Chapter 8: Attention-Deficit/Hyperactivity Disorder

# 8.1 Description & Epidemiology

## What is ADHD?

* ADHD is a DSM-5 neurodevelopmental disorder characterized by significant inattention and/or hyperactivity-impulsivity that emerges prior to age 12 years, is present in 2 or more settings, and interferes with academic or social functioning.
* ADHD can be differentiated from normal functioning because ADHD (1) is persistent over time, (2) signs and symptoms are present across multiple settings, and (3) the person’s behavior is developmentally atypical.
* Individuals can be diagnosed with ADHD, predominantly hyperactive/impulsive presentation, predominantly inattentive presentation, or combined presentation. Presentations differ across age and gender.

## What Problems are Associated with ADHD?

* Many children with ADHD develop comorbid conduct problems, such as ODD or CD. Adolescents with ADHD are at risk for substance use problems. ADHD is a specific risk factor for cigarette smoking. Youths with ADHD may use nicotine to regulate their behavior.
* Approximately 45% of children and adolescents with ADHD are also diagnosed with a learning disability. Approximately 50% of youths with ADHD have sleep problems and 20% have a sleep–wake disorder.
* Youths with ADHD are at risk for hostile parent–child interactions and peer rejection. Both factors predict the emergence of conduct problems later in childhood or adolescence.
* Sluggish cognitive tempo is characterized by daydreaming, mind-wandering, drowsy appearance, lethargy, social passivity, and concentration problems. It is unclear whether sluggish cognitive tempo is distinct from ADHD, Predominantly Inattentive Presentation.

## How Common is ADHD?

* Medical records indicate that between 5 and 7% of school-age children have ADHD. However, prevalence based on parental report indicates that the prevalence of ADHD is between 7 and 9%. Prevalence has increased significantly in the past 30 years.
* ADHD is more common in boys than girls. Boys show more severe hyperactive/impulsive symptoms and conduct problems, whereas girls show more severe inattentive symptoms, academic problems, and overall impairment.
* Hyperactive/impulsive symptoms tend to emerge during the preschool years, usually followed by inattentive symptoms in elementary school. Most (50-80%) children with ADHD continue to meet diagnostic criteria as adolescents.

# 8.2 Causes

## Is ADHD Heritable?

* ADHD is highly heritable. Concordance for monozygotic twins approaches .80 whereas concordance for dizygotic twins is only .33.
* Genes that regulate the neurotransmitter dopamine likely play a role in the development of ADHD.
* Restricted oxygen intake places infants at young children at risk for ADHD later in development.

## What Brain Abnormalities Are Associated with ADHD?

* The mesolimbic neural circuit consists of the (1) ventral tegmental area and nucleus accumbens, (2) amygdala and hippocampus, and (3) prefrontal cortex. Dysregulation may cause heightened sensitivity to immediate rewards.
* The frontal–striatal neural circuit consists of the (1) striatum and (2) prefrontal cortex. Dysregulation may cause impairments in inhibition.
* The default Mode Network consists of the (1) prefrontal, (2) parietal, and (3) temporal cortices. Dysregulation may cause youths’ inattention and daydreaming.

## How Do Deficits in Executive Functioning Underlie ADHD?

* Barkley’s neurodevelopmental model suggests that ADHD is caused by underlying deficits in behavioral inhibition which impair the development of executive functioning.
* The four basic executive functions are (1) working memory, (2) internalized speech, (3) emotion regulation, and (3) creative problem-solving.
* Impairments in development of the executive functions lead to the symptoms of ADHD.

# 8.3 Evidence-Based Treatment

## What Medications Are Effective for ADHD?

* The stimulant medications, amphetamine and methylphenidate, are most effective in reducing ADHD symptoms in children and adolescents. These medications enhance dopamine and (to a lesser extent) norepinephrine leading to improve attention and inhibition.
* Alternative medications for ADHD include atomoxetine (Strattera), a selective serotonin reuptake inhibitor, and guanfacine (Intuniv) an α2 receptor agonist.
* Approximately 70% of youths with ADHD show significant symptom reduction with medication. Medication is slightly less effective for preschoolers compared to school-age children and adolescents.

## What Psychosocial Treatments Are Effective for ADHD?

* Clinical behavior therapy relies on parental monitoring and positive reinforcement to improve the behavior of youths with ADHD. Key components are parent consultation, school consultation, and a combined home–school reward system.
* Summer treatment program (STP) is a form of direct contingency management in which children with ADHD receive positive reinforcement for appropriate behavior in the classroom, during social activities, and while playing sports.
* Clinicians who use behavioral classroom management administer positive reinforcement to foster appropriate behavior at school. It can be combined with peer interventions to improve social functioning.

## Which is More Effective: Medication or Psychosocial Treatment?

* The Multimodal Treatment Study of Children with ADHD (MTA Study) indicated that combined medication and behavior yielded the greatest benefits. Medication alone was superior to behavior therapy alone, however.
* Most professionals recommend behavior therapist as a first-line treatment for preschoolers with ADHD and combined behavior therapy/medication for children and adolescents with ADHD.
* Epidemiological studies indicate that only about one-third of youths with ADHD receive the recommended treatment.