

# HOSPITAL PHYSICIAN®

## PSYCHIATRY BOARD REVIEW MANUAL

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# Attention-Deficit/ Hyperactivity Disorder in Children

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Cover Illustration by Kathryn K. Johnson

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# Attention-Deficit/Hyperactivity Disorder in Children

Christina G. Weston, MD, and Suzie C. Nelson, MD

## INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a common chronic disorder that occurs in up to 10% of boys and 5% of girls of elementary school age,<sup>1</sup> although prevalence estimates vary. ADHD is characterized by pronounced difficulty in maintaining focused attention on tasks, hyperactivity, and impulsivity. Parents often focus on the difficulty children with ADHD have in acquiring academic skills; however, these children also have significant difficulties in social and family interactions. Success in school and with relationships is further compromised because children with ADHD are more likely to abuse substances and engage in delinquent behaviors.<sup>2,3</sup> While once believed to be a childhood disorder that would likely resolve during puberty, it is estimated that 60% of patients with childhood ADHD continue to have significant symptoms into adulthood,<sup>4</sup> resulting in further social and occupational difficulty. Adult outcomes of ADHD include lower educational and career attainment.<sup>5</sup>

ADHD is thought to be caused by a combination of environmental, genetic, and biologic factors, though the exact etiology of this disorder is unknown. Higher rates of ADHD have been found in children with exposure to cigarettes and alcohol in utero, low birth weight, exposure to lead, and brain injuries occurring in utero.<sup>6–9</sup> One study found that low parental education level was also a risk factor for ADHD, with this effect seen more often in boys.<sup>10</sup> ADHD is known to run in families; between 10% and 35% of children with ADHD have a first-degree relative with past or present ADHD. A recent multicenter study demonstrated aggregation of symptoms in families of children diagnosed with ADHD; parents of children with ADHD had higher reports of inattention, hyperactivity, and impulsivity than parents of controls.<sup>11</sup> Defects in several genes regulating dopamine, norepinephrine, and epinephrine have been associated with ADHD. The most widely confirmed gene association has been found to be the DRD4 gene defect, found in 30% of the general population and 50% to 60% of the population with ADHD.<sup>12</sup> This defect creates a delay in translating dopamine sig-

nals. Both epinephrine and norepinephrine are agonists at DRD4, which explains how medications that affect either of these catecholamines can affect the dopamine system and improve ADHD symptoms.<sup>13</sup> The “dopamine hypothesis” proposes that inadequate availability of dopamine in the central nervous system contributes to ADHD. The neurotransmitter dopamine is important in initiating purposeful movement, increasing motivation and alertness, reducing appetite, and inducing insomnia. Stimulants increase the availability of the neurotransmitter dopamine,<sup>14</sup> and their success in treating ADHD helps to confirm the dopamine hypothesis.

ADHD is one of the most common psychiatric disorders of childhood and adolescence. Given its high prevalence in school-age children, it is likely that pediatricians and child and adolescent psychiatrists will see these children often. Given the chronic nature of the illness and estimates of frequent persistence of its sequelae into adulthood, clinicians will need to manage the treatment of these patients for many years beyond childhood. Therefore, it is important for all psychiatrists to be able to identify patients with ADHD and to be comfortable with diagnosing and managing the disorder.<sup>15,16</sup>

## CASE STUDY

### INITIAL PRESENTATION

A 7-year-old first-grade boy is brought to the physician's office by his mother. She reports that she is worried about her son's behavior and that he doesn't listen to her.

### HISTORY

The patient's mother had an uncomplicated pregnancy, and the patient was born full term without any birth complications. His mother did not drink alcohol or use illicit drugs while pregnant but did smoke cigarettes. The patient achieved developmental milestones at appropriate times. He has been treated only for infections and for occasional accidents. He required stitches