

Attention-Deficit/Hyperactivity Disorder

DSM-5-TR 314.0X | ICD-10-CM F90.0-F90.9

Persistent inattention and/or hyperactivity-impulsivity beginning in childhood that impairs functioning across multiple settings.

PREVALENCE

~7% children; ~2.5% adults

TYPICAL ONSET

Symptoms present before age 12

SEX RATIO

2:1 male:female (childhood)

COURSE

~50-65% persist into adult

CLINICAL PICTURE

- Careless errors, lost belongings, and unfinished tasks; parents and teachers report the child hears instructions but does not follow through.
- Adults present with chronic lateness, disorganization, procrastination, and job or relationship instability rather than overt hyperactivity.
- Hyperactivity shifts with age from climbing and running to fidgeting, restlessness, and an internal sense of being driven by a motor.
- Impulsivity appears as interrupting, blurting answers, impatience waiting in line, and risky spending, driving, or sexual decisions.
- Emotional dysregulation, low frustration tolerance, and rejection sensitivity are common though not formal DSM-5-TR criteria.
- Function collapses under low structure; performance improves markedly with novelty, interest, urgency, or one-to-one supervision.

DIAGNOSTIC CRITERIA AT A GLANCE

- Requires six or more inattentive and/or six or more hyperactive-impulsive symptoms; five suffice from age 17 onward.
- Symptoms must persist at least 6 months at a level inconsistent with developmental stage and directly reduce social or academic function.
- Several symptoms must have been present before age 12 and be evident in two or more settings such as home, school, or work.
- Presentation is specified as predominantly inattentive, predominantly hyperactive-impulsive, or combined, with mild, moderate, or severe severity.
- Symptoms cannot be better explained by another disorder or occur exclusively during psychosis; partial remission is coded when criteria lapse.

NEUROBIOLOGY & PHYSIOLOGY

- Delayed cortical maturation, with peak thickness in prefrontal regions reached roughly 3 years later than in unaffected peers.
- Hypofunction of frontostriatal and frontoparietal circuits underlies deficits in response inhibition, working memory, and sustained attention.
- Deficient dopamine and norepinephrine signaling in prefrontal cortex and striatum explains response to stimulants and to atomoxetine.
- Heritability approaches **74%**; risk is polygenic with no single gene of large effect and substantial overlap with autism and mood disorders.
- The default mode network fails to suppress during task engagement, producing intrusive attentional lapses and highly variable reaction times.
- Prenatal exposures including nicotine, alcohol, extreme prematurity, low birth weight, and lead raise risk beyond inherited loading.

PSYCHOLOGICAL MECHANISMS

- Barkley's model frames ADHD as impaired behavioral inhibition that degrades working memory, self-directed speech, affect regulation, and planning.
- Delay aversion and steep temporal discounting drive selection of small immediate rewards over larger delayed ones in daily decisions.
- Years of correction and failure produce negative self-schemas, learned helplessness, and avoidance of tasks previously experienced as impossible.
- Executive dysfunction is a performance problem, not a knowledge problem; patients know what to do but cannot deploy it at the point of performance.
- Coercive parent-child cycles and inconsistent contingencies amplify oppositional behavior layered on top of core symptoms.

DIFFERENTIAL & COMORBIDITY

- Differentiate from anxiety, mood disorders, trauma, sleep apnea, learning disorders, absence seizures, and thyroid disease, all of which mimic inattention.
- Bipolar disorder shows episodic mood change with reduced need for sleep, whereas ADHD symptoms are chronic, daily, and situationally consistent.
- ODD** co-occurs in roughly 40-60%, learning disorders in 20-45%, anxiety in 25-40%, and substance use disorders rise in adolescence.
- Untreated ADHD elevates risk of motor vehicle crashes, unintentional injury, unplanned pregnancy, academic failure, and suicide attempts.
- Screen for stimulant diversion and misuse in college populations, and review cardiac and family sudden-death history before starting stimulants.

Treatment EVIDENCE-BASED MANAGEMENT

PHARMACOLOGIC

- Methylphenidate** products (OROS **18-72 mg/day**) and amphetamines (**lisdexamfetamine 30-70 mg/day**) are first line, each helping about 70%.
- Trying the second stimulant class after failure of the first raises overall response to roughly 85-90%; titrate every 1-2 weeks to effect.
- Monitor blood pressure, pulse, height, weight, appetite, and sleep at each visit; growth deceleration is usually modest and dose related.
- Atomoxetine 0.5-1.4 mg/kg/day** is a non-stimulant first-line option for tics, anxiety, or diversion risk; allow 4-6 weeks for full effect.
- Guanfacine ER 1-4 mg/day** and **clonidine ER 0.1-0.4 mg/day** work as monotherapy or stimulant adjuncts; watch sedation and hypotension.

PSYCHOTHERAPY

- Behavioral parent training** over 8-16 weekly sessions is first line for preschool-age children before any medication trial is considered.
- Classroom behavioral management using daily report cards, token systems, and antecedent structure produces moderate effects on target behavior.
- CBT** for adult ADHD across 12-16 sessions targets organization, planning, and distractibility with added benefit beyond medication alone.
- Organizational skills training in school-age children improves homework completion, materials management, and time tracking at school and home.
- Cognitive training and neurofeedback improve trained tasks but show weak transfer to real-world function on blinded outcome ratings.

ADJUNCT & SUPPORTIVE

- Standardized rating scales such as **Vanderbilt**, **Conners-3**, and **ASRS-v1.1** anchor baseline severity and track medication titration.
- Section 504 plans and IEPs provide extended time, preferential seating, reduced written load, chunked assignments, and testing accommodations.
- Sleep evaluation is essential; treating obstructive sleep apnea or delayed sleep phase can substantially reduce daytime inattention.
- Aerobic exercise, consistent routines, external cueing systems, and reduced screen-based multitasking provide small adjunctive gains.
- Coordinate with school, ADHD coaching, or occupational therapy; driving safety counseling matters most for newly licensed adolescents.

- ☆ **CLINICAL PEARLS**
- Chronic, cross-setting symptoms point to ADHD; episodic symptoms point somewhere else.
 - Stimulant failure usually means wrong dose, wrong timing, or a missed comorbidity.
 - Check pulse and blood pressure at every titration visit, not only at baseline.

References

- American Academy of Pediatrics, Subcommittee on Children and Adolescents With Attention-Deficit/Hyperactivity Disorder. (2019). Clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *Pediatrics*, 144(4), e20192528. <https://doi.org/10.1542/peds.2019-2528>
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Cortese, S., Adamo, N., Del Giovane, C., Mohr-Jensen, C., Hayes, A. J., Carucci, S., Atkinson, L. Z., Tessari, L., Banaschewski, T., Coghill, D., Hollis, C., Simonoff, E., Zuddas, A., Barbui, C., Purgato, M., Steinhausen, H.-C., Shokrane, F., Xia, J., & Cipriani, A. (2018). Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: A systematic review and network meta-analysis. *The Lancet Psychiatry*, 5(9), 727-738. [https://doi.org/10.1016/S2215-0366\(18\)30269-4](https://doi.org/10.1016/S2215-0366(18)30269-4)
- National Institute for Health and Care Excellence. (2018). *Attention deficit hyperactivity disorder: Diagnosis and management* (NICE Guideline NG87). <https://www.nice.org.uk/guidance/ng87>
- National Institute of Mental Health. (n.d.). *Attention-deficit/hyperactivity disorder*. U.S. Department of Health and Human Services. <https://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd>
- Sadock, B. J., Sadock, V. A., & Ruiz, P. (2021). *Kaplan & Sadock's synopsis of psychiatry* (12th ed.). Wolters Kluwer.
- Stahl, S. M. (2021). *Stahl's essential psychopharmacology* (5th ed.). Cambridge University Press.

NOTE

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