

ADHD AND LATE LIFE COGNITIVE DECLINE

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OBJECTIVES

- Participants will learn the diagnostic criteria for ADHD
- Participants will gain understanding of differentiating ADHD from neurodegenerative disorders
- Participants will be able to discuss the benefits of diagnosing ADHD when it is present

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CASE STUDY

- Pt in her 80's
- Widowed, 2 kids
- Seen for cognitive testing 3-4 times; lifelong inattention, depression, anx.
- 2021 Delayed Memory 2nd %ile in context of intact scores in all other domains
- DX: MCI and ADHD, initiated atomoxetine
- F/U testing 1 yr later delayed memory improved to normal.
- But mood concerns significant- almost suicidal

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CASE STUDY

- Increased atomoxetine
- Scores in April one year later all average to high average
- Plans to leave ALF move into own apartment

“Doctor X is a life saver!”

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PREVALENCE

ADHD affects 5% of children and 2.1-2.5% adults

Quiz question # 1: What is the prevalence of older adults **treated** for ADHD?

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0.09%

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QUIZ QUESTION #2:

What is the number of prospective studies of ADHD into old age?

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0-1

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WHAT IS ADHD?

Name: Attention Deficit/Hyperactivity Disorder

Class: Neurodevelopmental Disorders

(Deficit Model)

A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, persisting at least 6 months, with direct negative impacts on social and occupational/academic activities

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2 PRESENTATIONS: INATTENTIVE

- a. Fails to give close attention to details or makes careless mistakes - overlooks or misses details, work is inaccurate
- b. Difficulty sustaining attention in tasks not inherently enjoyable***
- c. Does not seem to listen when spoken to directly
- d. Does not follow through on instructions and fails to chores or duties-starts tasks but loses focus, easily sidetracked
- e. Has difficulty organizing tasks and activities (e.g. difficulty managing sequential tasks, difficulty keeping materials and belongings in order, messy, disorganized work, poor time management, fails to meet deadlines)
- f. Avoids, dislikes or is reluctant to engage in tasks that require sustained mental effort when not enjoyable***
- g. Loses things necessary for tasks or activities (e.g. mobile phones, keys, paperwork, glasses, wallets)
- h. Easily distracted by extraneous stimuli, including unrelated thoughts
- i. Forgetful in daily activities (e.g. completing chores, returning calls, paying bills, keeping appointments, retaining details of conversations)

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2 PRESENTATIONS: HYPERACTIVE/IMPULSIVE

- Fidgets with hands, fingers, small objects, taps feet
- Leaves seat
- Feels restless
- Unable to take part in leisure activities quietly
- Restless or difficult to keep up with
- May talk excessively
- Blurts out answer before question completed, or **trouble inhibiting less appropriate comments**
- Trouble waiting for turn
- May intrude into or take over what others are doing

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ADDITIONAL CRITERIA

- Several symptom present before age 12
- Present in 2 or more settings
- Symptoms interfere with or reduce quality of work
- Not better explained by another disorder: mood, anxiety, personality, substance use, cognitive

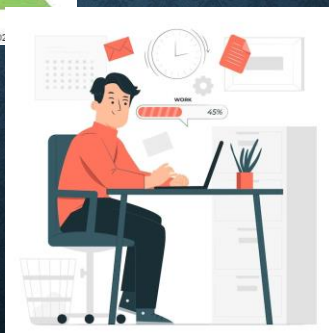
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SYMPTOMS OF ADHD

Pervasive



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EXECUTIVE INATTENTION

- Poor self monitoring
- Failure of contemplation
- Poor persistence toward goals
- Emotional dysregulation and impulsivity

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TIME BLINDNESS



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ADHD: EXECUTIVE FUNCTION IS SELF REGULATION

ADHD is disorder of brain networks that contribute to executive function and self regulation

Self directed action

Intended to change behavior to alter the probability of a delayed consequence

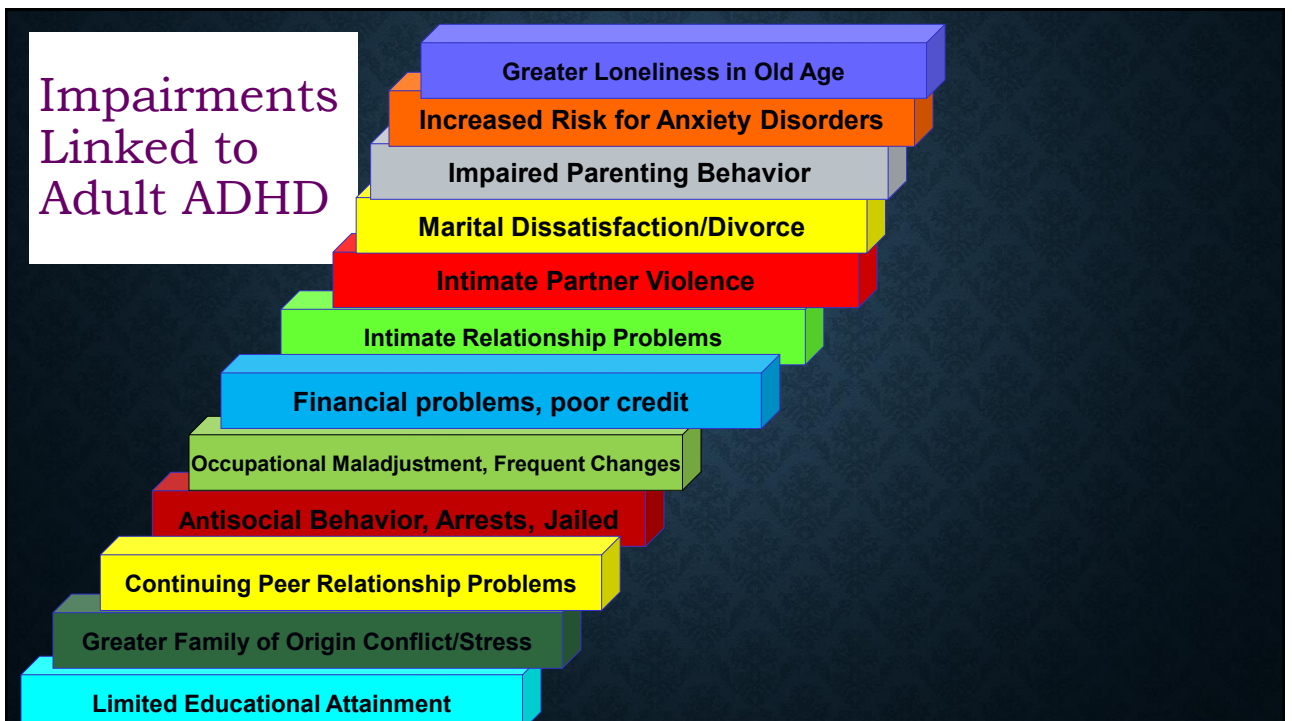
Performance deficit- can't use what you know at point of performance

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PRESENTATION IN ADULTS/OLDER ADULTS

- Inattention may include forgetfulness, trouble following instruction, trouble organizing tasks, procrastination
- Hyperactivity may include restless, fidgeting, difficulty engaging in sedentary activities without moving
- Impulsivity may include interrupting others, impatience, hasty decisions, making comments later regretted

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HIGHER RISK OF SELF INJURY AND MORTALITY

- Both veterans and non-veterans with ADHD more likely to engage in NSSI. Those with ADHD more likely than those with PTSD and alcohol use disorder. (Kimbrel et al., 2018)
- 27 studies of 642,260 individuals with ASD or ADHD
- Compared to general population:
 - All cause mortality higher in both sexes
 - Deaths from unnatural causes higher (injury, unintentional incidents, poisoning, suicide) but not natural causes (Catala-Lopez et al., 2022)

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GENETIC CONTRIBUTION

ADHD highly heritable (70-80% concordance in 30 twin studies)

Genetic overlap with other similar disorders

Polygenic

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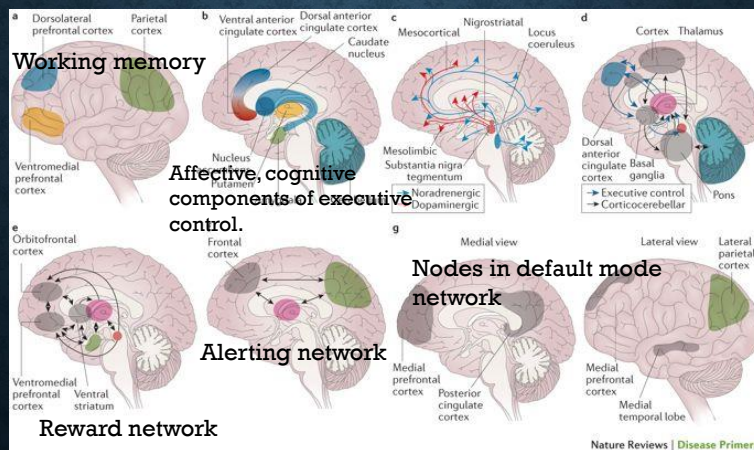
GENETIC + ENVIRONMENTAL

Prenatal

Perinatal

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BRAIN NETWORKS ASSOCIATED WITH ADHD



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DIFFERENCES IN NEUROTRANSMITTERS

Dopamine: recent findings suggest DA depressed in adult ADHD. Regions implicated include prefrontal cortex, striatum and midbrain (del Campo et al, 2011)

Norepinephrine: decreased norepinephrine transporter availability in **unmedicated** ADHD in regions associated with attention, esp in R hem. (but not in medicated ADHD)
(Ulke et al (2019))

Serotonin

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MECHANISMS OF TREATMENT

- Methylphenidate and amphetamine block DA and NE transporters
- Neurovascular coupling and glymphatics
- Metabolic
- White matter connectivity

- McDonald et al (2024)

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WHY IS ADHD SO DIFFICULT TO RECOGNIZE AND DIAGNOSE IN GERIATRICS?

Diagnosis is CLINICAL

No specific test with a cut point



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VARIABILITY IN PRESENTATION

Continuum in severity

Setting

Symptom

Comorbid mood

Functional challenges

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KNOWLEDGE GAP

- Current studies based on retrospective assessment
- Today's older adults did not grow up in an educational culture that recognized ADHD
- Many people with ADHD are unaware of their symptoms
- Older adults excluded from research on ADHD



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KNOWLEDGE GAP

Many providers have little knowledge or training in ADHD

Many providers do not look for ADHD

164 memory clinics surveyed, 64 responded

85% never or rarely seen pts already diagnosed with ADHD

84% never or rarely dx ADHD in memory clinic

(Fischer et al., 2012)

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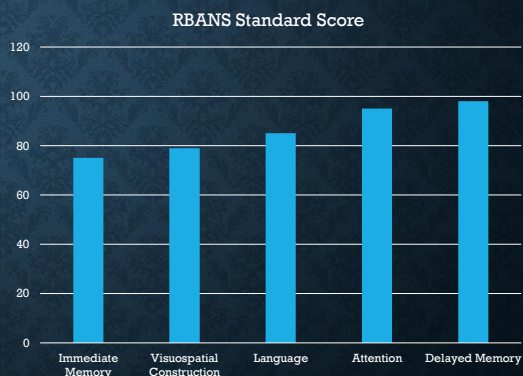
ADHD VS MCI

	ADHD	MCI
Symptom Onset	Childhood	Late Life
Course	Stable	Variable
Hx of Sx	Attn, Ex Fx, memory	Depends on etiology
Hx of LD	More likely	
Hx Substance Use	More likely	
Hx multiple jobs, relationships	More likely	
Hx disorganization, procrastination	More likely	
Hx Time blindness	More likely	

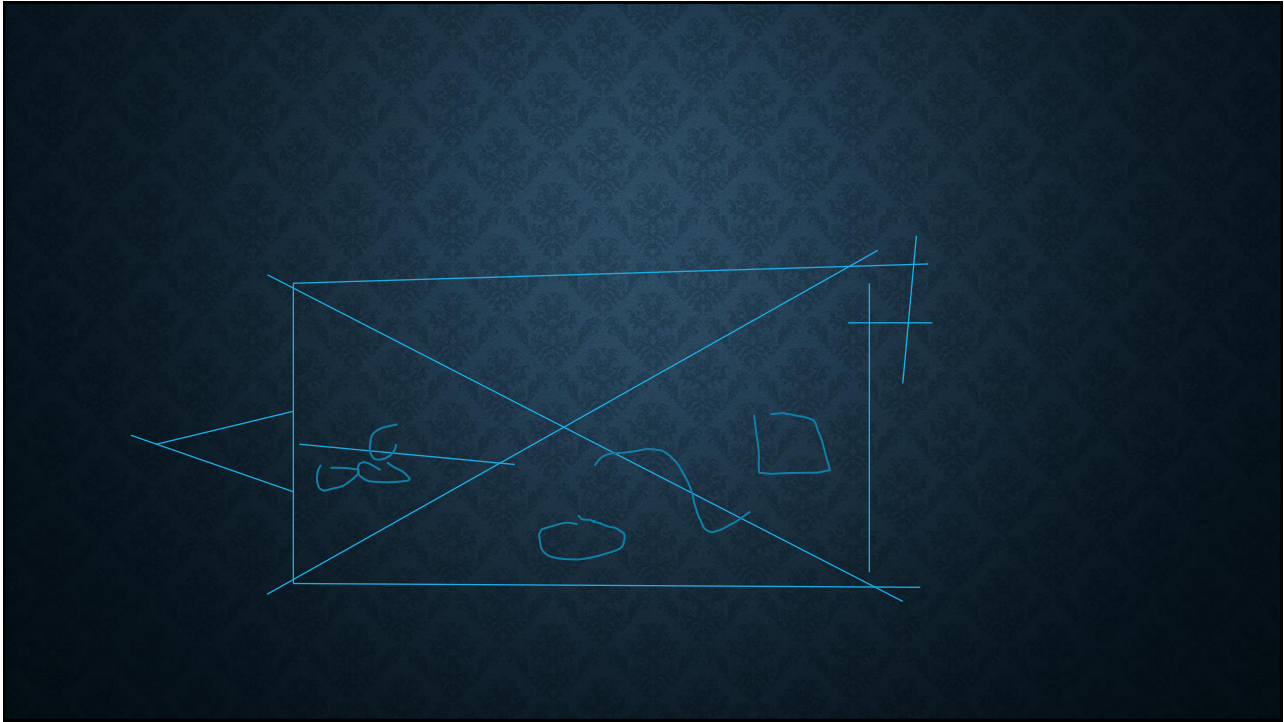
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ADHD ON MEMORY CLINIC BATTERY

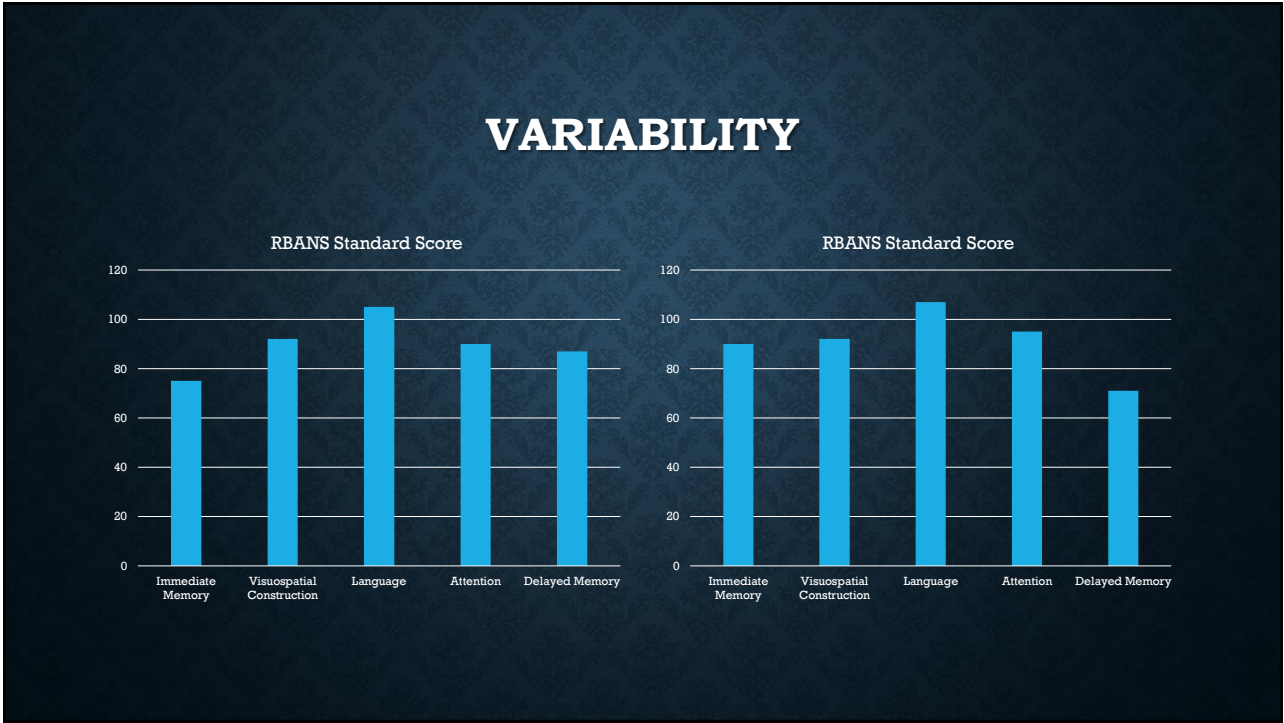
- Lower Imm Mem than Delayed Mem (occasional recog diff)
- Attention may be intact
- Difficulties with working memory on MMSE



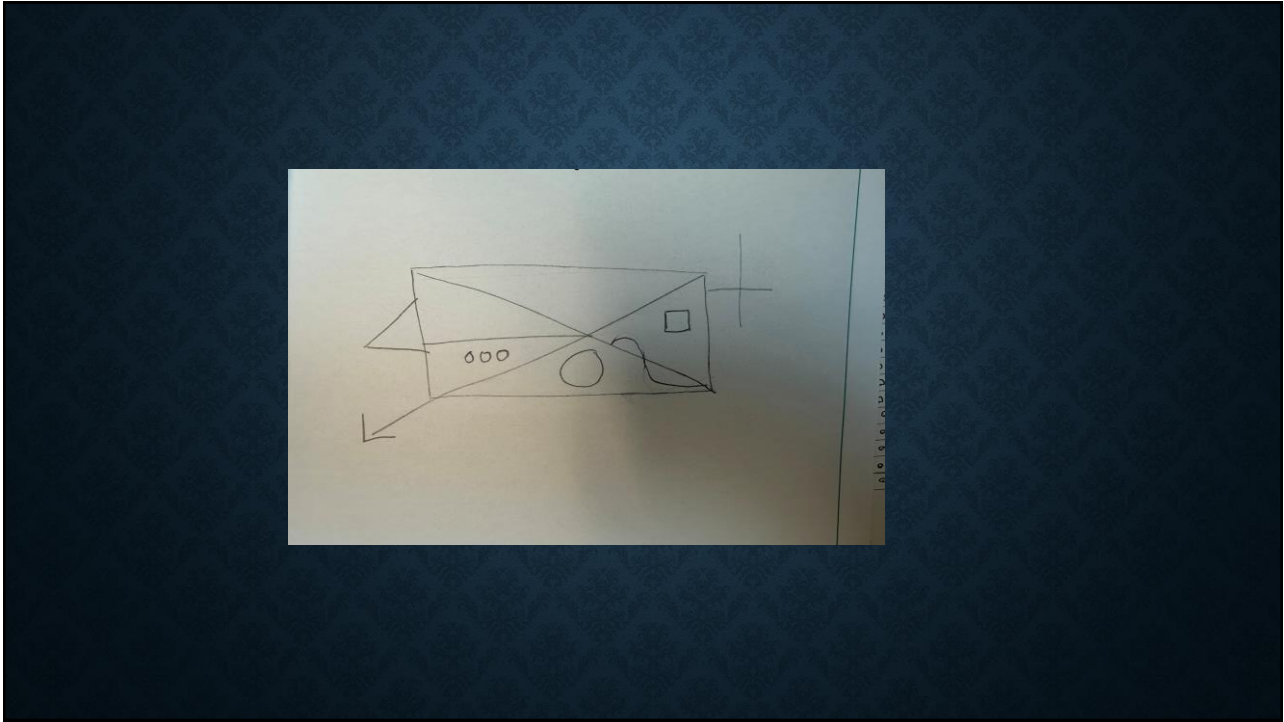
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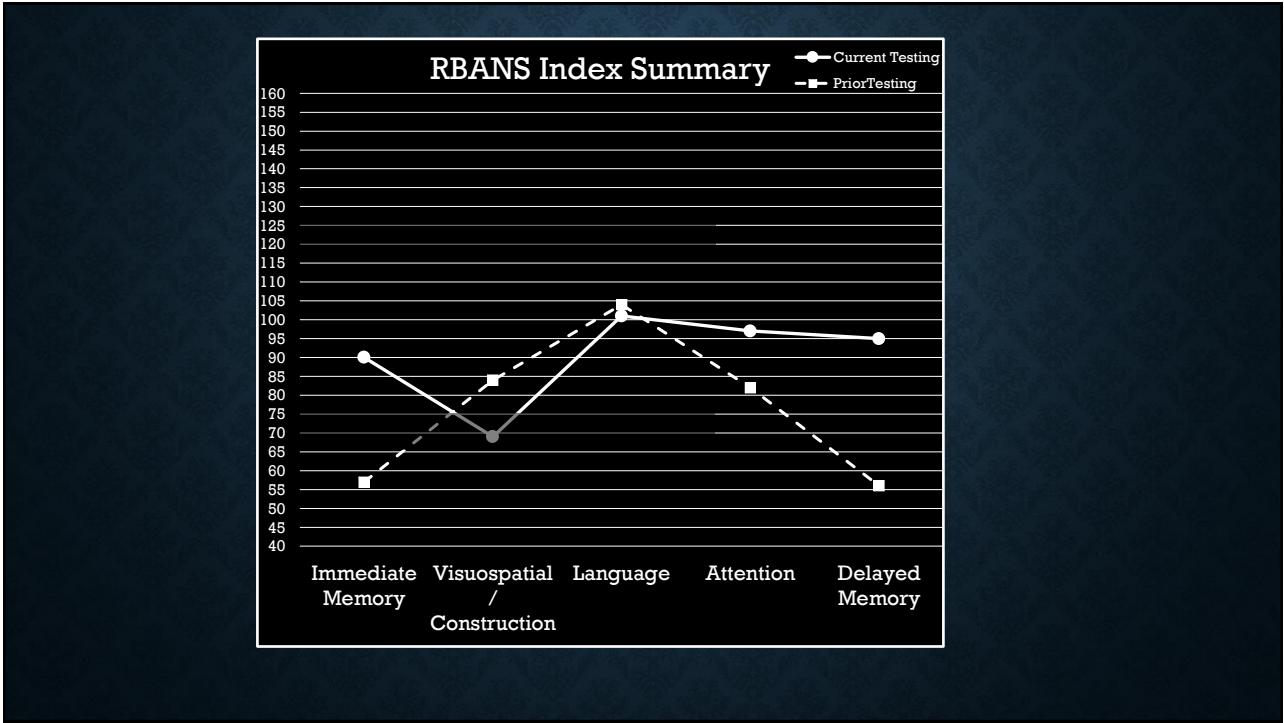
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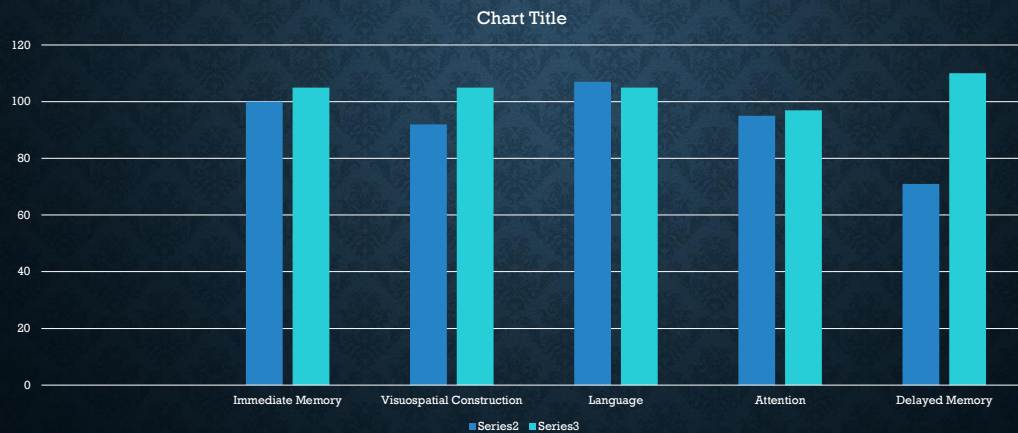


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BEFORE AND AFTER ATOMOXETINE



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ADHD AS RISK FACTOR FOR COGNITIVE DECLINE

- Levine et al., (2023) National cohort study >100,000 participants mean age 57.7. Participants with ADHD had higher rates of dementia compared with controls.
- Dobrosavljevic et al, (2021) Retrospective cohort design of 3.5 million people in Sweden Increased risk of both MCI and dementia in those with ADHD.
- Golimstok et al., (2024) Prospective observational cohort study 12-15 year f/u 270 pts

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WHY MANAGE WITH MEDICATION?

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MEDICAL MANAGEMENT: IMPROVES BRAIN CONNECTIVITY

- Methylphenidate and atomoxetine resulted in normalized connectivity in right superior parietal gyrus and left central operculum/insula (del Campo et al)
- Methylphenidate increased connectivity in right middle frontal gyrus, cingulo temporal parietal and striatal thalamic regions in adolescents. (Kowalczyk et al., 2023)

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MEDICATION AFFECTS ACTIVATION PATTERNS

- Stop task and Switch task
 - ADHD+, ADHD-, control
 - Brain activation patterns differed on fMRI in IPF, IF, insula, putamen, thalamus, R caudate, ,RACC. R pre and post central gyrus.
 - ADHD- showed increased activation or hyperactivation
 - ADHD+ showed reduced activation
- Berberat et al (2021)

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PT REPORT

Most older adults treated with stimulants/atomoxetine report positive response

Pharmacological treatment

Observational Study

148 Older adults 55-79 low dose stimulant therapy (dextroamphetamine, methylphenidate)

65% reported positive response after 7 days

42% dc 2/2 side effects or non-response

(Michielsen et al., 2021)

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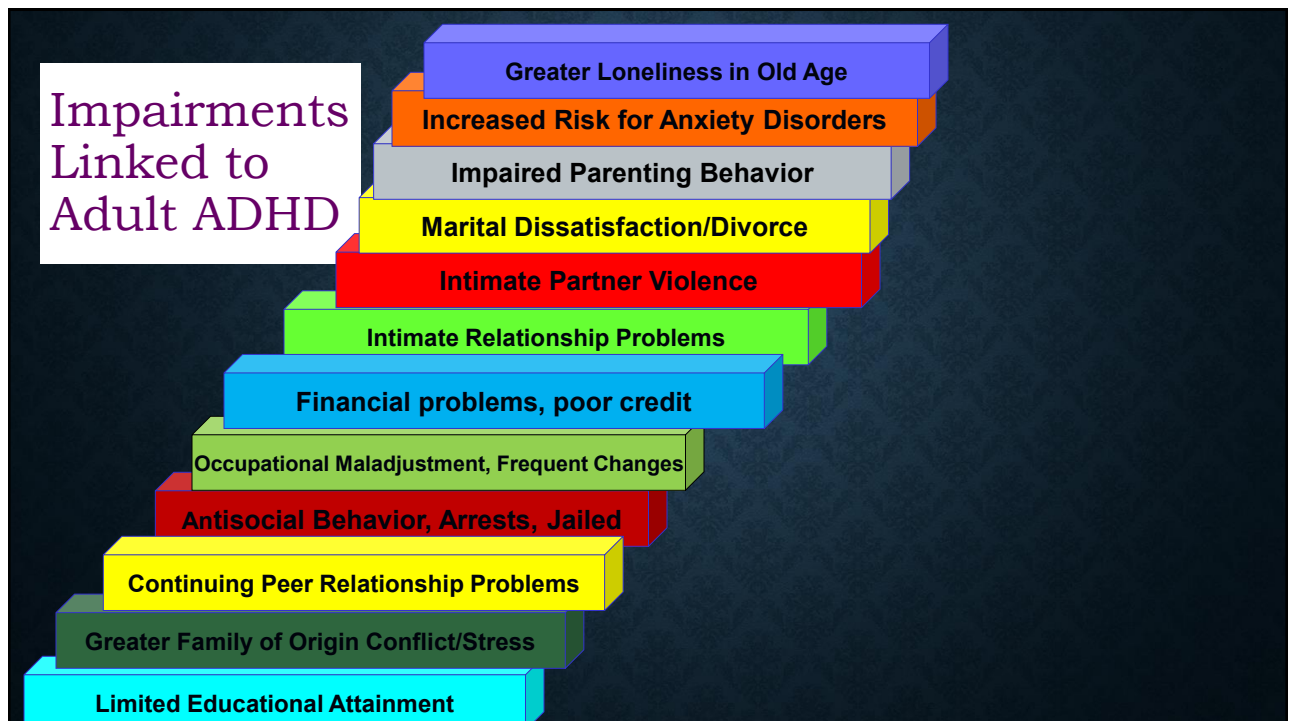
EFFECT ON FUNCTION

Impact of pharmacological treatment

- Improved:
 - Social function
 - Parenting
 - Attentiveness needed in college
 - Time out of work
 - Driving performance and accidents
 - Unintentional injuries
 - SI risk
 - Risk of early pregnancy (<20)
 - May lower risk of substance use
 - Criminality

(Kosheleff et al., 2023)

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RISKS ASSOCIATED WITH STIMULANT TREATMENT

Observational cohort study >6,400 exposed to stimulants, >24,800 without stimulant use. Increased risk of ventricular arrhythmia, MI, stroke or TIA short term (30 days) but not long term (180-365 days) Tadrour et al (2021)

Meta Analysis 3,931,532 children, adults, older adults found NO association between stimulant and CVD though increased risk could not be excluded

Non-significant increased risk of CVD in those with pre-existing CVD (Zhang et al., 2022)

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MANAGEMENT: NON PHARMACOLOGICAL

- Off-load-automatize
- Compensatory strategies
- Assistance from others
- Exercise



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EDITORIAL
WHY IS ADHD SO DIFFICULT TO DIAGNOSE IN OLDER ADULTS?

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ARTICLE HISTORY RECEIVED 23 APRIL 2024; ACCEPTED 25 JULY 2024

KEYWORDS ADHD; ATTENTION DEFICIT HYPERACTIVITY DISORDER; OLDER ADULTS; COGNITIVE DECLINE; GERIATRICS

EXPERT REVIEW OF NEUROTHERAPEUTICS 2024, VOL. 24, NO.

10, 941 -944<https://doi.org/10.1080/14737175.2024.2385932> © 2024 Informa UK Limited, trading as Taylor & Francis Group

**OBSTACLES TO EVALUATION AND
TREATMENT**

If ADHD is so important, why did I not receive training?

OBSTACLES: CLINICAL BLINDNESS



If it's so important, why did I not receive training?

Field is learning more

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Obstacle: Clinical Prejudice

Why bother treating it? They've coped with it all their lives.

Psychological, emotional, financial toll on patients and families

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BURDEN OF ADHD IN OLDER ADULTS

Qualitative Study n = 27, age 60-77

Loneliness

Depression and anxiety

Low self esteem

Feel misunderstood, different, overstep boundaries, difficulty saying no

Michielsen et al (2018)

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OBSTACLE: TREATMENT HESITANCY

I won't prescribe treatment for ADHD in this age range, regardless of symptoms or dx

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OBSTACLE: CLINICAL INEXPERIENCE

- How do I prescribe when I am uncertain?
- Rule in/Rule out and treat as appropriate

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OBSTACLE: CLINICAL COMPLEXITY

I doubt ADHD is a major factor, given the multiple comorbidities-it's probably MCI given the patient's age.

Consider screening for ADHD: Adult Self Report Scale (ASRS) for ADHD

Problem List

General Anxiety Disorder

Gastro-Esophageal Reflux Disease

Sleep apnea

Hyperlipidemia

Diabetes

Degenerative Disc Disease

Fibromyalgia

Chronic Kidney Disease

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Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Patient Name _____ Today's Date _____

Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today's appointment. Never Rarely Sometimes Often Very Often

1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?
3. How often do you have problems remembering appointments or obligations?
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?

Part A

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OBSTACLE: CONCERN FOR ABUSE

I do not want my patients to abuse medications

Are patients over-reporting to obtain medications?



(Shura et al., 2017)

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FACTORS CONTRIBUTING TO SUCCESS

- Accepting that they have adult ADHD- **Validate**
- Participating in science-based treatments for ADHD, such as medication, cognitive behavioral therapy, ADHD Coaching, etc. – the earlier the better.
- **STRUCTURE HELPS**
- Identifying individual differences in aptitude(s):
 - Finding that high aptitude or talent in a particular ability, (e.g. sports, art, music, inventor, entrepreneur, etc.) and find resources to support it
- Having loved ones who accept the adult's ADHD, encourage and support them in constructive pursuits, work with them on controlling symptoms, and find ways to open doors (gain access) to special resources.

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SUMMARY

- Dx of ADHD in late life often missed or ignored- substantial implications for pt and fam
- Be aware and screen for ADHD in memory clinics
- Discriminate between ADHD and MCI (may be comorbid)
- If ADHD, validate pt experience
- Consider treatment and monitor- improved function, mood, etc.
- Most pts with ADHD benefit from external support

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