



Diagnosis and Management of ADHD in Adults



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FPs and pediatricians are familiar with their children and teenagers who suffer from attention deficit hyperactivity disorder (ADHD) (Table 1). More boys than girls are diagnosed in childhood (ratios vary from three to 10 males per one female). Worldwide, prevalence is between 5% and 12%.

Children with ADHD followed until age 25 continue to struggle with ADHD symptoms. More than half of children with ADHD still have major symptoms as adults. ADHD is a chronic condition for most patients. Interestingly, the male to female ratio changes in adults to 3:2, perhaps because more females suffer from the inattentive subgroup of ADHD which is more likely to be overlooked in the school setting.¹⁻⁴

Biological basis and genetics of ADHD

Parents often believe that ADHD is a consequence of our modern sedentary era with its flashing video screens. In fact, the disorder was first described in the early 1900s. There is an extremely potent genetic contribution to ADHD. Twin studies reveal a concordance of 0.8, just below heritability for height and well above that for schizophrenia, asthma and breast cancer. Dopamine transporter/receptor genes have been implicated. Both anatomical and functional MRI studies reveal differences between ADHD patients and normal controls. Those with ADHD have:

- Smaller cortical areas (prefrontal cortex and cerebellum)

- Smaller sub-cortical areas (corpus callosum and thalamus)
- Reduced perfusion in these areas correctable by stimulants
- A functional abnormality in the anterior cingulate cognitive division which is activated by cognitive/attentional tasks in normal controls but not in ADHD sufferers⁵⁻⁸

ADHD over the lifespan

Childhood behavioural disturbances, school and academic problems, difficulties with social interactions and low self-esteem give way over the lifespan to legal issues, academic and occupational failures, injuries, accidents and relationship problems (Figures 1a, 1b, 1c). There may be an erratic work history with frequent job changes, incomplete projects, missed appointments, marital and parenting problems, poor money management, paralyzing procrastination, impatience with line-ups and posted speed limits, anger outbursts, inappropriate comments and poor time management.

Comorbid conditions are common and include:

- Depression
- Anxiety
- Substance abuse
- Dysthymic disorder
- Antisocial disorders (25% of prison inmates meet the criteria for ADHD)



Table 1

Common signs of attention deficit hyperactivity disorder (ADHD): DSM-IV

Inattention

- Failure to pay close attention to details or making careless mistakes at school, work, or other activities
- Difficulty sustaining attention in tasks or play activities
- Not seeming to listen when spoken to directly
- Not following through on instructions and/or failure to finish school work, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)
- Difficulty organizing tasks and activities
- Avoidance of, dislike of, or reluctance to engage in tasks that require sustained mental effort (*i.e.*, school work or homework)
- Frequent loss of things necessary for tasks or activities (*e.g.*, toys, school assignments, pencils, books, or tools)
- Easily distracted by extraneous stimuli
- Forgetfulness in daily activities

Hyperactivity-impulsivity

- Fidgeting with hands or feet or squirming in seat
- Frequently leaving seat in classroom or in other situations in which remaining seated is expected
- Frequent running around or climbing excessively in situations in which it is inappropriate
- Difficulty playing or engaging in leisure activities quietly
- Constantly appearing to be “on the go” or acting as if “driven by a motor”
- Excessive talking
- Blurting out answers before questions have been completed
- Difficulty awaiting turns
- Frequently interrupting or intruding on others (*e.g.*, butting into conversations or games)

To make a diagnosis of ADHD, the patient must have ≥ 6 symptoms of inattention or of hyperactivity/impulsivity appearing often. These symptoms must have persisted for at least 6 months to a degree that is maladaptive and inconsistent with the developmental level and onset must have occurred before age 7. Furthermore, the symptoms must be pervasive (*i.e.*, present in at least 2 settings, are much more than personality traits and quirks and must significantly impair major aspects of day-to-day life [*e.g.*, social, academic, or occupational functioning]).

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.

Adult ADHD drivers get more traffic tickets and are more likely to be involved in accidents (Figure 2). Income also suffers in adults with ADHD (Figure 3).

ADHD and its comorbid anxiety, mood and substance abuse, have enormously high costs both to individual sufferers and society at large.

Diagnosis

FPs who suspect ADHD can use the five-minute Adult ADHD Self-report Scale Symptom Checklist which is available online at the The Canadian ADHD Resource Alliance (CADDRA) website at: [http://www.caddra.ca/english/2007-08_](http://www.caddra.ca/english/2007-08_guidelines_pdfs/Appendices/2007-08_)

Caddra_Guidelines_Appendix13.pdf (CADDRA contains excellent guidelines and tools for families and healthcare providers alike).

Four marks in the shaded sections of Part A make the diagnosis of ADHD likely, while Part B provides clues for further probes into patients' symptoms.

Interviewing the patient and their family (spouse, parents if permitted) regarding impairments in work/school, social and family settings is helpful. Access to old report cards is useful. A history of similar problems with attention or self-control in childhood is important but a formal diagnosis of ADHD in childhood is not required.

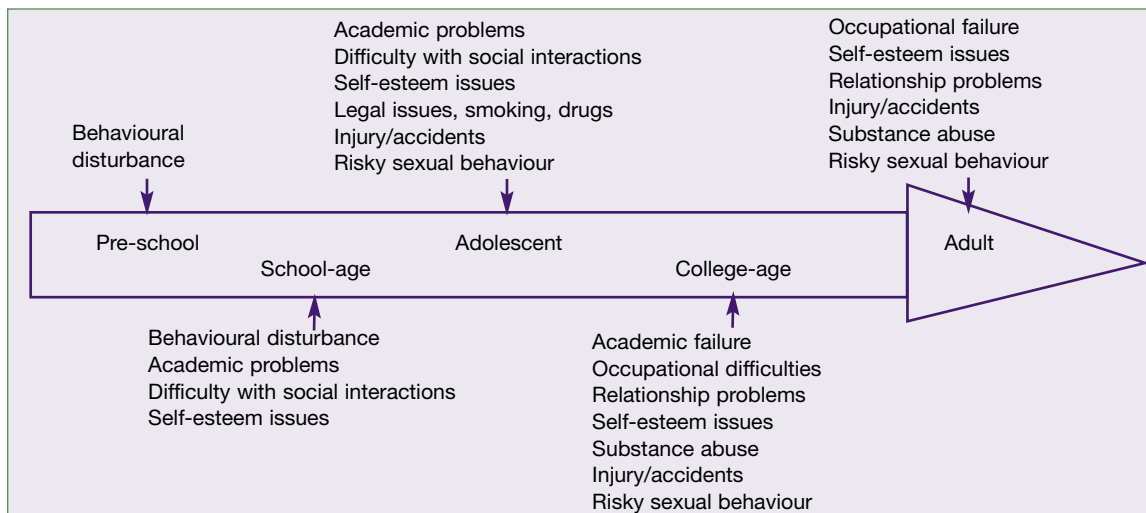


Figure 1a. ADHD over the lifespan.⁹

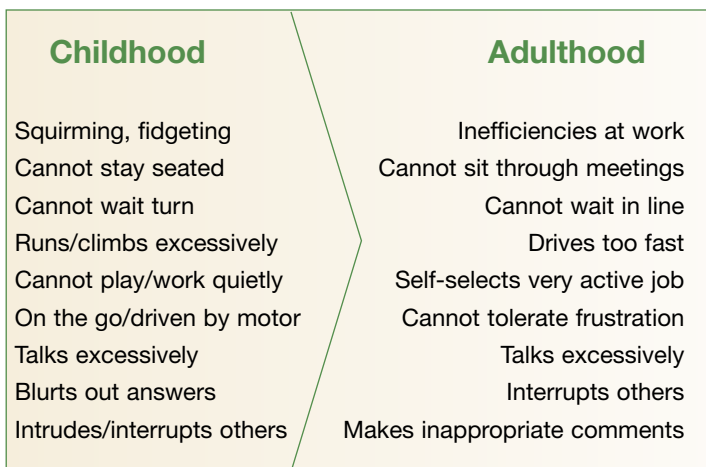


Figure 1b. Hyperactivity.¹⁰⁻¹²

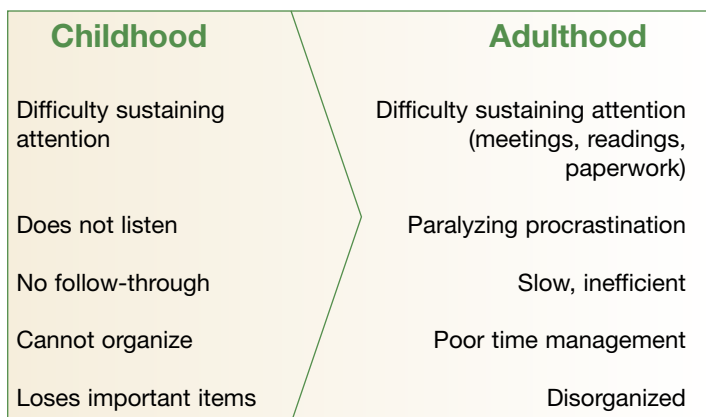


Figure 1c. Inattention.¹⁰⁻¹²

Treatment

Non-pharmacological management can include:

- Self education
- Cognitive behaviour therapy
- Social skills training
- Organizational skills training
- Individual psychotherapy
- Support groups
- Remediation for learning disabilities and dyslexia
- Life skills coaching

Medications are very effective. The response of adults to the commonly-used methylphenidate and amphetamine-based psychostimulants and non-stimulant medications like atomoxetine and imipramine is about 70% to 80%.

Atomoxetine is a norepinephrine reuptake inhibitor with positive effects on ADHD and anxiety. Atomoxetine can be considered first-line therapy for patients who have ADHD with anxiety, tic or Tourette's disorder. Less commonly used are imipramine, bupropion and clonidine.



Table 2

Recommended doses for ADHD medications (CADDRA guidelines 2008)

First-line agents		Starting dose	Maximum dose
Trade Name	Generic name		
Adderall XR	mixed amphetamine salts	10 mg a.m.	30 mg a.m.
Biphentin	slow release methylphenidate	10 mg a.m.	80 mg a.m.
Concerta	slow release methylphenidate	18 mg a.m.	108 mg a.m.
Strattera	atomoxetine	0.5 mg/kg/day	100 mg or 1.4 mg/kg (whichever is less)
Second-line agents			
Trade Name	Generic name		
Ritalin (short acting)	methylphenidate	total maximum dose 100 mg/day (can be administered in 2-3 divided doses)	
Ritalin SR	slow release methylphenidate	20 mg a.m.	60 mg a.m.
Dexedrine **	dextroamphetamine	5 mg a.m. and noon	25 mg a.m. and noon
Dexedrine Spansule**	long acting dextroamphetamine	10 mg a.m.	50 mg a.m.

(Note: Adderall XR, Biphentin, Concerta and Strattera are all approved in the treatment of ADHD for children, adolescents and adults. Coverage by provincial formularies may limit choices [e.g., Ritalin SR 20 mg is the only long-acting formulation covered by Ontario Drug Benefits in Ontario]).

** off label use

Take-home message

ADHD is a genetic disorder which affects 1 in 25 adults who suffer functional impairments at work, home and school. Half of adult ADHD patients also suffer from mood and/or anxiety disorders. They also have an increased risk for substance abuse and/or involvement with the law. The impact of ADHD on income and job status is considerable. Overall quality of life may be poor and personal relationships are often disrupted. FPs have the tools and knowledge to assess, diagnose and treat this potentially serious disorder.

Table 3

Resources and links for further information

1. www.caddra.ca/
2. www.caddra.ca/english/adults.html
3. www.mdbriefcase.com
4. www.metacafe.com/w/437942
5. www.cmeonadhd.com

ADHD is a genetic disorder which affects one in 25 adults who suffer functional impairments at work, home and school.

If considering stimulant medications, check for irregular pulse and family history of sudden cardiac death. Do not use stimulants in patients with:

- symptomatic heart disease,
- moderate-to-severe hypertension,
- advanced atherosclerosis,
- hyperthyroidism and
- known structural cardiac abnormalities.¹³

Street drugs cannot be combined with ADHD medications.

In ADHD, the core impairments last all day long, so long-acting formulations are best. These improve medication compliance, decrease abuse potential and maintain confidentiality.

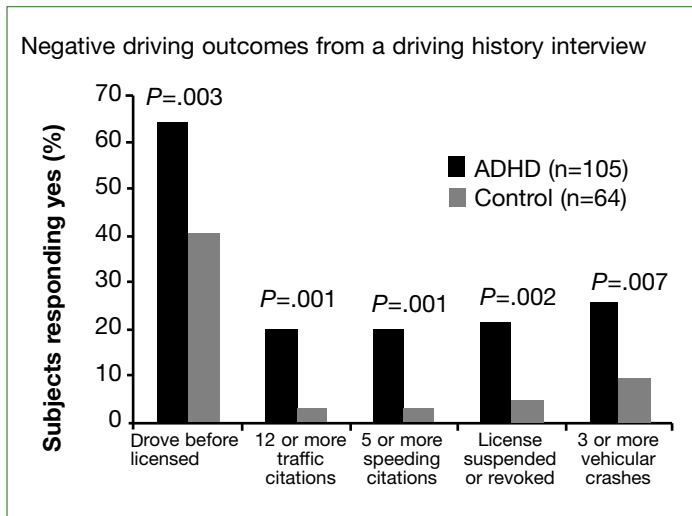


Figure 2. Driving and ADHD.¹⁴

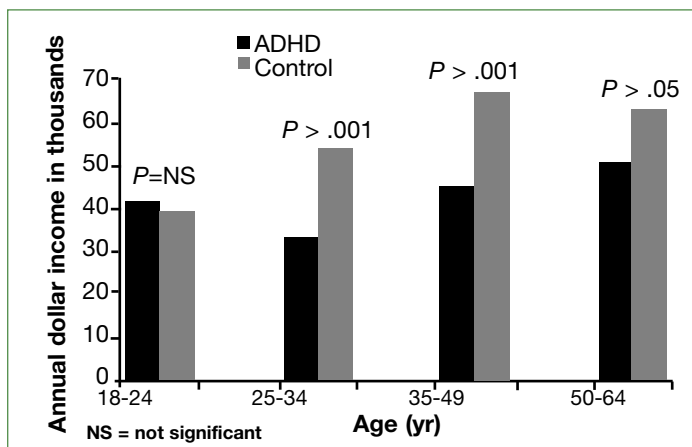




Figure 3. ADHD effect on income.

Normalization rates and adherence in long-term follow-up is higher with long-acting medications.

Dose ranges are shown in Table 2. Ritalin SR, Adderall XR, Biphentin and Concerta are long-acting products. Adderall XR, Biphentin and



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Strattera are approved for adults in Canada. Concerta is also effective and safe in adults with ADHD and has just received this approval in Canada.

All patients on ADHD medications should have their BP, pulse and cardiac status monitored periodically.

Further information on ADHD can be found at the websites listed in Table 3.



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mdBriefCase.com allowed the use of information and figures used in the online program developed by Turgay, et al (2007) on Diagnosis and Management of Attention Deficit Hyperactivity Disorder in Adults with the support of Pat Payne at Queen's University Continuing Professional Education.

This article is written in loving memory of D'Arcy, an adult victim of ADHD. August 21, 1984 to March 23, 2008.