

ATTENTION DEFICIT HYPERACTIVITY DISORDER

Answering your questions
about ADHD and its treatment

What is ADHD?

Attention Deficit Hyperactivity Disorder is a neurobiological condition of the brain that can cause hyperactivity, impulsivity and difficulties with paying attention.¹

From time to time, we all have difficulty sitting still, concentrating and controlling impulsive behaviour. However, for someone with Attention Deficit Hyperactivity Disorder, the symptoms are so persistent and pervasive that it interferes with their daily life including school, work, and interacting with friends and family.

Attention Deficit Hyperactivity Disorder, also known as ADHD, affects millions of children and adults. An estimated 4% to 12% of school-age children have ADHD,² with boys diagnosed 3 to 4 times more than girls.³ For a diagnosis of Attention Deficit Hyperactivity Disorder, specific criteria must be met and the symptoms must persist over time.

ADHD can create problems for a child in getting along with peers.⁴ It can also cause underachievement or school failure⁵ and problems in dealing with authority. Without proper attention, the difficulties associated with ADHD may continue into adolescence and adulthood.

For years, it was commonly believed that children outgrew ADHD in adolescence. However, it is now known that many of the symptoms continue into adulthood.^{6,7} Approximately 50% of children diagnosed with ADHD will continue to have ADHD symptoms as an adult.⁶

What is the difference between ADHD and ADD?

ADHD is not a new disorder. It was first observed among children in the early 1900s, and has been extensively studied for more than 50 years.

Attention Deficit Disorder (ADD) may be the most well-known name for the disorder, but it is now considered a sub-classification of ADHD. In 1987, ADD was renamed Attention Deficit Hyperactivity Disorder to include not only inattention but also symptoms of hyperactivity-impulsivity.

Diagnosing ADHD

There is no single test for ADHD. Instead, a comprehensive evaluation is necessary to establish a diagnosis, rule out other possible causes, and determine if there are any other co-existing conditions (such as anxiety, mood disorder, conduct disorder, oppositional defiant disorder, learning disabilities).

The assessment includes obtaining detailed information from several sources including the child's parents, physicians and teachers using standardized assessment scales. The evaluation also involves observing the child and asking the child questions.

As established by current medical practice, criteria for diagnosing ADHD require that symptoms of inattention and/or hyperactivity-impulsivity have persisted for **at least 6 months** and that they are more frequent and severe than typically observed in individuals of the same age.⁸

Some symptoms of ADHD must be present before age 7, and be displayed in at least two settings (for instance, at school and at home). There must also be clear evidence of the symptoms affecting academic or social functioning. Above all, the symptoms must be causing sufficient impairment of the child's daily functioning. In adults, the symptoms must affect the ability to function in daily life and persist from childhood.

Diagnostic Criteria for ADHD

Symptoms of Inattention

1. Often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
2. Often has difficulty sustaining attention in tasks or play activities
3. Often does not seem to listen when spoken to directly
4. Often does not follow through on instructions and fails to complete schoolwork, chores, or duties (not due to oppositional behaviour or failure to understand instructions)
5. Often has difficulty organizing tasks and activities
6. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
7. Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books or tools)
8. Is often easily distracted by extraneous stimuli
9. Is often forgetful in daily activities

Symptoms of Hyperactivity/Impulsivity

1. Often fidgets with hands or feet or squirms in seat
2. Often leaves seat in classroom or in other situations in which remaining seated is expected
3. Often runs about or climbs excessively in situations in which it is inappropriate; (in adolescents or adults, may be limited to subjective feelings of restlessness)
4. Often has difficulty playing or engaging in leisure activities quietly
5. Is often "on the go" or often acts as if "driven by a motor"
6. Often talks excessively
7. Often blurts out answers before questions have been completed
8. Often has difficulty awaiting turn
9. Often interrupts or intrudes on others (e.g., butts into conversations or games)

Adapted from the American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 4th edition (Washington, DC, 1994).

While most people with ADHD have symptoms of both inattention and hyperactivity-impulsivity (see chart on page 5), one symptom pattern may predominate, resulting in three different subtypes:

- **Predominantly Inattentive Type:** When a person displays 6 or more symptoms of inattention, but fewer than 6 symptoms of hyperactivity-impulsivity, and the symptoms have persisted for at least 6 months
- **Predominantly Hyperactive-Impulsive Type:** When a person displays 6 or more symptoms of hyperactivity-impulsivity, but fewer than 6 symptoms of inattention, and the symptoms have persisted for at least 6 months
- **Combined Type:** When a person displays 6 or more symptoms of inattention and 6 or more symptoms of hyperactivity-impulsivity, and the symptoms have persisted for at least 6 months. Most children and adolescents with ADHD have the combined type.⁹

What Causes ADHD?

The specific cause of ADHD is not known. However, there is increasing evidence from PET scan and MRI studies of the brain, and from genetic twin studies, that ADHD has a biological basis.¹⁰ Investigations of brain structure and function using advanced imaging devices have shown significant differences between people with and without ADHD.¹¹

The two PET scan images below highlight the differences between adult patients without ADHD (left) and those with ADHD not receiving treatment (right).¹¹ Note that metabolic activity (white, red, and orange areas) appears decreased in the patient with ADHD, especially in areas of the brain believed responsible for control of attention and motor activity. It is important to note that PET scans are not used to diagnose ADHD. They are currently used as a research tool to assess differences in the brains of individuals with and without ADHD. This research has not been completed in children.

PET scan of
adult brain
no ADHD



PET scan of
adult brain
diagnosed
with ADHD



Strong evidence of genetic involvement in ADHD has been derived from studies in twin, adoption, and family populations.^{12,13} In a large twin study, if one twin had ADHD, there was a 75% to 91% chance the other identical twin also had ADHD.¹³

Environmental factors may also play a role, such as diet, exposure to toxins (e.g. lead poisoning) or prenatal exposure to smoke, alcohol or drugs.^{14,15} The impact of these factors is being studied.

Treating ADHD

Although individuals with ADHD can be very successful in life, without identification and proper treatment, ADHD may have serious consequences, including school failure, job failure, depression, lack of self-esteem, problems with relationships, substance abuse and conduct disorder.^{5, 6, 16} Early identification and treatment are extremely important.

Studies show that children who receive adequate treatment for ADHD have fewer problems with school, peers and substance abuse, and show improved overall functioning, compared to those who do not receive treatment.^{17, 18}

What are the treatment options for children with ADHD?

There are two main approaches for the treatment and management of the symptoms of ADHD:

1. Behaviour modification
2. Medication

The combination of these two main types of treatment is what is referred to as a **total treatment program**.

A total treatment program includes:

- parent education and training in ADHD,
- behaviour management techniques,
- appropriate school environment,
- family counselling, and
- medication.

A total treatment program requires an ongoing partnership involving:

- the child,
- the family,
- school personnel,
- physicians, and
- other healthcare professionals.

Behaviour Modification

Behaviour management techniques are useful for parents and teachers, in home and school settings. Developing consistency across school, home, and community settings and among parents, teachers, and therapists is crucial to the success of behavioural treatment, but can be a significant challenge to achieve.

Behaviour management, as part of a total treatment program, is an important type of therapy for ADHD. Some behavioural adjustments may include:

- Asking your child's teacher to move your child to the front of the room
- Establishing daily checklists
- Focusing on success
- Reinforcing your child's self-esteem and good behaviour

Medication

Research from a landmark study by the National Institute for Mental Health found that children who received medication, alone or in combination with behavioural treatment, showed significant improvement in their behaviour and schoolwork plus better relationships with their classmates and family.¹⁷

Among medications, stimulants are most frequently used for managing ADHD symptoms. These medications are effective in decreasing impulsivity and hyperactivity, and increasing attention. Seventy to eighty percent of people with ADHD respond to stimulant medications.¹⁹

You may be wondering why a stimulant medication is effective in treating someone with ADHD. Although there are many theories as to why stimulant medications work, recent clinical research has shown that certain areas of the brain in people with ADHD are under-aroused – areas believed important for concentration, weighing consequences, inhibiting actions and foresight.¹¹ One theory is that stimulant medications work by arousing these areas of the brain, allowing the person to be able to concentrate better and be less impulsive and hyperactive.

Many parents worry or feel guilty about medicating a child, but it is important to know that some of these medications have been used successfully and safely²⁰ for 30 years in treating ADHD patients. If you see reports in the media about ADHD medications that concern you, you should discuss these issues with your child's physician. Your physician is best qualified to help you decide what's right for your child and you.

Keep in mind that ADHD is a recognized medical condition that often requires medical intervention.

Support within the Community

For more information on ADHD and support services contact:

NATIONAL:

- CH.A.D.D. Canada (Children and Adults with Attention Deficit Hyperactivity Disorder)
Website: www.chaddcanada.org
Tel: (613) 731-1209
Email: info@chaddcanada.org
- Learning Disabilities Association of Canada
Website: www.ldac-taac.ca
Email: information@ldac-taac.ca
Tel: (613) 238-5721

ALBERTA:

- Learning Disabilities Association of Alberta
Email: ldaa@telusplanet.net
Tel: (403) 448-0360

BRITISH COLUMBIA:

- Learning Disabilities Association of British Columbia
c/o Learning Disabilities Association of Vancouver
Website: www.ldav.ca
Tel: (604) 873-8139

MANITOBA:

- Learning Disabilities Association of Manitoba
Email: ldamb@escape.ca
Tel: (204) 774-1821

NEW BRUNSWICK:

- Learning Disabilities Association of New Brunswick
Website: <http://www.nald.ca/ldanb>
Email: ldanb@nald.ca
Tel: (506) 459-7852
Toll Free: 1-877-544-7852

NEWFOUNDLAND AND LABRADOR:

- Learning Disabilities Association of Newfoundland and Labrador
Website: www.nald.ca/ldanl/
Email: ldanl@roadrunner.nf.net
Tel: (709) 753-1445

NOVA SCOTIA:

- Learning Disabilities Association of Nova Scotia
Website: <http://ldans.nsnet.org/>
Email: ldans@ns.sympatico.ca
Tel: (902) 423-2850
- Attention Deficit Association of Nova Scotia
Website: www.adans.ns.ca
Email: adans@adans.ns.ca
Tel: (902) 869-1117

ONTARIO:

- Learning Disabilities Association of Ontario
Website: <http://www.ldao.on.ca>
Email: resource@ldao.on.ca
Tel: (416) 929-4311
- Attention Deficit Resource Network
Website: www.adrn.org
Email: info@adrn.org
Tel: (416) 208-3141

- Parents Helping Parents
Website: http://www.geocities.com/parents_helping_parents/
Email: parents_helping_parents@yahoo.com
Tel: (519) 759-1298

QUEBEC:

- AQETA/LDAQ (Association Québécoise pour les troubles d'apprentissage/Learning Disabilities Association of Quebec)
Website: www.aqeta.qc.ca
Email: info@aqeta.qc.ca
Tel: (514) 847-1324
- PANDA (Regroupement des associations de parents PANDA du Québec)
Website: <http://panda.cyberquebec.com> or <http://www.associationpanda.qc.ca>
Tel: (450) 979-7788

SASKATCHEWAN:

- Learning Disabilities Association of Saskatchewan
Website: <http://www.ldas.org>
Email: reception@ldas.org
Tel: (306) 652-4114

NORTHWEST TERRITORIES:

- Learning Disabilities Association of Northwest Territories
Website: www.nald.ca/ldanwt.htm
Email: ldanwt@ssimicro.com
Tel: (867) 873-6378

YUKON:

- Learning Disabilities Association of Yukon
Website: <http://www.nald.ca/lday.htm>
Email: lday@yknet.yk.ca
Tel: (867) 668-5167

REFERENCES

1. American Academy of Pediatrics. AAP Parent Pages. October 2001.
2. Brown RT, Freeman WS, Perrin JM *et al.* Prevalence and assessment of attention-deficit/hyperactivity disorder in primary care settings. *Pediatrics* 2001; 107(3): 1-11.
3. Biederman J, Mick E, Faraone S. *et al.* Influence of Gender on Attention Deficit Hyperactivity Disorder in Children Referred to a Psychiatric Clinic. *Am J Psychiatry* 2002;159(1): 36-42.
4. Frankel F, Feinberg D. Social problems associated with ADHD vs. ODD in children referred for friendship problems. *Child Psychiatry Hum Dev* 2002; 33(2): 125-46.
5. Szatmari P, Offord DR, Boyle MH. Correlates, associated impairments and patterns of service utilization of children with attention deficit disorder: Findings from the Ontario Child Health Study. *J Child Psychol Psychiatry* 1989; 30(2): 205-217.
6. Weiss G, Hechtman L, Milroy T, *et al.* Psychiatric status of hyperactives as adults: a controlled prospective 15-yr follow-up of 63 hyperactive children. *J Am Acad Child Psychiatry* 1985; 24: 211-220.
7. Pary R, Lewis S, Matuschka PR, Rudzinskiy P, Safi M, Lippmann S. Attention deficit disorder in adults. *Ann Clin Psychiatry* 2002;14(2):105-11.
8. American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 4th edition (Washington, DC, 1994).
9. Lalonde J, Turgay A, Hudson J. Attention-Deficit Hyperactivity Disorder Subtypes and Comorbid Disruptive Behaviour Disorders in a Child and Adolescent Mental Health Clinic. *Can J Psychiatry* 1998;43:623-628.
10. PET stands for Positron Emission Technology and MRI stands for Magnetic Resonance Imaging.
11. Zametkin AJ, Nordahl TE, Gross M, *et al.* Cerebral glucose metabolism in adults with hyperactivity of childhood onset. *N Engl J Med* 1990; 323: 1361-1366.
12. Biederman J, Munir K, Knee D, *et al.* A family study of patients with attention deficit disorder and normal controls. *J Psychiatr Res* 1986; 20: 263-74.
13. Levy F, Hay DA, McStephen M, Wood C, Waldman I. 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(6): 737-44.
14. Thomson GO, Raab GM, Hepburn WS, Hunter R, Fulton M, Laxen DP. Blood-lead levels and children's behaviour--results from the Edinburgh Lead Study. *J Child Psychol Psychiatry* 1989; 30(4): 515-28.
15. Mick E, Biederman J, Faraone SV, Sayer J, Kleinman S. Case-control study of attention-deficit hyperactivity disorder and maternal smoking, alcohol use, and drug use during pregnancy. *J Am Acad Child Adolesc Psychiatry* 2002 Apr; 41(4): 378-85.
16. Almond BW Jr, Tanner JL, Goffman HF. *The Family Is the Patient: Using Family Interviews in Children's Medical Care*. 2nd ed. Baltimore, MD: Williams & Wilkins; 1999:307-313.
17. Jensen P, Arnold L, Richters J, *et al.* 14-month randomized clinical trial of treatment strategies for attention deficit hyperactivity disorder. *Arch Gen Psychiatry* 1999; 56:1073-1086.
18. Wilens T, Faraone S, Biederman J, Gunawardene S. Does stimulant therapy of attention deficit/hyperactivity disorder beget later substance abuse? A meta-analytic review of the literature. *Pediatrics* 2003; 111(1): 179-85.
19. Spencer T, Wilens T, Biederman J, *et al.* A double-blind, crossover comparison of methylphenidate and placebo in adults with childhood-onset attention-deficit hyperactivity disorder. *Arch Gen Psychiatry* 1995; 52: 434-443.
20. Greenhill LL, Pliszka S, Dulcan MK & the AACAP Work Group on Quality Issues. Practice parameter for the use of stimulant medications in the treatment of children, adolescents and adults. *J Am Acad Child Adolesc Psychiatry* 2002; 41(Suppl 2): 26S-49S.



JANSSEN-ORTHO

19 Green Belt Drive
Toronto, Ontario M3C 1L9

*All trademark rights used under license
© 2003 JANSSEN-ORTHO Inc.
CRCB031004A



COMMUNITY RELATIONS

Member

