CHAPTER 1

Neurodevelopmental Disorders

Prior to DSM-5, the name of this chapter was even more of a mouthful: "Disorders Usually First Evident in Infancy, Childhood, or Adolescence." With the focus on the individual during the formative period of the nervous system, the name *neurodevelopmental* seems logical and appropriate. However, *DSM-5-TR Made Easy* emphasizes the evaluation of older patients—later adolescence to maturity and beyond. For that reason, I've taken some liberties in arranging the conditions discussed in this chapter—placing at the beginning those to be discussed at length and listing later those where I provide just prototypes and limited discussion.

Of course, many of the disorders considered in subsequent chapters can be first encountered in children or young adolescents; anorexia nervosa and schizophrenia are two examples that spring to mind. Conversely, many of the disorders discussed in this chapter can continue to cause problems for years after a child has grown up. But only a few commonly preoccupy clinicians who treat adults. For the remainder of the disorders DSM-5-TR includes in its first chapter, I provide introductions and Essential Features, but no illustrative case example.

Quick Guide to the Neurodevelopmental Disorders

In every Quick Guide, the page number following each item refers to the point at which discussion begins. Also mentioned below, just as in any other competent differential diagnosis, are various conditions arising in early life that are discussed in other chapters.

Autism Spectrum and Intellectual Developmental Disorder

Intellectual developmental disorder. This condition usually begins in infancy; people with it have low intelligence that causes them to need special help in coping with life (p. 20).

Borderline intellectual functioning. This term indicates persons nominally ranked in the IQ range of 71–84 who do not have the coping problems associated with intellectual developmental disorder (p. 616).

Autism spectrum disorder. From early childhood, the patient has impaired social interactions and communications, and shows stereotyped behaviors and interests (p. 26).

Global developmental delay. Use when a child under the age of 5 seems to be falling behind developmentally but you cannot reliably assess the degree (p. 26).

Unspecified intellectual developmental disorder. Use when a child at least 5 years old cannot be reliably assessed, perhaps due to physical or mental impairment (p. 26).

Communication and Learning Disorders

Language disorder. A child's delay in using spoken and written language is characterized by limited vocabulary, grammatically incorrect sentences, or trouble understanding words or sentences (p. 46).

Social (pragmatic) communication disorder. Despite adequate vocabulary and the ability to create sentences, these patients have trouble with the practical use of language; their conversational interactions tend to be inappropriate (p. 49).

Speech sound disorder. Difficulty producing the sounds of normal speech limits the patient's ability to be understood (p. 47).

Childhood-onset fluency disorder (stuttering). The normal fluency of speech is frequently disrupted (p. 48).

Selective mutism. A child chooses not to talk, except when alone or with select intimates. DSM-5-TR lists this as an anxiety disorder (p. 186).

Specific learning disorder. This may involve problems with reading (p. 50), mathematics (p. 50), or written expression (p. 50).

Academic or educational problems. These Z-codes are used when a scholastic problem (other than a learning disorder) is the focus of treatment (p. 608).

Unspecified communication disorder. Use for communication problems where you haven't enough information to make a specific diagnosis (p. 50).

Tic and Motor Disorders

Developmental coordination disorder. The patient is slow to develop motor coordination; some also have attention-deficit/hyperactivity disorder or learning disorders (p. 43).

Stereotypic movement disorder. Patients repeatedly rock, bang their heads, bite themselves, or pick at their own skin or body orifices (p. 44).

Tourette's disorder. Multiple vocal and motor tics occur frequently throughout the day in these patients (p. 39).

Persistent (chronic) motor or vocal tic disorder. A patient has either motor or vocal tics, but not both (p. 43).

Provisional tic disorder. Tics occur for no longer than 1 year (p. 42).

Other specified, or unspecified, tic disorder. Use one of these categories for tics that do not meet the criteria for any of the preceding (p. 43).

Attention-Deficit and Disruptive Behavior Disorders

Attention-deficit/hyperactivity disorder. In this common condition (usually abbreviated as ADHD), patients are hyperactive, impulsive, or inattentive, and often all three (p. 33).

Oppositional defiant disorder. Multiple examples of negativistic behavior persist for at least 6 months (p. 388).

Conduct disorder. A child persistently violates rules or the rights of others (p. 389).

Disorders of Eating, Sleeping, and Elimination

Pica. The patient eats material that is not food (p. 293).

Rumination disorder. There is persistent regurgitation and chewing of food already eaten (p. 294).

Encopresis. At age 4 years or later, the patient repeatedly passes feces into clothing or onto the floor (p. 300).

Enuresis. At age 5 years or later, there is repeated voiding of urine (it can be voluntary or involuntary) into bedding or clothing (p. 298).

Non–rapid eye movement sleep arousal disorder, sleep terror type. During the first part of the night, these patients cry out in apparent fear. Often they don't really wake up at all. This behavior is considered pathological only in adults, not children (p. 339).

Other Disorders or Conditions That Begin in the Developmental Period

Parent–child relational problem. One of these Z-codes is used when there is no mental disorder, but a child and parent have problems getting along, for example, overprotection or inconsistent discipline (p. 606).

Sibling relational problem. Z62.891 is used for difficulties between siblings (p. 606).

Problems related to abuse or neglect. A variety of Z-codes can be used to cover difficulties that arise from neglect or from physical or sexual abuse of children (p. 613).

Disruptive mood dysregulation disorder. A child's mood is persistently negative between severe temper outbursts (p. 149).

Separation anxiety disorder. The patient becomes anxious when apart from parent or away from home (p. 187).

Posttraumatic stress disorder in preschool children. Children repeatedly relive a severely traumatic event, such as a car accident, natural disaster, or war (p. 218).

Disinhibited social engagement and reactive attachment disorders. There is evidence of pathogenic care in a child who habitually doesn't seek comfort from parents or who fails to show expected reticence in the company of strangers (p. 235).

Gender dysphoria in children. A boy or girl wants to be of the other gender (p. 399).

Factitious disorder imposed on another. A caregiver induces symptoms in someone else, usually a child, with no intention of material gain (p. 273).

Other specified, or unspecified, neurodevelopmental disorder. These categories serve for patients whose difficulties don't fulfill criteria for one of the above disorders (p. 54).

Intellectual Developmental Disorder and Autism Spectrum Disorder

Intellectual Developmental Disorder

Individuals with intellectual developmental disorder (IDD), at one time called mental retardation, have two sorts of problem, one resulting from the other. First, there's a fundamental deficit in their ability to think. This will be some combination of difficulties with abstract thinking, judgment, planning, problem solving, reasoning, and general learning (whether from academic study or from experience). Overall intelligence level, as determined by a standard individual test (not one of the group tests, which tend to be less accurate), will be markedly below average. In practical terms, this generally means an IQ of less than 70. (For infants, we can only subjectively judge intellectual functioning.)

Most people with such a deficit need special help to cope, and this need defines the other major requirement for diagnosis: The patient's ability to adapt to the demands of everyday life—in school, at work, at home with family—must be impaired in some important way. We can break down adaptive functioning into three areas: (1) the conceptual (also referred to as the academic), which depends on language, math, reading, writing, reasoning, and memory to solve problems; (2) the social, which includes deploying such abilities as empathy, communication, awareness of the experiences of other people, social judgment, and self-regulation; and (3) the practical, which includes regulating behavior, organizing tasks, managing finances, and dealing with personal care and recreation. How well these adaptations succeed depends on the patient's edu-

cation, job training, motivation, personality, support from significant others, and innate intelligence level.

By definition, IDD begins during the developmental years (childhood and adolescence). In most instances the onset is at the very beginning of this period—usually in infancy, often even before birth. If the behavior begins at age 18 or after, it is often called a neurocognitive disorder (NCD), which of course can coexist with IDD. Diagnostic assessment must be done with caution, especially in younger children whose other problems may interfere with accurate assessment. For example, a patient who can overcome a sensory impairment of hearing or vision may no longer appear intellectually challenged.

Various behavioral problems are commonly associated with IDD, but they don't constitute criteria for diagnosis. Among them are aggression, dependency, impulsivity, passivity, self-injury, stubbornness, low self-esteem, and poor frustration tolerance. Gullibility and naïveté can lead to risk for exploitation by others. Some patients with IDD also suffer from mood disorders (which often go undiagnosed), psychotic disorders, poor attention span, and hyperactivity. However, many are placid, loving, pleasant people whom relatives and associates find enjoyable to live with and befriend.

Although many people with IDD bear no evident distinguishing features, others have physical characteristics that even the untrained observer can notice. These include short stature, seizures, hemangiomas, and eyes, ears, and other parts of the face that bear distinctive shapes. A diagnosis of IDD is likely to be made earlier when there are associated physical abnormalities such as those associated with Down syndrome. IDD affects about 1% of the general population. Males outnumber females roughly 3:2.

The many causes of IDD include genetic abnormalities, chemical effects, structural brain damage, inborn errors of metabolism, and childhood disease. An individual's IDD may have biological or social causes, or both. Some of these etiologies (with the approximate percentages of all patients with IDD they represent) are given below. Note that the percentages are only approximate and the categories tend to flow into one another.

Genetic causes (about 5%). Trisomy 21 (Down syndrome), chromosomal abnormalities, Tay–Sachs, tuberous sclerosis.

Early pregnancy factors (about 30%). Maternal substance use, infections (e.g., rubella).

Later pregnancy and perinatal factors (about 10%). Prematurity, anoxia, birth trauma, fetal malnutrition.

Acquired childhood physical conditions (about 5%). Lead poisoning, infections, trauma.

Environmental influences and mental disorders (about 20%). Cultural deprivation, poverty.

No identifiable cause (about 30%).

Though measurement of intelligence no longer figures in the official DSM-5-TR criteria, in the Essential Features below I have included IQ ranges to provide some anchoring for the several severity specifiers. However, remember that the actual diagnosis given to any individual depends on adaptive functioning, not some number on a page.

Even individually administered IQ tests will have a few points of error. That's one reason why patients with measured IQs as high as 75 can sometimes be diagnosed as having IDD: They still have the problems with adaptive functioning that help define the condition. On the other hand, an occasional person with an IQ of less than 70 may function well enough not to qualify for this diagnosis. In addition, cultural differences, illness, and mental set can all affect the accuracy of IQ testing.

Interpretation of intelligence test scores must also consider the possibility of *scatter* (better performance on verbal tests than on performance tests, or the reverse), as well as physical, cultural, and emotional disabilities. These factors are not easy to judge; some test batteries may require the help of a skilled psychometrist. Such factors are among the reasons why definitions of IDD have moved away from relying solely on test results.

Essential Features of **Intellectual Developmental Disorder**

From their earliest years, people with IDD are in cognitive trouble. Actually, it's trouble of two sorts. First, as assessed both clinically and with formal testing, they have difficulty with intellectual tasks such as reasoning, making plans, thinking in the abstract, exercising judgment, solving problems, and learning from formal study or from life's experiences. Second, they experience difficulty modifying their behavior so they can become independent, socially accountable citizens. They require support to function adequately in the conceptual domain (defined below), social interactions, and practical living skills. These patients experience difficulty in at least one of these domains across multiple life areas—family, school, work, and social relations.

The Fine Print

Conceptual (academic) domain: Memory, use of language, reading and writing, mathematical reasoning, solving problems, judgment.

Social domain: Awareness of how others think and feel, ability to communicate, empathy, ability to make friends.

Practical domain: Self-care, workplace responsibilities, managing money, behavioral self-management—and many other factors.

Don't forget the D's: • Duration (from early childhood) • Differential diagnosis (autism spectrum disorder, cognitive disorders, borderline intellectual functioning, specific learning disorders, and communication disorders)

Coding Notes

Specify level of severity (and code numbers) according to descriptions below.

IQ ranges are stated only for points of reference; severity depends on level of adaptive functioning.

F70 Mild. As children, these individuals learn slowly and lag schoolmates, though they can be expected to attain roughly sixth-grade academic skills by the time they are adults. As they mature, deficiencies in judgment and solving problems cause them to require extra help managing everyday situations; personal relationships may suffer. They typically need help with such tasks as paying bills, shopping for groceries, and finding appropriate living accommodations. However, many can work independently, though at jobs that require relatively little cognitive involvement. Memory and the ability to use language can be quite good, but these patients become lost when confronted with metaphor or other examples of abstract thinking. IQ typically ranges from 50 to 70. They constitute 85% of all patients with IDD.

F71 Moderate. When they are small children, the differences these individuals have from nonaffected peers are marked and encompassing. Though they can learn to read, to do simple math, and to handle money, language use is slow to develop and remains relatively simple. Far more than is the case with mildly affected individuals, in early life they need help in learning to provide their own self-care and engage in household tasks. Relationships with others (even romantic ones) are possible, though they often don't recognize the cues that govern ordinary personal interaction. Although they require assistance with making decisions, they may be able to work (with help from supervisors and co-workers) at relatively undemanding jobs, typically in sheltered workshops. IQ will range from the high 30s to low 50s. They represent about 10% of all patients with IDD.

F72 Severe. Though these people may learn simple commands or instructions, communication skills are rudimentary (single words, some phrases). With guidance, they may be able to perform simple jobs. They can maintain personal relationships with relatives but require supervision for all activities; they need help dressing and with personal hygiene. IQs are in the low 20s to high 30s. They make up roughly 5% of the total of all patients with IDD.

F73 Profound. With limited speech and only rudimentary capacity for social interaction, these individuals may communicate largely through gestures. They rely completely on other people for their needs, including activities of daily living, though they may help with simple chores. Even so, they can enjoy relationships with close family and associates. Profound IDD usually results from a serious neurological disorder, which often carries with it sensory or motor disabilities. IQ ranges downward from the low 20s. About 1–2% of all patients with IDD are so profoundly affected.

Grover Peary

Grover Peary was born when his mother was only 15. Mercedes was an obese girl who hadn't realized she was pregnant until she was 6 months along. Even then, she didn't seek prenatal care. Born after 30 hours of hard labor, Grover hadn't breathed right away. After the delivery, Mercedes lost interest in him; he had been reared alternately by his grandmother and an aunt.

Grover walked at 20 months; he spoke his first words at age 2½ years. A pediatrician pronounced him "somewhat slow," so his grandmother enrolled him in an infant school for children with developmental disabilities. At the age of 7, he had done well enough to be mainstreamed at his local elementary school. Throughout the remainder of his school career, he worked with a special education teacher for 2 hours each day; otherwise, he attended regular classes. Individual testing when he was in the 4th and 10th grades pegged his IQ at 70 and 72.

Despite his disability, Grover loved school. He had learned to read by the time he was 8, and he spent much of his free time poring over books about geography and natural science. (He had a great deal of free time, especially at recess and lunch hour. He was clumsy and short for his age, and the other children routinely excluded him from their games.) At one time he wanted to become a geologist, but his teachers steered him into a general curriculum. He lived in a county that provided special education and training for individuals with IDD, so by the time he graduated, he had learned some manual skills and knew by heart the complicated local public transportation system. A job coach helped him to find work washing dishes at a restaurant in a downtown hotel—and to acquire the social skills necessary to maintain that job. The restaurant manager negotiated a bedroom for him in the hotel basement.

Living at the hotel, he didn't need much money—his room and food were covered, and the tiny dish room where he worked didn't require much of a wardrobe. The waitresses often gave Grover a few dollars out of their tips, which he spent on his CD collection and going to baseball games. His aunt, who saw him every week, helped him with grooming and reminded him to shave. She and her husband also took him to the ballpark; otherwise, he would have spent nearly all of his free time in his room, listening to music and reading magazines.

When Grover was 28, an earthquake hit the city where he lived. Badly damaged, the hotel closed without notice. Thrown out of work, Grover's fellow employees were too busy with their own families to think about him. With his aunt out of town on vacation, he had nowhere to turn. It was summertime, so he placed the few possessions he had rescued in a heavy-duty lawn and leaf bag and walked the streets until he grew tired; he then rolled out some blankets in the park. He slept this way for nearly 2 weeks, eating what he could scrounge from other campers. Although FEMA workers had been sent to help those hit by the earthquake, Grover did not realize he could request relief. Finally, a park ranger recognized his plight and referred him to the mental health clinic.

During the interview, Grover's shaggy hair and thin face add years to his appearance. Dressed in a soiled shirt and baggy pants—they look like someone's castoffs—he

sits quietly in his chair and gives little eye contact. He speaks hesitantly at first, but he is clear and coherent, and eventually he communicates quite well with the interviewer. (However, much of the background information is obtained later from old school records and from his aunt, when she returns from vacation.)

Grover's mood is surprisingly good, and totally appropriate to the topic of conversation. He smiles when he talks about his aunt but looks serious when he is asked where he plans to stay. He has no delusions, hallucinations, obsessions, compulsions, or phobias. He denies having any panic attacks, though he admits he feels "sorta worried" about sleeping in the park.

Grover scores 25 out of 30 on the Mini-Mental State Exam (MMSE). He is oriented except to month and day of the week; with a great deal of effort subtracting sevens, he finally gets two correct. He can recall three objects after 5 minutes and manages a perfect score on the language section. He recognizes that he has a problem of finding a place to live, but aside from asking his aunt, he hasn't the slightest idea how to begin.

Evaluation of Grover Peary

Before the hotel closed, Grover had a place to live, food to eat, and activities to occupy him. Although his aunt would occasionally have to remind him about shaving and keeping his clothing presentable, had he been evaluated then, he might not have fully met the criteria for IDD. Despite low scores on at least two IQ tests (criterion A in DSM-5-TR), he was functioning pretty well in a highly, if informally, structured environment.

When his support system quite literally collapses, Grover cannot cope with the change. He doesn't make use of the resources available to others who have lost their homes. He is also unable to find work; only through the attentiveness and generosity of others does he manage even to eat—overall, a clear deficit of adaptive functioning (B). Of course, his condition has existed since early childhood (C). Therefore, despite an IQ that hovers in the low 70s, he seems impaired enough to warrant the diagnosis of IDD. Note that Grover comfortably matches the prototype for mild IDD.

The differential diagnosis of IDD includes a variety of learning and communication disorders, which are presented later in this chapter. Major neurocognitive disorder in DSM-5-TR would have been diagnosed if Grover's cognitive issues represented a marked decline from a previous level of functioning. (NCD and IDD sometimes coexist, though they can be difficult to tease apart.) At his intellectual level, Grover might be diagnosed as having borderline intellectual functioning were it not for his obvious difficulties in coping with life.

Youngsters and adults with IDD often have associated mental disorders, which include attention-deficit/hyperactivity disorder and autism spectrum disorder; these conditions can exist concurrently. Mood and anxiety disorders are often present, though clinicians may not recognize them without adequate collateral information. Personality traits such as stubbornness are also sometimes noted. Patients with IDD may have physical conditions such as epilepsy and cerebral palsy. As they approach middle age, people with Down syndrome may be at special risk for developing major neurocogni-

tive disorder due to Alzheimer's disease. Attempted (and completed) suicide is also a risk for some.

Adding in his homelessness (and a GAF score of 45), Grover's diagnosis would be as follows:

F70	Mild intellectual developmental disorder
Z59.0	Homelessness
Z56.9	Unemployed

The various editions of the DSM have recorded more than 200 changes in the names of mental disorders (a figure that doesn't even include new disorders added over the years), but the case of intellectual disability (now intellectual developmental disorder) may be the only time a mental disorder was renamed pursuant to an act of Congress.

During the 2009–2010 legislative session, Congress approved, and President Obama signed, a statute substituting in law the term *intellectual disability* for *mental retardation*. The inspiration was Rosa Marcellino, a 9-year-old girl with Down syndrome who, with her parents and siblings, worked to expunge the words *mentally retarded* from the health and education codes in Maryland, her home state.

Note further that, as it is used in law, the term *developmental disability* is not restricted to people with IDD. The legal term applies to anyone who by age 22 has permanent problems functioning in at least three areas because of mental or physical impairment.

F88 Global Developmental Delay

Use the category of global developmental delay for a patient less than 5 years old who has not been adequately evaluated. Such a child may have delayed developmental milestones. Obviously, fuller assessment will be required later.

F79 Unspecified Intellectual Developmental Disorder

Use the category of unspecified IDD for a patient 5 years of age or older who has additional disabilities (blindness, mental or behavioral disorder) too severe to allow full evaluation of intellectual abilities. Again, reassess later.

F84.0 Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a heterogeneous group of neurodevelopmental disorders with widely varying degrees and manifestations that have both genetic and environmental causes. Typically recognized in early childhood, these conditions continue through to adult life, though the form may be greatly modified by experience and education. The symptoms fall into three broad categories.

Communication. Despite normal hearing, the speech of patients with ASD may be delayed by as much as several years. Their deficits vary greatly in scope and severity, ranging from what we used to call Asperger's disorder (people with this type of ASD can speak clearly and have normal, even superior, intelligence) to patients so severely affected that they can hardly communicate at all. Others may show unusual speech patterns and idiosyncratic use of phrases. They may speak too loudly or lack the prosody (lilt) that supplies the music that underlies speech. They may also fail to use body language or other nonverbal behavior to communicate—for example, the smiles or head nods with which most of us express approval. They may not understand the basis of humor (the concept that the words people use can have multiple or abstract meanings, for instance). Children with ASD often have trouble beginning or sustaining conversation; rather, they may talk to themselves or hold monologues on subjects that interest them, but not other people. They tend to ask questions over and again, even after they've obtained repeated answers.

Socialization. The social maturation of patients with ASD occurs more slowly than for most children, and developmental phases may occur out of the expected sequence. Parents often become concerned in the second 6 months, when their child doesn't make eye contact, smile reciprocally, or cuddle; instead, the baby will arch away from a parent's embrace and stare into space. Toddlers don't point to objects or play with other children. They may not stretch out their arms to be picked up or show age-appropriate anxiety at separation from parents. Perhaps because of frustration at the inability to communicate, ASD can result in tantrums and aggression in young children. With little apparent requirement for closeness, older children with ASD have few friends and seem not to share their joys or sorrows with other people. In adolescence and beyond, this can play out as a nearly absent need for sex.

Motor behavior. The motor milestones of patients with ASD typically arrive on time; it's the types of behavior they choose that mark them as different. These include compulsive or ritualistic actions (called *stereotypies*)—twirling, rocking, hand flapping, head banging, and maintaining odd body postures. Patients with ASD suck on toys or spin them rather than using them as symbols for imaginative play. Their restricted interests lead them to be preoccupied with parts of objects. They tend to resist change, preferring to adhere rigidly to routine. They may appear indifferent to pain or extremes of temperature; they may be preoccupied with smelling or touching things. Many such patients injure themselves by head banging, skin picking, or other repetitive motions.

Apart from the subtype formerly known as Asperger's disorder, ASD wasn't recognized at all until Leo Kanner introduced the term *early infantile autism* in 1943. Since then, the concept has expanded in scope and grown new subdivisions (DSM-IV listed four types plus the ubiquitous *not otherwise specified*). The category has now con-

tracted again into the unified concept presented by DSM-5-TR. Although the degree of disability varies widely, the effect upon the lives of most patients and their families is profound and enduring.

ASD is often associated with intellectual developmental disorder; discriminating between these two disorders can be difficult. Sensory abnormalities occur in perhaps 90% of patients with ASD; some children hate bright lights or loud sounds, or even the prickly texture of certain fabrics or other surfaces. A small minority have cognitive "splinter" skills—special abilities in computation, music, or rote memory that occasionally rise to the level of savantism.

Physical conditions associated with ASD include phenylketonuria, fragile X syndrome, tuberous sclerosis, and a history of perinatal distress. Mental health comorbidity issues include anxiety disorders (especially prevalent) and depression (2–30%), obsessive–compulsive behavior (in about one-third), attention-deficit/hyperactivity disorder (over half), intellectual developmental disorder (about half), and seizures (25–50%). Some patients complain of initial insomnia or a reduced need for sleep; a few even sleep days and remain awake nights. Researchers have recently reported an association of a form of autism with a gene responsible for kidney, breast, colon, brain, and skin cancer. The bottom line: Many patients with ASD will require additional diagnoses to capture the full complexity of their symptoms.

ASD's overall prevalence in the United States is currently stated as a bit above 1% of children; studies from other countries tend to report somewhat lower figures. Numbers have increased in recent years, at least in part due to increased awareness of ASD. ASD affects all cultural and socioeconomic groups, with boys affected two to three times as often as girls. Siblings of patients with ASD have an elevated risk for the same disorder.

Note that ASD's impressive range of severity can be reflected in separate ratings for the social communication and behavioral components. Though the DSM-5-TR definitions for severity levels are a bit fussy, they boil down to *mild, moderate,* and *severe*. That's how I've listed them, though DSM-5-TR hasn't for a practical reason: Some DSM-5 committee members who wrote the criteria worried that a label of *mild* could give an insurance company leverage to deny services. Of course, that reasoning could apply to just about any disorder in the book.

Essential Features of **Autism Spectrum Disorder**

From early childhood, contact with others affects to some extent nearly every aspect of how patients with ASD function. Social relationships vary from mild impairment to an almost complete lack of interaction. Some patients may experience a reduced

sharing of interests and experiences, whereas others fail utterly to initiate or respond to the approach of other people. Patients with ASD tend to speak with few of the usual physical signals most people use to communicate emotions and ideas—eye contact, hand gestures, smiles, and nods. Relationships founder, so that those with ASD have trouble adapting their behavior to different social situations; they may lack general interest in other people and make few friends, if any.

Repetition and narrow focus characterize the activities and interests of those with ASD. They may resist even small changes in their routines (perhaps demanding exactly the same menu every lunchtime or endlessly repeating already-answered questions). Some are fascinated with movement (such as spinning) or small parts of objects. Their reaction to stimuli (pain, loud sounds, extremes of temperature) may be either feeble or excessive. Some are unusually preoccupied with sensory experiences: They are fascinated by visual movement or certain smells, or they sometimes fear or reject certain sounds or the texture of particular fabrics. They may use peculiar speech or show stereotypies of behavior, such as hand flapping, body rocking, or echolalia.

The Fine Print

Note that there are varying degrees of ASD, some of which received separate diagnoses and codes in DSM-IV that no longer apply in DSM-5-TR. What was formerly called *Asperger's disorder* is relatively milder; many communicate verbally quite well, yet still lack other skills needed to form social bonds with others.

Deal with the D's: • Duration (from early childhood, though symptoms may appear only later, in response to the demands of socialization) • Distress or disability (work/academic, social, or personal impairment) • Differential diagnosis (ordinary children may have strong preferences and enjoy repetition; consider also **intellectual developmental disorder, global developmental delay,** attention-deficit/hyperactivity disorder, stereotypic movement disorder, obsessive–compulsive disorder, social anxiety disorder, language disorders, social [pragmatic] communication disorder)

Coding Notes

Specify:

{With}{Without} accompanying intellectual impairment
{With}{Without} accompanying language impairment
Associated with a known genetic or other medical condition or environmental factor. [Don't forget to code that factor, too.]
Associated with a neurodevelopmental, mental, or behavioral disorder
With catatonia (p. 100)
Severity (separate ratings are required for social communication and restricted, repetitive behavior)

Social communication

Level 1 (mild). The patient has trouble starting conversations or may seem less interested in them than most people. Code as "Requiring support."

Level 2 (moderate). There are pronounced deficits in both verbal and nonverbal communication. Code as "Requiring substantial support."

Level 3 (severe). Little response to the approach of others markedly limits functioning. Speech is limited, perhaps to just a few words. Code as "Requiring very substantial support."

Restricted, repetitive behaviors

Level 1 (mild). Change provokes some problems in at least one area of activity. Code as "Requiring support."

Level 2 (moderate). Problems in coping with change are readily apparent and interfere with functioning in various areas of activity. Code as "Requiring substantial support."

Level 3 (severe). Change is exceptionally hard; all areas of activity are influenced by behavioral rigidity. Causes severe distress. Code as "Requiring very substantial support."

Temple Grandin

Temple Grandin's career would be noteworthy even had she not been born with ASD. Her life story serves as an inspiration for patients, their families, and for all of us who would offer help. The following information, intended not to present a full picture of her life but to illustrate the features of ASD, has been abstracted from several of her own books.

Born in 1947, Temple began walking shortly after her first birthday. Even as a toddler, she didn't like to be picked up, and would stiffen when her mother tried to hold her. In her autobiographies, she recalls that she would sit and rock for long periods; rocking and spinning helped calm her when she felt overstimulated. Much later, she remembers that being touched by other people caused such sensory overload that she would struggle to escape; hugging was "too overwhelming." She couldn't even tolerate the feel of edges of clothing, such as seams of her underwear.

Temple was alert and well-coordinated, and she had normal hearing; yet she didn't speak until after her fourth birthday. Later, she recalls her frustration at understanding what was said but being unable to respond. For many years thereafter, her voice was toneless and uninflected, without lilt or rhythm. Even as a college student, she would speak too loudly, unaware of the effect her voice was having on others.

As a small child, Temple was taken to a psychiatrist who diagnosed her as having "childhood schizophrenia"; her parents were advised that she might need institution-

alization. Instead, she received the benefit of private schooling, where her teachers taught the other students to accept her—and her eccentricities.

For example, she was unable to meet the gaze of others and she lacked the sense of emotion normally attached to personal relationships. She might even hold a cat too tightly, not recognizing the signals of distress it was giving her. Uninterested in playing with other children, she would instead sit and spin objects such as coins or the lids of cans or bottles. She had an intense interest in odors and was fascinated by bright colors and the movement of sliding doors and other objects.

Consistency was balm for Temple. At school age, she resisted change in her routines and would repeatedly ask the same questions. She reacted badly to Christmas and Thanksgiving because they entailed so much noise and confusion. As an older child, she became fixated on issues such as elections—the campaign buttons, bumper stickers, and posters for the governor of her state held special interest for her.

But emotional nuance escaped her. With no internal compass for navigating personal relationships, understanding ordinary social communication was, for her, like being "an anthropologist on Mars." Because she doesn't have the feelings people usually attach to others, her social interactions had to be guided by intellect, not emotion. To communicate, she used lines scripted in advance—she didn't have the instinct to speak in a socially appropriate manner. What she has learned of empathy she attained by visualizing herself in the other person's place.

Although Temple always rejected human contact, she nonetheless craved comfort. She found it one summer she spent on a farm, when she observed that a device used to immobilize cattle so that they could be immunized appeared to calm them. As a result, she designed and built a squeezing machine that applied mechanical pressure to her own body; the result was tranquility she hadn't found by other means. Refined over the years, her invention led to her eventual career in creating devices used in animal husbandry.

As an adult, Temple still has trouble responding to unexpected social situations, and she would have severe panic attacks were they not controlled with a small dose of the antidepressant imipramine. But she became salutatorian of her college graduating class; eventually she earned a PhD and ran her own company. She is world-famous as a designer of machinery that helps calm animals on their road to slaughter. And she is a sought-after speaker on autism. But if someone's pager or cell phone goes off when she's giving a lecture, it still causes her to lose her train of thought.

Evaluation of Temple Grandin

Of course, we should make a solid diagnosis only with multiple sources of information—for Temple, as for any patient. But lacking that, we can garner material from the treasure trove of data in her own books.

Working our way through the diagnostic criteria, I think we can agree that she has persistent problems in social interaction and communication (criterion A). They

include social and emotional reciprocity (rejection of being hugged—A1); use of nonverbal behaviors (poor eye contact—A2); and relationships (lacking interest in other children—A3). There must be deficits in each of these three areas for a person to be given a DSM-5-TR diagnosis of ASD.

Temple's restricted behavior and interests include examples of all four symptoms in the criterion B category (only two are required for diagnosis): stereotyped spinning of coins and other objects (she even twirled herself—B1); a rejection of change in routine (dislike of holiday festivities—B2); fixed, restricted interests in, for example, sliding doors and the paraphernalia of political campaigns (B3); and hyperreactivity to sounds and fascination with smells (B4). Temple had symptoms from early childhood (C); her biography and other books richly document the degree to which they have dominated and impaired her everyday functioning (D). However, she eventually surmounted them brilliantly, thereby disposing of the final possible objection (E) that the symptoms must not be better explained by intellectual developmental disorder.

Patients with stereotypic movement disorder will exhibit motor behaviors that do not fulfill an obvious function, but the criteria for that diagnosis specifically exclude ASD. Temple began speaking late and had difficulty communicating verbally, but the criteria for social communication disorder also exclude ASD. Her parents were supportive and sensitive to her needs, eliminating severe psychosocial deprivation as a possible etiology. We'd also need to consider general medical problems such as a hearing deficit, which Temple herself explicitly denies having.

She does have a history of severe anxiety, well controlled with medication, that would probably qualify for a comorbid diagnosis of panic disorder, though it cannot account for most of her past symptoms. (I'm leaving the details of that diagnosis as an exercise for diligent readers.) Although some aspects of her history are reminiscent of obsessive–compulsive disorder, she has many other symptoms that it cannot explain.

Besides panic and other anxiety disorders, ASD can be comorbid with intellectual developmental disorder, attention-deficit/hyperactivity disorder, developmental coordination disorder, specific learning disorders, and mood disorders. I'd judge Temple's childhood GAF score as about 55. Though today she may no longer meet DSM-5-TR's diagnostic standards, she clearly did when young. She is highly intelligent but gives clear indication in her own writings of childhood difficulty with language.

F84.0	Autism spectrum disorder, requiring support, without accompanying intellectual impairment, with accompanying language impairment
F41.0	Panic disorder

With the elimination of Asperger's disorder (and other specific autism diagnoses) from DSM-5-TR, patient support groups have been up in arms. Used since 1944, Asperger's has a history as extensive as autism. It seems to define a group of people who, though clearly burdened by their symptoms, also possess a sometimes remarkable intelligence

and range of capabilities that may even be superior. It's tempting to regard Asperger's as a sort of "autism lite." However, that would be a mistake, for patients with Asperger's have many of the same deficits as do other individuals with ASD. Perhaps desiring friends, but lacking the empathy necessary for social interaction, these solitary individuals might like to change but have no idea how to go about it.

The concept of Asperger's has been so useful and is so ingrained in the common usage of patients and professionals alike, that it seems unlikely to disappear—even though it hasn't been blessed by recent DSMs. It is an irony that because of her language delay, DSM-IV criteria would have deemed Temple Grandin ineligible for a diagnosis of Asperger's, though she remains the poster person for that diagnosis. This is a great example in support of the prototype-matching method of diagnosis I describe in the Introduction (p. 2). Using it, I'd rate Temple (when she was a child) a 4 out of 5 for the diagnosis of Asperger's disorder. However, DSM-5-TR, in a nod to voluble statements from the community of patients, does state that those who were formerly diagnosed as Asperger's can still be regarded as having ASD, whether or not they meet current criteria. That's the second irony in one paragraph.

Attention-Deficit/Hyperactivity Disorder

Attention-deficit/hyperactivity disorder (ADHD) has borne a long string of names since it was first described in 1902. Though it is one of the most common behavioral disorders of childhood, only recently—within a few decades, at most—have we recognized the persistence of ADHD symptoms into adult life.

Although this disorder usually isn't diagnosed until the age of 9, symptoms typically begin even before a child starts school. (DSM-5-TR criteria require some symptoms before age 12.) Parents sometimes report that their child with ADHD cried more than their other babies, that they were colicky or irritable, or that they slept less. Some mothers will even swear that their children with ADHD kicked a lot before they were born.

Developmental milestones may occur early; children with ADHD may be described as running almost before they could walk. "Motorically driven," they have trouble just sitting quietly. They may also be clumsy and have problems with coordination. At least one study found that they require more emergency care for injuries and accidental poisonings than do children without ADHD. They often cannot focus on schoolwork; therefore, though intelligence is usually average or better, they may perform poorly in school. They tend to be impulsive, to say things that hurt the feelings of others, to be unpopular.

A competent history is essential: Direct observation may not reveal the typical symptoms, which the stress of close scrutiny or an office visit with a new clinician can drive temporarily underground.

These behaviors typically decrease with adolescence, when many patients with ADHD settle down and become normally active and capable students. But some use substances or develop other forms of delinquent behavior. Adults may have interpersonal problems, alcohol or drug use, or personality disorders. Adults may also complain of trouble with concentration, disorganization, impulsivity, mood lability, overactivity, quick temper, and intolerance of stress.

ADHD affects perhaps 7% of all children, with a male preponderance ratio of 2:1 or greater. DSM-5-TR criteria identify perhaps 2.5% of adults ages 17 and over, though the range reported in various studies is great. The male–female ratio is less among adults, for reasons that are obscure.

The condition tends to run in families: Parents and siblings are more likely than average to be affected; alcoholism and divorce, as well as other causes of family disruption, are common in family backgrounds. There may be a genetic association with antisocial personality disorder and somatic symptom disorder. Also associated with ADHD are learning disorders, especially problems with reading. In adults, look for substance use, mood, and anxiety disorders.

Several disorders are likely to co-occur with ADHD. These include oppositional defiant disorder and conduct disorder, each of which will be present in a substantial minority of people with ADHD. Patients with these comorbidities may be so unhappy that they also fulfill criteria for persistent depressive disorder. Disruptive mood dysregulation disorder, a newly devised condition, may be even more strongly associated. Also look for specific learning disorders, obsessive–compulsive disorder, and tic disorders. Adults may have antisocial personality disorder or a substance use problem.

Essential Features of **Attention-Deficit/Hyperactivity Disorder**

Teachers often notice and refer for evaluation children with ADHD, who are forever in motion, disrupting class by their restlessness or fidgeting, jumping out of their seats, talking endlessly, seeming unable to play quietly or take turns, intruding on or interrupting others—perhaps even answering questions before they are fully asked. However, hyperactivity/impulsivity is only half the story. Such children also have difficulty paying attention when spoken to directly or maintaining focus on their work or play—the inattentive feature. Readily distracted (and therefore disliking and avoiding sustained mental effort such as homework), they neglect details and make careless errors. Their poor organization habits lead to messy work or lost assignments or other materials and an inability to follow through with chores or other responsibilities.

These behaviors plague many aspects of their lives, including school, family relations, and social life away from home. Although the behaviors associated with ADHD may be somewhat attenuated with increasing age, they can affect these individuals through the teen years and beyond.

The Fine Print

Determine the D's: • Duration and demographics (6+ months; onset before age 12) • Disability (work/educational, social, or personal impairment) • Differential diagnosis (intellectual developmental disorder, **anxiety** and **mood disorders,** autism spectrum disorder, **dissociative disorder,** conduct disorder, substance intoxication disorders, oppositional defiant disorder, reactive attachment disorder, PTSD, intermittent explosive disorder, specific learning disorders, cognitive disorders, disruptive mood dysregulation disorder, **psychotic disorders,** or **other mental disorders, personality disorders, substance intoxication** or **withdrawal**)

Coding Notes

Specify (for the past 6 months):

F90.0 Predominantly inattentive presentation. Inattentive criteria met, but not hyperactive/impulsive criteria.
F90.1 Predominantly hyperactive/impulsive presentation. The reverse of F90.0.
F90.2 Combined presentation. Both criteria sets are met.

Specify if:

In partial remission. For at least 6 months impairment persists (perhaps into adulthood), but with fewer symptoms so that full criteria are no longer met.

Specify current severity:

Mild. Relatively few symptoms are found, resulting in only minor impairment.
Moderate. Intermediate.
Severe. Many symptoms are experienced, or some are especially severe.

If you read the actual DSM-5-TR criteria carefully, you'll encounter this anomaly: Criterion D specifies that the symptoms "interfere with, or reduce the quality of" the patient's functioning (p. 69), whereas nearly every other disorder in the book specifies "impairment" of functioning. The subcommittee that wrote the criteria apparently decided that "impairment" was too much influenced by culture. This, of course, prompts the question: Why should the diagnosis of ADHD pay more attention to cultural influences than does every other disorder in DSM-5-TR?

The answer is, also of course, that it shouldn't, and neither should we. Stick with the Essential Features: They might just keep you sane.

Denis Tourney

"I think I've got what my son has."

Denis Tourney is a 37-year-old married man who works as a research chemist. Denis has always had trouble focusing his attention on any task at hand, but he is bright and personable, so he has been able to overcome his handicap and succeed at his job for a major pharmaceutical manufacturer.

At home one evening the week before this appointment, Denis was working on plans for a new chemical synthesis. His wife and children were in bed, and it was quiet, but he had been having an unusually hard time keeping his mind on his work. Everything seemed to distract him—the ticking of the clock, the cat jumping up onto the table. Besides, his head was beginning to pound, so he grabbed what he thought were two aspirin tablets and washed them down with a glass of milk.

"What happened next seemed like magic," he tells the clinician. "It was as if somebody had put my brain waves through a funnel and squirted them onto the paper I was working on. Within half an hour I had shut out everything but my work. In 2 hours, I accomplished what would ordinarily take a day or more to get done. Then I got suspicious and looked at the pill bottle. I had swallowed two of the tablets that were prescribed last month for Randy."

Denis's son is 8, and until a month ago he was the terror of the second grade. But after 4 weeks on Ritalin, he has become less driven, his grades have improved, and he has become "almost a pleasure to live with."

For years, Denis has suspected that he himself might have been hyperactive as a child. Like Randy, during the first few grades of elementary school he had been unable to sit still in his seat—bouncing up to use the pencil sharpener or to watch a passing ambulance. His teacher had once written a note home complaining that he talked constantly and that he "squirmed like a bug on a griddle." It was part of the family mythology that he "crawled at 8 months, ran at 10." On questioning, Denis admits that as a kid he was always on the go and could hardly tolerate waiting his turn for anything ("I felt like I was going to climb right out of my skin").

He was almost stupifyingly forgetful. "Still am. I really can't recall much else about my attention span when I was a kid—it's too long ago," he says. "But I have the general impression that I didn't listen very well, just like I am today. Except when I took those two tablets by mistake."

The remainder of Denis's evaluation is unremarkable. He is in excellent physical health, and he has had no other mental health problems. Apart from some fidgeting in his chair, his appearance, speech, and affect are all completely ordinary, and he earns a perfect score on the MMSE.

Denis was born in Ceylon, where his parents were both stationed as career diplomats with the Foreign Service. His father drank himself into an early grave, but not before divorcing his mother when their only child was 7 or 8. Because he was its subject, Denis vividly remembered their last major argument. His mother pleaded to have Denis's behavioral problems evaluated, but his father banged his fist and swore that no

kid of his was "going to see some damn shrink." Not long afterward, his parents split up for good.

Denis feels he has learned a lot from his father's example—he doesn't drink, has never tried drugs, and doesn't argue with his wife; he had readily agreed when she suggested having Randy evaluated. "You always dream that your kids will have what you never did," he says. "In our case, it's Ritalin."

Evaluation of Denis Tourney

As a child, Denis undoubtedly had several symptoms of ADHD. It is easier for him to remember the problems relating to his activity level (the A2 criteria). Those include the childhood symptoms of squirming (A2a), inability to remain seated (A2b) or wait his turn (A2h), always being on the go (A2e), excessive running (A2c), and excessive talking (A2f). (For children, DSM-5-TR requires six of these symptoms—but, because they tend to be poorly remembered years later, only five for patients ages 17 and above. The same numbers and rationale hold for symptoms of inattention.) Denis thinks that his attention span was also problematic, though he is less clear about the details.

His symptoms were present when he was a small child, certainly before age 12 (B); we have only anecdotal "clear evidence" that they interfered with the quality of his schoolwork, but at this remove, it seems to be enough. His clinician should ascertain that he had had difficulties in more than one setting (such as school and at home, C). But even 3 decades later, he remembers enough hyperactivity/impulsivity symptoms to justify the childhood diagnosis. As adults, many such patients recognize restlessness as their predominant symptom. It would be a good idea for the clinician to verify what Denis thought he remembered, perhaps by obtaining old school records.

In children, several other conditions make up the differential diagnosis. (Note that in a clinician's office, many children with ADHD can sit still and focus attention well; the diagnosis often hinges on the history.) Those with intellectual developmental disorder learn slowly and may be overly active and impulsive, but patients with ADHD, once their attention is captured, are able to learn normally. Unlike children with autism spectrum disorder, patients with ADHD communicate without undue difficulty. Depressed patients may be agitated or have a poor attention span, but the duration is not usually lifelong. Many patients with Tourette's disorder are also hyperactive, but those who only have ADHD will not show motor and vocal tics.

Children reared in a chaotic social environment may also have difficulty with hyperactivity and inattention; although ADHD can be diagnosed in a child who lives in an unstable social environment, the process requires extra care and thought. Oppositional defiant disorder and conduct disorder may involve behavior that runs afoul of adults or peers, but those behaviors appear purposeful and are not accompanied by the feelings of remorse typical of ADHD behavior. However, many children with ADHD have comorbid conduct, oppositional defiant, or Tourette's disorder.

The differential diagnosis in adults includes antisocial personality disorder and mood disorders (patients with mood disorders can have problems with concentration

and agitation). The diagnosis should not be made if the symptoms are better explained by schizophrenia, an anxiety disorder, or a personality disorder.

As a child, Denis might have fulfilled criteria for ADHD, combined type; with the information currently available, however, this would be a tough sell to any coder with a hard nose. Although as an adult he continued to have severe problems concentrating, he overcame them with drive and raw intelligence. Until he compared his usual concentration to the kind of work he could do with medication, he never realized just how disabled he had been.

Although we have some specifics that would constitute a current DSM-5-TR diagnosis (he was distractible—A1b), even with more information we might not be able to dredge up enough detail to make a full adult diagnosis by contemporary standards. As a clinician, I feel more comfortable with the qualifier "in partial remission." A fuller examination, perhaps with added information from his wife (or boss), might justify a different final diagnosis. Oh, and I'd give him a GAF score of 70.

F90.2 Attention-deficit/hyperactivity disorder, combined presentation, in partial remission

ADHD is probably underdiagnosed in adults. Although some writers have expressed skepticism about its validity, the evidence of its legitimacy in this age range is increasing. However, the fussiness of their language makes the specifier criteria seem ripe for neglect.

F90.8 Other Specified Attention-Deficit/Hyperactivity Disorder

F90.9 Unspecified Attention-Deficit/Hyperactivity Disorder

Use other specified ADHD or unspecified ADHD for patients with prominent symptoms that don't fulfill the criteria for ADHD proper. Examples would include people whose symptoms begin after age 12 or who have too few symptoms. Remember that, to qualify, the symptoms that are present should be associated with impairment. If you want to specify the reason why ADHD doesn't work for the patient, choose F90.8 and tack on something to the effect of "symptoms first identified at age 13." Otherwise, choose F90.9. See page 11 (sidebar).

Tic Disorders

A *tic* is a sudden vocalization or movement of the body that is unrhythmic, repeated, and rapid—so quick, in fact, that it can occur literally in (and sometimes is) the blink

of an eye. Complex tics, which may include several simple tics in quick succession, naturally take longer. Tics are common; they can occur by themselves or as symptoms of Tourette's disorder.

Tics range from the occasional twitch to repetitive motor and vocal outbursts that can occur in clusters that create utter (!) chaos in the classroom. Motor tics first appear in early childhood, sometimes as early as 2 years of age. Classically, they involve the upper part of the face (grimaces and twitching of the muscles around the eyes), though affected children can present with a wide range of symptoms that include abdominal tensing and jerking of shoulders, head, or extremities. Vocal tics tend to begin somewhat later. Simple vocal tics may include barks, coughs, throat clearing, sniffs, and single syllables that may be muttered or called out.

Tics cause children to feel out of control of their own bodies and mental processes, though as they get older, some patients do develop a "tension and release" buildup of the urge to tic that is relieved by the tic itself. Although tics are involuntary, patients can sometimes suppress them for a time; they usually disappear during sleep. Though tic disorders are described as persistent, they do change in intensity with time, perhaps disappearing entirely for weeks at a time. Frequency often increases when a person is sick, tired, or stressed.

Childhood tics are common, occurring in around 10% of boys and 5% of girls. Most of these are motor tics that disappear as the child matures; typically, they don't generate enough concern to warrant an evaluation. When they persist into adulthood, the prevalence is lower, though males still predominate. Adults rarely develop tics de novo; when it does happen, it is often in response to use of cocaine or other street drugs. The tics of adult patients tend to remain the same, varying in intensity though less severe than in childhood. Several factors contribute to a worse prognosis in an adult: comorbid mental conditions or chronic physical illness, lack of support at home, and psychoactive drug use.

Because tics look pretty much the same regardless of diagnosis, I've presented an example only in the context of Tourette's disorder.

F95.2 Tourette's Disorder

Tourette's disorder (TD) was first described in 1895 by the French neurologist Georges Gilles de la Tourette. It entails many tics that affect various parts of the body. Motor tics of the head are usually present; eye blinking is often the first symptom to appear. Some patients have complex motor tics—for example, doing deep knee bends. The location and severity of motor tics in patients with TD typically change with time.

But the vocal tics are what make this disorder so distinctive and bring patients to the attention of professionals—often mental health clinicians rather than neurologists. Vocal tics can include an astonishing variety of barks, clicks, coughs, grunts, and understandable words. A sizeable minority (10–30%) of patients also have *coprolalia*, which means that they utter obscenities or other language that can render the condition

intolerable by family and acquaintances. Mental coprolalia (intrusive dirty thoughts) can also occur.

Now acknowledged to be far from rare, TD affects up to 1% of young people, with males outnumbering females 2–3:1. For unknown reasons, it is less common in African Americans than in other racial/ethnic groups. Associated symptoms include self-injury due to head banging and skin picking. TD is strongly familial, with concordance over 50% in monozygotic twins and 10% in dizygotic. There is often a family history of tics or obsessive–compulsive disorder (OCD), so that clinicians suspect a genetic linkage between Tourette's and early-onset OCD.

Typically, TD begins by age 6; most patients reach maximum severity by ages 10–12, after which improvement occurs in perhaps 75%. The rest will continue to have tics that are moderate or worse. Though there may be periods of remission, TD usually lasts throughout life. Maturity, however, can bring reduced severity or even complete disappearance. Most patients have comorbid conditions, especially OCD and ADHD.

Essential Features of **Tic Disorders (Compared)**

	Tourette's disorder	**Persistent (chronic) motor or vocal tic disorder**	**Provisional tic disorder**
Specific tic type	1+ vocal tics & 2+ motor tics (see The Fine Print)	Motor or vocal tics, but *not* both	Motor or vocal tics, or both, in any quantity
Duration	Longer than 1 year; tic-free periods may occur		Less than 1 year
Differential diagnosis	No other medical condition or substance use	No other medical condition or substance use; not TD	No other medical condition or substance use; never TD or persistent motor or vocal tic disorder
Demographics	Must begin by age 18		
Specify if	—	With motor tics only With vocal tics only	—
Tic definition	Abrupt, nonrhythmic, rapid, repeated motor movement or vocalization		

The Fine Print

In TD, motor and vocal tics need not occur in the same time frame.

Essential Features of **Tourette's Disorder**

The first tics of patients with TD are often eye blinks that appear around age 6 years. They are joined by vocal tics, which may initially be grunts or throat clearings. Eventually, patients with TD have multiple motor tics and at least one vocal tic. The best-known tic of all, coprolalia—swear words and other socially unacceptable speech—is relatively uncommon.

The Fine Print

Delve into the D's: • Duration and demographics (1+ years; beginning before age 18, though typically by age 4–6) • Differential diagnosis (OCD, other tic disorders, substance use disorders, and physical disorders)

Gordon Whitmore

Gordon is a 20-year-old college student who comes to the clinic with this chief complaint: "I stopped my medicine, and my Tourette's is back."

The product of a full-term pregnancy and uncomplicated delivery, Gordon's development seemed completely ordinary. But when he was 8½ years old, his mother noticed the first tic. At the breakfast table, she was looking at him across the Post Toasties box he was reading. Every few seconds he would, quite deliberately, blink his eyes, squeezing them shut and then opening them wide.

"She asked me what was wrong, said she wondered if I was having a convulsion," Gordon tells the mental health clinician. He suddenly interrupts his story to yell, "Shit-fuck! Shit-fuck!" As he barks out each exclamation, he twists his head sharply to the right and shakes it so that his teeth actually rattle.

"But I never lost consciousness or anything like that. It was only the beginning of my Tourette's." Unperturbed by his sudden outburst, Gordon continues his story. Gradually throughout his childhood, he accumulated an assortment of facial twitches and other abrupt movements of his head and upper body. Each new motor tic earned renewed taunts from his classmates, but these were mild compared with the abuse he suffered once the vocal tics began.

Not long after he turned 13, Gordon noticed that a certain tension creeps into the back of his throat. He cannot describe it—it doesn't tickle, and it doesn't have a taste. It isn't something he can swallow down. Sometimes a cough will temporarily relieve it, but more often it requires some form of vocalization to ease it. A bark or yelp usually works just fine. But at its most intense, only an obscenity will do.

"Shit-fuck! Shit-fuck!" he yells again. Then, "Cunt!" Gordon shakes his head again and hoots twice.

Halfway through his third year in high school, the vocal tics got so bad that they placed Gordon on "permanent suspension" until he could learn to sit in a classroom

without creating pandemonium. The third clinician his parents consulted prescribed haloperidol. This relieved his symptoms completely, except for the tendency to blink when he is under stress.

He remained on this drug until a month ago, when he read an article about tardive dyskinesia and began to worry about side effects. But once he stopped taking haloperidol, the full spectrum of tics rapidly returned. He was recently evaluated by his general physician, who pronounced him healthy. He has never abused street drugs or alcohol.

Gordon is a neatly dressed, pleasant-appearing young man who sits quietly during most of the interview. He really seems quite ordinary, aside from exaggerated blinking, which occurs several times a minute. He sometimes accompanies the blinks by opening his mouth and curling his lips around his teeth. But every few minutes there occurs a small explosion of hoots, grunts, yelps, or barks, along with a variety of tics that involve his face, head, and shoulders. Irregularly, but with some frequency, his outbursts include the expletives quoted above—uttered with more volume than conviction. Afterward, he placidly resumes the conversation.

The remainder of Gordon's mental status is unremarkable. When he isn't having tics, his speech is clear, coherent, relevant, and spontaneous, and he scores a perfect 30 on the MMSE. He worries about his symptoms but denies feeling especially depressed or anxious. He has never had hallucinations, delusions, or suicidal ideas. He also denies having obsessions or compulsions, adding, "You mean like Uncle George. He does rituals."

Evaluation of Gordon Whitmore

Gordon's symptoms began when he was a child (criterion C) and include vocal as well as multiple motor tics (A), which have occurred frequently enough and long enough (B) to qualify him fully for a diagnosis of Tourette's disorder. He is otherwise healthy, so another medical condition (especially a neurological disorder such as dystonia) would not appear to be a likely cause of his symptoms. Other mental disorders associated with abnormal movements include schizophrenia and amphetamine intoxication, but Gordon presents no evidence for either of these (D). The duration and full spectrum of vocal and multiple motor tics distinguish his condition from other tic disorders (persistent motor or vocal tic disorder, provisional tic disorder).

We should also inquire about conditions that may be associated with Tourette's. These include OCD and ADHD of childhood. (Gordon's uncle may have had OCD.) Gordon's diagnosis would therefore be as follows (I'd assign him a GAF score of 55):

F95.2 Tourette's disorder

F95.0 Provisional Tic Disorder

By definition, the tics in provisional tic disorder are transient. Typically, they are simple motor tics that begin somewhere in the 3–10 age range and wax and wane over a period

of weeks to months; vocal tics are less common than motor tics. A patient who has been diagnosed with persistent motor or vocal tic disorder can never receive the diagnosis of provisional tic disorder.

F95.1 Persistent (Chronic) Motor or Vocal Tic Disorder

Once tics have been present for a year, they can no longer be considered provisional. Persistent motor tics also wax and wane over a range of severity. However, persistent vocal tics are rare. Even persistent motor tics usually disappear within a few years, though they may recur in an adult who is tired or stressed. Although persistent tics are probably related genetically to TD, patients with TD cannot receive this diagnosis.

F95.8 Other Specified Tic Disorder

F95.9 Unspecified Tic Disorder

Use unspecified tic disorder to code tics that don't fulfill criteria for one of the preceding tic disorders. Or you can specify the reason by using other specified tic disorder. One example would be tics that have apparently begun after age 18.

Motor Disorders

F82 Developmental Coordination Disorder

Developmental coordination disorder (DCD) is perhaps better known by a pejorative label—"clumsy-child syndrome." More or less synonymous with *dyspraxia* (difficulty in performing skilled movements despite normal strength and sensation), DCD remains a focus of some controversy. And it's a big controversy, because DCD affects perhaps 6% of children ages 5–10; a third of these have severe symptoms. By a ratio of around 4:1, boys are affected more often than girls.

Young people with DCD have difficulty getting their bodies to perform as they might wish. Younger children may experience delayed milestones, especially crawling, walking, speaking—even getting dressed. Older children, chosen last for team sports because they don't catch, run, jump, or kick well, may have trouble making friends. Some children have trouble mastering classroom skills such as coloring, printing, cursive, and cutting with scissors.

Although the symptoms often stand on their own, for over half of patients DCD exists as part of a broader problem that includes attention deficits or learning problems such as dyslexia. Autism spectrum disorder has also been linked.

After years of study, the cause is still unknown. In the individual case, a variety of physical conditions must be ruled out: muscular dystrophy, congenital myasthenia, cerebral palsy, central nervous system tumors, epilepsy, Friedreich's ataxia, and

Ehlers–Danlos disease. Obviously, late onset of motor incoordination would weigh heavily against DCD.

Motor skill deficits can persist through adolescence and into adult life, though little is known about the course of DCD in adults.

Essential Features of **Developmental Coordination Disorder**

Motor skills are so much poorer than you'd expect, given a child's age, that they get in the way of progress in academics, sports, or other activities. The specific motor behaviors involved include general awkwardness; problems with balance; delayed developmental milestones; and slow achievement of basic skills such as jumping, playing catch with a ball, and writing legibly.

The Fine Print

The D's: • Demographics (onset in early childhood) • Disability (work/educational, social, or personal impairment) • Differential diagnosis (**physical conditions** such as **impaired vision, cerebral palsy, muscular dystrophy; intellectual developmental disorder;** autism spectrum disorder; ADHD)

F98.4 Stereotypic Movement Disorder

Stereotypies are behaviors that people seem driven to perform over and again without any apparent goal—repetitive movement for the sake of motion. Such behavior is expected in babies and young children, who will rock themselves, suck their thumbs, and put into their mouths just about anything that will fit. But when stereotypies persist until later childhood and beyond, they may come to clinical attention as stereotypic movement disorder (SMD).

The behaviors include rocking, hand flapping or waving, twiddling of fingers, picking at skin, and spinning of objects. Serious injury can result from biting, head banging, or striking fingers, mouth parts, or other body parts. You'll typically encounter these behaviors in patients with intellectual developmental disorder or autism spectrum disorder, though also in perhaps 3% of otherwise healthy children with ADHD, tics, or OCD.

Just what percentage of adults may be affected isn't known; though, other than in individuals with intellectual developmental disorder, it's probably uncommon. Of 20 adults with SMD in one study, 14 were women; a lifetime history of mood and anxiety disorders was the rule in these patients.

Patients who abuse amphetamines may become fascinated with handling mechanical devices such as watches or radios or picking at their own skin. Some will sort

or rearrange small objects such as jewelry or even pebbles—*punding* (from a word popularized by amphetamine abusers), which may be related to excessive dopamine stimulation.

SMD behaviors are associated with blindness (especially when it's congenital), deafness, Lesch–Nyhan syndrome, temporal lobe epilepsy, and postencephalitic syndrome, as well as severe instances of schizophrenia and OCD. It has also been reported in individual patients with Wilson's disease (a disorder of copper metabolism) and brainstem stroke, several with the genetic syndrome *cri du chat* ("cry of the cat," so called because of the characteristic sound the patients make as infants). You may also find SMD behavior in demented elderly patients. Perhaps 10% of people with intellectual developmental disorder who live in a facility have the self-injury type of SMD.

In 1995, *The New Yorker* reported that Bill Gates, then the CEO of Microsoft, rocks when he works. "His upper body rocks down to an almost forty-five-degree angle, rocks back up, rocks down again. His elbows are often folded together, resting in his crotch. He rocks at different levels of intensity according to his mood. Sometimes people who are in the meetings begin to rock with him." Claiming it a holdover from "an extremely young age," Gates told the reporter, "I think it's just excess energy."

Essential Features of **Stereotypic Movement Disorder**

You can't find another physical or mental cause for the patient's pointless, repeated movements, such as head banging, swaying, biting or hitting of self, or hand flapping.

The Fine Print

The D's: • Demographics (begins in early childhood) • Distress or disability (social, occupational, or personal impairment; self-injury can occur) • Differential diagnosis (normal child development, **OCD,** autism spectrum disorder, **trichotillomania,** tic disorders, excoriation disorder, intellectual developmental disorder, **substance use disorders,** and **physical disorders**)

Coding Notes

Specify:

{With}{Without} self-injurious behavior (includes behavior potentially injurious if not prevented)

Specify current severity:

Mild. Symptoms are readily managed behaviorally.
Moderate. Symptoms require behavior modification and specific protective measures.
Severe. Symptoms require continuous watching to avert possible injury.

Specify if:

Associated with a known medical or genetic condition, neurodevelopmental disorder, or environmental factor such as intellectual developmental disorder or fetal alcohol syndrome.

Communication Disorders

Communication disorders are among the most frequent reasons that children are referred for special evaluation. For some children, problems with communication are symptomatic of broader developmental problems, such as autism spectrum disorder and intellectual developmental disorder. Many other children, however, have standalone disorders of speech and language.

Disorders of speech include lack of speech fluidity (for example, stuttering); inaccurately produced or appropriately used speech sounds (as in speech sound disorder); and developmental verbal dyspraxias, which result from impaired motor control and coordination of speech organs. Disorders of language comprise problems with formation of words (morphology) or sentences (syntax), language meaning (semantics), and the use of context (pragmatics).

These disorders still are not well understood or (often) well recognized. Whereas they are differentiable, they are also highly comorbid with one another.

F80.2 Language Disorder

Language disorder (LD) is a recently devised category intended to cover language-related problems including spoken and written language (and even sign language) that are manifested in receptive and expressive language ability—though these may be affected to different degrees. Both vocabulary and grammar are typically affected. Patients with LD speak later and less often than most children, ultimately impairing academic progress. Later in life, occupational success may be affected.

The diagnosis should be based on history, direct observation, and standardized testing, though no actual testing results are specified in the criteria. The condition tends to persist, so that affected teens and adults will likely continue to have difficulty expressing themselves. This disorder has strong genetic underpinnings.

Language impairments can also coexist with other developmental disorders, including intellectual developmental disorder, ADHD, and autism spectrum disorder.

Essential Features of **Language Disorder**

Beginning early in childhood, a patient's use of spoken and written language persistently lags age expectations. Compared to peers, patients will have small vocabularies, impaired use of words to form sentences, and impaired ability to employ words and sentences to express ideas.

The Fine Print

The D's: • Demographics (begins in early childhood; tends to chronicity) • Disability (work/educational, social, or personal impairment) • Differential diagnosis (**hearing or other sensory impairment,** autism spectrum disorder, **intellectual developmental disorder, global developmental delay, other medical conditions**—though any of these may coexist with LD)

F80.0 Speech Sound Disorder

Substituting one sound for another or omitting certain sounds completely is the sort of error made by patients with speech sound disorder (SSD), formerly called *phonological disorder.* The difficulty can arise from inadequate knowledge of speech sounds or from motor problems that interfere with speech production. Consonants are affected most often, as in lisping. Other examples include errors in the order of sounds ("gaspetti" for spaghetti). The errors of speech found in those who learn English as a second language are not considered examples of SSD. When SSD is mild, the effects may appear quaint or even cute, but the disorder renders more severely affected individuals hard to understand, sometimes unintelligible.

Although SSD affects 2–3% of preschool children (it's more prevalent in boys), spontaneous improvement is the rule, reducing the prevalence to about 1 in 200 by late teens. The condition is familial and can occur with other language disorders, anxiety disorders (including selective mutism), and ADHD.

Essential Features of **Speech Sound Disorder**

The patient has problems producing the sounds of speech, compromising communication.

The Fine Print

The D's: • Demographics (beginning in early childhood) • Disability (work/educational or social) • Differential diagnosis (**physical disorders** such as **cleft palate** or **neurological disorders; hearing impairment;** selective mutism; **other medical disorders**)

F80.81 Childhood-Onset Fluency Disorder

Although the loss of fluency and rhythm once called *stuttering* (the title was changed to comply with ICD-10) is familiar to every layperson, the stutterer's agonized sense of dyscontrol is not. The momentary panic that ensues may cause people with childhood-onset fluency disorder to take extreme measures to avoid difficult sounds or situations—even such ordinary experiences as using a telephone. Typically, they report anxiety or frustration, even physical tension. You'll notice children clenching their fists or blinking their eyes in the effort to regain control, especially when there is extra pressure to succeed (as when speaking to a group).

Stuttering occurs especially with consonants; the initial sounds of words, the first word of a sentence; and words that are accented, long, or seldom used. It may be provoked by joke telling, saying one's own name, talking to strangers, or speaking to an authority figure. Stutterers often find that they are fluent when singing, swearing, or speaking to the rhythm of a metronome.

On average, stuttering starts at age 5, but it can begin as young as 2. Because young children often have dysfluencies of speech, early stuttering is often ignored. Sudden onset may correlate with greater severity. As many as 3% of young children stutter; the percentage is higher for children with brain injuries or intellectual developmental disorder. Boys outnumber girls at least 3:1. Although reports vary, the prevalence in adults is about 1 in 1,000, of whom 80% are male.

Stuttering runs in families, and there is some evidence of heritability. There are genetic (and some symptomatic) links to Tourette's disorder, which is a dopamine-related disorder; dopamine antagonists have been used to ameliorate the effects of stuttering.

Essential Features of **Childhood-Onset Fluency Disorder (Stuttering)**

These patients have problems speaking smoothly, most notably with sounds that are drawn out or repeated. Entire (monosyllabic) words may be repeated, or there may be pauses in the middle of words. Patients experience marked physical tension while speaking and may substitute easier words for those that are difficult to produce. The result: anxiety about the act of speaking.

The Fine Print

The D's: • Demographics (beginning in early childhood) • Distress or disability (social, academic, or occupational) • Differential diagnosis (**speech motor deficits; neurological conditions** such as **stroke; hearing deficits; other mental** or **medical disorders**)

Coding Note

Stuttering that begins later in life should be recorded as adult-onset fluency disorder and coded F98.5.

F80.82 Social (Pragmatic) Communication Disorder

Social (pragmatic) communication disorder (SCD) describes patients who, despite adequate vocabulary and ability to form sentences, still have problems with the practical use of language. The world of communications calls this *pragmatics,* and it involves several principal skills:

- Using language to pursue different tasks, such as welcoming someone, communicating facts, making a demand, issuing a promise, or making a request.
- Adapting language in accord with the needs of a particular situation or individual, such as speaking differently to children than to adults or in class versus at home.
- Adhering to the conventions of conversation, such as taking turns, staying on topic, using nonverbal (eye contact, facial expressions) as well as verbal signals, allowing adequate physical space between speaker and listener, or restating something that's been misinterpreted.
- Understanding implied communications, such as metaphors, idioms, and humor.

Patients with SCD, whether children or adults, have difficulty understanding and using the pragmatic aspects of social communication, to the point that their conversations can be socially inappropriate. Yet they do not have the restricted interests and repetitive behaviors that would qualify them for a diagnosis of autism spectrum disorder. SCD can occur by itself or with other diagnoses, such as other communication disorders, specific learning disorders, or intellectual developmental disorder.

Essential Features of **Social (Pragmatic) Communication Disorder**

From early childhood, the patient has difficulty with each of these features: using language for social reasons, adapting communication to fit the context, following the conventions (rules) of conversation, and understanding implied communications (such as metaphor, idiom, and humor).

The Fine Print

The D's: • Disability (work/educational, social, or personal impairment) • Demographics (usually first appears around age 4–5) • Differential diagnosis (**physical** or **neurological conditions, autism spectrum disorder, intellectual developmental disorder,** social anxiety disorder, ADHD)

F80.9 Unspecified Communication Disorder

The usual drill applies: Diagnose unspecified communication disorder when a problem with communication doesn't fulfill criteria for one of the previously mentioned conditions yet causes problems for the patient.

Specific Learning Disorder

Specific learning disorder (SLD) is a particular problem in acquiring information—a problem that isn't consistent with a child's age and native intelligence, and that can't be explained by external factors such as culture or lack of educational opportunity. SLD thus comprises a set of discrepancies (in reading, mathematics, and written expression, as well as some not yet specified) between the child's theoretical ability to learn and actual academic achievement.

Before a diagnosis can be affirmed, the criteria require evidence of significant deficit obtained from an individually administered, standardized test that is psychometrically sound and culturally appropriate. Like most DSM-5-TR disorders, SLD cannot be diagnosed unless it affects school, work, or social life. Of course, the child's intellectual level will affect the manifestation, prognosis, and remedy of the SLD.

Except for the descriptive specifier "with impairment in written expression," which can appear a year or two later than the others, SLD usually declares itself by the time the child reaches second grade. Two main groups of affected children have been identified. Most affected children have problems with language skills, including spelling and reading; these stem from a basic difficulty in processing sounds and symbols of language (in other words, they have a phonological processing disability). A smaller number have difficulties solving problems—visuospatial, motor, and/or tactile perceptual problems that manifest as dyscalculia.

In one form or another, SLD affects 5–15% of Americans over the course of their lifetimes; boys are two or three times more often affected than girls. Of course, a child's behavioral and social consequences are proportional to the severity of the impairment and to the available educational remediation and social support. Overall, however, as many as 40% of children formally diagnosed with SLD leave school before completing high school, against a national average of about 6%. These disorders are likely to persist into adult life, where the prevalence is about half that for children. Of the types of SLD, problems with math are the most likely to have an influence on adult functioning.

Children with SLD are also more likely to have behavioral or emotional problems, specifically ADHD (which worsens the mental health prognosis), autism spectrum disorder, developmental coordination disorder, and communication disorders, as well as anxiety and mood disorders.

Specific Learning Disorder with Impairment in Reading (Dyslexia)

The best-studied disorder of this group, the reading type of SLD (aka dyslexia), occurs when a child (or adult, should it persist) cannot read at the level expected for age and intelligence. It can take several forms: difficulty with comprehension or speed when the person is reading silently; with accuracy when the person is reading aloud; with spelling when the person is, well, trying to spell. Normally distributed throughout the population (and occurring at every intelligence level), dyslexia affects about 4% of school-age children, most of them boys.

In the quest for causation, it is interesting to note that children are less likely to have reading problems when their native language has good correspondence between phonemes and graphemes (that is, the words sound generally the way they look). In that sense, English is relatively troublesome, Italian *facile*.

Dyslexia has been attributed to a variety of environmental factors (lead poisoning, fetal alcohol syndrome, low socioeconomic status) and familial causes (inheritance may account for 30% of cases). Especially at risk are socially disadvantaged children, who are less likely to receive the early stimulation that is important to childhood development. Clinicians must rule out vision and hearing problems, behavioral disorders, and ADHD (which is often comorbid).

Prognosis for dyslexia depends on several factors, especially its severity in the individual patient: Reading at two standard deviations below the population mean signifies an especially poor outlook. Other factors include parents' educational levels and the child's overall intellectual capabilities.

Early identification of dyslexia improves outcome. One study showed that 40% of children treated when age 7 could read normally at age 14. However, some news isn't so good: Perhaps 40 million adult Americans are barely literate. Although reading accuracy tends to improve with time, fluency continues to be a problem into maturity. Adults may read slowly, confuse or mispronounce proper names and unfamiliar words, avoid reading aloud (due to embarrassment), or spell imaginatively (and choose words that are easier to spell). They may find reading such a tiring chore that they avoid recreational reading.

Specific Learning Disorder with Impairment in Mathematics (Dyscalculia)

What do we know about the mathematics type of SLD? It's a little hard to figure. People with dyscalculia have difficulty performing mathematical operations—counting, understanding mathematical concepts, and recognizing symbols, learning multiplication tables, performing operations as simple as addition or as complex as story problems—but we don't really know the cause. Perhaps it's part of a larger nonverbal learning disability, or a problem in making a connection between number sense and the representation of numbers.

Whatever the cause, about 5% of schoolchildren are affected. Of course, you won't identify it in very young children. Although it's been shown that even babies have number sense, this condition cannot rear its head until the age at which children are expected to start doing math—sometimes in kindergarten, but more usually by the beginning of second grade.

Gerstmann's syndrome is a collection of symptoms that results from a stroke or other damage to the left parietal lobe of the brain in the region of the angular gyrus. It comprises four main disabilities: writing clearly (agraphia or dysgraphia), understanding the rules for calculation (dyscalculia), telling left from right, and distinguishing fingers on the hand (finger agnosia). In addition, many adults have aphasia.

The syndrome is sometimes reported in children, for whom the cause is unknown; some kids with Gerstmann's syndrome are otherwise quite bright. It is usually identified when a child starts school. Besides the four main symptoms, many children also have dyslexia and cannot copy simple drawings—a disability called *constructional apraxia*.

Specific Learning Disorder with Impairment in Written Expression

Patients with the written expression form of SLD have problems with grammar, punctuation, spelling, and developing their ideas in writing. Children have problems translating information from oral/auditory form to visual/written form; what they write may be too simple, too brief, or too hard to follow. Some have trouble generating new ideas. Note that though handwriting may be indecipherable, you wouldn't make this diagnosis when poor penmanship is the *only* problem.

SLD written expression doesn't usually appear until second grade or later—well after the typical onset of SLD in reading—as writing demands increase. SLD written expression can be due to troubles with working memory (there's a problem with the organization of what the child is trying to say). The diagnosis is generally not appropriate if the patient is poorly coordinated, as in developmental coordination disorder. Perhaps 10% of school-age children are affected; the condition is strongly familial.

Essential Features of **Specific Learning Disorder**

Despite targeted interventions, the patient has problems with reading, writing, or arithmetic, *to wit:*

- Reading is slow or requires inordinate effort, or the patient has marked difficulty grasping the meaning.
- The patient has trouble with writing content (not the mechanics): There are gram-

matical errors, ideas are expressed in an unclear manner or are poorly organized, or spelling is unusually "creative."

The patient experiences unusual difficulty with math facts, calculation, or mathematical reasoning.

Whichever skill is affected, standardized tests reveal scores markedly less than expected for age.

The Fine Print

School records of impairment can be used instead of testing for someone 17+ years of age.

The D's: • Duration and demographics (beginning in early school years, though full manifestation may come only when demands exceed the person's abilities; lasts at least 6 months) • Disability (social, academic, occupational) • Differential diagnosis (**physical disorders** such as **vision** or **hearing impairment,** or motor performance; **intellectual developmental disorder;** ADHD; extrinsic factors such as **lack of ability in the language being used in school, lack of educational opportunity, poverty**)

Coding Notes

F81.0 With impairment in reading. Specify word reading accuracy, reading rate or fluency, reading comprehension.

F81.2 With impairment in mathematics. Specify number sense, memorization of arithmetic facts, accurate or fluent calculation, accurate math reasoning.

F81.81 With impairment in written expression. Specify spelling accuracy, grammar and punctuation accuracy, clarity or organization of written expression.

Specify severity for each affected discipline (with subsets) as a group:

Mild. There are some problems in a skill or two, but (often with support and accommodation, especially in school) the patient can compensate well enough to succeed.

Moderate. Difficulties are serious enough to require specialized education; accommodation and support may also be needed at school, work, and home.

Severe. Critical problems will be difficult to overcome without intensive remediation throughout the years in school. Even extensive support services may not be adequate for success.

F88 Other Specified Neurodevelopmental Disorder

Use this category for those patients who have a disorder that appears to begin before adulthood and is not better defined elsewhere, but you can specify a reason. Here are two:

Neurodevelopmental disorder associated with ingestion of lead

Neurodevelopmental disorder associated with prenatal alcohol exposure. Neurodevelopmental disorder associated with prenatal alcohol exposure is the formal name for *fetal alcohol syndrome*, which carries with it a number of developmental disabilities as well as a variety of physical (especially facial) features.

F89 Unspecified Neurodevelopmental Disorder

Use unspecified neurodevelopmental disorder when full criteria are not met or when you lack adequate information.

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