Technology and Adolescent Mental Health

Megan A. Moreno
Ana Radovic
Editors

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Preface

In today's world, healthcare providers who see adolescent patients will undoubtedly encounter patients with mental health concerns. Anxiety and depression are common among adolescents and may present with physical, cognitive, or emotional symptoms. Providers who care for adolescents will also experience the encroachment of technology into their patient's lives and health, be it the patient who is distracted and texting during a clinical visit, the patient who asks questions about health information found via a common search engine like Google, or the patient who discloses that he is posting about depression on a popular blogging social media site like Tumblr. Given the overlap in mental health and technology for today's adolescents, this book seeks to inform and empower healthcare providers to take on the challenges and opportunities presented by the intersection of mental health and technology.

With this book's focus on adolescent mental health and technology, our goal was to provide salient information to a range of healthcare providers who may encounter these issues among their adolescent patients. These providers may include primary care providers such as pediatricians, family physicians, or internal medicine providers and specialists including in adolescent medicine and psychiatry. Adolescents also seek care from nurses, social workers, therapists, and counselors, in school-based as well as community-based settings. Providers such as nurse practitioners, physician assistants, and psychologists also provide care to adolescents across these clinical settings. These valuable providers may all be called upon to address mental health concerns among adolescent patients, and we hope this book will provide both familiar and new information to enhance clinical practice.

This book is organized using a public health framework. Thus, the early chapters focus on the epidemiology of mental health and on technology use by teens in health-related ways. Dr. Berman's chapter on adolescent mental health provides an overview of the key mental health conditions, including diagnosis and treatment, among adolescents. Dr. Colditz et al.'s chapter describes current trends and rationale for how and why adolescents use online sources of information for health. Dr. Evans describes ways in which patients with mental health concerns use technology such as the Internet differently compared with peers without mental health concerns.

In the second part of the book, authors dive into associations between the offline and online worlds that affect mental health, presenting both positive and negative outcomes. Dr. Ahrens and Allison Schimmel-Bristow illustrate key aspects of special populations to consider in the relationship between

mental health and technology use, including foster youth, disabled youth, and other teens at risk. Dr. Charmaraman et al. describe associations between mental health symptoms, social media use, and self-reported mental health, while Dr. Radovic et al. go into greater detail about social media use and display of depressive symptoms online. Drs. Selkie and Kota describe the phenomenon of cyberbullying and its impact on mental health. Dr. Cheever et al.'s chapter focused on multitasking illustrates how this approach to technology use can affect mental health, as well as other health and academic outcomes. This part also includes two chapters on technology-driven illnesses, including a chapter by Dr. Gentile et al. describing Internet Gaming Disorder, and one by Dr. Cheever et al. describing Problematic Internet Use.

The third part of the book focuses on technology use for the purposes of diagnosis or screening for, intervention, and treatment of mental health conditions. This includes Dr. Doryab's chapter on using technology to identify symptoms of mental illness and Dr. Adrian and Aaron Lyon's chapter discussing new approaches using machine learning to identify risk of suicide. In this part, we also highlight promising approaches to using technology to improve intervention and treatment for mental health concerns and illnesses. Dr. Myers and Jennifer McWilliams provide updates on telemental health. Dr. Santesteban-Echarri et al. describe social media interventions for improving mental health. Dr. Ranney illustrates the emerging role of texting in mental health interventions. Dr. Khan et al. describe promising online intervention approaches for mental health conditions. Drs. DeRosier and Thomas provide a delightful overview of games for mental health, and Dr. Lindheim and Harris describe innovations in mobile applications for mental health. And finally, we conclude with a chapter by Dr. Cash et al. describing organizations that have developed multi-tech approaches including online pages, social media platforms, and other components to present comprehensive programs using technology.

Throughout this book, we aim to provide the most recent, evidence-based approaches that are applicable to clinical practice. To maintain our focus on the application of the information in this book to clinical practice, each chapter includes a patient case illustrating key components of the chapter contents. While we recognize that technology moves quickly, it is our goal that the key approaches and adolescent health considerations described in this book will remain salient even as new platforms and websites emerge. Thus, providers can apply lessons from this read to future tech advances to understand their clinical implications.

Pittsburgh, PA — Ana Radovic
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Part III Use of Technology for Diagnosis, Intervention, and Treatment

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Part I

Epidemiology of Mental Health and Technology

1 An Overview of Adolescent Mental Health

Henry Berman

Overview

You arrive at your office one morning and see that your first patient is Danny, a 15-year-old boy, brought in by his mother.

> *Danny was referred by his pediatrician because of her concerns about changes in his behavior over the past several months. Danny had been a good student, but his grades are deteriorating, and he has recently been truant. He seems withdrawn to his parents and friends, and last week he quit the soccer team, which he had always enjoyed, after a fight with the coach.*

There are a number of diagnoses or conditions that could explain Danny's behavior, including anxiety, depression, ADHD, a history of abuse (domestic violence, sexual, bullying, etc.), disruptions at home, *or* Sex, Drugs, and Rock 'n' Roll, a phrase specialists in adolescent medicine often use to describe normal adolescent behavior. There are seldom hints from a physical examination or a blood test that point to a diagnosis in patients with this kind of presentation. Danny's clinician will need to gather most of the information he needs by interviewing him.

Interviewing Teens

It is not uncommon for teens to show up without an established diagnosis. Before clinicians begin to ask about onset, symptoms, previous history, family history, etc., they need to understand the world of that teen. The established approach to learning about that is the HEADSS interview.[1] HEADSS is the acronym for home, education, activities, drugs, sexual activities/issues, and suicidal ideation or behaviors/depression (see [1, 2] for information about the HEADSS interview and its usefulness).

There are three goals for the HEADSS interview. In order of importance, they are:

1. To establish a relationship with a patient. Teens do not expect an adult to take an interest in their lives and experiences. Just by asking such questions, and listening without judgment, a clinician can gain trust quickly. Trust is the essence of adolescent medicine—teens who trust their medical provider will answer questions honestly, and are more likely to adhere to recommended treatments [3].

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[1] The author of this chapter created the HEADS system as a way to obtain a "social history." Several years later, S for suicidal ideation and behaviors/depression was added, thus converting the approach to a psychosocial history.

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The HEADSS interview uses the same approach as a "cognitive interview," created to interview witnesses and victims. A succinct explanation for this approach is: "Rapport is essential and the interviewer, therefore, needs to be socially skilled in order to put the interviewee at their ease and give them license to tell their story in detail. The interviewer needs to be very attentive to what the interviewee is saying. This attentiveness and freedom from interruption seems to encourage interviewees to provide copious detail, apparently serving as affirmation that they are being taken seriously (in our research, incidents lasting minutes were recalled in interviews exceeding an hour)" [4].

2. To assess how well a teen is progressing in managing the journey from the end of childhood to beginning of adulthood, discussed in the last section of this chapter.
3. To identify risk factors and/or risky behaviors.

(With teens, one never knows what a simple question will elicit. Simon Clarke, an Australian specialist in adolescent medicine, had the following experience: "One nice youngster, who was 14, with severe learning difficulties, had a reading age of 7. He had spent 3 years in first class, 2 years in second and 2 years in third. When I asked, 'Did you burn your school down?' he replied, 'yes,' much to the surprise of his jailors") [5].

In addition, a complete HEADSS interview may yield a diagnosis that would not have been considered using a standard medical workup.

Case

JH is a 15-year-old boy who had been taken to the emergency department by ambulance several times because of seizures. The ED staff had not been able to determine the cause, so they referred JH to the pediatrics clinic for a comprehensive workup. The resident who assessed the patient could not find any condition that may have caused the seizures, so he asked for help from the clinic attending. HEADSS had been developed by then but had not been disseminated. The resident had not been taught the HEADSS interview; the attending, however, was familiar with that approach to interviewing.

Even though there did not seem to be any purpose in asking HEADSS questions of a patient with a seizure disorder, the attending physician felt this was the one thing he could do that the resident had not. To the question, "What grade are you in?" the patient responded "eighth grade." (A 15-year-old would generally be in ninth grade.) The most common reason for a student to be held back was poor attendance, so the physician asked, "How many days of school did you miss last year?" The patient replied, "I haven't been to school for a year." To the follow-up question "Why is that?" the patient answered "I am afraid to leave my apartment."

It was a small step for the physician to come to the conclusion that JH suffered from extreme anxiety and would have had severe panic attacks which, in turn, had caused hyperventilation, which lowers carbon dioxide (CO_2). Very low CO_2 can cause carpopedal spasms, which *appear* to be a seizure. By the time an ambulance brought JH to the ED, he had been breathing normally for long enough that all of his blood tests were normal. The correct diagnosis was made only because the question "What grade are you in?" is part of the HEADSS interview.

To determine the underlying cause or causes of behavior changes, clinicians need to understand not only the adolescent but also adolescence. They need to be able to sort out "normal" behaviors for this age group from concerns caused by life situations and also from problems that have a diagnosis and need further evaluation. This chapter discusses the likely causes of worrisome behaviors and provides information on each, including prevalence and the most effective treatments.

Common Mental Health Concerns in Adolescents

Anxiety Disorders

Background on Anxiety Disorders

These are among the most common of mental illnesses in teens; the NIH estimates a 25% lifetime prevalence in 13- to 18-year-olds. However, an NIMH study found that only 18% of adolescents with clinical anxiety ever receive treatment [6]. Identifying and managing adolescent anxiety can be challenging. Symptoms and the focus of anxiety are varied and are often misidentified in primary care as somatic complaints due to "normal" teenage stress. They frequently become manifest in early adolescence and can be incapacitating.

Diagnosing an Anxiety Disorder

The DSM-5 criteria for generalized anxiety disorder (GAD) state that the diagnosis requires the presence of excessive anxiety and worry about a variety of topics, events, or activities; in addition, worry occurs more often than not for at least 6 months and is clearly excessive.

Many individuals with GAD experience symptoms such as sweating, nausea, or diarrhea.

- The anxiety, worry, or associated symptoms make it hard to carry out day-to-day activities and responsibilities. They may cause problems in relationships, at school or at work, or in other important areas.
- These symptoms are unrelated to any other medical conditions and cannot be explained by the effect of substances, including a prescription medication, alcohol, or recreational drugs.
- These symptoms are not better explained by a different mental disorder.

The first two questions of the GAD-7 [44] (Generalized Anxiety Disorder, seven questions) serve as a screening for general anxiety. If the answers to the first two questions add up to three or more, then all seven questions should be asked. GAD-7 [44] is Chart 1.1 in Appendix.

A second validated tool for diagnosing anxiety in subjects 8 to 18 is Screening Children for Anxiety-Related Emotional Disorders (SCARED). Chart 1.2 in the Appendix includes a brief version, the SCARED-5, and the URL for the full SCARED. One advantage of the SCARED tool is that it provides a score for each of the five types of anxiety.

Why Would We Consider Anxiety as the Cause of Danny's Behaviors?

- He may have difficulty concentrating in class because he is afraid something awful might happen, leading to a falloff in his school performance.
- Perhaps he has begun to miss school because he has social anxiety. He is afraid that his teacher will call on him and he won't know the right answer, so the other students will make fun of him.
- Perhaps the coach criticized him for letting an opponent score, and he was so humiliated he quit the team.

Treating an Anxiety Disorder

Mild anxiety disorders that do not appear to be causing serious problems can be managed with support from a clinician, along with non-medication interventions. These include breathing exercises, muscle relaxation, therapeutic imaging, journaling, exercise, and involvement in art or music. Today, some of these modalities may be taught using technology. Websites and apps exist to support teaching breathing exercises and muscle relaxation. Journaling can happen both offline and online, and art and music are accessed in both tactile and virtual worlds. Another modality of treatment is biofeedback. Biofeedback harnesses the power of technology to visually show vital signs such as breathing and heart rate. Then, as a patient learns to relax, he or she can visualize the change in these vital signs in real time. A review of the literature found that "biofeedback of various modalities is effective for anxiety reduction" [7].

For patients who have moderate anxiety that is causing them some, but not severe, problems, cognitive behavioral therapy (CBT) is the best choice. For patients who are resistant to therapy, medication is *helpful*, while for patients with moderate-to-severe anxiety, medication is *necessary*. One study that included 488 children and

adolescents found that medication alone was more effective than CBT alone; the two together had an excellent success rate of 81% [8].

Patients who need medication are treated with an SSRI (selective serotonin reuptake inhibitor). (The FDA has approved sertraline (Zoloft) for the treatment of anxiety in teens. If it is not effective, or there are too many side effects, then clinicians generally "cross-taper" to a different SSRI.)

The DSM-5 describes five kinds of anxiety: general anxiety, separation anxiety, social anxiety, panic disorder, and phobias. Several of these—phobias in particular—respond well to desensitization. Other forms of anxiety are well treated by encouraging the teen to "avoid the avoidance," since avoiding the situation that causes anxiety makes it worse. Sometimes the level of fear or anxiety is reduced by pervasive avoidance behaviors. Panic attacks feature prominently within the anxiety disorders as a particular type of fear response. They are not limited to anxiety disorders and can be seen in other mental disorders as well.

School Refusal Behaviors

Case

WG, a senior in high school, was referred to the adolescent clinic by the gastroenterology clinic where he had been evaluated for nausea and vomiting that had caused him to miss school for the past month. Their doctors had done a series of tests, all of which were normal, and had sent him to the adolescent clinic in the hope that they could determine the cause of his symptoms. WG was asked to describe his experience; it was noteworthy that the symptoms occurred only on school days.

When asked when his symptoms had started, he replied "early July." And when asked had any particular event occurred before he had become sick, he said, "My father came home from work one day and beat up my mother so severely she was afraid she was going to die." His father subsequently spent some time in jail and was released with the requirement that he stay away from the house for several months and take a course in anger management.

His father returned to the home at the beginning of September, and WG said everything was fine now. But, no surprise, his mother was not fine. She worked evenings and slept at home during the day. Subconsciously, WG knew she was still in danger—and if he was home, she would be safe.

"School refusal behaviors" (previously called "school phobia" or "school avoidance") refer to a child-motivated refusal to attend school and/or difficulty remaining in classes for an entire day. Although it is not classified as one of the anxiety disorders, it is caused by the interaction of several of them, so is discussed here. The problem may manifest as lengthy absences from school, skipping classes during the day, being late to school, or misbehaving in the morning in an attempt to miss school. Some youths manage to attend school but do so with great dread and distress.

Extended school refusal behaviors can lead to serious short-term and long-term consequences if left unaddressed. These consequences include academic problems, social alienation, family conflict and stress, school dropout, delinquency, and occupational and marital problems in adulthood. School refusal is extraordinarily difficult to treat. Teens who suffer from both separation anxiety (making it difficult for them to *leave* for school) and social anxiety (making it difficult for them to *be* in school) are particularly difficult to help. Also, any of the other anxiety disorders or any combination can potentiate school refusal.

Common symptoms include anxiety, depression, withdrawal, fatigue, crying, and physical complaints such as stomachaches and headaches. More disruptive symptoms may include tantrums, dawdling, noncompliance, arguing, refusing to move, running away from school or home, and aggression [9].

Barriers: Anxiety is the stepchild of behavioral medicine. For example, the psychiatry department of a highly regarded children's hospital opened a program in the rural part of the state in order to provide care to the children who had no access to mental health services. The announcement of the program described which children would be eligible to receive care: those who have a diagnosis of mild-to-moderate depression or disruptive behavior [e.g., hyperactive/impulsive ADHD and/or an oppositional behavior disorder]. There was no mention of anxiety.

Why are teens with anxiety underserved? Perhaps it is because teens with depression look and act depressed, whereas those with anxiety may show no outward signs of their disorder. In addition, there are five different kinds of anxiety, each presenting in a different way. For the most part, clinicians receive little training in understanding this complex diagnosis.

Depression

Major Depressive Episode (from the DSM-5) condensed

To qualify for "major depressive disorder" (MDD), patients need to have been experiencing symptoms almost every day for at least 2 weeks that are more intense than the normal fluctuations in mood that all of us experience in our daily lives. They need to have at least five of nine symptoms to qualify; one of these five has to be either depressed mood or loss of interest or pleasure in activities. The NIH estimates that 12.5% of the US population aged 12 to 17 has had depression. The prevalence of depression is much higher in females (19.5%) than males (5.8%). As for age, the prevalence in 12-year-olds is 5.4%, rising to 16.1% at age 15. And depression is more common in Whites (13.4%) and Hispanics (12.6%) than in Asians (9.7% and Blacks (9.0%). It is highest in teens with two of more races (15.6%) [10].

What About His Behaviors Would Lead Us to the Conclusion That Danny May Have Depression?

A. Symptoms

1. *Depressed mood most of the day*, almost every day, indicated by subjective report or *by the report of others*. This mood might be characterized by sadness, emptiness, or *hopelessness*.
2. *Markedly diminished interest or pleasure in all or almost all activities* most of the day.
3. Significant weight loss or weight gain when not dieting.
4. Inability to sleep or oversleeping.
5. Psychomotor agitation or retardation.
6. Fatigue or loss of energy.
7. Feelings of worthlessness or excessive or inappropriate guilt.
8. *Diminished ability to think or concentrate*, or indecisiveness.
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for killing themselves.

People who die from suicide usually had exhibited one or more warning signs through what they said or what they did, including talking about suicide or having no reason to live, withdrawing from activities, visiting or calling people to say goodbye, or giving away prized possessions. They also may have had mood changes such as depression, loss of interest, anxiety, and irritability. One study found that patients with a previous suicide attempt were 38 times more likely to eventually die from suicide than those with no past attempts [11].

B. Symptoms cause clinically significant distress or *impairment in social, occupational, or other important areas of functioning*.
C. The episode is not due to the effects of a substance or to a medical condition.

Depression can cause low energy and concentration difficulties. *At school, this may lead to poor attendance, a drop in grades, or frustration with schoolwork in a formerly good student.*

The American Academy of Pediatrics recommends that all adolescents 11–21 be screened for depression with the PHQ-2 (Patient Health Questionnaire, two questions); if the answer to either question is "yes," then the full PHQ-9 is administered (Chart 1.3, PHQ-A, Appendix).

In the past 2 weeks, have you been bothered by:

	0	1	2	3
	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things?				
2. Feeling down, depressed, irritable, or hopeless?				

Treating Depression

Mild depression that does not appear to be causing problems can be managed with support from a clinician along with non-medication interventions. These include breathing exercises, muscle relaxation, therapeutic imaging, journaling, exercise, and involvement in art or music.

For patients who have mild-to-moderate depression that is causing them some, but not severe, distress, cognitive behavioral therapy may be helpful. Moderately severe depression is treated by medication, therapy, or both, and severe depression is treated with both. A review article published in 2006 found that treating depressed teens with medication alone was more effective than therapy alone; the combination was the most effective [12].

Fluoxetine (Prozac) is the only SSRI approved by the FDA for treating children and adolescents for depression. However, if it is not effective, or causes persistent side effects, other medications in the same family are used.

Persistent Depressive Disorder: PDD (Dysthymia)

Dysthymia is a chronic condition characterized by depressive symptoms that occur for most of the day, more days than not, for at least 1 year (2 years in adults). This disorder is often associated with impaired school performance and poor social interactions, plus irritability and crankiness. Adolescents with this condition also have low self-esteem and are pessimistic and are at high risk to develop major depression. The symptoms must have been present for at least 1 year. During this period, any symptom-free interval cannot have lasted longer than 2 months. Treatment includes both medication and talk therapy.

Bipolar Disorder

The phrase "bipolar disorder" is used to describe a set of "mood swing" conditions, the most severe of which, in the past, was called "manic depression." These patients suffer recurrent episodes of high or elevated moods (mania or hypomania) and depression. Most experience both the highs and the lows. Occasionally people can experience a mixture of both highs and lows at the same time, or switch during the day, giving a "mixed" picture of symptoms. A very small percentage of sufferers of bipolar disorder only experience the "highs." People with bipolar disorder experience normal moods in between their mood swings [13].

A clinician concerned about these behaviors should refer such a patient to a psychiatrist, requesting an urgent assessment due to greater severity and more complicated medication management.

Barriers to receiving care for all of these depressive disorders include a severe shortage of child and adolescent psychiatrists.

ADHD

What Is ADHD (Attention-Deficit/Hyperactivity Disorder)?

The DSM-5 defines ADHD as a persistent pattern of inattention and/or hyperactivity-impulsivity that

interferes with functioning or development, has symptoms presenting in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities), and negatively impacts directly on social, academic, or occupational functioning. Several symptoms must have been present before age 12. A patient may have hyperactivity/impulsivity alone, inattention alone, (labeled ADHD without hyperactivity/impulsivity), or the "combined type." The NIH estimates a prevalence of 11% [14].

It is difficult to come to any definitive conclusions about the epidemiology of ADHD. Most studies are based on patients of different gender or of different ethnic backgrounds or different socioeconomic status. Results can be distorted by the source of the subjects (e.g., if based on patients seen in clinical settings, it will exclude teens who were not seen by a provider and who may be of a different age or gender). Or the variable may be how concerned parents are about school grades; the more important grades are to parents, the more likely they will bring their children to a clinician's office for an evaluation, and the more likely it will be that ADHD is found.

A comprehensive analysis by the National Committee on Health Statistics found that 13.3% of boys and 5.6% of girls aged 4–17 had ever been diagnosed with ADHD. Prevalence was highest among non-Hispanic white children and lowest among Hispanic children. And prevalence was higher for children with family income less than 200% of the federal poverty threshold than for children with family income at 200% or more of the poverty threshold. Most experts believe that girls are more apt to have inattentive ADHD than the hyperactive version. Since being inattentive is less obvious than being hyperactive/impulsive, that might be the basis for some of the difference in gender frequency [15].

What Is the Cause of ADHD?

Our present understanding is that ADHD is caused by a deficit in the circulation of several neurotransmitters, primarily dopamine. The frontal lobes, basal ganglia, corpus callosum, and cerebellum have emerged as the primary areas of the brain showing deficits. These areas are interconnected by a network of neurons. Together, they regulate attention, thoughts, emotions, behavior, and actions. Studies in ADHD patients have showed slower maturation or reduced activity in these areas of the brain. The activity between these areas is maintained by neurotransmitters, in particular dopamine, with involvement of the frontal lobes, basal ganglia, corpus callosum, and cerebellum [16].

A deficit in the amount of dopamine leads to a delay in the development of "executive functions." Executive functions are a set of cognitive processes—including attentional control, inhibitory control, working memory, cognitive flexibility, and planning—that are necessary for the cognitive control of behavior [17].

There is a strong genetic factor. A twin study with 1938 pairs found there was heritability of 0.75–0.91, robust across familial relationships (twin, sibling, and twin sibling) and across definitions of ADHD [18]. It is not unusual for parents to say that there is no family history of ADHD. But a query about behaviors, as opposed to a diagnosis, may lead to a discussion of a father who never graduated from high school or a mother who is always late, often loses her keys, cannot hold down a job, etc. And, as the clinician asks parents about their teen, they may suddenly come to the realization that they themselves may have undiagnosed ADHD.

What About His Behaviors Would Lead Us to the Conclusion That Danny May Have ADHD?

His grades are deteriorating. Many teens with ADHD have above-average intelligence. They do well in lower grades where most of their classes are with one teacher in one room. That teacher knows that Danny needs reminders to pay attention, and she is happy to do that, since he is very receptive to her reminders. Once these teens are in a school situation where each class is in a different room, with a different teacher, their problems with being organized move from the background to the foreground. These problems are exacerbated by the increasing complexity of the course work and in the importance of homework. Danny may be discouraged by his poor grades, so he skips school to play video games. (Video games

are characterized by continuous action and are, therefore, particularly attractive to teens with ADHD with their very short attention spans.)

Difficulty in sustaining attention can show up in problems in certain sports. Soccer is a particular problem for teen athletes at the high school level. There are 20 players scattered over a field that measures about 70 *yards* in width and 100 *yards* in length. Who is supposed to do what, when, and where? With experience, teens learn, but it takes more concentration than a sport like basketball, where everyone is moving all the time; there are only ten players, and the court is 94 by 50 *feet*. The problem is even more likely to occur at practice—when only a few players are involved in practicing a particular aspect of the game.

Teens with ADHD are *less likely to have friends*. Acting without thinking, blurting out comments, and not paying attention to conversations—all of these behaviors can interfere with their ability to make and keep friends.

Diagnosing ADHD

The diagnosis is made based on answers by parents, teachers, and the teen to a structured questionnaire (Chart 1.4, Teen Behavior Checklist, Appendix).

DSM-5 lists the 18 questions that determine the likelihood of the diagnosis. If the score for *either* "inattention" or "hyperactive/impulsive" is ≥6, and the behaviors cause problems in more than one setting, the clinician can make tentative diagnosis of ADHD. (For subjects 18 or older, only five need to be positive.) For children, it is important to ask teachers to answer the same questions; however, that is seldom useful with teens. They can have up to six teachers, each with 30 students per class, making it difficult for a given teacher to notice behaviors of any one student. And whereas they can't miss noticing a hyperactive student, they are not likely to pay as much attention to one who is only inattentive.

Is It a "Real Diagnosis?"

No blood test or radiological procedure is useful in diagnosing ADHD. That contributes to the confusion surrounding the disorder. In addition, pronouncements about ADHD from celebrities, the media, neighbors, and grandparents create additional barriers. Fortunately, the medications act very quickly, so clinicians can determine easily if they are effective. The patient can stop at any time without risks or side effects. At times the improvement is so quick and so substantial that the parent is amazed, calling it "a magic pill."

Is ADHD Overdiagnosed?

The section on ADHD in the CDC site states that "less than 1 in 3 children with ADHD received both medication treatment and behavior therapy, the preferred treatment approach for children ages 6 and older" [19].

Treatment of ADHD

Case

JS is a 13-year-old boy brought in by his mother because of poor grades, despite his high intelligence. Two years earlier he had been diagnosed with ADHD, and his clinician had recommended medication. His mother believed that his symptoms could be treated with vitamins and diet, but there was no improvement. She still had doubts about giving her son medication, but after a discussion about the risks and side effects, she agreed to do a trial. After 2 weeks there was some improvement. The dose was increased, and at the next visit, when his clinician asked how he was doing, JS answered "good." When asked what he meant by "good," he answered "I can read boring stuff." [Anyone reading this book has had to "read boring stuff."]

ADHD is best treated by a combination of medication and modification of the behaviors of the teen and the parents. Studies have shown that medication alone can be effective—especially in highly structured home settings—but behavioral modification without the use of medication is not an effective treatment [20].

Medication

There are scores of medications with various chemical compositions, different ways of affecting the brain, different doses, and different durations of actions (see References for a very useful guide for ADHD meds [21]).

The Risks of Not Treating a Teen with Medication

There is a substantial body of literature that demonstrates the effectiveness of medication to reduce a number of problems frequently caused by teens with ADHD. These include:

The reduction of driving risks and impairments associated with ADHD. Teens with ADHD are nearly four times more likely to have had an accident, while they were the driver of a vehicle [22].

A decrease in legal troubles. The estimated probability of *not* being convicted of a crime during a 4-year treatment period was 0.49 for men and 0.75 for women. The same probability during the nontreatment period was 0.37 for men and 0.69 for women [23].

Teens with ADHD who are not on medication are 2.7 times more likely to drop out before high school graduation [24].

Stimulant treatment of children with ADHD was associated with improved reading achievement, decreased school absenteeism, and a modest improvement in grades [25].

Teens with ADHD also experience a greater risk for developing oppositional and defiant behavior (≥50%), conduct problems and antisocial difficulties (25–45%), learning disabilities (25–40%), low self-esteem, and depression (25%) [26].

Three Outcomes of Treatment with Medication:

- There may be dramatic improvement in all aspects of concern immediately or after adjusting medication.
- School performance may improve, but the teen still forgets to hand in homework, and grades suffer.
- There may be minimal improvement in home situations.

If problems persist, it is critical that parents work closely with their teen on behavior management.

Behavior Modification

The first step in modifying the behaviors of the teen and the parents is to "demystify" the cause of the problems. A discussion of the effects of the neurotransmitters on executive functions, as listed above, makes it clear that teens' behaviors are not their "fault," thereby reducing some of the parent-teen conflicts. The next step is "contingency management."

Contingency management, derived from the theory of Operant Conditioning by B.F. Skinner [27], is based on the idea that parents or caregivers provide privileges or preferred activities only when the teen completes a given task. The theory proposes that the requested behavior will increase the frequency of successful completion when desired activities or privileges are allowed, but only after requested behaviors have been completed by the teen. The corollary of this is that when reinforcing events are not contingent upon a given behavior, the behavior will decrease in strength [28].

Because teens with ADHD often have deficits in "active working memory," their ability to remember can be remarkably short. Discussing that one characteristic of ADHD with parents is particularly important. Parents often focus on their teen's forgetting to do chores or saying they will do something soon and then never doing it at all. Once they understand that they are not being ignored, or lied to, they can learn that they need to ask for simple tasks, like taking out the garbage, to be done "now." For tasks that are more complex, and can be postponed, like folding the laundry, the teen must enter a reminder into their iPhone—and do that immediately (before they forget). That way they will remember to do it later, without their parents having to remind them. A few weeks of parents being persistent in these efforts will lead to their teen remembering, with only occasional lapses.

Technology and ADHD

It appears that the use of technology can be a blessing or a curse for teens with ADHD. One

study shows that working memory (WM) can be improved by training in children with ADHD by computerized, systematic practice of WM tasks. This training also improved response inhibition and reasoning and resulted in a reduction of the parent-rated inattentive symptoms of ADHD" [29]. Another found that gaming had negative effects on boys—and, in particular, those with ADHD. Boys had more than eight times the probability, odds ratio (OR), of having problematic gaming. Symptoms of ADHD, depression, and anxiety were associated with ORs of 2.43, 2.47, and 2.06, respectively, in relation to coexisting problematic gaming [30]. And a third found that children with ADHD had higher scores on the Internet Addiction Test (IAT), used the internet for longer hours, and went to sleep late than those without ADHD [31].

Summary

It is not uncommon for primary care clinicians to miss the diagnosis of inattentive ADHD. In addition, the short- and long-term consequences are often not appreciated. Also, few clinicians have been taught about the importance of going beyond medication and adding the kinds of structure discussed above.

Twenty years ago, the American Medical Association established a council for the following purpose: to deal with public and professional concern regarding possible overprescription of ADHD medications, particularly methylphenidate, by reviewing issues related to the diagnosis, optimal treatment, and actual care of patients with ADHD, and of evidence of patient misuse of ADHD medications. Among their conclusions were the following:

> "ADHD is one of the best-researched disorders in medicine, and the overall data on its validity are far more compelling than for most mental disorders and even for many medical conditions."

> "ADHD is associated with significant potential comorbidity and functional impairment, and its presence at any age increases the risk of behavioral and emotional problems at subsequent stages of life. It is thus a chronic illness with persistence common into adolescence and beyond."

> "Optimal treatment of ADHD involves an individualized plan based on any comorbidity as well as child and family preferences. This treatment generally will include pharmacotherapy (usually with stimulant medication) along with adjunctive psychoeducation, behavioral therapy, environmental changes, and, at times, supportive psychotherapy of the child, the family, or both"[2] [32].

This summary describes most of the barriers to the diagnosis and treatment of ADHD in teens. Additional barriers include the shortage of professionals to implement the AMA's "optimal treatment," as well as the cost of the stimulants needed for effective treatment.

Understanding Adolescent Mental Health in Context of Life and Stress

Behavioral Problems Related to Stress

The American Psychological Society found that in a survey of over 1000 teens, they reported that their stress level during the school year far exceeded what they believe to be healthy (5.8 on a 10-point scale). Note: their assessment even in the summer, with no school, was a level of 4.6. Teens also reported feeling overwhelmed (31%) and depressed or sad (30 percent) as a result of stress. More than one-third of teens reported fatigue or feeling tired (36%), and nearly one-quarter (23%) reported skipping a meal due to stress [33].

The best way to determine if a teen's symptoms are primarily due to stress is to use the HEADSS system (discussed in the introduction to the chapter), listening for the possibility of a stressful situation. The following are examples of questions that can elicit useful information.

Home

Who is in Peter's household? Perhaps his mother remarried several months ago—there is now a stepfather and some stepsiblings too. Suppose his father died recently after a long illness—how is

[2] Russell Barkley, PhD, has written a number of books and articles about ADHD—for both clinicians and for parents. *Taking Charge of ADHD—the Complete Authoritative Guide for Parents*, the Guilford Press, 2013, is particularly helpful. The book includes tips for changing behavior.

affecting him? How does he get along with those he shares a house with? Does his father abuse him physically—perhaps even sexually? Does he have an older brother who bullies him? If his parents are divorced, are there issues around custody? If so, does one parent insist on seeing him every other weekend even when he does not want to be with that parent? Did his family move recently? And being in a new school—the year had already started—has it been difficult to become included in any group?

Education

What grade is Madison in? Perhaps she is 15 and in 11th grade—she had skipped a grade in elementary school and could do the work for several years but is now over her head. How many days of school has she missed this year? Perhaps she has had 15 absences in the first 3 months; she often has severe abdominal pain upon awakening—likely to be secondary to anxiety.

What are Madison's grades, "and how does she feel about them? Does she have a 3.3 grade-point average, but her parents are pushing her to get her grades up to 3.6? Or does she have a 2.3 average, and her parents are worried that she won't get any financial aid for college to supplement their low earnings? Does she want to attend an elite school, but several months ago got her PSAT scores and they were only 1010? (An example from a recent adolescent medicine listserv: "The patient has an older sister who goes to a prestigious college but is upset she did not get into an even more prestigious place. The parents talk about how crazy other parents in the area are in terms of unreasonable expectations for their children, yet one of the issues the patient has with her father is that he is 'helicopter parenting.'").

If her grades are lower than they were in the past, is she getting enough sleep? If not, is it because the work is so difficult that she stays up past midnight to finish it? Or does she complete it by 11:00 but texts her friends until 1 a.m.? Is there a television set in her bedroom?

Activities

How does Omar like to spend his time? Perhaps he liked soccer, but his performance did not live up to his older brother's, so he managed to have a fight with his coach, is now off the team, and no longer has the burden of equaling his brother. Does he have close friends—what are they like? Are they all A students and he feels inadequate with his 3.3 GPA? Or is *he* the A student and his friends appreciate his help in preparing for exams? And what does he mean by "friends?" Does he see them only in school, or does he spend a lot of time with them after school and on weekends? Are they face-to-face friends, or are they Facebook "friends?"

Does he attend a house of worship regularly and enjoy it, or does he feel it is a burden—his parents won't let him miss a service? Does Omar have a part-time job—Saturdays only—and can he use the money? Or is money tight and he has to work 3 hours each night and falls behind in his homework or has no spare time to spend with friends?

Drugs

Does Mateo smoke cigarettes or use alcohol or smoke marijuana and drive while high or ride in his best friend's car while his friend is driving after smoking marijuana? Does he use oxycodone—if so, where does he get it, and where does he get the money to purchase it? Does he have friends who use fentanyl and urge him to try it because the high is mind-blowing? Has he ever gotten into trouble when he is high?

Sexual Experiences/Concerns

Does Aisha have a dating relationship? If so, what attracts her to that person (be sure to be gender neutral until the patient describes the friend)? Has she had a sexual experience? If so, ask about it. Was it entirely consensual? How old is that partner? More than 2 years older increases the possibility of less-than-consensual sex. It also raises the possibility of being illegal. (Clinicians should know the law in their state about what is a crime in these situations.) Has she been involved with "sexting?" If so, does she understand what problems that might cause for her? (A 13-year-old girl was brought in by her mother who was concerned about some of her behaviors, including sending her "boyfriend" a picture of herself from the waist up. The girl was outraged: "I had my bra on!")

Is she attracted to the same sex, the opposite sex, both, or neither? If she has had sexual intercourse, was a condom used? Plus, another method of contraception? And did Aisha's partner use a condom *every time* they had intercourse? Has she ever had a sexual experience against her will? Does she have any questions about sex?

Summary

The answers to these questions may identify the underlying problem. There is often a cascade effect—parents get divorced, and the custodial parent can't afford their house and so moves to a less expensive part of town. It is too far for the patient to see their friends regularly and their new friends smoke marijuana. They get busted, or they develop amotivational syndrome and their grades drop.

Do they have a "disorder" or have there been too many stressful situations in their life? The "treatment" is likely to be an adult who they trust. Perhaps a grandparent, or the mother of one of their good friends. Or a teacher/school counselor. Or a clinician who has earned their trust by listening, not judging, and by being available.

Sex, Drugs, and Rock 'n' Roll

Understanding Normal Teenage Behavior

Adolescence begins at the end of childhood and ends at the beginning of adulthood. In order to appreciate just how overwhelming this may seem to 12-year-olds facing that journey, look at it from their point of view:

If they want to become autonomous adults, they must:

- Find out who they are.
- Convince their parents they can take care of themselves responsibly.
- Develop a set of ethical guidelines.
- Learn how to live with rules that help them get along in the world, neither accepting nor rejecting them blindly.
- Learn how to have close relationships.
- Learn how to deal with people in a practical way.
- Learn how to deal with their sexuality, both physically and emotionally.
- Explore what they want to do with their lives.
- Begin to acquire the skills they will need to be self-supporting.
- Learn to view their parents realistically, and limit their battles with them to a necessary minimum.
- Develop realistic aspirations and find role models that embody them [34].

Certain behavioral features common among adolescents may have evolved to promote attainment of the necessary skills for independence. These age-related behaviors, such as an adolescent-associated increase in risk-taking, have often been attributed to increases in pubertal hormones. However, it appears that the primary cause is developmental events occurring in the brain during adolescence.

Giedd et al. (1999) published a landmark study on brain development during childhood and adolescence. The prior assumption about the adolescent brain had been that there was growth and change up to about the age of 12 and after that there were no significant changes in brain structure. The article reported that pediatric neuroimaging studies confirmed linear increases in white matter but demonstrated "nonlinear changes in cortical gray matter, with a preadolescent increase followed by a post-adolescent decrease" [35].

Spear (2000) noted "We provide evidence from recent brain imaging and animal studies that there is a heightened responsiveness to incentives and socioemotional contexts during this time, when impulse control is still relatively immature. These findings suggest differential development of bottoms-up limbic systems, implicated in the incentive and emotional processing, to top-down control systems during adolescence prone to emotional reactivity, increasing the likelihood of poor outcomes" [36].

More recently, Casey, Jones, and Hare (2008) wrote "Adolescents knowingly engage in risky behavior, and this is often due to influences of feelings, emotions, and peers …. Our model

suggests that the adolescent is capable of making rational decisions, but in emotionally charged situations the more mature limbic system will win over the prefrontal control system." Adolescents show adult levels of intellectual capability but do not yet have full capacity to override impulses in emotionally charged situations that require decisions in the heat of the moment [37].

It is important for clinicians to pay attention to aspects of adolescent brain development other than risk-taking, as articulated in an article by Guyer et al. (2009). "This general model of adolescent brain development has been extended beyond the study of risk-taking in several ways… Adolescence is also a time of important changes in the processing of social and emotional information, much of which is subserved by the same regions and systems that undergird the motivational and self-regulatory changes described by writers who have focused on risk-taking. For instance, there is evidence that adolescents are highly responsive to the social rewards afforded by positive peer evaluation and that *such rewards activate the same brain regions as non-social rewards.*" [Italics added by author] [38].

The critical role that peers play in the life of teens is also emphasized by the following observation: "We also have evidence that the presence of peers leads adolescents to more steeply discount delayed rewards, leading to increased preference for immediate, although smaller, ones" [39].

Of particular interest for readers of this book, a recent study found that in adolescents, "symptoms of video game addiction depend not only on video game play but also on concurrent levels of online communication. Those who are very socially active online report fewer symptoms of game addiction" [40].

Knowledge of key elements in the development of the adolescent brain can enable clinicians to counsel their teen patients more effectively. For example:

- Understanding that, despite their intellectual level, adolescents are susceptible to making poor decisions "in the heat of the moment," clinicians realize that they need to urge their female patients who are sexually active to consider long-acting, reversible, contraception (LARC).
- Being knowledgeable about the critical importance of peer relationships gives clinicians insight into the puzzling behavior of teens who, even at their own detriment, refuse to "rat" on their friends.
- Knowing the propensity of teens to take more risks in the presence of their peers, clinicians might want to warn their patients about the extreme risks of drinking heavily at a party because they want to fit in.

It appears that an increased emphasis on reducing risky behaviors of "normal teenagers" is worth the effort of law-makers, parents, clinicians, and perhaps the media, as can be seen in the chart below:

Behavior	Earlier rate	Year	New rate	Year
Teen birth rate[a]	61.8 per 1000 adolescent females	1991	24.2 per 1000 adolescent females	2014
Use of marijuana in past month for 8th graders[b]	6.5%	2015	5.4%	2016
Of those, daily use	1.1%	2015	0.7%	2016
Cigarette use (≥½ pack a day) by high school students	10.7%	1991	1.8%	2016
12th graders being drunk over past year	53.2%	2001	37.3%	2016

[a]HHS Office of Adolescent Health 2014

[b]This and the remaining behaviors are from the Monitoring the Future annual survey by the National Institute on Drug Abuse of the NIH; it surveys students in 8th, 10th and, 12th grades

This chapter is about teens with difficulties—ranging from severe problems to normal adolescence. It is important for clinicians to remind themselves that, for the most part, they see teens who are healthy only occasionally—for exams for sports or camp—but see those who have a problem often. Most teens are doing well—the most recent CDC data show that close to 83% of teens are in excellent or very good health and another 15% are in good health [41].

And they are not only healthy, but most are also happy. Psychiatrist Daniel Offer was a pioneer in the study of adolescents; he challenged prevailing beliefs that adolescence is inherently a time of storm and stress. In 1963, Offer received 8 years of federal grants to study the psychological development of normal adolescents. In the first phase of the study, 73 boys were selected from two suburban Chicago area high schools and followed for 8 years. The major finding for the high school phase was that stability and not turmoil was the overriding characteristic of normal adolescents. This finding contradicted the then current notion of normal development. At that time, it was believed that all adolescents go through major turmoil as they move through the high school years. In 1981, Offer and two colleagues published a book based on the Offer Longitudinal Study that concluded that "eighty-five percent of the adolescents they tested reported being happy most of the time" [42].

Offer's study is considered the "gold standard" for research about *normal* adolescents. The author could not identify any other longitudinal study of healthy teens. However, in 2010, the NIMH published *Lifetime Prevalence of Mental Disorders in U.S. Adolescents* [43]. The study concluded that approximately one in every four to five youth in the USA will meet criteria for a mental disorder with severe impairment across their lifetime. We can infer from that that 75–80% of youth will *not* experience such a disorder in their lifetime.

Resources

Society for Adolescent Health and Medicine website:
www.adolescenthealth.org/

Appendix

Chart 1.1 GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Having trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
Add columns Total score ____	___	___	___	___

If you checked off problems, how difficult have they made it for you to do your schoolwork, take care of things at home, or get along with other people?
Not difficult at all ___ Somewhat difficult ___ Very difficult ___ Extremely difficult___
Scoring: A total score of ≥10 means the patient is likely to have an anxiety disorder
Spitzer RL, et al. A brief measure for assessing generalized anxiety disorder. Arch Intern Med. 2006;166:1092–97

Chart 1.2 SCARED. Screening for Childhood Anxiety-Related Disorders (SCARED). Below is the **SCARED-5**. If the score for this assessment is ≥3, use the full SCARED questionnaire: ww.psychiatry.pitt.edu/sites/default/files/Documents/assessments/SCARED%20Child.pdf

During the past 3 months are the following statements "not true or hardly ever true," "somewhat true or sometimes true," or "very true or often true?" (scored 0 to 2)	People tell me that I worry too much 0 1 2
I get frightened for no reason at all 0 1 2	I am scared to go to school 0 1 2
I am afraid to be alone in the house 0 1 2	I am shy 0 1 2
Total points for SCARED 5:	*Scoring: ≥ 3 separates anxiety from non-anxiety*

Chart 1.3 PHQ-9 modified for adolescents (PHQ-A)

	0	1	2	3
	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things?				
2. Feeling down, depressed, irritable, or hopeless?				
3. Trouble falling asleep or staying asleep or sleeping too much?				
4. Feeling tired or having little energy?				
5. Poor appetite or overeating?				
6. Feeling bad about yourself—Or that you are a failure or let yourself or your family down?				
7. Trouble concentrating on things, such as reading the newspaper, doing homework, or watching television?				
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—Being so fidgety or restless that you have been moving around a lot more than usual?				
9. Thoughts that you would be better off dead or of hurting yourself in some way?				
Total each column				

Total: _____

If you said yes to *any* problems, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all ___ Somewhat ____ Very ____Extremely ___

Scoring:

0–4 No depression symptoms

5–9 Mild depression symptoms

10–14 Moderate depression symptoms (therapy)

15–19 Moderate to severe depression symptoms (therapy and/or meds)

20 or more severe depression symptoms (therapy and meds)

If the patient responds "yes" to question 9, the risk of suicide needs to be determined and a plan developed

Chart 1.4 Teen behavior checklist (updated as per DSM-5)

Name of Person Being Rated _____
Name of Rater, if not Patient _____Date_____

Inattentive Behaviors

Check the column that best describes the teen's behavior *over the past 6 months*

	Never or rarely	Sometimes	Often	Very often
1. Fails to give close attention to details or makes careless mistakes in school work, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate)				
2. Has difficulty sustaining attention to tasks or activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading)				
3. Does not seem to listen when spoken to directly (e.g.., mind seems elsewhere, even in the absence of any obvious distraction)				
4. Does not follow through on instructions and fails to finish school work, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily distracted)				
5. Has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks, difficulty keeping materials and belongings in order, has poor time management, fails to meet deadlines)				
6. Avoids, dislikes, or is reluctant to engage in tasks that require **sustained** mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers)				
7. Loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, phones). Sometimes loses **completed** homework				
8. Is easily distracted by extraneous stimuli (for older adolescents, may include unrelated thoughts)				
9. Is forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls paying bills)				
Total				

Hyperactive/Impulsive Behaviors

	Never or rarely	Sometimes	Often	Very often
10. Fidgets with hands or feet or squirms in seat				
11. Leaves seat in classroom or in other situations in which remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place)				
12. Frequently feels restlessness				

	Never or rarely	Sometimes	Often	Very often
13. Has difficulty engaging in leisure activities or doing fun things **quietly**				
14. Is "on the go" or acts as if "driven by a motor" (e.g., is unable to be or uncomfortable being still for an extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with)				
15. Talks excessively [**ends *hyperactivity***]				
16. Blurts out an answer before questions have been completed (e.g., completes people's sentences, cannot wait for turn in conversation)				
17. Has difficulty awaiting turn (e.g., while waiting in line)				
18. Interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; may intrude into or take over what others are doing) [**ends *impulsivity***]				
Total				

Do these behaviors cause significant difficulties?
Home: yes ___ no___ School: yes ___ no ___
Scoring: Add each of the columns in the Inattentive ADHD set. Combine totals for "Often" and "Very Often." Do the same for the hyperactive/impulsive behaviors. See article for next step
[Content from DSM-5. Structure created by author]

References

1. Katzenellenbogen R. HEADSS: The "Review of Systems" for adolescents. Virtual Mentor. AMA J Ethics. 2005;7(3):Clinical Pearl.
2. Goldenring JM, Rosen D. Getting into adolescent heads: an essential update. Contemp Pediatr. 2004;21(64):1–19.
3. Litt IF, Cuskey WR. Compliance with medical regimens during adolescence. Pediatr Clin N Am. 1980; 27(1):3–15.
4. Waddington PAJ, Bull R. Cognitive interviewing as a research technique. Social Res Update. 2007;50:Summer.
5. Berman HS, Dashefsky HS. Teens and their doctors. The story of the development of adolescent medicine. Sagamore Beach, MA: Science History. p. 65.
6. https://www.nimh.nih.gov/health/statistics/prevalence/any-anxiety-disorder-among-children.shtml.
7. Yucha CB, Montgomery D. Evidence-based practice in biofeedback and neurofeedback. A faculty publication by the University of Nevada, Las Vegas. 2009. http://digitalcommons.library.unlv.edu/nursing_fac_articles/1.
8. Walkup, et al. Cognitive behavioral therapy, sertraline, or a combination in childhood anxiety. N Engl J Med. 2008;359:2753–66.
9. Berman HS. Teens who don't go to school. J Child Adolesc Behav. 2015;3:3.
10. NIH. A complicated picture. https://www.nimh.nih.gov/about/directors/thomas-insel/blog/2011/antidepressants-a-complicated-picture.shtml.
11. Harris EC, Barraclough B. Suicide as an outcome for mental disorders: a meta-analysis. Br J Psychiatry. 1997;170:205–28.
12. Ruple SJ, Blecke DM, Renfrow M. Cognitive therapy for depression. Am Fam Physician. 2006;73:83–6.
13. NIDA. January Bipolar disorder. 2014. https://www.nimh.nih.gov/health/topics/bipolar-disorder/index.shtml.
14. CDC. https://www.cdc.gov/ncbddd/adhd/data.html.
15. NCHS Association between diagnosed ADHD and selected characteristics among children aged 4–17 years: United States, 2011–2013. NCHS Data Brief No. 201, May 2015.
16. Giedd JN, et al. Brain imaging of attention deficit/hyperactivity disorder. Ann N Y Acad Sci. 2001; 931:33–49.
17. https://en.wikipedia.org/wiki/Executive_functions.
18. Levy F, et al. Attention-deficit hyperactivity disorder: a category or a continuum? Genetic analysis of a large-scale twin study. J Am Acad Child Adolesc Psychiatry. 1997;36:737–44.
19. CDC ADHD. https://www.cdc.gov/ncbddd/adhd/data.html.
20. The MTA Cooperative Group. A 14-month randomized clinical trial of treatment strategies for attention deficit/hyperactivity disorder. Arch Gen Psychiatry. 1999;50:1073–86.
21. Googling "North Shore LIJ ADHD" and selecting "medication guide" will open a remarkable chart that has a photo of every one of these medications, in each dose, in full color. The chart can be obtained free of charge.

22. Fischer M, et al. Hyperactive children as young adults: driving abilities, safe driving behavior, and adverse driving outcomes. Accid Anal Prev. 2007;39:94–105.
23. Lichtenstein P, et al. Medication for attention deficit–hyperactivity disorder and criminality. N Engl J Med. 2012;367:2006–14.
24. Barbaresi WJ, et al. Modifiers of long-term school outcomes for children with attention-deficit/hyperactivity disorder: does treatment with stimulant medication make a difference? Results from a population-based study. J Dev Behav Pediatr. 2007;28(4):274–87.
25. Robyn L, et al. Stimulant treatment in children with attention-deficit/hyperactivity disorder moderates adolescent academic outcome. J Child Adolesc Psychopharmacol. 2008;18(5):449–59.
26. Adapted from Barkley RA, Murphy KR. Attention deficit hyperactivity disorder: a clinical workbook. 3rd ed. New York: Guilford; 2006.
27. Skinner BF. Science and human behavior. New York, London: The Free Press, Collier-Macmillan; 1953.
28. Graziano AM, editor. Behavior therapy with children II. Aldine Transaction; 2008.
29. Klingberg T, et al. Computerized training of working memory in children with ADHD—a randomized, controlled trial. J Am Acad Child Adolesc Psychiatry. 2005;44:177–86.
30. Vadlin S, et al. Associations between problematic gaming and psychiatric symptoms among adolescents in two samples. Addict Behav. 2016;61:8.
31. Weinstein A, et al. Internet addiction and attention deficit hyperactivity disorder among schoolchildren. Isr Med Assoc J. 2015;17(12):731–4.
32. Slanetz PJ, et al. For the council on scientific affairs. Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. JAMA. 1998;279:1107–0.
33. American Psychological Association survey shows teen stress rivals that of adults. 2014. http://www.apa.org/news/press/releases/2014/02/teen-stress.aspx.
34. Williams LH, Berman HS, Rose LM. The too precious child. The perils of being a super-parent and how to avoid them. New York: Atheneum Macmillan; 1987. pp. 229–30.
35. Giedd JN, et al. Brain development during childhood and adolescence: a longitudinal MRI study. Nat Neurosci. 1999;2:861–3.
36. Spear LP. The adolescent brain and age-related behavioral manifestations. Neurosci Biobehav Rev. 2000;24:417–63. [Abstract].
37. Casey BJ, Jones RM, Hare TA. The adolescent brain. Ann N Y Acad Sci 2008;1124:111–26.
38. Guyer A, et al. Probing the neural correlates of anticipated peer evaluation in adolescence. Child Dev. 2009;80:1000–15.
39. O'Brien L, Steinberg L. Impact of peers on delay discounting. Presented at the biennial meeting of the Society for Research on Adolescence, Philadelphia; 2010.
40. Carras MC, et al. Video gaming in a hyperconnected world: a cross-sectional study of heavy gaming, problematic gaming symptoms, and online socializing in adolescents. Comput Hum Behav. 2017;68:472–79.
41. CDC. https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2014_SHS_Table_C-5.pdf.
42. Offer D, Ostrov E, Howard HI. The adolescent, a psychological self-portrait. New York: Basic Books; 1981.
43. Merikangas KS, et al. Lifetime prevalence of mental disorders in U.S. adolescents: results from the National Comorbidity Survey Replication–Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry. 2010;49(10):980–9.
44. Spitzer RL, et al. A brief measure for assessing generalized anxiety disorder. Arch Intern Med. 2006;166:1092–7.