Diagnosis and Management of ADHD

Justin Jagger MD FRCPC
Pediatrician
Assistant Professor of Medicine
Northern Ontario School of Medicine
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Northern Ontario School of Medicine
École de médecine du Nord de l'Ontario
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CEPD
continuing education and professional development

Conflict of Interest Declaration: Nothing to Disclose

Presenter: Dr. Justin Jagger

Title of Presentation: Diagnosis and Management of ADHD

I have no financial or personal relationship related to this presentation to disclose.

Learning Objectives

At the end of this presentation, participants will be able to:

1. Describe how to make a diagnosis of ADHD in children using standardized tools to support their decision.

2. Discuss the differential diagnosis and common co-morbidities associated with ADHD

3. Describe the treatment strategies for ADHD including pharmacological and behavioural approaches

Secret (real) objective….

To empower the primary care providers of Thunder Bay and the region to feel confident that they can make the diagnosis of ADHD in children/adolescents and to start first line medication.

….and refer the tough cases to pediatrics

Resources and References

CPS Position Statements, Oct, 2018:

Part 1: Etiology, Diagnosis and Comorbidity

Part 2: Treatment

Part 3: Comorbid ASD, ID or Prematurity

CADDRA Guidelines (4th Edition, 2018)

“I’m not sure there is any such thing as ADHD…….”

-J. Jagger 2004

1st year paediatric resident

A Case….”Linda”

12 year old girl here with her foster mother

Grade 7 -- “struggling at school”

“Talkative” -- on every report card since JK

Unable to read simple words in Grade 1

Has made gains but “always behind” her peers

Slow reader -- private tutoring has helped

“Linda” Con’t

Grades were “OK” but has started failing classes in Grade 7

Very social girl

“boundless energy”

Active in cheerleading and soccer

“Linda” con’t

Born ~32 weeks GA

Suspected substance abuse during pregnancy including alcohol

“Colicky” infant

Initial expressive speech delay and previous SLP involvement

“A few” ear infections when she younger

“Linda” con’t

O/E:

75th %ile for height, weight and head circumference

Normal vital signs

Non dysmorphic

No stigmata of neurocutaneous disease

Normal P/E

Some Historical Perspective

First formally introduced into the DSM III (1980) (although the DSM II referenced a “hyperkinetic reaction of childhood” in 1968)

Earliest references to “hyperactive” and “impulsive” children, Dr. Weikard, German medical textbook, 1775

In 1937, Dr. Charles Bradley administered Benzedrine sulphate as a headache remedy to children living in a group home setting -- improved school performance, social interactions and emotional responses

Epidemiology -- ADHD

Neurodevelopmental disorder

Most recent estimate is 6.8% of school aged children

Boys three times more likely to receive the diagnosis (9.2 vs 3%)

Depending on the study, between 60-80% of patients will continue to meet criteria into young adulthood

Etiology

No single cause has been identified

Dopaminergic and noradrenergic systems have been implicated

These systems are particularly rich in the prefrontal cortex, striatum and cerebellum

fMRI studies show these regions are less activated in kids with ADHD than in age-matched controls during activities associated with executive function

Etiology

Genetic component

Higher concordance rates in monozygotic twins (Heritability ~75%)

Strong family history. Rates of ADHD increase when ADHD has been diagnosed in a first degree relative (~50%)

Multiple genes have been implicated (DRD4, DRD5, DAT1)

Linked to tobacco/EtOH use during pregnancy

Diagnosis

ADHD is defined by DSM-5 criteria

There are three subtypes:

1) primarily inattentive (ADHD-IA)
2) hyperactive-impulsive (ADHD-HI)
3) combined (ADHD-CT)

DSM-V Criteria

Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often has trouble organizing tasks and activities.
- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted
- Is often forgetful in daily activities.

DSM-V Criteria

Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:

- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).
- Often unable to play or take part in leisure activities quietly.
- Is often "on the go" acting as if "driven by a motor".
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games)

DSM-V Criteria

In addition, the following conditions must be met:

- Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.
- Several symptoms are present in two or more setting, (such as at home, school or work; with friends or relatives; in other activities).
- There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.
- The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.

Diagnosis

Cornerstone remains the clinical interview supported by the use of standardized rating scales

Rating scales alone do not make the diagnosis of ADHD

Standardized Tests

A number of standardized tools are available:

Connors (ages 6-17)

SNAP-IV (ages 5-11)

Vanderbilt (ages 5-12)

ADHDratingscales.com

“I see behavioural consults as the ‘eating my vegetables’ of general paediatric practice….”

- J. Jagger, 2009

First year in practice

Differential Diagnosis and/or Comorbidities

Normal (parental/cultural expectations)

Specific Learning Disability or Intellectual Disability

Anxiety/Depression

Oppositional Defiant Disorder

Tic Disorder / OCD

Pervasive Developmental Disorder

Sleep Disorder

Stress/Chaos

Differential Diagnosis and/or Comorbidities

Hearing / Vision Impairment

Substance Abuse

Neurodevelopmental Disorders

Chronic Disease Complications

Seizure Disorders

Sleep Disorders

Chronic lead exposure / iron deficiency anemia / thyroid

Evaluation of Comorbid Disorders

Selections from:

Recommend formal psychoeducational assessment

Anxiety screening

Vision/hearing testing

Pediatrics referral -- FASD? Autism?

Management: Education

Recognize this is a chronic medical condition requiring ongoing care

ADHD is a neurobiological condition with a strong genetic component

Management: Not just medication…..

There can be frustrations in parenting kids with ADHD…..

Calm, structured positive approach to parenting

Find activities the child excels at...

Parenting includes providing structure, guidance and fun (!)

Management: Structure

Clarity of communication and expectations

Appropriate and consistent limit-setting

Age-relevant suitable supports and consequences (positive and negative)

Cues for the kid -- calendars, clocks, schedules

Management: Self-Esteem

They hear a lot of “No” “Stop that” “Enough” “Good Lord…..”

Re-discover and reinforce the things they do well

May do poorly at seat work but might be mechanically inclined….

Might be day-dreamy in school but have a rich imaginative inner life….

The more the family finds that is positive and reinforceable the easier they will manage the difficult times

The child should feel like a welcome member of the family…..

Management: Other Interventions

Depending on story, resources, availability, etc., consider involving:

Psychologist

Occupational Therapist

Family Services

Educational aid

Mental Health

Management: Goes Without Saying….

Proper nutrition

Good sleep hygiene

Regular exercise

Extracurricular activities

Screen time (!!)

Management: School Strategies

I write a lot of letters….

Preferential seating

Additional time for tests/assignments

More frequent breaks

Should be allowed to ask clarifying questions / expectations

“Chunking” questions or assignments into more manageable components

Management: School Strategies

- May recommend a formal psychoeducational assessment…..

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CADDRA

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Welcome to CADDRA
Canadian ADHD Resource Alliance

CADDRA is an independent, not-for-profit, resource organization for medical, healthcare and research professionals with an interest in the field of ADHD. We do not have any health professionals on staff to diagnose or to answer questions. If you are seeking these services, please consult your healthcare professional.

Submissions Now Open!

CADDRA
CANADIAN ADHD RESOURCE ALLIANCE

Patient Name:	
Date of Birth:	MRN/File No:
Physician Name:	Date:

REQUEST FOR SCHOOL SUPPORT SERVICES

Date: _____
Name and address of School or Institution: _____
_____
_____

Dear Principal:

Re: Name of Student: _____
Date of Birth: (dd/mm/yr) _____
Name of Parent: _____

Indicate signed parent consent exists (or is attached) for exchange of information with school staff

The above-named student is being assessed through my medical practice for Attention Deficit Hyperactivity Disorder (ADHD). Best practices in the assessment of ADHD recommend a collaborative approach to fully understand the child's range of challenges and possible explanations. A collaborative approach involving school staff is particularly helpful when a student presents with both learning and attention problems.

To provide an integrative approach to this student's care, it would be most helpful if you would bring this student to the attention of the School Board's team of relevant professional support staff to provide information and consultation as appropriate. In particular, it would be helpful to receive the teacher's observations regarding this student's performance in the classroom, including behaviour, attention, activity level, social interactions as well as the child's learning strengths and needs. Also, I would appreciate knowing if there are any special education services in place currently for this child, and the focus of these supports.

Based on my own professional judgment and assessment at this time, for this student to improve and succeed, I strongly recommend a psychoeducational assessment for this child. However, I do understand that this is the school's decision.

I wish to thank you in advance for your collaboration on this matter and I would appreciate receiving your feedback. The information from the school will help me in my treatment planning and in turn, my treatment recommendations may be helpful for the school's education plans for this student.

Should you have any further questions or concerns, please feel free to contact me for information.

Yours truly,
Signature _____ Print name _____
Telephone No. _____ Fax No. _____

CADDRA
CANADIAN ADHD RESOURCE ALLIANCE

Patient Name:	
Date of Birth:	MRN/File No:
Physician Name:	Date:

CADDRA EDUCATIONAL ACCOMMODATION LETTER TEMPLATE

This document can also be copied or downloaded from www.caddra.ca and can be used as a template when requesting educational accommodations for a patient.

Date: _____

Name and address of School or Institution:

_____

_____

Dear _____ ,

I am writing to inform you that your student, _____, has been diagnosed with ADHD. This diagnosis was based on information from *clinical diagnostic interview, standardized behaviour rating scales, psychoeducational assessment and* _____.

I am requesting that a meeting be held to discuss this student's cognitive, academic and mental health profile, as I believe that _____ should have an Education Plan developed to ensure that his/her needs are met as he/she proceeds through his/her educational program. At this time, it is essential that accommodations be put in place to ensure that this student is able to successfully access the school curriculum. These accommodations will be critical in assisting the student with their special learning needs and help him/her compensate for his/her impairments which include: ☐ difficulty maintaining necessary levels of attention, ☐ distractibility, ☐ impairments in executive functioning, ☐ poor working memory, ☐ problem solving, ☐ mental arithmetic calculation, ☐ writing notes while listening to the teacher, ☐ slow processing speed as outlined in the WISC-IV PSI.

Learning disabilities outside of the parameters of ADHD may be outlined in the psychoeducational report. From my clinical evaluation, I recommend the following accommodations (from the Canadian ADHD Resource Alliance (CADDRA) list of usual accommodations for ADHD) be implemented, with the understanding that additional accommodations may be decided on by the school and put in place in collaboration with the student's parents.

- ☐ Direct instruction, repetition and frequent clarification to assist with attentional difficulties
- ☐ Preferential seating to help alleviate distractibility
- ☐ Additional time for assignments, class work, tests/exams and flexibility of due dates
- ☐ Testing should be done on the computer or orally where necessary (with the use of spellcheck, if applicable)
- ☐ A quiet environment to write tests and complete assignments to assist with external distraction
- ☐ Copying written text from the blackboard or otherwise to be kept at a minimum
- ☐ Lengthy assignments to be given in written format for easy referral
- ☐ Copies of overheads, PowerPoint presentations, classmate's notes and teacher's notes required
- ☐ Flexibility in scheduling of tests/exams is essential if student is easily overwhelmed
- ☐ Listening to headsets during individual class work time
- ☐ Should not be unduly penalized for grammar or spelling
- ☐ Should be allowed to clarify questions on tests and assignments
- ☐ Will require more frequent breaks
- ☐ Will need assistance on assignments including: breaking assignments into manageable chunks; time management; procrastination; reviewing due dates and reviewing assignments to ensure that instructions are clearly understood
- ☐ A scribe should be provided.

Thank you for your kind attention to this matter. Should you have any questions, please do not hesitate to contact me.

Sincerely,

_____

Management: Pharmacotherapy

1st line therapy are the long-acting stimulant medications

They are either methylphenidate or dextroamphetamine-based

Actual mechanism are not well-described although dopamine, norepinephrine and other catecholamine pathways implicated

Improve sustained attention, organization and motor inhibitor control

Decrease disruptive behaviours (fidgetiness, impulsive interruption, aggression, relational interactions, oppositionality)

Management: Pharmacotherapy

Improves cognitive functioning, performance accuracy, short-term memory, reaction time and seatwork computation

These effect sizes are smaller than with the behavioural challenges

Initial trial of a stimulant is ~70% effective

Success rate with either one of two stimulant classes approaches ~90%

Management: Pharmacotherapy

There is no absolute indication to choose a methylphenidate based medication over a dextroamphetamine based preparation

Side effect profile is essentially identical as is efficacy

Be cautious if age < 6

Warn against “silver bullet” thinking

Long-acting recommended over intermediate or short-acting

Consider whether the child can swallow a pill

Management: Methylphenidate

Concerta

Felt to work by blocking reuptake of dopamine

Available in 18, 27, 36, 54mg strengths

22:78 immediate vs sustained release

Limited diversion/abuse potential

Relatively “coarse” dosing intervals

All methylphenidate based dosing ranges from 0.5 - 2 mg/kg/day

Management: Methylphenidate

Biphentin

40:60 delivery system (immediate vs sustained release)

Available in 10, 15, 20, 30, 40, 50, 60 and 80mg strengths

Relatively easy to titrate especially for younger children

May be “sprinkled” on apple sauce, etc.

Duration of action ~10-12 hours

Management: Methylphenidate

Tevo (novo) methylphenidate

Generic of Concerta approved by Health Canada in 2010

Shown to have bio-equivalence with Concerta

This is not the same as clinically equivalent

Management: Methylphenidate

Ritalin / Ritalin SR

Short-acting (3-4 hours vs 4-6 hours) preparations

Can lead to “peak” and “valley” effects

Generally not considered first line

Sometimes used to extend the effect of a long-acting preparation later into the day/evening

Management: Dextroamphetamine

Vyvanse (lis-dextroamphetamine)

Pro-drug metabolized by the liver

Duration of action is 10-14 hours

Available in 10, 20, 30, 40, 50 and 60mg strengths

Capsule may be opened and dissolved in water

Management: Dextroamphetamine

Adderall XR

Available in 5, 10, 15, 20, 25 and 30mg strengths

May be opened and sprinkled in apple sauce, etc.

Duration is ~10-12 hours

50:50 delivery system

Management: Dextroamphetamine

Dexedrine and Dexedrine Spansules

Relatively short (3-5 hours) and intermediate (6-8 hours) duration of action

Would be considered second-line treatment

Useful as a “top-up” to a longer acting dextroamphetamine based preparation

Relatively cheap

Management: 2nd Line Options

True “second line” would be to titrate up with the other stimulant medication

Some kids do not tolerate medication well

Appetite suppression progressing to weight loss

Worsening anxiety, edginess, irritability

May develop tachycardia or hypertension

Management: 2nd Line Pharmacotherapy

α-agonist (clonidine, guanfacine (Intuniv))

atomoxetine (Strattera)

Risperidone (Risperdal) -- not in the 2018 CPS Statement but commonly used with severe comorbid ODD (S/E include metabolic syndrome and requires blood work monitoring)

Sometimes useful as monotherapy and sometimes helpful as adjunctive therapy

Management

Needs to be seen “every 2-3 weeks” as you titrate up the dose

History, side effects need to reviewed and monitored

Growth, heart rate, blood pressure need to be documented

Stable patients who are doing well should be seen every “3 months” for review

Management: Tips

Appetite suppression common and not an absolute indication to switch medication

Disordered sleep is a common (!) comorbidity in these kids

Review sleep hygiene, minimize screen exposure and consider melatonin

Potential Roadblocks to Diagnosing and Managing ADHD in Primary Care

Time

Time

Time

Use the resources of the CADDRA website

Empower yourself to make the diagnosis and to start a long-acting stimulant medication

If the long-acting stimulants are not working, refer to paediatrics….

“Some of the most rewarding cases in my practice are diagnosing and treating ADHD……”

-J. Jagger to a 3rd Year NOSM Peds Resident, May, 2019


EAST COAST
EST. 2015
LIFESTYLE

Diagnosis and Management of ADHD

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Stimulants and Cardiac Side Effects

An ECG is not absolutely indicated in the setting of initiating a stimulant medication

A cardiac history needs to be elicited (chest pain, palpitations, etc.) as well as a family history of sudden death or arrhythmia (pacemaker, medication for rhythm control)

If there are any red flags present, consider obtaining an ECG and if there are abnormalities (eg: prolonged QT, etc.) consider obtaining subspecialty opinion

Stimulants and Growth

ADHD, Stimulant Treatment, and Growth: A Longitudinal Study

AUTHORS: Elizabeth B. Harstad, MD, MPH,[a] Amy L. Weaver, MS,[b] Slavica K. Katusic, MD,[b] Robert C. Colligan, PhD,[c] Seema Kumar, MD,[d] Eugenia Chan, MD, MPH,[a] Robert G. Voigt, MD,[e] and William J. Barbaresi, MD[a]

[a]Division of Developmental Medicine, Boston Children's Hospital, Harvard Medical School, Boston, Massachusetts; Departments of [b]Health Sciences Research, [c]Psychiatry and Psychology, and [d]Pediatrics, Mayo Clinic, Rochester, Minnesota; and [e]Department of Pediatrics, Texas Children's Hospital, Baylor College of Medicine, Houston, Texas

KEY WORDS
attention-deficit/hyperactivity disorder, stimulant medications, adult outcomes, height, growth

ABBREVIATIONS
ADHD—attention-deficit/hyperactivity disorder
PHV—peak height velocity

Dr Harstad participated in the design of this analysis and drafted the initial manuscript; Ms Weaver participated in the design of this study and analysis, conducted the statistical

WHAT'S KNOWN ON THIS SUBJECT: Stimulant medications are indicated for treatment of childhood attention-deficit/hyperactivity disorder (ADHD), but there is concern that stimulants may negatively affect growth. However, no longitudinal, population-based studies have examined height into adulthood for childhood ADHD cases.

WHAT THIS STUDY ADDS: This longitudinal, population-based study shows that neither childhood ADHD itself nor treatment with stimulants is associated with significant deficits in height into adulthood.

abstract

NIH FREE

BACKGROUND AND OBJECTIVE: There is ongoing concern that stimulant

ADHD and Birth Month

REVIEW

Misdiagnosis of attention deficit hyperactivity disorder: 'Normal behaviour' and relative maturity

Polly Christine Ford-Jones MA AEMCA PhD(c)

Ford-Jones PC. Misdiagnosis of attention deficit hyperactivity disorder: 'Normal behaviour' and relative maturity Paediatr Child Health 2015;20(4):200-202.

Attention deficit hyperactivity disorder (ADHD) is one of the most frequently diagnosed disorders in children, yet it remains poorly understood. Substantial controversy exists regarding correct diagnosis of ADHD, and areas of subjectivity in diagnosis have been identified. Concerns for appropriate diagnosis are critical in terms of children's educational outcomes, as well as health concerns associated with the use and potential overuse of stimulant medications. There exists a relative-age effect in which children who are relatively younger than their peers and born closest to the school start age cut-off are more frequently diagnosed and treated for ADHD. Additionally, substantial variation exists in ADHD diagnosis between boys and girls, with boys often presenting with more stereotypical symptoms. Both the relative-age effect and variation in sex diagnosis, as well as the challenges of early preschool diagnosis, emphasize the importance of considering relative maturity in ADHD diagnosis of children. Implications and knowledge translation strategies for practitioners, parents and the education system are presented.

Key Words: *ADHD; Misdiagnosis; Relative maturity; Relative-age effect; Sex*

L'erreur de diagnostic de trouble de déficit de l'attention avec hyperactivité : le « comportement normal » et la maturité relative

Le trouble de déficit de l'attention avec hyperactivité (TDAH) est l'un des troubles les plus diagnostiqués chez les enfants, mais il demeure mal compris. Il existe une controverse importante au sujet du bon diagnostic de TDAH, de même que des secteurs de subjectivité diagnostique. Il est essentiel de bien poser le diagnostic, qui a une incidence sur la réussite scolaire des enfants et qui s'associe à l'utilisation ou à la surutilisation possible de stimulants. L'âge relatif a un effet sur le diagnostic, car les enfants relativement plus jeunes que leurs camarades, nés plus près de la limite inférieure d'âge pour amorcer la scolarité, sont diagnostiqués et traités davantage pour le TDAH. De plus, on constate une variation importante quant au diagnostic de TDAH chez les garçons et les filles, les garçons ayant souvent des symptômes plus stéréotypés. L'effet de l'âge relatif, la variation du sexe sur le diagnostic et la difficulté de poser un diagnostic précoce à l'âge préscolaire font ressortir l'importance de la maturité relative dans le diagnostic de TDAH chez les enfants. L'auteure présente les conséquences et des stratégies de transfert du savoir pour les praticiens, les parents et le système d'éducation.