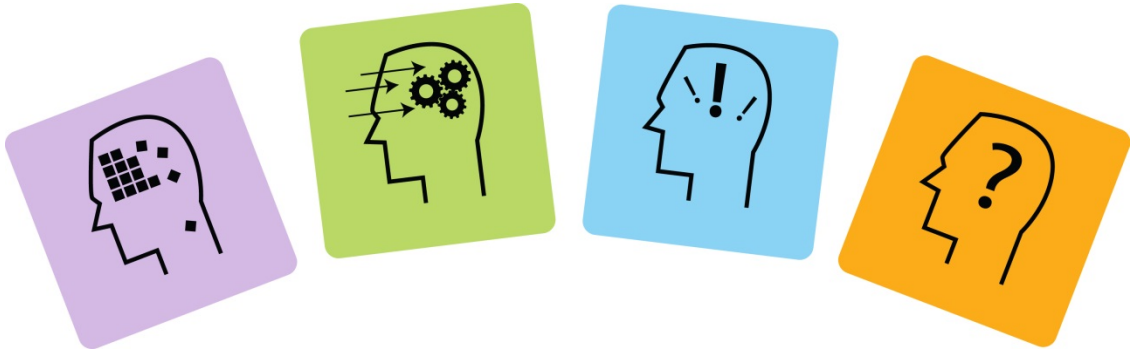

ADHD and Psychiatric Comorbidities in Adults

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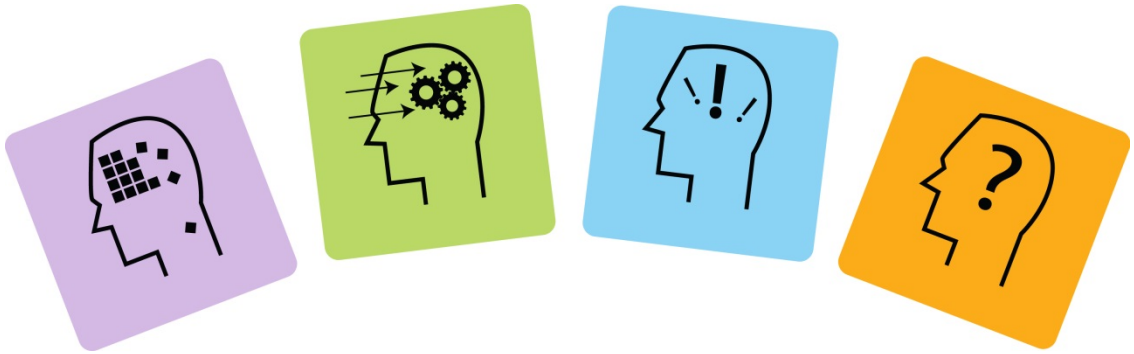
Author Disclosure

- Dr. Margaret Oakander has received research and education grants, served on advisory boards, or acted on speaker bureaus for the following organizations:
  - AstraZeneca, Lundbeck, Janssen, Otsuka, Pfizer, Purdue
- Dr. Valerie Tourjman has received research and education grants, served on advisory boards, or acted on speaker bureaus for the following organizations:
  - BMS, Lundbeck, Janssen, Pfizer, Purdue, Shire, Sunovion, Valeant

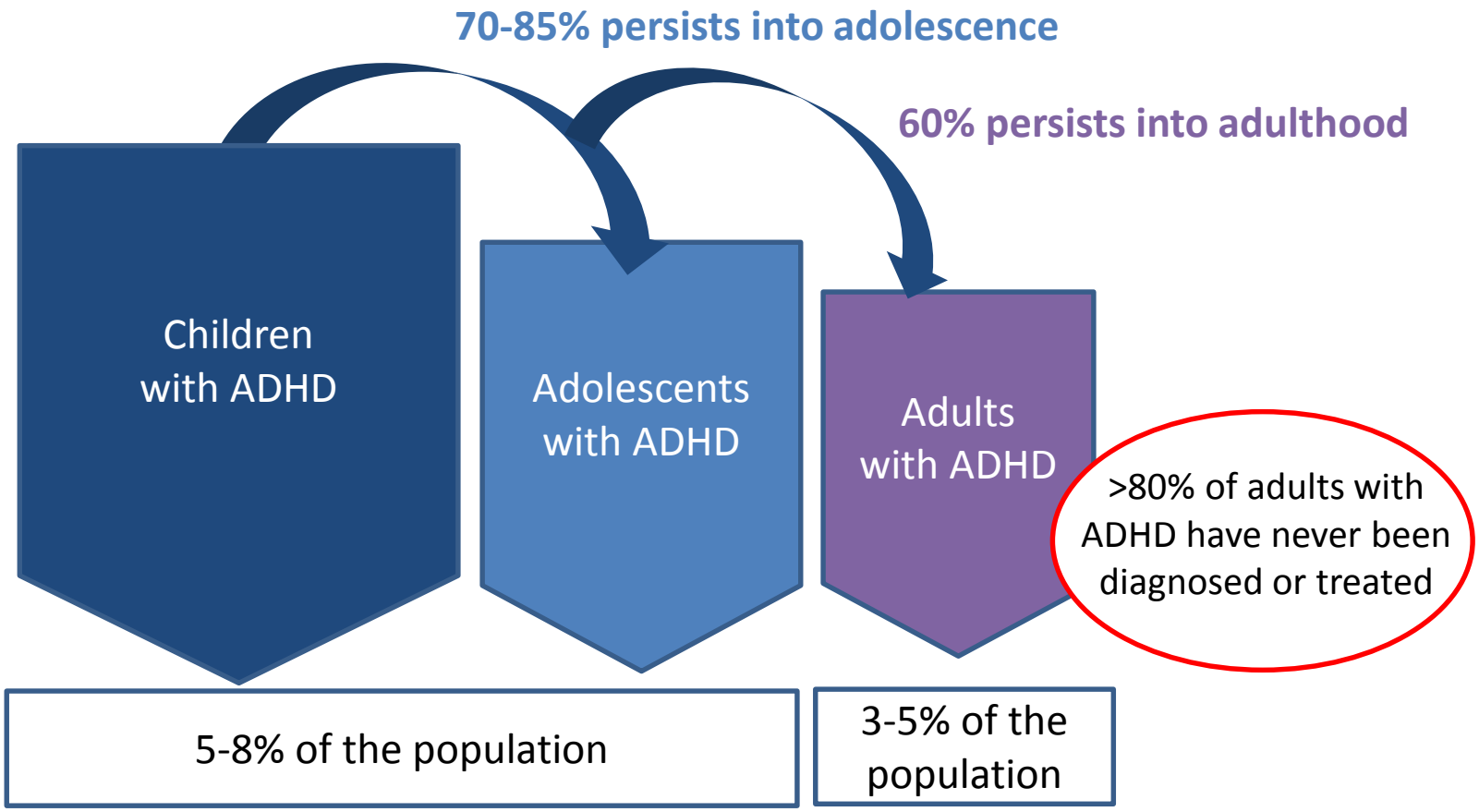
Learning Objectives

- After completing this program, participants will be better able to:
  - Discuss current understandings of the neurobiology of ADHD
  - Identify psychiatric disorders that frequently co-exist with ADHD in the adult population
  - Assess patients with existing psychiatric disorders, including anxiety, mood, and substance use disorders, for ADHD
  - Recognize challenges in the diagnosis and management of ADHD in adult patients with psychiatric comorbidities
  - Discuss the positive outcomes when ADHD is identified and treated in this patient population

ADHD Overview

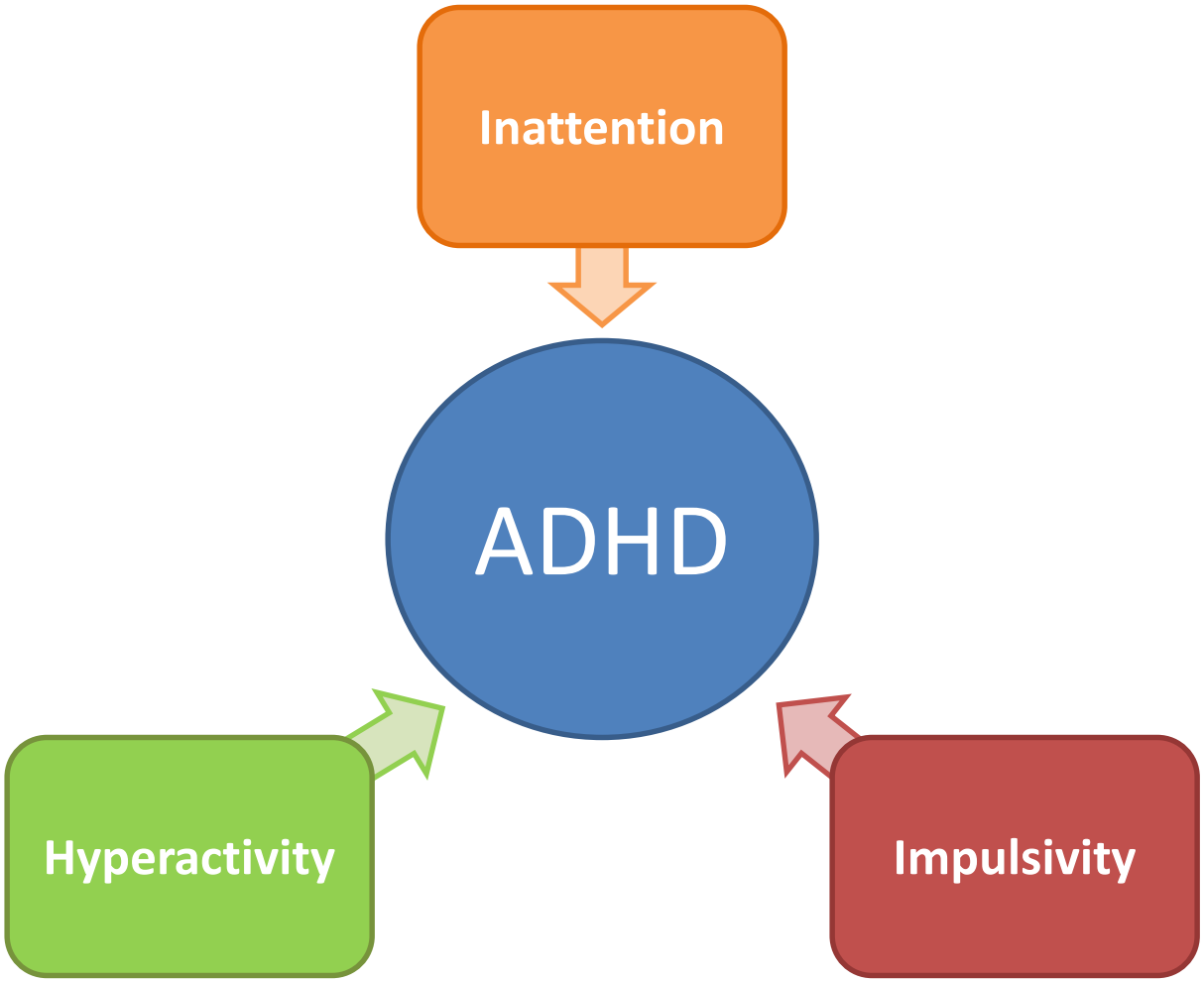


ADHD Prevalence



CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.
Biederman J. *J Clin Psychiatry*. 2004;65:3-7; Ginsberg Y, et al. *Prim Care Companion CNS Disord.* 2014;16(3).
Kessler RC, *et al. Am J Psychiatry*. 2006;163:716-723; Michelson D, et al. *Biol Psychiatry.* 2003;53:112-120.
Wender PH, *et al. Ann N Y Acad Sci.* 2001;931:1-16; Wilens, TE *et al. Annu Rev Med.* 2002;53:113-131.
Young JL. *ADHD Grown Up: A Guide to Adolescent and Adult ADHD.* New York: WW Norton & Company; 2007.

Core Symptoms of ADHD



Adapted from: American Psychiatric Association. DSM-5. 2013.

Symptoms of Inattention

Fails to give close attention to details	Makes careless mistakes at work
Difficulty sustaining attention	Difficulty remaining focused during lectures, conversations, or reading
Does not seem to listen when spoken to directly	Mind seems elsewhere, even in the absence of any obvious distraction
Does not follow through on instructions	Starts tasks but easily sidetracked; Fails to finish household chores or tasks in the workplace; inefficient
Has difficulty organizing tasks and activities	Disorganized, messy, poor time management, fails to meet deadlines
Avoids or dislikes tasks that require sustained mental effort	Avoids preparing reports, completing forms, or reviewing lengthy papers
Loses things necessary for tasks or activities	Loses things such as glasses, wallets, paperwork, keys, mobile phones
Easily distracted	Paralyzing procrastination
Forgetful in daily activities	Forgets to return calls, pay bills, misses appointments

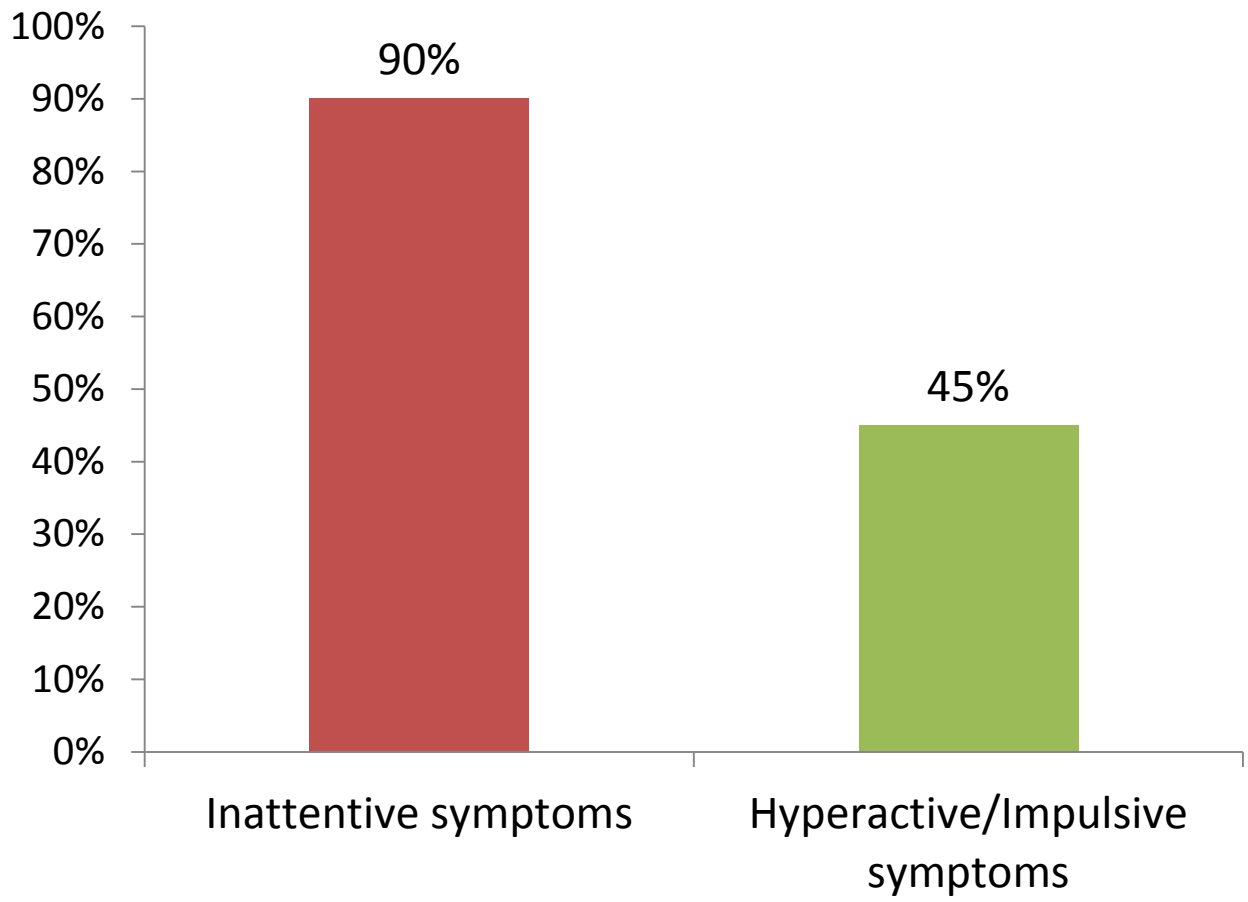
Adapted from: American Psychiatric Association. DSM-5. 2013.

Symptoms of Hyperactivity-Impulsivity

Fidgets with or taps hands or feet	→	Inefficiencies at work
Leaves seat in situations that require remaining seated	→	Can't sit through meetings; Can't relax
Often runs about in situations where it is inappropriate	→	Feeling restless; Drives too fast
Unable to work or engage in leisure activities quietly	→	Self-selects very active job
"On the go" as if "driven by a motor"	→	Impatient; Uncomfortable being still for an extended time, as in restaurants, meetings, etc.; Can't tolerate frustration
Talks excessively	→	
Blurts out an answer before a question has been completed	→	Completes people's sentences; Cannot wait for turn in conversation
Has difficulty waiting his or her turn	→	Can't wait in line
Interrupts or intrudes on others	→	Butts into conversations or activities; Take over what others are doing

Adapted from: American Psychiatric Association. DSM-5. 2013.

Inattention Drives Presentation in Adults



Millstein RB, et al. *J Atten Disord.* 1997;2(3):159–166.

DSM-5 Criteria For Diagnosis of ADHD

ADHD Diagnosis

- ≥5 symptoms for older adolescents and adults
- Symptoms must have persisted for at least 6 months
- Symptoms present before age 12
- Symptoms present in at least 2 settings
- Symptoms interfere or reduce the quality of social, academic, or occupational functioning
- Symptoms are not better explained by another mental disorder

Adapted from: American Psychiatric Association. DSM-5. 2013.

DSM-5 vs DSM-IV

- Age of onset raised to age 12 vs age 7 in DSM-IV
  - In a sample of US youth (n=1,894), led to an increase in the prevalence rate from 7.4% (DSM-IV) to 10.8% (DSM-5)
  - Youth with later age of onset did not differ from those with earlier age of onset in terms of severity and patterns of comorbidity
  - The greatest increase was found for inattention, which tends to have a later onset than hyperactivity symptoms, which emerge earlier in development

- Reduction in the number of symptoms required (5 vs 6) for assigning an ADHD diagnosis in adults
  - In an adult sample (n=133) , led to an increase in diagnosis from 51.1% to 60.2%
  - Fewer symptoms provided the best cutoff point for identifying impaired adults

Vande Voort JL, et al. *J Am Acad Child Adolesc Psychiatry.* 2014;53(7):736-44.
Matte B, et al. *J Neuropsychiatry Clin Neurosci.* 2015;27(3):228-36.

Challenges in ADHD Diagnosis in Adults

- DSM-5 requirement of onset prior to age 12
  - Reliance on the memory of the informant and retrospective accounts of symptoms might be inaccurate
  - Ancillary information, such as school reports, is frequently not available for adults
- Presentation may be obscured by outcomes of the chronic illness such as demoralization and substance misuse
- Many adults with ADHD attribute their symptoms to motivational, character, or intellectual deficits
- Adaptations made to accommodate symptoms might make them consider their symptoms part of the individual's "personal style" as opposed to symptoms of a disorder

Weisler R, Goodman D. Primary Psychiatry. 2008;15(11):53.

Neurobiology of ADHD

- Decreased size and activity in various brain regions:
  - Caudate nucleus
  - Prefrontal cortex white matter
  - Corpus callosum
  - Cerebellar vermis

Tripp G, Wickens JR. Neuropharmacology. 2009;57(7-8):579-89.

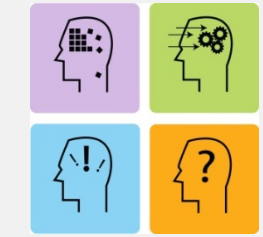
Neurobiology of ADHD (cont'd)

Brain region	Children			Adults			Changes after treatment
	GM	WM	FCN	GM	WM	FCN	
Caudate	↓		↓	±			Volume increase, increased activity, improved frontostriatal functional connectivity
Thalamus	↓		↓	↓		↓	
Anterior cingulated	↓	↓	↓	↓	↓	↓	Increased activity
Prefrontal cortex	↓	↓	↓	↓		↓	Volume reduction in untreated patients, increased activity
Premotor and SMA cortex	↓		↓				
Superior parietal cortex	↓		↓	↓		↓	Increased activity
Precuneus, posterior cingulate, lateral parietal cortex, medial frontal cortex (default-mode network)			↓			↓	Improved functional connectivity
Cerebellum (posterior inferior vermis)	↓	↓	↓	↓		↓	Increased activity after treatment, improved frontocerebellar functional connectivity
Corpus callosum (splenium/isthmus)		↓			↓		
Fasciculus longitudinalis superior		↓			↓		
Anterior corona radiate		↓			↓		

GM = gray matter volume; WM = white matter integrity; FCN = activity and functional connectivity; SMA = supplementary motor area

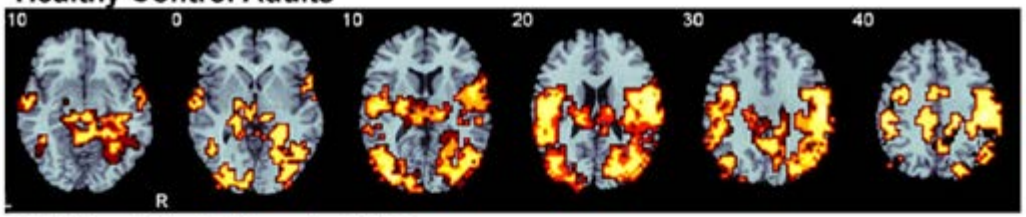
Kasparek T, et al. J Atten Disord. 2015;19(11):931-43.

Activation Maps: ADHD vs Control

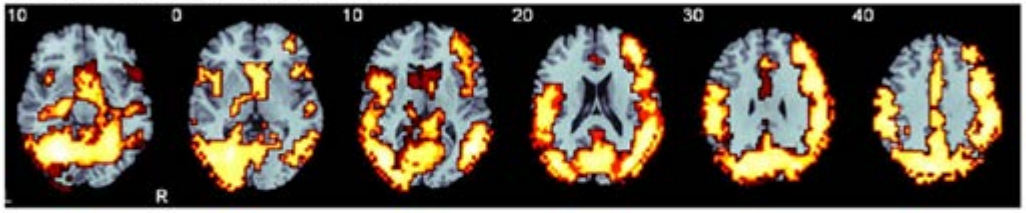


Sustained attention: non-rewarded target trials vs non-target trials

Healthy Control Adults

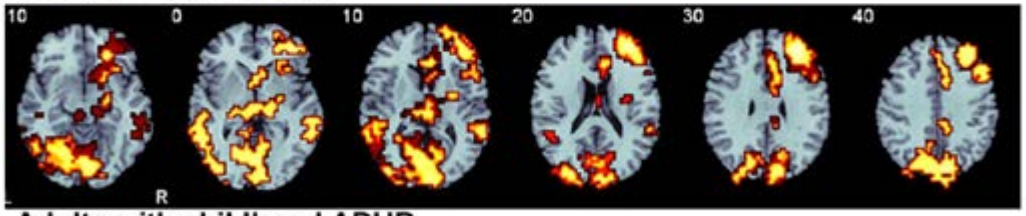


Adults with childhood ADHD

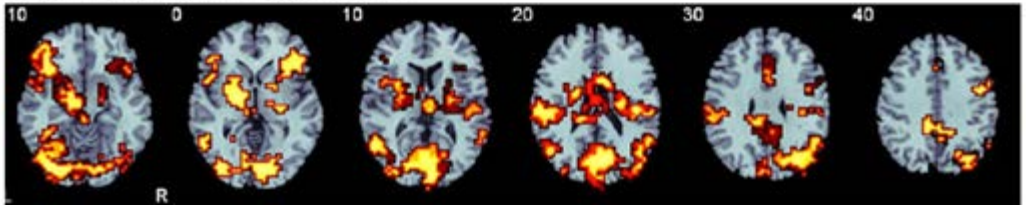


Reward: rewarded vs non-rewarded target trials

Healthy Control Adults



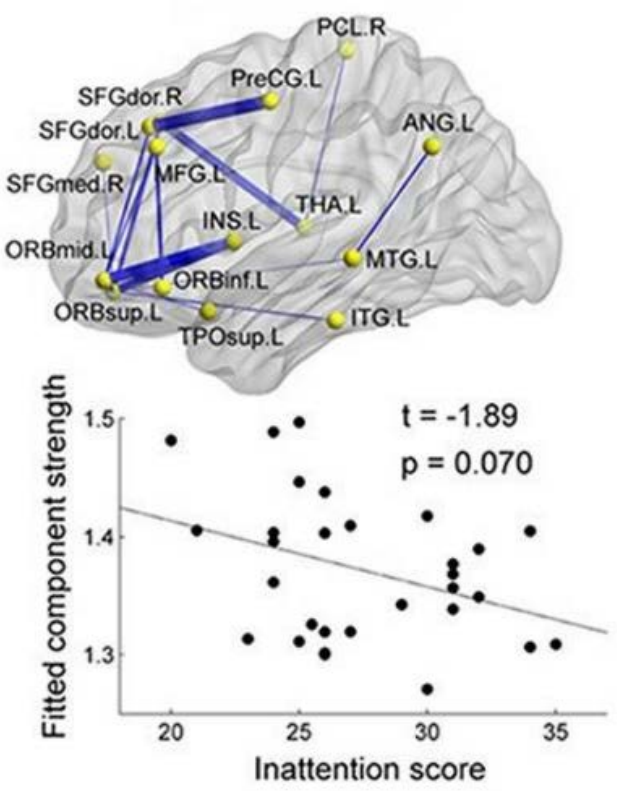
Adults with childhood ADHD



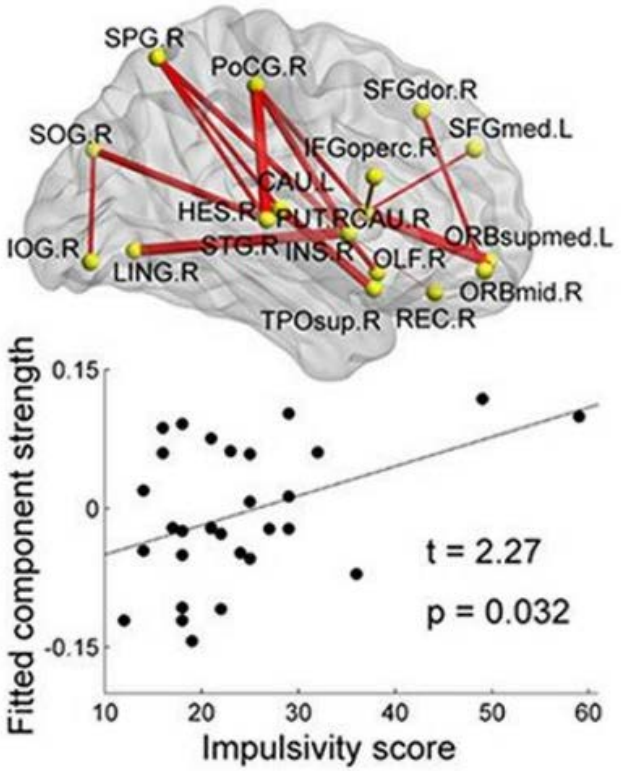
Cubillo A, et al. *Cortex.* 2012;48(2):194-215.

Structural Networks in ADHD

Decreased networks

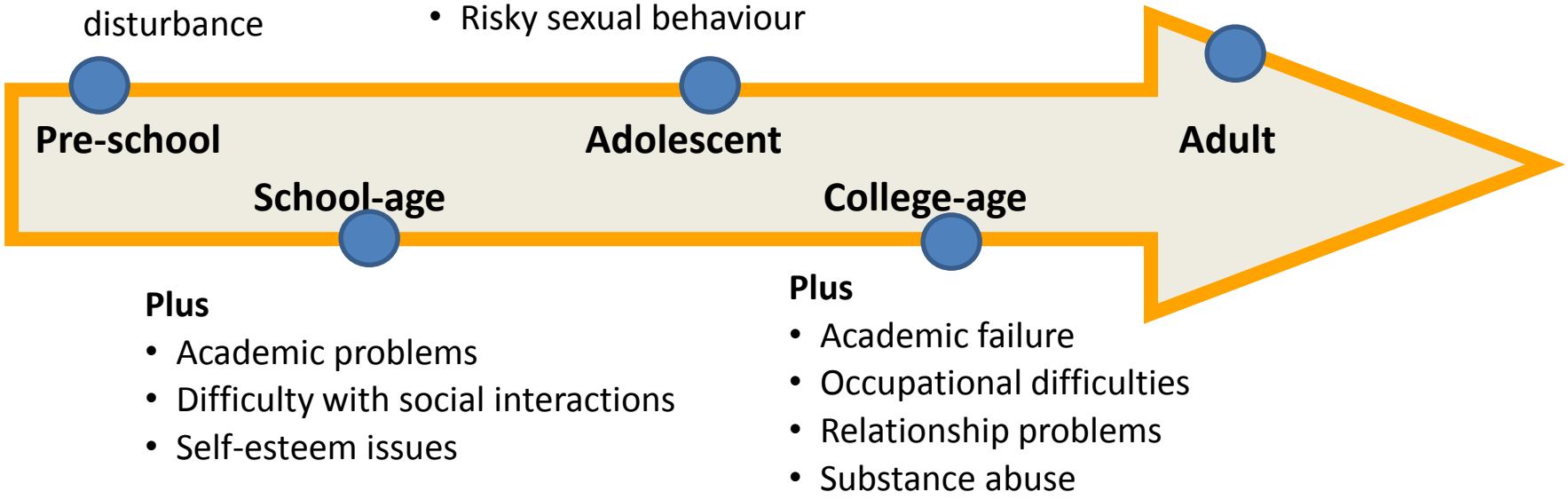


Increased networks



Cao M, et al. Front Neuroanat. 2016;10:25.

Developmental Impact of ADHD



Bhat V, Hechtman L. *Clinical Pharmacist.* 2016;8(2).

Impact of Delayed ADHD Diagnosis or Untreated ADHD in Adults

Functional and psychological impairment

- Academic and work-related difficulties
- Higher incidence of interpersonal problems
  - Significantly more divorces; problems making friends
- Diminished self-esteem
- Risky behaviours
- Significantly reduced quality of life for adults

Weisler RH, Goodman DW. *Primary Psychiatry*. 2008;15(11):53-64.
Goodman DW, Thase ME. *Postgrad Med.* 2009;121(5):20-30.

Red Flags for Suspicion of ADHD in Adults

History	Tell-tale symptoms	Organizational skill problems	Self-regulation problems
Erratic work history Marital problems Parenting problems Parent whose child/children have ADHD	Substance use/abuse or excessive caffeine consumption Involvement in risk-taking or extreme sports Frequent accidents Problems with driving	Money management problems Time management issues Grooming	Anger control problems Impulse-based addictions such as hoarding, compulsive shopping, sexual avoidance or addiction, overeating, compulsive exercising, gambling, TV, video games, chat groups, etc.

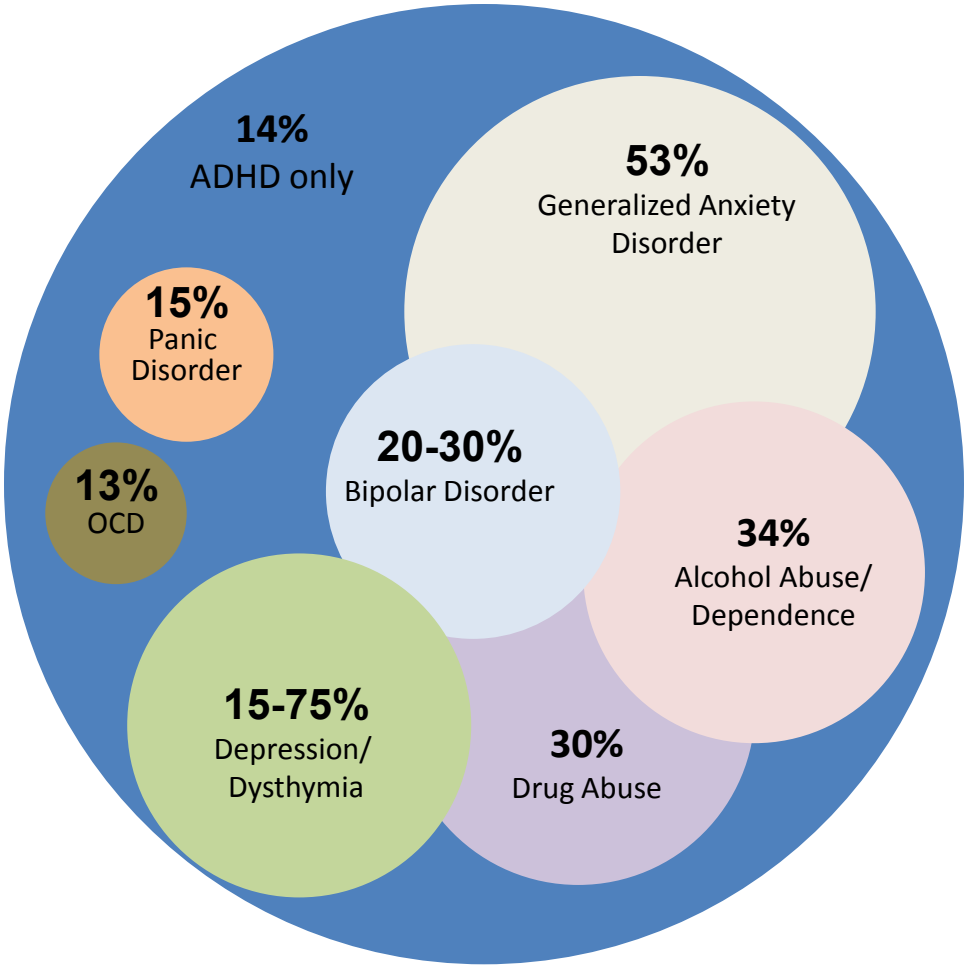
CADDRA. *Canadian ADHD Practice Guidelines*, Third Edition. 2011.

Comorbid Problems that can Complicate ADHD Evaluation

- 50-90% of children with ADHD have at least one comorbid condition
- 85% of adults with ADHD meet criteria for a comorbid condition

Kessler RC, et al. *Am J Psychiatry*. 2006;163:716-723.
Cumyn L et al. *Can J Psychiatry*. 2009;54(10):673-683.

ADHD Comorbidities in Adults



Barkley RA. 2nd ed. 1998:152-213.
Biederman J, *et al. Am J Psych.* 1993;150(12):1792-1798.
Biederman J, *et al. Arch Gen Psych*. 1996;53(5):437-446.
Shekim WO, *et al. Compr Psych*. 1990;31(5):416-425.
The MTA Cooperative Group. *Arch Gen Psych.* 1999;56(12):1073-1086.

Case Studies

Case 1: David

Anxiety

Case 2: Gabrielle

Depression

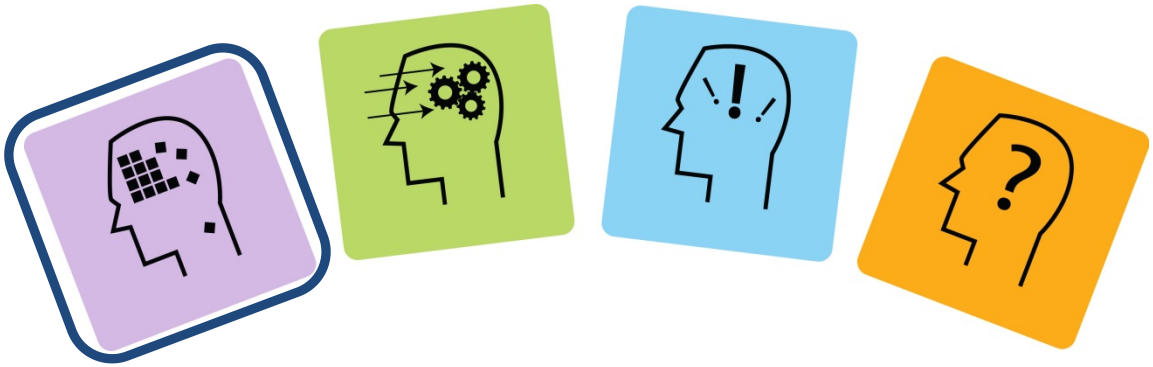
Case 3: Jackie

Bipolar Disorder

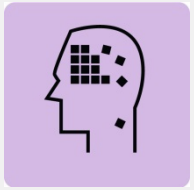
Case 4: Chad

Substance Abuse

Case 1: Anxiety

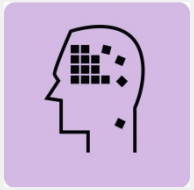


David



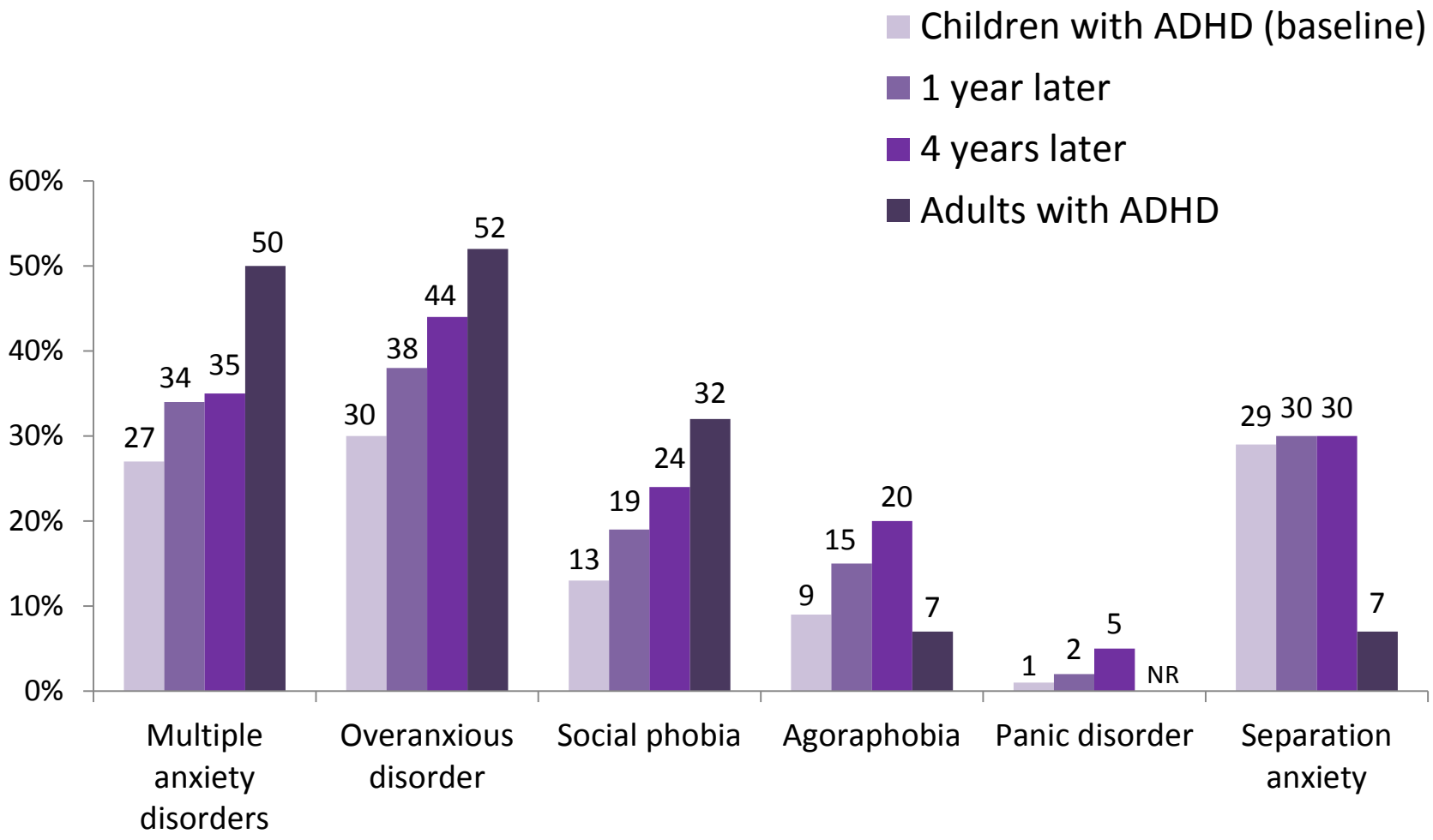
- John is a 42-year-old man; married for 12 years
- He has 2 young daughters (9 and 11 years old)
  - He mentions that his 9-year-old was diagnosed with ADHD 6 months ago
- Diagnosed with GAD and social anxiety many years ago
  - Takes an SSRI daily plus benzodiazepine as needed
  - Unemployed
  - Mostly performs home duties and helps with children's school work
- His wife is usually emotionally supportive and calm – but has urged him to come in as “he is very nervous, short-tempered, and forgetful”
- His current complaints include:
  - Marital problems – always forgets chores and “doesn’t listen”
  - Constant worry from increased demands of children
  - Very impatient with daughter who was diagnosed with ADHD
  - Trouble falling asleep
- Constant nail biting and skin picking throughout interview

Questions to Consider



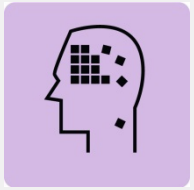
- Is there diagnostic certainty?
- Could this be treatment-resistant anxiety?
- Could this be ADHD?
- Could this be both anxiety and ADHD?
- Is there another reason for these symptoms?

Prevalence of ADHD + Anxiety Disorders Across the Lifespan



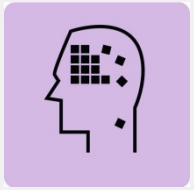
Biederman J, et al. *Am J Psychiatry.* 1993;150(12):1792-8.
Biederman J, et al. *Arch Gen Psychiatry.* 1996;53(5):437-46.

Question



- Which of David's symptoms is not directly related to ADHD?
  - ❑ Short-tempered
  - ❑ Forgetful
  - ❑ Doesn’t listen
  - ❑ Constant worry
  - ❑ Trouble sleeping
  - ❑ Fidgety (nail biting; skin picking)

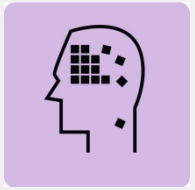
Anxiety or ADHD?



- ADHD moves towards an internalization of symptoms
  - The emergence of anxiety may be a natural extension of ADHD
  - Having ADHD also exposes the individual to considerable negative situations and anxiety may be a compensation for environmental insults
- There are anxious patients in whom problems concentrating and other aspects of dysregulation are caused by a primary anxiety disorder and not ADHD
  - People with anxiety disorders are often impaired by their fears, which often impairs their ability to focus on the task at hand
- As a result, one might overlook ADHD in adults with anxiety or vice versa

Schatz DB, Rostain AL. *J Atten Disord*. 2006;10:141-149.
CADDRA. *Canadian ADHD Practice Guidelines*, Third Edition. 2011.

ADHD Symptoms that mimic Anxiety



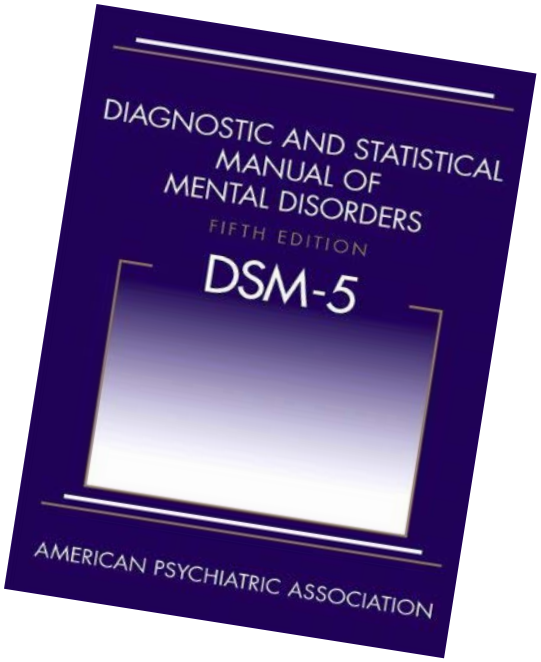
- Worrying about performance deficits
- Excessive mind-wandering
- Feeling overwhelmed
- Feeling restless
- Avoidance of situations due to ADHD symptoms, such as difficulty waiting in lines or social situations requiring focused attention
- Sleep problems linked to mental restlessness

Asherson P, et al. Lancet Psychiatry. 2016;3(6):568-78.

Panic Disorder vs. Panic Attack

Panic Disorder

- Recurrent unexpected panic attacks
- At least 1 attack followed by ≥1 month of either:
  - Persistent worry about additional panic attacks
  - Maladaptive behaviour change

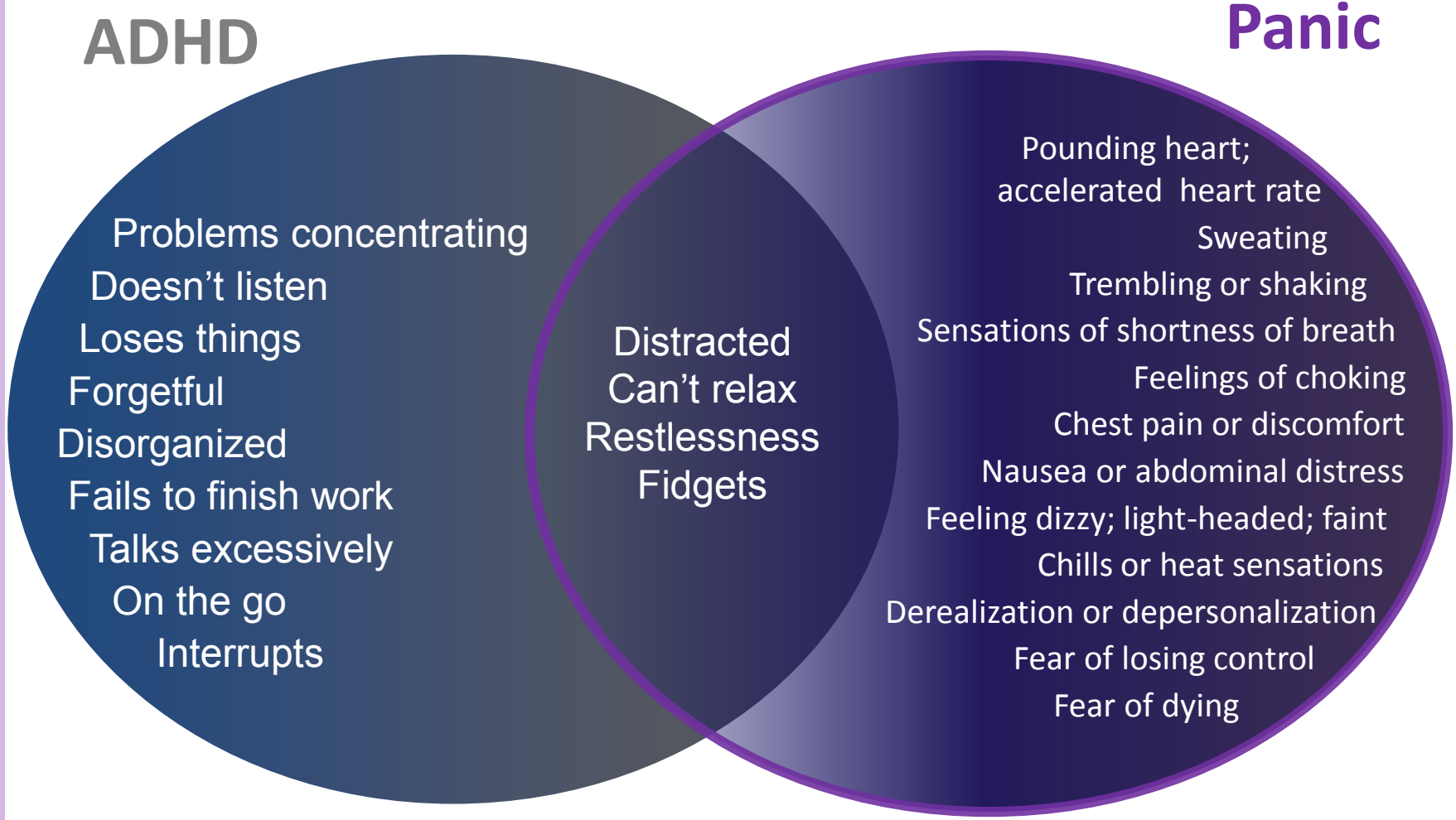


Panic Attack <u>Specifier</u>

- Not a mental disorder
  - Symptoms of a panic attack (abrupt surge of intense fear or discomfort)
  - Can occur in the content of any anxiety disorder or mental disorder

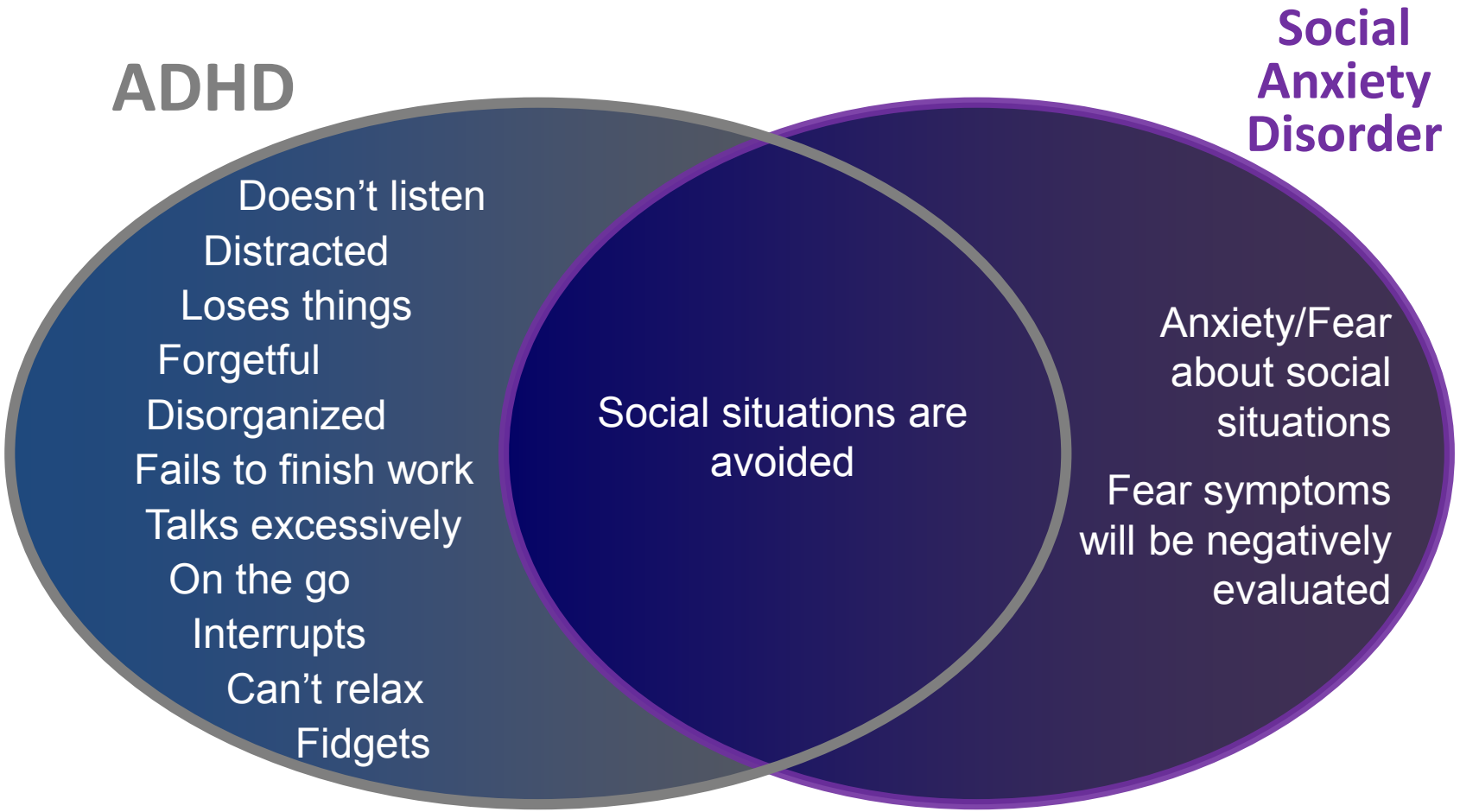
American Psychiatric Association. DSM-5. 2013.

Overlap of DSM-5 Symptoms



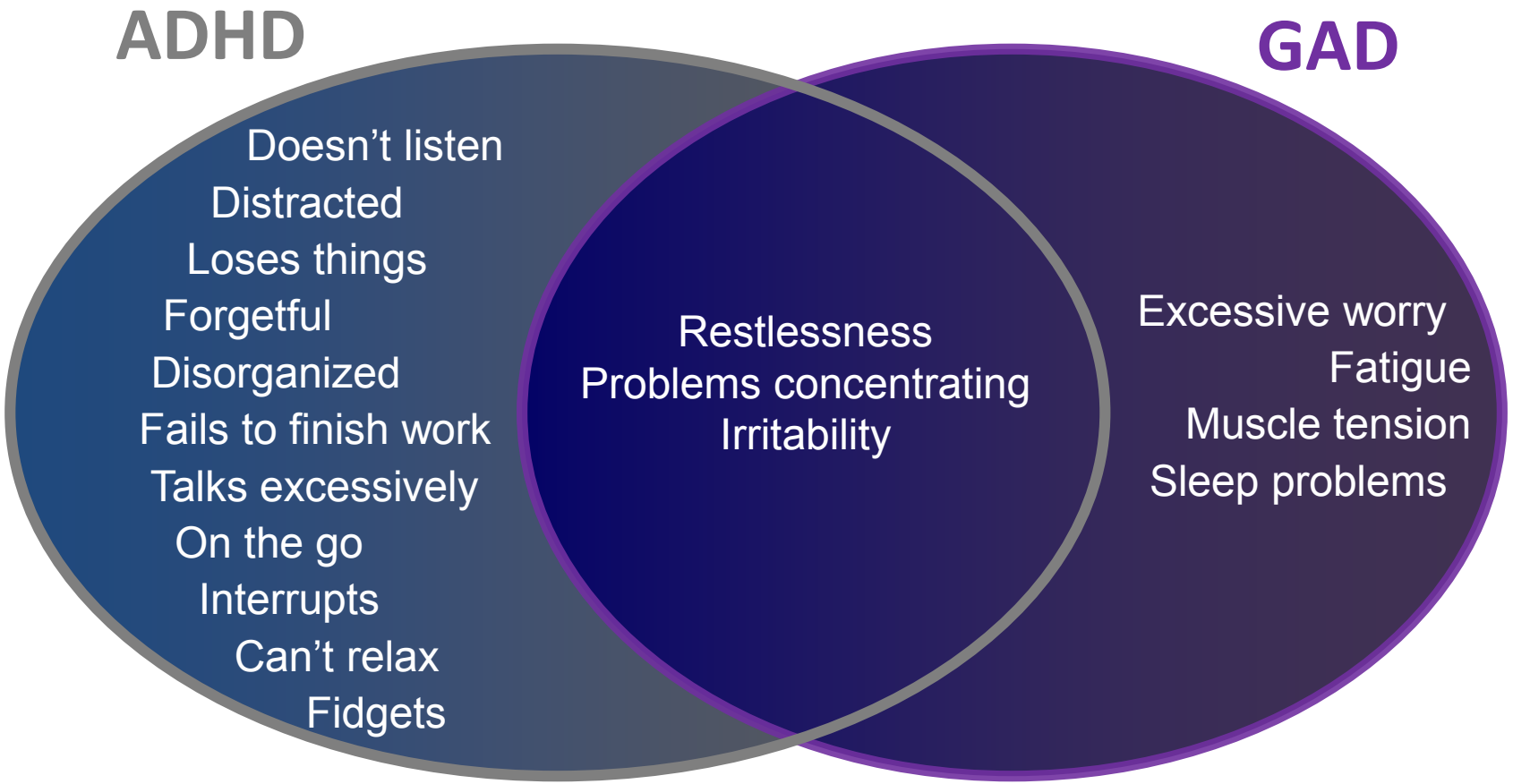
Adapted from: American Psychiatric Association. DSM-5. 2013.

Overlap of DSM-5 Symptoms



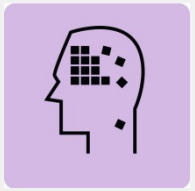
Adapted from: American Psychiatric Association. DSM-5. 2013.

Overlap of DSM-5 Symptoms



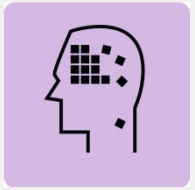
Adapted from: American Psychiatric Association. DSM-5. 2013.

Question



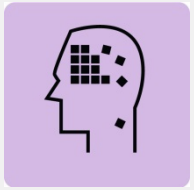
- Which of David's symptoms is not directly related to ADHD?
  - ❑ Short-tempered
  - ❑ Forgetful
  - ❑ Doesn’t listen
  - ❑ Constant worry
  - ❑ Trouble sleeping
  - ❑ Fidgety (nail biting; skin picking)

Question



- Should parents who have children with ADHD be screened for ADHD?
  - ❑ Yes – always
  - ❑ Only for certain cases
  - ❑ No

ADHD Risk Factors

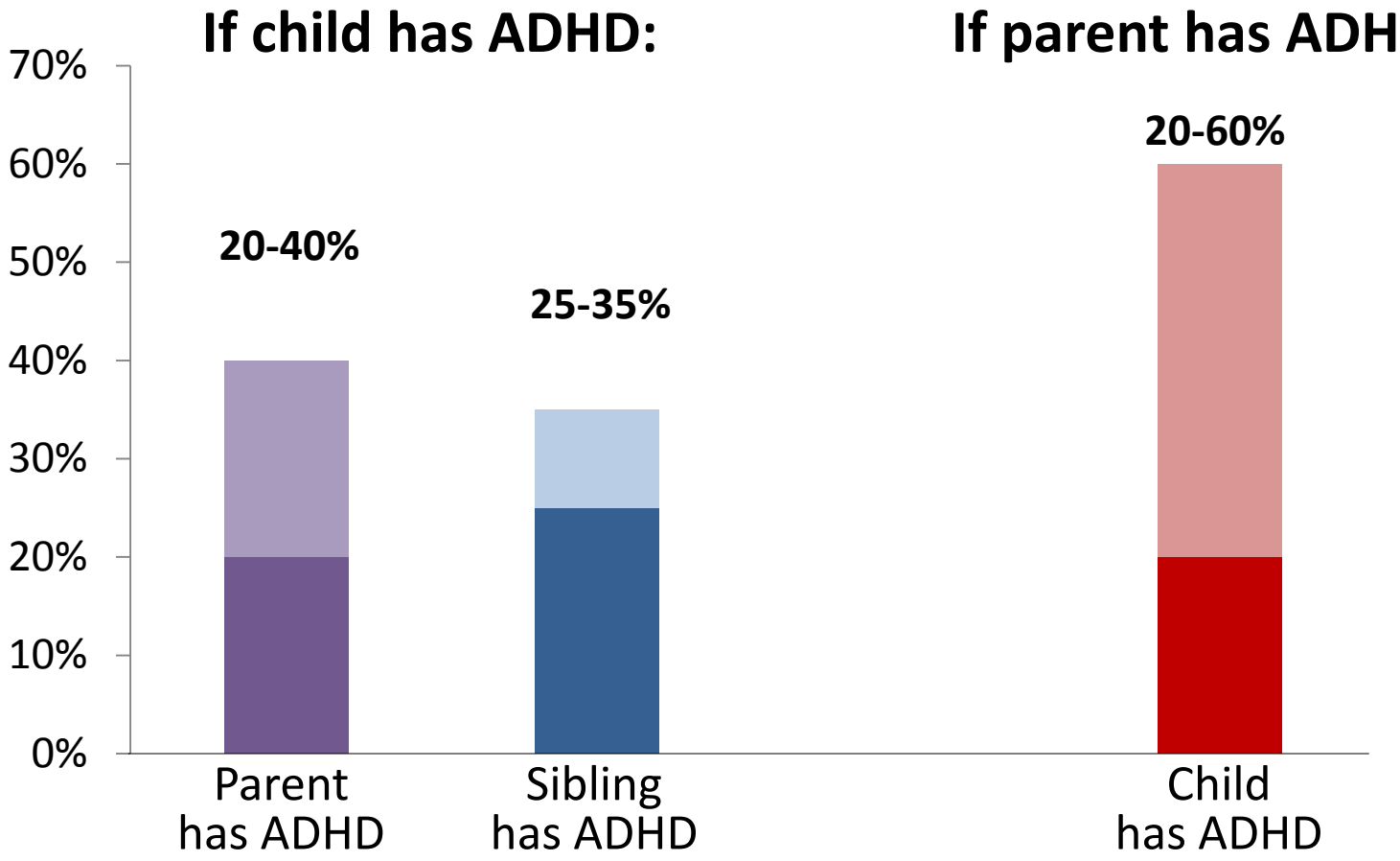


- **Genetics/Familial**
  - Accounts for 75-80% of cases
  - Many molecular genetic, family, twin/adoption studies

- **Environmental Adversity**
  - Maternal smoking, alcohol, drug use, and stress in pregnancy
  - Premature labor or low birth weight
  - Exposure to lead and other toxins

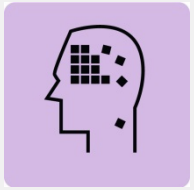
Banerjee TD, et al. *Acta Paediatr*. 2007;96(9):1269-1274.
Cengel-Kültür E, et al. *Turk J Pediatr*. 2007;49:256-62.
Faraone SV, Mick E. *Psychiatr Clin North Am.* 2010;33:159-80.
Froehlich TE, et al. *Curr Psychiatry Rep.* 2011;13:333-344.
Thapar A, et al. *Arch Dis Child.* 2012;97(3):260-265.

Hereditary – Family Studies



Bhat V, Hechtman L. *Clinical Pharmacist.* 2016;8(2).
Biederman J, et al. J Am Acad Child Adolesc Psychiatry. 1990;29(4):526-33.
Goos LM, et al. Psychiatry Res. 2007;149(1-3):1-9.
Mick E, Faraone SV. Child Adolesc Psychiatr Clin N Am. 2008;17(2):261-84.
Starck M, et al. Neuropsychiatr Dis Treat. 2016;12:581-8.
Takeda T, et al. J Pediatr.2010;157(6):995-1000.

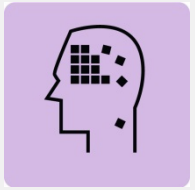
Impact of Parents with ADHD



- Parents with ADHD significantly more likely to be unskilled workers and less likely to have a college degree
- 87% have at least one other psychiatric disorder
- 56% have at least two other psychiatric disorders

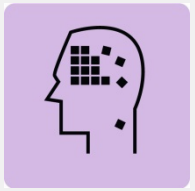
McGough JJ, et al. Am J Psychiatry. 2005;162(9):1621-7.

Question



- Should parents who have children with ADHD be screened for ADHD?
  - ❑ Yes – always
  - ❑ Only for certain cases
  - ❑ No

Screening Tools



ADHD in Adults

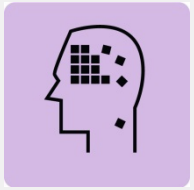
- Adult ADHD Self-Report Scale (ASRS)

Anxiety

- Generalized Anxiety Disorder 7-item scale (GAD-7)

Routine screening of all patients with anxiety disorders for ADHD?

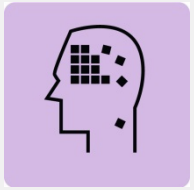
David's Assessment



- Rating scales indicate he meets criteria for both Anxiety and ADHD

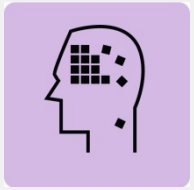
- What would you do next?

History of Symptoms



- His school performance was poor, but with a lot of effort he managed to graduate from high school and college
  - Admittedly “socially awkward” from when he was young
  - Had trouble paying attention in class
  - Avoided giving presentations/talks because he was unsure of the material (didn’t want to be humiliated)
- He explains that his daughter reminds him of himself when he was around that age
- Feelings of inadequacy, especially when school or work required public speaking, group work, or extensive interface with others
- Has always had trouble adjusting to new situations

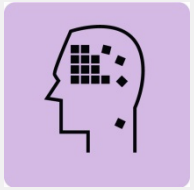
Impact of David's Comorbid ADHD



- Lower levels of self-esteem
- Increased cognitive inefficiency
  - Increased working memory deficits
  - Increased rates of sluggish cognitive tempo (SCT)

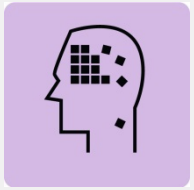
Schatz DB, et al. *J Atten Disord.* 2006;10:141-149

Question



- Does having ADHD impact parental skills?
  - ❑ Yes
  - ❑ No

Impact of ADHD on Parenting Skills

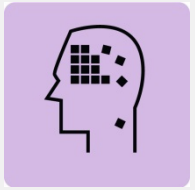


- ADHD symptoms likely to lead to:
  - Inconsistency and reactivity
  - Difficulties organizing/planning routine care of family life
  - Negative effect on parent's sense of efficacy
  - Negative parent-child interactions
  - Tension and instability within the family
  - Reduced quality of care experienced by children

→ Identification and treatment of parents with ADHD should be a high priority

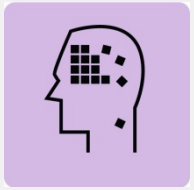
Sonuga-Barke EJ. *Am Acad Child Adolesc Psychiatry.* 2002;41(6):696-702.
Weiss M, et al. *J Am Acad Child Adolesc Psychiatry* 2000;39(8):1059-61

Question



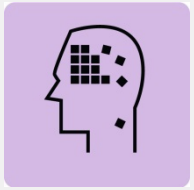
- Does having ADHD impact parental skills?
  - ❑ Yes
  - ❑ No

David's Life at Home



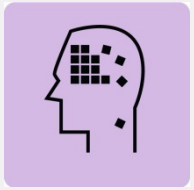
- Often loses his keys, glasses, frequently forgets appointments and birthdays
- He is unable to focus enough to help children complete their homework
  - Instead, finds himself surfing discussion boards on the internet
- Impatient; often has multiple verbal outbursts but no physical violence with the kids
  - Wife complains that he "never listens"
  - She's started to call him "lazy" and often tells him to "get his act together"

Management Considerations



- Treat the most disabling condition with the most effective treatment for that condition first
- Then treat the other condition

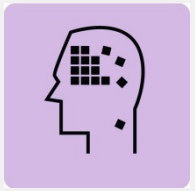
Treatment Options



- Behavioural interventions (e.g., organizational skills, yoga)
- Cognitive behavioural therapy (CBT)
- First-line treatment for ADHD
  - Oftentimes, stabilizing the core ADHD symptoms will provide the patient with a sense of calm and control
  - Stimulant medication can sometimes aggravate certain anxiety disorders
- Antidepressants
- Combining the ADHD treatment with an antidepressant may be necessary in certain situations

CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.
Goldman LS, et al. *JAMA.* 1998;279(14):1100-1107.
Young JL. *ADHD Grown Up: A Guide to Adolescent and Adult ADHD*. New York: WW Norton & Company; 2007:54.

Resources

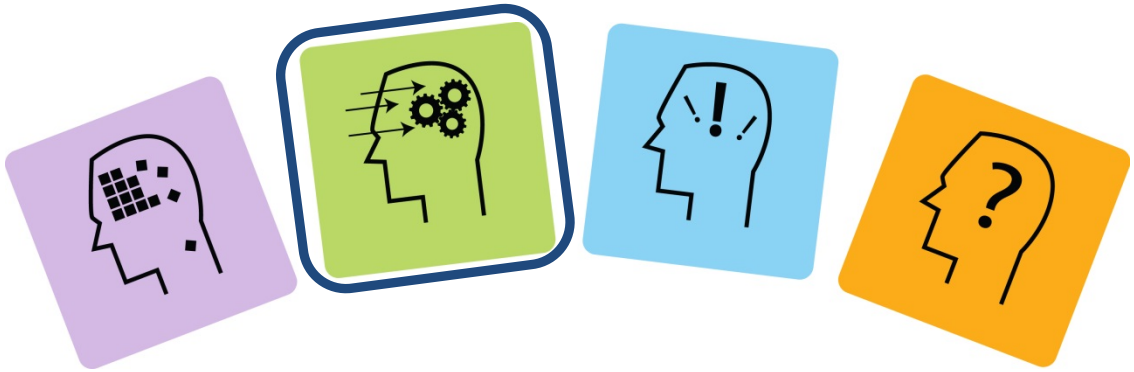


- Anxiety
  - www.canmat.org - Canadian Network for Mood and Anxiety Treatments
  - www.cmha.ca - Canadian Mental Health Association
  - www.anxietybc.com - Anxiety Disorders Association of BC - focuses on anxiety management
  - www.mooddisorderscanada.ca
  - www.healthymindscanada.ca
  - www.llttf.ca - Living Life to the Full - fun and engaging mental health promotion course that helps people learn skills to deal with the stresses of everyday life
  - The Mood Gym: www.moodgym.anu.edu.au - Australian National University- free self help CBT. A free interactive internet-based program designed to prevent and decrease symptoms of depression and anxiety. Aims to teach you how to feel less stressed and better able to cope with life.

- ADHD
  - www.caddra.ca - Canadian ADHD Resource Alliance
  - www.chaddcanada.com - CH.A.D.D. Canada
  - TotallyADD.com - dedicated to helping adults with ADHD
  - www.CliniqueFocus.com - Multidisciplinary specialized assessment and intervention for children, adolescents and adults with ADHD and related issues; includes practical tips and strategies

Back to Cases

Case 2: Depression



Gabrielle

- 34-year-old woman, single – referred by her family physician
  - Diagnosed with MDD
  - After 2 months of optimal dose of SSRI – little symptom improvement
  - States she has been compliant with medication, even though taking medication everyday is challenging
- Feeling sad, overwhelmed, irritable, and sluggish
- She has difficulty keeping up with her work load
  - Works in home office as a graphic designer
  - Frequently forgoes sleep to complete work
- Daily activities are “too difficult”
  - Neglects house chores and hygiene – “can’t be bothered”
  - Envies people who die young, though she states she has no plan to commit suicide, but wishes she would die in her sleep
- Has been overeating to “feed the sadness”
  - She is overweight, which contributes to her low self-esteem

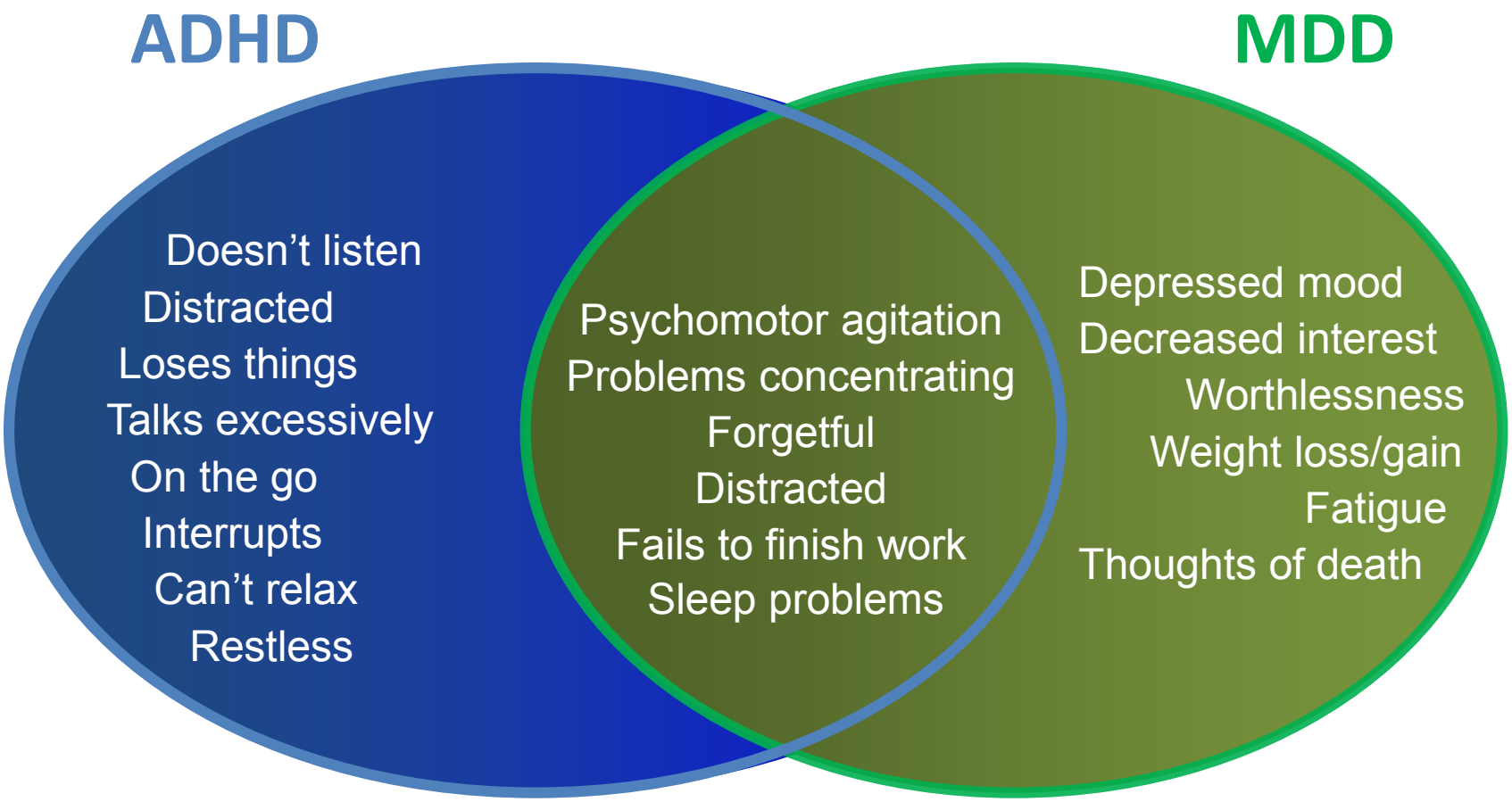
Questions to Consider

- Is there diagnostic certainty?
- Could this be treatment-resistant MDD?
- Could this be ADHD?
- Could this be both MDD and ADHD?
- Is there another reason for failure to achieve remission?

Question

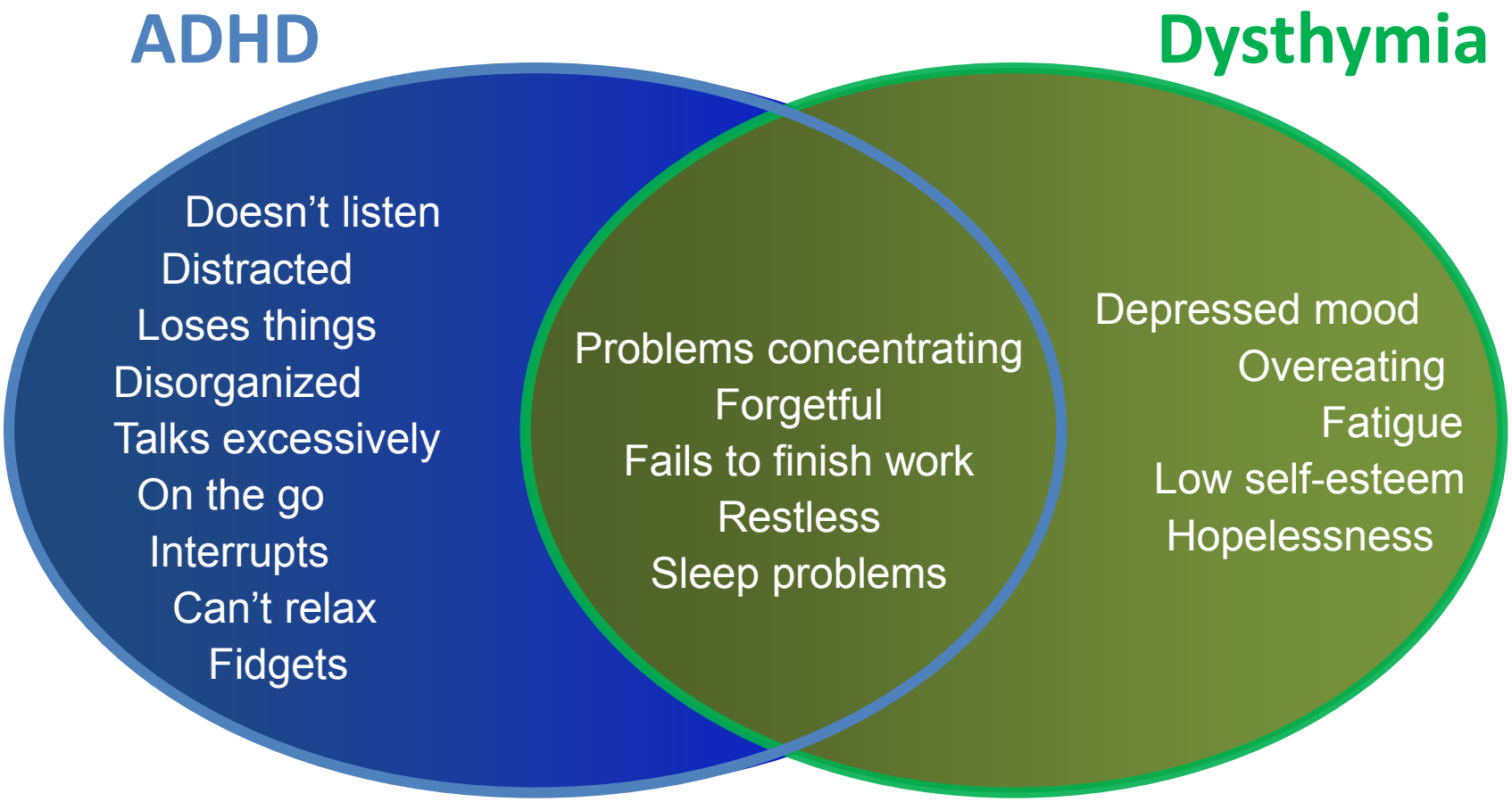
- Which of Gabrielle's symptoms is not directly related to ADHD?
  - ❑ Feeling sad
  - ❑ Irritable
  - ❑ Overwhelmed
  - ❑ Forgoes sleep (procrastination)
  - ❑ Neglects house chores
  - ❑ Overweight/overeating

Overlap of DSM-5 Symptoms



Adapted from: American Psychiatric Association. DSM-5. 2013.

Overlap of DSM-5 Symptoms



Adapted from: American Psychiatric Association. DSM-5. 2013.

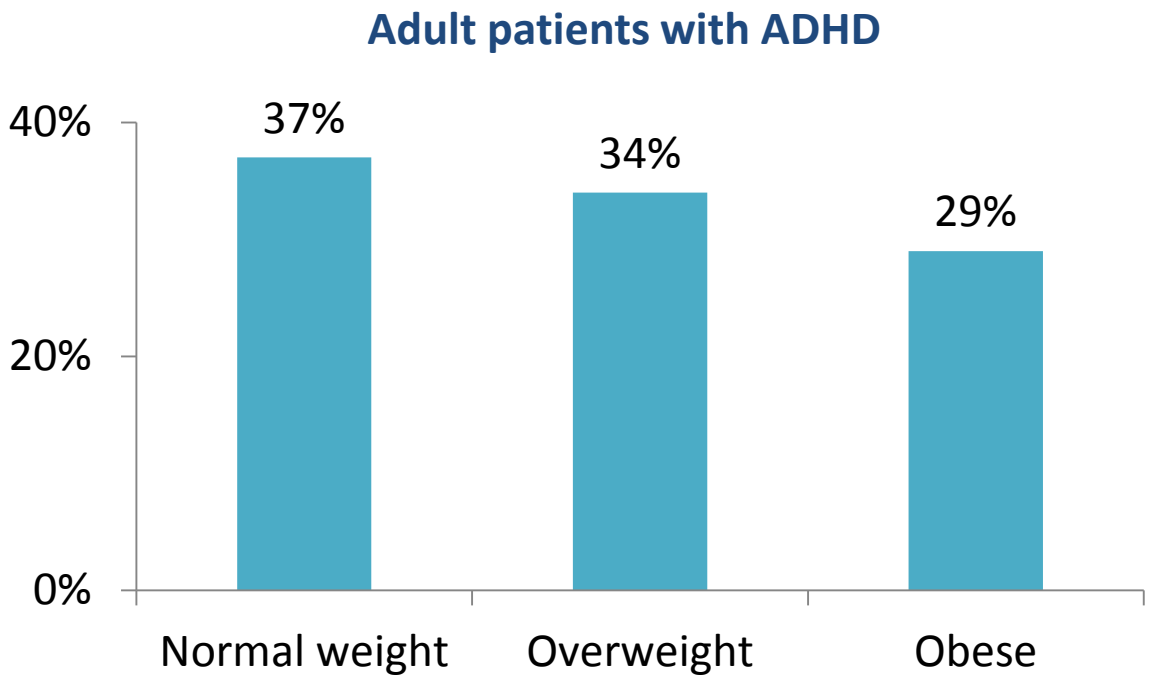
High Prevalence of ADHD Among Overweight/Obese Adults

- Over 1/3 of patients referred to an obesity specialist were subsequently diagnosed with ADHD
  - Of these patients (Obese/ADHD), 65% had a binge eating disorder

de Zwaan M, et al. *Obes Facts.* 2011;4(3):204-11.
Levy LD, et al. *Int J Obest (Lond*) 2009;33(3):326-334.
Pagoto SL, et al. *Obesity* 2009;17:539-544.

High Prevalence of Overweight/Obesity Among Adults with ADHD

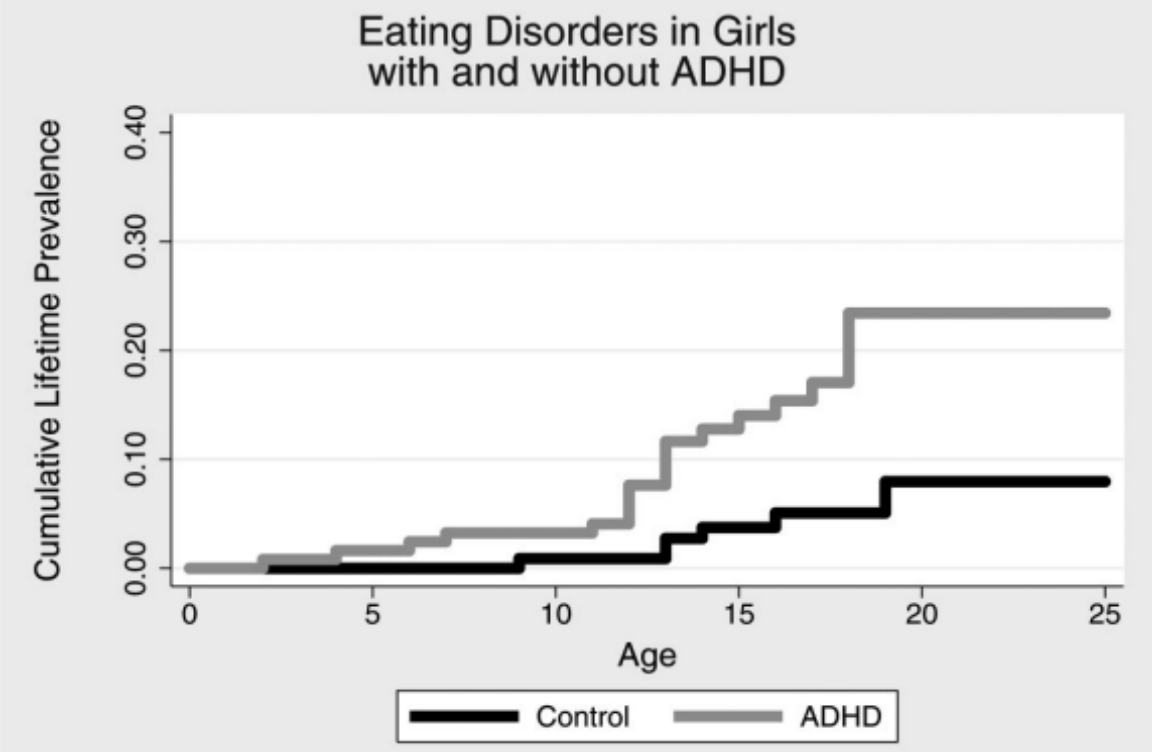
- Conversely, ADHD patients up to 2 times as likely to be obese than the general population



de Zwaan M, et al. *Obes Facts.* 2011;4(3):204-11.
Levy LD, et al. *Int J Obest (Lond)* 2009;33(3):326-334.
Pagoto SL, et al. *Obesity* 2009;17:539-544.

Higher Prevalence of Eating Disorders in ADHD Patients

- ADHD linked with binge eating, bulimia nervosa, and anorexia nervosa
  - Impulsive behavior in ADHD patients leads to disordered eating behavior
  - Other psychologic comorbidities present in ADHD patients may account for eating behavior



Biederman J, et al. *J Dev Behav Pediatr.* 2007;28(4):302-7.
Ptacek R, et al. *Neuropsychiatr Dis Treat.* 2016;12:571-9.

Relationship Between ADHD and Obesity/Overeating

- ADHD symptoms positively predict overeating and BMI in both men and women
- ADHD and obesity have both been associated with hypo-dopaminergic brain function
  - Dopaminergic changes in the prefrontal cortex of patients with ADHD increase the risk for obesity
- Another explanation is the impulsive and disorganized eating behaviors of adults with ADHD
  - ADHD symptoms may interfere with an individual's ability to persist with weight loss regimens, including diet and exercise

Campbell et al. *Coll Antropol.* 2007;31:33-38.
Cortese S, Angriman M. *Pediatrics.* 2008;122:1155.
Ptacek R, et al. *Neuropsychiatr Dis Treat.* 2016;12:571-9.
Strimas R, et al. *Eat Behav.* 2008;9:516-518.

Question

- Which of Gabrielle's symptoms is not directly related to ADHD?
  - ❑ Feeling sad
  - ❑ Irritable
  - ❑ Overwhelmed
  - ❑ Forgoes sleep (procrastination)
  - ❑ Neglects house chores
  - ❑ Overweight/overeating

Challenges of Diagnosis

- Presenting with MDD:
  - No systematic diagnosis of comorbid disorders in routine care
  - Lack of systematic assessment of childhood onset disorders
  - Cognitive complaints (focus, memory, etc.) and impairment in general functioning attributed to mood disorder

Screening Tools

ADHD in Adults

- Adult ADHD Self-Report Scale (ASRS)

MDD

- Patient Health Questionnaire (PHQ-9)

Routine screening of all patients with mood disorders for ADHD?

Gabrielle's Assessment

- Rating scales indicate she meets criteria for both MDD and ADHD

- What would you do next?

Thorough History

Developmental History

- How did you do in school as a child?
- Could you provide school records?
- Do you recall any comments from teachers regarding your behaviour or performance in school?
- Did you have to repeat a grade?

Thorough History (cont'd)

Educational/ Vocational History	Occupational History	Social Functioning
Ask the patient specific questions about their inattention, hyperactivity, and impulsivity in these three domains		

Gabrielle's History

- She did very well in school
  - Was on the honour roll, but always finished her assignments at the last minute and crammed for exams the night before
  - Had more difficulty in university than high school – grades began to drop
- She has a tendency to "pull all-nighters"
  - Finds she continues her bad habits in the workplace
  - More difficult to do as she gets older
- She remembers being told by many teachers, even in elementary school, that she was "daydreamer" or was "off in her own world"
  - She always doodled in the classroom

Gabrielle's History (cont'd)

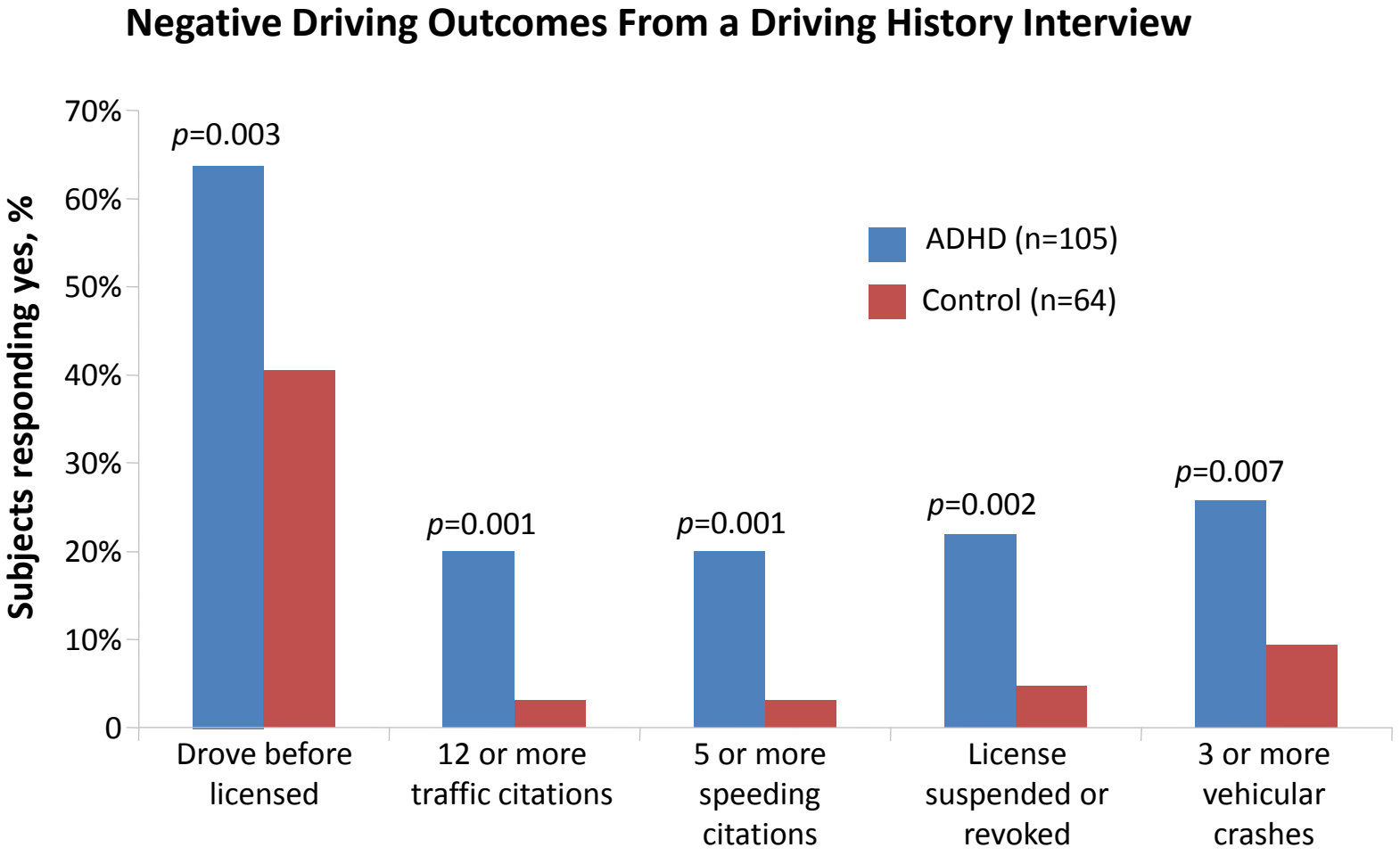
- She has always used food during times of stress
  - Snacking while studying for an exam, eating tubs of ice cream when stressed, etc.
- Tries to exercise but the lack of sleep makes it difficult
  - Admits she uses many excuses not to exercise
- She often delays house chores and grooming (cleaning dishes, doing laundry, taking showers)
- Her bedroom is cluttered with clothes that have not been put away; her home office is cluttered by paperwork
- She has difficulties keeping in touch with friends and family and often tells them she is "busy"
- She has not had a boyfriend for several years, explaining that she is too "self-conscious" to date

Question

- Would asking Gabrielle about her driving habits help with your diagnosis?
  - ❑ Yes
  - ❑ No

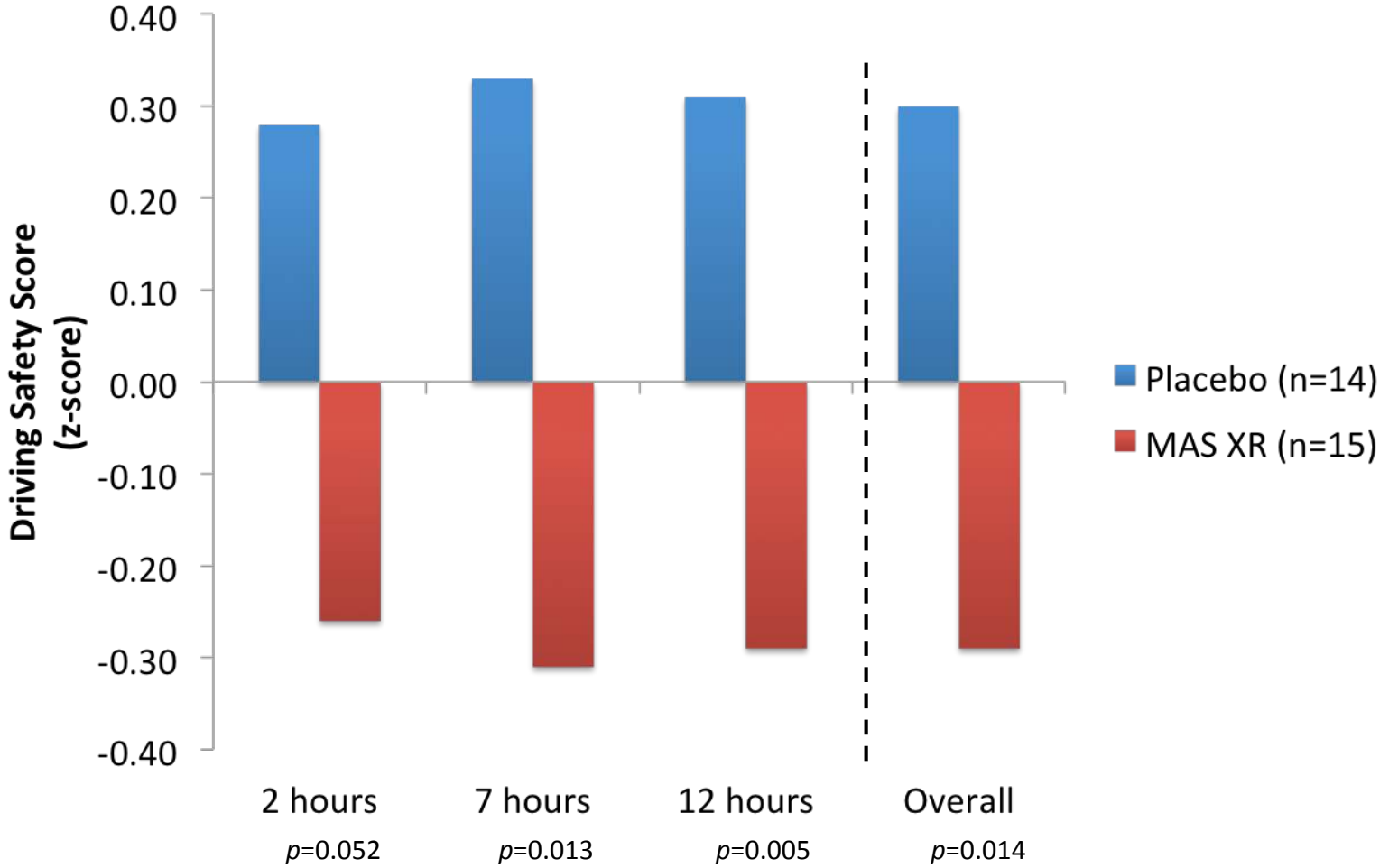
Impact of ADHD on Driving

Increased Risk for Traffic Violations and Accidents



Barkley RA, *et al. J Int Neuropsychol Soc*. 2002;8:655-672.

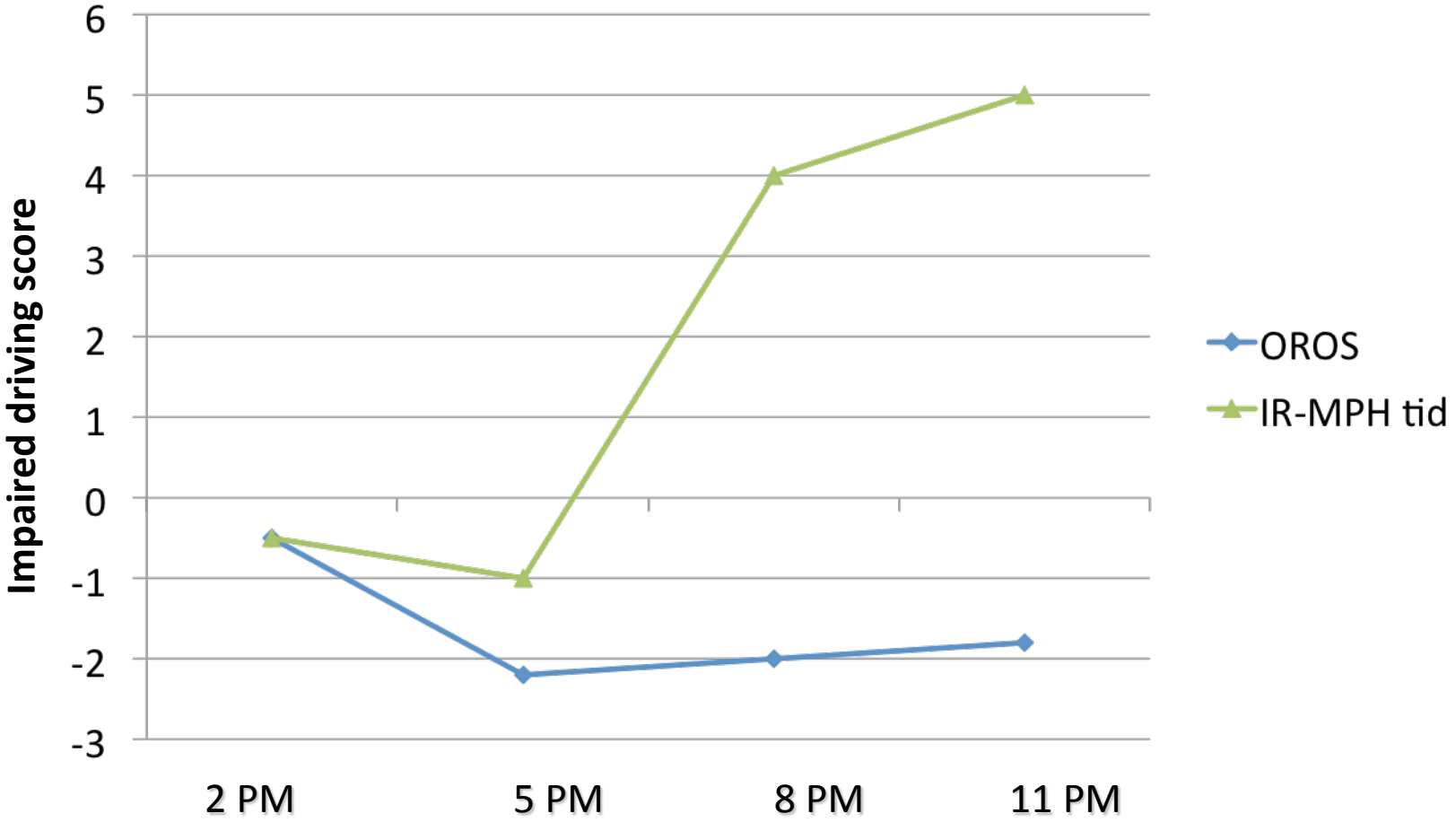
Mixed Amphetamine Salts XR Effect on Driving



Kay GG, *et al. J Atten Disord.* 2009;12(4):316-29.

OROS Methylphenidate Demonstrated Lower Impaired Driving Scores (FIX)

Participants performed significantly better when receiving OROS MPH once daily compared with MPH three times daily (F=9.3, df=1, p=0.004)

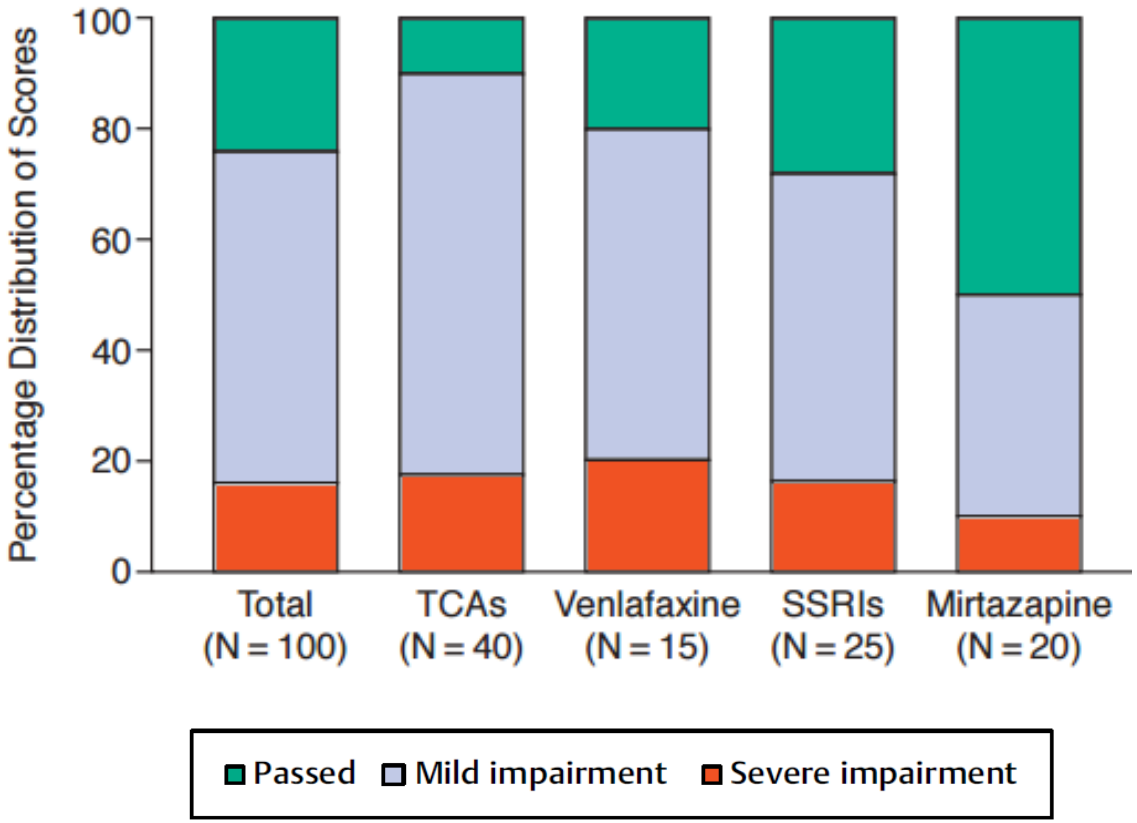


Impaired driving score 0 = average driving, >0 worse than average driving

Cox DJ, *et al. J Am Acad Child Adolesc Psychiatry*. 2004 Mar;43(3):269-275.

Impact of Depression and Antidepressant Treatment on Driving

Global driving ability scores by treatment group



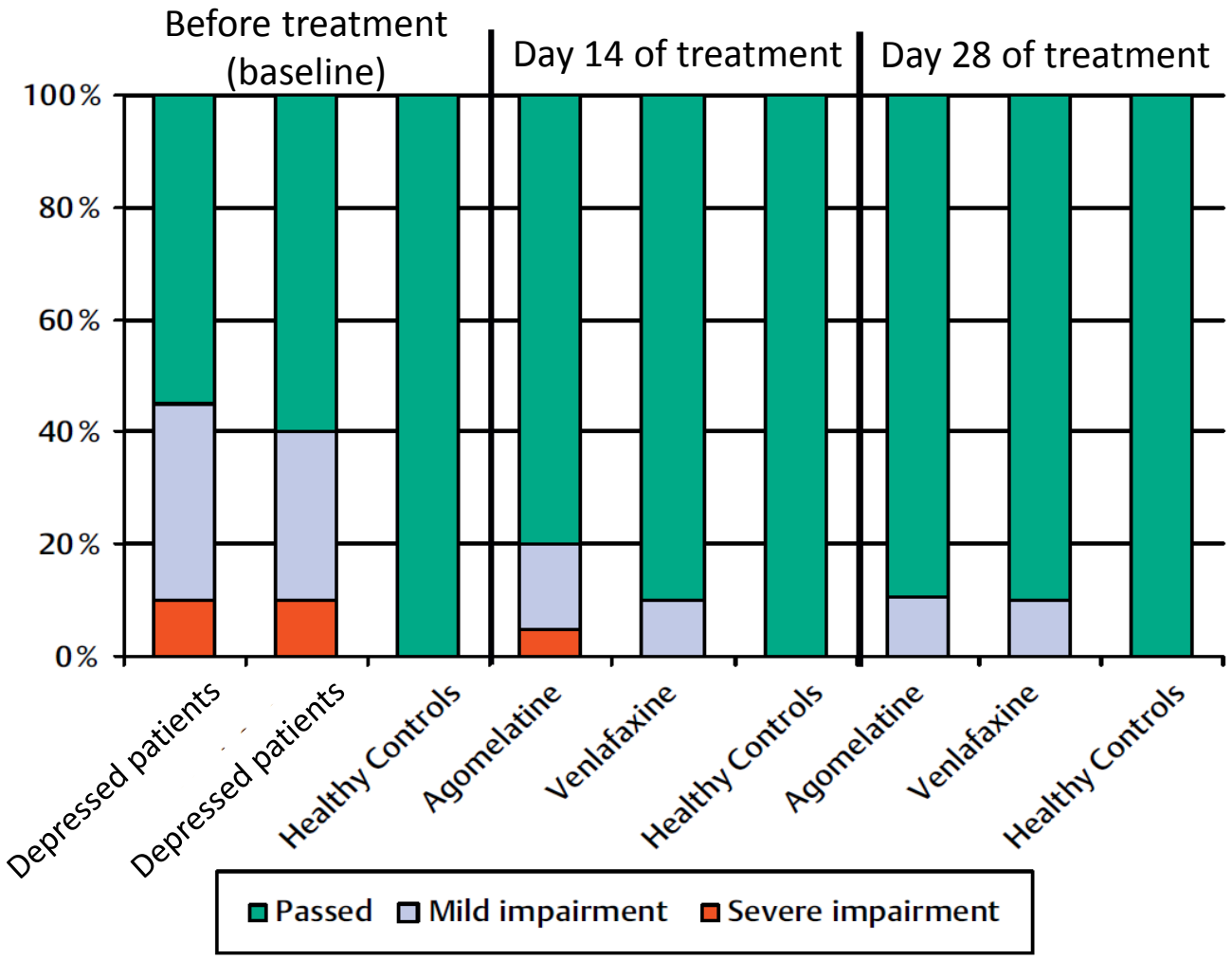
Measuring:

- visual perception
- reaction time
- selective attention
- Vigilance
- stress tolerance

Brunnauer A, et al. *J Clin Psychiatry.* 2006;67(11):1776-81.

Impact of Depression and Antidepressant Treatment on Driving

Global driving ability scores (n=20 for each group)



Brunnauer A, et al. *Pharmacopsychiatry.* 2015;48(2):65-71.

Question

- Would asking Gabrielle about her driving habits help with your diagnosis?
  - ❑ Yes
  - ❑ No

Gabrielle's Driving

- She has had a bad driving record as a teenager
  - Multiple speeding and parking tickets
  - Extreme "road rage"
- Lost her license at the age of 25
  - Driving has improved; minimal traffic violations since
- Family members still "afraid" to drive with her

Impact of Gabrielle's ADHD

- Women may receive an ADHD diagnosis later in life
  - Tend to show more symptoms of inattention than of hyperactivity and therefore a more conspicuous presentation in childhood
- Patients often blame themselves for their ADHD symptoms
  - May result in low self-esteem and depression
- When the patient's coping mechanisms taken into account, it can be easier to see the chronic nature of their symptoms
  - The loss or failure of coping mechanisms to continue to control ADHD symptoms is a reason why patients may present for help
  - Patients may report only their recent difficulties and overlook years of dysfunction (from childhood)

Reinhold JA. *Psychiatric Times.* 2015.
Weisler R, Goodman D. *Primary Psychiatry.* 2008;15(11):53.

Management Considerations

- Treat the most disabling condition with the most effective treatment for that condition first
- Then treat the other condition

CANMAT recommended treatment for MDD+ADHD:

- Bupropion
- Long-acting stimulant plus an antidepressant

Bond DJ*, et al. Ann Clin Psychiatry.* 2012;24(1):23-37.
Daviss WB, et al. *J Am Acad Child Adolesc Psychiatry.* 2001;40(3):307-314.
Findling RL. *J Child Adolesc Psychopharmacol.* 1996;6(3):165-175.

Management Considerations

- If a patient presents with mild depression or chronic dysthymia and ADHD, the ADHD should be the priority
  - Its treatment may lead to amelioration of the depression

- Some evidence suggests that ADHD treatments may be less effective in patients with active depression
  - May lead to an exacerbation of dysphoria, poor sleep, and decreased appetite

Weiss M, Hechtman L. *J Clin Psychiatry.* 2006;67(4):611-619.

Individual Psychotherapy

Management should include pharmacological treatment, as well as psychosocial treatment:

- CBT
- Organization skills
- Social skills
- Anger management
- Psychoeducation (regarding disorder and medication)
- Vocational counselling

Bond DJ*, et al. Ann Clin Psychiatry.* 2012;24(1):23-37.
CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.

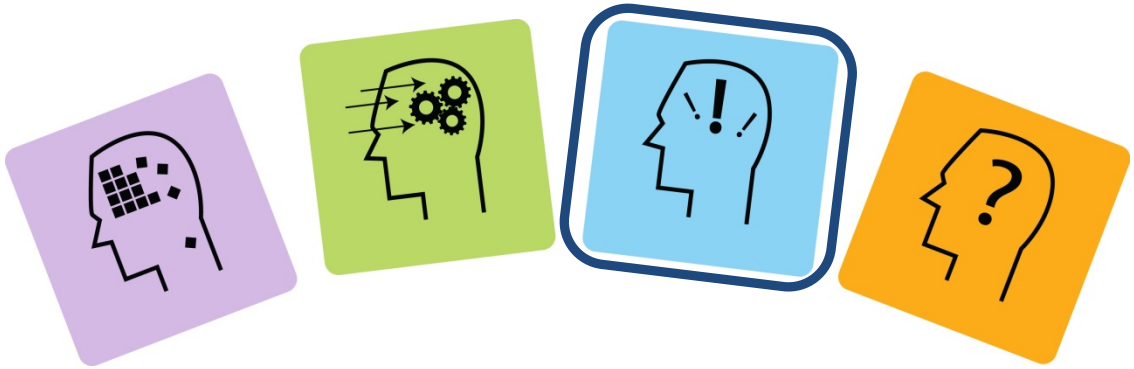
Resources

- Depression
  - www.canmat.org - Canadian Network for Mood and Anxiety Treatments
  - www.cmha.ca - Canadian Mental Health Association
  - www.mooddisorderscanada.ca
  - www.healthymindscanada.ca
  - www.bouncebackbc.ca - Bounce Back is a free program for adults experiencing mild to moderate depression, low mood, or stress using self-help materials and telephone coaching
  - www.llttf.ca - Living Life to the Full - fun and engaging mental health promotion course that helps people learn skills to deal with the stresses of everyday life
  - The Mood Gym: www.moodgym.anu.edu.au - Australian National University- free self help CBT. A free interactive internet-based program designed to prevent and decrease symptoms of depression and anxiety. Aims to teach you how to feel less stressed and better able to cope with life.
  - www.depressionhurts.ca

- ADHD
  - www.caddra.ca - Canadian ADHD Resource Alliance
  - www.chaddcanada.com - CH.A.D.D. Canada
  - TotallyADD.com - dedicated to helping adults with ADHD
  - www.CliniqueFocus.com - Multidisciplinary specialized assessment and intervention for children, adolescents and adults with ADHD and related issues; includes practical tips and strategies

Back to Cases

Case 3: Bipolar Disorder



Jackie

- 24-year-old woman, engaged
- Diagnosed with bipolar II disorder several years ago
  - Has had several hypomanic and many depressive episodes
- Presents to your office for a follow-up; wonders about effectiveness of medication
- Complains of some difficulties at work (waitress)
  - Makes inappropriate comments; arguments with co-workers
  - Skips work on slow days ("it's so boring"); goes shopping instead
  - Trouble focusing
  - Decreased need for sleep
- History of difficulty keeping a steady job
  - This is her 5th job in the past 10 years
  - At her last job as a receptionist, she complained of too much paperwork and filing – she became aggravated and quit
  - Has had periods of bad depression where she could not get out of bed and was unemployed

Questions to Consider

- Is there diagnostic certainty?
- Could this be treatment-resistant bipolar disorder?
- Could this be ADHD?
- Could this be both bipolar disorder and ADHD?
- Other?

Question

- Which of Jackie's symptoms is not directly related to ADHD?
  - ❑ Makes inappropriate comments
  - ❑ Arguments
  - ❑ Decreased need for sleep
  - ❑ Skips work
  - ❑ Trouble focusing
  - ❑ Erratic work history

ADHD Symptoms that Mimic Bipolar Disorder

- Restlessness
- Sleep disturbance
- Mood instability
- Unfocused mental activity
- Distractibility

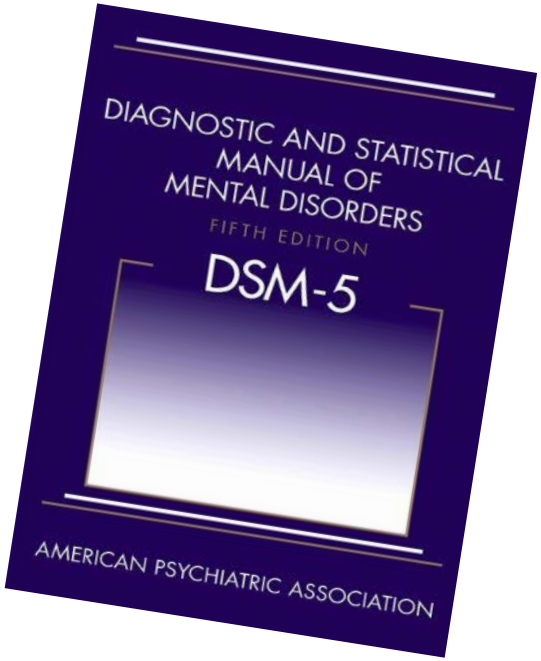
- These symptoms are limited to the hypomania/mania episodes in bipolar patients, and they are chronically persistent in ADHD

Asherson P, et al. Lancet Psychiatry. 2016;3(6):568-78.
McIntosh D, et al. *Neuropsychiatr Dis Treat.* 2009;5:137-150.

DSM-5: Bipolar Disorder

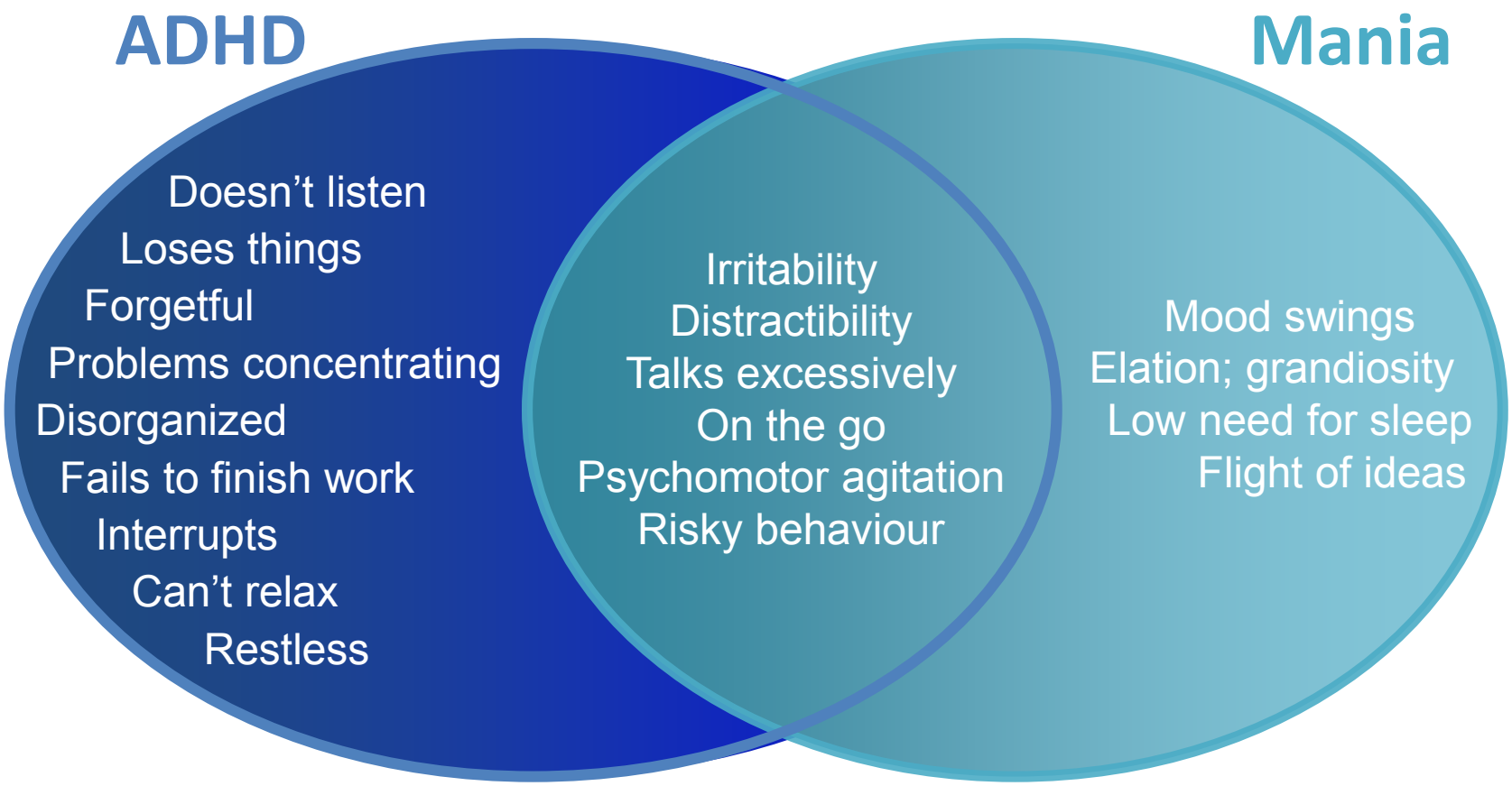
- Bipolar I Disorder
  - At least one manic episode
  - The manic episode may have been preceded by and may be followed by hypomanic or major depressive episodes

- Bipolar II Disorder
  - At least one hypomanic episode
  - At least one major depressive episode
  - There has never been a manic episode
  - Not severe enough to necessitate hospitalization



American Psychiatric Association. DSM-5. 2013.

Overlap of DSM-5 Symptoms



Adapted from: American Psychiatric Association. DSM-5. 2013.

Question

- Which of Jackie's symptoms is not directly related to ADHD?
  - ❑ Makes inappropriate comments
  - ❑ Arguments
  - ❑ Decreased need for sleep
  - ❑ Skips work
  - ❑ Trouble focusing
  - ❑ Erratic work history

Screening Tools

ADHD in Adults

- Adult ADHD Self-Report Scale (ASRS)

Bipolar Disorder

- Mood Disorder Questionnaire (MDQ)
- Mood diary; chart; tracker

Routine screening of all patients with mood disorders for ADHD?

Example Mood Diary Chart

Daily Mood Chart

STABLE RESOURCE TOOLKIT

How to use the Mood Chart

- At the end of each day rate your mood –the "Highest" or "Lowest" that you felt that day
- Place a dot in the box that best describes your mood
- If you have had High and Low moods on the same day place two dots
- List the number of hours you slept each day
- Weigh yourself on the 14th & 28th day of each month and record
- Rate any anxiety or irritability that you may have on a scale from 0-3 (3=high) and record daily
- List your medications and place a check mark daily if you took your medicine
- Place an "A" if you drank Alcohol or a "D" if you used any drug that was not prescribed by a doctor

HIGH MOOD	+3																													
	+2																													
	+1																													
NORMAL																														
LOW MOOD	-1																													
	-2																													
	-3																													
	DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
HOURS SLEPT																														
WEIGHT ON DAY 14 & 28																														
ANXIETY																														
IRRITABILITY																														
MEDICATION (name/mg)	Place a checkmark if medication was taken each day																													
ALCOHOL/DRUGS																														

Name _____ Month/Year _____

http://www.cqaimh.org/pdf/tool_edu_moodchart.pdf

Jackie's Assessment

- Rating scales indicate she meets criteria for both bipolar disorder and ADHD

- What would you do next?

Thorough History

Developmental History

- How did you do in school as a child?
- Could you provide school records?
- Do you recall any comments from teachers regarding your behaviour or performance in school?
- Did you have to repeat a grade?

Thorough History (cont'd)

Educational/ Vocational History	Occupational History	Social Functioning
Ask the patient specific questions about their inattention, hyperactivity, and impulsivity in these three domains		

Jackie's History

- Cannot recall school years very well
  - States she was frequently bored of school and mundane tasks
  - Was always irritable; had a hard time
  - Very energetic and impulsive behaviour
- In the past few years, had some relationship problems:
  - Often interrupts her fiancé, losing her temper, and is impulsive in her responses
  - "I find myself saying things without thinking and then regretting it"

Question

- Do ADHD and bipolar disorder have neuroimaging findings unique to their comorbid presentation?
  - ❑ Yes
  - ❑ No
  - ❑ Unknown

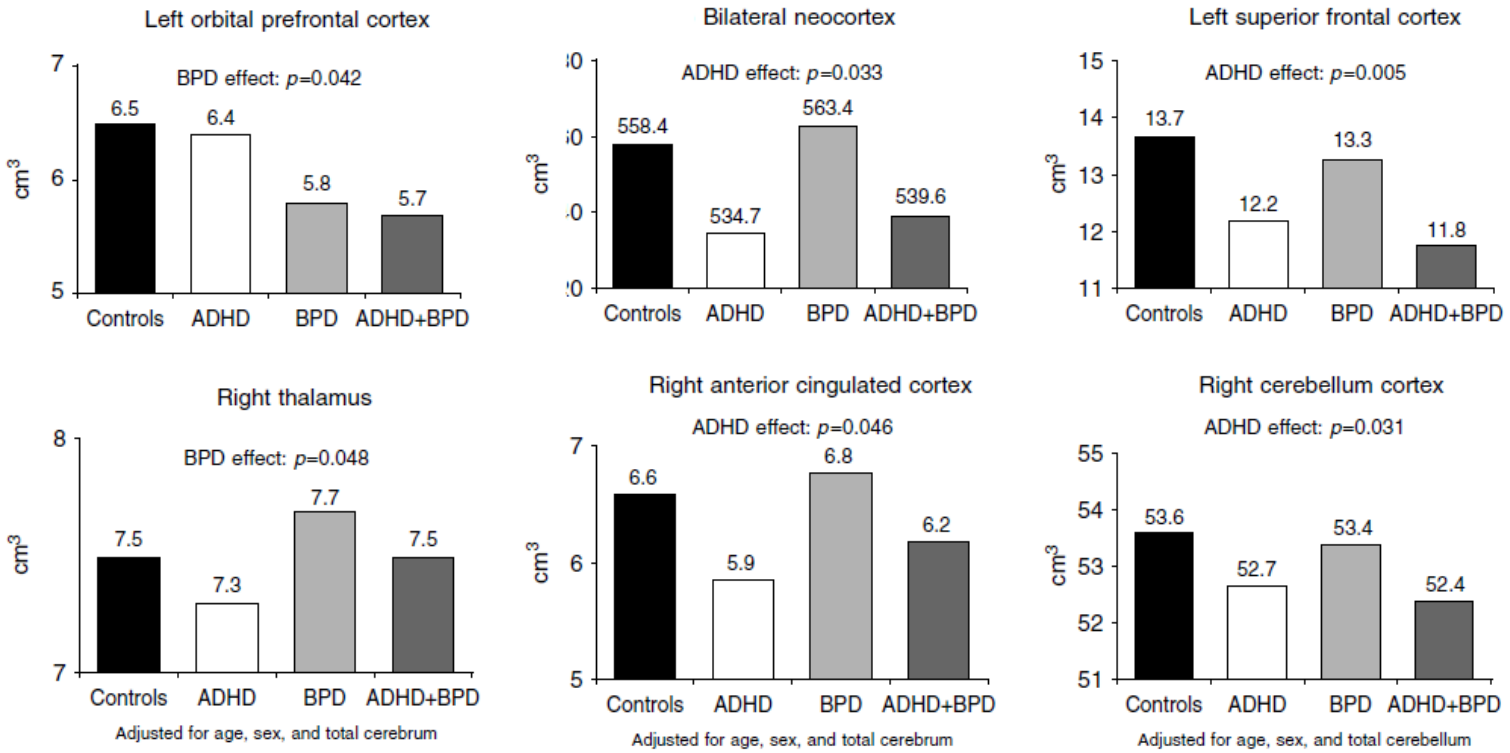
Relationship between ADHD and Bipolar Disorder?

- Both ADHD and bipolar disorder individually are known to have strong familial links
- Similar areas of the brain are involved in both conditions
  - Neuroimaging studies have highlighted the importance of prefrontal, basal ganglia and anterior cingulate dysfunction in ADHD patients
  - Bipolar disorder patients have shown differences in frontal, temporal, corpus callosum and basal ganglia

Klassen LJ, et al. *J Affect Disord.* 2010;124(1-2):1-8.

Brain Volumes in ADHD and BD

Adjusted mean volumes for significant regions of interest

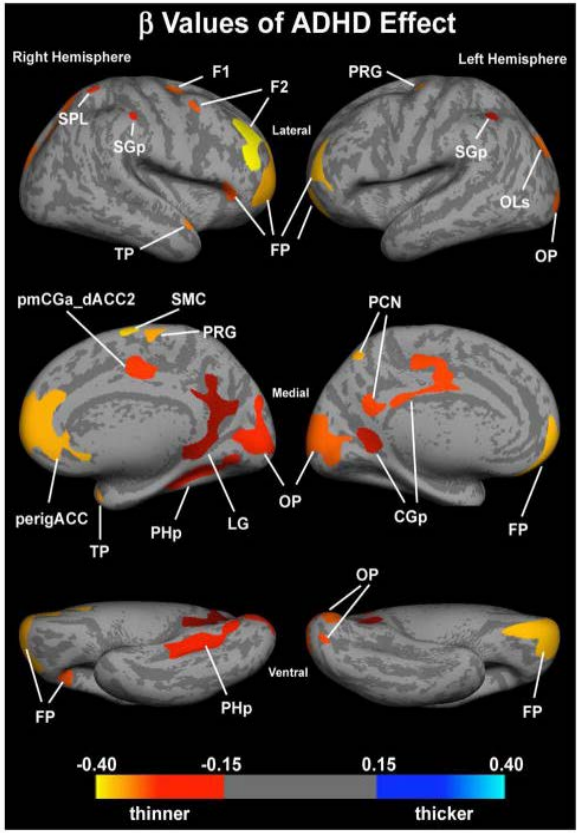


- ADHD and BD are associated with separate alterations
- ADHD+BD distinguished by additive effects of each disorder

Biederman J, et al. *Psychol Med.* 2008;38(7):1045-56.

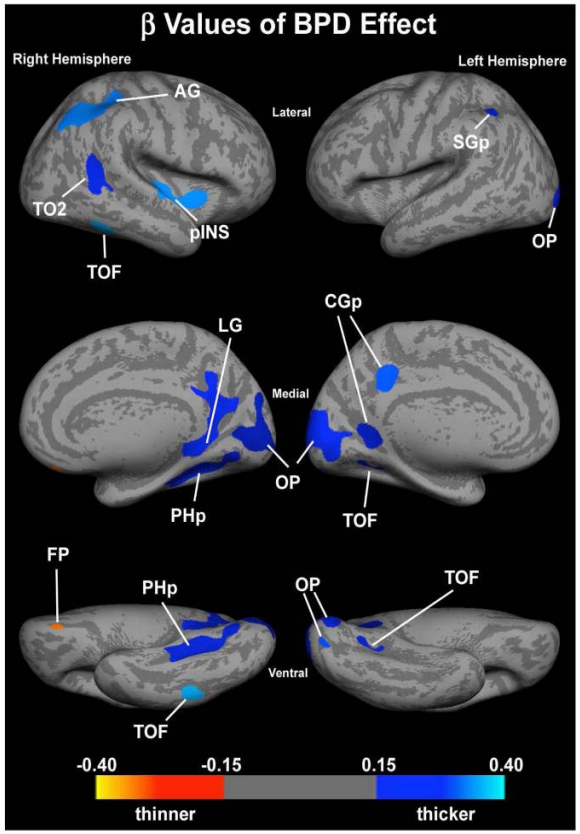
Cortical Thickness in ADHD and BD

ADHD



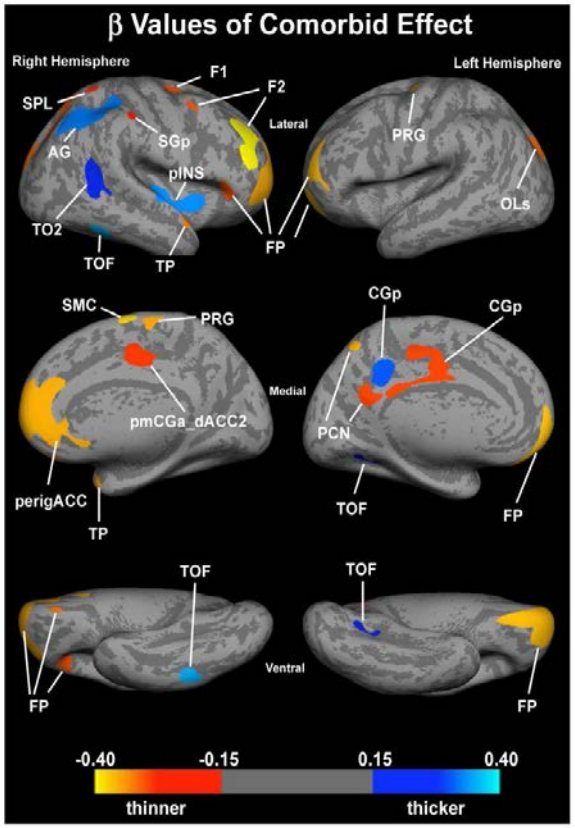
Significantly thinner neocortical gray matter in 28 regions

BD



Significantly thicker cortices in 13 regions

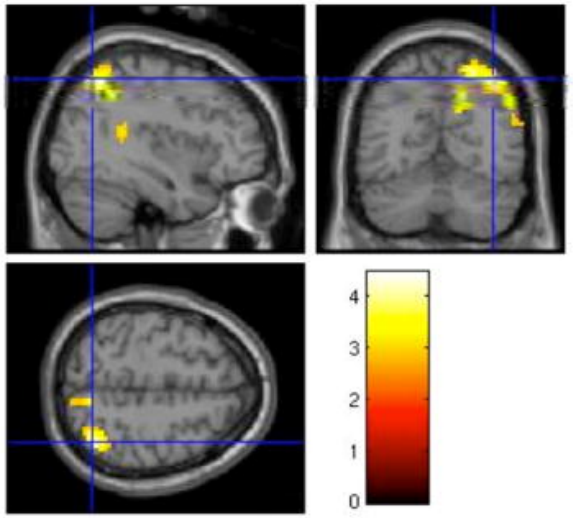
ADHD + BD

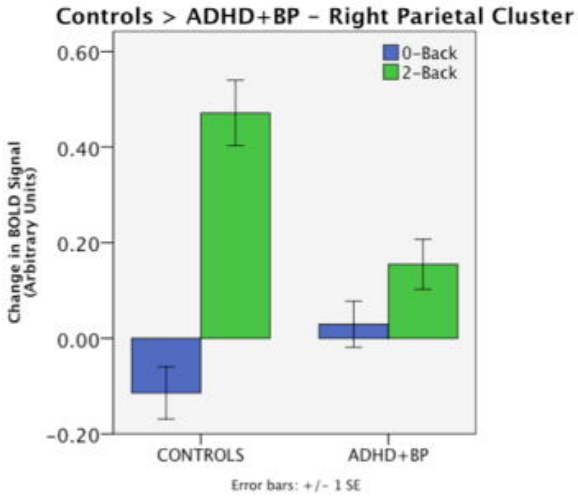


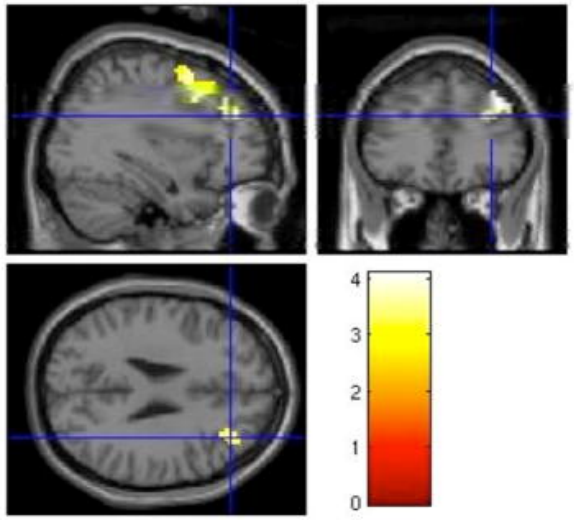
Cortical abnormalities consist of structures altered in both disorders individually

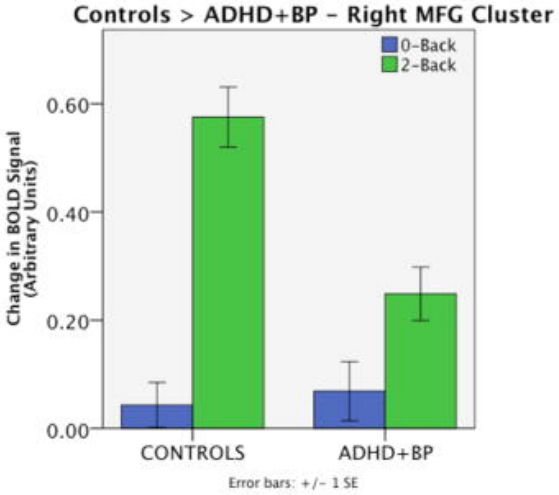
Makris N, et al. *Psychiatry Res.* 2012;202(1):1-11.

Less Working Memory-related Brain Activity in ADHD+BD vs Healthy Controls





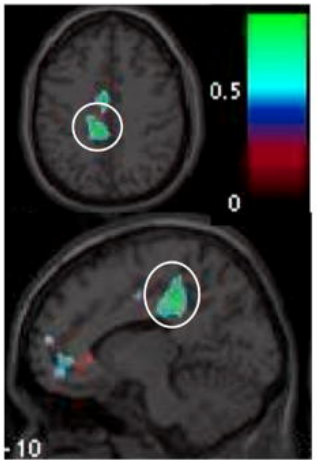


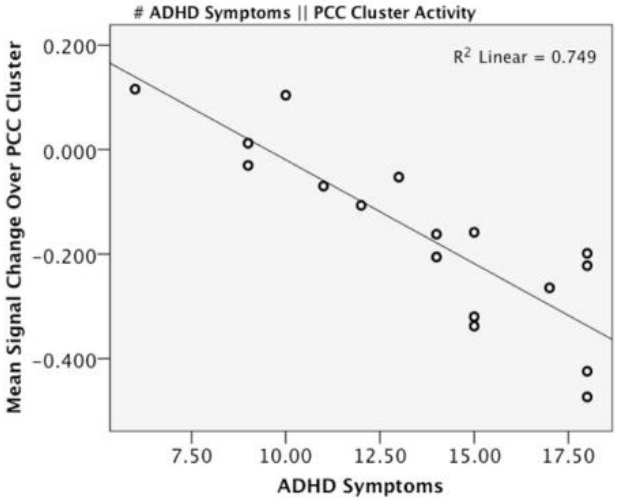


Brown A, et al. *J Psychiatr Res.* 2012;46(4):476-83.

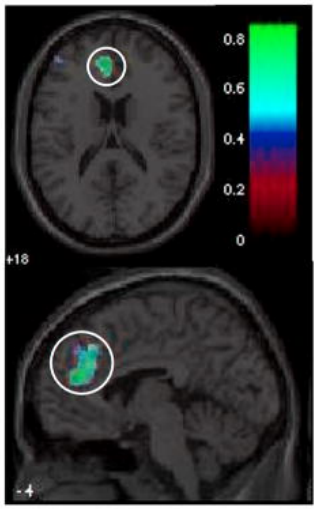
ADHD + BD Symptoms Related to Activity in Anatomically Distinct Regions

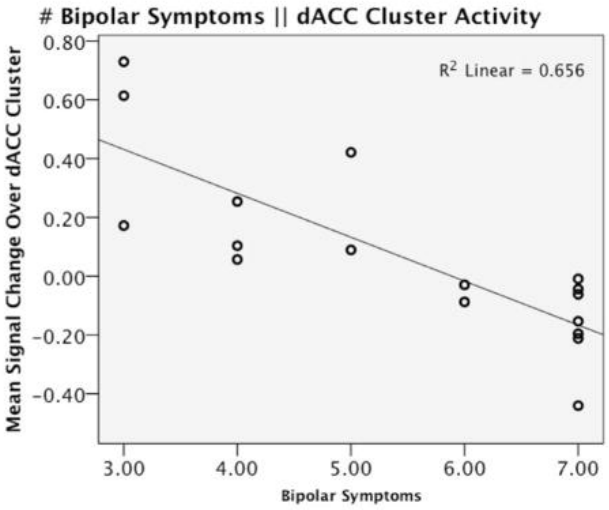
ADHD symptoms





Mania symptoms





Brown A, et al. *J Psychiatr Res.* 2012;46(4):476-83.

Question

- Do ADHD and bipolar disorder have neuroimaging findings unique to their comorbid presentation?
  - ❑ Yes
  - ❑ No
  - ❑ Unknown

Impact of Comorbid ADHD

- Associated with more severe symptoms, course, and worse outcome of both conditions
- First onset of mania symptoms presents at an earlier age (3–5 years earlier) as compared to the BD patients without the ADHD comorbidity
- Higher probability of being diagnosed with type I bipolar disorder
- More frequent depressive episodes with shorter duration of wellness
- Less compliant to treatment

Klassen LJ, et al. J Affect Disord. 2010;124(1-2):1-8.

Management Considerations

- Treat bipolar disorder first
  - Mood stabilizers or atypical antipsychotics
- If ADHD symptoms persist, titrate ADHD medications carefully
  - Stimulant use may require ongoing monitoring as it may destabilize the mood disorder
  - Several studies reported that treatment with stimulants was not associated with worsening of mania symptoms
  - It may be safe to use stimulants if bipolar symptoms respond well to mood stabilizer – and if patient determined low risk for manic switch
- Some evidence suggests use of atomoxetine or bupropion in combination with mood stabilizers
- Physicians must use clinical judgement on how to time and sequence therapies to get the best risk-benefit profile

Bond DJ, *et al. Ann Clin Psychiatry.* 2012;24(1):23-37.
Klassen LJ, et al. *J Affect Disord.* 2010;124(1-2):1-8.
Patel NC, Floyd RS. *Curent Psychiatry.* 2005;4(4).
Perugi G, Vannucchi G. *Expert Opin Pharmacother.* 2015;16(14):2193-204.

Psychotherapeutic Considerations

- Support groups
- Group psychoeducation
- Cognitive behavioral therapy (CBT)
- Interpersonal and social rhythm therapy (IPSRT)

Yatham LN, et al. *Bipolar Disord.* 2013;15(1):1-44.

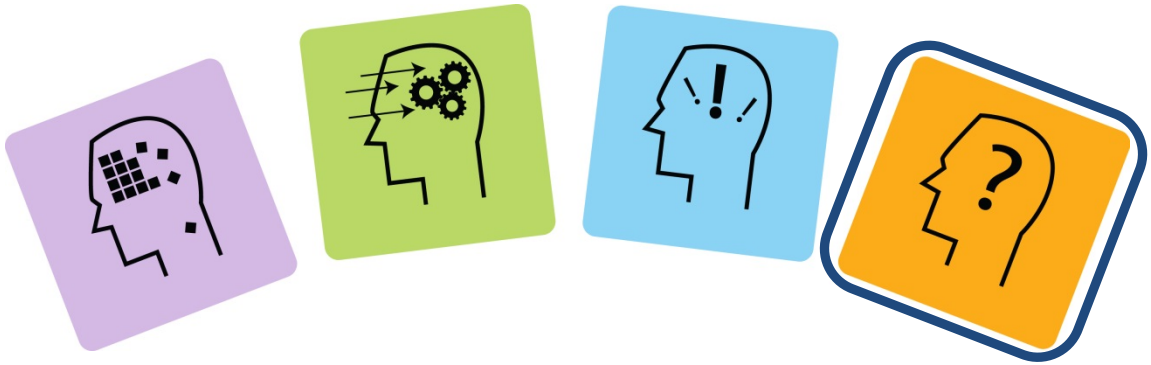
Resources

- Bipolar Disorder
  - www.canmat.org - Canadian Network for Mood and Anxiety Treatments
  - www.cmha.ca - Canadian Mental Health Association
  - www.obad.ca - Organization for Bipolar Affective Disorder
  - www.mooddisorderscanada.ca
  - www.healthymindscanada.ca

- ADHD
  - www.caddra.ca - Canadian ADHD Resource Alliance
  - www.chaddcanada.com - CH.A.D.D. Canada
  - TotallyADD.com - dedicated to helping adults with ADHD
  - www.CliniqueFocus.com - Multidisciplinary specialized assessment and intervention for children, adolescents and adults with ADHD and related issues; includes practical tips and strategies

Back to Cases

Case 4: Substance Abuse



Chad

- 21-year-old male – prompted by mother to seek addiction treatment
  - Single mother; former alcoholic who is 15 years sober
- Recently in trouble with the police for drug offense
  - He regularly smokes cigarettes and marijuana
  - Has experimented with ecstasy and LSD
  - Started experimenting with drugs and alcohol in school (at the age of 12-13)
  - Says he takes drugs to “help him relax”
- Currently unemployed
  - Lives with and is supported by his mother
- Dropped out of high school
  - He was “bored by the classes”; had trouble concentrating and paying attention
  - Was the “class clown”; impulsive/excitable
  - Only had a few friends
- Involved in risk-taking behaviours, such as jumping off buildings
- Very articulate, however in constant motion during entire interview
  - Rocked in his chair, jiggled his legs, etc.

Questions to Consider

- Is there diagnostic certainty?
- Could this be ADHD?
- Could this be both substance abuse and ADHD?
- Other?

Question

- Which of Chad's symptoms is not directly related to ADHD?
  - ❑ Takes drugs to relax
  - ❑ Concentration problems
  - ❑ Risk-taking behaviours
  - ❑ Impulsive
  - ❑ Jiggling legs while seated
  - ❑ None of the above (these are all related to ADHD)

Overlapping Symptoms Between ADHD and Substance Abuse

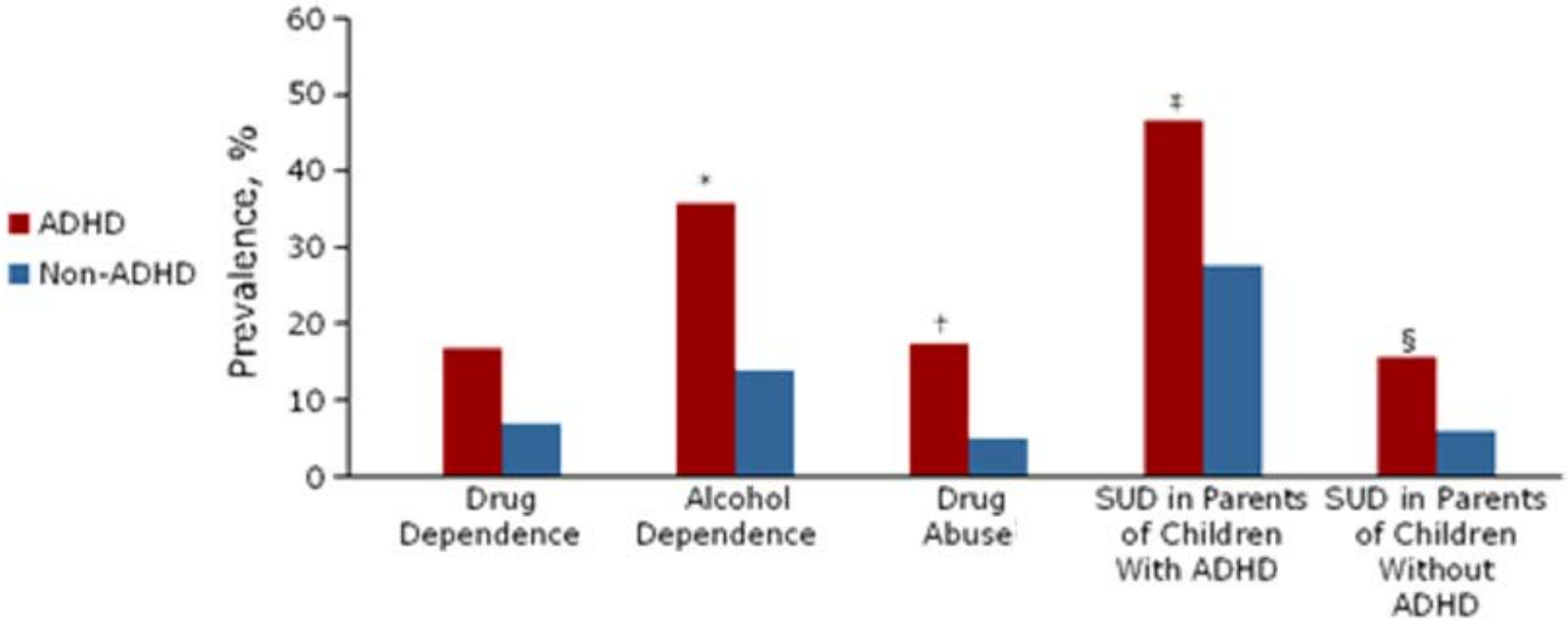
Psychopathology	Clinical features
Substance effects: Acute intoxication or withdrawal symptoms	Agitation Mood instability Anxiety Intolerance to frustrations Restlessness Impulsivity Concentration and memory difficulties
Addictive process: Craving and loss of control	Impulsivity Poor decision making Planning difficulties Mood instability Dysphoria Anxiety Continued substance use in spite of adverse consequences
Deficits in executive functions	Impulsivity Risk-taking behavior Inattention Inability to inhibit responses

Fatseas M, et al. *Curr Opin Psychiatry*. 2012;25(3):219-225.

Question

- Which of Chad's symptoms is not directly related to ADHD?
  - ❑ Takes drugs to relax
  - ❑ Concentration problems
  - ❑ Risk-taking behaviours
  - ❑ Impulsive
  - ❑ Jiggling legs while seated
  - ❑ None of the above (these are all related to ADHD)

SUD in ADHD vs Non-ADHD



*p ≤ .001; data from Biederman et al
† p ≤ .01; data from Mannuzza et al
‡ p < .0001 (α < .005); data from McGough et al, rates may be higher because the group of adults without ADHD were selected from parents of children with ADHD
§ p < .05; data from Kessler et al

‘Accelerated’ Gateway Theory

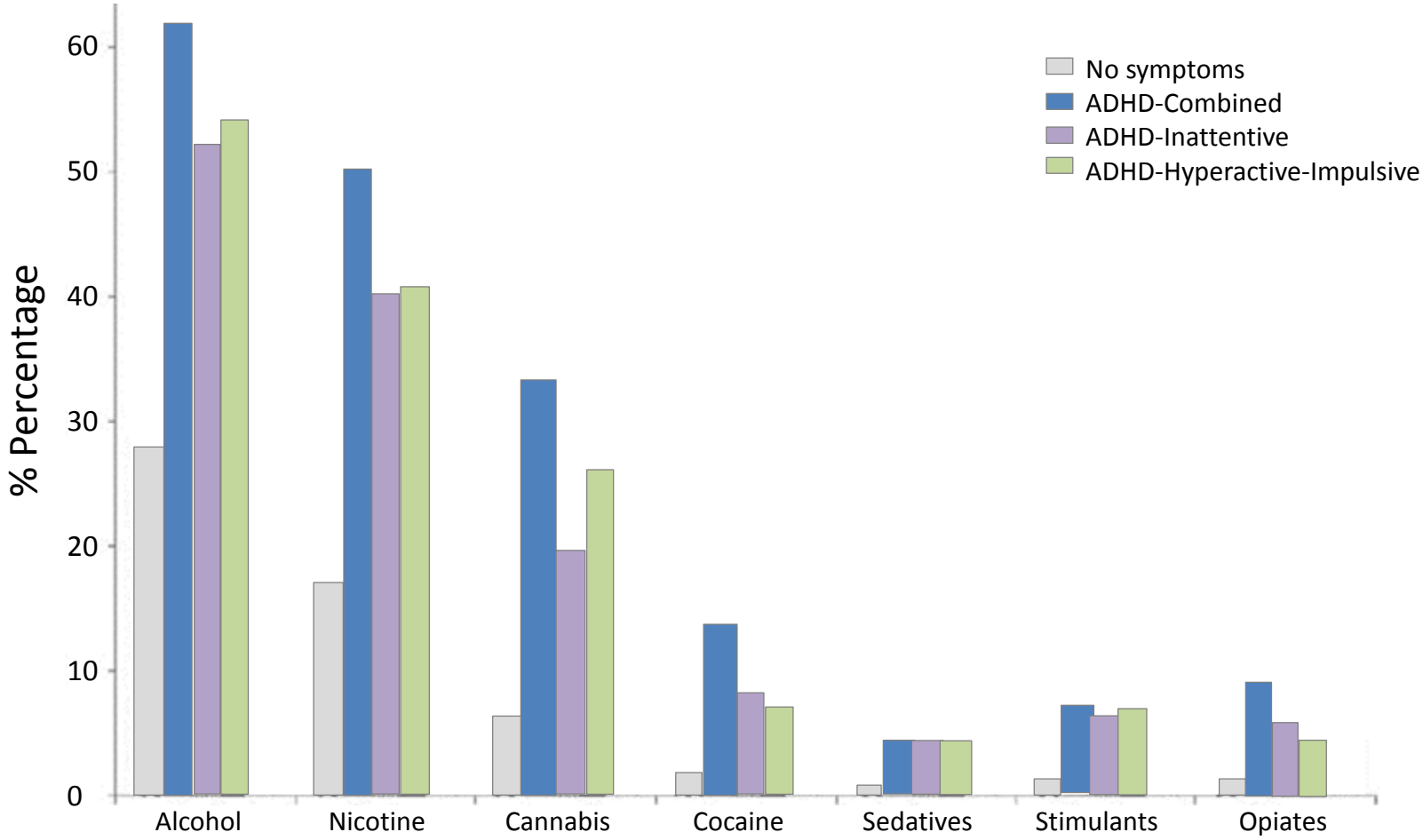
- ADHD associated with younger ages of initiation for alcohol, cigarettes, marijuana, and cocaine use
- Those with ADHD also more likely to engage in recent HIV-risk behavior (injection drug use and needle sharing)

Dunne EM, et al. *Addict Behav*. 2014;39(12):1755-8.
Kandel D. *Science.* 1975;190(4217):912-4.

Prevalence of Types of Substance Abuse

- Data from National Epidemiologic Survey of Alcohol and Related Conditions (NESARC)

N=33,588



De Alwis D, et al. *Addict Behav.* 2014;39(8):1278-85.

Impact of ADHD on Substance Abuse

- ADHD adult patients may use alcohol, drugs, and nicotine as a form of self-medication
- ADHD associated with earlier onset of SUDs and a higher risk of using multiple substances concomitantly

- Ongoing substance abuse might also mimic ADHD symptoms
  - Early onset cannabis users (<17 years) exhibit poor cognitive performance compared to late-onset users

Klassen LJ, et al. J Affect Disord. 2010;124(1-2):1-8.

Question

- Is there a neurological basis to suggest ADHD patients may use substances as a form of self-medication?
  - ❑ Yes
  - ❑ No

Neurobiological Basis for ADHD and Substance Abuse?

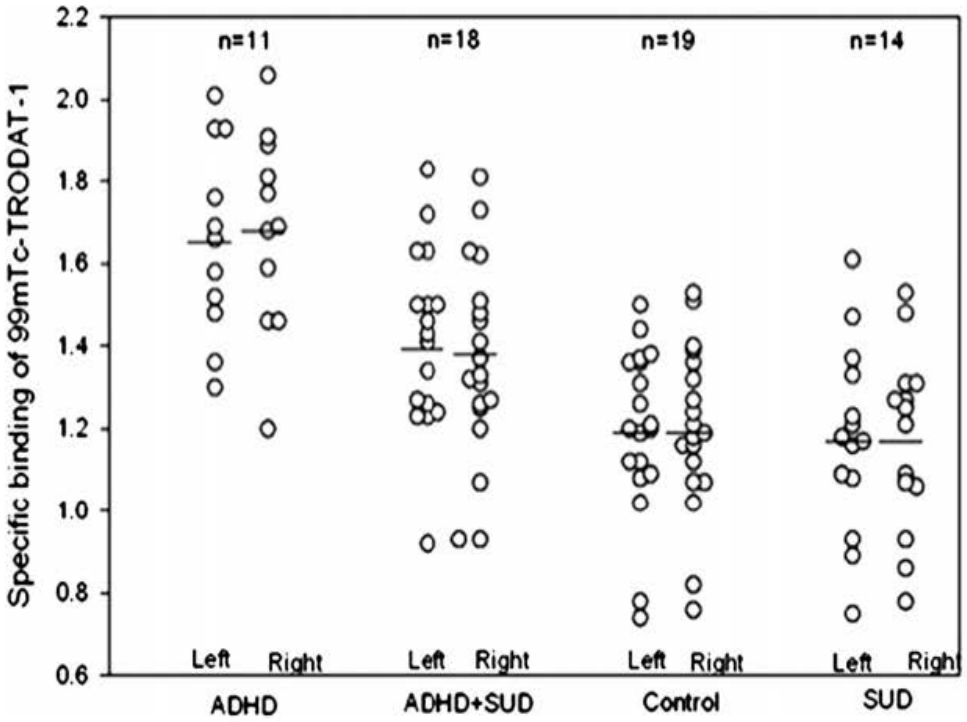
- Dopamine transmission is central to current models of both ADHD and SUDs
  - Drugs of abuse (cocaine, amphetamine, nicotine, alcohol, opiates, and marijuana, etc.) all increase synaptic dopamine concentrations, most notably in the brain's reward center, the nucleus accumbens
  - Stimulant medications manage ADHD symptoms by increasing synaptic dopamine concentrations in the striatum (which includes the nucleus accumbens) via presynaptic transporters

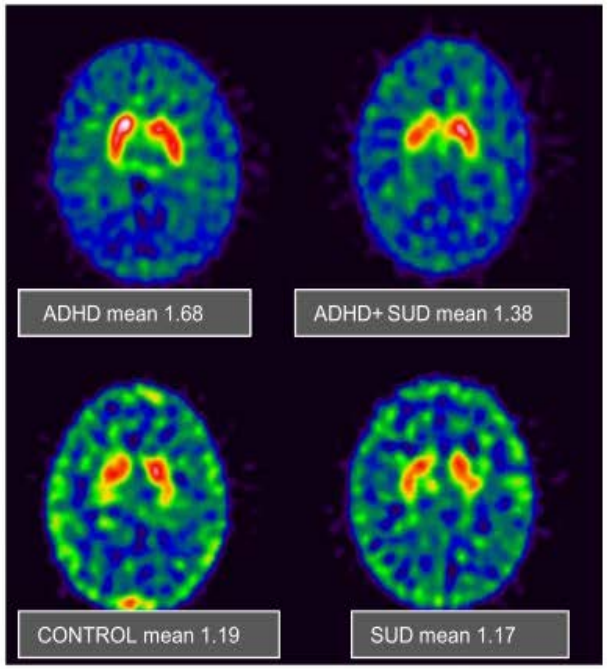
- Theoretically, some individuals with ADHD may use substances to increase synaptic dopamine concentrations as a form of self-medication

Harstad E, et al. Pediatrics. 2014;134(1):e293-301.

Neurobiological Basis for Self-Medication in ADHD?

Dopamine transporter density in the striatum





Silva N Jr, et al. *Clin Nucl Med.* 2014;39(2):e129-34.

Question

- Is there a neurological basis to suggest ADHD patients may use substances as a form of self-medication?
  - ❑ Yes
  - ❑ No

Screening Tools

ADHD in Adults

- Adult ADHD Self-Report Scale (ASRS)

Substance Abuse

- CAGE – Adapted to Include Drug Use (CAGE-AID)
- Drug Abuse Screening Test (DAST-20)
- Substance abuse timeline worksheets

Routine screening of all patients with substance abuse for ADHD?

Example Substance Abuse Timeline

Please document below, under the proper age range, your use of all substances

SUBSTANCE	AGE																		
	10	12	14	16	18	20	22	24	26	28	30	32	34	35+	40+	45+	50+	55+	60+	65+
Nicotine																				
Alcohol																				
Cannabis																				
Amphetamines																				
Cocaine																				
Ecstasy																				
Ketamine																				
Gamma-hydroxybutyric acid																				
Opiates, Narcotics (heroin, oxycodone, etc.)																				
Hallucinogens																				
Prescription drugs																				
Other drugs																				

Ontario Bilkey ADHD Clinics, 2005.

Thorough History

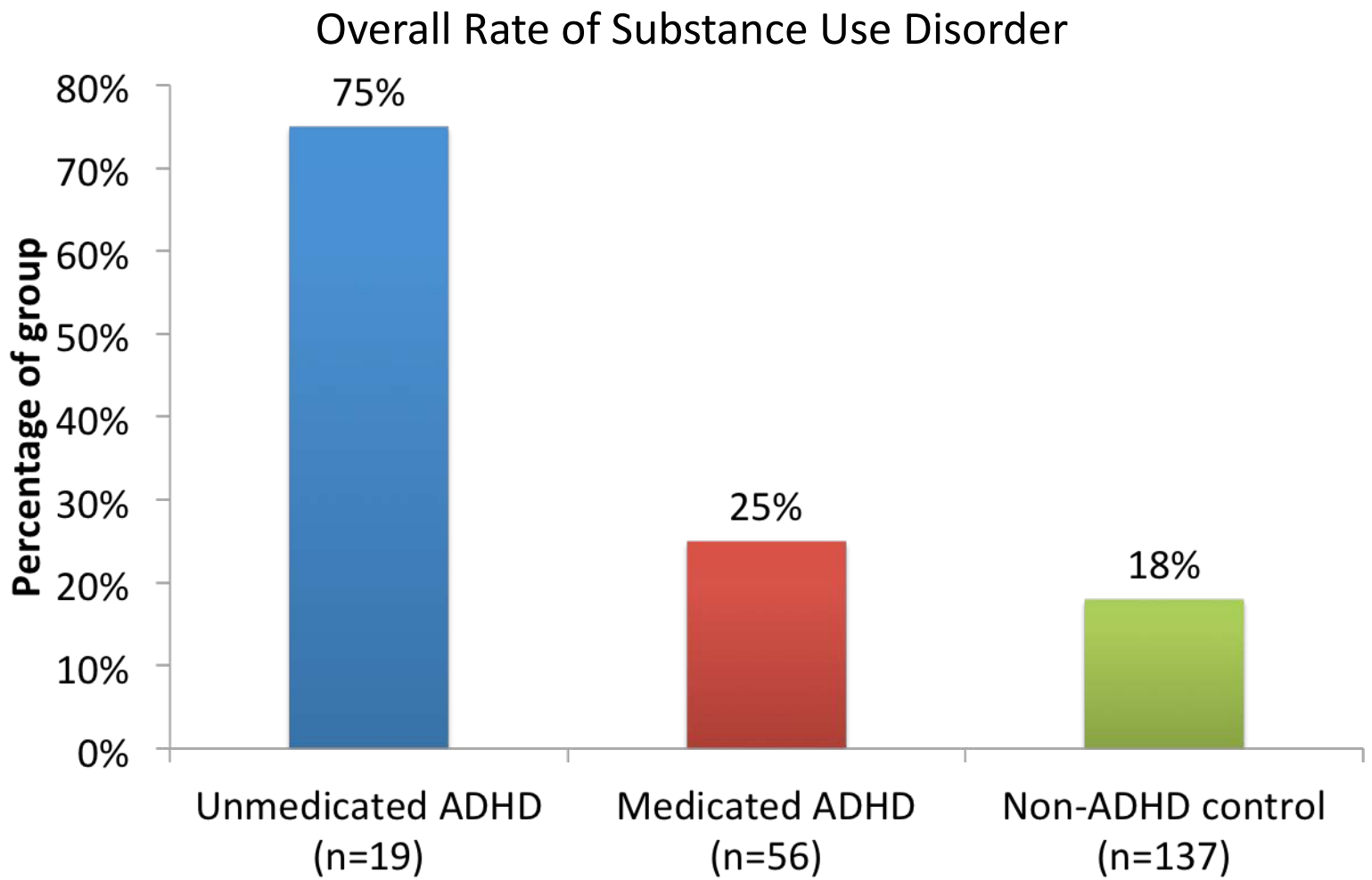
- The diagnostic interview should carefully question about childhood and behavioral symptoms
  - Focusing on childhood onset, current symptoms and impairment in at least two domains specific to ADHD

- Complete a timeline for ADHD symptoms
- Complete a timeline for SUD

Question

- If ADHD were to be treated, does stimulant use lead to increased subsequent substance abuse?
  - ❑ Yes
  - ❑ No

Prevalence of SUD: Prospective 4-Year Follow-up Study

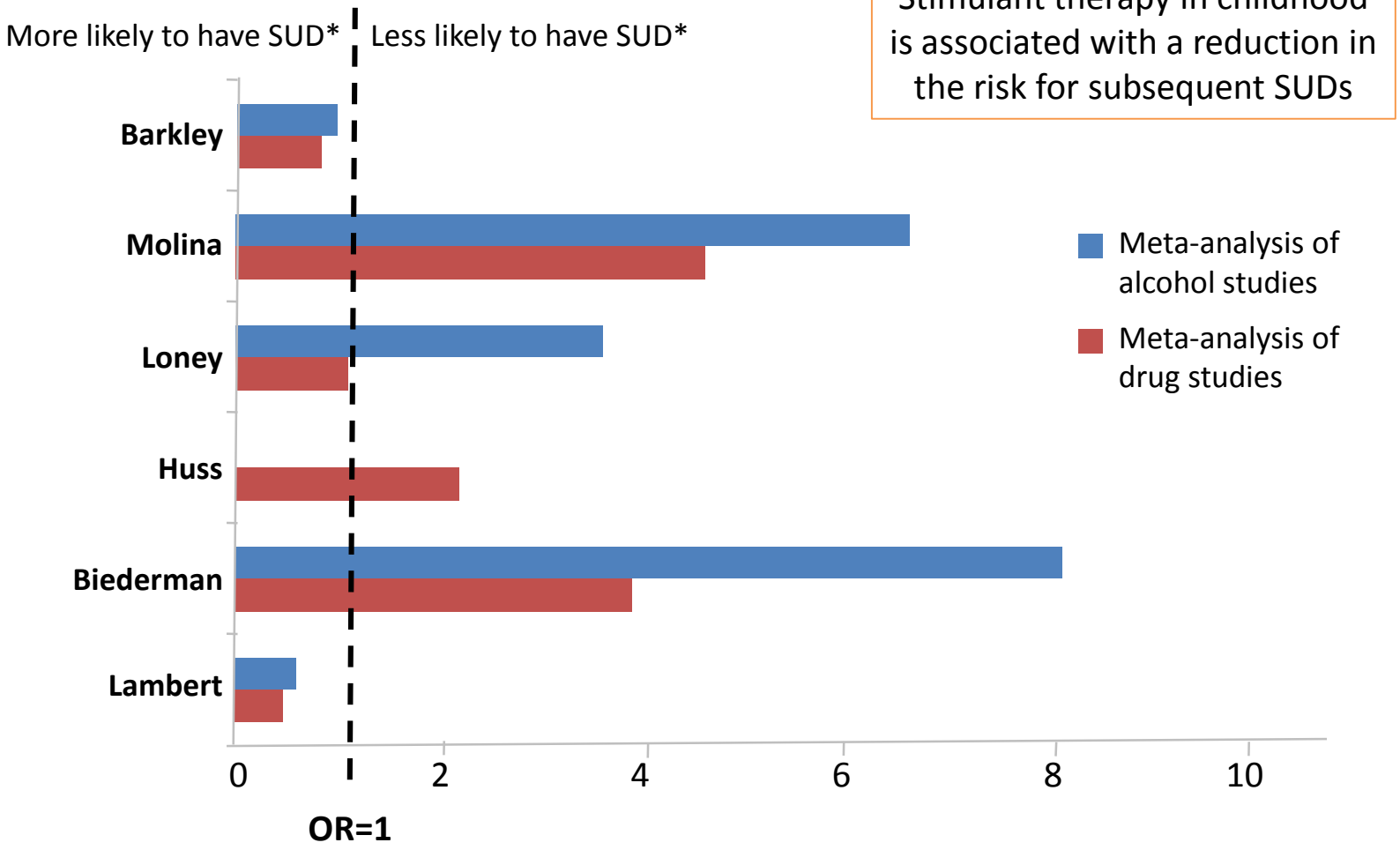


p<0.001 across groups

Biederman J, *et al. Pediatrics.* 1999;104:e20.

Effect of ADHD Pharmacotherapy in Youths on Later Substance Use Disorders

Stimulant therapy in childhood is associated with a reduction in the risk for subsequent SUDs

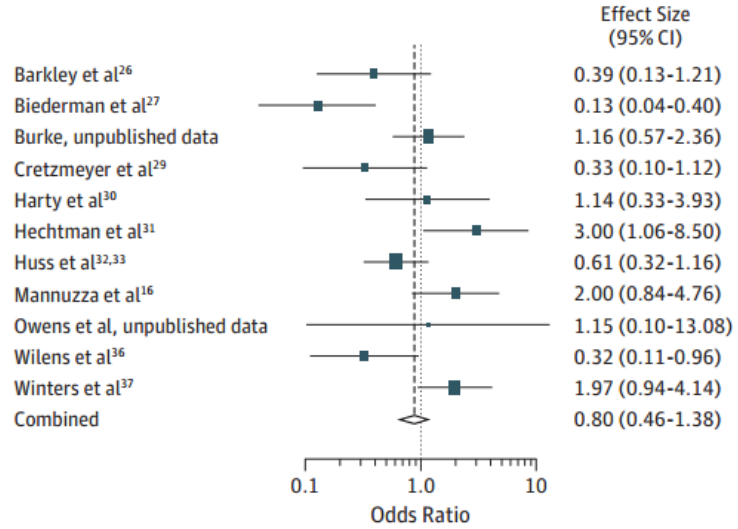


*Compared to unmedicated youth with ADHD

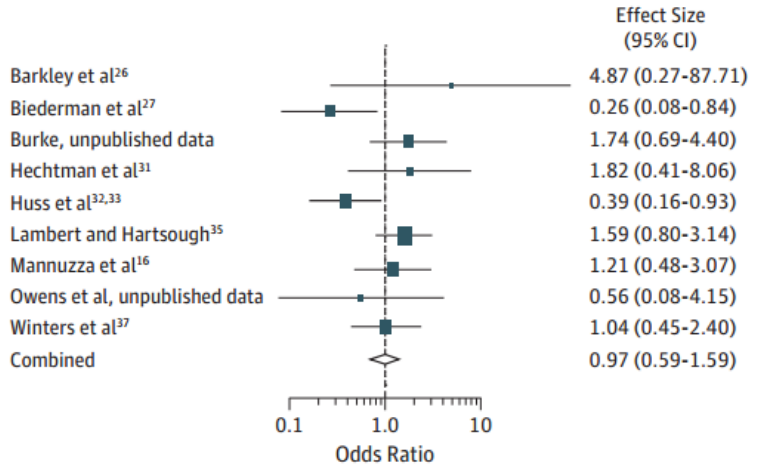
Wilens TE, *et al. Pediatrics.* 2003;111:179-185.

ADHD Pharmacotherapy Neither Protects Against Nor Increases the Risk of Later SUD

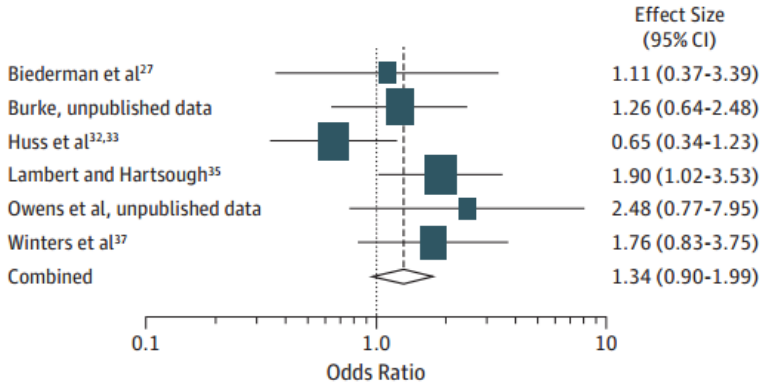
Alcohol Abuse or Dependence



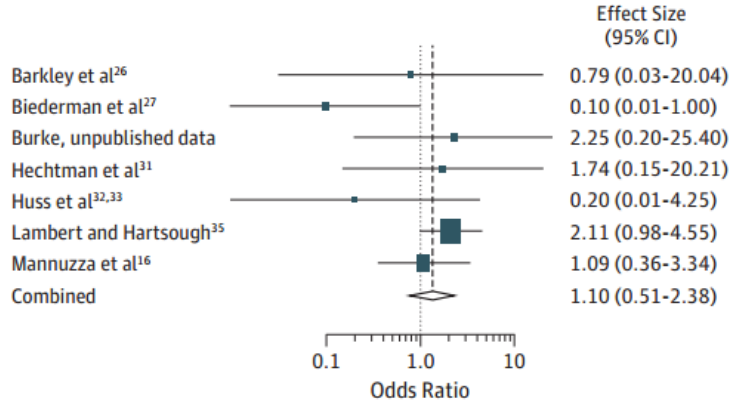
Marijuana Abuse or Dependence



Nicotine Dependence



Cocaine Abuse or Dependence



Humphreys KL, et al. *JAMA Psychiatry.* 2013;70(7):740-9.

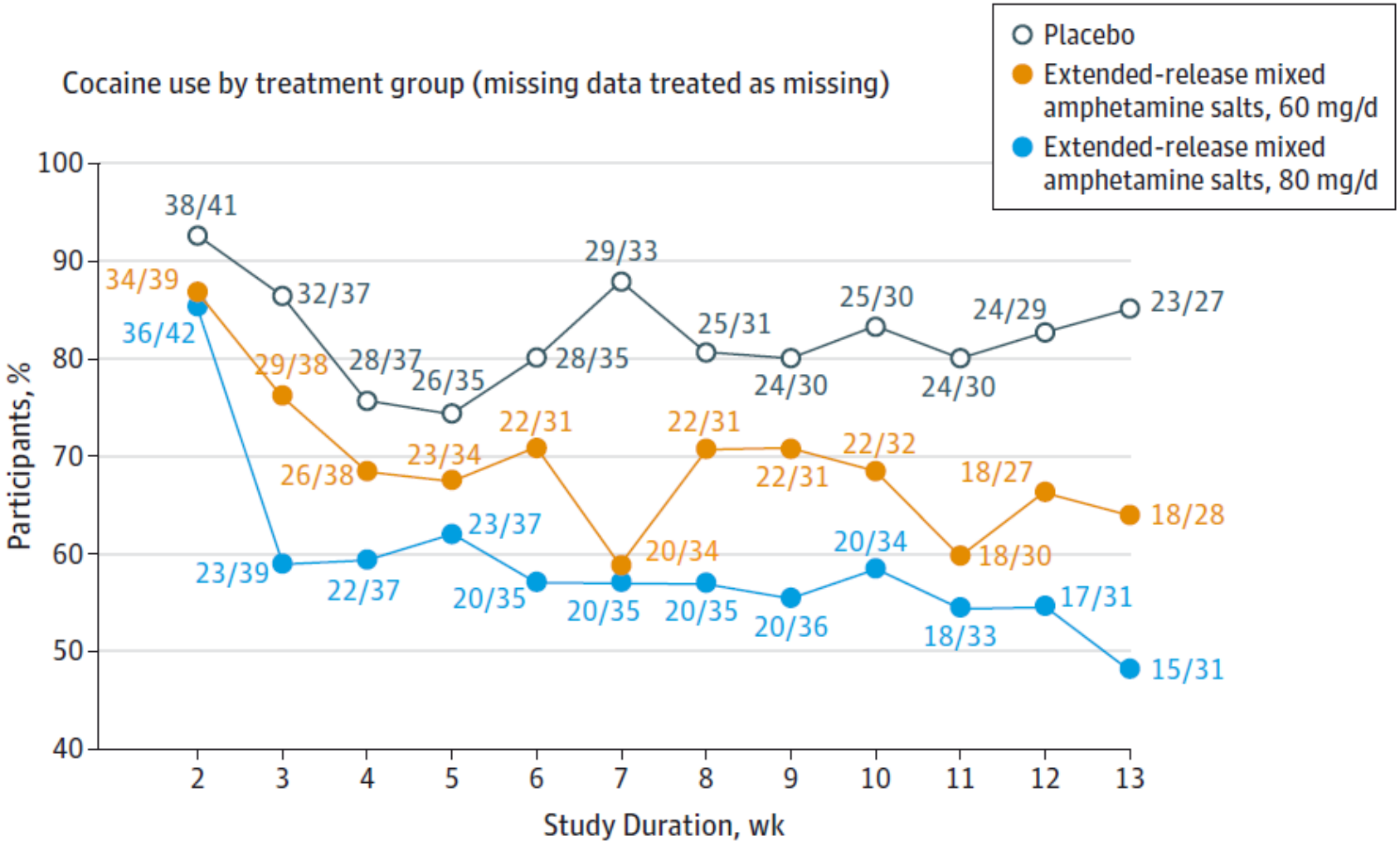
What if Pharmacotherapy is Initiated in Adolescents or Young Adults?

	Odds ratio				
	2-week binge drinking	Monthly alcohol use	Annual marijuana use	Annual cocaine use	Past year illicit stimulant use
No prescribed stimulant (n = 8199)	1.00	1.00	1.00	1.00	1.00 (n = 8048)
Elementary school initiation (n = 65)	0.69	1.01	1.49	2.42	1.72 (n = 65)
Secondary school initiation (n = 105)	1.68*	2.59†	1.98†	4.40‡	3.14‡ (n = 99)
College initiation (n = 97)	1.07	3.60†	4.30‡	4.46‡	7.51‡ (n = 95)

*$p < 0.05$; †$p < 0.01$; ‡$p < 0.001$

Kollins SH. *Curr Med Res Opin*. 2008;24(5):1345-57.

Stimulant Treatment in Adults with ADHD and Cocaine Use Disorder



Levin FR, et al. *JAMA Psychiatry.* 2015;72(6):593-602.

Question

- If ADHD were to be treated, does stimulant use lead to increased subsequent substance abuse?
  - ❑ Yes
  - ❑ No

Management Considerations

- Addiction treatment
- Treatment of ADHD symptoms with stimulant medication may reduce the risk of developing SUDs
  - Stimulants are more effective than nonstimulants
- But stimulants are a class of medication with significant abuse and diversion potential
  - Clinicians should be mindful of the risks and benefits of this treatment approach in a high-risk population
  - Before prescribing, confirm a diagnosis of ADHD
  - Document prescription records
- Behavioral therapy for ADHD may also be effective in preventing SUDs

Harstad E, et al. *Pediatrics.* 2014;134(1):e293-301.
Kollins SH. *Curr Med Res Opin.* 2008;24(5):1345-57.

Resources

- Substance Abuse
  - www.ccsa.ca - Canadian Centre on Substance Abuse
  - www.camh.ca - Centre for Addiction and Mental Health
  - www.canadarehab.ca - Help addicts find substance abuse treatment centers in Canada; provides a gratis referral service to substance abuse treatment, in patient rehabilitation facilities, long term or short term residential rehab.

- ADHD
  - www.caddra.ca - Canadian ADHD Resource Alliance
  - www.chaddcanada.com - CH.A.D.D. Canada
  - TotallyADD.com - dedicated to helping adults with ADHD
  - www.CliniqueFocus.com - Multidisciplinary specialized assessment and intervention for children, adolescents and adults with ADHD and related issues; includes practical tips and strategies

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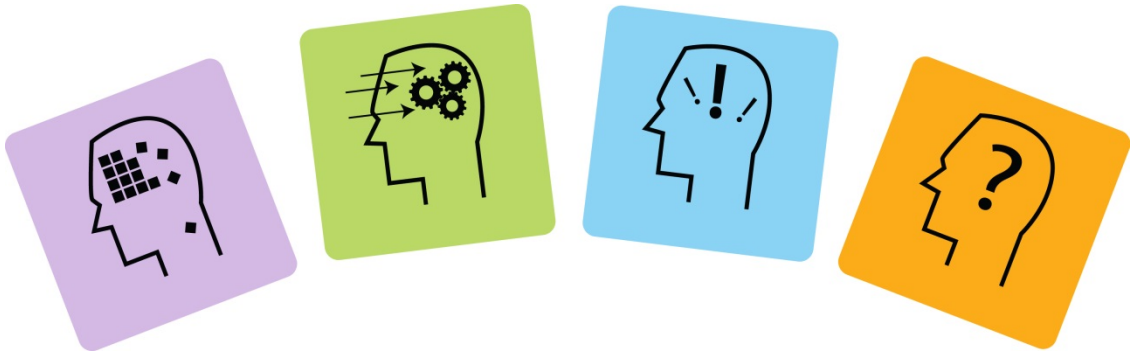
ADHD Management



Optimize ADHD Management

- 2011 CADDRA guidelines:
  - Patient education
  - Psychosocial interventions
  - Education/vocational supports
  - Pharmacological options

CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.
Wolraich M, *et al. Pediatrics.* 2011;128(5):1007-1022.

Explaining ADHD to Patient

- ADHD is a neurobiological condition with a strong genetic etiology
- ADHD affects behaviour, interpersonal relationships, academic/work output, etc. – this is not anyone's fault, but is a result of brain development and functioning
- Medications are an important aspect of treatment
- Requires long-term care

CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.

Useful Psychosocial Interventions

Behavioural

- Social skills training
- Organization skills
- Anger management
- ADHD/ADD coaching

Lifestyle

- Proper nutrition
- Good sleep hygiene
- Regular exercise
- Extracurricular activities

Psychoeducation

- Regarding disorder and medication

CADDRA. Canadian ADHD Practice Guidelines, Third Edition. 2011.

Psychotherapy

- Cognitive behavioural therapy (CBT)
- Interpersonal psychotherapy (IPT)
- Art therapy
- Supportive psychotherapy
- Couple and/or family therapy
- Vocational counselling

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Wender PH, et al. *Ann N Y Acad Sci.* 2001;931:1-16.

Environmental Interventions

- Consistent, structured, predictable environment
- Decrease in disruptive distractions (including screen use)
- Post lists, calendars, visual reminders
- Divide tasks in small chunks, with short term delays
- Immediate consequences, positive incentives
- Enhance self-esteem

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Medication Overview in ADHD: Stimulants

- Dextroamphetamine
- Dextroamphetamine sustained release (SR)
- Mixed amphetamine salts extended release (MAS XR)
- Lisdexamfetamine
- Immediate-release (IR) methylphenidate
- Multilayer-release (MLR) methylphenidate*
- Osmotic-controlled release oral delivery system(OROS) methylphenidate

AMPHETAMINE-BASED PSYCHOSTIMULANTS	Characteristics	Duration of Action
Dexedrine® tablets 5 mg Dexedrine® spansules 10, 15 mg 	Pill can be crushed Spansule (not crushable)	~ 4 h ~ 6 - 8 h
Adderall XR® Capsules 5, 10, 15, 20, 25, 30 mg 	Sprinkable Granules	~ 12 h
Vyvanse® Capsules 10, 20, 30, 40 50, 60 mg 	Capsule content can be diluted in water, orange juice and yogurt	~ 13 - 14 h
METHYLPHENIDATE-BASED PSYCHOSTIMULANTS		
Methylphenidate short acting, tablets 5 mg (generic) 10, 20 mg (Ritalin®) 	Pill can be crushed	~ 3 - 4 h
Biphentin® Capsules 10, 15, 20, 30, 40, 50, 60, 80 mg 	Sprinkable Granules	~ 10 - 12 h
Concerta® Extended Release Tabs 18, 27, 36, 54 mg 	Pill needs to swallowed whole to keep delivery mechanism intact	~ 12 h

*New MLR formulation with longer duration of action to be available soon

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Medication Overview in ADHD: Non-Stimulants

- Atomoxetine
- Guanfacine extended release (XR)

Medications available and illustrations	Characteristics	Duration of action
NON PSYCHOSTIMULANT - SELECTIVE NOREPINEPHRINE REUPTAKE INHIBITOR		
Strattera[MD] Capsules 10, 18, 25, 40, 60, 80, 100 mg 	Capsule needs to swallowed whole to reduce GI side effects	Up to 24 h
NON PSYCHOSTIMULANT - SELECTIVE ALPHA-2A ADRENERGIC RECEPTOR AGONIST		
Intuniv XR® Extended release tabs 1, 2, 3, 4 mg 	Pills need to be swallowed whole to keep delivery mechanism intact	Up to 24 h

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2016 CADDRA First-Line Dosing Guide

Medications available and illustrations	Starting dose	Dose titration as per product monograph	Dose titration as per CADDRA www.caddra.ca
AMPHETAMINE-BASED PSYCHOSTIMULANTS			
Mixed amphetamine salts Adderall XR® Capsules 5, 10, 15, 20, 25, 30 mg 	5 - 10 mg q.d. a.m.	↑ 5 - 10 mg at weekly intervals Max. dose/day: Children = 30 mg Adolescents and Adults = 20 - 30 mg	Children: ↑ 5 mg at weekly intervals Max. dose/day = 30 mg Adolescents and Adults: ↑ 5 mg at weekly intervals max. dose/day = 50 mg
Lisdexamfetamine Vyvanse® Capsules 10, 20, 30, 40 50, 60 mg 	20 - 30 mg q.d. a.m.	↑ by clinical discretion at weekly intervals Max. dose/day: All ages = 60 mg	↑ 10 mg at weekly intervals Max. dose/day: Children = 60mg Adolescents and Adults = 70 mg
METHYLPHENIDATE-BASED PSYCHOSTIMULANTS			
MLR methylphenidate Biphentin® Capsules 10, 15, 20, 30, 40, 50, 60, 80 mg 	10 - 20 mg q.d. a.m.	↑ 10 mg at weekly intervals Max. dose/day: Children and Adolescents = 60 mg Adults = 80 mg	↑ 5 - 10 mg at weekly intervals Max. dose/day: Children = 60 mg Adolescents and Adults = 80 mg
OROS methylphenidate Concerta® Extended Release Tabs 18, 27, 36, 54 mg 	18 mg q.d. a.m.	↑ 18 mg at weekly intervals Max. dose/day: Children = 54 mg Adolescents = 54 mg / Adults = 72 mg	↑ 9 - 18 mg at weekly intervals Max. dose/day: Children = 72 mg Adolescents = 90 mg / Adults = 108 mg
NON PSYCHOSTIMULANT - SELECTIVE NOREPINEPHRINE REUPTAKE INHIBITOR			
Atomoxetine Strattera™ Capsules 10, 18, 25, 40, 60, 80, 100 mg 	Children and Adolescents : 0.5 mg/kg/day Adults = 40 mg q.d. for 7-14 days	Maintain dose for a minimum of 7 - 14 days before adjusting: Children = 0.8 then 1.2 mg/kg/day 70 kg or Adults = 60 then 80 mg/day Max. dose/day : 1.4 mg/kg/day or 100 mg	Maintain dose for a minimum of 7 - 14 days before adjusting: Children = 0.8 then 1.2 mg/kg/day 70 kg or Adults = 60 then 80 mg/day Max. dose/day: 1.4 mg/kg/day or 100 mg
NON PSYCHOSTIMULANT - SELECTIVE ALPHA-2A ADRENERGIC RECEPTOR AGONIST			
Guanfacine XR Intuniv XR® Extended release tabs 1, 2, 3, 4 mg 	1 mg q.d. (morning or evening)	Maintain dose for a minimum of 7 days before adjusting by no more than 1 mg increment weekly Max. dose/day: Monotherapy: 6-12 years = 4 mg, 13-17 years = 7 mg As adjunctive therapy to psychostimulants 6-17 years = 4 mg	Maintain dose for a minimum of 7 days before adjusting by no more than 1 mg increment weekly Max. dose/day: Monotherapy: 6-12 years = 4 mg, 13-17 years = 7 mg As adjunctive therapy to psychostimulants 6-17 years = 4 mg

Although several ranges are depicted, a guiding principle should be to **start low** and **go slow**.

BID, Twice a day. IR, Immediate-release. MLR, Multilayer-release. OROS, Osmotic controlled-release oral delivery system. XR, Extended release, QD, Once a day.
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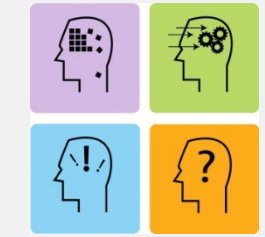
CADDRA ADHD Toolkit

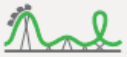
ADULT TOOLKIT
Assessment and Follow-Up Forms
CADDRA ADHD Assessment Form
Weiss Symptom Record (WSR)
ADHD Checklist
Adult ADHD Self-Report Scale (ASRS)
Weiss Functional Impairment Rating Scale – Self Report (WFIRS-S)
Weiss Functional Impairment Rating Scale – Parent Report (WFIRS-P)
CADDRA Clinician ADHD Baseline/Follow-Up Form (F)
CADDRA Patient ADHD Medication Form
Handouts
CADDRA ADHD Information and Resources
CADDRA Adult Assessment Instructions

Free to download from www.caddra.ca

ADHD Tips and Tricks for Adults



TOOLBOX 1 | INFOSHEETS TO BETTER EQUIP TEENS AND ADULTS WITH ADHD

Pictogram	Infosheet no.	Title
CADDRA	1	CADDRA: General ADHD Information and Resources
	2	Time Management to Boost Your Productivity
	3	Conquering Space
	4	Practical Financial Management Tips
	5	ADHD and High School Accommodations
	6	Cognitive Restructuring 101
	7	ADHD and Emotional Management
	8	ADHD and Leading a Balanced Life

Available online at *www.cliniquefocus.com/ADHD-TIPS.php*

Key Take-Home Messages

- ADHD is common and an impairing disease affecting about 5% of the adult population
- Many adults with ADHD were never diagnosed as children
- ADHD symptoms and impairments can mimic other common psychiatric disorders, leading to incorrect diagnoses and management
- Clinicians should be vigilant in screening for comorbid ADHD in anxiety, mood, and substance abuse disorder patients
- Untreated ADHD may diminish the treatment outcomes of comorbid psychiatric disorders
- Better clinical outcomes can be achieved by treating adults with ADHD with an evidence-based approach using approved ADHD therapies than by solely treating comorbid conditions