Asperger's Disorder in Children and Adolescents: Speech Therapy

Indexing Metadata/Description

› Title/condition: Asperger’s Disorder in Children and Adolescents: Speech Therapy
› Synonyms: Autism spectrum disorder (ASD); Asperger’s syndrome; autistic psychopathy; speech therapy: Asperger syndrome in children and adolescents; Asperger disorder in children and adolescents: speech therapy
› Anatomical location/body part affected: Asperger’s disorder (AD) is a neurodevelopmental disorder that affects the entire individual
› Area(s) of specialty: Autism spectrum disorder
› Description

• In May 2013, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) changed the diagnostic category to which people exhibiting symptoms of AD belong.\(^{63}\) However, those individuals who exhibit signs and symptoms consistent with the previous diagnostic label of AD are now given a diagnosis of autism spectrum disorder (ASD)\(^{63}\)
• ASD is a developmental disorder characterized by impairments in the areas of language, communication, and reciprocal interaction as well as the presence of repetitive and ritualistic behaviors.\(^{63}\) Onset of ASD is before the age of 3 years.\(^{63}\) The diagnostic label of ASD now encompasses several conditions that were previously considered separate disorders: autistic disorder, pervasive developmental disorder not otherwise specified (PDD-NOS), early infantile autism, atypical autism, Kanner’s autism, high-functioning autism, childhood disintegrative disorder, and AD.\(^{63}\) According to the DSM-5, patients who exhibit signs and symptoms consistent with any of the aforementioned conditions are now diagnosed as ASD.\(^{63}\) For additional information on ASD in children and adolescents, see the series of Clinical Reviews on this topic. Diagnostic criteria for ASD per the DSM-5 are as follows:
  – Criterion A: Current or previous persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following:
    - Deficits in social-emotional reciprocity (e.g., failure to initiate social interactions; inappropriate responses to social situations)\(^{63}\)
    - Deficits in nonverbal communicative behaviors used for social interaction (e.g., poor eye contact; lack of facial expression)\(^{63}\)
    - Deficits in developing, maintaining, and understanding relationships (e.g., difficulty making friends; no interest in one’s peers)\(^{63}\)
  - For the diagnosis of ASD, the above deficits must be pervasive and sustained\(^{63}\)
  - In addition to documenting the presence of the abovementioned deficits, the diagnosing clinician (a specially trained developmental physician or psychologist) must also specify current severity level of social communication impairments when diagnosing ASD.\(^{63}\) Because the severity of behaviors in ASD is known to fluctuate over time, the severity label is used to refer only to current severity\(^{63}\)
  – Criterion B: Restricted, repetitive patterns of behaviors, interests, or activities, as manifested by at least two of the following, currently or by history:
- Stereotyped or repetitive motor movements, use of objects, or speech \(^{(63)}\)
- An example of stereotyped speech is echolalia, described below \(^{(63)}\)
- Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., rigid thought patterns; wanting the same sequence of activities in each therapy session) \(^{(63)}\)
- Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., a strong preoccupation with comic books to the exclusion of all other activities and interests) \(^{(63)}\)
- Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., inability to tolerate loud noises; apparent indifference to pain or temperature) \(^{(63)}\)
- In addition to documenting the presence of two or more of the abovementioned deficits, the diagnosing physician or psychologist must also specify current severity level of restrictive, repetitive behaviors when diagnosing ASD \(^{(63)}\)

Because the severity of behaviors in ASD is known to fluctuate over time, the severity label is used to refer only to current severity \(^{(63)}\)

–Criterion C: Symptoms must be present in the early developmental period (however, symptoms may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies later in life) \(^{(62)}\)
–Criterion D: Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning \(^{(63)}\)
–Criterion E: Signs and symptoms are not better explained by intellectual disability or global developmental delay \(^{(63)}\)

- Intellectual disability often co-occurs with ASD; in order for both diagnoses to be applicable, social functioning would be impaired more than would be expected given the individual’s developmental level and cognitive functioning \(^{(63)}\)

–The diagnosing physician or psychologist will also specify whether or not ASD presents:
  - With or without accompanying intellectual impairment \(^{(63)}\)
  - With or without accompanying language impairment \(^{(63)}\)
  - With or without another neurodevelopmental, mental, or behavioral disorder \(^{(63)}\)
  - With or without catatonia \(^{(63)}\)

• Severity levels in ASD \(^{(63)}\)
  –Level 3 – requiring very substantial support
  –Level 2 – requiring substantial support
  –Level 1 – requiring support

• AD was previously considered one of five diagnostic categories of ASDs and shared many characteristics with high-functioning autism (HFA) \(^{(2)}\). According to the new diagnostic criteria, a patient diagnosed after May 2013 who exhibits the same characteristics as a person who was previously diagnosed with AD would be considered to have ASD with a severity level 1 without language or intellectual impairment \(^{(63)}\)

• Individuals previously diagnosed with AD demonstrate age-appropriate cognitive functioning with impaired social skills, narrow interests, repetitive routines, nonverbal communication problems, and speech and language peculiarities (e.g., formal pedantic language) \(^{(2)}\)

• In accordance with diagnostic criteria for AD from the prior edition of the DSM, the DSM-IV, individuals with AD demonstrate typical early history of language development, typical cognitive functioning, and have normal to minimal impairments in adaptive behavior \(^{(3)}\)

› ICD-9 codes:
  • 299.80 Asperger Syndrome

› ICD-10 codes:
  • F84.5 Asperger Syndrome

(ICA codes are provided for the readers’ reference, not for billing purposes)

› Reimbursement: Reimbursement for therapy will depend on insurance contract coverage; no specific issues or information regarding reimbursement have been identified
Presentation/signs and symptoms

- AD was characterized by impaired social skills, unusual speech and language patterns, obsessions, and sensitivity to sensory (auditory, visual, or tactile) stimuli\(^{1,5}\)
- While many individuals were diagnosed as young as age 5 years, the average age at diagnosis was 11 years\(^{5}\)
- Characteristics of individuals who were previously diagnosed with AD include:
  - Social impairment (e.g., inability to interact with peers, lack of desire to interact with peers, lack of appreciation of social cues)\(^{2}\)
    - The lack of theory of mind (ToM), also referred to as mindblindness, is thought to contribute greatly to social impairment in individuals with AD.\(^{53,65}\) ToM is the ability to attribute a specific state of mind to another person and differentiate other people’s thoughts and states of mind from one’s own.\(^{65}\) ToM is directly related to the ability to mentalize (i.e., the ability to consciously or subconsciously attribute the actions of one’s self and the actions of others to a mental state).\(^{65}\) In typically developing individuals, mentalizing is mastered by the age of 10; however, in AD, individuals do not develop this ability.\(^{65}\) In social situations, the ability to mentalize is extremely important for developing normal relationships. Because this ability is lacking in children with AD, they often have difficulty developing relationships and friendships.\(^{65}\) An example of a situation in which mentalizing is necessary for making friendships is playground behavior. If a typically developing boy finds himself “tagged” on the playground by another child, he would be able to look at the other child’s eye contact, facial expression, and body language and understand that he has just been pulled into a fun game with a friend. For a child with AD, the action of being “tagged” out of the blue on the playground might be interpreted as being hit or punched because of his inability to attribute this action to the other child’s mental state based on nonverbal information, and the game would not continue
  - Narrow interests\(^{2}\)
  - Exclusion of other activities
  - Repetitive adherence – engaging in the activities in a repetitive fashion
  - Involvement in activities of interest – more rote than meaning
  - Repetitive routines (involving oneself or others)\(^{2}\)
  - Speech and language peculiarities (e.g., unusual prosody, superficially perfect expressive language, formal pedantic language)\(^{2}\)
    - Nonverbal communication problems (e.g., limited use of gestures, inappropriate facial expression, peculiar, stiff gaze)\(^{2}\)
  - Motor clumsiness (poor performance on neurodevelopmental examination; often appears stiff or unbalanced)\(^{2}\)
- Individuals who were previously diagnosed with AD often exhibit other conditions and issues such as hyperactivity, poor attention, compulsions, preoccupations, sleep problems, anxiety, and depressive moods\(^{2}\)
- Symptoms of AD/ASD vary with each individual and can also change over the individual’s lifetime\(^{5}\)

Causes, Pathogenesis, & Risk Factors

Cause

- It is thought that ASD is caused by genetic and/or environmental factors that affect brain development before or soon after birth\(^{2}\)
- Researchers are uncertain as to the cause of AD, and many suspect that the cause of AD is multifactorial\(^{8}\)
- There is no evidence linking the measles-mumps-rubella (MMR) vaccine or thimerosal to the development of ASD.
  Evidence from a systematic review conducted in 2014 shows that there is no link between vaccinating a child and the child developing ASD\(^{60,61}\)
- It is hypothesized that there is a genetic/heredity component to ASD. Families in the United States with a cluster of ASD were found to be more likely to have children with regressive-onset ASD (child appears to develop typically for the first few months of life, then begins to regress in the areas of speech and social skills), suggesting a genetic basis for ASD.\(^{9}\)
  However, there is insufficient research to conclusively support this\(^{10}\)
  - In the same study from the United States, researchers found that there were higher than average rates of alcoholism in the families of individuals with ASD. In this study, regressive-onset ASD was found to be associated with maternal alcoholism\(^{9}\)
Another hypothesis posits that ASD may be caused in part by neurochemical disruptions such as decreased amounts of platelet 5-HT2A receptor binding in certain areas of the brain\(^{(11)}\).

Researchers in the United Kingdom investigated cortical platelet 5-HT2A receptor binding in 8 adult men who had been diagnosed with AD and compared the results to 10 adult men without ASD, and found that the men diagnosed with AD exhibited decreased platelet 5-HT2A receptor binding. Cortical 5-HT2A receptors are part of the serotonergic (5-HT) system, which controls social behavior. Reduced binding of these receptors has been found to be related to reciprocal social interaction abnormalities. Therefore, reduced receptor binding might impair response to facial expression of emotion, influence personality traits, and increase repetitive behaviors. Limitations of the study included small subject number (N=18) as well as limited population of the study (i.e., only men)\(^{(11)}\).

Pathogenesis

- The pathogenesis of ASD is unknown\(^{(9)}\).

- Children with ASD have been found to have increased overall brain size\(^{(12-13)}\).

- Magnetic resonance imaging (MRI) studies have found that children with ASD have less grey matter in the bilateral caudate and left thalamus areas of the brain as compared to children without ASD\(^{(14)}\).

Risk factors

- Sex (more common in males than females)\(^{(4)}\)

- Family history of or ASD
  - Monozygotic twins show 60-90% concordance, suggesting a genetic component\(^{(13)}\)

- Environmental factors
  - In a study of genetic and environmental factors, researchers found that in 100 male children who had a diagnosis of AD, there were prenatal or perinatal risk factors in 25% of cases (such as exposure to alcohol, severe postnatal asphyxia, neonatal seizures, and prematurity)\(^{(2)}\).

Overall Contraindications/Precautions

- The speech-language pathologist (SLP) must be aware of the cultural and linguistic background of the patient, which can affect assessment and the treatment protocol.

- SLPs should involve family members, school personnel, educational professionals, medical professionals, and other therapists (collaborative model) in the assessment and treatment process for more accurate information and best results.

- SLPs must be aware of the patient’s attention span, anxiety level, and any other behavioral issues during assessment and treatment and their impact on language performance/test results.

- SLPs should complete a thorough review of the patient’s medical history prior to conducting a speech-language evaluation or treatment.

- Children with ASD often have difficulty with a change or interruption in routine; making sure the patient is given adequate transition time and informing him or her about changes to the schedule may help during assessment or treatment.

- See specific Contraindications/precautions under Assessment/Plan of Care.

Examination

- Contraindications/precautions to examination
  - The manner in which the medical history is gathered and testing measures might differ according to the specific age, needs, developmental level, cultural background, and living and educational environment of the patient.

- History
  - History of present illness/injury
    - Mechanism of injury or etiology of illness
      - When was AD first diagnosed and by whom? When were symptoms of AD first noted? Which symptoms were noted and by whom?
      - Onset of the symptoms of ASD is usually before age 3 years\(^{(15)}\).
      - While many individuals with AD were diagnosed as early as age 5 years, the average age at diagnosis was 11 years\(^{(5)}\).
      - Document prenatal and perinatal history.
      - Were the patient’s speech, language, and motor developmental milestones achieved on time?
Course of treatment

- Medical management
  - Which physicians and other professionals care for the patient?
  - The primary care physician will typically refer the patient to a psychologist (behavioral evaluation and treatment), a neuropsychologist (cognitive evaluation), an SLP, physical and occupational therapists, and other professionals
  - What is the patient’s general health status?
  - Review medical records as well as any previous therapy (e.g., speech, occupational, or physical therapy) records, especially those pertaining to communication skills
  - Review results of diagnostic tests specifically for ASD or AD (e.g., Gilliam Asperger’s Disorder Scale, Asperger Syndrome Diagnostic Scale, Krug Asperger’s Disorder Index, and Autism Spectrum Screening Questionnaire)\(^{(16)}\)

- Medications for current illness/injury: Determine what medications physician has prescribed; are they being taken?
  - Psychostimulants (e.g., methylphenidate) or selective noradrenergic reuptake inhibitors (e.g., atomoxetine) are often prescribed to treat hyperactivity and inattention\(^{(10)}\)
  - Serotonin reuptake inhibitors (SSRIs) are sometimes prescribed to treat cognitive rigidity, irritability, aggression, depression, or anxiety\(^{(10)}\)
  - Sleep disorders related to AD are sometimes treated with medication (such as trazodone, an antidepressant) as well\(^{(17)}\)

- Diagnostic tests completed: Usual tests for this condition are the following:
  - Diagnosis for AD was usually based on the DSM-IV criteria for AD and was made by a physician.\(^{(18)}\) However, physicians, psychologists, and other health professionals typically used a variety of diagnostic checklists and criteria to complete a differential diagnosis. The four sets of criteria that were most commonly used were the DSM-IV criteria, the ICD-10 criteria, the Gillberg and Gillberg criteria, and the Szatmari et al. criteria. Studies found that these four sets of criteria had low agreement with each other.\(^{(19)}\) A popular standard for diagnosis of AD was clinical judgment combined with the use of the Autism Diagnostic Interview Revised (ADI-R). The ADI-R is an assessment tool composed of a structured interview, which can be used with anyone with a mental age of at least 24 months. Alternatively, or in addition to the ADI-R, the Autism Diagnostic Observation Scale can be used to assess and diagnose ASDs. This assessment tool is composed of various structured and semistructured tasks that test social interaction skills. It is often used together with the ADI-R.\(^{(62)}\) Diagnostic assignments of autism, AD, and PDD varied according to the different systems described above\(^{(20)}\)
  - A comprehensive team evaluation is needed to formally diagnose any ASD. Professionals who are usually part of the assessment process include a psychologist, neurologist, psychiatrist, SLP, and occupational therapist\(^{(12)}\)
  - Historically, there has been a lack of agreement and consistency among professionals when assigning diagnostic labels to children with ASD\(^{(21)}\)
  - Other testing\(^{(4)}\)
    - Neuropsychological testing for IQ
    - Neurological exam by neurologist
    - Audiological screening by audiologist
    - Behavioral evaluation by a psychologist
    - Electroencephalogram (EEG) if the patient is suspected to have seizures

- Home remedies/alternative therapies: Document any use of home remedies (e.g., diet modifications/supplements) or alternative therapies (e.g., music/art therapy) and whether or not they help

- Previous therapy: Document whether patient has had speech, occupational, physical, art, or music therapy or applied behavioral analysis (ABA) for this or other conditions and what specific treatments were helpful or not helpful

- Aggravating/easing factors: Is there anything specifically that worsens or brings on symptoms/behaviors (e.g., if the patient is sensitive to auditory stimuli, do loud noises induce behavioral issues?)

- Nature of symptoms: Document nature of symptoms, including severity of each symptom. A key feature of AD is social communication difficulties/pragmatic problems, especially with peers. Characteristics of AD can change over a person’s lifetime\(^{(1)}\)
  - Speech
    - Poor prosodic abilities, including poor intonation contour and difficulty differentiating between questions and declaratives (rising/falling intonation)\(^{(22)}\)
- Reduced clarity and fluency of speech\(^{(22)}\)
- Echolalia, disorganized speech, and reduced affect\(^{(23)}\)
- Difficulty adjusting language register or language style according to listener needs\(^{(25)}\)
  - Typically developing children are able to vary language style or change tone, language, and vocabulary as appropriate to a specific listener by the age of 4 or 5 years\(^{(24)}\)
- Overly formal speech patterns\(^{(25)}\)

Language
- Overly literal in language comprehension
- Tendency to over generalize world knowledge (e.g., all apples are red, all doctors are men)\(^{(26)}\)
- Difficulty comprehending humor in narratives\(^{(23)}\)
- Difficulty understanding metaphors
- Considerable difficulty with complex language tasks\(^{(27)}\)
  - Overall, less adept at clearly explaining how to complete tasks\(^{(25)}\)
- Difficulty answering questions, difficulty justifying answers, and tendency to answer questions using irrelevant information\(^{(26)}\)

Underdeveloped play skills
- Fantasy play is often repetitive and stereotyped\(^{(13)}\)

Executive functioning (EF) impairments\(^{(28,29)}\)
- Struggle with efficient cognitive search strategies and problem solving\(^{(28)}\)
- Impairments in organizing, flexibility of thought, and prioritizing\(^{(29)}\)
- Difficulties with goal selection, planning activities, starting activities, self-monitoring, feedback, maintaining attention, making reasonable inferences, and self-regulation\(^{(29)}\)
  - Difficulty on map tasks that require making a plan and carrying out effective strategies is common\(^{(30)}\)
- EF impairments often affect social and job opportunities\(^{(29)}\)
  - EF improves with age\(^{(30)}\)

Social skills
- Poor conversational skills
  - Difficulty with topic maintenance\(^{(26)}\)
  - Difficulty giving the right amount of information\(^{(26)}\) (tendency to get sidetracked)
- Difficulty initiating conversations
- Unusual, awkward speech patterns in conversation
  - Individuals with AD exhibit unusual speech patterns as well as lack of variation in pitch, stress, and rhythm, precise intonation, or formal pedantic style\(^{(31)}\)
  - Difficulty identifying and distinguishing expressive faces and voices, which can negatively impact social interaction, as it is difficult for individuals with AD to process and integrate auditory and visual information that give clues about emotions and expressions\(^{(32)}\)
- Weak social inference skills, making it difficult for children to empathize with their peers or to predict outcomes\(^{(32)}\)
  - Individuals with AD have better emotion perception (identifying emotions such as happy, sad, and angry) than individuals with HFA\(^{(33)}\)
  - Children with AD tend to have fewer friends and play with friends for a shorter period of time as compared to typically developing children\(^{(31)}\)
  - Most children with AD do desire social relationships, but due to deficits in social skills they have trouble making and maintaining relationships, perhaps due to low interest in the thoughts and interests of others\(^{(31)}\)
- Poor social problem solving, which can lead to difficulty maintaining healthy relationships\(^{(34)}\)
- Children with AD might be seen as abrupt or rude due to over-initiation (e.g., attempting too often or at inappropriate
times to initiate interactions). However, children with AD usually do not have as much difficulty with social turn
taking\(^{(34)}\).

- Children with AD may show off or share information in inappropriate ways (monologues, incessant talking) as they
are interested in sharing their experiences with others. They may appear self-involved\(^{(34)}\).

- Behavior/emotional
  - Preoccupation with special interests\(^{(32)}\)
    - Children might use these interests to overcome anxiety and to give themselves a sense of predictability or routine\(^{(31)}\).
  - Affective disorders, including anxiety disorders and depression\(^{(31)}\)
  - Children with AD often feel socially isolated and/or lonely\(^{(13)}\)
  - Sensory sensitivities to auditory, tactile, or visual stimuli\(^{(31)}\)
  - Aggression may be sparked by disturbing visual or auditory stimuli.\(^{(32)}\) Overall, violent or offensive behavior is not
    significantly higher than among non-AD population\(^{(35)}\).
  - Cognitive inflexibility, ritualistic adherence to rules, obsessive compulsive behavior, and policing behavior (attempting
to enforce rules with peers)\(^{(34)}\).

- Rating of symptoms: Use a visual analog scale (VAS) or 0-10 scale to assess symptoms at their best, at their worst, and
at the moment

- Pattern of symptoms: Document changes in symptoms throughout the day and night, if any (A.M., mid-day, P.M.,
night); also document changes in symptoms due to changes in routine, in certain environments, and in response to the
presence of certain individuals

- Sleep disturbance: Document number of waking/night

- Other symptoms: Document other symptoms patient may be experiencing that could exacerbate the condition and/or
symptoms that could be indicative of a need to refer to physician

- Respiratory status: Document patient’s respiratory status

- Psychosocial status: How is the patient’s mood and self-esteem? What are the current stressors in the patient’s life? Does
the patient exhibit signs of anxiety or depression? Affective disorders, including anxiety disorders and depression, are
common in patients with AD\(^{(32)}\). Children with AD often feel socially isolated and/or lonely\(^{(14)}\).

- Document symptoms of behavioral problems and review reports from behavioral specialists
  - Conners Comprehensive Behavior Rating Scales can be used to assess behavior, emotions, and academic problems in
children aged 6-17 years. This standardized assessment can be used as a diagnostic tool and is also useful in helping
plan intervention strategies. An SLP or a professional in the field of child and youth psychology can administer this
assessment
  - Does the child demonstrate obsessive interests or thoughts? Does the child demonstrate rituals or compulsive
behaviors? How are the child’s adaptive skills?
  - Does the child exhibit problem behaviors such as aggression, hyperactivity, or anxiety?

- Hearing: Document results of any audiological evaluations. Does the patient have any hearing impairments?

- Barriers to learning
  - Are there any barriers to learning? Yes__ No__
  - If Yes, describe __________________________

• Medical history
  - Past medical history
    - Comorbid diagnoses: Ask patient and/or family/caregiver about other problems, including learning disabilities and
mental health conditions. Is there a family history of AD or a related disorder? Does the patient have other medical
conditions, such as diabetes, seizures, sleep difficulties, sensory issues, anxiety, or depression
    - Medications previously prescribed: Obtain a comprehensive list of medications prescribed and/or being taken
(including over-the-counter drugs)
  - Other symptoms: Ask patient and/or family/caregiver about other symptoms the patient is experiencing

• Social/occupational history
  - Patient’s goals: Document what the patient hopes to accomplish with therapy and in general; ask patient, family, and
teachers/educational staff what their goals are for the home, school, and/or social environment
Vocation/avocation and associated repetitive behaviors, if any: What kind of support is in place for the patient in school, at home, or in the community? Is the child currently receiving therapy? Is it home, center, or school based? Is the child in a regular or special education classroom? What kind of educational supports are needed or are provided for the patient? How does the patient interact with peers? Does the patient participate in group activities, projects, or sports?

Functional limitations/assistance with ADLs/adaptive equipment: Document if and what type of adaptive equipment the patient is using, such as AAC, hearing aids, or glasses. Ask patient and family members about the effect of the patient’s communication deficits on participation in social and/or occupational activities. Ask the patient or family/caretakers about and document any difficulties with feeding or swallowing. Does the patient have specific food preferences or aversions? Does the patient have difficulty eating certain textures of food?

Living environment: With whom does patient live (e.g., caregivers, family)? Identify if there are barriers to independence in the home; any modifications necessary? With whom does the patient communicate? How does the patient communicate? How do his or her impairments affect family/home life?

Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting.) Evaluation of a patient with AD will differ depending on the age of the patient and the setting in which the patient is being evaluated. Most commonly, SLPs use standardized assessments together with clinical observations in order to get a full picture of the patient’s speech, language, and communication abilities and/or limitations. Due to relative cognitive strength, children and adolescents with AD often perform better on formal communication tests as compared to informal testing. Thus, formal testing might not be as sensitive to specific communication impairments. The following list of the assessment materials is not comprehensive. In addition, not all assessment protocols from each category need be administered.

Arousal, attention, cognition (including memory, problem solving)
- Review reports/results of testing completed by developmental psychologist, neurologist on cognitive skills
- Document length of time the patient is able to attend to directions and activities
- Is the patient able to follow simple and complex directions?
- Is the patient able to attend to task and focus during the time of assessment?
- Document level of frustration and/or impulsivity during testing process
- Note any repetitive behaviors exhibited by the patient during the assessment
- Does the patient demonstrate appropriate drive and motivation?
- In a study conducted in the United States, researchers compared the performance of age-matched controls with the performances of adolescents and adults with diagnoses of either AD or HFA on the Wechsler Adult Intelligence Scale – 4th edition
  - Compared to the control group, patients with AD had significant weaknesses in social perception, processing speed, and auditory working memory
  - The group with AD had better overall cognitive skills compared to the group with HFA
- Refer the patient to a psychologist or neuropsychologist for cognitive testing such as nonverbal IQ testing

Assistive and adaptive devices
- Does the patient use any assistive or adaptive devices?
- What types (if any) of AAC are used by the patient? For example, does the patient use hand gestures, sign language, picture systems, or other AAC to communicate wants and needs?
- In a study conducted in the United Kingdom comparing text chat with telephone conversations, researchers found that individuals with AD do not communicate more effectively through text chat as compared to telephone

Speech and language examination (including reading)
- Speech
  - Is the patient’s speech intelligible?
  - Does the patient speak too quickly? Too slowly? Does the patient exhibit abnormal intonation or prosody? Can the patient show emotion in his or her voice (anger, sadness, happiness)?
  - Does the patient produce age-appropriate phonemes in isolation, words, sentences, and connected speech?
  - Document any noticeable disturbances to prosody, intonation, or pitch
  - Document any characteristics of speech that impact intelligibility and clarity of speech (e.g., mumbling, rapid rate of speech)
  - Goldman-Fristoe Test of Articulation-3 to assess articulation of consonant sounds in individuals aged 2-21 years
Language: The SLP should combine standardized assessment measures listed below with nonstandardized measures such as play-based, observational assessment, as well as the collection and analysis of language samples. As mentioned above, standardized assessment alone may not adequately capture the child’s language difficulties.

- Receptive and expressive language
  - Preschool Language Scale – 5th Edition (PLS-5) can be used in children aged 0-6 years 11 months. The PLS-5 can be administered by an SLP and assesses receptive and expressive language skills, overall interaction, attention, and vocal/gestural behaviors as well as early literacy skills and phonological awareness skills.
  - Clinical Evaluation of Language Fundamentals – Preschool, Second Edition (CELF-P-2) can be used in children aged 3-6 years to test concepts and the ability to follow directions, word structure, expressive vocabulary, recalling sentences, sentence structure, basic concepts, recalling sentences in context, understanding word classes, and phonological awareness.
  - The Clinical Evaluation of Language Fundamentals-5 (CELF-5) can be used for individuals aged 5-21 years and assesses language in the areas of semantics, phonology, syntax, and memory.
  - Profiling Elements of Prosodic Systems – Children (PEPS-C) is comprised of receptive tasks that test chunking (putting similar words, concepts, or ideas together in groups), affect (ability to understand affect or attitudinal meaning through intonation), focus (ability to understand stress or focus based on the emphasis in the spoken language), and turn end (ability to understand questioning versus declarative intonation). This test is appropriate for patients over the age of 5 years.
  - Test of Language Competence – Expanded Edition (TLC-E) (for children aged 9-18 years, 11 months) is appropriate for adolescents. This assessment includes subtests in understanding ambiguous sentences, listening comprehension, making inferences, recreating sentences, and figurative language. This test can provide clinically relevant information about language skills.
  - Test of Adolescent and Adult Language-4th Edition (TOAL-4): appropriate for individuals aged 12-24:9 years and tests receptive and expressive vocabulary, grammar, reading, and writing.

- Nonliteral language deficits
  - Assess patient’s ability to understand and solve nonliteral language problems.
  - Test of Problem Solving – Elementary, Third Edition: a standardized test for school-aged children; assesses the ability to integrate semantic and linguistic knowledge with reasoning ability.

- Verbal memory
  - Stanford-Binet Memory for Sentences Subtest assesses verbal memory and is appropriate for children, adolescents, and young adults.

- Reasoning and predictions
  - Assess the patient’s ability to make predictions (using story scenarios or picture cards is often helpful) and to demonstrate appropriate reasoning.

- Written language
  - Test of Written Language – Fourth Edition (TOWL-4) assesses a patient’s writing ability.

- Narrative capability
  - Assess the patient’s ability to retell a story accurately and clearly. Can the child talk about his or her life or day in a clear manner? Can he or she stay on topic? Can he or she provide relevant details (and leave out unnecessary information)?
  - Test of Narrative Language: assesses a child’s ability to use knowledge of the components of language during functional discourse.

- Nonverbal communication
  - How is the child’s eye contact? Does the child engage in joint attention and reciprocity? Does the child initiate or respond appropriately?
  - Which communicative functions does the child use (e.g., requesting, protesting, social routine, calling, greeting, giving information, asking permission/information, commenting)?
  - Does the child demonstrate appropriate presupposition (giving appropriate information and taking listener knowledge into account)?

Voice
- Note vocal quality. Is the patient’s voice hoarse? Raspy? Quiet? Too loud? Abnormal pitch/frequency (for age or gender)?
Fluency: Children with AD have increased incidence of stuttering-like disfluencies as compared to typically-developing children. Does the patient exhibit disfluent speech? If so, where does the breakdown occur (sound level, syllable level, word level)? Does the patient exhibit any secondary stuttering characteristics (e.g., eye blinking, twitching)? Does the patient exhibit blocking?

For additional information on assessment and treatment of fluency disorders, see the series of Clinical Reviews on this topic.

Reading: Assess reading where developmentally appropriate. SLPs often work collaboratively in this area with a special education teacher or learning disability specialist.

- Is the patient able to read fluently?
- Does the patient understand content he or she has read?
- Do limitations in the areas of abstract language or complex language impact the patient’s reading comprehension?
- How do reading fluency or reading comprehension issues impact the patient’s academic success or success in the workplace?

Early Reading Diagnostic Assessment – Second Edition (ERDA-2) can be used to identify children at risk for reading difficulties. This assessment can be used for children in grades K-3. This test is often administered by teachers, resource teachers, special education teachers, or learning disability specialists.

The Test of Reading Comprehension, Fourth Edition (TORC-4) can be used to assess reading fluency, relational vocabulary, sentence completion abilities, paragraph construction skills, text comprehension, and contextual fluency.

Oral structure and oral motor function

- Perform an oral motor examination in order to rule out or identify a motor-based speech disorder.

Special tests specific to diagnosis/pragmatics/social skills

- Social skills are typically impaired in children and adolescents with AD. In a study conducted in the United States involving 29 children with a diagnosis of AD and 26 typically developing children in a control group, researchers found that children with AD tend to have overly formal speech patterns and have difficulty managing topics and information, intonation, and gaze management. These skills can be improved with speech and language intervention.

- The Screening Questionnaire for Asperger Syndrome is a 27-item questionnaire appropriate for school-aged children that examines communication, social interaction, uncoordinated motor skills, and other symptoms, rated on a 3-point scale with 0 being normal. Screening for AD can lead to earlier diagnosis and treatment. This questionnaire is appropriate for adolescents.

- The Social Language Development Test can be used to assess social interaction skills in children aged 6-11 years.

- Autism identification protocols (some commonly used protocols are listed)
  - Autism Diagnostic Observation Schedule (ADOS) can be used to diagnose and assess autism and PDD in infancy-adulthood. The results of this assessment can be used to make a narrow diagnosis of autism or a broader diagnosis of PDD.
  - Autism Diagnostic Interview-Revised (ADI-R) can be used to diagnose autism and plan treatment. It can be used in patients who have a mental age above 2 years.
  - The Autism Spectrum Quotient is a 50-item self-report questionnaire; there is a 40-item version for family members. This assessment can be used for children aged 4-16 years.

Swallow examination: Perform a swallowing examination if indicated. Document any difficulties with feeding or swallowing. Does the patient have specific food preferences or aversions? Does the patient have difficulty eating certain textures of food? For additional information on dysphagia in patients with ASDs, see Clinical Review…Dysphagia: Autism Spectrum Disorders; Accession Number: 5000010831

Assessment/Plan of Care

Contraindications/precautions

- Only those contraindications/precautions applicable to this diagnosis are mentioned below, including with regard to modalities. Rehabilitation professionals should always use their professional judgment.

- Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary presented below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols.

- It is vital to work collaboratively with other professionals (e.g., physician, occupational therapist, psychologist) when writing an individualized education plan (IEP) to address educational needs.
Early intervention is often difficult in individuals with AD, as the average age at diagnosis is 11 years. Diagnosis/need for treatment: Speech therapy is often indicated as part of a multidisciplinary intervention for children and adolescents with AD leading to speech, language, and social communication impairments. Rule out: The patient’s medical team will attempt to rule out the following diagnoses during the diagnostic workup; however, the patient can have AD/ASD in addition to other diagnoses. Nonverbal learning disorder (NLD), which is characterized by social and learning impairments, motor deficits, and difficulties with emotional understanding and expression. Children with NLD have less serious social impairments than children with AD. Depression, Anxiety, Obsessive-compulsive disorder (OCD), Tourette syndrome, Schizophrenia, Hearing impairment, Lead poisoning, Fragile X syndrome, Developmental receptive language disorder, Hallucinations, Mania. Prognosis: AD is a chronic, lifelong developmental disorder for which there is no cure. Nevertheless, studies have shown that with time, some individuals with AD remain stable while others improve and show reduced symptoms over a period of 4-5 years. Older sample members (age 31 and over) show increased improvement as compared to adolescents. Over time, language skills usually improve. Children identified and treated earlier have been found to have higher IQs and better school placements. However, even children who are diagnosed early and have early treatment in behavioral programs for 1-4 years, have typical IQs (average IQ is 100), are in mainstreamed classrooms, and function at the level of their peers are found to have pragmatic and semantic language differences as they grow older. Referral to other disciplines: Refer to dieticians, physical therapists, occupational therapists, special education teachers, early intervention specialists, specialty healthcare providers, physicians, neurologists, neuropsychologists, psychiatrists, social workers, and behavioral therapists as needed to address associated conditions of AD such as behavior and sleep problems, orthopedic and vision problems, sensory integration issues, and safety issues. It is important to maintain contact with primary care providers in terms of all of the patient’s needs and progress. Other considerations: It is important to improve overall functional status of the individual. To do this, all involved professionals should work to help decrease maladaptive and repetitive behaviors and to help family manage stress. Refer for family support groups and counseling as appropriate. Adolescents with AD might not automatically receive speech and language services through the school system if expressive language skills and developmentally appropriate speech structure and vocabulary are within normal limits on standardized tests. Clinicians should recommend services (if necessary) in order to improve social communication and executive functioning. Children and adolescents with AD with good cognitive ability but poor social skills might not require a self-contained classroom. For these students, SLP services to address social skills development might be beneficial. Treatment summary: Speech and language therapy for individuals with AD. Common goals: develop social skills, teach adaptive problem-solving strategies and reduce maladaptive behaviors, and teach more effective communication. When appropriate, establish goals in social communication, problem solving, implementing support system in school and home environment, family support, and planning for transitions.
– Programs should be tailored to each individual’s strengths and weaknesses; in a school environment, small classes are generally better for individuals with AD. At the same time, individuals with AD should be integrated with typically developing peers.¹

– A parts-to-whole approach can be used to develop social skills and teach adaptive problem solving and effective communication. Tasks are broken up into smaller parts and taught in different segments.² Treatment should focus on one skill at a time, such as intonation, pausing appropriately, decreasing pitch variation.³

– It is important to work on social competence in friendship groups, classroom activities, or mentoring programs or through individual or dyadic therapy. To teach social skills a clinician can use direct therapy, role playing, modeling, social stories, practice with peers, and constructive feedback. Students can write their own social stories. Also, social skills can be taught by breaking skills into smaller subskills and teaching them through modeling/role play. Skills to work on may include greeting others, initiating conversation, staying on topic, maintaining eye contact, ending a conversation, accepting suggestions, handling criticism, resolving conflict, and showing empathy. Clinician should make sure to take advantage of strengths, work on specific areas of impairment, and generalize skills.⁴

– For information on speech therapy for children with ASD, please see the series of Clinical Reviews on this topic.

• Social skills programs

– Direct learning of social rules seems to be more effective than role-playing. It is important to teach adaptive skills explicitly, and then to practice and rehearse taught skills.⁵

- The Ohio Developmental Disabilities Council recommends that children with AD be taught social skills including empathy, types of humor, emotional identification, personal boundaries, and turn-taking.⁶

- Computers are a recommended teaching tool as most children with AD have a special interest in computers and computers allow for fast-paced learning, provide immediate feedback, and do not require real-world social interactions. However, generalization to nontraining tasks is limited. The Junior Detective Training Program is a computer program that teaches social skills and can be used for parent training as well. In a study conducted in Australia, 26 children (aged 7-11 years) with AD received 7 weeks of treatment and an introductory training session. As the sessions went on, more time was allocated to practice learned skills in role-playing activities. The program also helps children work on understanding complex emotions, problem solving, and social skills. Generalization is facilitated by role playing and home missions. The home missions included using relaxation techniques (e.g., slow breathing, exercising) and implementing social skills during play dates. Teacher handouts were given to the teachers to follow up on lessons. The researchers in the study found that a multicomponent social skills intervention was effective in enhancing social skills and emotional understanding. Compared to children on the waitlist (control group), the experimental group made significant improvements in social functioning and was also able to suggest emotion management strategies for story characters. Gains were maintained 6 weeks and 5 months post intervention. Limitations include multimodal approach (making it hard to pinpoint exactly what helped the students) and that the parents were both the intervention agents and primary evaluators.⁷

- In an experimental research study conducted in the United States of 6 male children with diagnoses of either AD or HFA, researchers found that direct teaching of the “why” of social thinking significantly improved subjects’ social skills. The children met in groups 60 minutes a week for 8 weeks. They were taught various lessons, such as: Looking = thinking; what one is looking at represents what that person is thinking about. Subjects were also taught that verbal and nonverbal actions affect how other people think about them, and that by changing the way you express yourself, both verbally and nonverbally, you can change the way others perceive you. Subjects learned about whole-body listening (using the body and eyes to listen or in conversations) and about knowledge and opinion (what to express and what to keep inside).⁸

- In a case study of a 9-year-old boy with AD, researchers found that social stories and video modeling were effective in increasing nonverbal skills in the areas of smiling, eye contact, and initiations. The study was comprised of 24 sessions over 15 weeks using interobserver agreement to judge improvement.⁹

- Per the Best Evidence Statement (BEST) published by the Cincinnati Children’s Hospital Medical Center and available on the National Guideline Clearinghouse Web site, it is recommended that SLPs working with children with ASD incorporate the use of video modeling into treatment plans to target either functional or imaginative play skills.¹⁰

– Peer and group training for social skills

- It is important to encourage friendships and to provide guided practice in how to maintain friends, as children with AD cannot rely on intuitive abilities to deal with social interactions. It is hard for an individual with AD to judge whether or
Emotions, empathy, and ToM: Individuals with AD demonstrate an impaired ability to recognize and identify envy and gloating, which may lead to difficulty understanding social faux pas. These skills (the ability to identify the above emotions) can be taught directly in social skills groups, individual therapy, or via computer programs. Treatment interventions should focus on improving perception of emotions by training children and adolescents with AD to attend to facial and vocal tone cues to decode emotion. The ability to decode emotion is closely related to social competence.

Social skills training groups (SSTGs) can be used to effectively model and practice skills such as initiation, responding to comments, and answering questions in conversation. One recommended program described in a study conducted in the United States involves a 6-week, 90-minute-per-week program in which skills are trained in a highly structured manner. Sessions include 10 minutes of open conversation, 20 minutes of a new lesson in which a skill is discussed and modeled, 5 minutes of comprehension check, 20 minutes of rehearsal and application, 15 minutes of a game that incorporates the skills, and 20 minutes of snack and homework assignment. Posttreatment measures of group participants indicated an increase in participants’ responses to comments and questions in conversation and improved mindfulness to turn taking in conversation. Researchers noted that findings cannot be generalized due to the descriptive nature of the study and the small sample size.

In a study conducted in the United Kingdom involving 31 children with diagnoses of either HFA or AD aged 6-11 years, researchers found LEGO therapy and the Social Use of Language Programme (SULP) to be effective in improving autism-specific social interaction scores on the Gilliam Autism Rating Scale. Maladaptive behavior decreased in experimental group compared to control group, and social communication improved. In LEGO therapy, children work together using verbal and nonverbal communication to build a LEGO set. Children use joint problem solving and joint attention to complete task. SULP uses a clear curriculum and direct hierarchical learning system to teach social skills. For example, SULP uses stories about monsters that experience different social issues, adult modeling, child practice, and games in a group setting. The study found both these programs to be easy to implement in a social skills group. In the study, children were compared to a control group that did not receive any intervention. LEGO therapy was more helpful concerning the maladaptive behavior domain, and the SULP was more helpful in the communication and socialization domains. Weaknesses of the study included lack of subject randomization and researcher bias.

In a study conducted in the United Kingdom, a group of 46 high-functioning children with ASD were divided into 6 intervention groups that met for 12-16 weeks for at least 1½ hour a week to work on social interaction and understanding. Follow-up exercises were given. Results indicated significant improvement in social communication. The study found that longer programs lead to better results. Follow-up interviews and postassessments showed significant gains in all posttherapy measures. Limitations of the study included a lack of a control group. Limitations of social skills group studies in general are that they are based on small sample sizes.

In a research study conducted in the United States, researchers analyzed improvement in 16 children with ASDs under the age of 9 who participated in the Relationship Development Intervention (RDI) program during the period 2000-2006. RDI addresses cognitive, perceptual, and emotional difficulties. RDI is a program in which parents attend 6 days of intensive workshops on the theory and principles of RDI, then weekly consultation and biweekly consultation with an RDI consultant. Parents learn how to scaffold opportunities for child to think flexibly and respond to problems and unpredictable settings. Treatment lasted on average 16 months. The program led to improvement in terms of flexibility of thoughts and educational placement. Weaknesses of the study included the lack of a control group, age and IQ constraints of participants, and parent self-selection.

For additional information on social skills training for children with ASD, see Clinical Review... Social Skills Intervention: Children with Autism Spectrum Disorder.

Emotions, empathy, and ToM: Individuals with AD demonstrate an impaired ability to recognize and identify envy and gloating, which may lead to difficulty understanding social faux pas. These skills (the ability to identify the above emotions) can be taught directly in social skills groups, individual therapy, or via computer programs. Treatment interventions should focus on improving perception of emotions by training children and adolescents with AD to attend to facial and vocal tone cues to decode emotion. The ability to decode emotion is closely related to social competence.

It is often necessary to directly teach children and adolescents with AD about ToM, which entails understanding things from someone else’s perspective as well as recognizing the beliefs, thoughts, and ideas of others. Social skills training...
in a group format, computer programs, and direct teaching manuals have been shown to improve ability to perform ToM
tasks.\(^{21}\) Computer programs can be used to teach about facial expressions and body language.\(^{21}\)

In a pilot study conducted in the United States analyzing the use of assistive technology to teach emotion recognition to
students with AD, researchers found that “mind reading” software was effective. Two girls and 6 boys aged 8-11 years
were involved in the study. All subjects were tested pretreatment in their ability to recognize 15 emotional concepts from
facial expression: happy, sad, angry, afraid, disgusted, surprised, loving, embarrassed, undecided, unfriendly, bothered,
nervous, disappointed, amused, and jealous. Following testing, the subjects were all exposed to software that included an
emotions library, a learning center, and a game zone. The subjects received various incentives and rewards throughout the
lessons. Results of the study indicated that the software used in the study can teach emotional recognition to individuals
with AD. The software helped improve recognition of basic and complex emotions. Limitations of the study included the
small sample size and the lack of a control group.\(^{55}\)

- Written language
  - Adolescents with AD often produce writing that is brief and less complex than their peers. Writing skills often affect
    academic performance and later job performance, and thus teaching these skills to adolescents with AD is important.
    In an experimental research study conducted in the United States, researchers analyzed the effects of an intervention
    program that consisted of teaching self-monitoring skills, making a video of the subject explaining the target skill and
demonstrating this skill, and then the subject watching his video. At the end of each intervention session, the subject was
    asked to write a persuasive essay, and the length and content of the writing sample was analyzed. The study found that
    video self-modeling was an effective method to increase length of written samples (number of words in each essay) as
    well as to increase the number of functional essay elements included in the sample. Limitations of this study included the
    small sample size (N = 3, male adolescents) and the study’s reliance on production-type measures.\(^ {56}\)

- Classroom/learning
  - Impairment of social skills can influence success in the classroom. For example, reduced eye contact can be interpreted
    as disrespect. Therefore, it is imperative to educate teachers and staff regarding the child’s impairments and involve them
    actively in treatment planning.\(^ {57}\)

- Support to caregivers
  - Provide support to parents and develop training for caregivers of children with AD.\(^{58}\) Parents are often concerned about
    adulthood for their child with AD, mental health concerns, victimization of their child, skills deficits of the child, and lack
    of resources to help their child. Parents may need counseling and guidance to address their worries about their child never
    becoming independent. Healthcare providers such as SLPs and others should address the concerns of the parents or make
    appropriate referrals.\(^{58}\)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Goal</th>
<th>Intervention</th>
<th>Expected Progression</th>
<th>Home Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social skills problems: Difficulty initiating and maintaining conversations, greeting, accepting suggestions, handling criticism</td>
<td>Improve ability to: Greet others, initiate and maintain conversation, stay on topic, maintain eye contact, end conversations, accept suggestions, handle criticism, show empathy, and resolve conflict</td>
<td><strong>Social skills training</strong>&lt;br&gt;• Role-playing&lt;br&gt;• Friendship groups&lt;br&gt;• Individual or dyadic direct therapy&lt;br&gt;• Modeling&lt;br&gt;• Social stories&lt;br&gt;• Practicing with peers/constructive feedback</td>
<td>Progression through specific social skills training tasks will vary according the individual’s needs and response to therapy activities</td>
<td>Review and practice skills taught in therapy&lt;br&gt;Patient will incorporate communication skill practice into the home environment</td>
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<tr>
<td>Poor functional conversation skills</td>
<td>Improve conversation skills</td>
<td><strong>Social skills training</strong>&lt;br&gt;• Social skills groups use a direct teaching approach; teach and model targeted skills&lt;br&gt;• Goals based on known difficulties or teacher/parent observation of difficulties&lt;br&gt;• Groups follow structured schedule of teaching, modeling, guided practice, and role-playing&lt;br&gt;• Skills include initiating conversation, responding to comments, answering questions in conversation</td>
<td>Progression through specific social skills training tasks will vary according the individual’s needs and response to therapy activities</td>
<td>Parents and caregivers can help patients practice and review tips for more successful interactions</td>
</tr>
<tr>
<td>Reduced ToM, reduced empathy</td>
<td>Improve ability to empathize with others and to understand contextual cues</td>
<td><strong>Computer programs</strong></td>
<td>Computer programs and direct teaching manuals will guide the progression of therapy tasks based on the individual’s success with each specific task and the individual’s overall goals</td>
<td>Parents/caregivers/family will review material taught and practiced during therapy</td>
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<tr>
<td>Obsessions with special interests</td>
<td>Reduce obsession with special interest</td>
<td><strong>Patient/family education</strong></td>
<td>Progression of therapeutic tasks will vary according to individual’s needs and goals</td>
<td>Parents/caregivers/family will incorporate strategies into home-based tasks as needed</td>
</tr>
<tr>
<td>Reduced self-awareness leading to poor conversational skills</td>
<td>Improve eye contact, smiling, nonverbal communication in conversations</td>
<td><strong>Social skills training</strong></td>
<td>Progression of social skills training tasks will vary according to individual needs with respect to conversation skills in the areas of smiling, eye contact, and initiations</td>
<td>Parents/caregivers/family will provide feedback and positive reinforcement to help patient improve in nonverbal communication</td>
</tr>
</tbody>
</table>
| Difficulty with social thinking (e.g., perspective taking, expressing opinions appropriately) | Improve social thinking and social skills | **Social thinking curriculum** *(51)*  
- Children are taught about social thinking *(51)*  
- Instructors explain why we use certain social skills, what the behaviors mean and how they influence interactions and the way people are seen. *(51)*  
- Not a behavioral model; no rewards or punishments are administered *(51)*  
- Lessons include: Looking = thinking, whole body listening, knowledge and opinion (what to keep in and what to express to others) *(51)* | Progression of specific tasks within a social thinking curriculum will vary according to the individual’s specific needs and goals | Parents/caregivers/family members will provide feedback at home to help patient become more self-aware |
Impairments in written language performance

Increase in number of words written in assignments and inclusion of functional essay elements

Self-monitoring activities
- Students are taught self-monitoring strategies to make sure their essays are long enough and incorporate key essay elements(56)
- Students make movies about their self-monitoring strategies in which they talk aloud and explain (to themselves) how to monitor the number of words written, how to use a bar graph, and determining if their goals are met(56)
- Video self-modeling: a student watches himself/herself performing a target skill accurately(56)
- During intervention sessions, students first watch their own self-monitoring videos, and then practice the trained behaviors(56)
- After students demonstrate 10% increase in words written for 3 consecutive sessions, they move onto second skills (key essay components)(56)

Students will be expected to write for longer periods of time and to write more words in persuasive and expository essays; exact progression varies according to individual needs and goals(56)

None mentioned

Desired Outcomes/Outcome Measures

Desired outcomes
- Improved social skills
  - The Social Language Development Test
- Improved adaptive and social problem-solving skills
- Improved ability to make and maintain friendships
- Improved ability to understand complex language
  - TOAL-4
  - Test of Narrative Language
- Improved fluency, vocal pitch, affect, and intonation patterns
  - PEPS-C
• Improved quality of life

**Maintenance or Prevention**
› There is no cure or prevention for AD. Education, support, and intervention can ensure that an individual with AD will have good quality of life

**Patient Education**
› Information on ASD and AD is available for parents and patients at http://www.autism-help.org/

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