

DECISIONS

A 7-year-old boy experiencing difficulty at school

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A 7-year-old boy and his parents present to their family practice at the request of the child's teacher. Since starting grade 1, the child has been easily distracted, has difficulty focusing on assignments, struggles to remain seated during class and argues with his teacher. His parents note similar behaviour at home and worry that it interferes with his learning. They ask if he has attention-deficit/hyperactivity disorder (ADHD).

How is ADHD diagnosed?

For a diagnosis of ADHD, the patient must meet at least 6 of 9 criteria in the hyperactive and impulsive and/or inattentive symptom domains listed in the *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition (DSM-5).¹ In addition, symptoms must develop before the patient is 12 years of age, must be present in 2 or more settings, must cause impairment and cannot be better explained by another disorder.

Many conditions mimic or coexist with ADHD, including learning disability, oppositional defiant disorder, depression, anxiety disorders and temperamental variations (Box 1). Distinguishing ADHD from other conditions is challenging and time-consuming. A thorough history that includes information from parents, the child (if appropriate) and an informant from a second setting (e.g., a teacher) regarding ADHD criteria and mimicking and comorbid conditions is necessary. A technical review supports using DSM-based ADHD rating scales to efficiently gather information from multiple settings and aid in making the diagnosis.² Some rating scales inquire about symptoms of mimicking and co-occurring conditions and can help identify them.³ The number of visits needed to diagnose ADHD depends on the complexity of the case, the health care provider's familiarity with the patient and office system support (e.g., support staff, information management system). In our experience, a diagnosis can be made in 2 visits for uncomplicated cases with sufficient information.

How can the goals of therapy be set for the child?

Once ADHD is diagnosed, the health care provider and family should work together to develop treatment goals.³ Goals should be informed by the child's needs and the family's priorities (e.g., increased time spent on assignments without distraction, decreased movement in chair during class, fewer behavioural outbursts). The parent and health care provider should establish metrics to monitor progress toward these goals (e.g., tracking the number of outbursts at school per day using a daily report card).³

What interventions should be considered?

Behavioural interventions and medication can be considered alone or in combination based on the family's preferences and goals. According to a comprehensive meta-analysis, some behavioural interventions (Box 2) improve ADHD symptoms.⁴ These interventions include parent training, behavioural classroom management and social skills support. Stimulant medications (e.g., methylphenidate, amphetamines) have been extensively studied, and well-designed randomized controlled trials⁵ support their safety and efficacy. Children whose ADHD was treated with stimulant medication showed greater improvement in symptoms compared with children who only received behavioural therapy in a study that directly compared the 2 treatment options.⁵ For domains such as oppositional behaviour and parent-child interactions, combining behavioural therapy and medications was superior to routine care, whereas medication alone was not. Combined therapy also resulted in the use of lower doses of medication compared with pharmacotherapy alone.⁶

When choosing a medication, health care providers should consider factors such as length of action, adherence, ability to swallow pills and cost. The response to treatment may vary by patient, with some children preferentially responding to one stimulant over another. Adverse

Competing interests:

Manuel Jimenez has received payment for lectures from the American Physician Institute. James Guevara has received a research grant from Shire Pharmaceuticals; he has received payment for the development of the Pediatric Boards Review Course from the American Physician Institute. No other competing interests were declared.

This article has been peer reviewed.

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CMAJ 2013. DOI:10.1503/cmaj.130042

effects should be reviewed with the family (Box 2). Before starting stimulants, cardiac risk should be assessed (Box 2),⁷ and identified risk factors should trigger further assessment. Once a patient starts taking stimulant medication, blood pressure and pulse, and weight and height in children and adolescents, should be monitored at each follow-up visit.³

Follow-up should occur regularly, with telephone contact between visits. A visit within 4 weeks of starting medication is recommended, and follow-up should continue at this interval until the dose is stable.³ Medication should be

started at the lowest dose and titrated slowly based on response and adverse effects. Adjustments can be made after about 7 days.³ As mentioned previously, changes in inattention, hyperactivity and impulsivity can be monitored using rating scales, and by parent, child and teacher report.³ Other goals can be monitored using metrics established at the start of treatment.³ If desired outcomes are not achieved, the diagnosis, co-occurring conditions and treatment plan should be reassessed.³ Once adequate progress toward goals has been made, follow-up should occur at least semiannually.³

Box 1: Conditions that may mimic or co-occur with attention-deficit/hyperactivity disorder⁸**

Developmental differences or normal variants

More common: Normal variation; giftedness

Less common: Sociocultural differences in expectations, parenting or both

Medical disorders

More common: Adverse effects of medication; substance abuse; hearing impairment; visual impairment; obstructive sleep apnea

Less common: Symptoms of toxin exposure (e.g., chronic lead exposure or acute lead intoxication); chronic iron deficiency anemia; thyroid disorders; complications of chronic diseases

Neurologic or developmental disorder

More common: Learning disability; pervasive developmental disorders; tic disorders (Tourette syndrome); communication disorders; processing disorders; intellectual disability; neurodevelopmental syndromes (e.g., fetal alcohol spectrum disorder, fragile X syndrome)

Less common: Cerebral palsy; seizure disorders (petit mal or developmental delays); sequelae of central nervous system trauma or infection; neurodegenerative disorders; motor coordination disorders

Psychosocial or environmental problems

Stress in the family situation (e.g., marriage, separation or divorce, birth of a sibling, death); stress in the environment (e.g., new home, new school); family dysfunction; parenting dysfunction; neglect, abuse or both; parental psychopathology; parental substance abuse; inappropriate educational program

Emotional or behavioural disorders

More common: Oppositional defiant disorder; conduct disorder; depressive disorders; anxiety disorders

Less common: Bipolar disorder; obsessive-compulsive disorder; posttraumatic stress disorder; adjustment reaction; schizophrenia

*The prevalence of any of these conditions will vary depending on the characteristics of the setting in which the patient is being evaluated.

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Box 2: Treatments for attention-deficit/hyperactivity disorder^{3,4,7}

Behavioural interventions

- Parent training, behavioural classroom management and social skills support
- Additional considerations: access; familiarity of the health care provider with local resources; time investment by families (interventions are typically conducted over several weeks)

Medications

- First-line: stimulant medications (e.g., methylphenidate, amphetamines)
- Second-line: nonstimulant medications (e.g., α 2- adrenergic agonists and atomoxetine)
- Additional considerations: adverse effects from stimulants; screening for cardiac risk
- Common adverse effects of stimulants include decreased appetite, headache, abdominal pain and insomnia; less common effects include irritability and mood change; rarely, hallucinations can occur; may unmask or exacerbate tics in some children; may result in minimal growth deceleration (1–2 cm)
- Cardiac risk factors on screening include a history of syncope or near syncope; palpitations; poor exercise tolerance; personal or family history of structural heart disease, arrhythmia or sudden death; physical examination should include blood pressure and auscultation for murmur.
- Further assessment is suggested if increased risk is identified.

Case revisited

This patient met the diagnostic criteria for ADHD supported by parent- and teacher-rating scales. Classroom accommodations were made to improve oppositional behaviours, and treatment with a methylphenidate preparation was started to reduce symptoms. At a 1-month follow-up visit, the patient's parents and teacher were satisfied with his progress, and rating scale scores supported a decrease in symptoms.

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Contributors: Both of the authors conceived the idea for the article, drafted and revised the manuscript, and approved the final version submitted for publication.

Resources

- More information on behavioural interventions is available from Children and Adults with Attention Deficit/Hyperactivity Disorder (www.chadd.org)
- A number of ADHD-specific rating scales are available, including one that is freely available from the National Initiative for Children's Health Quality: *Caring for Children with ADHD: A Resource Toolkit for Clinicians, 1st edition* (www.nichq.org/); the same rating scale is also included in the 2nd edition of the toolkit, which is available for purchase from the American Academy of Pediatrics bookstore.
- Additional guidance on medication management and titration can be found in the American Academy of Pediatrics guidelines and supplement.³