

Managing ADHD and ADHD-like conditions with complex comorbidities: A Case-based Discussion

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Faculty/Presenter Disclosure

- **Faculty:** Dr. Mark Katz
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Mitigating Potential Bias

Dr. Katz is solely responsible for the creation of this talk and its content

The term long acting psychostimulant is used rather than specific product names except where data is presented on generic vs. brand name differences

Attention Deficit–Hyperactivity Disorder (ADHD)

- ADHD is a persistent, psychiatric, neurobiological disorder diagnosed using three core symptom domains: inattention, hyperactivity, and impulsivity
- ADHD affects 3% to 9% of school-age children
- ADHD affects 2% to 12% of post-secondary students
- > 50% of individuals continue to have significant, impairing symptoms in adult life
- Adults with ADHD suffer higher rates of job loss, divorce, and accidents compared to their non-ADHD counterparts

Causes of ADHD

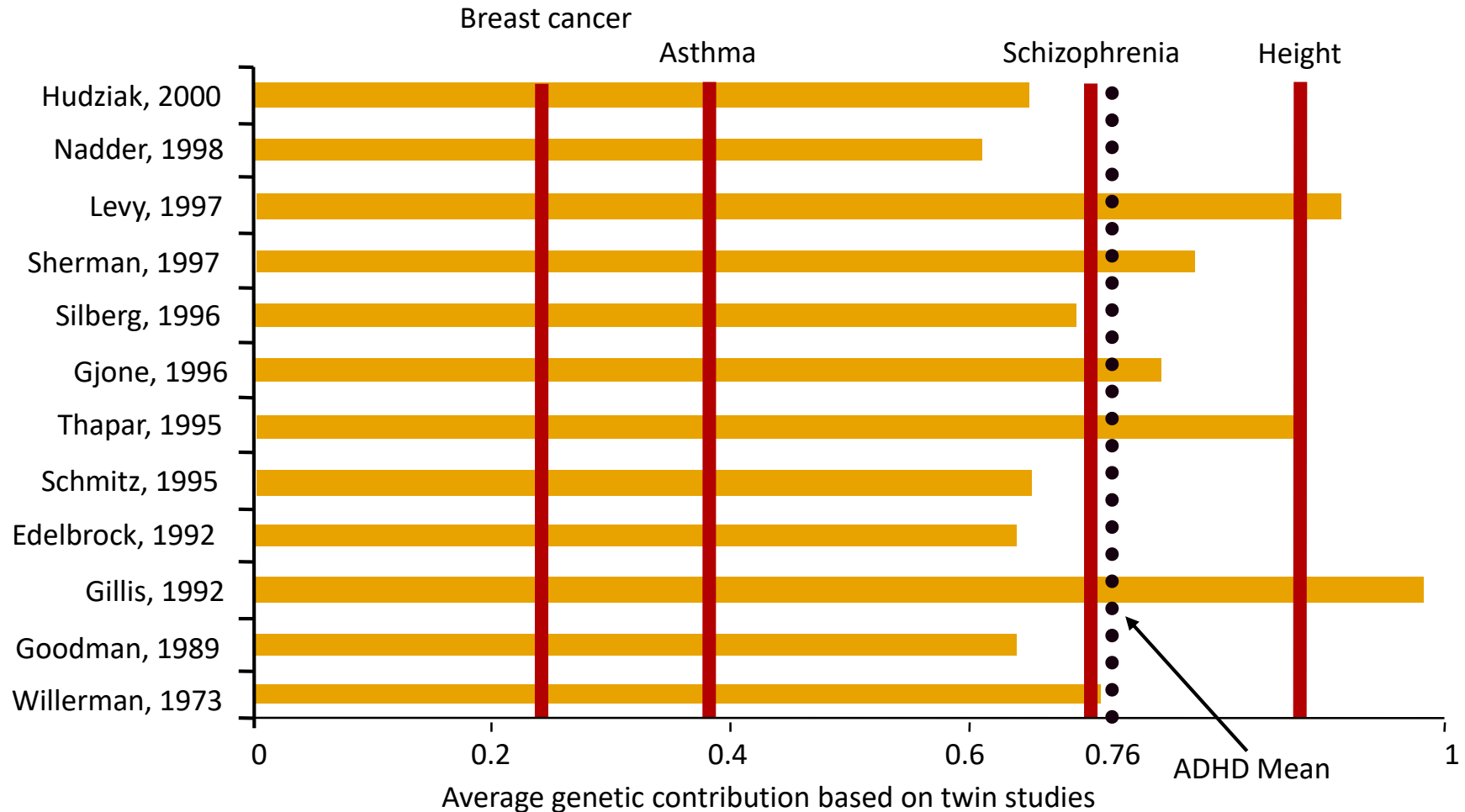
Genetics

- Scientists agree that ADHD is a medical neurobiological disorder:
 - Family, twin, and adoption studies have found that the disorder is often inherited
 - Some dopamine genes have been shown to be associated with ADHD
 - Parents with ADHD have a > 50% chance of having a child with ADHD
 - If a child has ADHD, the likelihood that another family member will also have the disorder is five times greater

Environmental / central nervous system (CNS) factors

- ADHD symptoms may occasionally be caused by:
 - Injury to the brain
 - Prenatal exposure to toxins or high blood lead levels

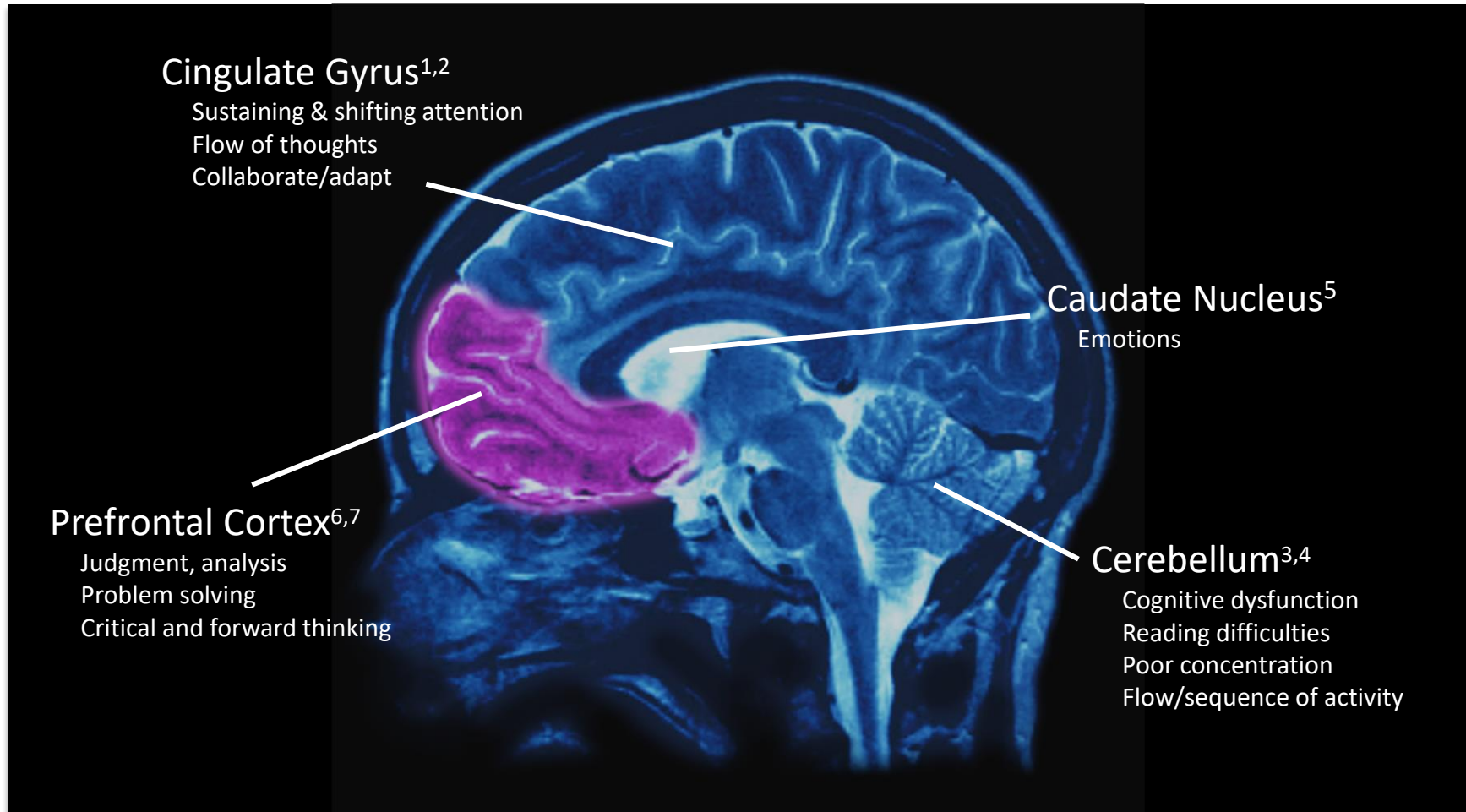
Heritability Co-efficient of ADHD



Faraone SV. J Am Acad Child Adolesc Psychiatry. 2000 Nov;39(11):1455-7.

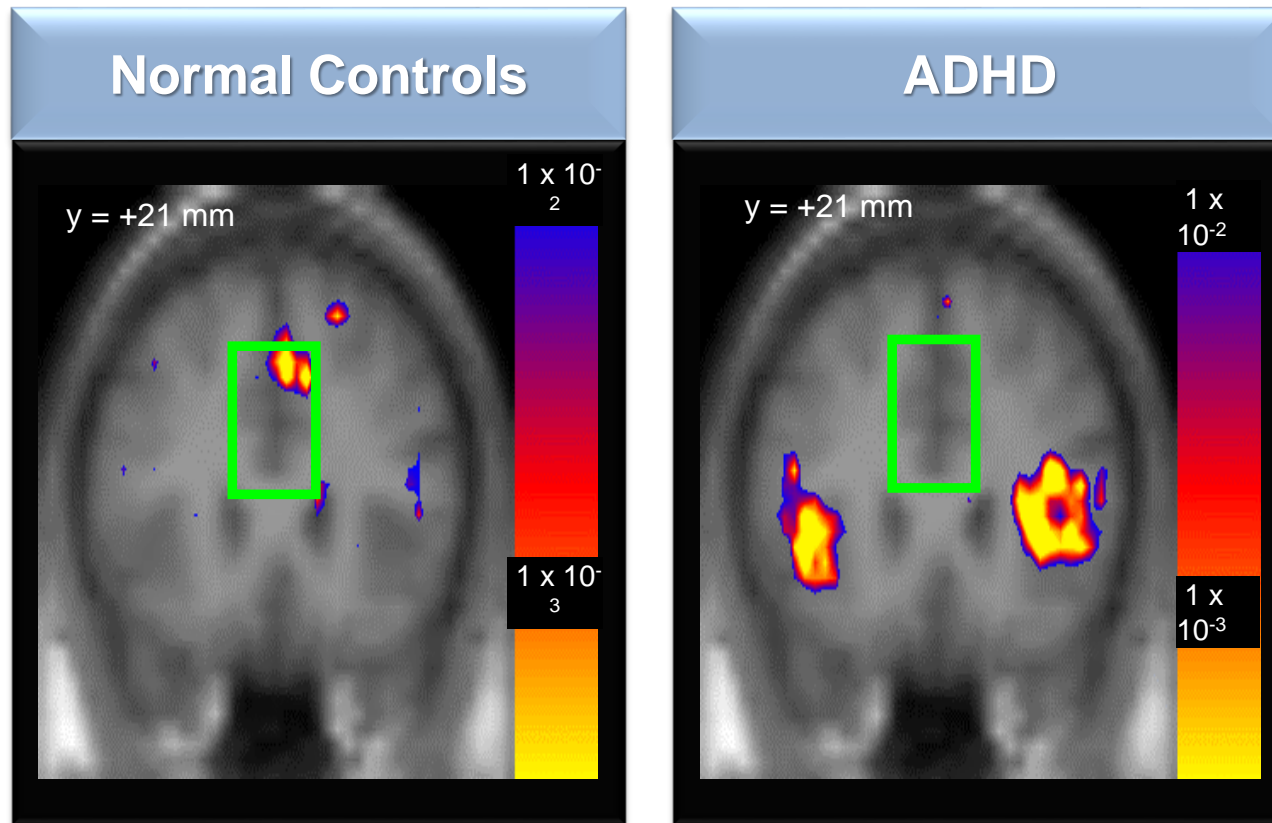
Hemminki K, Mutanen P. Mutat Res. 2001 Jan;473(1):11-21; Palmer LJ *et al.* Eur Respir J. 2001 Apr;17(4):696-702.

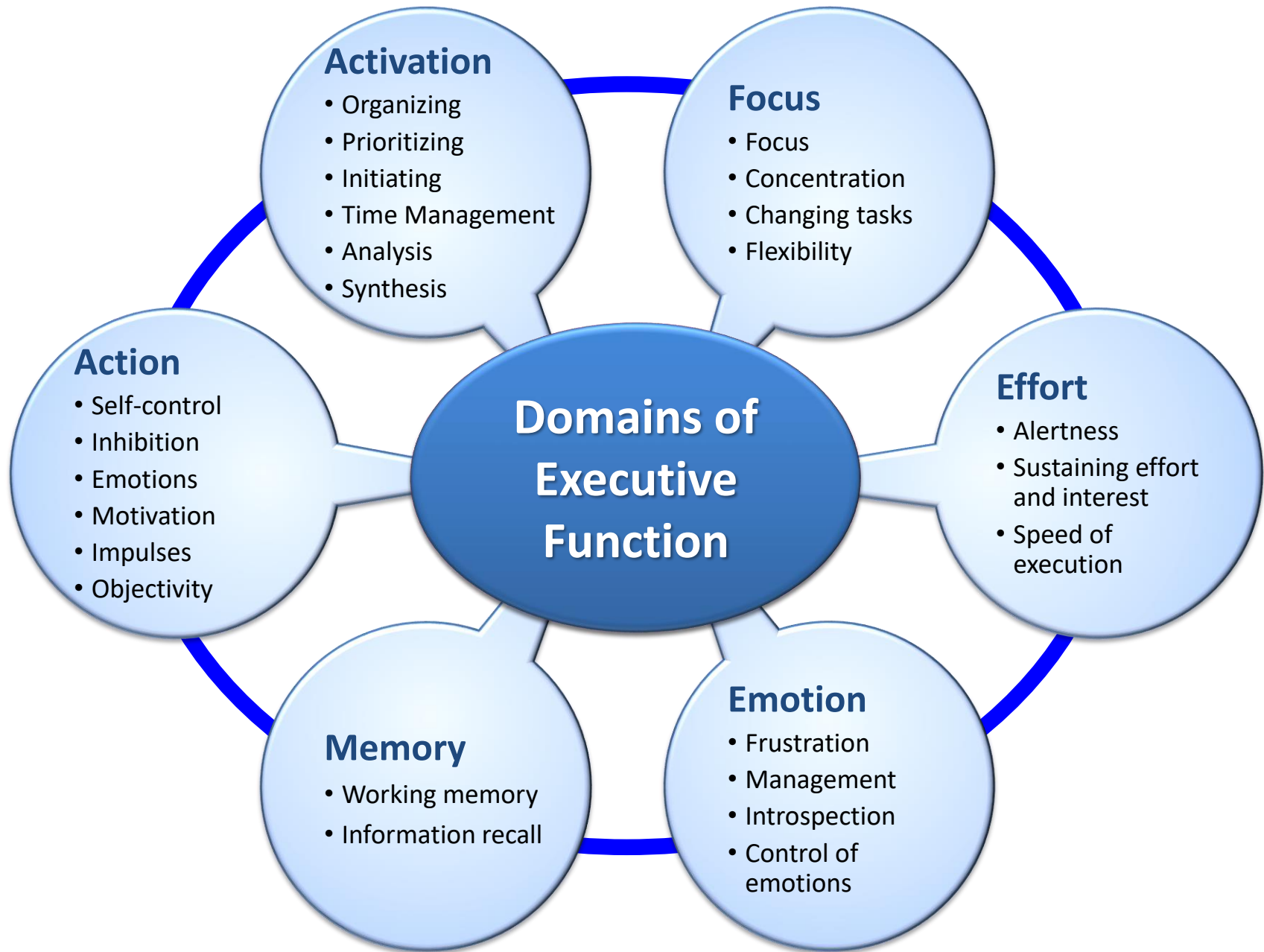
Regions of the Brain Involved in Executive Functioning



1. MacDonald et al. Science 2000;288:1835-8.
2. Kennerley et al. Nature Neuroscience 2006;9:940-7.
3. Gao et al. Science 1996;272:545-7.
4. Rapoport et al. J Neuropsychiatry Clin Neurosci 2000;12:193-8.
5. Tremols et al. Psychiatry Res 2008;163:270-8.
6. Rubia et al, Am J Psychiatry 2009;166:83-94.
7. Wolf et al. Hum Brain Mapp 2008.

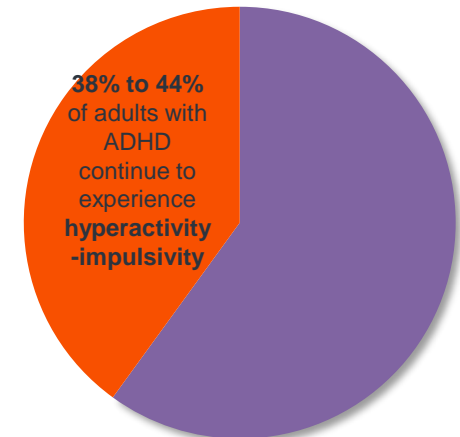
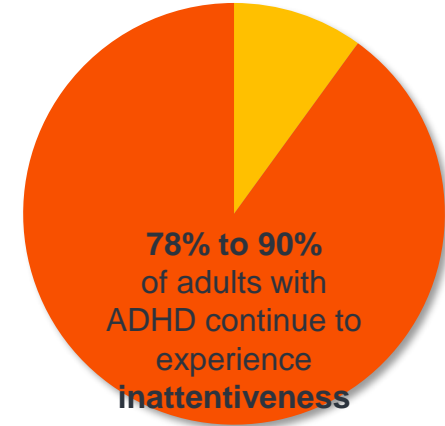
Anterior Cingulate Cognitive Division Is Not Activated in ADHD





ADHD Presentation Can Differ in Adults Compared to Children

- In DSM-5, subtypes have been replaced by specifiers of current presentation (placing emphasis on current symptom profile rather than longitudinally stable subtypes)
- ADHD presentation specifiers:
 - Predominantly inattentive presentation
 - Predominantly hyperactive-impulsive presentation
 - Combined presentation (exhibits both inattentive and hyperactive/impulsive symptoms)
- As patients with pediatric ADHD mature, some attenuation of ADHD severity is common



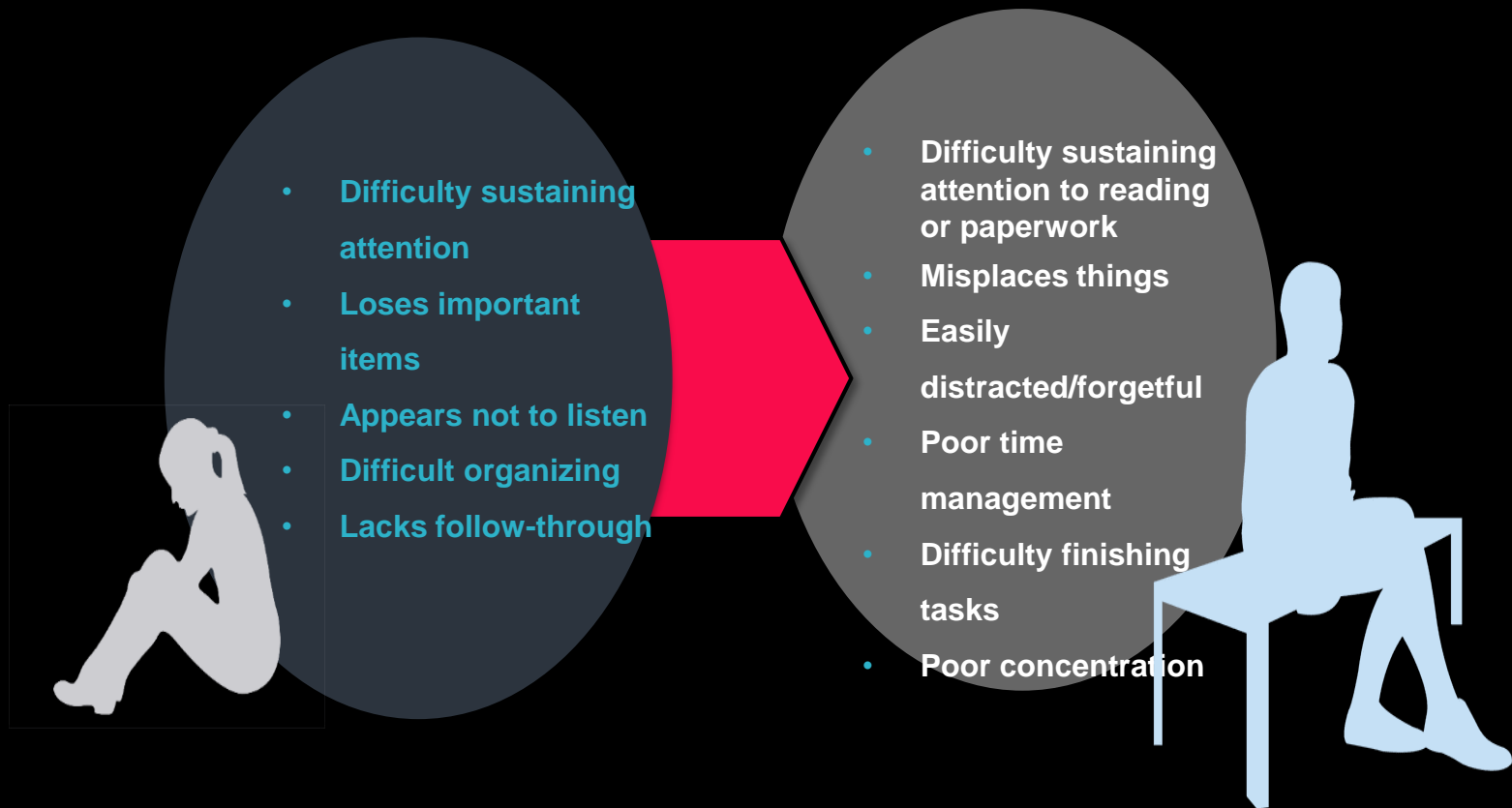
Adult ADHD: DSM-5 Criteria

- 5/9 symptoms from inattention and/or hyperactivity and impulsivity criteria present for 6 months
- In addition, the following conditions must be met:
 - Several symptoms present before age 12 years
 - Several symptoms present in 2 or more setting, (e.g., at home, school or work; with friends or relatives; in other activities)
 - Symptoms interfere with or reduce the quality of, social, school, or work functioning
 - Symptoms must not be better explained by schizophrenia/psychotic disorder or another mental disorder

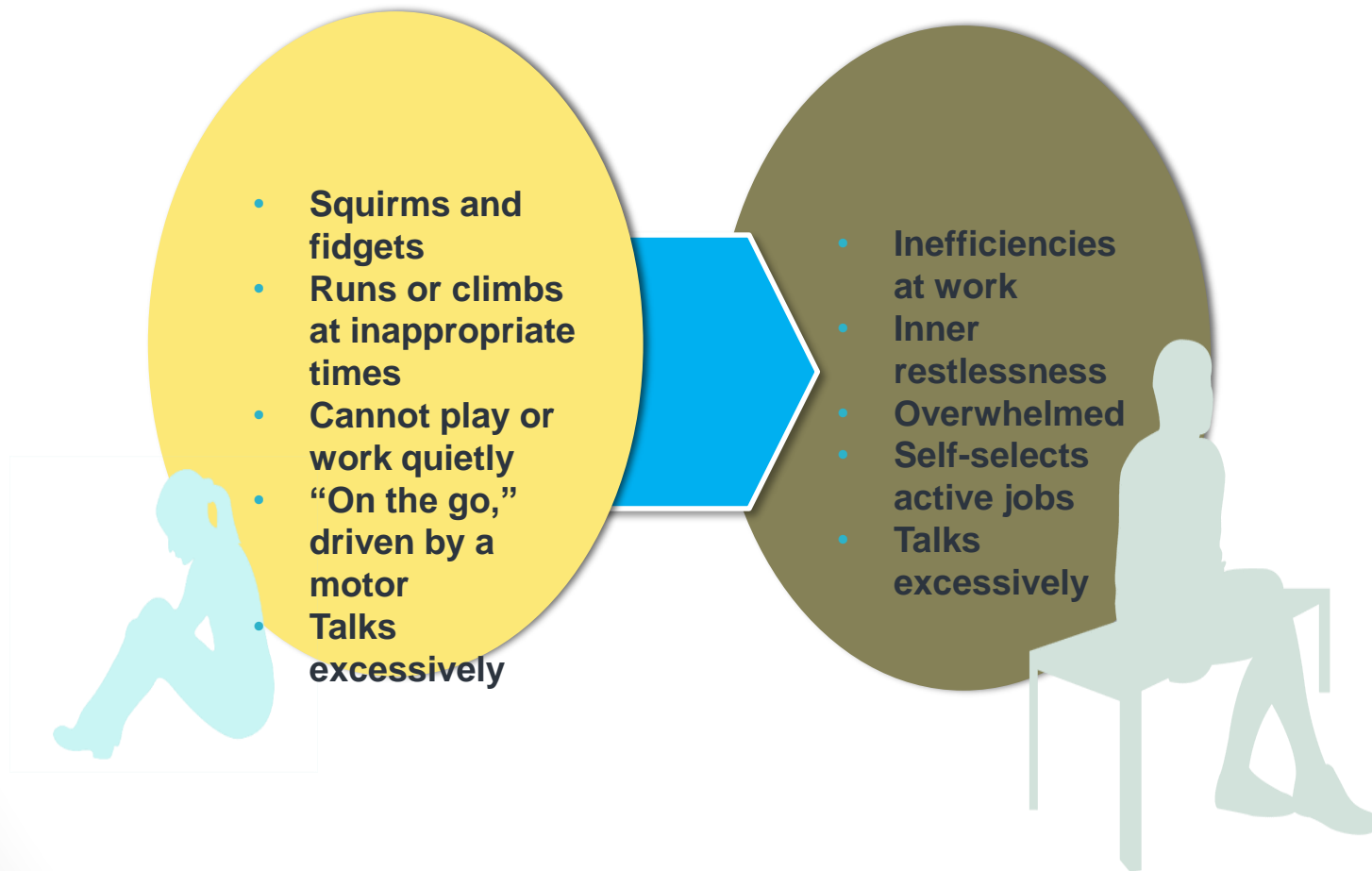
A person with ADHD can now have mild, moderate or severe ADHD

Care Beyond Childhood - DSM-5 makes a special effort to address adults affected by ADHD to ensure that they are able to get care when needed

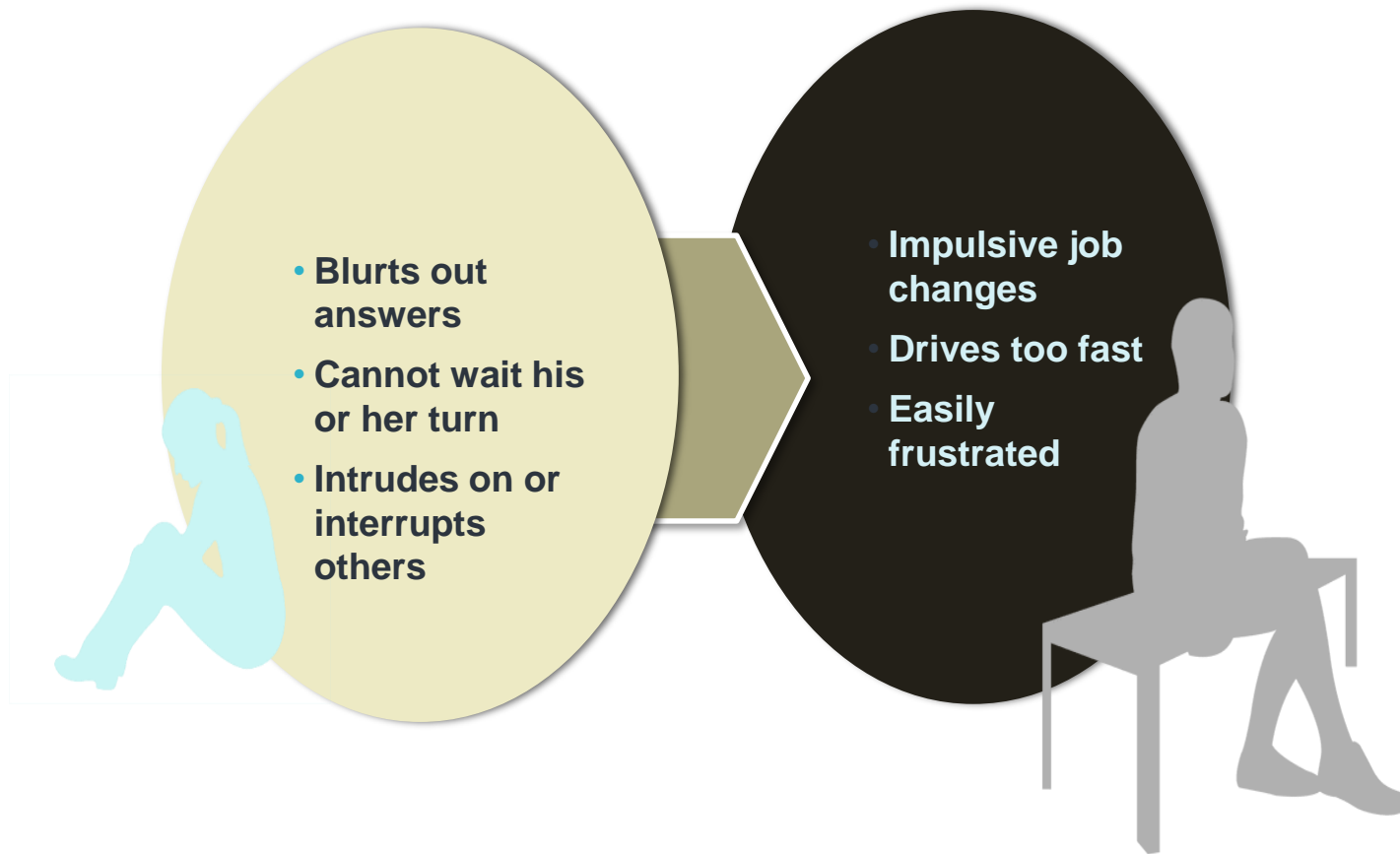
PEDIATRIC TO ADULT SYMPTOM EVOLUTION: INATTENTION



Pediatric to Adult Symptom Evolution: HYPERACTIVITY



Pediatric to Adult Symptom Evolution: IMPULSIVITY



Patients With ADHD Are at Increased Risk

PHYSIOPATHOLOGY

85%

of adults with ADHD meet criteria for a comorbid condition

DRIVING

2–4x

more motor vehicle crashes than non-ADHD population

EDUCATION

~32–38%

adolescents never complete high school education

RELATIONSHIPS

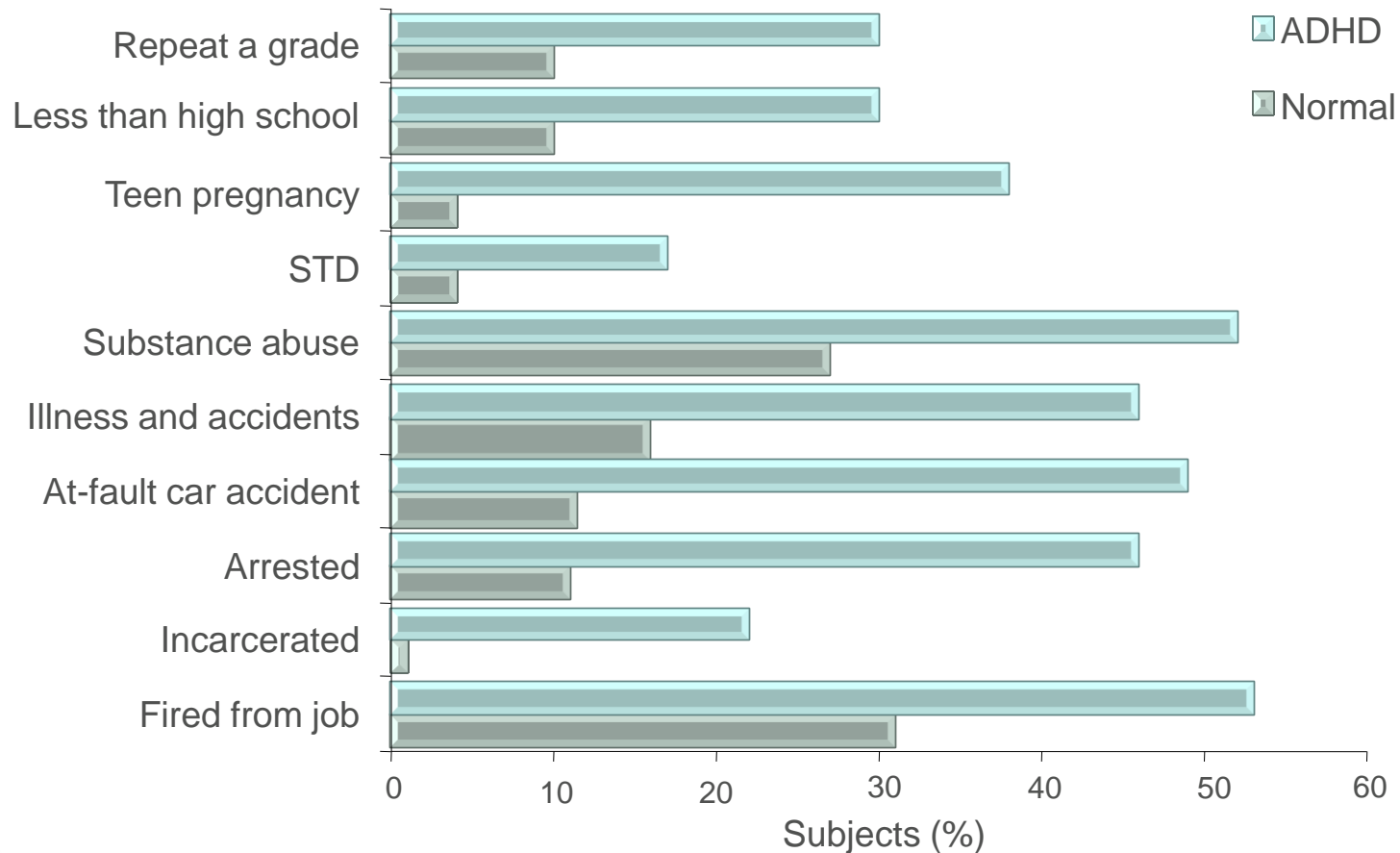
↑
long-standing interpersonal problems and strained marital relations

OCCUPATION

13

missed days of work per year, on average

Potential Consequences of Impairments in Executive Functioning



STD = sexually transmitted diseases

Note: These data are primarily from longitudinal, naturalistic follow-up studies, and outcomes were not assessed according to treatment status.

Red Flags for Adult ADHD

Discussion – When to screen?

- Childhood history or first degree relative
- Multiple failed drug trials in MDD with residual symptoms
 - *E.g. was there a history of focus or attention issues before the depression*
- Low self-esteem; feelings of worthlessness
 - *E.g. feeling of being a failure, sense of I should have been able to do better, I was smarter than I performed*
- Substance Abuse - especially alcohol, marijuana, caffeine
 - *E.g. use of really large amounts of caffeine “need the stimulation”*

Red Flags for Adult ADHD

Discussion – When to screen?

- Difficulty sustaining attention
 - *E.g. mixing up/forget instructions for medication, forget critical information until later in the visit, terrible historians, answers are off topic/convoluted/provides way too much information*
- History of disruptive or impulsive behaviour
 - *E.g. bankruptcy, dating the bad boys and girls, affairs, gambling,*
- Interpersonal relationship difficulties
 - *E.g. frequent partner changes, multiple failed relationships, antisocial, divorce, sibling fights*
- Talkative, loud, interrupts frequently or inappropriately
 - *E.g. rude to your staff, impatient in your office*

Red Flags for Adult ADHD

Discussion – When to screen?

- Organizational skill deficits
 - *E.g. missed appointments, frequently late, unfinished projects, procrastination, issues noted by family/boss*
 - *Depressed people complain about messing up a lot, but others don't see it as that bad, in ADHD, its the opposite, whatever they think they are doing wrong, the family and bosses think it's even worse*
- Consistent inconsistency
 - *E.g. Relationships, jobs, goals*
- Erratic work history
 - *E.g. multiple job changes, several jobs in the last few years*
- Poor driving record
 - *E.g. frequent driving/parking tickets, high number of accidents, have difficulty staying focused when others are in the car, difficulty maintaining a steady speed*

Comorbidities in ADHD: this is where it gets complicated

- Other psychiatric conditions can
- Mimic ADHD
- Overlie and Obscure ADHD
- Complicate ADHD
- A number of medical disorders can present with symptoms that look very much like ADHD and require similar treatment (secondary ADHD)
- The clinician needs to be able to diagnose other relevant conditions with ADHD
- Recognize when ADHD is hidden beneath the surface
- Determine which condition to treat first
- (for an excellent review see Katzman, Bilkey et al, BMC Psychiatry:2017; 17:302. Adult ADHD and Comorbid Disorders

Considering Comorbidities

- **50% to 90% of children and 85% of adults with ADHD have at least one comorbid condition**
- In most cases, ADHD does not exist in isolation. Evaluation requires screening for possible comorbid disorders and consideration of biological, social, and psychological factors

What percentage of your adult ADHD patients have a comorbid disorder?

NATIONAL COMORBIDITY SURVEY

Rate of
comorbid disorders within the previous 12
months

Major
Depression

Bipolar
Disorder

Chronic
Dysthymia

Any
Anxiety
Disorder

ADHD 9.4% ADHD 21.2% ADHD 22.6% ADHD 9.5%

Case1: Richard

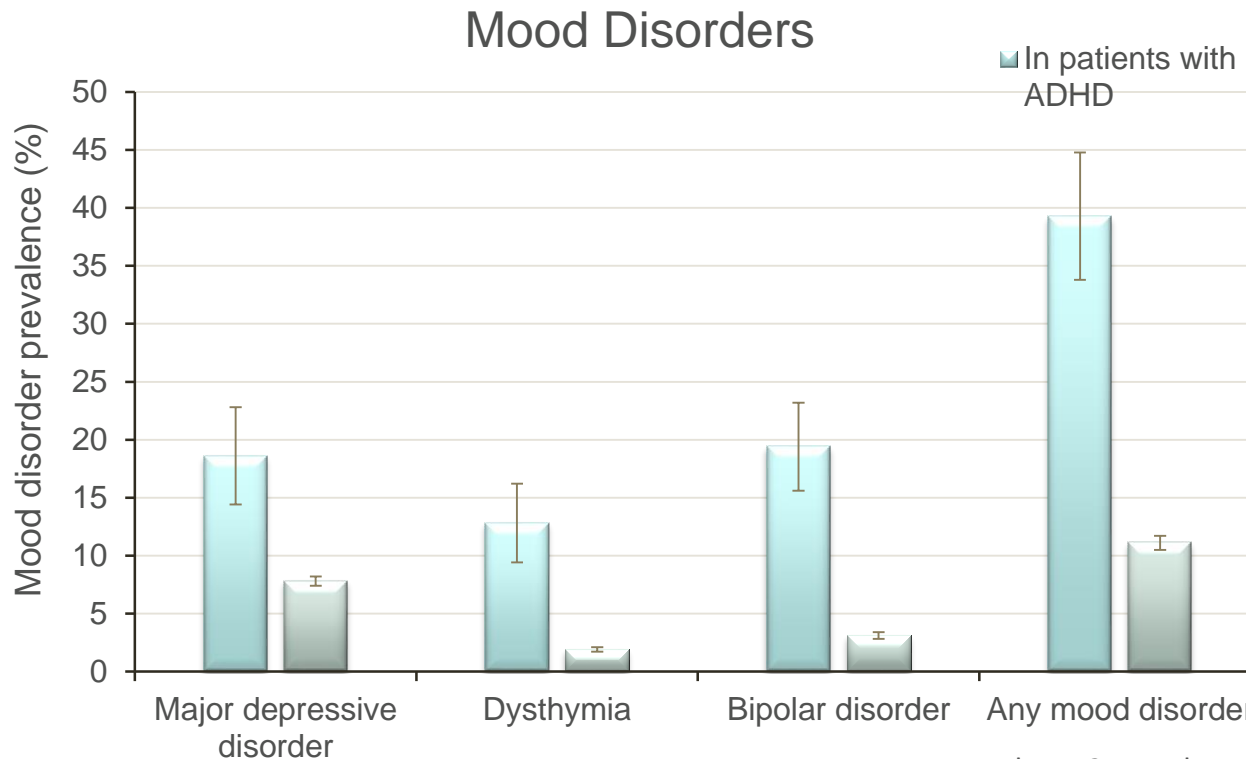
- 26 year old single male working FT in IT
- Presents with an 8-10 year history of severe social anxiety and chronic MDD diagnosed and managed by two previous psychiatrists
- Has already failed several SSRI, 2 SNRI and a tricyclic antidepressant; tends to feel flat, numb, less able to think clearly and more socially anxious with most treatments
- Trial of Parnate the MAOI ineffective
- CBT focusing on social anxiety “not helpful”
- Cautious trial of bupropion did not worsen anxiety; actually felt a little less depressed with modest improvement in functionality
- Retaking of the history: long history of inattentiveness which led to embarrassing social episodes and a shattering of self confidence in adolescence; did average in school despite high intellect, did reasonably well in college but seemed to work twice as hard as other students

Case1: Richard (continued)

- PHQ-9 14; GAD-7 18 and ASRS v1.1 4/6 positive
- On mental status presents as sad, scattered, shy, lacking confidence, poor eye contact, not suicidal.
- What are the most relevant diagnoses here? What else would you like to know?
- What would you focus on in treatment? He is currently on 300 mg of Wellbutrin XL

Comorbidity of Adult ADHD and Other Disorders is Bidirectional

Patients with adult ADHD often present with several comorbid psychiatric disorders



Based on 12-month prevalence results of the National Comorbidity Survey (n = 3,199 adults, age 18–44).

Adults with ADHD may look like they have a mood disorder when they do not

- Patients with ADHD often deal with failure and may become demoralized, depressed or dysthymic
- Lack of motivation may mimic anhedonia
- Chronic sleep problems and restlessness may mimic insomnia secondary to depression

Presentation of ADHD vs. Depression

ADHD

- Childhood onset
- Affective instability (with rapid recovery)
- Baseline is hyperactive (in boys)
- Enthusiasm for select activities
- Demoralized during life transitions
- Talkativeness
- Concentration (poor vs. selective)
- Difficulty getting to bed, initial insomnia

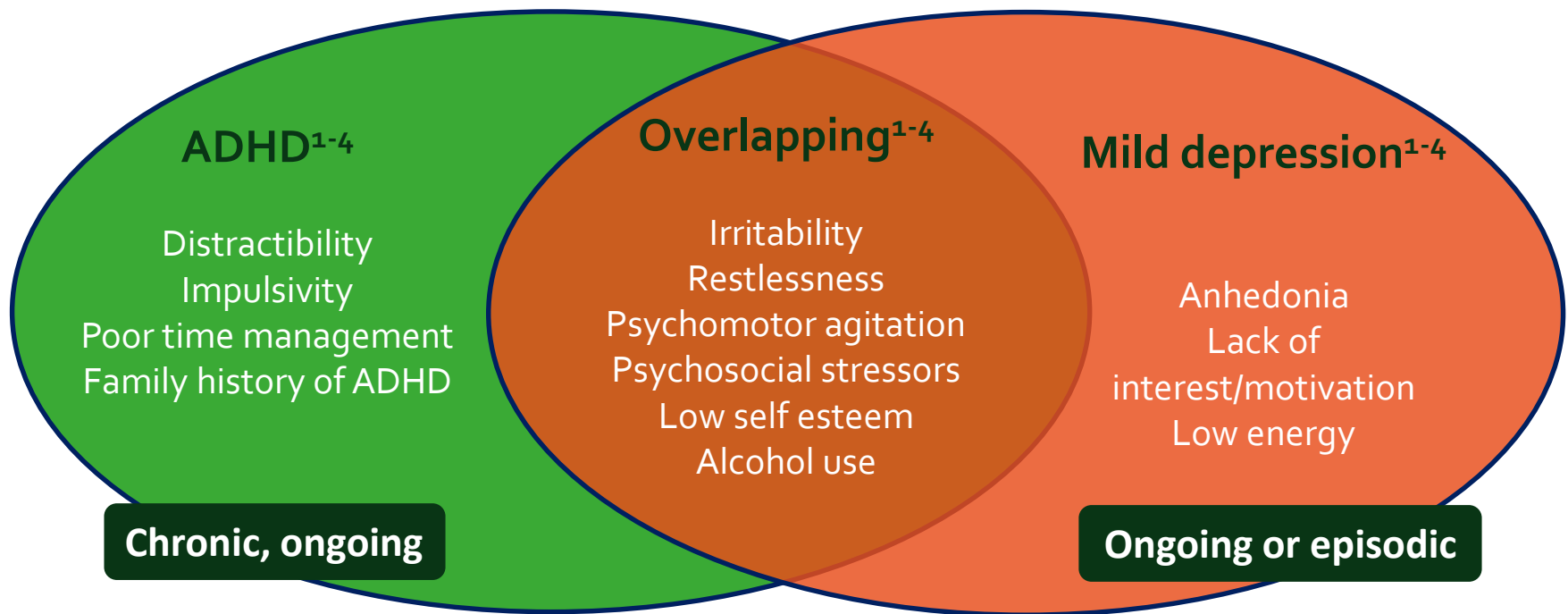
Onset during childhood

Depression

- Episodic
- Anhedonia, consistent low mood (for at least 2 weeks)
- Low energy
- Melancholia/anhedonia
- Worthlessness
- Little spontaneity
- Weight loss/gain
- Suicidality
- Insomnia

Usually occurs in late 20s

Step 4 – Unique vs. overlapping signs and symptoms



1. Kooij et al. *BMC Psychiatry* 2010;10:67 ;
2. CADDRA Practice Guidelines, 3rd Ed. <https://caddra.ca/pdfs/caddraGuidelines2011.pdf>;
3. Mao AR, Findling RL. *Postgrad Med* 2014; 126: 42-51;
4. Babcock et al. *Postgrad Med* 2009;121:73-82.

Medical treatment of ADHD and comorbid depression

- Determine whether the patient is depressed secondary to ADHD or vice versa
- Treat the “primary” (i.e. more severe, disabling and pervasive) condition first
 - Usually moderate or severe depression is treated first
 - If mild or persistent depression with ADHD, treat ADHD first as this may ameliorate dysphoria
 - Once stabilized, treat the other condition
- Assess for suicide risk at each follow-up visit

1. CADDRA Practice Guidelines, 3rd Ed. <https://caddra.ca/pdfs/caddraGuidelines2011.pdf>;

2. Mao AR, Findling RL. *Postgrad Med* 2014; 126: 42-51

Medications in patients with comorbid ADHD and depression

- SSRIs will often produce only a partial response in depression when ADHD is present¹
 - 1/3 of patients referred for resistant depression may have ADHD²
- Stimulants may be less effective for treatment of ADHD in patients with comorbid depression¹
 - Stimulants may also produce a dysphoric look in 30% of patients even in absence of depression
 - Dose adjustment may improve dysphoria
 - If dysphoria persists, try switching ADHD medication

1. CADDRA Practice Guidelines, 3rd Ed. <https://caddra.ca/pdfs/caddraGuidelines2011.pdf>

2. Sernat T et al. World Congress ADHD 2016 (Poster P-07).

Canadian recommendations for treatment of ADHD in adults with comorbid stable MDD

FIRST LINE

Bupropion*, antidepressant* + long-acting stimulant, antidepressant* + CBT

SECOND LINE

Desipramine*, nortriptyline*, venlafaxine*

THIRD LINE

Antidepressant* + short-acting stimulant, antidepressant* + atomoxetine, antidepressant* + lisdexamfetamine

* These treatments are not indicated for the treatment of ADHD; as such, they should be considered off-label use. Order of agents listed within a line of treatment is not based on any differences in efficacy.

ADHD: attention-deficit/hyperactivity disorder;
CBT: cognitive-behavioural therapy.

CANMAT Task Force Recommendations. *Ann Clin Psychiatry* 2012;24:23-37.

Presentation of ADHD vs. Anxiety

ADHD

- Childhood onset
- Specific worries e.g. being late, forgetting, losing things
- Restless
- Irritable
- Perseveration
- Feeling overwhelmed
- Novelty seeking

Anxiety

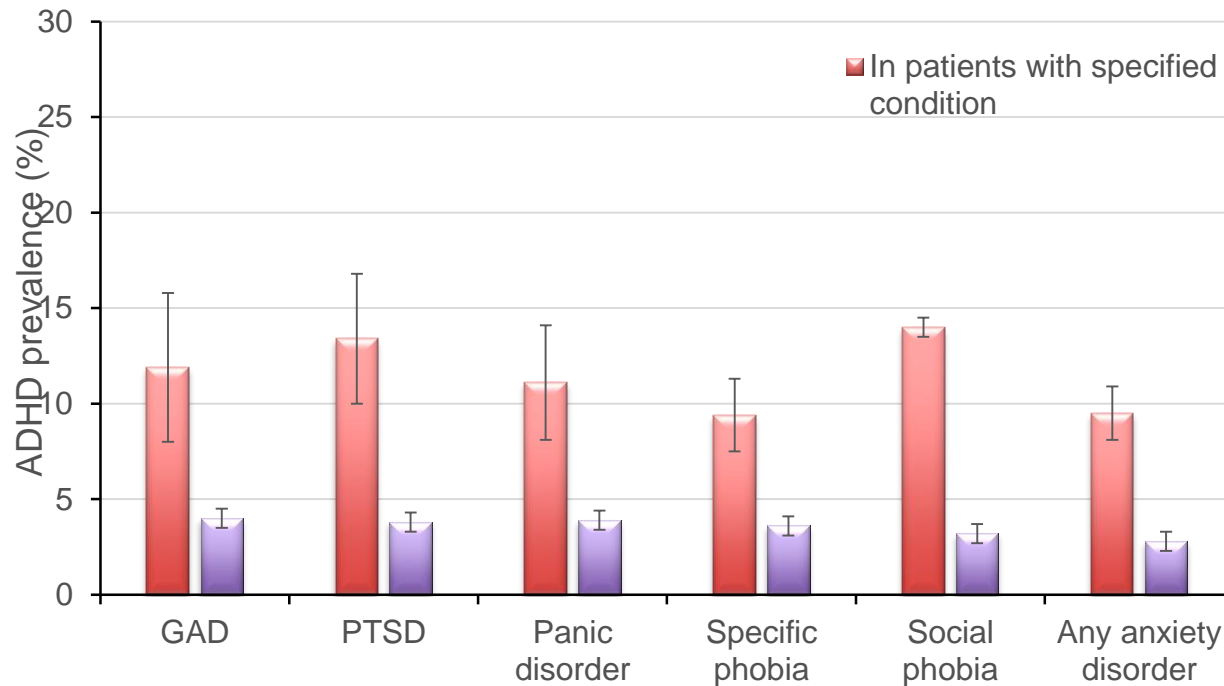
- Childhood onset
- Excessive general worry causing physical symptoms
- Fear of being judged
- Panic attacks with fear of recurrence
- Repetitive, intrusive thoughts
- Compulsive behaviours to relieve anxiety
- History of trauma with flashbacks, hyperarousal and avoidance
- Avoids new/unknown situations

Comorbidity of Adult ADHD and Other Disorders is Bidirectional

Patients with other psychiatric disorders often present

with adult ADHD as a comorbid diagnosis

Anxiety Disorders



Based on 12-month prevalence results of the National Comorbidity Survey (n = 3,199 adults, age 18–44).

Kessler RC, et al. *Am J Psychiatry* 2006;163:716

Prevalence and burden of ADHD and anxiety

- Up to 50% of adults with ADHD have a history of anxiety disorders¹
- Anxiety symptoms are more severe and have an earlier onset in individuals with ADHD²
- ADHD is often diagnosed later in patients with anxiety³
 - Presence of anxiety may inhibit impulsivity
- Substance abuse disorders are common²

1. Kessler RC, et al. *Am J Psychiatry* 2006; 163: 716-23;
2. Mancini C, et al. *Psychol Med* 1999; 29: 515-25
3. Schatz DB, Rostain AL. *J Atten Disord* 2006; 10: 141-9.

Course of ADHD and anxiety

- Anxiety may be a natural extension of ADHD as symptoms tend to be internalized over time
- Inattentive ADHD has a stronger link to anxiety than other types, especially in females who are highly sensitive
- Anxiety may arise as a compensation to repeated and negative external stimuli
- Once anxiety develops, attention can be further compromised leading to low self-esteem

Is it ADHD or anxiety?

- Problems concentrating and restlessness may be caused by a primary anxiety disorder and not by ADHD
 - Check for other signs of anxiety and family history of anxiety
- Evaluate for ADHD symptoms not typical of anxiety
 - E.g. stimulus-seeking behaviour, disinhibition, difficulty with organization and time management
- Determine if symptoms developed *de novo* as a result of new onset anxiety or a particular stressor

Case 2: Meagan

- 27 yr old single woman seen in UCC
- Recent visit to ED after an OD following a relationship breakup and episode of binge-drinking with friends
- History of intense chaotic relationships, destabilization with break ups, problems with managing anger, intermittent suicidality
- Difficulty finding and keeping work
- Mood swings some of which were untriggered and unrelated to life events, highs lasting days and low periods up to a few months

Case 2: Meagan con't

- Longstanding low self esteem, early adopter of alcohol and substances in the context of academic difficulties and behavioral problems as a child; pregnant at 17, 2 children by age 22
- Hx of learning disability and severe problems with inattention; frequently called to office for behaviour including fighting
- No childhood trauma; sexual assaults x2 as a teen
- Family history of substance abuse, criminality and Bipolar Disorder

Meagan con't

- What are the diagnostic possibilities?
- How would you manage Meagan from a pharmacologic and non pharmacologic point of view?

Presentation of ADHD vs. Bipolar Mood Disorder

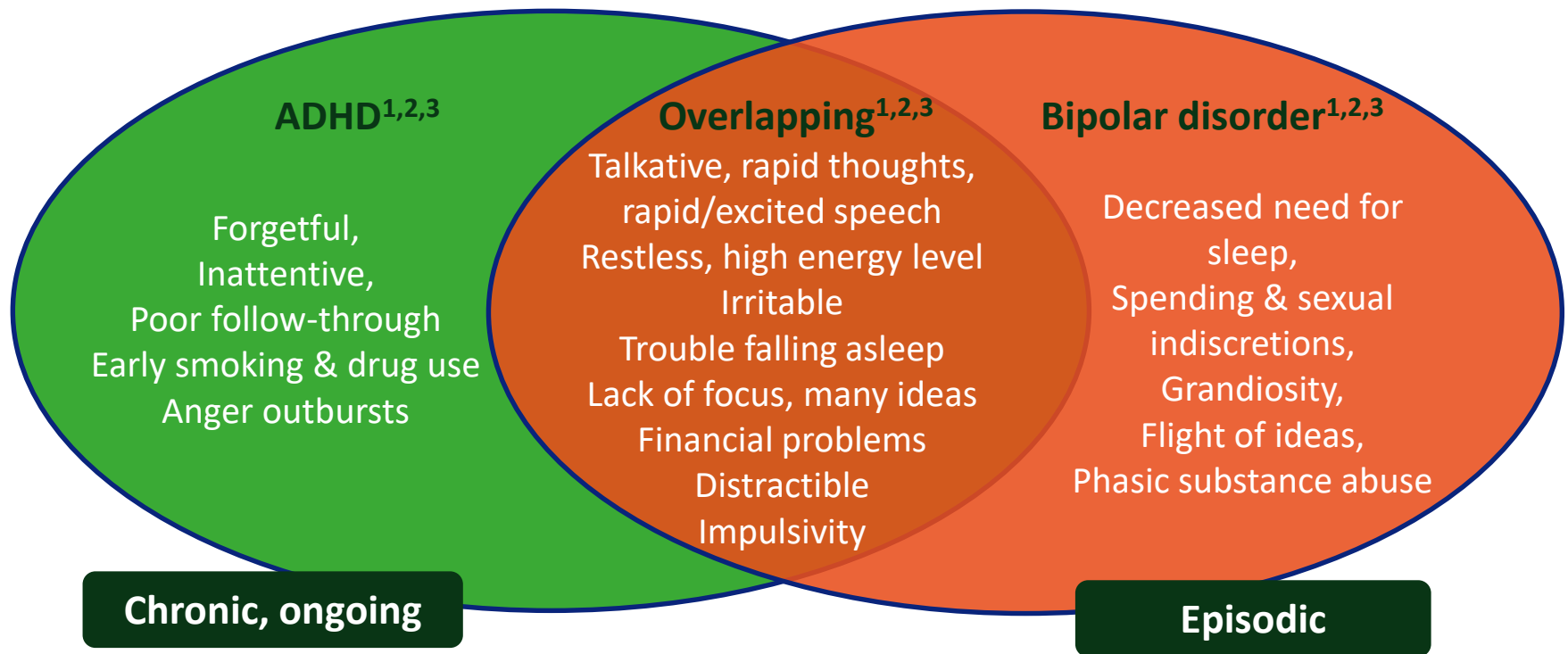
ADHD

- Constant
- Childhood onset
- Reactive mood
- Initial insomnia
- Scattered thoughts
- Low self-esteem
- Impulsivity (chronic)
- Family history of ADHD

Bipolar Disorder

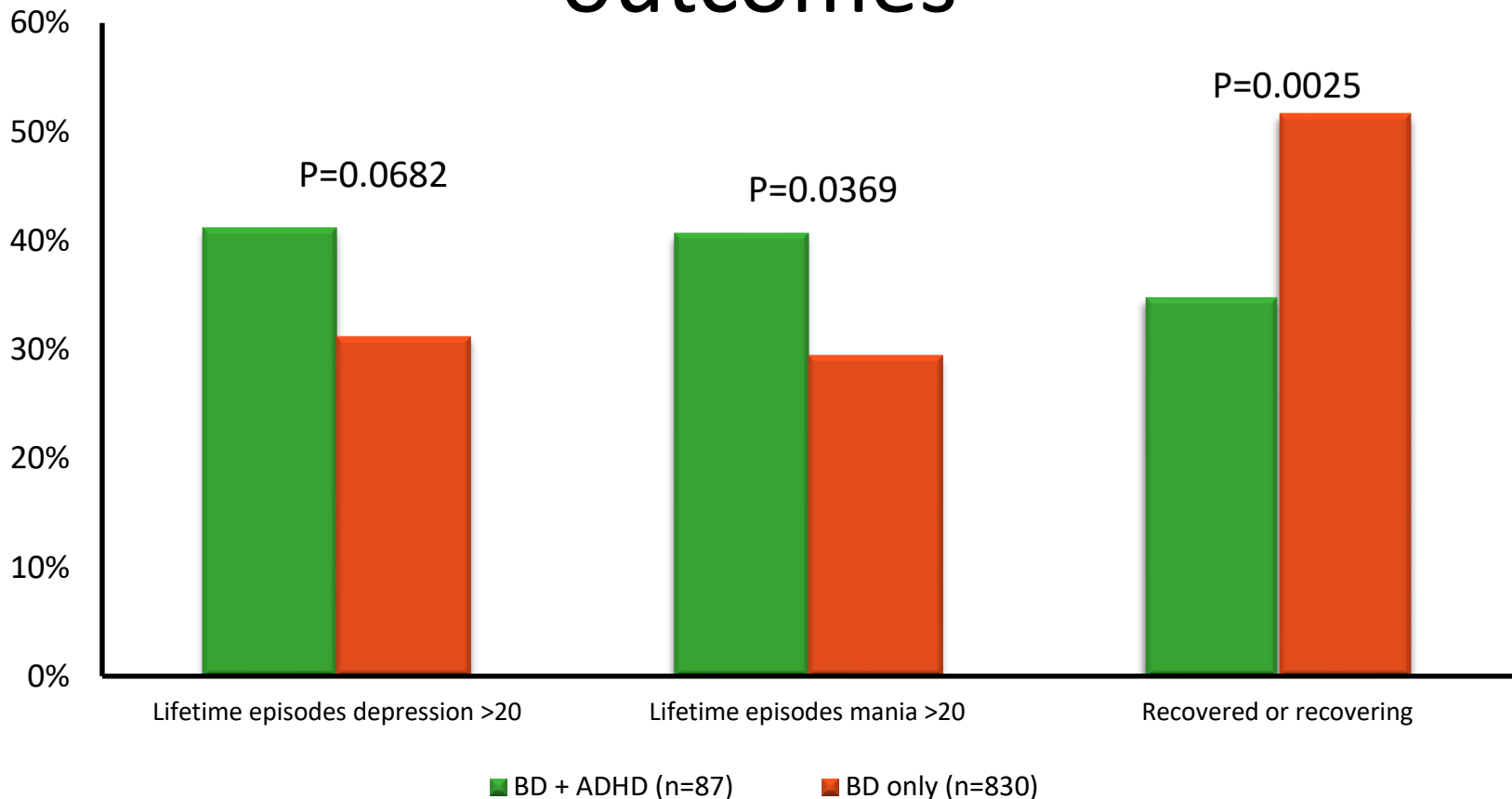
- Cyclic
- Early or late onset
- Non-reactive mood
- Increased energy, decreased need for sleep
- Racing thoughts
- Grandiosity (Type I)
- Impulsivity (transient)
- Family history of bipolar affective disorder

Step 4 – Unique vs. overlapping signs and symptoms



1. Klassen et al. *J Affective Disorders*. 2010; 124:1-8
2. Kooij et al. *BMC Psychiatry* 2010;10:67 ;
3. CADDRA Practice Guidelines, 3rd Ed. <https://caddra.ca/pdfs/caddraGuidelines2011.pdf> ;
4. Mao AR, Findling RL. *Postgrad Med* 2014; 126: 42-51.

Patients with comorbid bipolar disorder and ADHD have poorer outcomes



Analysis of the first 1000 patients enrolled in STEP-BD: overall prevalence of ADHD was 9.5%.

ADHD: attention deficit/hyperactivity disorder; BD: bipolar disorder.

Nierenberg et al. *Biol Psychiatry* 2005;57:1467-73.

ADHD and Borderline Personality Disorder

- Overlapping features:
 - both are chronic and enduring
 - Impulsivity and risk taking behaviours
 - problems with anger control/affective dysregulation
 - Low self esteem
 - Difficulties with future planning
- Differentiating features
 - Interpersonal sensitivity
 - Abandonment anxiety
 - Intolerance of aloneness in Borderline PD
 - Identity disturbance
 - Idealization/devaluation
 - Suicidality
 - Feelings of emptiness
 - Micropsychotic episodes
- Centrality of inattentiveness in ADHD

(Phillipson et al, 2006; Asherson et al, 2014)

Medical treatment of comorbid bipolar disorder and ADHD

- Treat bipolar disorder first
 - Use 1st-line treatments for acute mania and maintenance of stability
 - CANMAT guidelines: lithium valproate, atypical antipsychotics
- Treatment of ADHD can be offered when BD is stabilized
 - Preferably with a long-acting stimulant

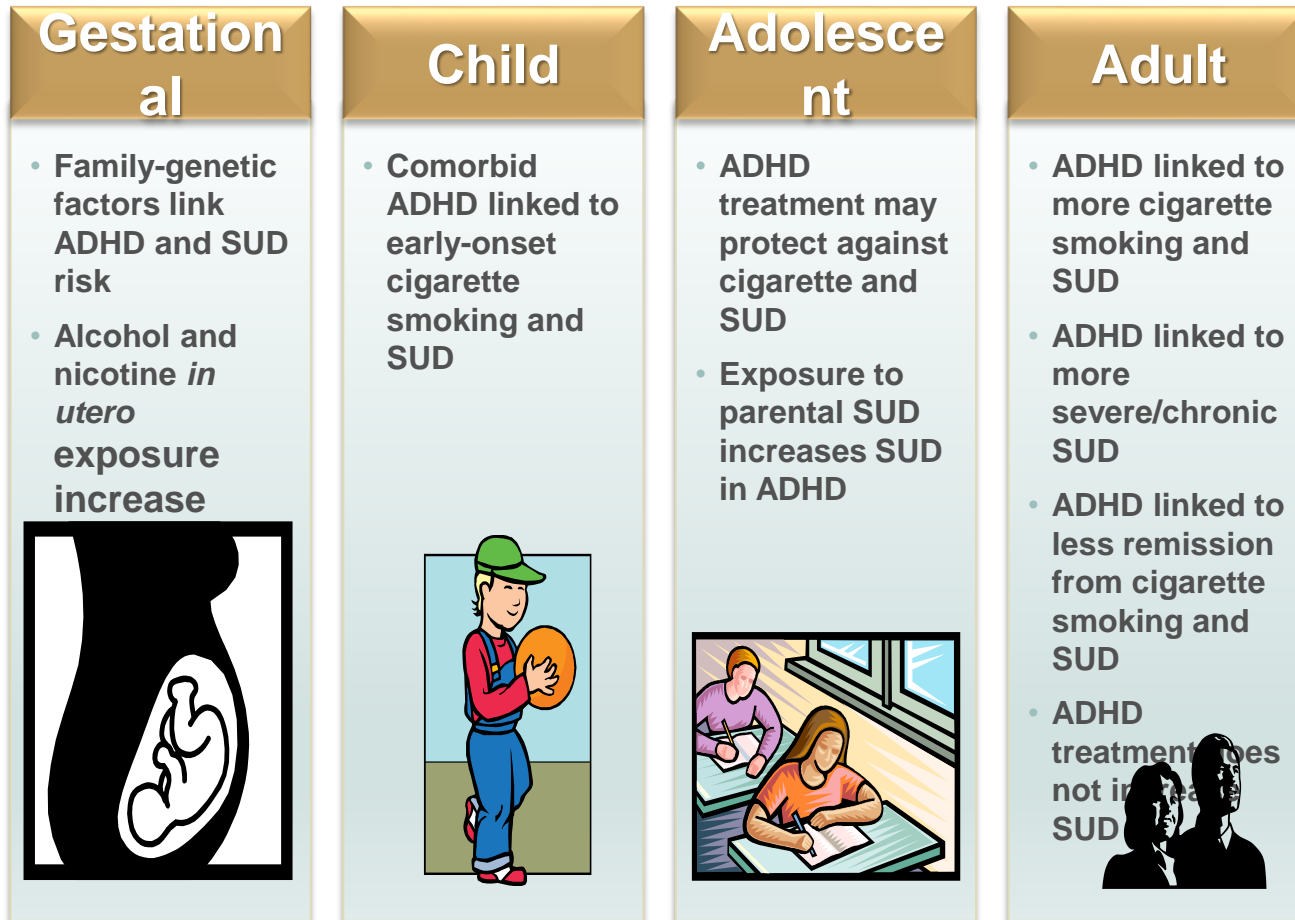
Tips for using ADHD medications in patients with comorbid bipolar disorder

- “Start low, go slow” until a therapeutic dose is reached
 - Weekly contact during titration phase
 - Schedule follow-up visits every 2-3 weeks during titration period to check response, side effects, functioning
- If patient switches from euthymia to mania/hypomania on stimulant medication:
 - Withdraw the stimulant
 - Treat the bipolar symptoms
 - Once mood stabilizes, cautiously restart the stimulant

What about treating ADHD and Borderline PD?

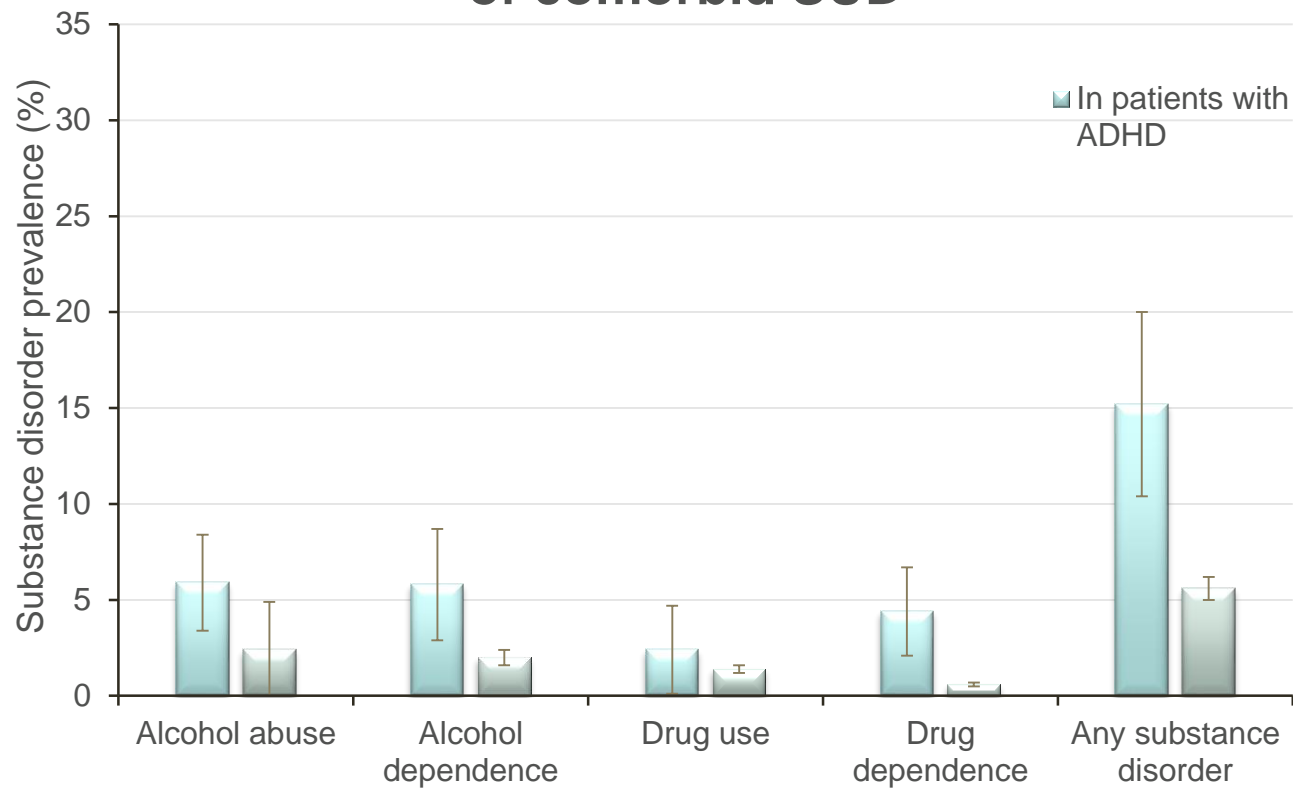
- Treat ADHD first because of ease, rapidity and effectiveness; impulsivity and capacity for problem solving under stress may improve
- No clear cut medication that works in BPD
- Dialectical Behavior Therapy is the treatment of choice; medication play a secondary role

Developmental Relationship Between ADHD and Substance Abuse

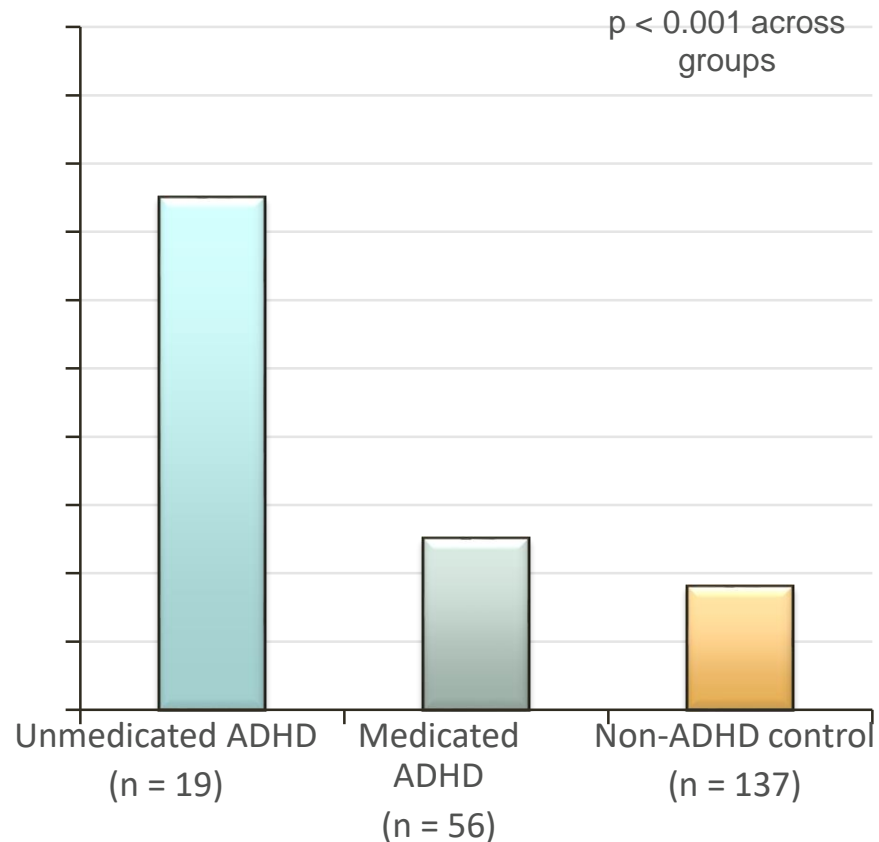


Comorbidity of ADHD and SUD

Patients with adult ADHD have a greater incidence of comorbid SUD



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



ADHD and Substance Abuse

- Legal products
 - Tobacco:
 - 1.7 times higher risk of smoking
 - Start smoking at early age
 - Coffee and colas
 - Alcohol
- Drugs
 - More frequent cannabis use
 - Cocaine, stimulants
 - Hallucinogens



Treatment with psychostimulants does not increase risk of drug dependence. In fact, treating ADHD could reduce risk of substance abuse.

Impact on Practice

- Treating ADHD may help protect against the onset of cigarette smoking, SUD, and SUD-related criminality in adolescent and young adulthood
- Substance abusing individuals with ADHD may require treatment of both the SUD and the ADHD
- Because stimulants can be misused, extended-release stimulants in high-risk individuals may be preferred
- (Crunelle et al, 2018)

Case 3: Sheila

- 53 yr old married woman with history of Hodgkin's lymphoma which relapsed after standard R-CHOP chemotherapy. She was treated with an autologous stem cell transplant and high dose chemotherapy.
- Referred to Psychosocial Oncology several months after transplant, in complete remission but with moderate symptoms of depression, some recurrence anxieties and prominent cognitive complaints out of keeping with the level of depression
- No psychiatric history including depression or ADHD as a child
- Trouble with memory, forgetfulness, distractibility, difficulty making decisions
- She kept losing her keys, forgetting what she was doing next, mixing up appointments, unable to plan a dinner party like before her transplant or organize her closet
- ?What's wrong with Sheila? What can we do about it?

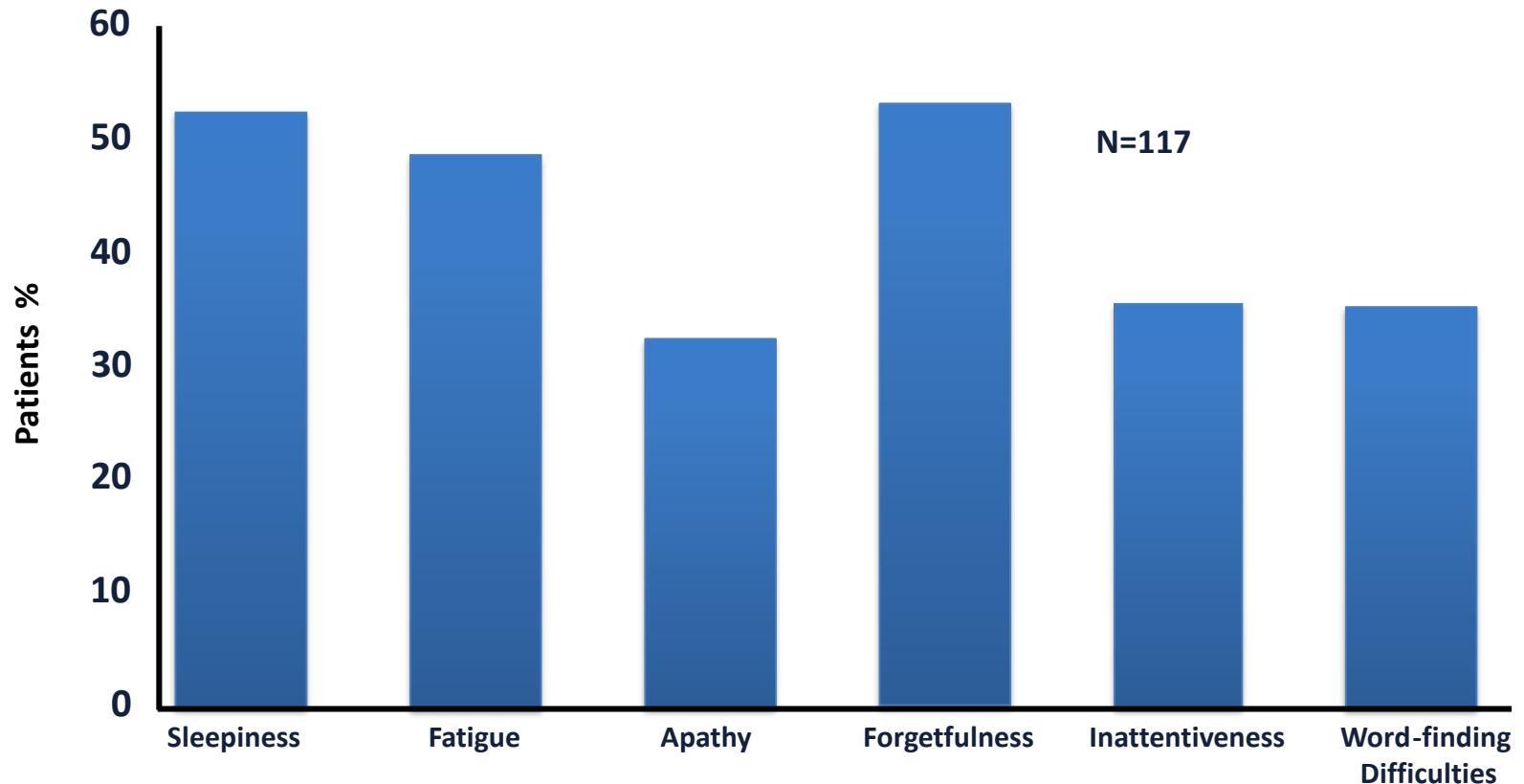
Secondary ADHD

- Head injury (repeated concussions, motor vehicle accidents)
- Neurological disorders (brain tumours, stroke, multiple sclerosis, HIV encephalopathy)
- Cancer- related brain fog
- Palliative care: depression in advanced cancer and hypoactive delirium (target symptoms may be fatigue, somnolence, lowered alertness)
- The residual cognitive and executive dysfunction seen in TRD (CANMAT puts stimulants as level 3 augmentation strategy)
- Evidence base for using stimulants is very weak, but there is a long clinical tradition supplemented by case reports, uncontrolled trials and a limited number of controlled trials, some with mixed results in the above mentioned conditions

(Sinita et al, 2014; Chan et al, 2015; Roy et al 2016; Ebede et al, 2017; McIntyre et al 2017)

Residual Cognitive Symptoms in MDD

**Patients with partial or full remission after 3 months of treatment:
Patients (%) reporting cognitive and physical impairment**



- Cognitive impairment ranged from 30% to 50% of patients
- Symptoms may have been residual, adverse events or a combination

Midlife ADHD in Women: Is Menopause A Window of Vulnerability?

- There are gender differences in the predominant subtype of ADHD¹
 - Females → Inattentive
 - Males → Hyperactive/impulsive
- Although ADHD is diagnosed in twice as many boys as girls, in midlife, more women than men self-report a diagnosis of ADHD²
- Some women report cognitive difficulties emerging in midlife that strongly resemble cognitive impairments in adults with ADHD³
- Could menopause (or the related estrogen changes) have any effect or interaction with ADHD symptomatology? ³

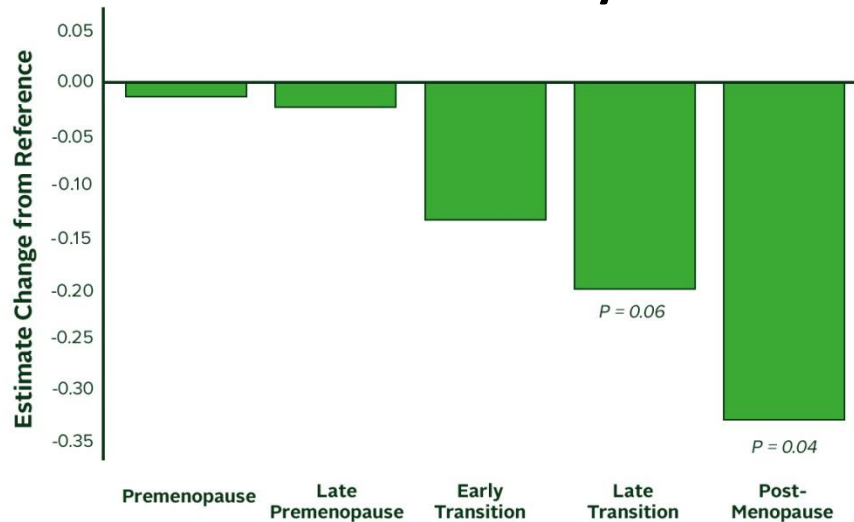
1. Quinn, Madhoo. *Prim Care Companion CNS Disord* 2014; 16: pii: PCC.13r01596;

2. Hesson, Fowler. *J Attend Disord* 2015 Mar 6;pii: 1087054715573992;

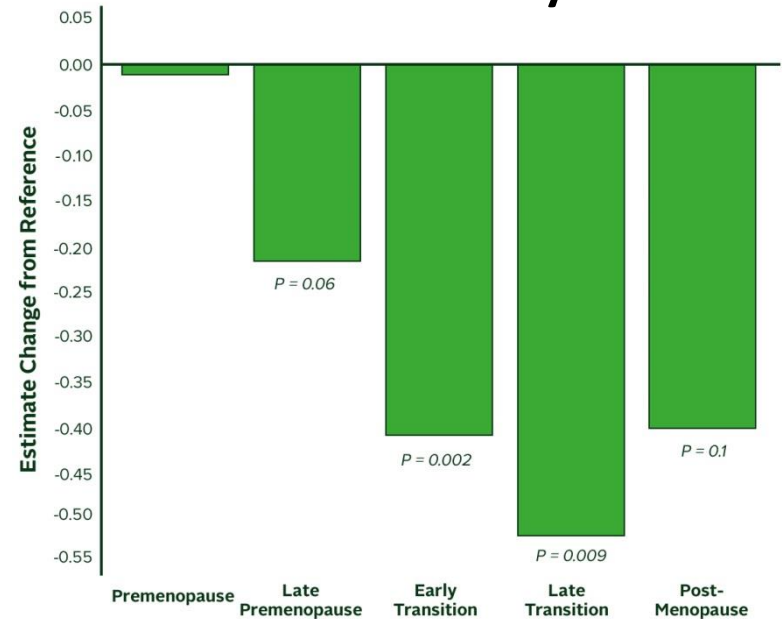
3. Pines. *Climacteric* 2016;19:423-425.

New onset executive dysfunction in perimenopausal women

Decrement in immediate verbal memory



Decrement in delayed verbal memory



N=403 women followed longitudinally for 14 years; annual endocrine, behavioural and cognitive assessments.
Epperson et al. *J Clin Endocrinol Metab* 2013; 98: 3829-38.

Effect Sizes in Psychiatry

	Effect Size
Atypical Neuroleptics (schiz.)	0.25
SSRI's for Major Depression	0.50
ADHD Medication	
Nonstimulants (as a group)	0.62
Extended Release Stimulants*	0.95

* Faraone SV. Using a meta-analysis to draw conclusions about ADHD medication effects.
American Psychiatric Association; May 21, 2003; San Francisco, Calif.

ADHD MEDICATIONS APPROVED IN CANADA

Class	Starting Dose	Manufacturer Maximum Daily Dose
CNS STIMULANTS: MPH-based		(CADDRA max dose where differs)
Biphentin® (MLR methylphenidate)	10–20 mg qd am	Children and adolescents: 60 mg (80 mg); Adults: 80 mg
Concerta® (OROS methylphenidate)	18 mg qd am	Children: 54 mg (72 mg); Adolescents: 54 mg (90 mg); Adults: 72 mg (108 mg)
Foquest™ (MLR methylphenidate)	Adult: 25 mg qd am	Adults: 100 mg
Ritalin® (methylphenidate)	5 mg bid–tid; consider qid in adults	Children and adolescents: 60 mg; Adults: 60 mg (100 mg)
Ritalin® SR (methylphenidate)	20 mg qd am	Children: 60 mg; Adolescents: 60 mg (80 mg); Adults: 60 mg (100 mg)
CNS STIMULANTS: Amphetamines		
Dexedrine® (dextroamphetamine)	2.5–5 mg bid	Children: 40mg (20 mg); Adolescents: 40 mg (30 mg); Adults: 40 mg (50 mg)
Dexedrine® spansule® (dextroamphetamine)	10 mg qd am	Children/adolescents: 40 mg (30 mg); Adults: 40 mg (50 mg)
Vyvanse® (lisdexamfetamine)	20–30 mg qd am	Children: 60 mg; Adolescents: 60 mg (70 mg); Adults: 60 mg (70 mg)
Adderall XR® (mixed amphetamine salts)	5-10 mg qd am	Children: 30 mg; Adolescents/adults: 20–30 mg (50 mg)
NON-STIMULANTS		
Strattera® (atomoxetine)	Children/Adolescent s: 0.5 mg/kg/day; Adults: 40 mg qd	Children: Lesser of 1.4 mg/kg/day or 60 mg/day; Adolescents/Adults: Lesser of 1.4 mg/kg/day or 100 mg/day
Intuniv XR® (guanfacine)	1 mg	Monotherapy: 6–12 yrs: 4 mg, 13–17 yrs: 7 mg Adjunctive to psychostimulants: 6–17 yrs: 4 mg

First-line agents (CADDRA) are in bold; CADDRA maximum recommended doses are in parentheses. Doses are based on the manufacturer's recommendation.

MPH, methylphenidate; MLR, multilayer release; OROS, osmotic-controlled release oral delivery system; SR, sustained release.

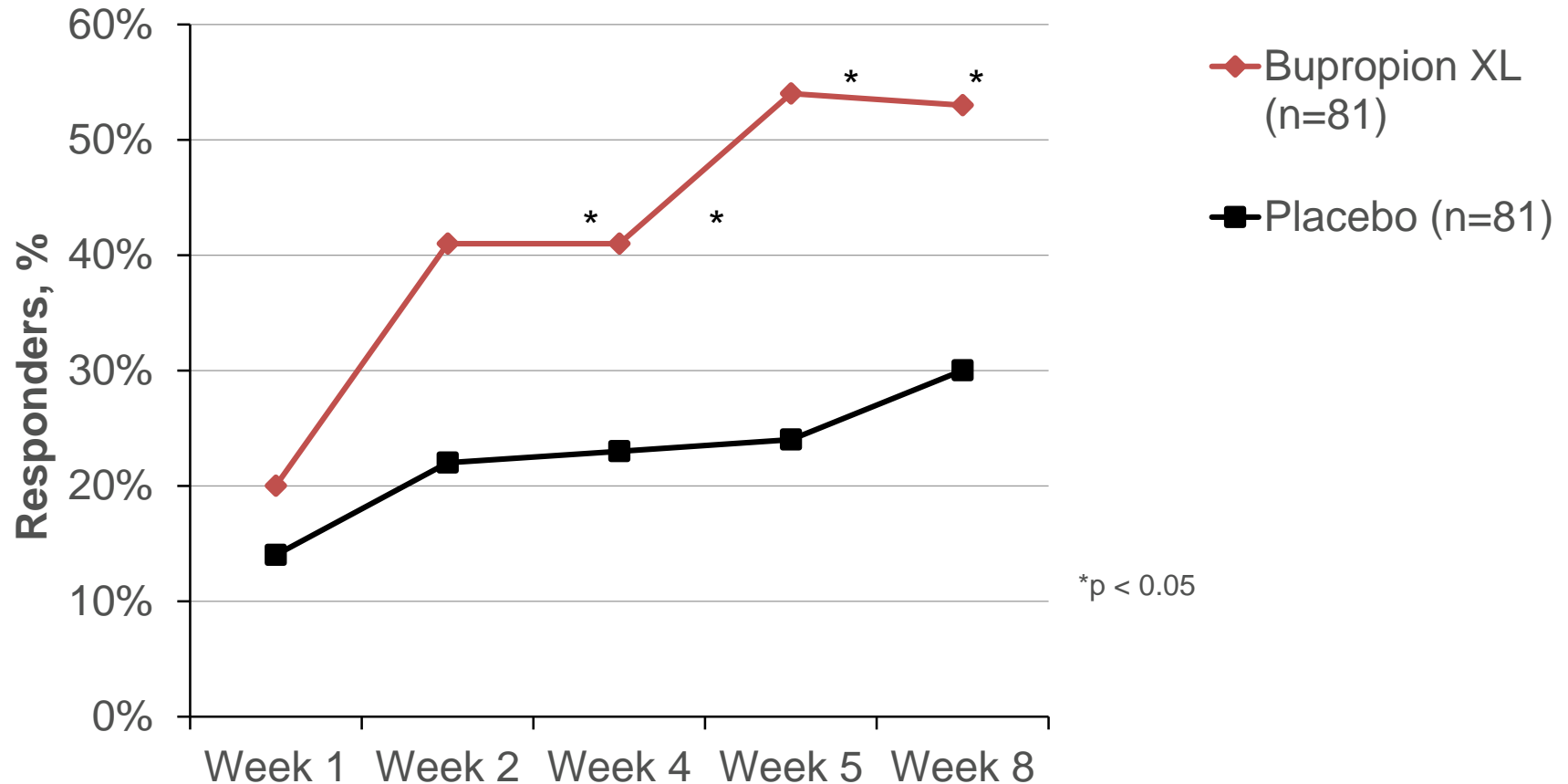
A consensus decision has been made based on clinical use and research data. Doses per CADDRA that are over or under product monograph maximum or minimum doses should be considered off-label use.

Interventions for ADHD: Monotherapy and as an adjunctive therapy to psychostimulants in children and adolescents.

b.i.d. refers to qam and qnoon and t.i.d. refers to qa.m., qnoon and q4p.m.

Canadian Attention Deficit Hyperactivity Disorder Resource
Practice Guidelines,
South Coast, 2021 (update)

Bupropion XL in Adults With ADHD: Percent Responders



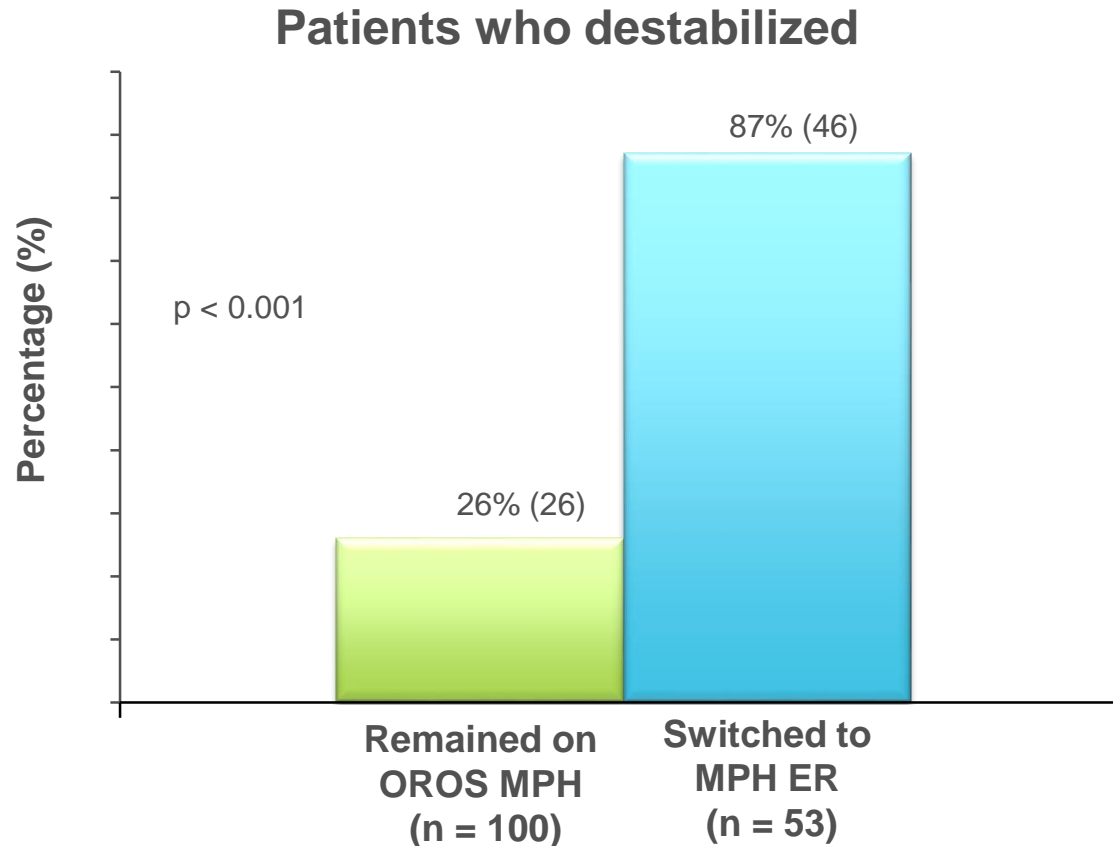
Teva-Methylphenidate ER-C

Pharmacokinetic Data

54 mg, <u>Fed Conditions</u>				
Parameter	Teva-MPH ER-C	OROS MPH	Ratio of Geometric Means (%)	CI, 90%
AUC _{0-t} (ng•h/mL)	170.44	161.97	105.23	100.80–109.85
C _{max} (ng/mL)	18.72	15.88	117.90	110.17–126.17
T _{max} (h)*	4.61 (21)	7.58 (26)	--	--

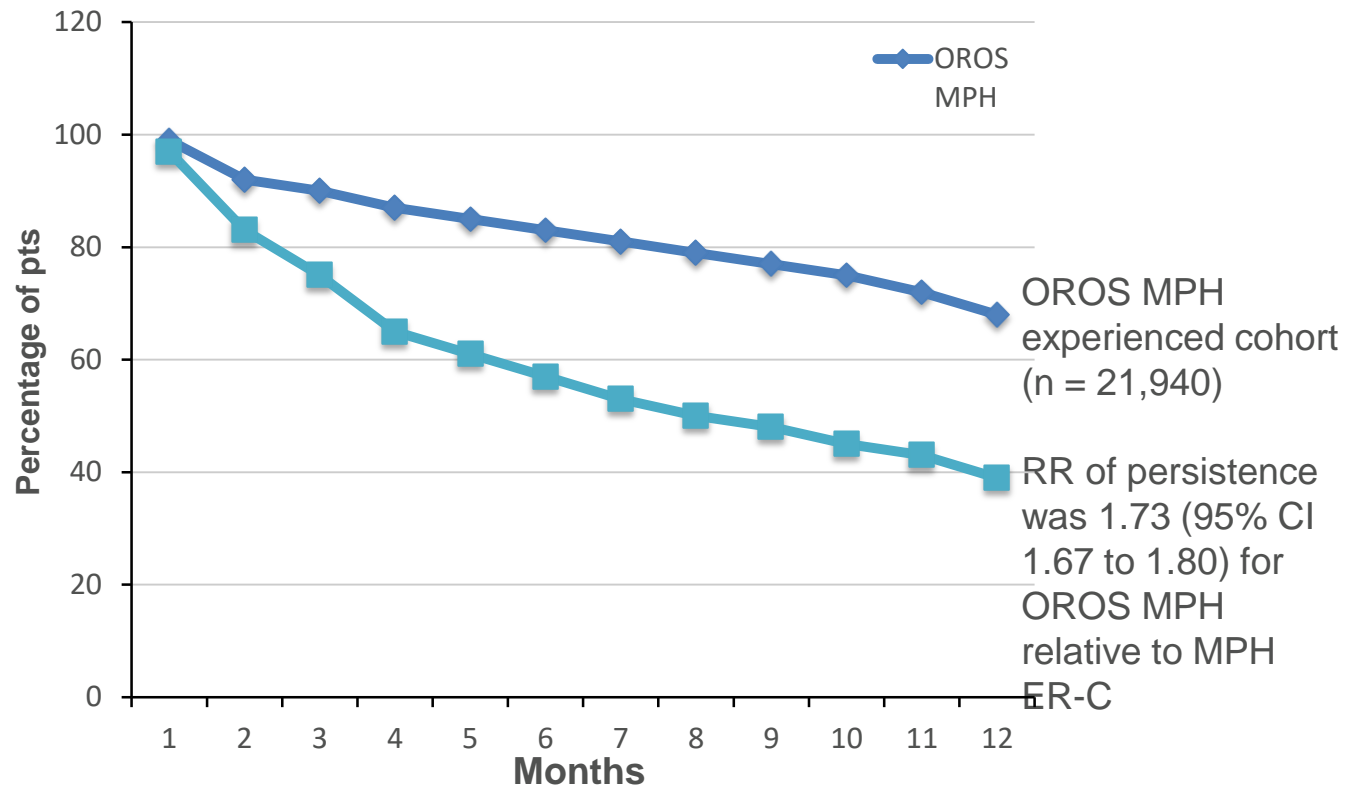
54 mg, <u>Fasted Conditions</u>				
Parameter	Teva-MPH ER-C	OROS MPH	Ratio of Geometric Means (%)	CI, 90%
AUC _{0-t} (ng•h/mL)	131.85	132.23	99.71	94.87–104.80
C _{max} (ng/mL)	15.31	13.90	110.10	104.22–116.32
T _{max} (h)*	3.81 (28)	7.20 (22)	--	--

More Patients Destabilized with the Switch from OROS-MPH to MPH ER-C



Of the 46 destabilized MPH ER-C patients: 43% (21) indicated shorter duration of effect, and 78% (36) eventually restabilized when switched back to OROS MPH ER-C.

Medication Persistence and Duration of Treatment: OROS MPH vs MPH ER-C



Persistence at 12 months was 68% for those who continued OROS MPH and 39% for those who switched to generic product (chi-square, $p < 0.001$). Duration of treatment was a median of 365 days (IQR 294–365) and 243 days (IQR 90–365) for brand and generic drugs, respectively (median test, $p < 0.001$). IQR = interquartile range

Patient Management: Reinforcing the Need for Behavioural Change

- 10% to 15% correctly identified patients will not be supported by the use of stimulants, hence the need for behavioural and educational initiatives
- Stimulants may enhance awareness and response to their perceived environment and may expose potential, previously unrecognized, complicating factors

Back to the Cases

- Richard: added long acting stimulant to his Wellbutrin XL with profound improvement in mood ADHD and social anxiety
- Meagan: focus on managing the Bipolar 2 first; Latuda partially effective, lithium added. Not yet addressing the ADHD. Referred to a DBT therapist
- Sheila: brain fog group emphasizing cognitive remediation strategies; Trintellix augmented by long acting stimulant; gradual improvement in brain fog and depression; targeting RTW

Additional Resources

- **Websites**
- Canadian ADHD Resource Alliance (CADDRA): www.caddra.ca
- Centre for ADHD Awareness, Canada (CADDAC): www.caddac.ca
- Attention Deficit Disorder Association (ADDA): www.add.org
- Quebec-based Dr Annick Vincent's ADHD website: www.attentiondeficit-info.com
- Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD):
www.chadd.org
- MyADHD, Connecting doctors, parents & teachers: www.myadhd.com
- Totally ADD: www.totallyadd.com

Additional Resources

- **Apps**
- Any to-do or task list (**Sticky Notes, Stickies, Evernote**)
- **Timeout, Workrave** (program-timed breaks)
- **Sleeptime, Shutdown Timer**
 - Set a timer to put your computer into sleep mode
- **30/30, Activity Timer**
 - Set up a task and assign it a set time
- **SelfControl, StayFocusd**
 - Block certain websites for a specified amount of time
- **Breathe2Relax**
 - Guided deep breathing
- **Sleep Cycle Alarm Clock**
 - Analyzes sleep patterns at night, wakes you up in your lightest sleep phase