

Tuesday, 3:00 – 4:30, C1

## **"Attention problems". Autism, ADHD or Intellectual disability?**

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### **Objective:**

Identify effective methods for the practical application of concepts related to improving the delivery of services for persons with developmental disabilities

Identify advances in clinical assessment and management of selected healthcare issues related to persons with developmental disabilities

Attendees will receive information that may be useful in differential diagnosis when dealing with individuals with attention problems.

### **Notes:**

## Attention problems

Autism, ADHD , Specific Learning Disability  
or Intellectual Disability ?

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## Objectives:

- ▶ Attendees will be able to:
  - Increase their understanding of the terms "attention" and "distractibility"
  - Identify the different types of attention
  - Differentiate "attention problems" from "intended distraction"
- ▶ Attendees will be able to identify "attention problems" as a symptom of:
  - Autism
  - ADHD
  - Specific Learning Disability
  - Intellectual disability
- ▶ Attendees will increase their understanding of "attention problems" as symptom of other conditions.

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## Words of caution

- ▶ "Decreased attention span...distractibility...are sensitive but non-specific brain functions and behavioral patterns. These expressions of altered functioning should be acknowledge as non-specific, rather than trying to fit them into specific diagnoses."
- ▶ "These abnormalities should be viewed in terms of underlying developmental processes and not as components of a discrete non-overlapping disorder."

Berger, I., Remington, A., Leitner, Y. & Leviton, A. Editors. (2015). Brain development and the attention spectrum. *Frontier in Human Neuroscience*. February 2015 Vol 9 Article 23, pag 4.

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## Words of caution

"The tendency to squeeze a group of symptoms into a diagnostic entity has the potential to lead to a non-accurate diagnosis, a less successful treatment plan, and has the potential to be of little prognostic value."

Berger, I., and Nevo, Y. (2011). Early developmental cues for diagnosis of attention deficit/hyperactivity disorder in young children. *Developmental Disabilities Research Review* 17, 170-179.

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## This is why...

An individual with attention problems may have:

- ADHD
- Autism
- Specific Learning Disability
- Cognitive disability
- ADHD + Autism
- ADHD + Specific Learning Disability
- ADHD + Cognitive Disability
- ADHD + Autism + Cognitive Disability
- Autism + Cognitive Disability
- Other diagnosis
- No definite diagnosis.

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## Attention <sup>(\*)</sup>

- ▶ Application of the mind to any object of sense or thought.
- ▶ The process of centering consciousness to produce greater vividness and clarity of certain...contents.
- ▶ Three functions: a) Orienting b) Focusing c) Maintaining

(\*) Attention. In *Webster's Medical Dictionary* (2015). Springfield, MA: Merriam-Webster Inc. On-line edition

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## Attention types

- ▶ **Sustained attention:** the ability to focus on one specific situation, for a period of time, without distraction.
- ▶ **Divided attention:** the ability to process 2 or more responses. The ability to react to 2 or more demands simultaneously (multi-tasking).
- ▶ **Selective attention:** The ability to select from a variety of options and focusing on just one, filtering others.
- ▶ **Alternating attention:** The ability to switch focus back and forth between stimulus that require different cognitive processes.

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## Attention Problems

**Inattention:** The "inability" to pay attention (when we want to pay attention)

**Inability:** Lack of sufficient power, capacity, strength, or means to accomplish some end.



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## Distractibility

**Distractibility:** The degree of concentration and paying attention displayed when a person is not particularly interested in an activity (\*).

**Distraction:** Diversion (to turn in another direction) of the attention caused by factors related to motivation, lack of interest, lack of caring or concern, or deliberate neglect (\*).

(\*) In *Webster's Medical Dictionary (2015)*. Springfield, MA: Merriam-Webster, Inc. On-line edition

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## The positive aspects of "distractibility"

- + Becoming productive
- + Increasing Imagination
- + Relaxation
- + Making room for more input



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## Inattention and distractibility

- ▶ I can be inattentive and this may cause distractibility
- ▶ I can be distracted but having an appropriate attention span (distracted from the classroom lecture but attentive to my plans for next week vacations).

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## Attention-Deficit Hyperactivity Disorder

- ▶ **DSM-5:**
  - ▶ A persistent pattern of "inattention" and/or "hyperactivity-impulsivity" that interferes with functioning or development.
  - ▶ Several symptoms of "inattention" and/or "hyperactivity-impulsivity" are present prior to age 12.
  - ▶ Clear evidence that symptoms interfere with, or reduce the quality of social, academic, or occupational functioning.
  - ▶ Symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g. mood disorder, anxiety...)

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (6th ed.)*. Arlington, VA: American Psychiatric Publishing.

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## Attention-Deficit Hyperactivity Disorder

- ▶ F90.2: Combined presentation:
  - ▶ Six or more symptoms of both inattention and hyperactivity-impulsivity for the past 6 months
- ▶ F90.0: Predominantly inattentive presentation:
  - ▶ Six or more symptoms of inattention. Does not meet "hyper-impulsivity" criteria for the last 6 months
- ▶ F90.1: Predominantly hyperactive-impulsive presentation:
  - ▶ Six or more symptoms of "hyper-impulsivity". Does not meet inattention criteria for the last 6 months.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Attention-Deficit Hyperactivity Disorder

In the DSM-5 "Inattention" manifests behaviorally as:

- ▶ Wandering off tasks (Orienting)
- ▶ Lacking persistence (Maintaining)
- ▶ Having difficulties sustaining focus (Focusing)
- ▶ Being disorganized

Not due to defiance or lack of comprehension

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Autism Spectrum Disorder

In the DSM-5 :

- ▶ Persistent deficit in social communication and social interaction across multiple contexts.
- ▶ Restrictive, repetitive patterns of behavior, interest, or activities, as manifested by at least two of the following, currently or by history:
  - Stereotyped or repetitive motor movements
  - Insistence on sameness, inflexible adherence to routines
  - Highly restrictive, fixated interests that are abnormal in intensity or focus
  - Hyper- or hypo reactivity to sensory input or unusual interest in sensory aspects of the environment.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Autism Spectrum Disorder

### Joint Attention

- ▶ Joint attention refers to the adoption of a common point of reference with other people.
- ▶ Infants learn to share information and experiences with other people by coordinating their visual, auditory, or tactile attention on objects or events with these people.
- ▶ Involves coordinating attention with other people to the external world which leads to the emergence of the capacity to socially coordinate attention to internal mental objects in later infancy.

Mundy, Peter (2016). Autism and Joint Attention: Development, Neuroscience, and Clinical Fundamentals. New York: The Guilford Press



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## Autism Spectrum Disorder

### Joint Attention

- ▶ This cognitive capacity for joint attention, and adopting a common point of reference, is fundamental:
  - to learning language
  - developing cooperative behavior
  - social-cognitive development.

Mundy, Peter (2016). Autism and Joint Attention: Development, Neuroscience, and Clinical Fundamentals. New York: The Guilford Press



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## Autism Spectrum Disorder

### PDA

"Pathological Demand Avoidance" or PDA, is a syndrome associated to the ASD that describes a profile of "obsessive resistance" to everyday demands and requests. Usually includes socially manipulative behavior, and even outrageous or embarrassing acts that are followed by a lack of concern for their effects. Distractibility plays a significant role in PDA.



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## Specific Learning Disability

DSM-5 :

A - Difficulties learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties.

- 1) Inaccurate or slow and effortful word reading
- 2) Difficulty understanding the meaning of what is read
- 3) Difficulty with spelling
- 4) Difficulty with written expression
- 5) Difficulty mastering number sense, number facts or calculation
- 6) Difficulty with mathematical reasoning

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Specific Learning Disability

DSM-5 :

B - The affected academic skills are substantially and quantifiable below those expected for the individual's chronological age, and cause significant interference with academic or occupational performance or with activities of daily living as confirmed by individually administered standardized achievement measures and comprehensive clinical assessment. For individuals age 17 years and older, a documented history of impaired learning difficulties may be substituted for the standardized assessment.

C - The learning difficulties begin during the school-age years but may not become fully manifest until the demands for those affected academic skills exceed the individual's limited capacities.

D - The learning difficulties are not better accounted for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders, psychosocial adversity, lack of proficiency in the language of academic instruction, or inadequate educational instruction.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Specific Learning Disability

DSM-5 :

- With impairment in reading
- With impairment in written expression
- With impairment in mathematics



American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Intellectual Disability (Intellectual Developmental Disorder)

DSM-5 :

➤ Is a disorder with onset during the developmental period that includes both intellectual and adaptive functioning deficits in conceptual, developmental and practical domains.

- Intellectual deficits in reasoning, problem solving, planning, abstract thinking, judgement, academic learning and learning from experience.
- Deficits in adaptive functioning that result in failure to meet developmental and socio-cultural standards for personal independence and social responsibility.

“Global Developmental Delay” (under 5)

“Unspecified Intellectual Disability” (over 5)

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Intellectual Disability (Intellectual Developmental Disorder)

- “The relationship between attention and intelligence is usually considered as the relationship between a basic ability and a complex ability in the sense that attention is a source, determinant or constituent of intelligence.”

Attention

Schweitzer, K. (2010). The relationship of attention and intelligence. In Handbook of Individual Differences in Cognition. Attention, Memory and Executive control. Chapter 15, (247-262). Aleksandra Gruszka, Gerald Matthews & Blazej Szymura (Eds.)

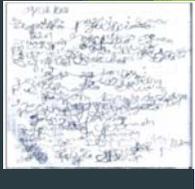
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## Attention Problems and Specific Learning Disability “Reading”

- New research by Duke University suggest that the attention problems lead to reading problems, while a poor ability for reading, even in children younger than 12, does not affect the ability in these children for paying attention.
- In Elementary education students the attention problems lead to reading problems and this happens independent of the intellectual capacity of the child, the previous progress in reading and the attention and support offered by the parents during the educational process.
- When proper and effective assistance is not offered to the child during the first grade the possibility that this child develop reading problems increases in the years to come (mainly in de-codification and word sound)

### Attention Problems and Specific Learning Disability "Writing"

- ❖ One of six boys without attention problems (16.6%) has writing problems
- ❖ One of ten girls without attention problems (10%) has writing problems
- ❖ 66% of boys with ADHD have writing problems
- ❖ 57% of girls with ADHD have writing problems
- ❖ Memory problems and poor planning in boys with ADHD affect their writing ability.



### Attention Problems and Specific Learning Disability "Mathematics"

- Math learning is an accumulative process where each new concept is based on a previous learning at the same time that it will be the basis for a future learning.
- Students with ADHD, in comparison with students without ADHD, tend to have more problems learning Math because this learning includes a diversity of cognitive abilities such as memory, attention and organization, which are abilities affected by the ADHD.



### ADHD and Autism

- The DSM IV did not allow the co-diagnosis of ADHD and ASD.
- The DSM 5 recognizes the possibility of the co-existence for both disorders
- "Because of the high frequency of ADHD symptoms in autism, children with autism may be initially misdiagnosed with ADHD" (1)
- Children with autism spectrum disorder (ASD) often present similar symptoms (to those in ADHD) and may receive a diagnosis of ADHD first (2)

(1) Dickerson, M., Cahoun, S., Mayes, R., & Mollitoris, S. (2012). Autism and ADHD: Overlapping and discriminating symptoms. Research in Autism Spectrum Disorders, 6(1), 277-295.  
(2) Miodownik, A., Hanstad, E., Sideridis, G., & Huntington, N. (2015). Timing of the diagnosis of Attention-Deficit Hyperactivity Disorder and Autism Spectrum Disorder.

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### ADHD and Autism

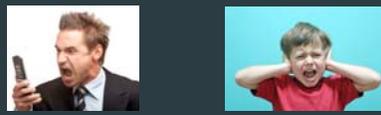
- In ADHD social dysfunction is basically due to impulsive behavior.
- In ASD social dysfunction comes from social disengagement and indifference to social cues.



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### ADHD and Autism

- ❖ In ADHD temper tantrums come as a result of poor control.
- ❖ In ASD temper tantrums results from intolerance to changes or sensory overload.



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### ADHD and Autism

- In ADHD the individual experiences attention problems defined as the "inability" to pay attention (even when he/she wants to pay attention).
- In ASD the individual may be hyper focusing on a situation while distracting from others. More than "inability", there is a preference for not paying attention (distraction)



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## ADHD and Autism

- ▶ In ADHD the individual experiences problems with sustained attention, even when the activity/situation may be of interest for the individual.
- ▶ In ASD the individual experiences problems with divided attention but doing well with selective and sustained attention
- ▶ In ADHD plus ASD the individual experiences more impairment in sustained attention and even selective attention diminishes.

Sinzig, J., Brunling, N., Morsch, D & Lehmkühn (2008). Attention profiles in autistic children with and without comorbid hyperactivity and attention problems. *Acta Neuropsychiatrica* 20, 207-215.

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## ADHD and Intellectual Disability

- ▶ "Symptoms of ADHD are common among students placed in academic settings that are inappropriate to their intellectual ability...the symptoms are not evident during non-academic tasks" (1)

(1) American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.)*. Arlington, VA: American Psychiatric Publishing.

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## ADHD and Intellectual Disability

- ▶ ADHD w/o Intellectual Disability
  - ▶ When attention problems get under control...cognitive performance increases to a normal level
- ▶ ADHD with Intellectual Disability
  - ▶ When attention problems get under control...cognitive performance remains low
- ▶ Intellectual Disability w/o ADHD
  - ▶ Other cognitive functions are below expectations for chronological age

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## ADHD and Intellectual Disability

- ▶ "A diagnosis of ADHD in I. D. requires that inattention...be excessive for mental age" (1).
- ▶ Attention span for learning = chronological age + 1
  - 5 year old = 6 minutes
  - 6 year old = 7 minutes
  - 7 year old = 8 minutes
  - 10 year old = 11 minutes
- ❖ For a 14 year old boy with a MA of 7 the expected attention span is 8 minutes.

(1) American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.)*. Arlington, VA: American Psychiatric Publishing.

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## Intellectual Disability and Autism

- ▶ "Intellectual disability and autism spectrum disorder covary at very high rates...greater severity of one of these...appears to have effects on the other...(1)
- ▶ Approximately 10% of individuals with Intellectual disability have autism. A larger portion of children with autism have intellectual disabilities.

(1) Melson, J. and Shoemaker, M. (2009) Intellectual disability and its relationship to autism spectrum disorders. *Research in Developmental Disabilities*, 30 (6), 1107-1114.

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## Intellectual Disability and Autism

- ▶ In Intellectual disability the attention functions are performing below expectation for chronological age. Attention performance is consistently low.
- ▶ In Autism the effectiveness of the attention functions are related to interest by the individual in the situation. Attention performance is significantly irregular with highs and lows.

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## Inattention and Anxiety

- ▶ "Fear" is the emotional response to real or perceived imminent threats, whereas "anxiety" is anticipation of future threats (1)
- ▶ During episodes of anxiety, the attention is centered on an anticipated threat and removed from other situations/objects considered as less important.




(1) American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.

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## Inattention and Depression

- ▶ Along with the presence of sadness, feelings of emptiness or irritability, depressive disorders are accompanied by somatic and "cognitive changes" that significantly affects the individual's capacity to function. Diminished ability to think and concentrate.
- ▶ Markedly diminished interest or pleasure in all, or almost all, activities most of the time, nearly everyday. (distractibility?)




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## Inattention and Bipolar Disorder

- ▶ In Manic Episodes: "Distractibility" (attention drawn to unimportant or irrelevant external stimuli).
- ▶ In Hypomanic Episodes: : "Distractibility"
- ▶ In Major Depressive Episodes: "Diminished ability to think or concentrate"



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## Inattention and TBI

- ▶ Children diagnosed as having ADHD before TBI are going to present more severe and persistent ADHD symptoms than those who did not have symptoms before a head injury.




Levin H, Heiten G, Max J, Li X, Swank P, Ewing Gibbs L, et al. (2007). Symptoms of attention deficit/hyperactivity disorder following traumatic brain injury in children. *Journal of Developmental Pediatrics*, 28, 106-118.

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## Inattention due to a medical condition

- ▶ Graves disease: (hyperthyroidism)
  - "Short attention span"
  - Motor hyperactivity
  - Emotional disturbance
  - Irritability



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ADHD	AUTISM	INTELLECTUAL DISABILITY
Inability to pay attention	Lack of interest in paying attention	Attention correlates with "interest"
Non productive "shifting"	Significant deficit in "shifting"	"Shifting" is not necessarily affected
Attention usually improves with behavioral strategies and medication	Prompts, routines and environmental modifications improve distractibility	For "moderate" and lower levels, to implement similar suggestions to those for ASD

SLD MATHEMATICS	SLD READING	SLD WRITING
Inattention is more noticeable during the resolutions of math problems.	Inattention is more noticeable during reading	Inattention is more noticeable during activities that involve writing
Attention problems may not affect other learning processes with the same intensity	Attention problems may not affect other learning processes with the same intensity	Attention problems may not affect other learning processes with the same intensity

ADHD + AUTISM	AUTISM + INTELLECTUAL DISABILITY	ADHD + INTELLECTUAL DISABILITY
The biggest deficit in the sustained attention	The biggest deficit in the divided attention	The lower the IQ, the more significant the problems with attention
Distractibility and attention problems coexist	Distractibility and attention problems coexist	Distractibility and attention problems coexist
Once the inattention for the ADHD is under control, the distractibility persists	If the distraction is under control (autism), the attention problems persist	The degree of inattention correlates with the severity of the intellectual disability



