ADHD
Attention deficit hyperactivity disorder

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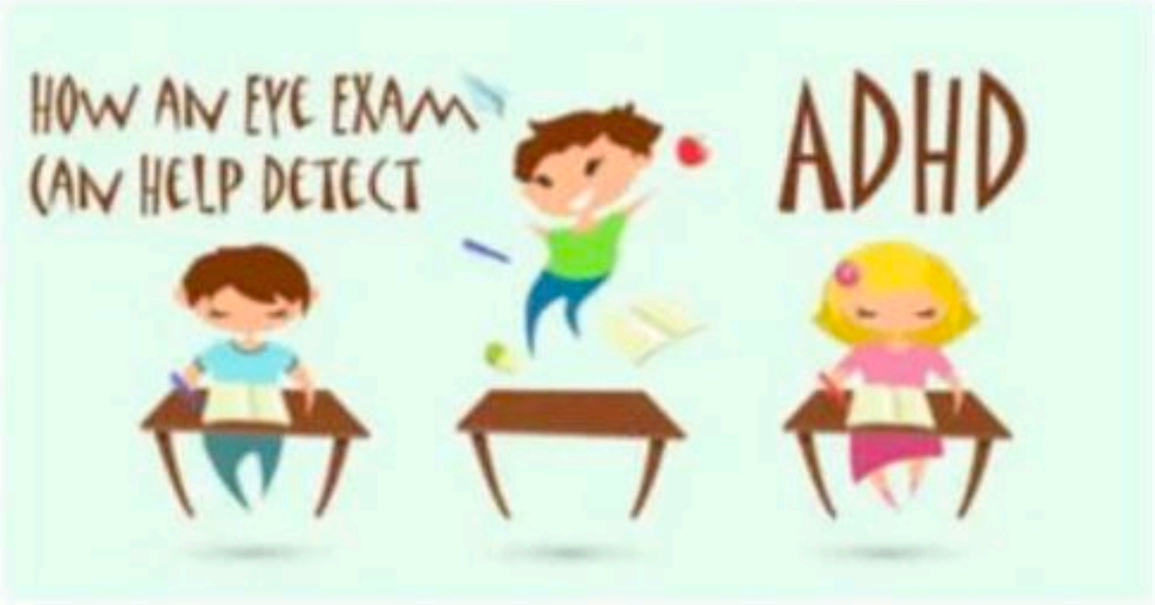
DEFINITION

ADHD is consists of persistent pattern of in attention and hyperactive and impulsive behaviour.



ADHD subcategories

- A. Predominantly inattentive type
- B. Predominantly hyperactive type
- C. Combined type

Inattentive Symptoms

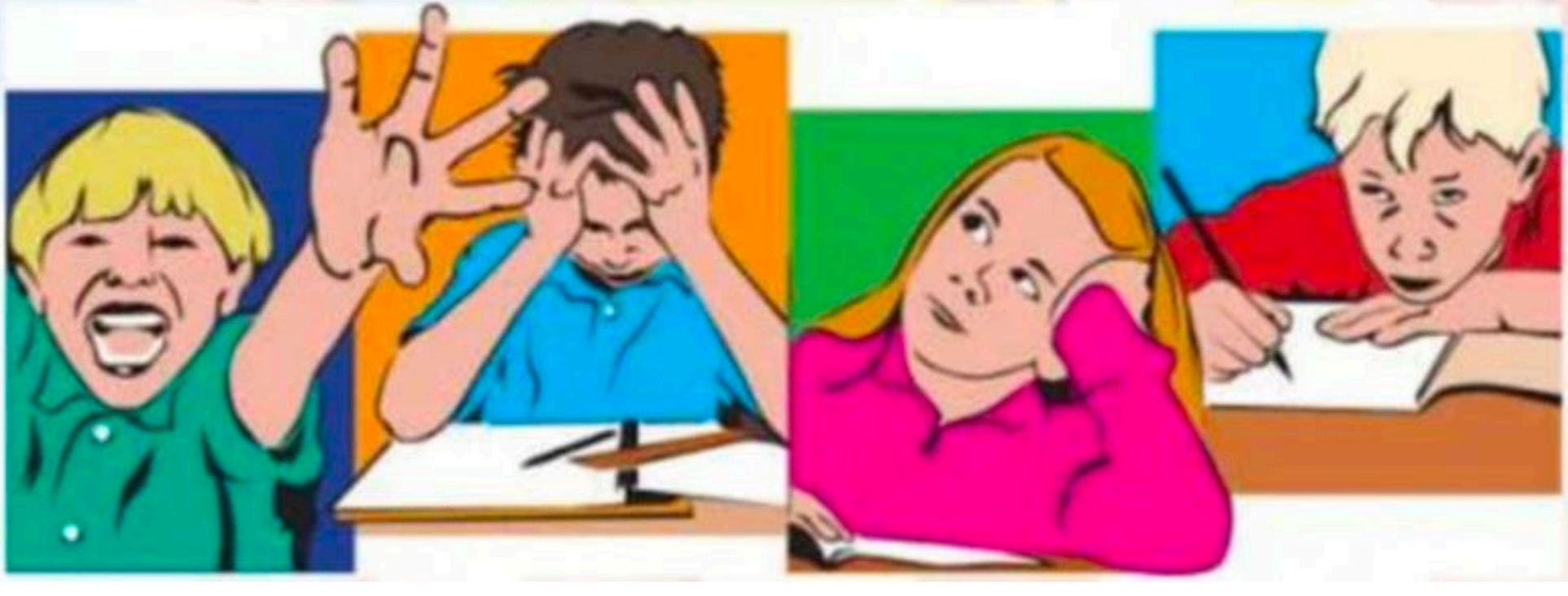
- Fails to give close attention to details or makes careless mistakes.
- Has difficulty sustaining attention.
- Does not appear to listen.
- Struggles to follow through on instructions.
- Has difficulty with organization.
- Avoids or dislikes tasks requiring a lot of thinking.
- Loses things.
- Is easily distracted.
- Is forgetful in daily activities.

Hyperactivity Symptoms

- Fidgets with hands or feet or squirms in chair.
- Has difficulty remaining seated.
- Runs about or climbs excessively in childhood; extreme restlessness in adults.
- Difficulty engaging in activities quietly.
- Acts as if driven by a motor; may be an internal sensation in adults.
- Talks excessively.
- Blurts out answers before questions have been completed.
- Difficulty waiting or taking turns.
- Interrupts or intrudes upon others.

3) ADHD combined Presentation

Clients with both inattention, hyperactive- impulse symptoms



ADHD Epidemiology

* Four times more common in Male
* 3 - 5% school age children (6 to 12 year old)
* Symptoms persist to adulthood up to 2/3 of cases

Prognosis

- Stable through adolescence.
- Many continue to have symptoms as adults.(inattentive > hyperactive)
- High incidence of comorbid oppositional defiant disorder, conduct disorder(CD), and specific learning disorder.

Diagnosis

- Two symptom domains: - inattentiveness and hyperactivity/impulsivity.
- Symptoms >6 months and present in two or more settings (e.g., home, school, work) .
- Symptoms not due to another mental disorder.

DSM-5 Criteria

1. At least six inattentive symptoms and/or At least six hyperactivity/impulsivity symptoms .
2. Symptoms interfere with or reduce quality of social/academic/occupational functioning .
3. Onset prior to age 12, but can be diagnosed retrospectively in adulthood
4. Females present more often with inattentive symptoms.

ATTENTION DEFICIT HYPERACTIVITY DISORDER

INATTENTIVE ~ not paying attention

HYPERACTIVE / IMPULSIVE ~ overly active & impulsive

cause?

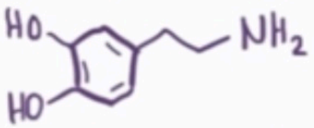
LOW LEVELS

↓

Symptoms of ADHD

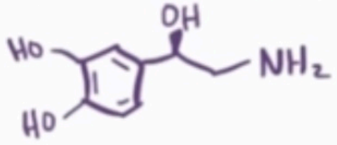
CAUSE: Environmental + Genetic factors

DOPAMINE

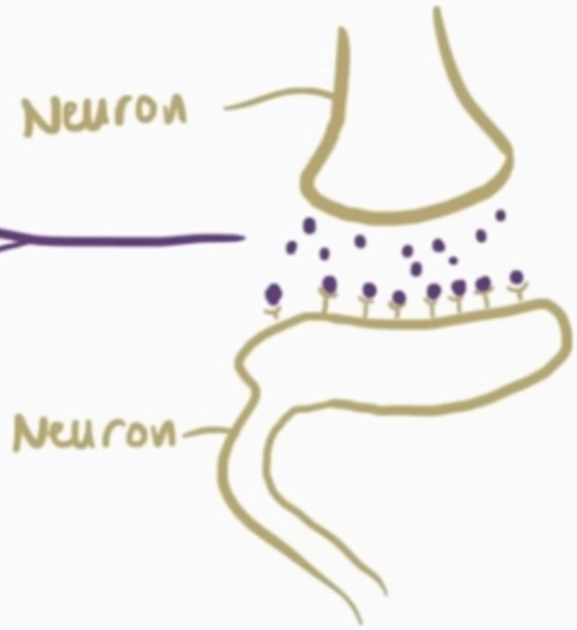


- reward, risk, impulsiveness

NOREPINEPHRINE



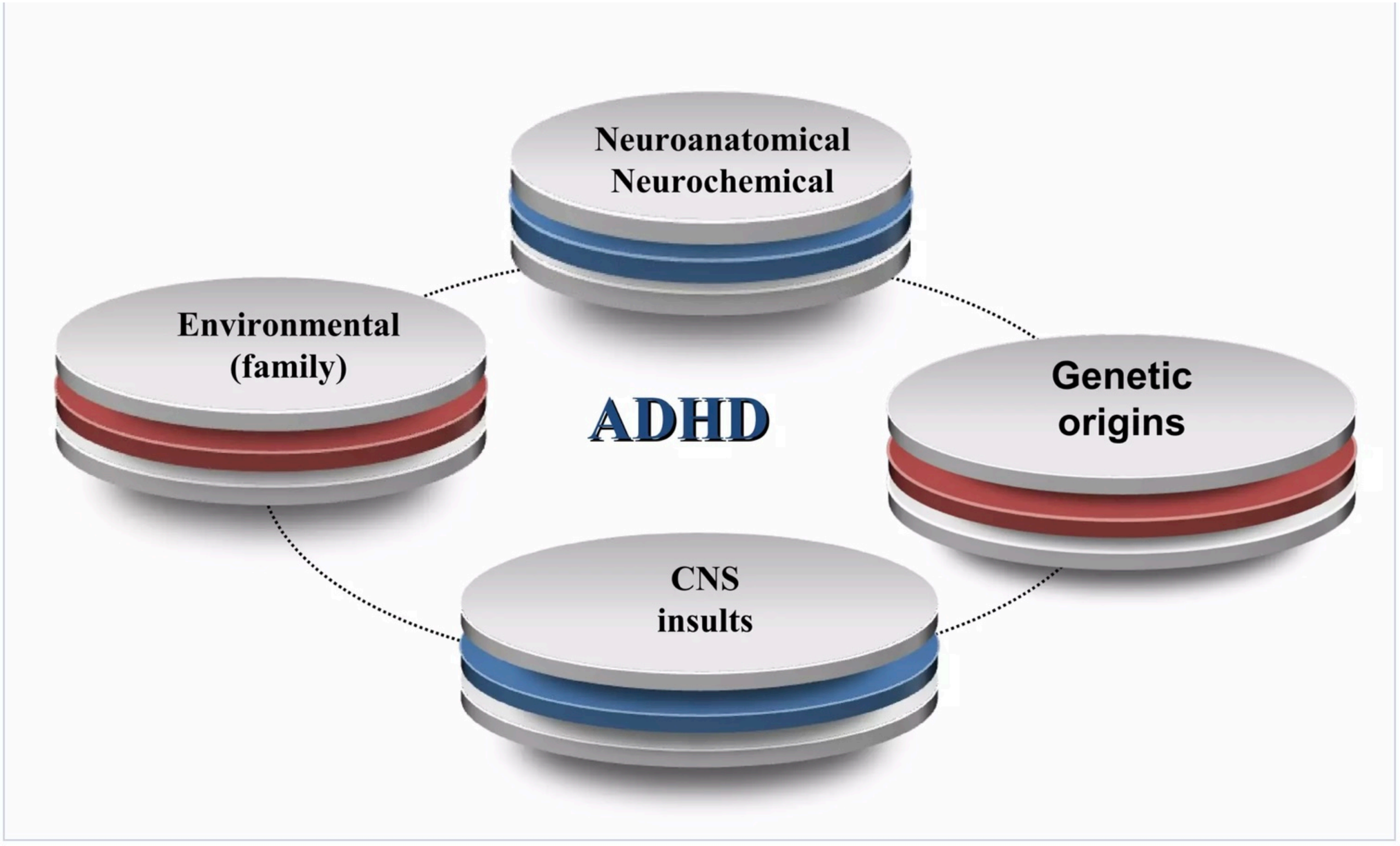
- attention & arousal



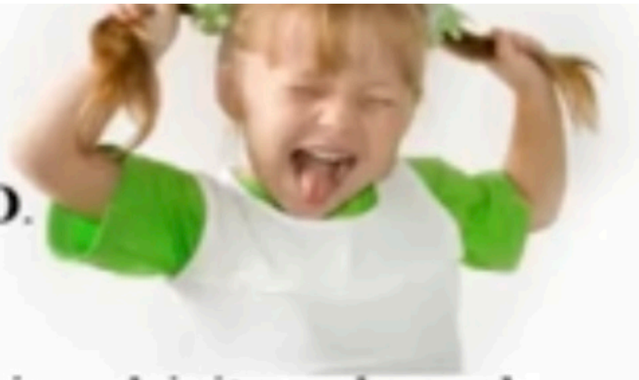
The etiology :-

- The etiology of ADHD is multifactorial and may include:
- **Genetic factors:** ↑ rate in first-degree relatives of affected individuals

- **Environmental factors:**
- Low birth weight, smoking during pregnancy, childhood abuse/neglect , neurotoxin/alcohol exposure


Neuroanatomical
Neurochemical
Environmental
(family)
ADHD
Genetic
origins
CNS
insults

➢ Causes and Pathophysiology:-



- The ***exact*** **pathology** of **ADHD** is ***not clear***.
- Both **genetic** and **environmental factors** ***contribute to*** **ADHD**.
  - **Neurotransmitters dopamine** and **norepinephrine** are ***implicated*** in the pathophysiology of ADHD;
    - * **Dopamine (DA)**; ***Involved*** in reward, risk taking, impulsivity and mood.
    - * **Norepinephrine (NE)**; ***Modulates*** attention, arousal and mood.
      - ***Brain studies*** on individuals with ADHD suggest a ***defect*** in the **DA receptor D_4 receptor gene** (responsible for modulate attention to and responses to one's environment) and ***overexpression*** of **dopamine transporter-1** (**DAT_1**; transport DA/NE into the presynapse ⇨ ↓ DA/NE in synapse).

ATTENTION DEFICIT HYPERACTIVITY DISORDER

INATTENTIVE ~ not paying attention

HYPERACTIVE / IMPULSIVE ~ overly active & impulsive

TREATMENT

↳ Behavioral psychotherapy

↳ Medication

Multimodal treatment plan:

Medication are the most effective treatment for decreasing core symptoms, but should be used in conjunction with educational and behavioral interventions

Attention Deficit Hyperactivity Disorder

Inattentive ~ not paying attention

Hyperactive / Impulsive ~ overly active & impulsive

Treatment

↳ Behavioral psychotherapy

Children

- time management
- organizational skills

} Parent + Teacher involvement

Parent → Behavioral parent training

Teacher involvement → Behavioral classroom management

Adults

- decrease distractions
- organizational skills

↳ Medication

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TREATMENT

↳ Behavioral psychotherapy

↳ Medication

Stimulants ~ ↑ neurotransmitters (e.g. dopamine)

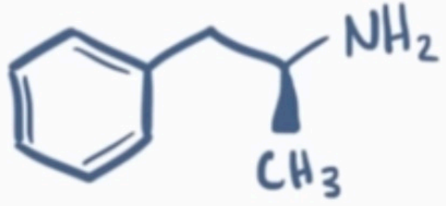
SLOW

Release DOPAMINE

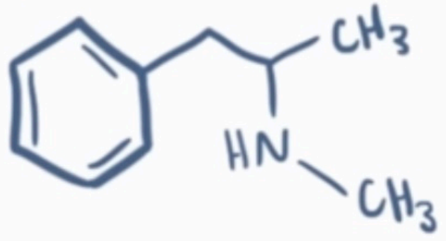
↳ controlled

↳ improve focus & attention

ADHD MEDICATION
(DEXTROAMPHETAMINE)



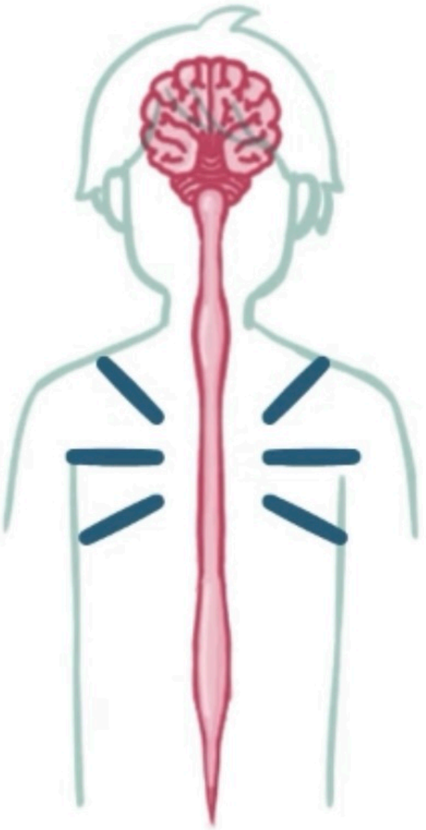
ILLICIT STIMULANT
(METHAMPHETAMINE)



(REALLY)
FAST
Release DOPAMINE
↳ EUPHORIA
↳ ADDICTIVE

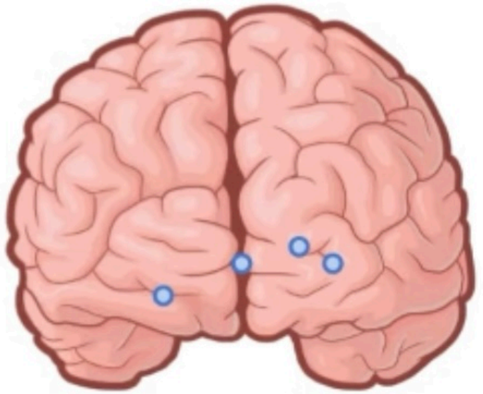
ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

* RANGE of BEHAVIORS CHARACTERIZED by INATTENTION, HYPERACTIVITY, & IMPULSIVITY
* SEVERAL MEDICATION GROUPS:
  - ~ CNS STIMULANT MEDICATIONS
  - ~ NOREPINEPHRINE REUPTAKE INHIBITORS
    - └ ATOMOXETINE
  - ~ ALPHA 2 ADRENERGIC AGONISTS
    - └ GUANFACINE
* ADJUVANT MEDICATIONS
  - ~ ANTIDEPRESSANTS
    - └ SEROTONIN-NOREPINEPHRINE REUPTAKE INHIBITORS like VENLAFAXINE
    - └ TRICYCLIC ANTIDEPRESSANTS like IMIPRAMINE
  - ~ ANTIPSYCHOTICS
    - └ RISPERIDONE

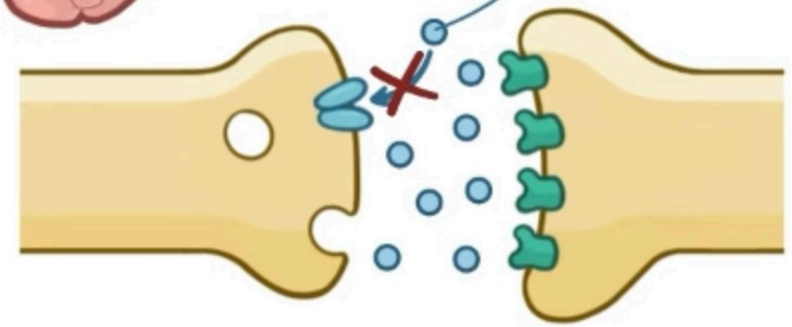


STIMULANT MEDICATIONS

* AMPHETAMINE
* DEXTROAMPHETAMINE
* LISDEXAMFETAMINE
* METHYLPHENIDATE



NEUROTRANSMITTERS
NOREPINEPHRINE &
DOPAMINE

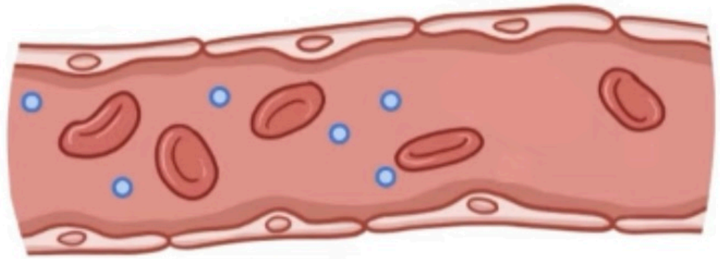


SYNAPTIC CLEFT

↓

TRANSDERMALLY

ABSORBED into BLOODSTREAM



~ ↑ FOCUS & ATTENTION
~ ↓ IMPULSIVITY

SIDE EFFECTS

* CNS STIMULANTS are HIGHLY ADDICTIVE

WARNING

* POTENTIAL ABUSE & DEPENDENCE

* TACHYCARDIA
* PALPITATIONS
* HYPERTENSION
* ARRHYTHMIAS

* HYPERACTIVITY
* IRRITABILITY
* INSOMNIA
* ANOREXIA
* WEIGHT LOSS

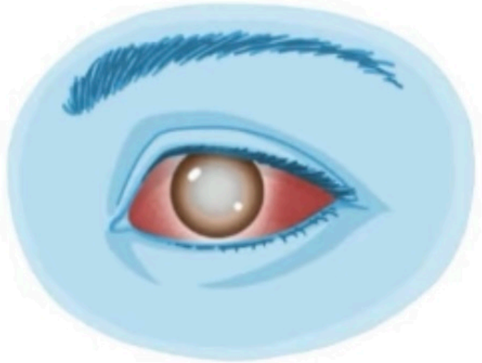
* HEADACHES
* DIZZINESS
* TREMORS
* SEIZURES

WARNING

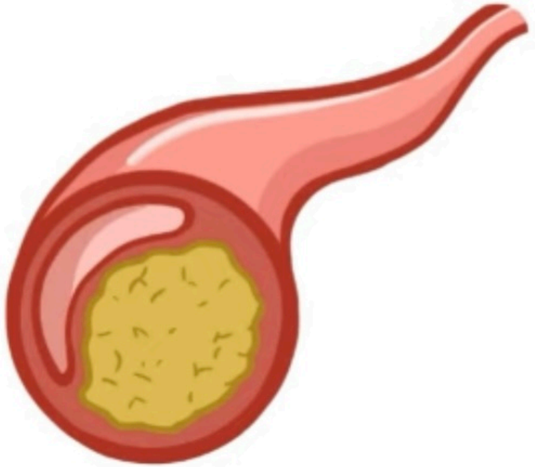
* SERIOUS CARDIOVASCULAR DISEASE
  - MYOCARDIAL INFARCTION
  - SUDDEN DEATH

CONTRAINDICATIONS

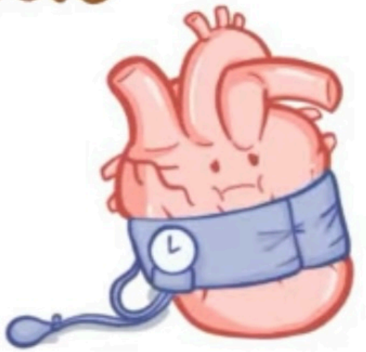
* SEVERE ARTERIOSCLEROSIS
* SYMPTOMATIC CARDIOVASCULAR DISEASE
* MODERATE to SEVERE HYPERTENSION



* GLAUCOMA
* HYPERTHYROIDISM
* HISTORY of SUBSTANCE ABUSE

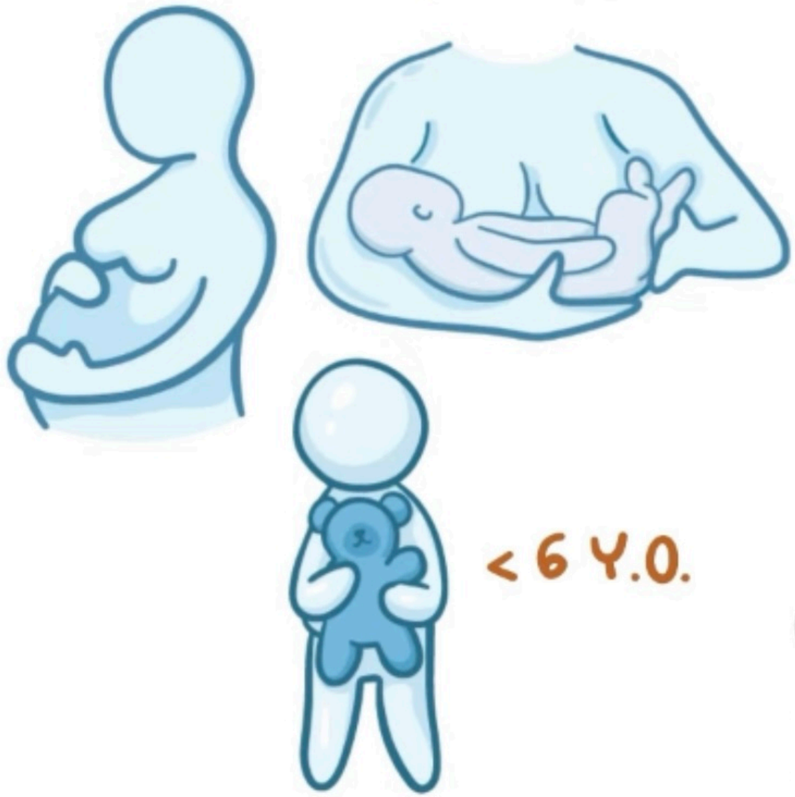


* DURING or w/in 14 days of TREATMENT with MONOAMINE OXIDASE INHIBITORS (MAOIs) → HYPERTENSIVE CRISIS



CONTRAINDICATIONS

* TAKE PRECAUTIONS:



< 6 Y.O.

* USE with CAUTION:
  - ~ HISTORY of SEIZURES or MYOCARDIAL INFARCTION
  - ~ CARDIOVASCULAR DISEASE
  - ~ PSYCHIATRIC CONDITIONS
    - └ ANOREXIA NERVOSA
    - └ DEPRESSION
    - └ BIPOLAR DISORDER

NURSING CONSIDERATIONS & CLIENT EDUCATION

* PEDIATRIC CLIENT w/ ADHD PRESCRIBED CNS STIMULANT
  - METHYLPHENIDATE

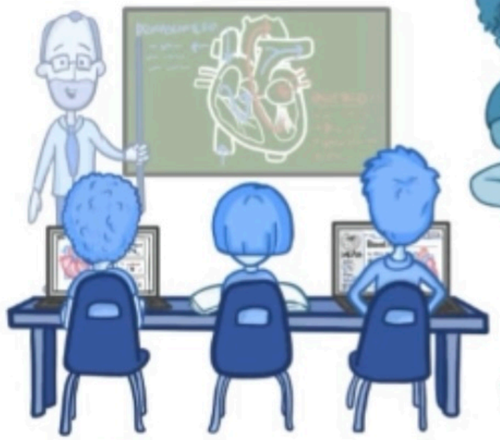
~ FOCUSED BASELINE ASSESSMENT
- HEIGHT
- WEIGHT
- CARDIAC ASSESSMENT
- VITAL SIGNS
- BASELINE MENTAL STATUS
- SLEEP PATTERNS
- NUTRITIONAL HISTORY

~ REVIEW LABS
- CBC
- LIVER & RENAL FUNCTION TESTS

~ OTHER DIAGNOSTIC TESTS
- ECG

METHYLPHENIDATE

* ↓ SYMPTOMS of ADHD
* IMPROVE FUNCTIONING

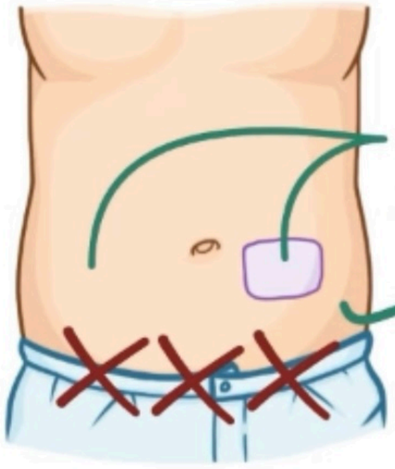


* IMMEDIATE-RELEASE MEDICATION ~~2x/day~~ 3x Doses
  - ~ 1x after BREAKFAST
  - ~ 1x in EARLY AFTERNOON

* EXTENDED-RELEASE MEDICATION
  - ~ 1x after BREAKFAST

* SIDE EFFECTS
  - ~ HEADACHES
  - ~ DIZZINESS
  - ~ TREMORS
  - ~ FAST HEARTBEAT
  - ~ PALPATIONS

* TRANSDERMAL PATCH
  - ~ NEW PATCH at SAME TIME each day
  - ~ WASH HANDS after HANDLING
  - ~ REMOVE after 9 hr



CLEAN, DRY, INTACT SKIN on ALTERNATING HIPS

MONITOR for REDNESS, BLISTER FORMATION, EDEMA, or other SIGNS of IRRITATION

ADVISE CAREGIVER

* MONITOR CHILD'S APPETITE & WEIGHT

* PROVIDE APPEALING, NUTRITIOUS MEALS

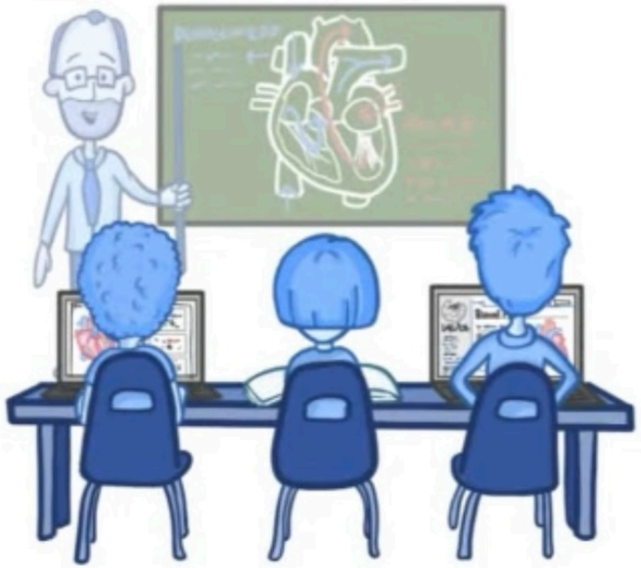
* KEEP a CLOSE EYE on CHILD'S MOOD
  - HYPERACTIVITY
  - IMPULSIVITY
  - AGGRESSIVENESS
  - SLEEP PATTERNS

* if MEDICATION NO LONGER HELPING
  - NOTIFY PEDIATRICIAN
  - NEVER DISCONTINUE MEDICATION ABRUPTLY

* KEEP MEDICATION in a SAFE, SECURE PLACE
  - PREVENT MISUSE

DURING TREATMENT with a CNS STIMULANT

* MONITOR RESPONSE to MEDICATION
* ASSESS EFFECTS ON:
  - ~ SLEEP
  - ~ APPETITE
  - ~ HEART RATE & BLOOD PRESSURE
* ASSESS THERAPEUTIC EFFECT of IMPROVED SOCIAL & ACADEMIC FUNCTIONING



- They improve symptoms in most patients.
- Typically start with short acting formulations for children (ages 5 years and under), but short or long acting for adults .

- ***When starting a medication;***
- **Start with a low dose and increase until you control symptoms with the least adverse effects.**
- **If side effects are severe reduce the dose or consider changing the medication.**
- **Extended release Clonidine & Guanificine are FDA approved as adjuvants.**

Stimulant Failure

- If one class of medication fails, then chose another!
- Consider non-stimulants like:
- Atmoxitine
- Guanificine
- Clonidine

- Second-line choice:
- ***Atomoxetine***, a norepinephrine reuptake inhibitor
- SNRI, sometimes tolerated better than stimulants, can reduce comorbid anxiety
- ***Alpha-2 agonists*** (e.g., clonidine, guanfacine) can be used instead of or as adjunctive therapy to stimulants .
- **Medications are the most effective treatment fordecreasing core symptoms, but should be used inconjunction with educational and behavioral interventions.**

Common side effects of Atmoxitine

- GI distress / Headaches
- Sedation
- Black box warning about suicidal ideation

It may take 2 weeks to see any results, it is taken daily, and you should taper it down when discontinuing it.

Common side effects of Alpha Agonists

- GI Distress/ Headaches
- Lowered HR & BP
- Sedation (seen more in Clonidine so may be used to help with insomnia).

A 10-year-old girl is referred for psychiatric evaluation because of academic and behavior problems at school over the last year. In the office, she is constantly on the move and appears to be "driven by a motor." During the interview, she has difficulty staying focused on the questions. Her mother complains that she never seems to pay attention. Her teacher reports that the patient does not follow directions. She has trouble waiting her turn and often blurts out answers during class. Although she seems to comprehend the material, she makes careless mistakes on homework and tests.

What is the most likely diagnosis?

What treatment is indicated?


Thank you