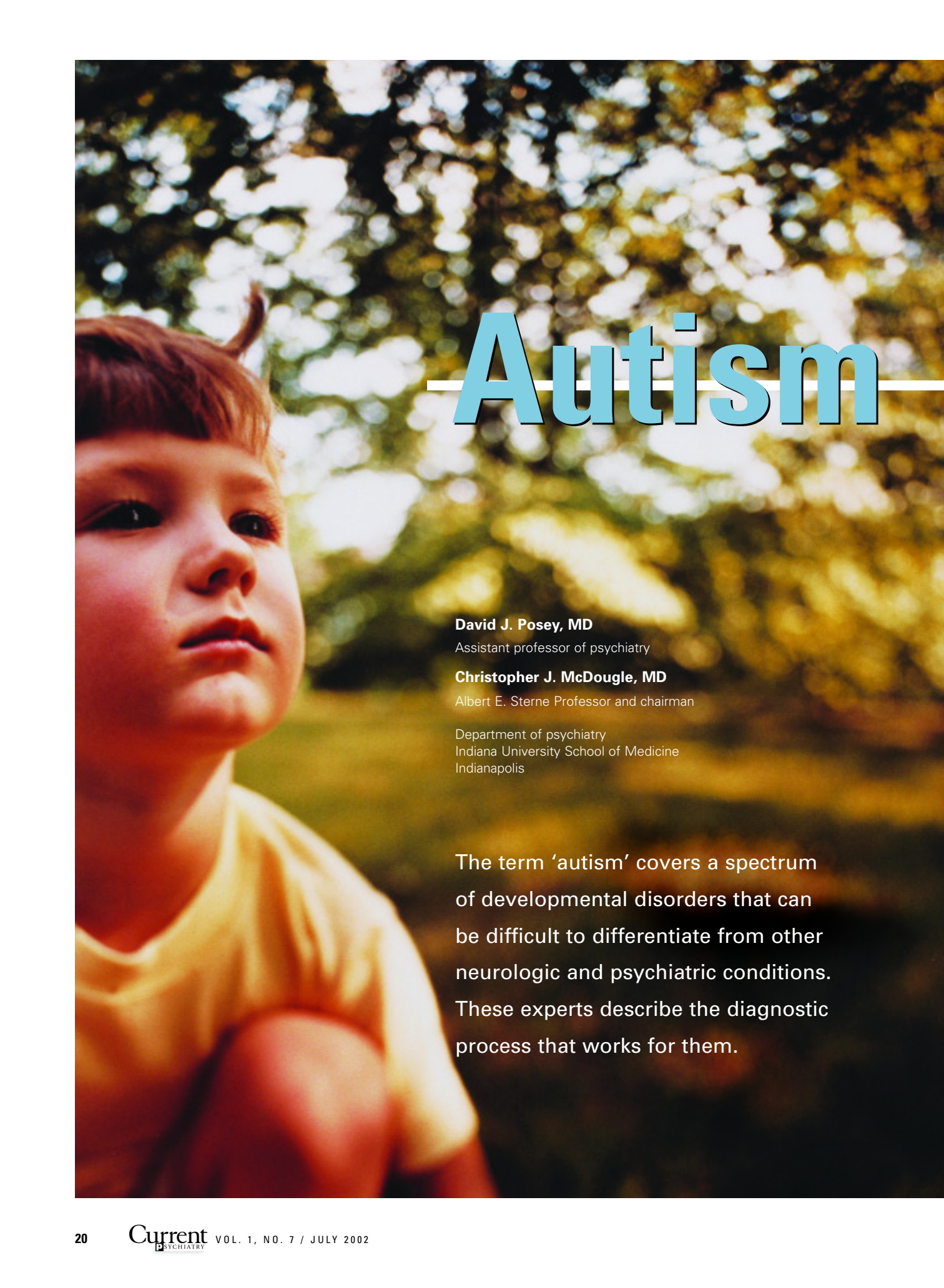




Autism

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The term 'autism' covers a spectrum of developmental disorders that can be difficult to differentiate from other neurologic and psychiatric conditions. These experts describe the diagnostic process that works for them.

A three-step practical approach to making the diagnosis

Autism and related pervasive developmental disorders (PDD) are increasingly being identified in children—and even in some adolescents and adults. As a result, psychiatry now recognizes that these debilitating disorders are more common than was once believed, with a prevalence as high as 1 in 250.

An accurate diagnosis can help families take advantage of the variety of treatments being offered and investigated for affected individuals (*Box*).¹ As psychiatrists who primarily see patients with autism and PDD, we recommend a three-step diagnostic approach that includes:

- a comprehensive initial assessment to rule out medical or neurologic illnesses that can mimic or are associated with autism
- differentiating PDDs from other psychiatric disorders with similar symptoms
- distinguishing among the five PDD subtypes described in DSM-IV.²

Step 1: Comprehensive initial assessment

Assessment for possible PDD begins with a comprehensive history and examination. Most patients will be assessed in childhood, but milder symptoms of autism or Asperger's disorder may go unrecognized initially and not be brought to a clinician's attention until adolescence or even adulthood.

As PDDs are childhood-onset disorders, the

logical approach emphasizes the developmental course and onset of symptoms. By definition, children with autism show evidence of the disorder by age 3. However, the diagnosis can often be made as early as age 18 to 24 months, when typically developing children exhibit a number of social and communicative milestones that are absent in autism.

History A thorough description of the mother's pregnancy, labor, and delivery (if known) can help you determine whether intrauterine or perinatal events could be related to the patient's presenting problem. These include infections and exposure to exogenous substances (e.g., alcohol) during the pregnancy, as well as complications during pregnancy and delivery (e.g., maternal bleeding, neonatal hypoxia).

A complete description of the child's development including major milestones (e.g., sitting without support, walking, first words) can help distinguish among certain diagnoses and estimate the extent of developmental delay. Ask the parents what first concerned them about their child's development, as children with autism most often present with delays in social or language milestones. Any developmental regression in acquired skills may implicate other neurologic processes and help distinguish among the subtypes of PDD. **Symptoms** Review the symptoms of autism at length in all patients in whom you suspect a PDD. It is important to assess these symptoms in

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Box

TREATMENT OPTIONS
FOR AUTISM AND OTHER PDDs

Optimal treatment for autism and related pervasive developmental disorders (PDDs) involves the collaboration of many disciplines.

- All school-aged children who are diagnosed with a PDD should be evaluated by the local school system to determine eligibility for special education. For those who are eligible, an individualized educational plan (IEP) is established to outline specific educational objectives and how they will be met. This IEP will often recommend speech therapy, occupational therapy, and social skills training.
- Children with the disability of autism are guaranteed an appropriate education. Advocates are often available to assist parents in ensuring that their child's educational needs are being met.
- Many families also make use of treatment offered outside the school, such as speech and occupational therapy. In addition, behavioral psychotherapy based on principles of applied behavioral analysis is often helpful. Certain specialty clinics offer social skills training and additional supports for families. Parent support groups can also be a crucial source of information and support (see "Related resources," page 28).
- Symptoms associated with autism such as aggression, irritability, hyperactivity, anxiety, and interfering repetitive phenomena may be reduced with appropriate psychopharmacologic treatment.² In general, treatment is aimed at these associated target symptoms because no single drug treatment has been consistently shown to improve the core social and communication impairments.

the context of the child's overall developmental level. For example, a child with known mental retardation should be compared with peers of similar age and cognitive impairment.

Approximately 75% of persons with autism are diagnosed with mental retardation. A review of intellectual abilities and level of adaptive functioning can suggest the degree of mental retardation. A detailed family history is important

because autism and other syndromes associated with mental retardation have varying degrees of heritability.

A thorough medical history, review of systems, and physical exam (with focus on the neurologic exam) can suggest the presence of medical conditions that could mimic or be associated with autism. The symptoms of autism are traditionally divided into three domains: social, communication, and repetitive behavior/narrow interests (*Table 1*):

- Social impairment includes problems with nonverbal behaviors such as eye contact, facial expressions, and "body language;" failure to develop peer relationships; lack of spontaneous seeking to share enjoyment, interests, or achievements with other people; and lack of social or emotional reciprocity.
- Communication impairment includes language delay, decreased communication with others, conversational impairment, echolalia, and lack of imaginative or social imitative play.
- Impairments in behavior, interests, and activity take the form of all-encompassing preoccupations, "need for sameness" and compulsive rituals, motor stereotypies, and preoccupation with parts of objects.

After the preliminary history and exam, you should have an initial impression as to whether a PDD may be present. Conditions that could mimic or co-exist with autism will then need to be evaluated (*Table 2*).

Hearing and vision testing Every child presenting with a language or cognitive delay should have an adequate hearing assessment, including an audiogram at the very least. If results are equivocal, then brainstem auditory-evoked responses are indicated to establish the auditory system's integrity. Vision screening should be completed, and the child should be referred to an ophthalmologist if a problem is suspected.

IQ testing A child with cognitive delays, learning problems, or suspected PDD should be referred to an experienced psychologist for intelligence testing. Public school systems often provide this service. Intelligence testing can document mental retardation and offer important information about the child's strengths and weaknesses in learning.

Speech and language assessment A speech and language pathologist should evaluate children with PDD and/or language problems for articulation, prosody, receptive and expressive language, and pragmatics.

Lab and genetic tests Laboratory investigation in a child

Table 1

THE THREE DOMAINS OF IMPAIRMENT IN AUTISM

Impairment in social interaction

- Marked impairment in nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
- Failure to develop peer relationships appropriate to developmental level
- Lack of spontaneous seeking to share enjoyment, interests, or achievements with other people
- Lack of social or emotional reciprocity

Impairment in communication

- Delay in, or total lack of, development of spoken language (not accompanied by an attempt to compensate through alternate modes of communication, such as gesture or mime)
- In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
- Stereotyped and repetitive use of language or idiosyncratic language
- Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

Restricted repetitive and stereotyped patterns of behavior, interests, and activities

- Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
- Apparent inflexible adherence to specific, nonfunctional routines or rituals
- Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
- Persistent preoccupation with parts of objects

Adapted from DSM-IV-TR, American Psychiatric Association, 2000

with cognitive delays should include routine blood chemistries, CBC, thyroid function tests, and lead level. Screen for fragile X syndrome, as its symptoms overlap those of autism, and for disorders of amino acid and organic acid metabolism. Finally, consider a chromosome karyotype, especially in patients with dysmorphic features on physical exam.

EEG Obtain a sleep-deprived electroencephalogram (EEG) in children with a history of significant language regression, episodic symptoms, or other indicators of possible seizures. Ideally, the EEG should include monitoring during sleep to help rule out acquired epileptic aphasia (Landau-Kleffner syndrome), a rare disorder associated with late-onset language regression. MRI of the brain is not routine but should be considered if indicated by the history or neurologic exam.

Consultations Consider consulting colleagues in neurology and medical genetics, especially when patients present with definite neurologic signs and symptoms or obvious dysmorphic features. These medical specialists are trained to screen for complex and rare syndromes that are sometimes associated with features of PDD.

Step 2. Is it PDD or another psychiatric disorder?

Psychiatric disorders that can be mistaken for PDD are listed in Table 3. The central feature of all PDDs is disturbance in social relatedness, and a diagnosis of PDD requires a history of significant social impairment.

Problems with social reciprocity in PDD are qualitatively different from the social impairment seen in other psychiatric disorders. For example, a child with attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) may have few friends because of a

tendency to act impulsively and get into frequent conflicts with others. These social difficulties would not be considered indicative of PDD, as they typify those seen in children with ADHD and ODD.

Mental retardation Although mental retardation occurs in

Table 2

TESTING OPTIONS FOR PATIENTS WITH PDD

Hearing evaluation	Fragile X testing
Vision evaluation	Amino acids/organic acids
IQ testing	Chromosome karyotype
Speech/language evaluation	EEG
Chemistries, CBC, thyroid function tests	Brain MRI
Lead level	Neurology consultation
	Genetics consultation

Table 3

DIFFERENTIAL DIAGNOSIS OF PDD

Mental retardation
 Reactive attachment disorder
 Language disorders
 Stereotypic movement disorder
 Attention-deficit/hyperactivity disorder
 Social phobia
 Obsessive-compulsive disorder
 Selective mutism
 Schizophrenia
 Personality disorders
 Normality

approximately 75% of persons with autism, most patients with mental retardation do not have autism. In assessing an individual with mental retardation for symptoms of PDD, consider the overall developmental level. It is not uncommon for individuals with mental retardation to have mild social problems, a history of language delay, and even motor stereotypies. These symptoms are considered indicative of PDD only when they are more severe than would be expected for the patient's developmental level.

Other symptoms that are relatively specific to autism and PDD include lack of appropriate eye-to-eye gaze, abnormal speech prosody, echolalia, pronominal reversal, and narrow and circumscribed interests. The presence of these symptoms in excess should increase your suspicion of comorbid PDD.

RAD Reactive attachment disorder presents with abnormal social relatedness that can sometimes be confused with milder PDDs, especially in patients with comorbid mental retardation. In RAD, however, a history of severe neglect or abuse is thought to have caused the abnormal social relatedness. Placing the child in a caring and secure environment should improve many of the social deficits.

Language disorders are distinguished from PDDs by the absence of marked social impairment and lack of restricted interests and repetitive behaviors. In addition, children with primary language disorders often have intact nonverbal communication skills and make other attempts to communicate (e.g., through gesture, eye contact).

Stereotypic movement disorder can be seen in individuals with and without comorbid mental retardation. It is not diagnosed in the presence of autism, as these movements are thought to be part of the underlying disorder. The lack of social and communication impairments distinguishes stereotypic movement disorder from PDD.

ADHD Many children with autism and other PDDs have interfering symptoms of inattention, hyperactivity, and impulsivity. We usually do not give them an additional diagnosis of ADHD, as these symptoms are common in PDD. The pathophysiology of these symptoms may be different in ADHD and PDD, as evidenced by the frequent report of adverse effects following stimulant treatment of children with autism.²

Social phobia In higher functioning individuals with PDD, excessive social anxiety can sometimes be confused with social phobia. In social phobia, however, individuals usually do not exhibit marked problems with social relatedness and are able to interact normally with persons they know well and in some situations.

OCD Obsessive-compulsive disorder can occur in individuals with PDD but must be distinguished from the abnormal pre-occupations and ritualistic behavior characteristic of autism. In autism, these activities often differ in quality from obsessions and compulsions.³ Furthermore, they usually are not associated with distress, and repetitive behaviors are not linked to a specific obsession.

Selective mutism is usually easy to distinguish from PDD because the affected child is typically able to talk in certain environments, such as at home. Also, the onset of selective mutism follows a period of normal social and communicative development.

Schizophrenia Autism was historically conceptualized as a type of childhood schizophrenia but is now thought to be distinct from the psychotic disorders. Schizophrenia with onset in childhood is much more rare than autism. Its onset usually occurs after several years of normal development, though some children with schizophrenia may have symptoms that resemble PDD early in their illness.⁴ Autistic persons may at times present with symptoms of a thought disorder. A diagnosis of schizophrenia usually is not made without evidence of prominent delusions and hallucinations.

Personality disorders PDDs are sometimes difficult to distinguish from personality disorders with similar features (e.g., schizotypal personality, schizoid personality). The social

Table 4

CHARACTERISTIC FEATURES OF DSM-IV SUBTYPES OF PERVASIVE DEVELOPMENTAL DISORDERS

Feature	Autistic disorder	Asperger's disorder	Rett's disorder	Childhood disintegrative disorder	Pervasive developmental disorder NOS*
Sex	Male:female ratio 4:1	Male > female	Females only	Male > female	Male > female
Age of onset	< 3 years	Variable	5-30 months	2-10 years	Variable
Presence of regression	Mild regression in minority of patients	No	Yes	Yes	No
IQ	Most have mental retardation	Most have normal intellectual functioning	Severe mental retardation	Severe mental retardation	Variable
Social impairment	Yes	Yes	Yes	Yes	Yes
Communication impairment	Yes	No	Yes	Yes	Variable
Restricted interests/ repetitive behaviors	Yes	Yes	Yes	Yes	Variable
Motor involvement	Usually not	Some have motor clumsiness	Gait and trunk ataxia; loss of purposeful hand movements	Loss of bowel/bladder control	Variable

*NOS: Not otherwise specified

impairment in autistic and Asperger's disorders is generally of earlier onset and greater severity than that seen in personality disorders. Those with personality disorders also typically lack stereotyped language or repetitive behaviors that are common in PDDs.

Social awkwardness Finally, some of the PDDs that allow higher functioning (e.g., Asperger's disorder and PDD not otherwise specified [NOS]) need to be distinguished from normal social awkwardness that can be common, especially in adolescence. The social impairment in PDD is marked and interferes with normal functioning and development.

Step 3. Which PDD is it?

DSM-IV describes five subtypes of PDD (autistic disorder, Asperger's disorder, Rett's disorder, childhood disintegrative disorder, and PDD NOS) that have in common problems

with reciprocal social interaction (*Table 4*). For psychiatrists making the diagnosis, it is probably most difficult to differentiate the two most common types: autistic and Asperger's disorders.

Autistic disorder is the prototypical PDD that is associated with abnormalities in reciprocal social interaction, qualitative impairments in communication, and narrow interests and repetitive behaviors (*Table 1*). By definition, symptoms of the disorder manifest by age 3.

Asperger's disorder has several features that distinguish it from autistic disorder:

- Children with Asperger's disorder do not have language delays. By definition, a child who has not developed single words by age 2 cannot be diagnosed with Asperger's disorder.
- Early cognitive development in Asperger's disorder is

normal. Children with Asperger's disorder are much more likely to have normal or above-average intellectual functioning than children with autistic disorder.

- Circumscribed interests and intense preoccupations are more common than motor stereotypies.
- Affected children may show verbal abilities that greatly exceed their visual-spatial skills. This may be apparent on individualized intelligence testing (i.e., verbal IQ > performance IQ) and clinically in the form of good language abilities but lagging fine-motor development (e.g., clumsiness).

Rett's disorder occurs almost exclusively in girls, whereas autistic disorder is more common in boys. Following a brief period of normal development, affected girls experience deceleration of head growth, loss of previously acquired purposeful hand skills with subsequent development of stereotyped hand-wringing movements, loss of social engagement, onset of trunk and gait ataxia, and severe language and cognitive impairment. Genetic testing for mutations at MECP2 will be positive in most patients having all features of the classic phenotype.⁵

Childhood disintegrative disorder is thought to be more rare than autistic disorder. Following at least 2 years of normal development, affected children lose previously acquired skills. These can include play skills, language, social skills, bowel or bladder control, and motor skills. The children show impairments in social interaction, communication, and behavior of the type common to autistic disorder and often have severe mental retardation. The late onset of severe regression in development often prompts extensive neurologic evaluation, but a specific etiology is usually not found. The disorder is not diagnosed if full diagnostic criteria for autistic disorder are met (including onset of symptoms before age 3).

Autism and related PDDs can be reliably differentiated from medical conditions and other psychiatric disorders through a careful psychiatric interview and diagnostic tests. This skill includes identification of common and more rare subtypes in the autism spectrum disorders.

BottomLine

Related resources

- ▶ Cohen DJ, Volkmar FR (eds). *Handbook of autism and pervasive developmental disorders (2nd ed)*. New York: Wiley, 1997.
- ▶ National Institute of Mental Health. Autism booklet. <http://www.nimh.nih.gov/publicat/autism.cfm>
- ▶ Autism Society of America <http://www.autism-society.org>
- ▶ Online Asperger Syndrome Information and Support (OASIS) <http://www.udel.edu/bkirby/asperger>

PDD NOS is diagnosed in many patients who are determined to have a significant impairment in social relatedness but do not meet full criteria for a specific PDD. Recent epidemiologic studies suggest that PDD NOS may be more common than autistic disorder.⁶ It may also be an appropriate designation for children with other proposed diagnostic constructs, such as nonverbal learning disabilities⁷ and multiple complex developmental disorders.⁸

Unfortunately, children diagnosed with PDD NOS instead of the better-recognized term "autism" may be denied appropriate social and financial services. When you inform others about the diagnosis of PDD NOS, it is important to emphasize to parents, schools, and funding agencies that PDD NOS is related to autism and should be considered one of the "autism spectrum disorders." Children with PDDs or autism spectrum disorders will often benefit from similar treatment and educational interventions. In addition, their needs are equivalent for adequate insurance coverage and funding for specialized treatments.

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