



ATTENTION DEFICIT HYPERACTIVITY DISORDER

PRESENTED BY
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OBJECTIVES

- 1. Compare and Contrast the differences in symptoms in Children and Adults
- 2. Discuss Prescription Medications used for the Condition
- 3. Discuss Holistic and Integrative management of Attention Deficit Hyperactivity Disorder
- 4. Describe what Comorbidities are associated with Attention Deficit Hyperactivity Disorder
- 5. Review what resources and accommodations are available to those with the Disorder in both Education and the Workplace

DISCLOSURES

- I have none

WHAT IS ADHD ?

- Neurodevelopmental Disorder that causes trouble paying attention, impulsive behavior, and hyperactivity in multiple settings. It is a life-long disorder but depending on severity and behavioral modifications, it may or may not be as evident in adulthood.

AGENDA

Incidence

Pathophysiology

Diagnostic Criteria

Comorbidities

Treatment

Psychosocial Modalities

School and Job Programs

INCIDENCE

- According to the CDC in 2022, 7 million, or 11.4 percent of children between 3 and 17 have ever been diagnosed.
- The CDC as of November 2023 estimates 6 percent of adults are affected.
- Suspected to be higher because many adults grew up in a time less recognized and have developed work arounds to help manage.



INCIDENCE

- ADHD is thought to be twice as prevalent in Boys than girls.
- Researchers believe this is likely due to underdiagnosis of girls of childhood.
- Boys are more hyperactive, and girls tend to be more inattentive and less disruptive.



What part of the brain is responsible for working memory

Cerebellum

0%

Basal Ganglia

0%

Pre-Frontal Cortex

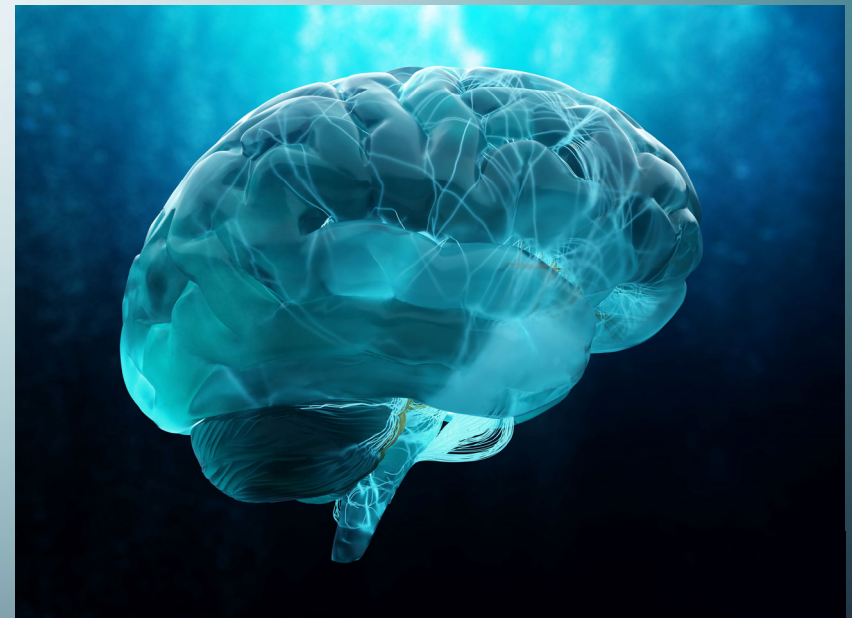
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Temporal Lobe

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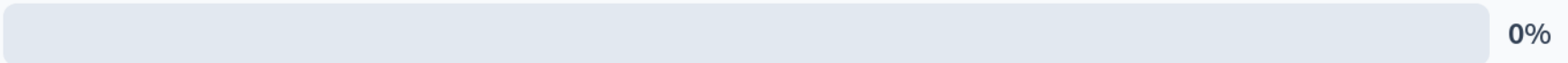
PATHOPHYSIOLOGY

- Difference in Mean Volume of Pre-Frontal Cortex, Basal Ganglia, and Cerebellar Vermis for ADHD patients.
- Pre-frontal cortex conducts executive function which includes your ability to stay organized, attentive, have memory recall, and execute and complete a task from beginning to end.
- It is responsible for the working memory, which is the manipulation of information held in short term memory. Working memory is the interface between the current environment and long term memory.



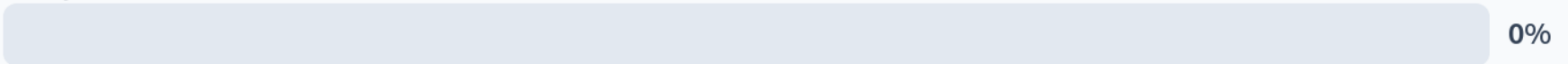
What Neuro-Transmitters are deficient in ADHD?

Serotonin



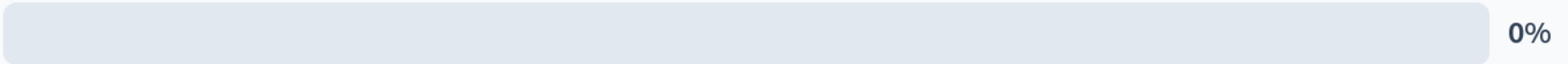
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Acetylcholine



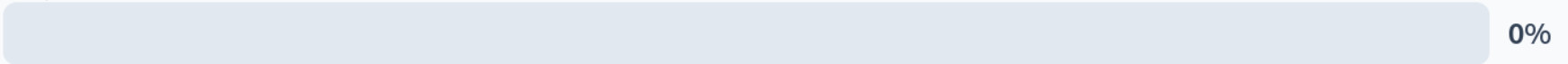
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Norepinephrine



0%

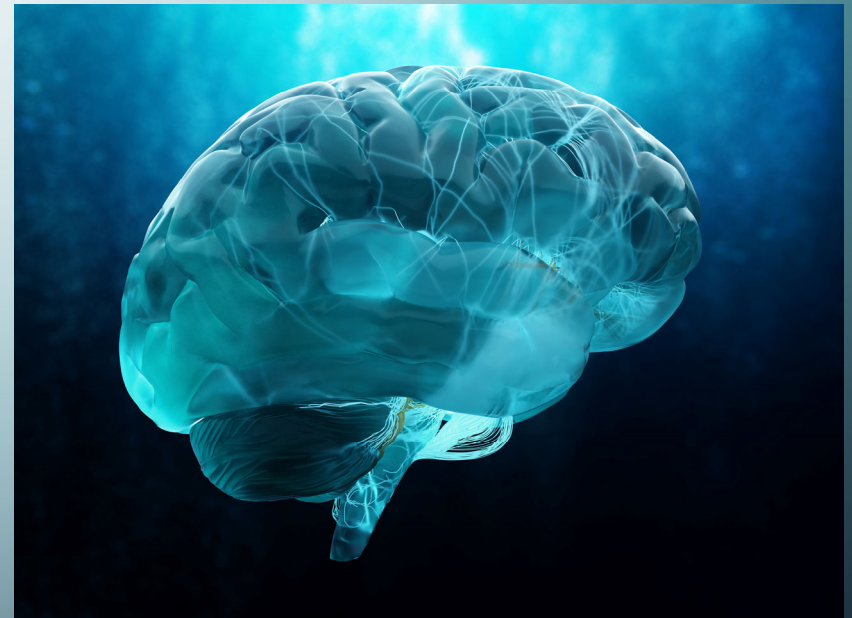
Dopamine



0%

PATHOPHYSIOLOGY

- There is a deficiency in neuroendocrine messengers of Dopamine and Norepinephrine in patients with ADHD.
- It represents a form of neurodivergence in the way a person's brain functions. Neurodivergent people may behave, learn and process information differently.
- 3 out of 4 children with ADHD have a relative who also has the condition.



Symptoms must be present prior to what age to be diagnosed as ADHD?

Age 5

0%

Age 8

0%

Age 12

0%

Age 17

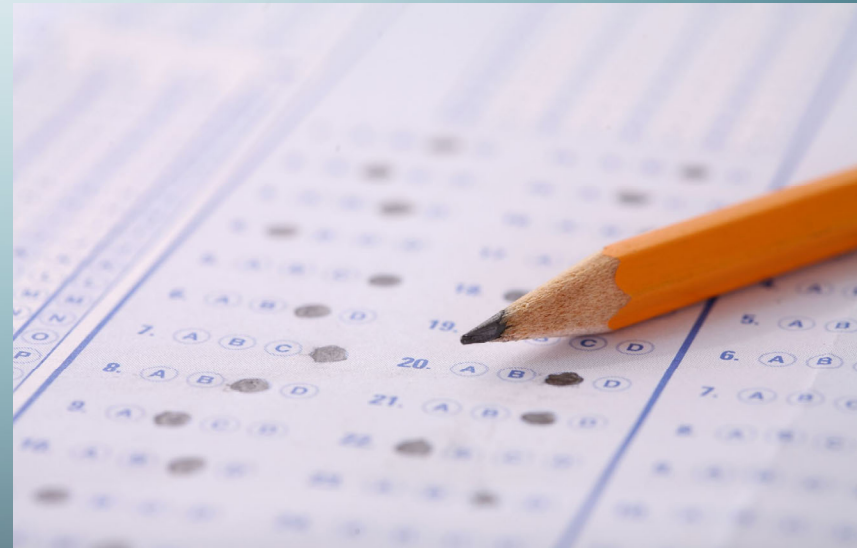
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DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS 5TH EDITION

- Some form of symptoms must be present prior to age 12 and can exhibit symptoms as young as 3, but the mean age of diagnosis is 6.
- Children are required to have 6 criteria for more than 6 months in two settings . For 17 and older, 5 criteria for more than 6 months in two settings .
- There are three different Presentations : combined, predominantly inattentive, and predominantly hyperactive-impulsive presentation
- ADHD also now has a grading scale of mild, moderate, to severe.

CHILDREN ASSESSMENTS

- Child Behavior Checklist
- Behavioral Assessment Scale for Children
- Brown Attention-Deficit Disorder
- Formal Conner, Vanderbilt Assessments



ADULT ASSESSMENT FORMS

Adult ADHD Clinical Diagnostic Scale

Brown Attention-Deficit Disorder Assessment Scale for Adults

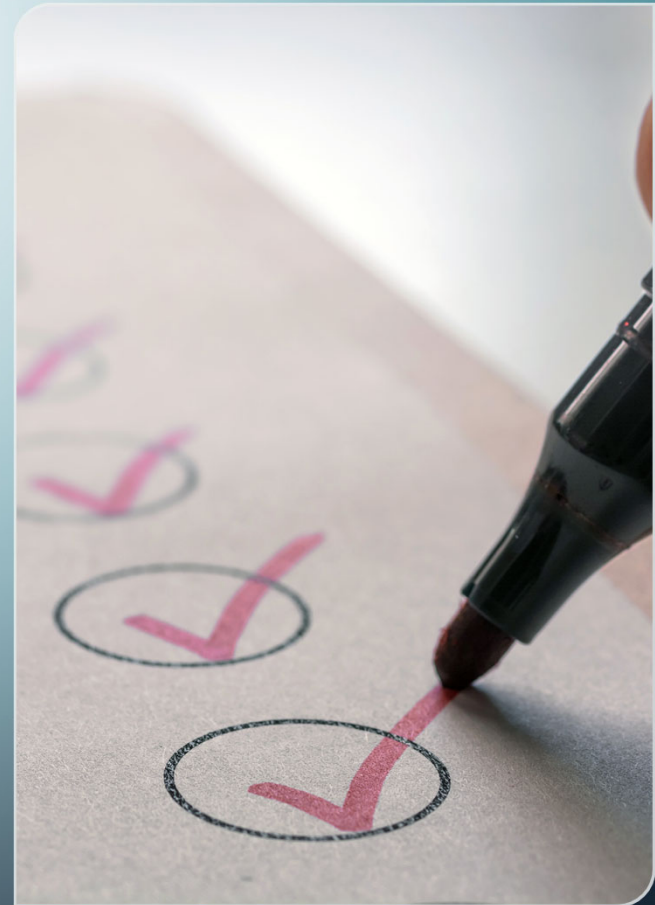
Test of variables of Attention or TOVA

Conners Adult ADHD Rating Scales

Adult Self Report Scale

The Behavior Rating Inventory of Executive Functioning- Adult Version (BRIEF-A)

Barkley Adult ADHD Rates Scales (BAARS)



ADULT VS CHILDREN ADHD

- Both Adults and children share similar Symptom Criteria but there is less hyperactivity and more inattentive symptoms in the Adult. Hyperactivity in the adult looks differently and is exhibited as difficulty with containing emotions, interrupting, and impulsivity in decision making (leap before you look), and participation in risky behavior for increased stimulation or adrenal rush.

INATTENTIVENESS

Difficulty paying attention to Details

Careless Mistakes

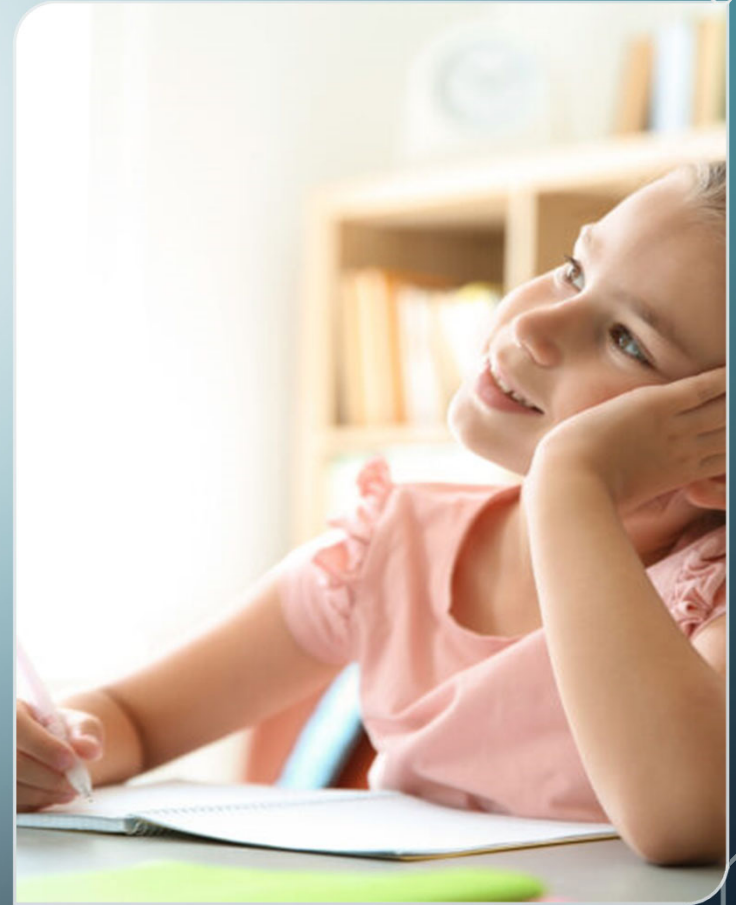
Short Attention Span

Difficulty with Effective Listening

Often unable to follow through on Tasks

Avoid Tasks that require sustained Mental Effort

Loses things



INATTENTIVENESS

Easily distracted

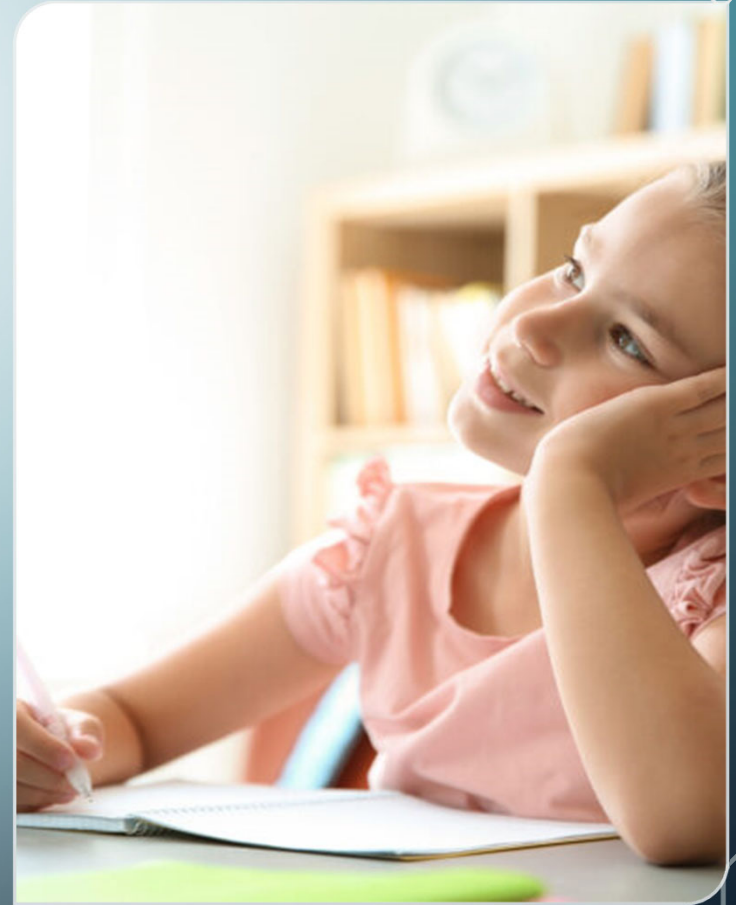
Difficulty Planning Ahead

Difficulty with Time Management and Meeting Deadlines

Over Scheduled

Forgetful in Completing Regular Duties

Poor Organization at Home or at Work



HYPERACTIVITY

Fidgets /Squirms

Trouble Staying Seated

Excessive Running Climbing or Restlessness

Trouble with quiet activities

Needs to be on the GO

Talks to Much

Blurts out Answers

Difficulty Awaiting Turn

Interrupts Conversations/Intrudes on Others



HYPERACTIVITY

Impulsivity including not thinking through decisions or long-term consequences. For example, engaging in sexual activities without considering the risks in adolescence

Seeking out highly rewarding activities and peer approval leading to risky actions related to driving and substance abuse. Having a heightened response to reward and underdeveloped cognitive control in adolescence

Emotional Lability

Quits Job or Relationships Prematurely

Is Excessively loud or makes excessive noise during leisurely activities

Engaged in Frequent or Intense Physical Activity



OTHER SYMPTOMS OF ADHD

- **Different Progress Speeds-** tasks take longer to process information, unless in a hyperfocus phase
- **Hyperfocus** occurs on tasks that interest them or at the last minute when deadline is upon them. Sometimes difficult to redirect.
- **Forgetfulness** such as birthdays, turning in completed homework, routine chores
- **Sleep Problems-** Getting to sleep, staying asleep, and waking up on time can all be difficulty. This is compounded by adolescence use of excess caffeine to stay focused and/or treatment with stimulants
- **Low Self Esteem-** worry about things might have forgotten to do or did poorly because of inattention or impulsivity. After not meeting their own or others expectation develop poor self esteem. Often accused of not trying or not appearing to care, which can be untrue and hurtful.

COMPLICATIONS OF ADHD

- Lack of absorption of information
- Challenges with Relationships- have difficulty reading social cues, interrupting with whatever is on their mind and not being attentive to needs of others. Also not keeping up with obligations due to forgetfulness. Mood lability.
- Inability to perform day to day tasks to completion or difficulty meeting deadlines



RELATIONSHIP BETWEEN ADHD AND ANGER

- Emotional dysregulation in both adults and children.
- Both children and adults are more likely to have angry outbursts, feel impatient, defy authority, irritable, experience conflict, be more excitable, feel emotions more intensely, and deal with more stress and anxiety
- Frustration and Irritability stem from Feeling overwhelmed with daily responsibilities, time management, relationship difficulties, and stimulating environments



BEHAVIORAL MODIFICATIONS FOR ANGER /IRRITABILITY RELATED TO BEING OVERWHELMED

- **Cognitive Behavioral therapy** helps people with ADHD label and better understand their emotions
- **Mindfulness** : Being present and awareness of emotions and letting them Pass without immediate Judgement.
- **Sleeping regularly** can help manage anger and lower the risk of outbursts
- **Meditation** can help with emotion regulation, concentration, and mood
- **Deep Breathing** can help feelings from becoming overwhelming
- **Social Skills Therapy** : Learning triggers, avoiding overstimulation if possible, Leaving the stressful situation for breaks, trying a repetitive action like knitting, fidgets, etc

THE INDECISION FACTOR

- In ADHD the feeling that you have so much to do that you cannot make yourself do anything is described as ADHD paralysis or ADHD Freeze.
- This experience may be linked to the dopamine imbalances seen in brains of those with ADHD. Low levels of Dopamine make it difficult to act on the desire to do something.



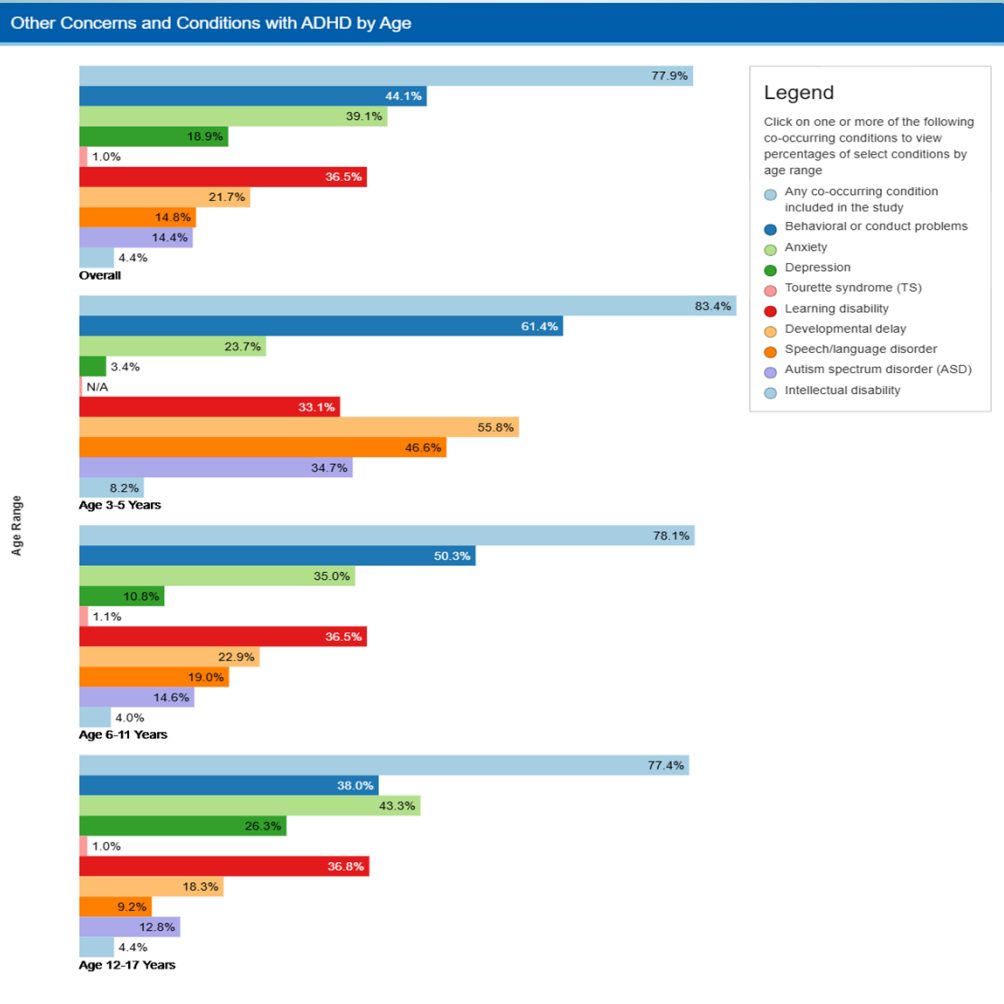
TIRING EFFECTS OF ADHD

- Overtime it is theorized that ADHD may develop into a syndrome that includes chronic fatigue and pain. ADHD meds may be useful in treating this associated symptoms by affecting neurotransmitters like dopamine and norepinephrine.



MULTIPLE COMORBIDITIES

- Depression Five Times More Likely in Children
- Anxiety 3 times more Likely in Children and in 25 percent of affected adults
- Substance Abuse for peer acceptance and immediate gratification
- Oppositional Defiant Disorder from increased impulsivity
- Conduct Disorder from lack of social awareness in almost half of children
- Increased mortality due to suicide, substance abuse, impulsive accidents
- Job Instability due to insufficient executive skills



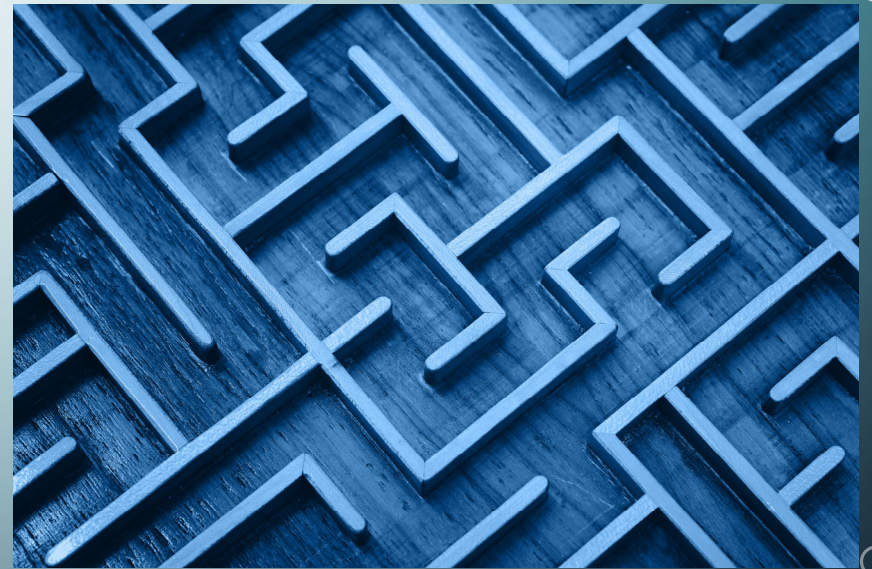
POSITIVES OF ADHD

- Fantastic problem solver that thinks outside of the box with divergent thinking
- Endless curiosity
- Resilience
- Energy that lights up a room
- Possesses a lot of creative talents
- Likes fast paced work with multiple tasking



CHOOSING THE RIGHT MEDICINE

- Critical to have an understanding if ADHD is the primary condition or it is the result of another underlying condition.
- For example, anxiety or depression having an effect on focus
- ADHD can be the source of anxiety and depression because of the barriers it presents, but this is not always the case.
- For example, if anxiety may be the predominant condition, starting a stimulant compounds the condition and causes more focus on obsessive worrying.



CRITERIA FOR STARTING MEDICATIONS IN CHILDREN

- **1.** When the child's attentional difficulties are so great that he or she is unable to learn and keep up academically.
- **2.** When ADHD causes severe social difficulties. Sometimes ADHD children's difficulty in paying attention to social signals and impulsiveness causes significant problems with making and keeping friends.
- **3.** When behavior at home has a seriously disruptive effect on family life, causing significant problems for the child, parents, and/or siblings.
- **4.** When a child's self-esteem is suffering to a significant degree due to this condition.



When is it required to Do an EKG prior to starting a stimulant?

Prior to starting any stimulant

0%

Only if History of Cardiomyopathy

0%

With any cardiac problem that would put at increased risk

0%

CARDIAC IMPLICATIONS OF STIMULANT USE FOR ADHD

- The use of stimulants should be avoided in patients with known structural cardiac abnormalities, cardiomyopathy, serious heart rhythm abnormalities, coronary artery disease, or other serious cardiac problems that could put them at increased risk of sympathomimetic effects.
- Findings from the history or physical exam that suggest cardiac disease may warrant evaluation by cardiologist first.
- The American Academy of Pediatrics recommends against performing routine EKG or routine cardiology referrals prior to initiating stimulant therapy. However, to do such when warranted by the exam and history.



IMMEDIATE RELEASE STIMULANTS

- Dexmethylphenidate (Focalin)
- Dextroamphetamine (Dexadrine)
- Methylphenidate (Ritalin)
- Amphetamine/Dextroamphetamine (Adderal)



SUSTAINED RELEASE AND LONG-ACTING STIMULANTS

- Amphetamine/Dextroamphetamine salts (Adderall XR)
- Dexmethylphenidate (Focalin XR)
- Dextroamphetamine (Dexadrine XR)
- Lisdexamphetamine (Vyvanse)
- Methylphenidate (Concerta and Daytrana Patch)
- Metadate CD
- Metadate ER
- Methylene ER
- Ritalin LA



STIMULANT SIDE EFFECTS

- Decreased Appetite
- Insomnia
- GI intolerance
- Increased Heart Rate
- Headache



FDA APPROVED NON STIMULANTS FOR THE TREATMENT OF ADHD

- **Atomoxetine** (Strattera) : Side effects of nausea, vomiting, GI pain, dizziness, somnolence, rash, increased heart rate or blood pressure, urinary retention, or liver injury(rare)
- **Qelbree**: Side effects of heart rate and blood pressure increase, insomnia, somnolence, headache, decreased appetite, nausea, dizziness, constipation
- **Guanfacine** (Intuniv): Side effects of somnolence, headache, fatigue, epigastric pain, nausea, lethargy, dizziness, irritability, decreased appetite, and hypotension



ALTERNATIVE MEDICATIONS

- **Bupropion** : Side effects of sedation, dry mouth, constipation, lower seizure threshold. Increases Dopamine.
- **Clonidine**: Side effects of rash, hypotension, Sedation. Calming effect.
- **Desipramine and Imipramine**: Side effects include cardiac conduction disturbances, xerostomia, urinary retention, and headache. Increases Serotonin.
- **Venlafaxine and Duloxetine** increase Norepinephrine
- These meds can be used as adjuncts or for primary management



STIMULANTS ARE THE MOST EFFECTIVE

- Non-stimulants are recommended if stimulants have been unhelpful, not a good fit with other prescribed medications, or do not work with current existing medical conditions.

PSYCHOSOCIAL TREATMENTS

- Parent Training
- Individualized Training Interventions
- Social Skills Training Clinics

PARENT TRAINING

- Recommended in parents of Preschool to Middle School Children. Focus to be given to positive behaviors and ignoring of minor negative behaviors.
- Consequences for targeted negative behaviors and supporting successful behavior.
- Address appropriate clear expectations and limits



TRAINING INTERVENTIONS

- Focuses on improving organization, time management, interpersonal skills, and works best for middle or high school children.
- Homework coaches to help students get past obstacles and reach their goals.



SOCIAL SKILLS TRAINING

- Children may benefit from social skills training in clinics, schools, summer camps, or individual counseling setting.
- Methods include role-play, modeling, practice, and positive feedback.
- The focus of social skills would be how to listen without interrupting. Teaching importance of eye contact and focusing on what is being said.
- Respecting others space and keeping their volume in check as to not interfere with other conversations.



DIET

Simple Sugars is an area of controversy, because research has not indicated a substantial connection. Perhaps some kids are more sensitive to sugar while others are not. However, the impact of simple sugar on serotonin could explain its implications.

Elimination Diets with removal of gluten or other antigenic foods to see if symptoms improve.

Elimination diets typically involved removal of Gluten, Casein, Soy, Corn, Egg, and Peanuts.

Artificial colors and flavors were offenders in most studies as potential instigator of increased ADHD symptoms.



SUPPLEMENTS

- Omega 3 Fatty Acids: ADHD children have lower RBC levels of omega 3
- Iron : ; 7 (#r:#fk.lgruhq#z lk#DGKG #kdyh#rz #huwlwq# dyyhov
- Zinc: alone not helpful but can reduce dosing of stimulant in children found deficient
- Magnesium: in 2 meta-anal but no randomized studies was found to help with hyperactivity not inattention
- A well- balanced diet could prevent potential need for supplements



ALTERNATIVE MODALITIES

- Meditation
- Mindfulness
- Yoga
- Thi Chi
- Nature
- Exercise
- MUSIC



SCHOOL BASED PROGRAMS

- Section 504 of the Rehabilitation Act of 1973 and the Individuals with Disabilities Education Act (IDEA). These laws provide guidance for the educations of all students with disabilities in public schools that receive federal funds.
- Accommodations to optimize learning for children with disabilities can include extended test time, reduced homework, extra study material, and supplemental class notes.



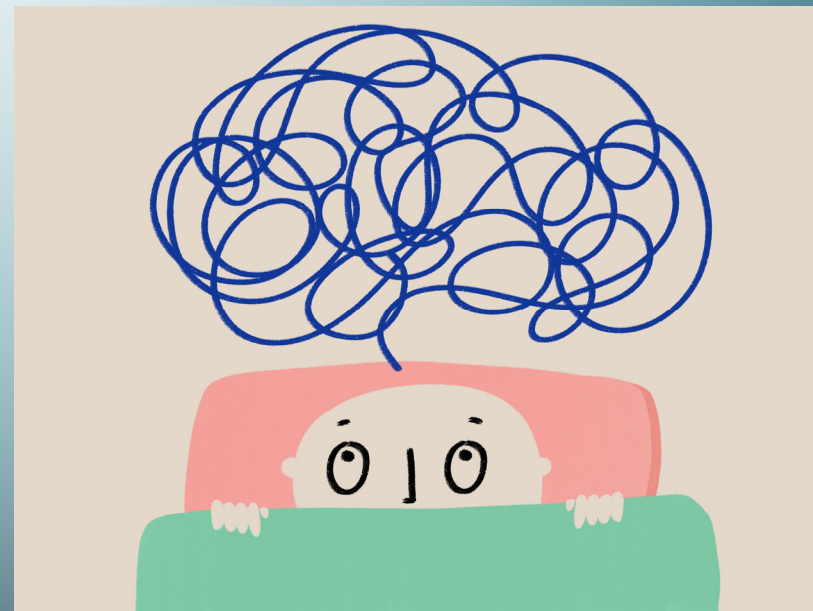
JOB ACCOMMODATIONS

- The Americans with Disabilities Act
- Americans with Disabilities Act Amendments Act of 2008
- The Job Accommodation Network offers services to assist in finding accommodations under these two laws.



SALLY 16 FEMALE

- Diagnosed since age 4
- Has Dysgraphia, using text to type
- Cannot complete homework or organize paperwork without assistance, also takes longer
- Struggles with Math and Science , becomes anxious with these subjects and has begun skin picking with these subjects as a means of soothing
- She likes drama and being animated
- Slow to wind down to get to sleep



SALLY 16 FEMALE

- Emotional Lability and can get LOUD
- Poor self Esteem and subsequent Depression from isolation due to impaired social skills
- Sometimes gets panic attacks and gets overwhelmed
- When gets stressed she ruminates and gets more anxious



SALLY 16 FEMALE

- Tried and failed on multiple meds .
Could not tolerate side effects. Made symptoms worse.
- Tried Behavioral training and has worked with an Occupational therapist since age 4
- Has been through 3 counsellors and did not work out with any, as she was not compliant with regimen recommended



SALLY 16 FEMALE

- At 14, She was found to have insufficient heart valve that causes chest pain when heart rate get over 100 and limits her physical activity and ability to take stimulants
- Ends up on two meds for anxiety and OCD , one for depression, and a nonstimulant for focus and continues to struggle.



SALLY 16 FEMALE

- Desk space and everything around it is in disarray which appears to be how she feels.
- Her parents work on a daily basis to help her with homework, organizing, transportation, working with school counselors, and putting out emotional fires.
- When she finally finds a medicine that helps focus somewhat , with the best dose for focus she starts losing weight and becoming more tired because the med upsets her stomach. Then has to be on lower dose than goal.
- Sally and her Family Continue to Struggle with her Condition, while hoping to find a better solution for her.



ADHD IS EXHAUSTING TO THOSE WHO HAVE IT TO
THOSE WHO LOVE AND WORK TO SUPPORT THEM



NATIONAL SUPPORT ORGANIZATIONS

- CHADD : Children and Adults with ADHD (chadd.org)
- ADDA : Attention Deficit Disorder Association (add.org)



MAGAZINES ABOUT ADHD

- ADDitude: Strategies and Support for ADHD and LD
- Attention Magazine printed by CHADD six times per year



PODCASTS

- ADDitude ADHD Experts Podcast: Leading Experts in the ADHD World share their knowledge.
- Distraction with Dr. Ned Hallowell: Dr. Hallowell is an ADHD expert, author, and psychiatrist

