

# Pervasive Developmental Disorder: Asperger Syndrome

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**Synonyms and related keywords:** Asperger syndrome, Asperger disorder, autistic psychopathy, high-functioning autism, HFA, hyperlexia, [nonverbal learning disorder](#), NLD, personality disorder—not otherwise specified, pervasive developmental disorder—not otherwise specified, PDD-NOS, pragmatic language disorder, right hemisphere dysfunction, schizoid personality, semantic pragmatic disorder, sensory integration disorder, persistent impairment in social interactions, repetitive behavior patterns, restricted interests, pedantic speech, early childhood motor delays, clumsiness, [fine motor difficulty](#), gait anomalies, odd movements, social insensitivity, severe social impairment, [depression](#), [mood disorders](#), [obsessive-compulsive disorder](#), [Tourette disorder](#), socially inappropriate behavior, abnormalities in speech, abnormalities in language, oddities in pitch, abnormalities in intonation, abnormalities in prosody, abnormalities in rhythm, [selective mutism](#), lax joints, anomalies of locomotion, anomalies of balance, anomalies of manual dexterity, anomalies of handwriting, anomalies of rapid movements, anomalies of rhythm, anomalies of imitation of movements, impaired ball-playing skills, doll-play paradigm, miscomprehension of language nuance, inability to use language in social contexts, lack of sensitivity about interrupting others, irrelevant commentary, absent facial expressions, inappropriate facial expressions, peer relation difficulties

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Author: **James Robert Brasic, MD, MPH**, Adjunct Assistant Professor, Department of Psychiatry, New York University School of Medicine; Fellow in Nuclear Medicine, Russell H Morgan Department of Radiology and Radiological Science, [Johns Hopkins University School of Medicine](#)

James Robert Brasic, MD, MPH, is a member of the following medical societies: [American Academy of Child and Adolescent Psychiatry](#), [American Academy of Neurology](#), and [Movement Disorders Society](#)

Editor(s): **Carol Diane Berkowitz, MD**, Executive Vice Chair, Professor, Department of Pediatrics, Harbor-University of California at Los Angeles Medical Center; **Mary L Windle, PharmD**, Adjunct Assistant Professor, University of Nebraska Medical Center College of Pharmacy, Pharmacy Editor, eMedicine.com, Inc; **Caroly Pataki, MD**, Associate Program Director, Clinical Associate Professor, Department of Psychiatry and Biobehavioral Sciences, Division of Child and Adolescent Psychiatry, Neuropsychiatric Institute and Hospital, UCLA; **Carrie Sylvester, MD, MPH**, Director of Education in Child and Adolescent Psychiatry, Professor, Departments of Psychiatry and Pediatrics, Northwestern University Medical School; and **Murray M Kappelman, MD**, Professor, Departments of Pediatrics and Psychiatry, University of Maryland School of Medicine

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## INTRODUCTION

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**Background:** Asperger disorder is a form of pervasive developmental disorder characterized by severe persistent impairment in social interactions, repetitive behavior patterns, and restricted interests. Unlike an autistic disorder, no significant delay occurs in language development or cognitive development. Asperger disorder is generally evident in children older than 3 years and primarily occurs in boys.

Children with this disorder often exhibit a limited capacity for empathy, a failure to develop friendships, and a limited number of intense and highly focused interests. While people with Asperger disorder may have certain communication problems, including poor nonverbal communication and pedantic speech, many individuals have good cognitive and verbal skills. Physical symptoms may include early childhood motor delays, clumsiness, fine motor difficulty, gait anomalies, and odd movements.

Individuals with Asperger disorder have normal or even superior intelligence, and they may make great intellectual contributions, while demonstrating social insensitivity or even apparent indifference toward loved ones. Published case reports of men with Asperger disorder suggest an association with the capacity to accomplish cutting-edge research in computer science, mathematics, and physics. While the deficits manifested by those with Asperger disorder are often debilitating, many individuals experience positive outcomes, especially those who excel in areas not dependent on social interaction. Persons with Asperger disorder have exhibited outstanding skills in mathematics, music, and computer sciences. Many are highly creative, and many prominent individuals demonstrate traits suggesting Asperger syndrome. As an example, biographers describe Albert Einstein as a person with highly developed mathematical skills who was unaware of social norms and insensitive to the emotional needs of family and friends.

Although normal language and cognitive development differentiate Asperger disorder from other developmental disorders, the severe social impairment associated with this condition overlaps disorders such as high-functioning autism (HFA). For clinical management purposes, Asperger disorder and HFA may be considered together. Impaired social skills are associated with several other conditions (eg, developmental learning disability of the right hemisphere, nonverbal learning disability, schizoid personality disorder, semantic-pragmatic processing disorder, social-emotional learning disabilities).

For further information about conditions characterized by social impairments, restricted interests, and mental retardation, see [Pervasive Developmental Disorder: Autism](#).

**Pathophysiology:** The pathophysiology of Asperger disorder is unknown.

Some individuals with Asperger disorder have a history of problems in the prenatal and neonatal periods and during delivery. The relationship between obstetric complications and Asperger disorder is unclear. Events in early development may play a role in the pathogenesis of Asperger disorder.

Neuroimaging of individuals with Asperger disorder and related conditions is described in [PET Scanning in Autism Spectrum Disorders](#), an article that also includes hypotheses about the possible pathophysiology of Asperger disorder.

#### Frequency:

- **In the US:** Because of the divergent diagnostic criteria used in the United States and Canada, estimates of Asperger disorder frequency vary widely. Various studies indicate rates ranging from 1 case in 250-10,000 children. Additional epidemiologic studies are needed, using widely accepted criteria and a screening instrument that targets these criteria.
- **Internationally:** A population study in Sweden estimates the prevalence of Asperger disorder as 1 case in 300 children. While this estimate is convincing for Sweden, the findings may not apply elsewhere because they are based on a homogeneous population. Extrapolating from this study, Asperger disorder may be more common than clinicians once thought; pediatricians, family physicians, general practitioners, and other health professionals may underdiagnose this disorder.

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**Mortality/Morbidity:** Individuals with Asperger disorder appear to have normal lifespans, but they seem to endure an increased prevalence of comorbid psychiatric maladies (eg, depression, mood disorders, obsessive-compulsive disorder, Tourette disorder).

**Race:** Asperger disorder has no racial predilection.

**Sex:** The estimated male-to-female ratio is approximately 4:1.

**Age:** Asperger disorder is commonly diagnosed in the early school years and less frequently during early childhood or even adulthood.

## CLINICAL

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### History:

- Developmental history
  - Interview parents about prenatal history and maternal health factors that may have affected the pregnancy.
  - Include a thorough evaluation of social behaviors, language, interests, routines, physical coordination, and sensory sensitivity, starting from birth.
- Social problems
  - Children with Asperger disorder may have difficulties with peer relations and may be rejected by other children.
  - Outside the realm of immediate family members, the affected child may exhibit inappropriate attempts to initiate social interaction and to make friends. Within the immediate family, the child is often loving and affectionate.
  - Alternatively, an affected child may not display affection to parents or other family members. A lack of bonding and warmth with parents and other guardians may seem apparent, typically resulting from the child's lack of social skills.
  - Separations from parents because of work and divorce may be particularly stressful for these children. Changing homes, communities, and neighborhoods may also exacerbate symptoms.
  - Individuals with Asperger disorder may have particular difficulty in dating and marriage. Boys and men with Asperger disorder may decide to marry suddenly without the dating and courtship that typically precede a union. Individuals with Asperger disorder may want to marry despite the lack of awareness of the many social interactions that usually lead up to matrimony. For example, in the movie *Roger Dodger*, an inexperienced youth with traits suggesting Asperger disorder encounters difficulty in relations with women (Chaisson and Kidd, 2002). Such problems may continue into adulthood.

Case vignette: A 50-year-old surgeon, who is an accomplished amateur musician with a PhD in mathematics and who has traits consistent with Asperger disorder, decides that it is time to marry and have children. He has always lived at home with his parents. Because he has trouble establishing relationships with women in his ethnic group locally, he goes overseas to marry a cousin less than half his age. He leaves his parents home for the first time to rent an apartment with his wife. They have no sexual relationship. She finds no career for herself in her new country, so she requests a divorce. Immediately after the divorce the patient wants to marry another

woman. He complains that he is unable to find a suitable woman in his ethnic group.

- People with Asperger disorder may benefit from counseling and social skills training. Attwood (1998) provides exercises for parents to use to foster social skills in their children. These activities can be modified for the needs of adults with Asperger disorder. Psychotherapy is often helpful for individuals to recognize their deficits in social skills.
- People with Asperger disorder are vulnerable to depression, even suicide, after a perceived rejection in a social situation such as dating and marriage. Clinicians must be aware of the risk of depression and institute prompt interventions when major depression occurs.
- Socially inappropriate behavior and failure to understand social cues may be reported.
- The child may not understand why people become upset when he or she breaks social rules.
- Communication abnormalities
  - Use of gestures is frequently limited.
  - Body language or nonverbal communication may be awkward and inappropriate.
  - Facial expressions may be absent or inappropriate.
- Speech and hearing
  - Affected children demonstrate several abnormalities in speech and language, including pedantic speech and oddities in pitch, intonation, prosody, and rhythm.
  - Miscomprehension of language nuance (eg, literal interpretations of figures of speech) is common.
  - Individuals often exhibit practical speech problems, including inability to use language in social contexts, lack of sensitivity about interrupting others, and irrelevant commentary.
  - Speech may be unusually formal or used in idiosyncratic ways that others do not understand.
  - Individuals may vocalize their thoughts without censoring. Personal remarks inappropriate to most social environments may be uttered routinely.
  - The amount of speech may also vary greatly and reflect the individual's current emotional state more than the communication requirements of the social setting. Some individuals may be verbose and others taciturn. Furthermore, the same individual may demonstrate excesses and paucity of speech intermittently.
  - Some individuals may display selective mutism, speaking not at all to most people and excessively to specific people. Some may choose to talk only to people they like. Thus, speech may reflect idiosyncratic interests and preferences of the individual.
  - The form of language chosen may include metaphors meaningful only to the speaker. The message meant by the speaker may not be understood by those who hear it, or the message may be meaningful only to a few people who understand the private language of the speaker.
  - Children often exhibit auditory discrimination and distortion, particularly when the child encounters 2 or more people speaking simultaneously.
- Activities

- Children exhibit peculiar and narrow interests, excluding other activities.
- These interests may be so important that the children do not develop typical relationships with their family, school, and community.
- Sensory sensitivity
  - Children may show sensitivity to sound, touch, taste, sight, smell, pain, and temperature. For example, a child may demonstrate either extreme or diminished sensitivity to pain.
  - Children may be particularly sensitive to the texture of foods.
  - Children may exhibit synesthesia, including a sensory response to an environmental stimulus in a different sensory modality.

## **Physical:**

### **Screening for a theory of mind**

Key features of the deficit manifested in people with Asperger syndrome pertain to their inability to understand the thoughts of other people and themselves. A typical child can recognize the thoughts of other children and himself or herself and hypothesize how other people are likely to respond to life occurrences. The lack of this comprehension in a person with Asperger syndrome is termed a deficiency in the formation of a theory of the mind.

A theory of the mind can be thought of as a form of intuition in which young children learn how other children respond to common situations. Children usually develop the skill to predict other children's responses to common occurrences before they begin school. Some people with Asperger syndrome appear never to develop a theory of mind.

Because most children have the ability to understand the mental processes of themselves and others since early childhood, pediatricians and other clinicians need to recognize that children with Asperger syndrome often lack abilities to intuit the thoughts of others and themselves. Pediatricians and other clinicians may be shocked to recognize that otherwise intelligent children with Asperger syndrome lack simple mental abilities to grasp situations that appear obvious to even typical preschool children. Therefore, screening for a theory of mind is an important process a pediatrician can use to identify some of the core behavioral symptoms of Asperger syndrome.

Clinicians can screen for a theory of mind in a few minutes in offices, homes, and other everyday settings with minimal props. Screening for a theory of mind involves a doll-play paradigm and an imagination task.

The two components of the doll-play paradigm constitute a fundamental procedure to demonstrate the presence of a theory of mind. The clinician and the patient are seated at opposite ends of a table. The clinician shows the patient two dolls and names them by saying, "This is Sally. This is Anne" (Baron-Cohen, 1985).

For the first procedure in the doll-play paradigm, the clinician tells and shows Sally placing a marble in a basket. The clinician then removes Sally from the room and closes the door, leaving her outside. The clinician then tells and shows Anne removing the marble from the basket and placing it in a box. The clinician then brings Sally back into the room. The clinician asks the patient, "Where will Sally look for the marble?" (Baron-Cohen, 1985)

Typical children, adolescents, and adults with a theory of mind will indicate that Sally will look for the marble in the basket where she placed it before leaving the room. If this response is elicited, the child passes the doll-play paradigm, and the subsequent sections and the clinician may then proceed to the imagination task.

If the patient does not indicate that Sally will look for the marble in the basket where she placed it before leaving the room, the clinician proceeds with questions to clarify the patient's understanding of the situation. The clinician asks the patient, "Where is the marble really?"

(Baron-Cohen, 1985) Both typical and atypical children, adolescents, and adults will usually state that the marble is in the box. The clinician then asks the patient, "Where was the marble in the beginning?" (Baron-Cohen, 1985) Both typical and atypical children, adolescents, and adults will usually state that the marble was originally in the basket.

The first procedure of the doll-play paradigm identifies the absence of a theory of mind when an affected child, adolescent, or adult indicates that Sally will look for the marble in the box. The patient thereby indicates an assumption that Sally, like the patient, will look for the marble in the box because the patient knows that the marble is in the box. The ability to recognize that Sally, unlike the patient, was absent and does not know that the marble was moved from the basket into the box is an example of a theory of mind of Sally as distinct from that of the patient.

For the second procedure of the doll-play paradigm, the clinician tells and shows Sally placing a marble in a basket. The clinician then removes Sally from the room and closes the door, leaving Sally outside. The clinician then tells and shows Anne removing the marble from the basket and placing it in the clinician's pocket. The clinician then brings Sally back into the room. The clinician then asks the patient, "Where will Sally look for the marble?" (Baron-Cohen, 1985)

Typical children, adolescents, and adults with a theory of mind will respond that Sally will look in the basket because Sally last placed it in the basket. If this response is elicited, then the patient passes the doll play paradigm so the clinician may proceed to the imagination task. Otherwise, the clinician then asks the patient, "Where is the marble really?" (Baron-Cohen, 1985)

Both typical and atypical children, adolescents, and adults respond that the marble is in the clinician's pocket. The clinician next asks the patient, "Where was the marble in the beginning?" (Baron-Cohen, 1985) Both typical and atypical children, adolescents, and adults respond that the marble was in the basket originally.

As for the first step in the doll-play paradigm, an absence of a theory of mind is identified when an affected child, adolescent, or adult indicates that Sally will look for the marble in the clinician's pocket. Affected children, adolescents, and adults repeatedly incorrectly think that Sally will know the location of the marble because they do. Affected individuals do not recognize that Sally's understanding of the placement of the marble is different from theirs because she was absent when it was moved. This is evidence of deficits in the ability to formulate a theory of mind in the affected person.

The final activity in the screen for a theory of mind is the imagination task. In this procedure, the clinician tells the patient, "Now, I want you to close your eyes and think about a big white teddy bear. Make a picture in your head of a big white teddy bear. Can you see the white teddy?" (Baron-Cohen, *Psychiatric Clin North Am*, 1991) Typical children, adolescents, and adults report the visualization of a big white teddy bear. If the patient does not report the image of a big white teddy bear, then the clinician asks, "What can you see when you close your eyes?" (Baron-Cohen, *Psychiatric Clin North Am*, 1991) If the patient reports any mental image, then the clinician asks, "What are you thinking of?" (Baron-Cohen, *Psychiatric Clin North Am*, 1991) Typical children, adolescents, and adults readily report the visualization of a big white teddy bear with these stimuli.

The next activity of the imagination task is a repetition of the first part with the substitution of a big red balloon for the white teddy bear. Typical children, adolescents, and adults readily report the visualization of a big red balloon.

For the final activity of the imagination task, the clinician asks the patient to identify the first picture of the task. Typical children, adolescents, and adults readily report that they first imagined a big white teddy bear. The ability to remember an earlier mental image is evidence of a theory of mind. The inability to recognize one's own prior mental images suggests the lack of a theory of mind; therefore, the report that a big red balloon was first item imagined is evidence of the absence of a theory of mind.

Typical children show evidence of having a theory of the mind before beginning school. Thus, inability to correctly perform any of the theory of mind screening procedures in a school-aged child suggests the need to refer the child for additional evaluation.

## Physical findings

Typical physical findings in children with Asperger syndrome include the following:

- Lax joints are often observed (eg, an immature or unusual grasp for handwriting and other fine hand movements).
- Clumsiness is common.
- Affected children may exhibit anomalies of locomotion, balance, manual dexterity, handwriting, rapid movements, rhythm, and imitation of movements.
- Individuals exhibit impaired ball-playing skills.

**Causes:** Although its etiology is unknown, Asperger disorder is a behavioral syndrome caused by one or more factors acting on the CNS. Reports of families with multiple members meeting the criteria for this disorder indicate a genetic contribution to development of the disorder. Asperger disorder and autistic disorder may or may not be related genetically.

### DIFFERENTIALS

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### Other Problems to be Considered:

Basic phonological processing disorder

Callosal dysgenesis

Catatonia

Cerebellar dysfunction

Dyslexia

Fahr syndrome

Hyperlexia

Interventricular hemorrhage

Leukodystrophy

Multiple sclerosis

Nonverbal learning disability

Personality disorder

Pragmatic language disorder

Right cerebral hemisphere damage or dysfunction

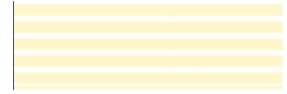
Schizoid personality

Semantic-pragmatic processing disorder

Sensory integration disorder

Substance abuse

Toxicant-induced encephalopathy



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### Imaging Studies:

- Computed tomography
  - CT scanning cannot be used either to diagnose or rule out Asperger disorder because no consistent findings are evident in people with this condition. Rather, CT can aid by excluding treatable conditions in the differential diagnosis such as neurological and neurosurgical disorders (eg, tumors).
  - Head analysis inconsistently demonstrates enlargement of the third ventricle and diminution of the caudate nucleus.
- Magnetic Resonance Imaging
  - MRI can uncover a variety of deficits, but results are inconsistent.
  - MRI helps demonstrate cortical defects in the right-central perisylvian area and incomplete formation of the posterior-inferior frontal gyrus (ie, pars opercularis, pars triangularis).
  - MRI demonstrates the following:
    - Inferior precentral gyrus and the anterior portion of the superior temporal gyrus, resulting in a widening of the sylvian fissure and a partial exposure of the insular cortex
    - Hypoplasia of the right temporo-occipital cortex
    - Small gyri of the posterior parietal lobes
    - Enlargement of the right lateral ventricle
    - Diminished size of the midbrain and medulla oblongata
- Positron emission tomography
  - Positron emission tomography (PET) scanning reveals multiple deficits in some individuals.
  - With F-18 2-deoxyglucose, the anterior rectal gyrus of some people with Asperger disorder is larger on the left than on the right, opposite the asymmetry seen in most people.
  - Other patients exhibit an increased glucose metabolic rate in the right posterior calcarine cortex and a decreased glucose metabolic rate in the left posterior putamen and left medial thalamus.
  - For more information on imaging studies, see [PET Scanning in Autism Spectrum Disorders](#).

### Other Tests:

- Audiography is indicated to rule out auditory discrimination deficits.

## TREATMENT

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### Consultations:

- Consult a neurologist for examination and neuropsychology testing.
  - Neuropsychological assessments should focus on both simple and complex problem-solving tasks, using



such tests and scales as the Wisconsin Card Sorting Test, the Trail-Making Test, and the Stanford-Binet Scale. Such diagnostic measures can demonstrate marked deficits in verbal and nonverbal functioning and intelligence level.

- Neuropsychological assessment is likely to demonstrate frontal system dysfunction.
- Consult with an otolaryngologist, audiologist, and speech pathologist to exclude treatable auditory and vocal system anomalies. Speech testing helps assess children with developmental disabilities, and speech therapy is often helpful.
- Consult with physical and occupational therapists because therapy often improves the handwriting and other fine motor activities of patients with lax joints and unusual grasps. Sensory integration therapy reportedly helps some individuals.

#### Activity:

- Observe patients walking and running. Adult patients may model appropriate motions to improve the coordination of their upper and lower extremities.
- Helping patients learn to catch and throw balls proficiently can facilitate their ability to participate in team sports and thereby enhance their social skills.
- Wearing sunglasses and avoiding intense light may help children with Asperger disorder who exhibit photosensitivity.
- Remedial exercises may improve handwriting. Alternatively, use of assisted technology (eg, laptop computer) often helps.
- Using earplugs may also help children who exhibit extreme intolerance or sensitivity to sound.

## MEDICATION

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Many pharmacologic agents (eg, antipsychotics, selective serotonin reuptake inhibitors [SSRIs], clonidine, naltrexone) have been tried to improve some of the symptoms associated with Asperger disorder and related conditions; these symptoms include stereotyped movements, self-injury, hyperactivity, and aggression. Recent studies suggest SSRIs help treat repetitive behaviors, impulsivity, irritability, and aggression. Controlled clinical trials, based on well-diagnosed populations, are needed to confirm the impressions that SSRIs and atypical neuroleptics may alleviate core symptoms of Asperger syndrome and related conditions.

No drugs are used routinely to treat Asperger syndrome. Pharmacologic interventions are used to treat comorbid disorders, including attention problems, mood disorders, dysthymia, bipolar disorder, and obsessive-compulsive disorder.

## FOLLOW-UP

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#### Complications:

- Depression and hypomania are common among adolescents and adults with Asperger disorder, particularly those with a family history of these conditions. An increased risk of suicide exists, with risks possibly rising in proportion to the number and severity of comorbid maladies. Asperger disorder is probably undiagnosed in many suicide cases because of (1) the dearth of awareness of the condition's existence and (2) the ineffective and unreliable tools used to identify it. Therefore, people with Asperger disorder who commit suicide are probably reported as having other or undiagnosed psychiatric problems. In cases of unexpected suicide, Asperger disorder is a strong possibility.
- People with Asperger disorder can have other neuropsychiatric disorders, including Tourette disorder, anorexia nervosa, and schizophrenia; treating such comorbid disorders may be beneficial.
- Patients may lose employment because their impaired comprehension of social norms may lead to poor

judgment in work site behavior (eg, speaking inappropriately to colleagues, bosses, or administrators).

- Changes to a child's environment may exacerbate symptoms. Therefore, minimize separations if the child is fond of family members, teachers, and others.

### **Prognosis:**

- Comorbid psychiatric disorders, when present, significantly affect the patient's prognosis.
- Individuals tend to have a better prognosis when they have supportive families who are knowledgeable about Asperger disorder.
- Individuals with Asperger disorder may be taught specific social guidelines, but the underlying social impairment is believed to be lifelong.

### **Patient Education:**

- Individuals with Asperger disorder can often concentrate on activities for hours without interruption and can continue this concentration daily for years. With proper instruction, their talents can be developed enormously, so identifying and nurturing their interests and abilities (eg, music, mathematics) at an early age is beneficial. While many children might refuse to practice a musical instrument for even a few minutes a day, a child with Asperger disorder may enjoy hours of daily practice. Skilled instruction is necessary to develop these talents fully. Parents and teachers should creatively uncover skills, abilities, and talents; these talents may also help the child earn respect from classmates.
- Social behaviors in school settings
  - Teachers have many opportunities to help children develop appropriate social behaviors.
  - Children can learn to watch other children for social cues and for behaviors to imitate.
  - Teachers can model socially appropriate behavior and encourage cooperative games in the classroom.
  - Teachers can explain appropriate means of seeking help when the child demonstrates problematic social behaviors in the classroom.
  - Teachers may identify suitable friends for children and encourage prospective friendships.
  - Teachers may help children in challenging social situations by supervising breaks between classes and lunchroom and playground activities.
  - Children may benefit from a full-time, trained, 1-on-1 teacher aide to shadow them in the classroom and to coach appropriate behavior.
  - Because changes in schools, classrooms, and teachers may exacerbate symptoms, attempt to minimize alterations to the patient's schedule and educational environment.
- Children, adolescents, and adults with Asperger disorder typically benefit from a weekly, therapist-guided, social skills group with peers.
- Auditory integration training helps some children with social interactions.
- Interaction with other children
  - Children may benefit from an organized club, chaperoned by adult leaders who provide advance preparation and a discussion forum.
  - Parents can help children learn appropriate play by modeling and rehearsing such skills as flexibility, cooperation, and sharing.
  - Parents should encourage an affected child to invite a friend to their home.
- Communication and language strategies
  - Children can be taught to memorize phrases for specific purposes (eg, to open conversations).

- Children can learn to seek clarification by asking people to rephrase confusing expressions. Encourage children to ask that confusing instructions be repeated, simplified, clarified, and written down.
  - Encourage children, when appropriate, to admit that they do not know an answer.
  - Caregivers, through modeling, can teach affected children how to interpret the conversational cues of others to reply, to interrupt, or to change topics.
  - Since interpretation of metaphors and figures of speech is often difficult, caregivers should explain these language subtleties when they arise.
  - Children can be taught to refrain from vocalizing every thought.
  - When communicating a series of instructions to a child with this disorder, pause between each separate statement.
  - Role-playing may help a child learn to understand the perspectives and thoughts of other people. Encourage the child to stop and think how another person will feel before the child acts and speaks.
  - Some children with Asperger disorder may have good visual thinking abilities; they may be encouraged to visualize using diagrams and visual analogues.
- Career counseling and orientation
    - Career choice is crucial for persons with Asperger disorder because social impairment limits their success in many occupations.
    - Career choices using technology, especially the Internet, are often particularly suitable for people with Asperger disorder. Computer science, engineering, and natural sciences are common career choices for individuals with this disorder. Other special interests may be developed into careers.
    - Individuals may need special help to prepare for job interviews and to maintain an appropriate demeanor in a work environment.

For excellent patient education resources, visit eMedicine's [Brain and Nervous System Center](#). Also, see eMedicine's patient education article [Asperger Syndrome](#).

## MISCELLANEOUS

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### Medical/Legal Pitfalls:

- Failure to consider comorbid movement disorders: Various rating scales, when used regularly, help identify and differentiate among various movement disorders. These rating scales include the following:
  - Movement Disorders Checklist (see Figures 7 and 8 in [Tardive Dyskinesia](#))
  - Hillside Akathisia Scale (see Figure 6 in [Tardive Dyskinesia](#))
  - Timed Stereotypies Rating Scale (see Figure 10 in [Tardive Dyskinesia](#))
- Prescription of drugs without indication: Regular administration of the Psychoactive Medication Quality Assurance Rating Survey (see Figure 5 in [Tardive Dyskinesia](#)) helps ascertain the need for psychoactive medication use.
- Failure to identify toxicity of medications: For example, regular administration of the Serotonin Syndrome Checklist (see Image 1 in [Pervasive Developmental Disorder: Autism](#)) helps identify early evidence of adverse effects of SSRIs.

### Special Concerns:

- Individuals with Asperger disorder (and related conditions), their families, teachers, and communities benefit from the experiences of other individuals with this disorder and from the experiences of their advocates. The following organizations provide information and advice to persons with Asperger disorder and related conditions:

- [Asperger Syndrome Coalition of the United States \(ASC-U. C.\), Inc.](#)  
PO Box 49267  
Jacksonville, FL 32240-9267  
Telephone: 904-745-6741  
Email: info@asc-us.org
  - [ASPEN®](#)  
Asperger Syndrome Education Network, Inc.  
9 Aspen Circle  
Edison, NJ 08820  
Telephone: 732-321-0880  
Email: info@aspennj.org
  - Asperger Norfolk  
Old Lion Cottage  
Thurne, Great Yarmouth  
NR29 3AP  
United Kingdom  
Telephone: 01 692 670 864
- Individuals with Asperger disorder and their families benefit from intensive assessments and treatment interventions. Contact the above resources for information about assessment and treatment facilities located near the patient.
  - Several other resources have been recorded in a recent manual for parents of young people with Asperger syndrome (Ozonoff, 2002). This excellent guide for lay people who encounter people with Asperger syndrome provides practical suggestions for day-to-day life.
  - The social deficits exhibited by many people with Asperger syndrome and related conditions remain major obstacles to their functioning in family, educational, occupational, and community settings. Research is needed to develop programs to train individuals in the nuances of social interaction.
  - The ability to communicate with groups with people can be developed. Toastmasters International, Inc. (www.toastmasters.org), is an organization of clubs to promote the communication and leadership skills of members. Some individuals with Asperger syndrome may develop special skills, such as interpretive reading and storytelling, by participation in the activities of Toastmasters. Toastmasters has local clubs around the world to help members become better speakers in public.

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