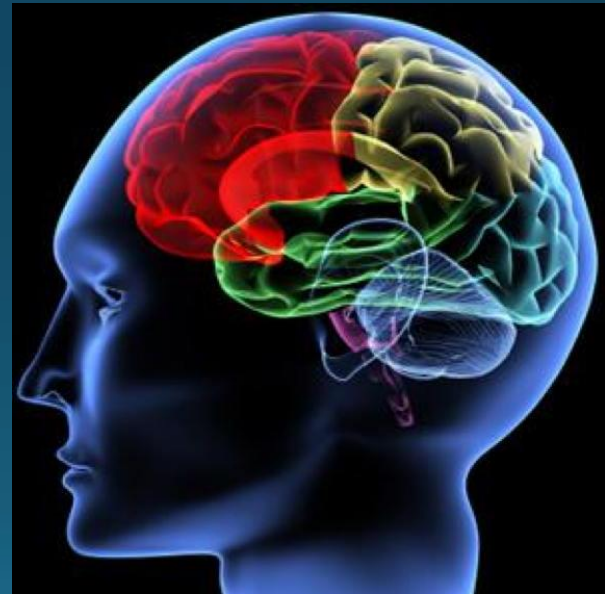


# Understanding ADHD

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# Understanding ADHD



- Introduction to ADHD
- Characteristics of ADHD
- The brain, executive functioning and ADHD
- Treatment for ADHD

# Signs of ADHD in Daily Life

- Difficulty paying attention and following instructions
- Daydreams or appears not to be listening
- Easily distracted
- Processes information slowly
- Feels overwhelmed by complex tasks
- Forgetful
- Talks too much or makes comments to others without thinking

# Signs of ADHD in Daily Life

- Fidgety, restless, often out of seat, excessive running, climbing
- Going off on tangents or may blurt out answers
- Difficulty organizing self and activities
- Messy
- Acts younger than age
- Sleep problems
- May have difficulty with relationships

# What is ADHD?

*A Neurodevelopmental Disorder* characterized by a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning and development

*Diagnostic and Statistical Manual of Mental Disorders – 5<sup>th</sup> Edition (DSM-5)*

# Attention Deficit Hyperactivity Disorder (ADHD)

**PREDOMINANTLY  
INATTENTIVE**

**PREDOMINANTLY  
HYPERACTIVE/  
IMPULSIVE**

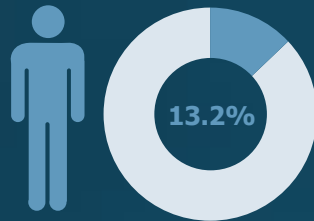
**COMBINED PRESENTATION**

# Diagnostic Criteria

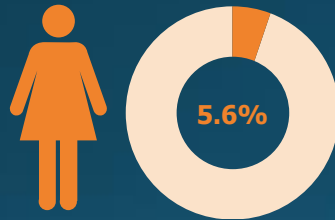
- Symptoms are present prior to age 12
- Present in 2 or more settings (E.g., home and school)
- Clear evidence that symptoms interfere with functioning (intensity, frequency, duration)
- Symptoms are not better explained by another disorder

*Source: DSM-5*

# How Common is ADHD?



The prevalence of ADHD for children and youth under the age of 18 ranges from 5-12%



Most commonly diagnosed in childhood as it is a neurodevelopmental disorder.



For many reasons, students who experience difficulty with attention, hyperactivity and impulsivity may not receive support.

In an average class, 2-3 students may experience ADHD.





# At Greater Risk for:

- Childhood – Injuries, academic underachievement, social/relationship challenges
- Adolescence – Motor vehicle accidents, smoking/substance abuse, low self-esteem, rule-breaking behaviours
- Adults – Underemployed/employment challenges, low income, legal difficulties
- Meeting criteria for at least one other diagnosis

# Video

**ADHD and the brain by Dr Mitul Mehta – King's College, London**

<http://adhd-institute.com/burden-of-adhd/aetiology/neurobiology/#Video1>

ADHD is not simply  
inattention, hyperactivity or a  
behaviour disorder... It is a  
Complex Neurodevelopmental  
Disorder!

# What causes ADHD?

- Abnormalities in the brain (developmental)
- ADHD tends to run in families – it is heritable
- Other possible causes (acquired):

Fetal exposure to alcohol, cigarettes/nicotine and environmental toxins (lead), prematurity, low birth weight, acquired brain injury

# ADHD and the Brain

- ADHD impacts how the brain develops from a neurotransmitter and structural perspective. Research shows:
    - Differences in levels of neurotransmitters
      - Dopamine
      - Norepinephrine
      - Serotonin
- \*Medications that treat ADHD target neurotransmitters

# Study Published in The Lancet

- Mega-analysis by **Hoogman et al. (2017)** involving over 3200 participants comparing MRI scans of children and adults with and without ADHD (ages 4-63)
- Results showed smaller overall brain volume and the volumes of **five brain regions** in participants with ADHD:
  - Caudate nucleus (storing and processing of memories)
  - Putamen (movement of limbs)
  - Nucleus accumbens (central role in reward circuit)
  - Amygdala (emotions)
  - Hippocampus (long-term memory and emotions)

# Study Published in The Lancet

- Differences in brain structures were most prevalent among children
- No significant differences in brain structures among adults
- Use of medication did not influence results
- *"It seems that there is a shift in the maturation of the brain but later in life it is caught up"* – Dr. M. Hoogman

# ADHD and the Brain

- ADHD impairs cognitive processes related to perceiving, thinking, remembering and learning; affects processing speed
- There is evidence of a neurological delay impacting the ability to regulate attention, behaviour and emotions
- 30% delay in the development of executive functioning

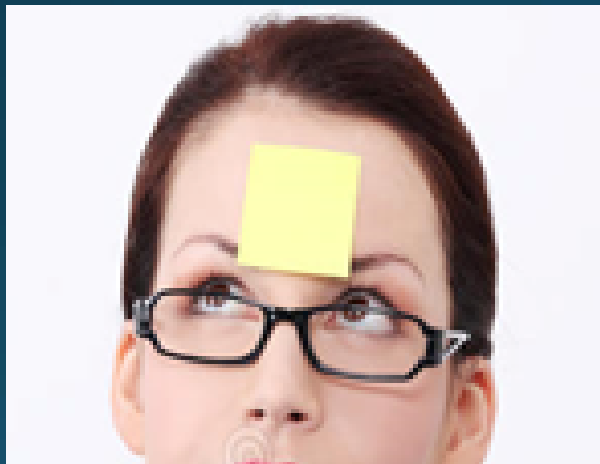


# What are Executive Functions?

- The brain-based skills that are required for people to execute or perform tasks (E.g., CEO – the 'boss' of the brain)
  - Start, persist and finish
  - Organize, prioritize, plan and problem solve
  - Emotional control
  - Inhibiting, shifting, one thought/activity to another
  - Self-monitoring
  - Working memory


# Working Memory as 'Mental Post-It Note'

Holding information in mind and using it to complete a task



# What is the Capacity of Working Memory?

<u>Age</u>	<u>Number of Instructions</u>
5 to 6	2 instructions
7 to 9	3 instructions
10 to 12	4 instructions
13 to 15	5 instructions
16 to 30's	6 instructions
40's	5 instructions
50's	4 instructions
60's to 70's	3 instructions



Capacity of WM is not fixed and can change!

# Key Point - Chronological vs. Developmental Age

8 year old  5 year old

10 year old  7 year old

12 year old  8 year old

14 year old  9 year old

\*Keep developmentally appropriate expectations!

easily distracted



# Shifting our Thinking

<b>From Seeing</b>	<b>To Understanding</b>
<ul style="list-style-type: none"><li>• Won't</li><li>• Bad</li><li>• Rude/disrespectful/blurting out</li><li>• Refusal to sit still</li><li>• Resistant</li><li>• Trying to get attention</li><li>• Doesn't try</li><li>• Forgetful/doesn't care</li><li>• Not knowing</li></ul>	<ul style="list-style-type: none"><li>• Can't</li><li>• Frustrated/challenged</li><li>• Difficulty with impulse control</li><li>• Overly stimulated</li><li>• Doesn't understand</li><li>• Needs connection and/or support</li><li>• Tired of failure/fatigued</li><li>• Working memory breakdown</li><li>• Not showing</li></ul>

# Treatment for ADHD

# A Multimodal Approach

- Research has shown that a combined approach to treatment produces the best outcomes
- Treatments such as:
  - Education
  - Medication
  - Behavioural modification
  - Psychotherapy (for adults)



# Treatment Implications

Target weaknesses in executive functioning:

- **Externalize** information (E.g., make lists, post rules, use signs)
- **Externalize** time (E.g., use timers)
- **Externalize** sources of motivation (E.g., token system)
- Chunking

# Treatment Implications

- Teaching skills in isolation does not work – teaching must occur at the time of performance!
- Recognize and validate successes
- A chronic disability perspective is most useful – think long term support and coaching!
- Instill hope, encourage, motivate and empathize

# Learning Summary

- ADHD is a neurodevelopmental disorder. It's not a choice!
- Expect a 30% delay in executive functioning and have developmentally appropriate expectations
- Externalize supports
- Think long-term support and coaching!

- Questions
- Feedback forms
- Future topics

# Resources

[www.caddra.ca](http://www.caddra.ca)

[www.attentiondeficit-info.com](http://www.attentiondeficit-info.com)

[adhd-institute.com](http://adhd-institute.com)

Supporting Minds:

<http://www.edu.gov.on.ca/eng/document/reports/SupportingMinds.pdf>

Books by:

Russell Barkley, Ph.D.

Peg Dawson, Ed.D. and Richard Guare, Ph.D.



SCHOOL MENTAL HEALTH-ASSIST  
ÉQUIPE D'APPUI POUR LA SANTÉ  
MENTALE DANS LES ÉCOLES

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