motor deficit of each individual. This evaluation is conducted by a speech-language pathologist (SLP). The evaluation consists of: a case history, the examination of the oral mechanism during nonspeech activities, an assessment of perceptual speech characteristics, an assessment of intelligibility, and acoustic physiological analyses. The SLP will be able to determine, based on these factors and on the natural course of the disease or condition, when a speech generating device or treatment is necessary and what type of device or treatment would best meet the needs of the specific patient in question. Upon completion of the evaluation, a speech generating device may be recommended according to the permanence and severity of expressive speech impairment, as well as the short- and long-term goals for these individuals.

For further information regarding speech generating devices, please refer to the Cigna Coverage Policy for Speech Generating Devices.

Chelation Therapy: Chelation has been proposed for treatment of ASD. The proposal is based on the theory that the chelating agent will remove mercury that is thought to be contained in the tissue after early childhood

vaccinations in children with ASD (Levy and Hyman, 2005). While there have been several studies that have examined the relationship of mercury to ASD, no consistent associations have been identified (Levy and Hyman, 2005). A Cochrane review was conducted to assess the potential benefits and adverse effects of pharmaceutical chelation therapy for ASD symptoms (James, et al., 2015). The review included data from one study with methodological limitations. The review concluded that no clinical trial evidence was found to suggest that pharmaceutical chelation is an effective intervention for ASD. In addition, the review noted that "given prior reports of serious adverse events, such as hypocalcaemia, renal impairment and reported death, the risks of using chelation for ASD currently outweigh proven benefits". There is insufficient evidence in the peer-reviewed literature regarding the efficacy of chelation therapy for treatment of ASD. The AAP guidelines for identification, evaluation, and management of children with ASD note that clinical trials do not support this therapy, and in addition to lack of supporting data, cautions against chelation therapy for children with ASD (Hyman, et al., 2020).

Cognitive Rehabilitation: Cognitive rehabilitation has been proposed as an intervention for ASD. This therapy involves a systematic, goal-oriented treatment program designed to improve cognitive functions and functional abilities, and increase levels of self-management and independence following neurological damage to the central nervous system. It is primarily used in rehabilitation of traumatic brain injury and stroke. There is insufficient evidence in the published medical literature to support the use of cognitive rehabilitation for ASD.

Craniosacral Therapy: Craniosacral therapy is a form of massage that involves using gentle pressure on the plates of the patient's skull. It is considered a complementary and alternative medicine (CAM) intervention. There is a lack of evidence that supports the efficacy of this treatment for ASD and it would be considered unproven.

Dietary and Nutritional Interventions: Various dietary interventions involving elimination diets, nutritional supplements and vitamins have been proposed for treatment of ASD. These include gluten and casein-free diets, a ketogenic diet, and providing diet supplements with vitamin B6 and magnesium (B6-Mg). The AAP guidelines for identification, evaluation, and management of children with ASD note that dietary elimination of gluten and casein-containing foods is often implemented in an attempt to ameliorate core symptoms of ASD, not on the basis of allergy or celiac disease and the double-blind clinical trials to date have not demonstrated a treatment effect with diet. (Hyman, et al., 2020).

Keller et al. (2021) reported on to investigate beneficial and safety of a gluten-free and casein-free (GFCF) diet among children with a diagnosis of ASD. The review included six randomized controlled trials with 143 participants. The results from a random effect model showed no effect of a GFCF diet on clinician-reported autism core symptoms. It was noted that the quality of evidence ranged from low to very low due to serious risk of bias, serious risk of inconsistency, and serious risk of imprecision. The authors noted that the limitations of the current literature hinder the possibility of drawing any solid conclusion, and more high-quality RCTs are needed.

A systematic review of nineteen randomized controlled trials was conducted to evaluate the effectiveness and safety of dietary interventions or nutritional supplements in children with ASD (Sathe, et al., 2017). The authors noted that limitations included that the studies were small and short-term, and there were few fully categorized populations or concomitant interventions. The authors concluded that there is little evidence to support the use of nutritional supplements or dietary therapies for children with ASD. There is insufficient evidence in the published, peer-reviewed medical literature to support the use of dietary and nutritional interventions in the management of ASD.

EEG Biofeedback/neurofeedback: is electroencephalogram (EEG) biofeedback, also called neurofeedback or neurotherapy, is a form of biofeedback which measures alpha (associated with relaxation and meditation) and theta (associated with focused attention) brainwave activity. It is proposed to counterbalance genetic and environmental tendencies by learning to alter brain wave patterns. EEG biofeedback has been proposed for the treatment of ASD. The evidence in the published peer-reviewed scientific literature does not support the efficacy of EEG biofeedback.

Equestrian Therapy: Equestrian therapy, also referred to as equine therapy, equine-assisted activities and therapies (EAAT), horseback riding or hippotherapy is proposed to offer a person with a disability, including ASD, a means of physical activity that aids in improving balance. Srinivasan et al. (2018) reported on a systematic

review for equine therapy for ASD. The review included 15 studies with six to 116 participants, with a variety of study designs, with three randomized studies. The authors note that there is preliminary support for the utility of equine therapy in ASD with beneficial effects on behavioral and to some extent on social communication skills in ASD noted. The studies are limited by small number of participants and further controlled, randomized studies are needed. There is insufficient published evidence regarding the effects of this therapy in children with ASD. Trzmiel, et al. (2019) reported on systematic review to assess the effectiveness of (EAAT) in ASD patients. The review included 15 studies with 390 participants (aged: 3–16 years). The review noted there appeared to be improved social functioning however it is impossible to draw universal conclusions due to the considerable discrepancies in therapeutic protocols and measurement instruments in the studies. In addition, longitudinal trials, with standardized EAAT protocols and representative large sample groups are necessary and homogeneous tools should be established to measure therapeutic progress and outcomes. The AAP guidelines for identification, evaluation, and management of children with ASD note that there has been conflicting evidence regarding the effect of equine-assisted therapy on the symptoms of ASD in children, but evidence does not support these therapies for treatment of the core deficits of ASD at this time (Hyman, et al., 2020).

Facilitated Communication (FC): This treatment is a method of providing assistance to a nonverbal person in typing out words using a typewriter, computer keyboard, or other communication device. FC involves supporting the individual's hand to make it easier for him or her to indicate the letters that are chosen sequentially to develop the communicative statement. The scientific literature indicates many controlled studies with consistently negative findings, indicating that the technique is neither reliably replicable nor valid. Several professional organizations have published statements regarding FC that indicates this treatment is unproven including AAP, AACAP, and American Psychological Association (APA) (AAP, 1998/2010; AACAP, 1993/2008; APA, 1994).

Holding Therapy: In this intervention the therapist or parent holds the child until they stops resisting or until a fixed amount of time has elapsed. Those who support the technique maintain that it forges a bond between the parent or therapist and child. The effectiveness of this therapy has not been demonstrated in the published peer-reviewed scientific literature.

Hyperbaric Oxygen Therapy: Hyperbaric oxygen therapy (HBO or HBOT) is a mode of treatment in which a patient breathes 100% oxygen at pressures greater than normal atmospheric (sea level) pressure. This treatment has been proposed as a treatment for ASD. The published data provided is preliminary and is insufficient to support HBO as a treatment for ASD.

A Cochrane review (Xiong, et al., 2016) of hyperbaric oxygen therapy for people with autism spectrum disorder (ASD) included one trial with a total of 60 children with a diagnosis of ASD who randomly received hyperbaric oxygen therapy or a sham treatment. The authors concluded that, there is no evidence that hyperbaric oxygen therapy improves core symptoms and associated symptoms of ASD. Ghanizadeh (2012) reported on a systematic review of the treatment of children with autism with hyperbaric oxygen therapy. The review found two randomized, double-blind, controlled clinical trials. The authors concluded that the results supporting the efficacy of HBO therapy are not replicated. In addition, none of these trials used placebo group. These results are not conclusive for the efficacy of HBO therapy for the treatment of autism.

Immune Globulin: Intravenous immunoglobulin (IVIG) has been proposed and administered to children with ASD. It is based on the theory that an immune deficiency may exist in ASD. A review of the literature by Levy and Hyman (2005) indicates that there are three small-case series published regarding this treatment. All three studies had a small number of participants and did not demonstrate the efficacy of this treatment. The published literature does not demonstrate the efficacy of IVIG for treatment of ASD. Rossignol et al. (2021) conducted a systematic review and meta-analysis examined the studies which assessed immunoglobulin G (IgG) concentrations and the therapeutic use of IVIG for individuals with ASD. The review included 27 publications were identified which examined the use of IVIG in ASD with four studies prospective, controlled studies; six prospective, uncontrolled studies; two retrospective, controlled studies; and 15 retrospective, uncontrolled studies (case reports and series). The authors noted that the quality of the evidence for the use of IVIG is still below what is commonly accepted for a routinely used treatment with the bulk of the studies being uncontrolled. They noted that many studies demonstrated bias, including selection bias (lack of randomization), performance bias (lack of blinding), detection bias (lack of standardized outcomes), attrition bias (retrospective studies are prone to losing patients to follow-up), and reporting bias (case studies tend to report positive rather than negative

outcomes). the authors concluded that the current set of studies presented should be used to design and implement well-controlled, blinded randomized clinical trials in the future and that additionally, the populations used in these studies are very heterogeneous with many different immune system abnormalities, making it hard to determine if there is a particular subset of children with ASD in which the treatment may be most effective.

Intensive Behavioral Interventions: 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.

Please refer to the Cigna Medical Coverage Policy on Intensive Behavioral Interventions for further information regarding this treatment.

Music Therapy: Music Therapy has been proposed as an intervention for ASD in an attempt to improve coordination and communication skills. The methods can vary and may involve the therapist musically responding to the child's sounds and movements, singing a running commentary to the child's actions, using play routines or stories set to music, or songs involving imitation.

Geretsegger et al. (2014) published an update to the 2006 Cochrane review (Gold, et al., 2006) to evaluate the effects of music therapy for individuals with autistic spectrum disorders. The review included ten studies randomized controlled trials or controlled clinical trials (165 participants) that examined the short- and medium-term effect of music therapy interventions (one week to seven months) for children with ASD. The studies that compared music therapy or music therapy added to standard care to placebo therapy, no treatment, or standard care for individuals with ASD. Music was found to be superior to placebo therapy or standard care with respect to the primary outcomes of social interaction within the therapy context; generalized social interaction outside of the therapy context (standardized mean difference [SMD] 0.71, 95% CI 0.18 to 1.25, 3 RCTs, n=57, moderate quality evidence), non-verbal communicative skills within the therapy context (SMD 0.57, 95% CI 0.29 to 0.85, 3 RCTs, n=30), verbal communicative skills (SMD 0.33, 95% CI 0.16 to 0.49, 6 RCTs, n=139), initiating behavior (SMD 0.73, 95% CI 0.36 to 1.11, 3 RCTs, n=22, moderate quality evidence), and social-emotional reciprocity (SMD 2.28, 95% CI 0.73 to 3.83, 1 RCT, n = 10, low quality evidence). There was no statistically significant difference in non-verbal communicative skills outside of the therapy context (SMD 0.48, 95% CI -0.02 to 0.98, 3 RCTs, n=57, low quality evidence). Music therapy was also superior to 'placebo' therapy or standard care in secondary outcome areas, including social adaptation (SMD 0.41, 95% CI 0.21 to 0.60, 4 RCTs, n=26), joy (SMD 0.96, 95% CI 0.04 to 1.88, 1 RCT, n=10), and quality of parent-child relationships (SMD 0.82, 95% CI 0.13 to 1.52, 2 RCTs, n=33, moderate quality evidence). The review is limited by small sample sizes of the studies. Further research is needed that includes larger samples and generalized outcome measures to validate these findings and to examine the long-term effects of music therapy.

Recreational Therapy: Recreational therapy or therapeutic recreation utilizes recreation and other activities as treatment interventions. This therapy has been proposed as a treatment for symptoms of ASD. The effectiveness of this therapy has not been demonstrated in the published peer-reviewed scientific literature.

Social Skill Training: Social skills training may include various treatment methods including social stories, peer-mediated interventions, scripts and script fading, social skills group, video modeling. The exact mechanism through which social skills groups may change behavior is not known, but in theory it may be based on learning theory. Social skills groups for people with ASD are thought to affect an individual's social functioning by

providing instruction on specific social skills in a group format that allows for immediate rehearsal and practice of the learned skills (Reichow, et al., 2012).

A Cochrane review was conducted to determine the effectiveness of social skills groups for improving social competence, social communication, and quality of life for people with ASD who are six to 21 years of age (Reichow, et al., 2012). Selection criteria included randomized controlled trials (RCTs) that compared treatment (social skills groups) with a control group who were not receiving the treatment. The control group could be no intervention, wait list, or treatment as usual. The outcomes were standardized measures of social competence, social communication, quality of life, emotion recognition, and any other specific behaviors. The review included five RCTs evaluating the effects of social skills groups in 196 participants. Results indicate some evidence that social skills groups improve overall social competence (effect size [ES]=0.47, 95% confidence interval (CI) 0.16 to 0.78, P=0.003) and friendship quality (ES=0.41, 95% CI 0.02 to 0.81, P = 0.04) for this population. No differences were found between treatment and control groups in relation to emotional recognition (ES=0.34, 95% CI -0.20 to 0.88, P=0.21) assessed in two studies or social communication as related to the understanding of idioms (ES=0.05, 95% CI -0.63 to 0.72, P = 0.89), which was assessed in only one study. Two additional quality of life outcomes were evaluated, with results of single studies suggesting decreases in loneliness (ES=-0.66, 95% CI -1.15 to -0.17) but no effect on child or parental depression. The risk of performance and detection bias were considered high considering the nature of the intervention and the selected outcome measures. There is limited generalizability from the studies as they were all conducted in the US; they focused mainly on children aged 7 to 12, and the participants were all of average or above average intelligence. The review is limited by the small number of studies with small number of participants.

Theory of Mind cognitive model: The Theory of Mind (ToM) model suggests that people with ASD have a profound difficulty understanding the minds of other people, including their emotions, feelings, beliefs, and thoughts. It has been proposed that this may be the cause of many of the difficulties experienced by people with ASD, including social and communication problems, and some challenging behaviors.

Fletcher-Watson (2014) reported on a Cochrane review to assess the effect of interventions, based on the ToM model, for autism spectrum disorders (ASD), on symptoms in the core diagnostic domains of social and communication impairments in autism, and on language and ToM skills the review included 22 randomized controlled trials involving 695 participants and conducted in a wide variety of locations. It was noted that there were very few studies for which there was adequate blinding of participants and personnel, and some were also judged at high risk of bias in blinding of outcome assessors. There was evidence of some bias in sequence generation and allocation concealment. Not all studies reported data that fell within the pre-defined primary outcome categories for the review, rather many studies reported measures which were intervention-specific (e.g., emotion recognition). The wide range of measures used within each outcome category and the mixed results from these measures presented further complexity when interpreting results. There was very low quality evidence of a positive effect on measures of communication based on individual results from three studies. There was low quality evidence from 11 studies reporting mixed results of interventions on measures of social interaction, very low quality evidence from four studies reporting mixed results on measures of general communication, and very low quality evidence from four studies reporting mixed results on measures of ToM ability. The authors concluded that while there is some evidence that ToM, or a precursor skill, can be taught to people with ASD, the evidence is scant that there is maintenance of that skill, generalization to other settings, or developmental effects on related skills. In addition, inconsistency in findings and measurement means that evidence has been graded of 'very low' or 'low' quality and there is low confidence of suggestions of positive effects will be sustained as high-quality evidence accumulates. Further longitudinal designs and larger samples are required to help make clear both the efficacy of ToM-linked interventions and the explanatory value of the ToM model itself.

Vision Therapy: Vision therapy is a proposed optometric treatment method for developing efficient visual skills and processing. A variety of visual therapies, oculomotor exercises, colored filters, Irlen lenses and ambient prism lenses have been used in children with autism for the proposed intent to improve visual processing or visual-spatial perception (NRC, 2001). Studies in the published scientific literature have not provided clear support for this treatment of ASD.

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 assessment (Volkmar, et al., 2014):

- The developmental assessment of young children and the psychiatric assessment of all children should routinely include questions about autism spectrum disorder symptomatology (CS).
- If the screening indicates significant autism spectrum disorder symptomatology, a thorough diagnostic evaluation should be performed to determine the presence of ASD (CS).
- Clinicians should coordinate an appropriate multi-disciplinary assessment of children with ASD [CS].

Recommendations for treatment include:

- The clinician should help the family obtain appropriate, evidence-based and structured educational and behavioral interventions for children with ASD (CS).
- There is a lack of evidence for most other forms of psychosocial intervention, though cognitive behavioral therapy (CBT) has shown efficacy for anxiety and anger management in high functioning youth with ASD
- Studies of sensory oriented interventions, such as auditory integration training (AIT), sensory integration therapy (SIT) and touch therapy/massage, have contained methodological flaws and have yet to show replicable improvements
- There is also limited evidence thus far for what are usually termed developmental, social-pragmatic models of intervention, such as Developmental-Individual Difference-Relationship Based (DIR)/Floortime, Relationship Development Intervention (RDI), Social Communication Emotional Regulation and Transactional Support (SCERTS) and Play and Language for Autistic Youths (PLAY), which generally use naturalistic techniques in the child's community setting to develop social communication abilities.
- Pharmacotherapy may be offered to children with ASD where there is a specific target symptom or comorbid condition (CS).
- The clinician should maintain an active role in long term treatment planning and family support as well as support of the individual (CS).
- Clinicians should specifically inquire about the use of alternative/complementary treatments, and be prepared to discuss their risk and potential benefits (CS).

*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.

The American Board of Internal Medicine's (ABIM) Foundation Choosing Wisely® Initiative:

The following are included:

- **American Academy of Pediatrics Council on Environmental Health:**
 - Do not routinely test urine for metals and minerals in children with autistic behaviors. Toxicologic exposures have not been conclusively associated with the development of autistic behaviors in children. Testing for metals and minerals may be harmful if treatment is guided on the basis of these results.
 - Do not order hair analyses for "environmental toxins" in children with behavioral or developmental disorders, including autism.
- **American College of Medical Toxicology and The American Academy of Clinical Toxicology:** Don't recommend chelation except for documented metal intoxication which has been diagnosed using validated tests in appropriate biological samples.
- **American Psychiatric Association:** Don't routinely prescribe an antipsychotic medication to treat behavioral and emotional symptoms of childhood mental disorders in the absence of approved or evidence supported indications.

Use Outside of the US

National Institute for Health and Clinical Excellence (NICE): NICE published guidelines for support and management of autism spectrum disorder in under 19s (NICE, 2013; 2021). The recommendations for treatment include:

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.

Pharmacological and dietary interventions

- Do not use the following interventions for the management of core features of autism in children and young people:
 - antipsychotics
 - antidepressants
 - anticonvulsants
 - exclusion diets (such as gluten- or casein-free diets)

Interventions that should not be used:

- Do not use neurofeedback to manage speech and language problems in autistic children and young people.
- Do not use auditory integration training to manage speech and language problems in autistic children and young people.
- Do not use omega-3 fatty acids to manage sleep problems in autistic children and young people.
- Do not use the following interventions to manage autism in any context in children and young people:
 - secretin
 - chelation
 - hyperbaric oxygen therapy

National Institute for Health and Clinical Excellence (NICE): NICE published clinical guidelines for diagnosis and management of adults on the autism spectrum. The guidelines include the following recommendations (NICE, 2012; 2021):

Psychosocial interventions for the core symptoms of autism

- For autistic adults without a learning disability or with a mild to moderate learning disability, who have identified problems with social interaction, consider:
 - a group-based social learning program focused on improving social interaction
 - an individually delivered social learning program for people who find group-based activities difficult
- Social learning programs to improve social interaction should typically include:
 - modeling
 - peer feedback (for group-based programs) or individual feedback (for individually delivered programs)
 - discussion and decision-making
 - explicit rules
 - suggested strategies for dealing with socially difficult situations
- Do not provide facilitated communication for adults with autism.

Psychosocial interventions focused on life skills

- For autistic adults of all ranges of intellectual ability, who need help with activities of daily living, consider a structured and predictable training program based on behavioral principles.

- For autistic adults without a learning disability or with a mild to moderate learning disability, who are socially isolated or have restricted social contact, consider:
 - a group-based structured leisure activity program
 - an individually delivered structured leisure activity program for people who find group-based activities difficult
- A structured leisure activity program should typically include:
 - a focus on the interests and abilities of the participant(s)
 - regular meetings for a valued leisure activity
 - for group-based programs, a facilitator with a broad understanding of autism to help integrate the participants
 - the provision of structure and support
- For autistic adults with autism without a learning disability or with a mild to moderate learning disability, who have problems with anger and aggression, offer an anger management intervention, adjusted to the needs of adults with autism.
- Anger management interventions should typically include:
 - functional analysis of anger and anger-provoking situations
 - coping-skills training and behavior rehearsal
 - relaxation training
 - development of problem-solving skills
- For autistic adults without a learning disability or with a mild learning disability, who are at risk of victimization, consider anti-victimization interventions based on teaching decision-making and problem-solving skills.
- Anti-victimization interventions should typically include:
 - identifying and, where possible, modifying and developing decision-making skills in situations associated with abuse
 - developing personal safety skills
- For autistic adults without a learning disability or with a mild learning disability, who are having difficulty obtaining or maintaining employment, consider an individual supported employment program.

Biomedical (pharmacological, physical and dietary) interventions and the core symptoms of autism

- Do not use the following:
 - anticonvulsants for the management of core symptoms of autism in adults
 - chelation for the management of core symptoms of autism in adults
 - the following interventions for the management of core symptoms of autism in adults:
 - exclusion diets (such as gluten- or casein-free and ketogenic diets)
 - vitamins, minerals and dietary supplements (such as vitamin B6 or iron supplementation)
 - drugs specifically designed to improve cognitive functioning (for example, cholinesterase inhibitors) for the management of core symptoms of autism or routinely for associated cognitive or behavioral problems in adults
 - oxytocin for the management of core symptoms of autism in adults
 - secretin for the management of core symptoms of autism in adults
 - testosterone regulation for the management of core symptoms of autism in adults
 - hyperbaric oxygen therapy for the management of core symptoms of autism in adults
 - antipsychotic medication for the management of core symptoms of autism in adults
 - antidepressant medication for the routine management of core symptoms of autism in adults

Medicare Coverage Determinations

	Contractor	Policy Name/Number	Revision Effective Date
NCD		No National Coverage Determination found	
LCD		No Local Coverage Determination found	

Note: Please review the current Medicare Policy for the most up-to-date information.

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.

Assessment of Suspected or Known Autism Spectrum Disorder (ASD)

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

CPT®* Codes	Description
83655	Lead
84030	Phenylalanine (PKU), blood
90791	Psychiatric diagnostic evaluation
90792	Psychiatric diagnostic evaluation with medical services
92521	Evaluation of speech fluency (eg, stuttering, cluttering)
92522	Evaluation of speech sound production (eg, articulation, phonological process, apraxia, dysarthria)
92523	Evaluation of speech sound production (eg, articulation, phonological process, apraxia, dysarthria); with evaluation of language comprehension and expression (eg, receptive and expressive language)
92524	Behavioral and qualitative analysis of voice and resonance
95705	Electroencephalogram (EEG), without video, review of data, technical description by EEG technologist, 2-12 hours; unmonitored
95706	Electroencephalogram (EEG), without video, review of data, technical description by EEG technologist, 2-12 hours; with intermittent monitoring and maintenance
95707	Electroencephalogram (EEG), without video, review of data, technical description by EEG technologist, 2-12 hours; with continuous, real-time monitoring and maintenance
95711	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; unmonitored
95712	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; with intermittent monitoring and maintenance
95713	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; with continuous, real-time monitoring and maintenance
95717	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation and report, 2-12 hours of EEG recording; without video
95718	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation and report, 2-12 hours of EEG recording; with video (VEEG)
95812	Electroencephalogram (EEG) extended monitoring; 41-60 minutes
95813	Electroencephalogram (EEG) extended monitoring; 60-119 minutes
95816	Electroencephalogram (EEG); including recording awake and drowsy
95819	Electroencephalogram (EEG); including recording awake and asleep
96110	Developmental screening (eg, developmental milestone survey, speech and language delay screen), with scoring and documentation, per standardized instrument
96112	Developmental test administration (including assessment of fine and/or gross motor, language, cognitive level, social, memory and/or executive functions by standardized developmental instruments when performed), by physician or other qualified health care professional, with interpretation and report; first hour)
96113	Developmental test administration (including assessment of fine and/or gross motor, language, cognitive level, social, memory and/or executive functions by standardized developmental instruments when performed), by physician or other qualified health care professional, with

CPT®* Codes	Description
	interpretation and report; each additional 30 minutes (List separately in addition to code for primary procedure)
97161	Physical therapy evaluation: low complexity, requiring these components: A history with no personal factors and/or comorbidities that impact the plan of care; An examination of body system(s) using standardized tests and measures addressing 1-2 elements from any of the following: body structures and functions, activity limitations, and/or participation restrictions; A clinical presentation with stable and/or uncomplicated characteristics; and Clinical decision making of low complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 20 minutes are spent face-to-face with the patient and/or family
97162	Physical therapy evaluation: moderate complexity, requiring these components: A history of present problem with 1-2 personal factors and/or comorbidities that impact the plan of care; An examination of body systems using standardized tests and measures in addressing a total of 3 or more elements from any of the following: body structures and functions, activity limitations, and/or participation restrictions; An evolving clinical presentation with changing characteristics; and Clinical decision making of moderate complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 30 minutes are spent face-to-face with the patient and/or family
97163	Physical therapy evaluation: high complexity, requiring these components: A history of present problem with 3 or more personal factors and/or comorbidities that impact the plan of care; An examination of body systems using standardized tests and measures addressing a total of 4 or more elements from any of the following: body structures and functions, activity limitations, and/or participation restrictions; A clinical presentation with unstable and unpredictable characteristics; and Clinical decision making of high complexity using standardized patient assessment instrument and/or measurable assessment of functional outcome. Typically, 45 minutes are spent face-to-face with the patient and/or family
97165	Occupational therapy evaluation, low complexity, requiring these components: An occupational profile and medical and therapy history, which includes a brief history including review of medical and/or therapy records relating to the presenting problem; An assessment(s) that identifies 1-3 performance deficits (ie, relating to physical, cognitive, or psychosocial skills) that result in activity limitations and/or participation restrictions; and Clinical decision making of low complexity, which includes an analysis of the occupational profile, analysis of data from problem-focused assessment(s), and consideration of a limited number of treatment options. Patient presents with no comorbidities that affect occupational performance. Modification of tasks or assistance (eg, physical or verbal) with assessment(s) is not necessary to enable completion of evaluation component. Typically, 30 minutes are spent face-to-face with the patient and/or family
97166	Occupational therapy evaluation, moderate complexity, requiring these components: An occupational profile and medical and therapy history, which includes an expanded review of medical and/or therapy records and additional review of physical, cognitive, or psychosocial history related to current functional performance; An assessment(s) that identifies 3-5 performance deficits (ie, relating to physical, cognitive, or psychosocial skills) that result in activity limitations and/or participation restrictions; and Clinical decision making of moderate analytic complexity, which includes an analysis of the occupational profile, analysis of data from detailed assessment(s), and consideration of several treatment options. Patient may present with comorbidities that affect occupational performance. Minimal to moderate modification of tasks or assistance (eg, physical or verbal) with assessment(s) is necessary to enable patient to complete evaluation component. Typically, 45 minutes are spent face-to-face with the patient and/or family
97167	Occupational therapy evaluation, high complexity, requiring these components: An occupational profile and medical and therapy history, which includes review of medical and/or therapy records and extensive additional review of physical, cognitive, or psychosocial history related to current functional performance; An assessment(s) that identifies 5 or more

CPT®* Codes	Description
	performance deficits (ie, relating to physical, cognitive, or psychosocial skills) that result in activity limitations and/or participation restrictions; and Clinical decision making of high analytic complexity, which includes an analysis of the patient profile, analysis of data from comprehensive assessment(s), and consideration of multiple treatment options. Patient presents with comorbidities that affect occupational performance. Significant modification of tasks or assistance (eg, physical or verbal) with assessment(s) is necessary to enable patient to complete evaluation component. Typically, 60 minutes are spent face-to-face with the patient and/or family

HCPCS Codes	Description
G0451	Development testing; with interpretation and report, per standardized instrument form

Treatment of Autism Spectrum Disorder (ASD)

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

CPT®* Codes	Description
90785	Interactive complexity (List separately in addition to the code for primary procedure)
90832	Psychotherapy, 30 minutes with patient
90833	Psychotherapy, 30 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)
90834	Psychotherapy, 45 minutes with patient
90836	Psychotherapy, 45 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)
90837	Psychotherapy, 60 minutes with patient
90838	Psychotherapy, 60 minutes with patient when performed with an evaluation and management service (List separately in addition to the code for primary procedure)

Speech Generating Device

Considered Medically Necessary when criteria in the applicable policy statements listed above are met for the treatment of ASD and specifically listed as covered under the benefit plan:

HCPCS Codes	Description
E2508	Speech generating device, synthesized speech, requiring message formulation by spelling and access by physical contact with the device
E2510	Speech generating device, synthesized speech, permitting multiple methods of message formulation and multiple methods of device access

Generally excluded from coverage:

HCPCS Codes	Description
E2500	Speech generating device, digitized speech, using pre-recorded messages, less than or equal to eight minutes recording time
E2502	Speech generating device, digitized speech, using pre-recorded messages, greater than 8 minutes but less than or equal to 20 minutes recording time
E2504	Speech generating device, digitized speech, using pre-recorded messages, greater than 20 minutes but less than or equal to 40 minutes recording time

HCPCS Codes	Description
E2506	Speech generating device, digitized speech, using pre-recorded messages, greater than 40 minutes recording time
E2511	Speech generating software program, for personal computer or personal digital assistant

Not Medically Necessary Services

Considered Educational in Nature/Not Medically Necessary for the assessment and/or treatment of ASD:

HCPCS Codes	Description
G0177	Training and educational services related to the care and treatment of patient's disabling mental health problems per session (45 minutes or more)
H2027	Psychoeducational service, per 15 minutes
S9445	Patient education, not otherwise classified, non-physician provider, individual, per session
S9446	Patient education, not otherwise classified, non-physician provider, group, per session
T1018	School-based individualized education program (IEP) services, bundled

Considered Not Medically Necessary when used to report multi-purpose, general consumer electronic devices:

HCPCS Codes	Description
E1399	Durable medical equipment, miscellaneous

Considered Experimental/Investigational/Unproven when used to report for the assessment of ASD:

CPT®*	Description
82705	Fat or lipids, feces; qualitative
82784	Gammaglobulin (immunoglobulin); IgA, IgD, IgG, IgM, each
83015	Heavy metal (eg, arsenic, barium, beryllium, bismuth, antimony, mercury); qualitative, any number of analytes
83018	Heavy metal (eg, arsenic, barium, beryllium, bismuth, antimony, mercury); quantitative, each, not elsewhere classified
83516	Immunoassay for analyte other than infectious agent antibody or infectious agent antigen; qualitative or semiquantitative, multiple step method
83519	Immunoassay for analyte other than infectious agent antibody or infectious agent antigen; quantitative, by radioimmunoassay (eg, RIA)
83615	Lactate dehydrogenase (LD), (LDH)
84378	Sugars (mono-, di-, and oligosaccharides); single quantitative, each specimen
84999†	Unlisted chemistry procedure
86001	Allergen specific IgG quantitative or semiquantitative, each allergen
86003	Allergen specific IgE; quantitative or semiquantitative, crude allergen extract, each
86005	Allergen specific IgE; qualitative, multiallergen screen (disk, sponge, card)
86008	Allergen specific IgE; quantitative or semiquantitative, recombinant or purified component, each
86255	Fluorescent noninfectious agent antibody; screen, each antibody
86485	Skin test; candida
95004	Percutaneous tests (scratch, puncture, prick) with allergenic extracts, immediate type reaction, including test interpretation and report, specify number of tests

CPT®* Codes	Description
95017	Allergy testing, any combination of percutaneous (scratch, puncture, prick) and intracutaneous (intradermal), sequential and incremental, with venoms, immediate type reaction, including test interpretation and report, specify number of tests
95018	Allergy testing, any combination of percutaneous (scratch, puncture, prick) and intracutaneous (intradermal), sequential and incremental, with drugs or biologicals, immediate type reaction, including test interpretation and report, specify number of tests
95076	Ingestion challenge test (sequential and incremental ingestion of test items, eg, food, drug or other substance); initial 120 minutes of testing
95079	Ingestion challenge test (sequential and incremental ingestion of test items, eg, food, drug or other substance); each additional 60 minutes of testing (List separately in addition to code for primary procedure)
95965	Magnetoencephalography (MEG), recording and analysis; for spontaneous brain magnetic activity (eg, epileptic cerebral cortex localization)
95966	Magnetoencephalography (MEG), recording and analysis; for evoked magnetic fields, single modality (eg, sensory, motor, language, or visual cortex localization)
95967	Magnetoencephalography (MEG), recording and analysis; for evoked magnetic fields, each additional modality (eg, sensory, motor, language, or visual cortex localization) (List separately in addition to code for primary procedure)
0063U	Neurology (autism), 32 amines by LC-MS/MS, using plasma, algorithm reported as metabolic signature associated with autism spectrum disorder
0139U	Neurology (autism spectrum disorder [ASD]), quantitative measurements of 6 central carbon metabolites (ie, α-ketoglutarate, alanine, lactate, phenylalanine, pyruvate, and succinate), LC-MS/MS, plasma, algorithmic analysis with result reported as negative or positive (with metabolic subtypes of ASD) (Code deleted effective 09/30/2021)
0263U	Neurology (autism spectrum disorder [ASD]), quantitative measurements of 16 central carbon metabolites (ie, a-ketoglutarate, alanine, lactate, phenylalanine, pyruvate, succinate, carnitine, citrate, fumarate, hypoxanthine, inosine, malate, S-sulfocysteine, taurine, urate, and xanthine), liquid chromatography tandem mass spectrometry (LC-MS/MS), plasma, algorithmic analysis with result reported as negative or positive (with metabolic subtypes of ASD)

†Note: Considered Experimental/Investigational/Unproven when used to report micronutrient testing (e.g., vitamin level)

HCPCS Codes	Description
P2031	Hair analysis (excluding arsenic)
S8035	Magnetic source imaging

Considered Experimental/Investigational/Unproven when used to report for the treatment of autism spectrum disorders:

CPT®* Codes	Description
90283	Immune globulin (IgIV), human, for intravenous use
90901	Biofeedback training by any modality
92065	Orthoptic and/or pleoptic training, with continuing medical direction and evaluation
97810	Acupuncture, 1 or more needles; without electrical stimulation, initial 15 minutes of personal one-on-one contact with the patient
97811	Acupuncture, 1 or more needles; without electrical stimulation, each additional 15 minutes of personal one-on-one contact with the patient, with re-insertion of needle(s) (List separately in addition to code for primary procedure)
97813	Acupuncture, 1 or more needles; with electrical stimulation, initial 15 minutes of personal one-on-one contact with the patient

CPT®* Codes	Description
97814	Acupuncture, 1 or more needles; with electrical stimulation, each additional 15 minutes of personal one-on-one contact with the patient, with re-insertion of needle(s) (List separately in addition to code for primary procedure)
99183	Physician or other qualified health care professional attendance and supervision of hyperbaric oxygen therapy, per session

HCPCS Codes	Description
A9152	Single vitamin/mineral/trace element, oral, per dose, not otherwise specified
A9153	Multiple vitamins, with or without minerals and trace elements, oral, per dose, not otherwise specified
G0176	Activity therapy, such as music, dance, art or play therapies not for recreation, related to the care and treatment of patient's disabling mental health problems, per session (45 minutes or more)
G0277	Hyperbaric oxygen under pressure, full body chamber, per 30 minute interval
H2032	Activity therapy, per 15 minutes
J1459	Injection, immune globulin (Privigen), intravenous, non-lyophilized (e.g. liquid), 500 mg
J1556	Injection, immune globulin (Bivigam), 500 mg
J1557	Injection, immune globulin, (Gammaplex), intravenous, non-lyophilized (e.g., liquid), 500 mg
J1558	Injection, immune globulin (xembify), 100 mg
J1559	Injection, immune globulin (Hizentra), 100 mg
J1561	Injection, immune globulin, (Gamunex-C - Gammaked), nonlyophilized (e.g., liquid), 500 mg
J1566	Injection, immune globulin, intravenous, lyophilized (e.g., powder), not otherwise specified, 500 mg
J1568	Injection, immune globulin, (Octagam), intravenous, non-lyophilized (e.g., liquid), 500 mg
J1569	Injection, immune globulin, (Gammagard liquid), intravenous, non-lyophilized, (e.g., liquid), 500 mg
J1572	Injection, immune globulin, (Flebogamma/Flebogamma DIF), intravenous, non-lyophilized (e.g., liquid), 500 mg
J1599†	Injection, immune globulin, intravenous, non-lyophilized (e.g. liquid), not otherwise specified, 500 mg
J2850	Injection, secretin, synthetic, human, 1 microgram
S8930	Electrical stimulation of auricular acupuncture points; each 15 minutes of personal one-on-one contact with patient
S8940	Equestrian/hippotherapy, per session
S9355	Home infusion therapy, chelation therapy; administrative services, professional pharmacy services, care coordination, and all necessary supplies and equipment (drugs and nursing visits coded separately), per diem

†Note: Considered Experimental/Investigational/Unproven when used to report when used to represent Asceniv, Cutaquig, or Panzyga

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