

ADHD

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What ADHD?

Attention-Deficit / Hyperactivity Disorder (ADHD) is a **neurodevelopmental disorder** characterized by a persistent pattern of **inattention**, **hyperactivity**, and **impulsivity** that interferes with functioning or development.

It reflects an underlying **deficit in executive functioning** and **self-regulation** due to alterations in the dopaminergic and noradrenergic pathways of the brain.



Epidemiology

Global prevalence
in children: about **5–7%**
in adult: **2.5-3.4%**

Sex: ♂ > ♀ (2:1)

Age of onset: usually before 12 years

Around 60% of affected children continue
to have symptoms into adulthood.



Causes of ADHD

In addition to genetics, scientists are studying other possible causes and risk factors including:



Genetics



Brain injury



Alcohol and tobacco use during pregnancy



Low birth weight



Premature delivery



Exposure to environmental (e.g., lead) during pregnancy or at a young age

Etiology

1 Genetic Factors

- Highly heritable; twin studies show concordance rates of 70–80%.
- Genes related to dopamine transport and receptor regulation (e.g., DRD4, DAT1) have been implicated.

2 Neurobiological Factors

- Dysfunction in fronto-striatal circuits, especially:
- Prefrontal cortex (responsible for attention and inhibition control)
- Basal ganglia and nucleus accumbens (reward and motivation)
- Dysregulation of dopamine (DA) and norepinephrine (NE) neurotransmission

3 Environmental Factors

- Prenatal exposure to nicotine, alcohol, or lead.
- Low birth weight and perinatal hypoxia.
- Psychosocial stressors may exacerbate symptoms but are not primary causes

TYPES OF ADHD IN CHILDREN

PREDOMINANTLY INATTENTIVE TYPE



- Difficulty staying focused
- Easily distracted
- Forgetting tasks easily

PREDOMINANTLY HYPERACTIVE/IMPULSIVE TYPE



- Always restless
- Talks too much
- Acts without thinking about consequences

COMBINED TYPE



- Symptoms of both inattentiveness and hyperactivity/impulsivity

Diagnosis:

- Clinical diagnosis based on DSM-5 criteria.

DSM-5 Criteria for ADHD:

to diagnose ADHD, there must be a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development

A.Symptoms

1. Inattention:

≥ 6 symptoms (for at least 6 months) inconsistent with developmental level and that negatively impact functioning.
(For age 17 and older: ≥ 5 symptoms)

2. Hyperactivity and Impulsivity:

≥ 6 symptoms (for at least 6 months) inconsistent with developmental level and that negatively impact functioning.
(For age 17 and older: ≥ 5 symptoms)

ADHD Overview

SIGNS OF INATTENTION



Difficulty with sustained attention



Difficulty breaking large projects down



Losing objects



Forgetfulness



Avoidance of tasks requiring sustained attention



Distractibility



Overlooking details



Daydreaming & spacing in conversations



Appearing not to listen

ADHD Overview

SIGNS OF IMPULSIVITY/HYPERACTIVITY



Excessive talking



Fidgeting



Difficulty sitting still



Difficulty with quiet



Difficulty engaging in leisure activities



Difficulty resting



Intruding/interrupting others



Restlessness (can be internal)



Difficulty waiting turn/impatience

For a diagnosis, 6 of the 9 traits of impulsivity/hyperactivity must be present. Or 5 out of 9 for adults (but must be able to demonstrate traits were present before age 12).

DSM5....

B. Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.

C. Several symptoms are present in two or more settings

(e.g., at home, school, or work; with friends or relatives; in other activities).

D. Clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder

(e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

Differential Diagnosis

Key Difference

Anxiety disorder

Concentration worsens due to worry, not inattention.

Depression

Decreased concentration secondary to low mood.

Bipolar disorder

Symptoms are episodic (mania/depression), not continuous.

Substance use

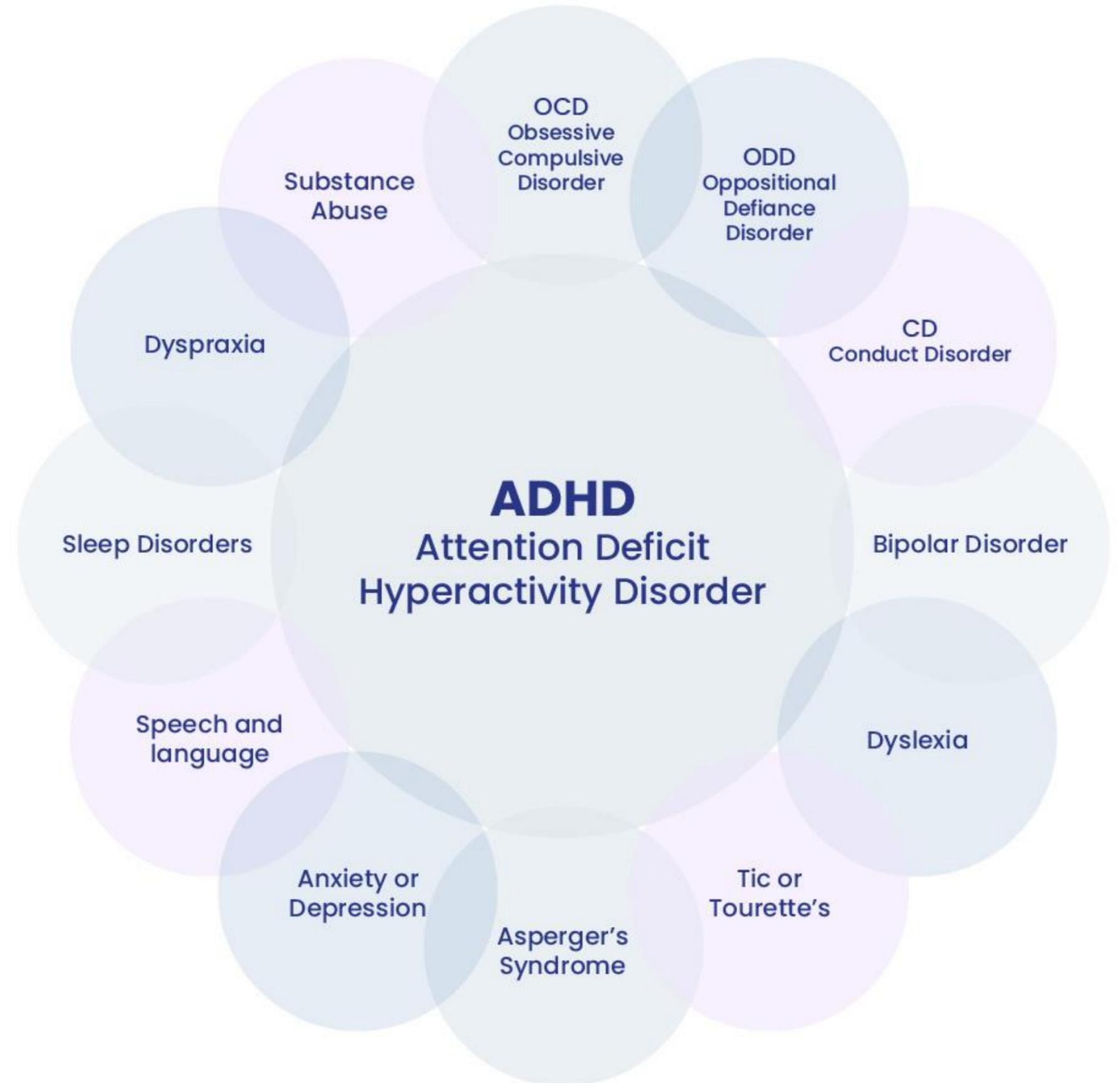
May cause secondary attention deficits.

BPD	ADHD
Impulsive under stress (may self-harm)	Impulsive anytime
Extreme mood swings	Mood swings (mild/moderate)
Rejection + fear of abandonment	Rejection sensitivity
Intense, unstable relationships	Social issues from distraction
Starts in adolescence	Starts in childhood
Feels empty without strong emotional connection	Craves novelty

Anxiety	ADHD
Distracted by internal thoughts	Distracted by external stuff
Avoids stimulation	Craves stimulation
Overthinks before acting	Impulsive
Tense/anxious	Restless/hyper
Worry issue (can't stop thinking)	Motivation issue (can't start)

Comorbidity with ADHD

The most common : anxiety disorder
secone most common: depression



ADHD PROGRESSION

Clinical progression



Smoking initiation

Behavioural disinhibition, emotional ability and emergence of diagnosis in preschool years

Prodrome: hyperactivity; and speech, language and motor coordination problems

Full expression of ADHD, psychiatric co-morbidity, school failure, peer rejection and neurocognitive dysfunction

Inattention persists and hyperactive-impulsive symptoms wane
Substance abuse, low self-esteem and social disability

Marital discord

Forensic issues

Poor quality of life

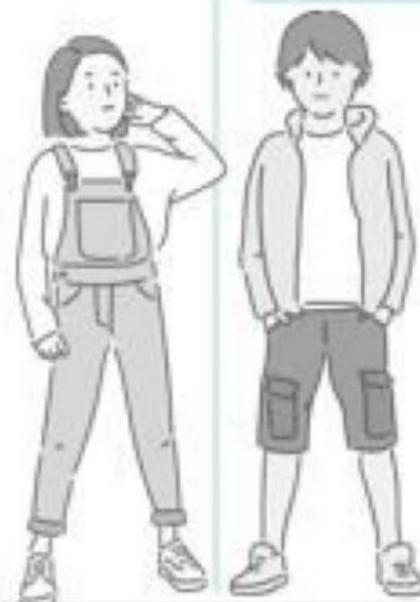
Accidents and traffic violations



In utero



Childhood



Adolescence



Adulthood

If not treated, the outcome gets worse as time progresses.

Perfect ✨ – let's go through this step by step so you can **confidently explain this slide** to your doctor and classmates in your presentation.

You can follow this structure (as if you're presenting):

Title: ADHD Progression

Introduction

"This slide shows how ADHD progresses across the lifespan – starting even before birth (in utero), through childhood, adolescence, and into adulthood – and how symptoms and complications change over time."

1. In Utero (Before Birth)

- Research shows **ADHD has neurodevelopmental origins.**
- **Genetic and prenatal factors** (like maternal smoking, alcohol use, stress, or premature birth) can affect fetal brain development, especially dopamine pathways.
- These early influences set the stage for **hyperactivity and attention problems** later.

2. Childhood

"This is when ADHD usually becomes clinically noticeable."

Prodrome (Early Signs)

- Early **hyperactivity**, and sometimes **speech, language, and motor coordination problems.**
- The child might seem more restless or talkative than others.

Clinical Presentation

- **Behavioral disinhibition:** difficulty controlling impulses or behavior.
- **Emotional lability:** rapid mood changes or overreacting emotionally.
- Diagnosis often becomes **clear in preschool or early school years**, when structure and attention demands increase.

Consequences if Untreated

- As the slide says: *'If not treated, the outcome gets worse as time progresses.'*
- Children may experience **academic problems, peer rejection, and low self-esteem.**

3. Adolescence

"During teenage years, symptoms may change – hyperactivity may decrease, but inattention often persists."

- This period shows the **full expression of ADHD** with:
- **Psychiatric comorbidities** (e.g., anxiety, depression, conduct disorder).
- **School failure** due to inattention or impulsivity.
- **Peer rejection and neurocognitive dysfunction** (executive function deficits).
- Some may start **smoking or substance use** – often as a way to self-medicate attention or mood problems.



4. Adulthood

“ADHD doesn’t disappear – many symptoms persist, though they may look different.”

- **Inattention** often remains, while **hyperactivity-impulsivity may decrease**.
- Adult consequences can include:
 - **Substance abuse**
 - **Low self-esteem and social disability**
 - **Marital and relationship issues**
 - **Forensic problems** (like risky or impulsive behavior)
 - **Poor quality of life**
 - **Accidents and traffic violations**



Key Message

“If ADHD is not treated early, the outcome gets progressively worse over time – affecting school, relationships, work, and safety.”

Early diagnosis and management can prevent these long-term complications.



Management (as shown at the bottom)

- Treatment aims to:
 - **Reduce symptoms**
 - **Improve functioning**
- **Support development** across life settings (home, school, work)
- Management is **multimodal**, involving:
 - **Medication** (e.g., stimulants)
 - **Behavioral therapy**
 - **Educational and family support**



How to End Your Presentation

You can conclude with:

“So, ADHD is not just a childhood disorder. It begins early, evolves over time, and can persist into adulthood – which makes early recognition and continuous support crucial for better long-term outcomes.”

Would you like me to help you write your **spoken script** (what exactly to say during the presentation, in smooth and natural English)?

management:

Treatment aims to reduce symptoms, improve functioning, and support development across settings (home, school, work, etc.). Management is usually multimodal, involving a combination of medication, behavioral therapy, psychoeducation, and environmental support.

Approach

Initiate first-line management based on the individual's age.

Children 4–5 years of age: behavioral interventions alone

Children \geq 6 years of age and adults: pharmacotherapy with adjunctive behavioral interventions

Educate patients and caregivers on ADHD

Children may be eligible for accommodations at school; caregivers should contact their school district

Ensure patients get [regular physical activity](#) and sufficient sleep.

Manage comorbid mental health conditions, e.g., [anxiety](#), [depression](#), [substance use disorder](#).

Schedule regular [follow-up for patients with ADHD](#).

management:

Treatment aims to reduce symptoms, improve functioning, and support development across settings (home, school, work, etc.). Management is usually multimodal, involving a combination of medication, behavioral therapy, psychoeducation, and environmental support.

Step 1: Confirm diagnosis and baseline assessment

- Confirm the diagnosis of ADHD (per American Academy of Pediatrics [AAP] guideline) in children age 4-18: assess symptom presentation (inattention, hyperactivity/impulsivity), functional impairment, onset in childhood, presence across settings.
- Obtain baseline measures: height, weight, blood pressure, heart rate, cardiac history (especially if stimulants are to be used) because stimulants carry cardiovascular risk.
- Screen for comorbidities (eg. anxiety, tics, learning disorders, substance use) because they may affect treatment choice.
- For younger children (age 4-6): behaviour interventions are first line. Medication may be considered only if behavioural therapy insufficient.
- The FDA states two major categories of approved medications: stimulants (eg. methylphenidate, amphetamine) and non-stimulants (eg. atomoxetine).
- Choose stimulant medication as first-line in most cases, unless contraindicated.

mamagment:

pharmacological Treatment:

A. Stimulants (First-line treatment)

Examples:

Methylphenidate

- Immediate-release (Ritalin):
 - Start: 5 mg once or twice daily (morning and noon).
 - Increase by 5–10 mg weekly based on response.
 - Usual effective dose: 20–30 mg/day.
 - Maximum: 60 mg/day.
- Extended-release (Concerta):
- Start: 18 mg once daily in the morning.
- Increase by 18 mg increments every 1–2 weeks.
- Max dose: 54 mg/day (children), 72 mg/day (adolescents).

amphetamines (e.g., Adderall, Vyvanse)

- Adderall (mixed amphetamine salts, IR):
 - Start: 2.5–5 mg once or twice daily.
 - Increase by 5 mg weekly as needed.
 - Usual dose: 10–30 mg/day.
 - Max: 40 mg/day.
- Vyvanse (Lisdexamfetamine):
 - Start: 20–30 mg once daily in the morning.
 - Increase by 10–20 mg weekly.
 - Max dose: 70 mg/day.

Mechanism: Increase dopamine and norepinephrine in the brain.

Benefits: Rapid onset, effective in ~70–80% of cases.

Side Effects: Insomnia, decreased appetite, weight loss headache, increased heart rate.

Monitoring:

- Heart rate, blood pressure, weight, appetite, sleep, tics.
- Reassess every 2–4 weeks initially.



mamagment:

pharmacological Treatment:

A. Stimulants (First-line treatment):

Contraindications

1. Cardiovascular Conditions (Risk sudden cardiac death in vulnerable individuals)
2. Psychiatric Disorders (as Marked anxiety, tension, or agitation)
because Stimulants can worsen anxiety or cause panic attacks.
3. MAOI Use (Monoamine Oxidase Inhibitors)
Risk of hypertensive crisis or serotonin syndrom
4. Glaucoma
Stimulants can increase intraocular pressure
5. History of Substance Abuse
Risk of misuse or addiction (especially amphetamines)

management:

B. Non-stimulants

Used when stimulants are not effective or cause intolerable side effects.

in certain cases (comorbid tics, sleep disorders)

Atomoxetine (Strattera)

Norepinephrine reuptake inhibitor (selective)

Dose:Start: 0.5 mg/kg/day.

- After ≥ 3 days, increase to 1.2 mg/kg/day (max 1.4 mg/kg/day or 100 mg/day, whichever is less).
- Given once or twice daily.
- Takes 2–4 weeks for full effect

- **Contraindications**
- Severe cardiovascular disorders, Pheochromocytoma, Glaucoma
- MAOI use within 14 days (risk of hypertensive crisis or

Side Effects

Common:

Decreased appetite

Nausea, vomiting

Fatigue

Dizziness

Mood swings or irritability

Less common but serious:

Increased risk of suicidal ideation

(especially in children/adolescents) → Warning

Liver injury (rare)

Urinary retention or sexual side effects

(e.g., erectile dysfunction in males)



mamagment:

Non-stimulants:

Alpha-2 agonists

Guanfacine (Intuniv), Clonidine

Mechanism: Alpha-2 adrenergic agonists – reduce hyperactivity and impulsivity.

Useful if child has sleep problems, tics, or aggressive behavior.

Clonidine XR:

- Start: 0.1 mg at bedtime.
- Increase by 0.1 mg weekly as needed (divided twice daily).
- Max: 0.4 mg/day.

Monitoring:

BP, HR (may cause hypotension, bradycardia, sedation).

Side Effects:

Common:

Sedation, drowsiness

Fatigue

Dry mouth

Dizziness, low blood pressure

Irritability

Less common:

Bradycardia (slow heart rate)

Rebound hypertension if stopped suddenly (especially with clonidine)

contrindications :

Severe hypotension

bradycardia

History of syncope related to heart conduction problems

Hypersensitivity to the drug

mamagment:

Non-stimulants:

Bupropion (Wellbutrin)

Class: Atypical antidepressant (norepinephrine–dopamine reuptake inhibitor, NDRI).

- Mechanism: Increases dopamine and norepinephrine levels in the synaptic cleft – neurotransmitters involved in attention and executive function

side effects :

Common:

Insomnia

Dry mouth

Headache

Weight loss

Serious (but rare):

Seizures (dose-dependent risk)

Anxiety or agitation

Increased suicidal ideation in youth (Black Box Warning)

Contraindications of Bupropion

Seizure disorders

Current or prior diagnosis of bulimia or anorexia nervosa

Known hypersensitivity to bupropion

MAOI use within 14 days

management:

Behavioral and Psychosocial Interventions

A. Behavioral Therapy (Especially effective in children):

Parent training in behavior management (PTBM)
Classroom behavior management
Positive reinforcement, token
economy systems

Cognitive Behavioral Therapy (CBT):

More effective in adolescents and adults
Focuses on developing coping skills, time management,
organizational strategies

C. Psychoeducation:

Helps patients and families understand the condition
Improves treatment adherence and coping

School and Workplace Support :

Individualized Education Plans (IEP) or 504 Plans
in schools

Classroom accommodations: extra time, reduced
distractions, shorter assignments

Workplace accommodations: flexible scheduling,
written instructions, structured environment

Lifestyle and Environmental Modifications:

Regular physical activity

Adequate sleep

Balanced diet (e.g., reducing sugar and
additives may help some)

Reducing screen time

Structured routines

management:

Family and Social Support

Parent support groups

Family therapy (especially if family dynamics are affected)

Social skills training for children

Monitoring and Follow-Up:

Regular follow-up to assess:

Symptom control

Medication side effects

Academic or occupational performance

Monitor growth (height/weight), cardiovascular parameters (BP/HR), potential for misuse/abuse especially in adolescents.

Mental health (e.g., comorbid anxiety, depression)

Consider Comorbidities

Many individuals with ADHD also have:

Learning disabilities

Anxiety or mood disorders

Oppositional defiant disorder (ODD)

Conduct disorder

Tic disorders

Treatment should be tailored accordingly.

The End

THANK YOU FOR LISTENING



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Microsoft 365 Copilot: <https://aka.ms/GetM365>