Review of Child and Adolescent Psychiatry

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Abstract: This article covers the pertinent features of the psychiatric evaluation and treatment of children and adolescents. It is not a comprehensive review of child and adolescent psychiatry. Instead, the article focuses on significant issues that clinicians trained in adult psychiatry might face when treating younger patients, particularly in disruptive behavior disorders, mood disorders, eating disorders, developmental disorders, and anxiety disorders.

The lives of children and adolescents are characterized by continual change, both internal (e.g., physiological, anatomical, and psychological changes) and external (e.g., changes in school, peers, and parenting practices). Each child is constantly trying to find his or her own equilibrium in the fluctuating circumstances of nature and nurture.

As in adult psychiatry, the main reference for evaluation and diagnosis in child and adolescent psychiatry is DSM-IV-TR. Most of the criteria for adults in the major psychopathologies are applicable to younger patients, although there are some exceptions, which are highlighted in the sections that follow. As noted above, an important principle to bear in mind when evaluating children and adolescents is the fluctuating circumstances of their lives. Behavior or signs or symptoms that are considered normal and acceptable at 4 years of age, for example, may be considered abnormal at 8 years and grossly abnormal at 12 years. Symptoms must be interpreted in the context of the child's age, culture, ethnicity, primary language, and intellectual level. The presence of comorbid disorders, considered the rule rather than the exception, is often a confounding and challenging aspect of diagnosis and treatment in children and adolescents.

Basic principles of evaluation and assessment

A psychiatric evaluation of a child or adolescent is conducted within a framework of biological, psychological, social, and spiritual factors. It may include some or all of the following (1–3):

1. A thorough, age-appropriate history from the child's primary caregivers (both parents whenever possible)
2. A focused and age-appropriate interview with the child, including an oral interview and, when appropriate, use of play and art as tools for evaluation
3. An age-appropriate mental status examination
4. An extensive review of school records and reports and of any available educational and neuropsychological testing
5. A review of any additional pertinent information that can be obtained from people closely involved in the child's life, such as his or her pediatrician, schoolteachers, and sports coaches
6. When appropriate, a review of information from legal protective agencies, such as the foster care system, child protective services, and the courts
7. A detailed developmental history, focusing on physical, social, and emotional developmental milestones and temperament

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CME Disclosure Statement

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8. A detailed review of presenting social skills, athletic abilities, hobbies, and interests
9. An examination of the family's genetic history
10. A safety assessment pertinent to the child's age and clinical presentation

This review focuses on five domains of psychopathology that may be seen frequently in children and adolescents presenting at a general or adult psychiatric practice:

1. Disruptive behavior disorders, including attention deficit hyperactivity disorder (ADHD), conduct disorder, and oppositional defiant disorder
2. Mood disorders, including major depression and bipolar disorder
3. Eating disorders, including anorexia nervosa and bulimia nervosa
4. Developmental disorders, including autistic spectrum disorders and mental retardation
5. Anxiety disorders, including generalized anxiety disorder, phobias, and obsessive-compulsive disorder

ATTENTION DEFICIT HYPERACTIVITY DISORDER

A diagnosis of ADHD is considered when developmentally inappropriate symptoms of inattention, hyperactivity, and impulsivity are present in two or more of a child's life settings. For a diagnosis, there must be significant impairment in functioning both at home and at school. DSM-IV-TR describes three subtypes of ADHD: combined type, in which criteria are met for both inattention and hyperactivity-impulsivity; predominantly inattentive type; and predominantly hyperactive-impulsive type (4, 5).

EPIDEMIOLOGY

The prevalence of ADHD is a matter of controversy, in part because of differences in the definitions used. The prevalence of ADHD as defined by DSM-IV-TR is in the range of 5%–10%, with a male-to-female ratio of about 3:1. Boys present more frequently with disruptive behavior, and girls are more likely to exhibit the inattentive subtype.

Comorbidity is common. Approximately 45% of youths with ADHD also have conduct disorder or oppositional defiant disorder, 25% have a comorbid anxiety disorder, and up to 20% have a substance use disorder (6, 7).

ETIOLOGY

Research has shown clearly that ADHD has a biological basis. Patients with ADHD appear to have a neuroanatomical deficit in the frontal and basal ganglia areas of the brain that is related to impairment in the dopamine and/or norepinephrine pathways. A relative deficit in frontal lobe volume and asymmetry of the caudate nucleus have been postulated as etiological factors associated with disturbed executive function. ADHD is thought to have a genetic basis. Estimates of the heritability of ADHD run up to 0.9, and twin studies suggest even higher rates. Research findings support the involvement of the dopamine transporter gene chromosome 5p15.3 and the dopamine receptor gene on chromosome 11p15.5. Important external etiological factors include head injury, prenatal insults such as maternal smoking and substance abuse during pregnancy, perinatal complications, and lead poisoning. In addition, specific genetic disorders, such as fragile X syndrome and neurofibromatosis, are associated with ADHD (6–8).

DIAGNOSIS AND TREATMENT

The DSM-IV-TR diagnosis of ADHD is based on clinical evaluation and the presence of six or more of nine symptoms of hyperactivity and six or more of nine symptoms of inattention or impulsiveness. Some of the symptoms must have been present before age 7 years, and some must be present in two or more settings. In boys, the majority of diagnoses are made by 4 years of age because of externalizing symptoms. In girls, because of a preponderance of inattentive symptoms, diagnosis tends to come later. Generally, clinical vigilance is needed to make the correct diagnosis in girls. Corroboration from teachers and other sources aside from the parents is required. The use of standard scales, such as the Conners Parent Rating Scale and the Conners Teacher Rating Scale, can assist not only in diagnosis but also in objectively monitoring the course of treatment (9).

Two main approaches are used in the treatment of ADHD: pharmacological, primarily with stimulant medications, and behavioral, primarily with cognitive behavior therapy and psychosocial interventions. Recent data from the National Institute of Mental Health's Multimodal Treatment of ADHD (MTA) trials indicate that use of stimulants (typically methylphenidate) works best in treating pure ADHD and that behavioral interventions with or without stimulants work best in treating ADHD accompanied by comorbid disorders.

Psychostimulants have remained the main arm of pharmacological treatment over the past five

decades. These agents include methylphenidate, which has been approved by the Food and Drug Administration (FDA) for use in patients aged 6 years and up, and amphetamine salts, which have FDA approval for use in patients aged 3 years and up. Both agents are available in various forms, including in rapid-release and extended-release formulations.

The use of stimulants is backed by evidence from more than 170 randomized controlled trials with nearly 6,000 patients, in which an efficacious response was seen in 65%–70% of patients, compared with 5%–30% in the placebo groups. Although the evidence thus far covers only short-term benefits, ongoing large randomized controlled trials, such as the MTA trials, are expected to shed light on the long-term utility of stimulant treatment. The extended-release forms of methylphenidate and mixed amphetamine salts have been favored in recent years. Pemoline, another stimulant, is used sparingly because of the risk of hepatotoxic effects.

Atomoxetine, a selective norepinephrine reuptake inhibitor, is a nonstimulant agent that has been shown in a variety of placebo-controlled studies to be efficacious in treating ADHD. It received FDA approval for use in children aged 6 years and up, and it is now considered, along with stimulants, a first-line agent for ADHD. Its effect size is around 0.5, compared with 0.7 for stimulants. Careful monitoring of weight, height, emergence of aggression, sleep loss, appetite loss, and possible abuse of the drug is essential.

Antidepressants (notably tricyclics and bupropion) and alpha-adrenergic agonists (such as clonidine and guanfacine) are considered clinically useful alternatives when treatment with stimulants fails or is accompanied by unacceptable side effects.

Two psychosocial interventions have an evidence base for efficacy in the treatment of ADHD: behavioral parent training and behavioral interventions in the classroom setting. Both are based on positive reinforcement, stimulus control, extinction, and appropriate consequences for deviant behavior.

Limited data are available to support the use of alternative regimens, such as dietary restrictions, biofeedback, sensory integrative training, vision training, chiropractic manipulations, music therapy, and herbal regimens (4, 9–11).

PROGNOSIS

There is evidence that ADHD persists into adulthood, and current studies indicate that some 50% of patients continue to have troublesome symptoms after the age of 18 years. In these patients, hyperactive symptoms often diminish while inattentive/impulsive symptoms remain. Use of stimulants is associated with less polysubstance and alcohol use and may act as a protective factor against substance abuse (1–3).

CONDUCT DISORDER

Serious violation of the basic rights of others is a key diagnostic feature of conduct disorder. DSM-IV-TR defines subtypes on the basis of age at onset: in the childhood-onset type, at least one criterion of antisocial or abnormal behavior is met before the age of 10 years, and in the adolescent-onset type, none of the criteria are met before the age of 10 years. The childhood-onset type, usually seen in male patients, is associated with more physical aggression and with comorbid ADHD. The risk of adult antisocial personality disorder is high among children with this type, and comorbid ADHD is associated with poor treatment outcomes and a poor long-term course. The adolescent-onset type, which is the predominant type in females who have conduct disorder, has a lower association with aggression and is associated with better treatment outcomes and a better prognosis.

School truancy, fire setting, cruelty to animals, early sexual behavior, sexually transmitted diseases, accidents, gang fights, smoking, drinking, and drug abuse are all specific risks among youths who have conduct disorder.

The incidence of conduct disorder ranges from 1% to 10%, with a male-to-female ratio of about 4:1. The etiology of the disorder is multifactorial, with socioeconomic, cultural, family-dynamics, and genetic factors. Data suggest that environmental factors have a greater role than genetic factors.

Treatment of conduct disorder requires a comprehensive biopsychosocial evaluation and appropriate targeting of symptoms in a broad-based, comprehensive treatment approach. Although few treatment strategies have been verified in studies, those thought to be effective include appropriate treatment of comorbid conditions (such as ADHD, oppositional defiant disorder, and mood disorders), family interventions, social support, behavior modification, and, when necessary, legal sanctions to address rule-breaking. Pharmacotherapy often has a role as well. Data from trials of psychostimulants (usually methylphenidate), lithium, and divalproex sodium support the use of these agents in treating the symptoms of conduct disorder, independent of comorbid ADHD and mood disorders (12–15). This multipronged treatment must be delivered in multiple treatment settings.

OPPOSITIONAL DEFIANT DISORDER

Oppositional defiant disorder presents with disruptive behaviors in at least one setting, typically with an early and gradual onset. Symptoms are argumentativeness, disobedience, or defiant behaviors other than serious violations of the rights of others. A DSM-IV-TR diagnosis requires that a pattern of negativistic, hostile, disobedient, defiant behavior be present for at least 6 months, with at least four of eight negative behaviors occurring more frequently than in other children at a comparable developmental level.

Epidemiological data indicate that oppositional defiant disorder has a prevalence in the range of 3%–15% and a predominance in males. Some major causes of oppositional defiant disorder are inconsistent parenting in terms of discipline and structured limit setting, poor role modeling, and low availability for emotional support. Oppositional defiant disorder is frequently a precursor to conduct disorder.

Treatment requires a multimodal approach on the same pattern as treatment of conduct disorder. Behavior modification with positive reinforcement, appropriate time-outs, limit setting, alleviation of power struggles, and specific targeting of oppositional behavior are the foundation of treatment. Treatment of comorbid disorders, such as ADHD, anxiety, and depression, can also alleviate some of the oppositional defiant symptoms (15, 16).

MAJOR DEPRESSIVE DISORDER

Major depressive disorder in children and adolescents is a chronic, relapsing, and disabling disease. It frequently presents with a set of symptoms that differs from the classic adult symptoms of depression. Rather than having true feelings of sadness, children frequently present with lack of joy, boredom, withdrawal, irritability, falling grades at school, and, in some cases, acting out with aggressive behavior.

EPIDEMIOLOGY AND CLINICAL COURSE

The prevalence of depression in children is in the range of 1%–2% during the preadolescent years and 5%–6% during adolescence. At any given time, 1 in 20 youths suffer from depression. The ratio of girls to boys is 1:1 during childhood, and then it increases to 2:1 in adolescence (17). When the family history includes a past depression in one or both parents, a child has a significantly higher risk of developing depression.

An episode of depression in a child lasts 8 to 13 months on average, and the recovery rate is 90% (5). In adolescents, episodes last 3 to 9 months on average, with recovery rates ranging from 50% to 90%. Relapse rates in children range from 30% to 70%, depending on length of follow-up. Among adolescents, 40% relapse in 2 years and 70% in 5 years (18, 19). First-episode preadolescent depression can be a harbinger of bipolar illness, with about 20% developing bipolar disorder (20).

Suicide is an important risk factor associated with depression. Boys attempt suicide less often than girls but are more likely to complete suicide (21). Risk factors for suicide and depression include substance abuse, impulsivity, aggression, a history of suicide attempts, a family history of suicide, firearms in the home or access to firearms, physical or sexual abuse, homosexuality, and being sexually active. In a recent study of 100,000 high school students, about 20% acknowledged having suicidal ideation during the previous year (22). Another study reported that 2.9 per 100,000 girls and 14.6 per 100,000 boys attempted suicide requiring medical treatment (23). Assessment of suicidality is an important part of the workup for depression in a child or adolescent. It is encouraging that there was a significant decline in suicide rates, from 6.2 to 4.6 per 100,000 population, in the 10- to 19-year-old age group between 1992 and 2001 (24).

EVALUATION AND TREATMENT

It is important to exclude some common medical conditions that can mimic depression, such as thyroid disorders, anemia, and infectious mononucleosis. A detailed and thorough family history should be taken, especially in preadolescent depressed youths, to explore the possibility of a family history of mania. Any history of suicide in the family should be thoroughly explored in the evaluation process as well. Screening and evaluation of comorbid symptoms of anxiety, ADHD, learning disability, and substance use disorders in adolescents is important. In gathering information, the clinician should bear in mind that the youth will relate internal states better and the parents will give a better description of external or behavioral symptoms. The use of clinician-based diagnostic rating scales and self-reported, parent-reported, and clinician-based clinical scales during treatment is helpful in overall management (25).

Several key steps should be taken early in the management of depression in children and adolescents. Providing psychoeducation about depression, to both the youth and the parents, is essential. Gauging the youth's sense of helplessness and hopelessness is also important, with a view to preventing self-harm and acting-out behaviors. When appropriate, a no-suicide pact can be made with

the youth, with clear direction about whom to contact when the patient is in need. Any firearms in the home should be removed (22).

Two main approaches are used in the treatment of depression: psychotherapy and pharmacotherapy with antidepressants. Both are supported by evidence from clinical trials, and ongoing research continues to clarify their utility and efficacy. Cognitive behavior therapy, family therapy, and interpersonal psychotherapy have been shown to be efficacious. Cognitive behavior therapy in adolescents, lasting 3–4 months with up to 16 sessions, has been shown to be more beneficial than other forms of therapy in treating adolescent depression. Its benefit in very young children has not been established. Cognitive behavior therapy is focused on problem solving, amelioration of self-defeating and dysfunctional thought processes, and management of interpersonal skills. Individual and group-based cognitive behavior therapy have both been proven beneficial, and trials are under way to evaluate the efficacy of interpersonal psychotherapy in adolescents. In some cases psychotherapy must be continued at length to prevent early relapse.

Selective serotonin reuptake inhibitors (SSRIs)—fluoxetine, sertraline, and citalopram—have proven efficacy in the treatment of pediatric depression in randomized controlled trials (26–29), with an overall response rate of 60%–65% and a favorable side effect profile. Currently fluoxetine is the only medication that has FDA approval for treatment of depression in children aged 7–18 years. The starting dose of an SSRI is approximately 5 mg fluoxetine-equivalents for 5–7 days, although a lower dosage may be used to alleviate any initial side effects. The dosage is then titrated to 10–20 mg fluoxetine-equivalents over 2–4 weeks. It generally takes about 6 weeks for any benefit to become apparent, and in some patients it can take up to 10 weeks. Children and adolescents generally require higher dosages and longer courses of initial treatment than adults before any benefit shows. Tricyclic antidepressants have not been shown to be superior to placebo in any of the clinical trials conducted thus far, and hence they have no role in the treatment of pediatric depression (30).

RECENT CONTROVERSY

Pharmacotherapy for depression in children and adolescents is currently the subject of a highly controversial debate (31, 32). Concerns have been expressed around the world about the use of SSRIs, and warnings have been issued by regulatory agencies about the potential risk of suicidality. In a comparison study of first-time exposure to one of two SSRIs (fluoxetine and paroxetine) and two tricyclics (amitriptyline and dothiepin) in patients undergoing a first episode of depression accompanied by nonfatal suicidal behavior or ideation, an increased risk of suicidality was noted during the first month after initiation of antidepressant therapy, and particularly during the first 10 days (33).

In the United Kingdom, the Medicines and Healthcare Products Regulatory Agency has placed restrictions on the use of all SSRIs except fluoxetine in the pediatric population. Similar warnings have been issued in the United States, initially with an emphasis on the risks associated with paroxetine and venlafaxine, and in September 2004 an FDA advisory panel recommended that a "black box" warning about pediatric suicidality be included with all antidepressant medications.

Clearly, increased vigilance and close follow-up monitoring are required in the initial phase of pharmacotherapy for children and adolescents with depression. In our pediatric psychopharmacology clinic, among the measures we use are a weekly objective assessment of depressive symptoms via telephone and faxed weekly feedback from the parents or caregivers. In selected cases a quick follow-up appointment is made within the first 15 days of initiating treatment with an SSRI.

BIPOLAR DISORDER

Bipolar disorder is a controversial diagnosis, and its exact clinical characteristics are subject to significant debate (34–45). The incidence of bipolar disorder is not known, but its occurrence in children and adolescents is now beyond doubt (34–38). Patients with bipolar disorder usually present with significant irritability, extreme temper tantrums that do not resolve within 30 minutes, hyperactivity, severe mood symptoms (sadness alternating with euphoria), and affective storms. The disorder typically has an unremitting chronic course (34, 35, 38, 40). In older adolescents, the classic signs and symptoms of adult mania are usually seen. Prepubertal depression, a family history of bipolar illness, and an immediate response to antidepressant medication (manic switch after starting pharmacotherapy for depression) are some significant clinical markers for diagnosis. Signs and symptoms overlap with those of ADHD, and some youths with a diagnosis of ADHD may develop full-blown bipolar disorder later in life (34, 35, 42, 43, 45).

The field has struggled with the phenomenology of bipolar disorder, and few guidelines have been formulated for pharmacological treatment, particularly in children and adolescents. Controlled studies with small samples have provided data

supporting the efficacy of valproate, lithium, and carbamazepine. Open-label studies and cases studies have shown efficacy for atypical antipsychotic medications, including risperidone, olanzapine, and aripiprazole. All of these agents are increasingly being used in clinical practice with children and adolescents (34–40).

EATING DISORDERS

Eating disorders are common, affecting some 5 million Americans, yet they present unique challenges in diagnosis and treatment. Symptoms may be delayed and ambiguous, and patients often hide symptoms and refuse treatment in a variety of settings, which often results in significant medical deterioration and even death. Diagnosis of an eating disorder often requires clinical acumen and a high index of suspicion.

The etiology of eating disorders includes genetic, sociocultural, neurochemical, and psychodevelopmental factors. Certain medical conditions, such as type 1 diabetes and inflammatory bowel diseases, are associated with a higher incidence of eating disorders (46–47).

ANOREXIA NERVOSA

The diagnostic criteria for anorexia nervosa are a body weight maintained at a level less than 85% of normal weight for age and height, an intense fear of becoming fat, a disturbed experience of one's body weight or shape, and amenorrhea for at least three consecutive menstrual cycles (46–48). A pathological reduction in body weight accompanied by a lack of insight into the weight loss is the cardinal sign of this disorder. DSM-IV-TR specifies two types of anorexia nervosa. The restricting type is characterized by strict dieting, fasting, or excessive exercise, and in postmenarcheal females it presents with cessation of menstruation. In the binge-eating/purging type, enormous intake of food is followed by vomiting or use of laxatives or others means of purging (46, 47).

Anorexia nervosa is mostly seen in women, with female-to-male ratio of 9:1. The incidence is about 3% among women in adolescence and young adulthood; young women aged 16–24 years are a high-risk group. There is some indication of a rise in incidence among males (46–49).

The etiology of anorexia nervosa is not known and is considered multifactorial, with psychological and genetic components. Family conflict and the level and appropriateness of communication are important. Also, among first-degree relatives of patients with anorexia nervosa, elevated rates of eating disorders are seen. Although anorexia nervosa is mostly seen in industrialized societies, its incidence is on the rise in the metropolitan populations of developing countries.

Anorexia nervosa presents important challenges in medical management, among them dehydration, hypocalcemia, leukopenia, hypothermia, abnormal liver function tests, abnormal thyroid function, and hyponatremia. Thus, a team approach is required that includes monitoring and treatment of medical issues. The elements of treatment are stabilization of the patient's weight, identification and resolution of psychosocial stressors, and development of healthy eating habits along with weight maintenance. Anorexia nervosa frequently requires hospitalization and treatment of bradycardia, hypertension, syncope, and cardiac arrhythmias; prolongation in the QT interval is the main indication for hospital treatment and management (1–3, 46, 48, 50, 51). The disorder has a relatively high mortality rate at 0.56% per year (49).

In outpatient management, the treatment target is a weight gain of about 1 pound per week. Family therapy and psychoeducation for family members facilitates treatment, especially when the patient's symptoms began before the age of 18 years. The cornerstone of treatment is behavior modification therapy to have the patient focus on achieving a healthy weight, decrease medical risk factors, and address emotional issues. Mood and anxiety symptoms are managed with SSRIs and benzodiazepines. Pharmacological agents have limited efficacy in the treatment of anorexia nervosa itself, however (46–51).

BULIMIA NERVOSA

Bulimia nervosa is characterized by repeated episodes of uncontrollable eating of huge amounts of food in a short time, usually followed by an attempt to compensate for the excessive caloric intake. Compensatory behavior includes mechanically or chemically induced vomiting, strict fasting, and use of laxatives, enemas, diuretics, and even thyroid medications. For a diagnosis, DSM-IV-TR criteria require that the binge eating and compensatory behavior occur twice a week for at least 3 months.

Like anorexia nervosa, bulimia nervosa occurs predominantly in females, and 50% of patients develop the disorder before the age of 18 years. Treatment includes elimination of the binge eating cycle, establishment of healthy eating habits, and skill training in emotional problem solving. Cognitive behavior therapy to address the sense of despair that is linked to binge eating is a corner-

stone of treatment. Use of tricyclic antidepressants (desipramine, up to 300 mg per day, and imipramine, up to 300 mg per day) is supported by clinical data, although SSRIs have become the mainstay of pharmacotherapy in recent years. Fluoxetine (up to 60 mg per day) is the only drug that has FDA approval for treating adults with bulimia nervosa. Unlike in anorexia nervosa, which is not amenable to pharmacotherapy, treatment of bulimia nervosa with SSRIs is associated with a response rate of about 40% (46, 47, 50).

MENTAL RETARDATION, AUTISTIC SPECTRUM DISORDERS, AND FRAGILE X SYNDROME

MENTAL RETARDATION

The incidence of mental retardation is about 1% in the general population. Mental retardation is frequently seen in adult psychiatric practices and is usually associated with psychiatric comorbidity, which is frequently missed. For a diagnosis of mental retardation, the patient must have an IQ of approximately 70 or below before the age of 18 years. Table 1 lists the clinical features of mental retardation.

Mental retardation is best managed by applying a comprehensive biopsychosocial model. If comorbid psychiatric conditions, such as ADHD, anxiety disorders, and mood disorders, are present, they should be treated according to established guidelines. There is some evidence suggesting that methylphenidate is effective in ameliorating ADHD symptoms and SSRIs in ameliorating anxiety and depressive symptoms in this population. Treatment should also include a variety of nonpharmacological interventions, such as special education, speech and language instruction, and vocational training (52, 53).

AUTISTIC SPECTRUM DISORDERS

Autistic spectrum disorders are characterized by impairment in social communication and social interactions and a restricted range of interests, along with repetitive stereotypic movements, repetitive behavior, and deviant mannerisms. Patients with these disorders frequently present with sen-

Table 1. Clinical Features of Mental Retardation

	Mild	Moderate	Severe	Profound
IQ	50–55 to about 70	35–40 to 50–55	20–25 to 35–40	Below 20–25
Percentage of mentally retarded population	85	10	4	1
Predominant socioeconomic class	Low	Less low	Even distribution	Even distribution
Academic level achieved by adulthood	6th grade	2nd grade	Below 1st grade	Below 1st grade
Education	Educable	Trainable (self-care)	Simple skills	—
Residence	Community	Sheltered	Mostly living in highly structured and closely supervised settings	Mostly living in highly structured and closely supervised settings
Economic	Makes change	Makes small change	Can use coin machines	Dependent on others for money management
	Holds a job	Usually able to manage pocket money	Can take notes to stores when shopping	
	Budget planning with effort or assistance			

Source: Reprinted with permission from Dulcan M, Martini R, Lake MB: Concise Guide to Child and Adolescent Psychiatry, 3rd ed. Washington, DC, American Psychiatric Press, 2000, table 6.1

sory problems and hypersensitivity to sensory stimuli. The incidence of autistic spectrum disorders is on the rise, a trend that has been attributed to increased case finding, greater awareness of autism, and rediagnosis for the purpose of obtaining services. The incidence is thought to be between 6 and 10 per 1,000 children, and higher figures have been reported for pervasive developmental disorder not otherwise specified.

The average age at the time a diagnosis of an autistic spectrum disorder is made is around 3 to 4 years. About 30% of children diagnosed show normal development at first, followed by regression at some time between 15 and 21 months of age. Several organic causes of autism have been identified, namely, prenatal rubella infection, postnatal encephalitis, and other infections; genetic and metabolic disorders, such as phenylketonuria, tuberous sclerosis, and fragile X syndrome; and in utero exposure to certain medications, such as anticonvulsants. However, these etiological factors account for a small proportion of autistic individuals (about 10%); for the majority of patients with autism, the cause is not known.

Autism is considered a genetic disorder; the incidence among identical monozygotic twins is 65%–70%. A higher concordance has been noted for autism among monozygotic twins than among dizygotic twins. The incidence in siblings is between 4% and 6%. Suspect genes have been identified on chromosomes 15, 2q, 7q, 16p, and 19p. The incidence of neurological disorders (such as seizures [25%] and macrocephaly [30%]) is also higher throughout life among patients with autism.

The majority of cases of autism are characterized by acquisition and then loss of language. Most autistic children show signs and symptoms early. With an emphasis in recent years on early diagnosis and intervention, screening instruments have been developed, such as the Checklist of Autism in Toddlers (54), which has high sensitivity but low specificity. High-functioning autistic phenotypes, such as Asperger's disorder, may present later, after the child enters school. Asperger's disorder, which overlaps with high-functioning autism, is characterized by preservation of language, continued social deficits, and occasional stereotypic abnormal interests (54–63).

Assessment and treatment

No biological tests have been developed for autistic spectrum disorders. The vast majority of diagnoses are made through detailed clinical evaluation. The Autism Diagnostic Inventory (57) and the Autism Diagnostic Observational Scale (57), are considered definitive tools for diagnosis and are used mainly in the research setting. These instruments are based on a detailed history from the parents, including the child's developmental history, and observation of the child in play settings to evaluate any social deficits and lack of affective reciprocity, social communication, and theory of mind. Early diagnosis and prompt early intervention remain the cornerstone of treatment.

Language disorders, mental retardation, and other overlapping, specific learning disorders as well as reactive attachment disorder and rare genetic disorders such as Rett's disorder sometimes confound a diagnosis of autism. Approximately 75% of children with autism have mental retardation, but 25% have normal or, in some cases, high intelligence. The rate of other psychiatric disorders in children with autism has been estimated to be as high as 20%.

Treatment usually occurs in an educational setting and involves a tailored set of services, which may include applied behavioral analysis and behavior intervention, speech and language assessment, and, later, therapy that is focused on improving communication skills and ameliorating stereotypic behaviors, sensory integration therapy for sensory issues, use of "floor time" techniques to ameliorate social difficulties, and pharmacological interventions to address specific self-injurious behaviors, aggression, obsessive-compulsive symptoms, and anxiety. In a variety of open-label trials, use of an SSRI, such as fluoxetine, has shown some benefit, with a response rate of about 50%. For severe and dangerous autistic spectrum behaviors, such as self-injurious behavior and aggression, risperidone has been proven efficacious in trials conducted through the Research Units on Pediatric Psychopharmacology (RUPP) network.

Treatment is not limited to the autistic child. Parents and families need counseling and respite on a long-term basis to cope with the stress of bringing up a child with autism (58, 59).

FRAGILE X SYNDROME

Fragile X syndrome is the most common form of genetically inherited mental retardation, with an incidence of 1 in 1,250 males and 1 in 2,500 females. It is characterized by prognathism, macrocephaly, and, in boys, macroorchidism. Other physical signs include flat feet, smooth skin, a high, arched palate, and hyperextensible joints. Children with fragile X syndrome commonly have sleep abnormalities, seizures, infections, hernia, strabismus, and scoliosis. They frequently exhibit hand flapping and gaze aversion. Boys usually have a low IQ, but girls, because they have two X chromosomes, may have normal intelligence with

learning disorders. ADHD symptoms are common in both sexes. Anxiety disorders may be present, especially in girls, and are manifested as social anxiety, isolation, shyness, poor eye contact, social oddness, and specific speech and language deficits. Approximately 20% of patients with fragile X syndrome meet the criteria for autistic spectrum disorder. Other psychiatric disorders have an elevated incidence in patients with this syndrome. Treatment is based on alleviating the presenting deviant and abnormal symptoms (64, 65).

ANXIETY DISORDERS

Anxiety disorders are the most commonly occurring childhood psychiatric disorders, with a lifetime prevalence of 20% in children and adolescents. There is clear evidence that anxiety disorders have an early, preadulthood onset with persistence into adulthood. One of the challenges of treating anxiety disorders is to have a clear understanding of the normal fears that occur in the different stages of life.

GENERALIZED ANXIETY DISORDER

Generalized anxiety disorder is manifested mainly as excessive worry that is prolonged, intense, and uncontrollable, combined with a general sense of perfectionism. A DSM-IV-TR diagnosis requires that the worries last at least 6 months and occur both at home and at school. Children with generalized anxiety disorder have a pessimistic demeanor, are avoidant and shy, and have frequent self-doubts and worries. They have been described as being in a constant state of fright, fight, or flight reactions. Thumb sucking that is age-inappropriate, nail biting, and scab picking or hair pulling are frequently seen. Children sometimes report their anxiety symptoms much more accurately than their parents, other caregivers, or teachers do. The Screen for Child Anxiety Related Emotional Disorders, the Multidimensional Anxiety Scale for Children, and the Pediatric Anxiety Rating Scale are frequently used in clinical practice for objective assessment and treatment (66).

The incidence of generalized anxiety disorder has been reported in various studies to be in the range of 3%–14%. The disorder is predominant in females in adolescence. It is frequently comorbid with mood disorders and with ADHD (66, 67). Generalized anxiety disorder appears to have a strong genetic component, and frequently there is a parental history of the disorder.

The treatment of choice, with strong support from clinical trials, is cognitive behavior therapy. Therapy has four major components: recognizing anxious feelings and physical reactions to anxiety; identifying and modifying negative self statements; generating strategies to cope with anxiety-provoking situations; and providing rewards for successful attempts to cope (66). Relaxation training, with or without imagery, has also been used successfully.

Pharmacological management of generalized anxiety disorder is based on the use of benzodiazepines, tricyclics, SSRIs, and monoamine oxidase inhibitors. Open trials with fluoxetine and buspirone (66, 68–70) have shown efficacy in the pediatric population with the drugs administered at half the adult dosages. The SSRI sertraline, in lower dosages, has FDA approval for use in the treatment of generalized anxiety disorder in children, and there is clinical evidence that fluvoxamine is efficacious. Paroxetine and venlafaxine are being used less with children and adolescents now, after cautions were issued by the FDA in response to concerns about the potential for thoughts of self-harm (67, 68, 71, 72).

SOCIAL PHOBIA (SOCIAL ANXIETY DISORDER) AND SPECIFIC PHOBIA

The DSM-IV-TR criteria for a diagnosis of social anxiety disorder in children are the same as for adults. The disorder is characterized by specific fears of social encounters and public performances. The fears are persistent and irrational, they are not normal for the child's age, and they cause functional impairment; for diagnosis, they must have been present for at least 6 months. The rate of social anxiety disorder is about 1%, although the lifetime rate is about 13% in adolescent samples. Rates for specific phobias are around 5%.

The etiology of phobias is multifactorial, with components in genetics, inheritance, temperament, family dynamics, and modeling. The onset of specific phobias can sometimes occur during growth and development, and their severity can wax and wane over time. Most phobias remit, but a small proportion persist, requiring treatment.

Evaluation and diagnosis require a thorough history and close observation with an emphasis on the expression of anxiety symptoms. In younger children, play or art work can be used for this purpose. In very young children, symptoms are expressed by freezing, crying, temper tantrums, and clinging, whereas older children and adolescents are able to verbalize the inner state of fear connected with a situation.

Treatment of phobias requires a tailored approach. The evidence is strongest for the efficacy of cognitive behavior therapy. The cornerstone of treatment is systemic desensitization through expo-

sure and response prevention, along with the provision of coping skills and problem-solving skills in a variety of situations. Real-time imagery is occasionally employed. The SSRIs fluoxetine and sertraline have been found to be efficacious in treating social anxiety disorder, and fluvoxamine has supportive data in the treatment of social phobia, especially. However, it is important to bear in mind that the primary arm of treatment is cognitive behavior therapy focusing on relaxation, desensitization, gradual exposure, modeling, coping skills, and reinforcement. The therapy can be provided in individual or group format, and it is frequently focused on addressing distorted beliefs (72, 73).

POSTTRAUMATIC STRESS DISORDER (PTSD)

The diagnostic criteria for PTSD in children differ somewhat from those for adults. Children present with more distractibility, more perceptual distortions, more avoidance (generally auditory and tactile), and greater separation issues. Children's reexperiencing of traumatic events often differs from that of adults. They may have nightmares with content about the events or related thematically to the events, and they may reenact traumatic events in play, as opposed to experiencing flashbacks. Prevalences of PTSD have been reported in the range of 0.5% to 14% in a variety of clinical settings.

PTSD can occur in a variety of circumstances. Whether PTSD symptoms develop depends on the manner, degree, and duration of exposure to trauma as well as the type of trauma. An important cause of PTSD is sexual or physical abuse during childhood, which have been clearly shown to be associated with lifetime psychopathology, especially in women. Even the death or serious illness of a loved one has been associated with PTSD in clinical samples.

In younger children the primary presentation might be reenactment of the trauma. A significant change in behavior accompanied by emotional lability, when these would not be expected for the child's age or developmental stage, should trigger suspicion of PTSD. Detailed questioning of both parents and child should follow. Younger children may be placed in a play setting to allow the clinician to observe any reenactment of a trauma.

The evidence base for treatment of PTSD is limited. The primary treatment strategy involves cognitive behavior therapy tailored to the specific trauma that caused the symptoms, often accompanied by relaxation and desensitization techniques. Pharmacotherapy may be used in combination with cognitive behavior therapy. SSRIs are the drug class of choice. As experience with fluoxetine and sertraline accumulates, the body of data supporting their efficacy has grown. Clonidine and beta-blockers are occasionally used in acute clinical settings.

OBSESSIVE-COMPULSIVE DISORDER (OCD)

OCD involves persistent, recurrent thoughts or impulsive images and behaviors or mental acts, which usually accompany stress. Children and adolescents with OCD might have obsessions or compulsions or both. Many children do not have insight into the behavior.

OCD is not uncommon; rates of 1%–4% have been reported. Onset is generally earlier in boys than in girls, although by adolescence the prevalence is equal between the sexes. In one recent study of OCD in adults, the symptoms that had their onset in adulthood were first manifested in childhood (1–3, 66).

The etiology of OCD has to do with disturbances in serotonin equilibrium in specific areas of the brain. Abnormal circuitry in the frontal striatal and thalamic areas of the brain has been proposed. Recent studies also support genetic and infectious causes of OCD. For example, Swedo et al. have described "pediatric autoimmune neuropsychiatric disorders associated with streptococcal infection" (PANDAS) in a small minority of children who have symptoms of OCD with and without tics (74).

OCD in children and adolescents is considered a chronic condition that waxes and wanes. The onset is usually gradual, although in cases of PANDAS it can be sudden; in these cases, patients have a positive throat culture and a high antistreptolysin O titer (74). The severity of obsessions, worries, and rituals in OCD generally varies over time. Comorbid disorders associated with OCD includes tics, trichotillomania, eating disorders, depression, ADHD, and oppositional defiant disorder.

OCD frequently presents with temper outbursts, academic difficulties, or altered eating patterns resulting from strict obsessions and rituals. Fear of contamination, fear of danger, compulsive and repetitive checking, frequent delays in doing homework, perfectionism, and excessive praying, counting, and touching are common symptoms of OCD. The Childhood Yale-Brown Obsessive Compulsive Scale is an important aid in diagnosis.

OCD is treated with cognitive behavior therapy and pharmacotherapy, frequently applied together. Cognitive behavior therapy is based on gradual exposure, response prevention, modeling, relaxation techniques, and habit-reversal and thought-stopping skills. Among pharmacological agents, SSRIs are the most commonly used. Use of sertraline, fluvoxamine, and fluoxetine in treating OCD has support from double-blind randomized con-

trolled trials, and all three have FDA approval for treating OCD in children (1–3, 66, 67).

PANIC DISORDER

Panic disorder is rare in children but does occur in adolescents. DSM-IV-TR diagnostic criteria are the same as for adults. The disorder has physiological and psychological features, and the two can occur spontaneously. Symptoms include hyperventilation, palpitations, shortness of breath, chest pains, dizziness, and out-of-body experience. Panic disorder can occur with or without agoraphobia.

The prevalence of panic disorder is not precisely known. Although the disorder is thought have a lifetime prevalence of 1%–2%, rates are notably higher in clinical samples. The etiology of panic disorder includes biological and psychological factors. Familial patterns have been noted, and twin studies point toward a genetic contribution. Modeling has also been proposed.

Adolescents with panic symptoms are generally well able to describe their experience in enough detail for a diagnosis to be made. In evaluating younger children, the history may reveal some symptoms, but an observation by a parent of a panic attack in a child can provide much more focused information.

Treatment includes cognitive behavior therapy, family therapy, and individual therapy, followed by a trial of an SSRI. Sertraline has FDA approval for use in treating panic disorder in children (1–3, 66).

CONCLUSION

The field of child and adolescent psychiatry is going through challenging times. Excitement and tremendous hope have accompanied the explosion in knowledge in genetics, child development, neuroimaging, and neuropsychology. At the same time, there is deep concern about the paucity of data on research-proven treatment strategies. It is hoped that we will be able, in the near future, to bridge the gap between evidence-based clinical treatment and research-proven efficacy.

DISCLOSURE OF UNAPPROVED OR INVESTIGATIONAL USE OF A PRODUCT

APA policy requires disclosure by CME authors of unapproved or investigational use of products discussed in CME programs. Off-label use of medications by individual physicians is permitted and common. Decisions about off-label use can be guided by the scientific literature and clinical experience. The majority of pediatric psychopharmacology is evidence based and does not have FDA approval for its use. In this article, only evidence-based pharmacological treatments, under the standards of national practice guidelines, are discussed.

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