Psychopharmacological Management of ADHD in Young Adults

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Disclosures

- **Richard J. Miller, MD, FAACAP**
  - No commercial conflicts of interest

  - Medications may be referred to by “Brand Name©,” for clarity.
  - Off-label use of medications will be discussed and identified.

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Learning Objectives

After attending this session, the participants will be able to:

- Be familiar with the medications available to treat ADHD and the difference between various formulations.
- Initiate, adjust and monitor treatment with ADHD medications.
- Know how to modify treatment if there are adverse effects, poor response or comorbid conditions.
- How to address medication shortages, if and when they occur.

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What is Attention Deficit Hyperactivity Disorder?

- **Persistent difficulties with inattention, hyperactivity & impulsivity, that is out of proportion to developmental expectations, and to the extent that it significantly interferes with functioning or development.**
- One of the most common neurobehavioral disorders of childhood, but symptoms often persists through adolescence and adulthood. (~50%)
- ADHD can not only profoundly affect early learning, behavior and social development in children, but it also has lifelong effects on interpersonal functioning, academic & professional achievement.

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Some Statistics

- The overall prevalence of adult ADHD is at least 4.4 %
  - Males (5.4%)
  - Females (3.2%).
  - The Non-Hispanic White group (5.4%) had a higher prevalence than all other race/ethnicity groups.
- Of those diagnosed during childhood:
  - 60% had some symptoms persisting into adulthood
  - 40% Had significant impairment*
    - *necessary to meet Dx criteria.

Kessler, Danielson, Et al 2016
Staley, 2024
Sibley, et al

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ADHD Diagnostic Criteria - DSM 5-TR

- 5 or more symptoms (6 if under 18y), out of a list of 9 each of Inattention and/or Hyperactivity/Impulsivity
- Symptoms need to be:
  - Persistent for ≥ 6 months
  - Be more pronounced than expected for the developmental level of the child/adult
  - Significantly interfere with functioning & occur in 2 or more settings (e.g., home, social, school, work)
  - Several symptoms present before age 12
  - Symptoms are not better explained by another mental condition and do not occur only during the course of another disorder.
- Presentations:
  - Inattentive, Hyperactive/Impulsive, Combined, Other Specified
  - May change over time

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ADHD Diagnostic Criteria: DSM 5-TR

INATTENTION

- ❑ **Careless/inattention to detail**
  Often fails to give close attention to details or makes careless, overlooks or misses details, work is inaccurate).
- ❑ **Problem concentrating**
  Often has difficulty sustaining attention (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
- ❑ **Doesn't seem to listen**
  Mind seems elsewhere, even in the absence of any obvious distraction).
- ❑ **Doesn't finish tasks**
  Schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- ❑ **Difficulty organizing**
  Managing sequential tasks; messy, disorganized; poor time management; fails to meet deadlines.
- ❑ **Avoids tasks requiring sustained mental effort**
  Preparing reports, completing forms, reviewing lengthy papers).
- ❑ **Loses important items**
  Tools, wallets, keys, paperwork, eyeglasses, mobile telephones
- ❑ **Easily distracted**
- ❑ **Forgetful in daily activities**
  Chores, running errands, returning calls, paying bills, keeping appointments.

HYPERACTIVITY/IMPULSIVITY

- ❑ **Squirms/fidgets**
  Taps hands or feet or squirms in their seat.
- ❑ **Can't stay seated**
  e.g., leaves his or her place in the classroom, workplace, or in other situations that require remaining in place).
- ❑ **Runs/climbs excessively**
  Often unable to play or engage in leisure activities quietly
- ❑ **Can't work or play/engage in leisure activities) quietly**
- ❑ **On the go as if "Driven by a motor"**
  Unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
- ❑ **Talks Excessively**
- ❑ **Blurts Out Answers**
  e.g., completes people's sentences; cannot wait for their turn
- ❑ **Can't wait Turn or wait on line**
- ❑ **Intrudes/Interrupts-** May intrude into or take over what others are doing)

Differential Diagnosis

Attention, impulsivity, and hyperactivity are nonspecific common symptoms.

- Many conditions present with attention difficulties
- A symptom, even if prominent, does not make a syndrome.
- Other conditions may be misdiagnosed as ADHD but also may be co-occurring (64%!)
- One needs to look at the severity, pattern, and chronology before ruling other conditions in or out before making the diagnosis.
- When found, other conditions may need to be addressed first, and then the ADHD re-assessed.

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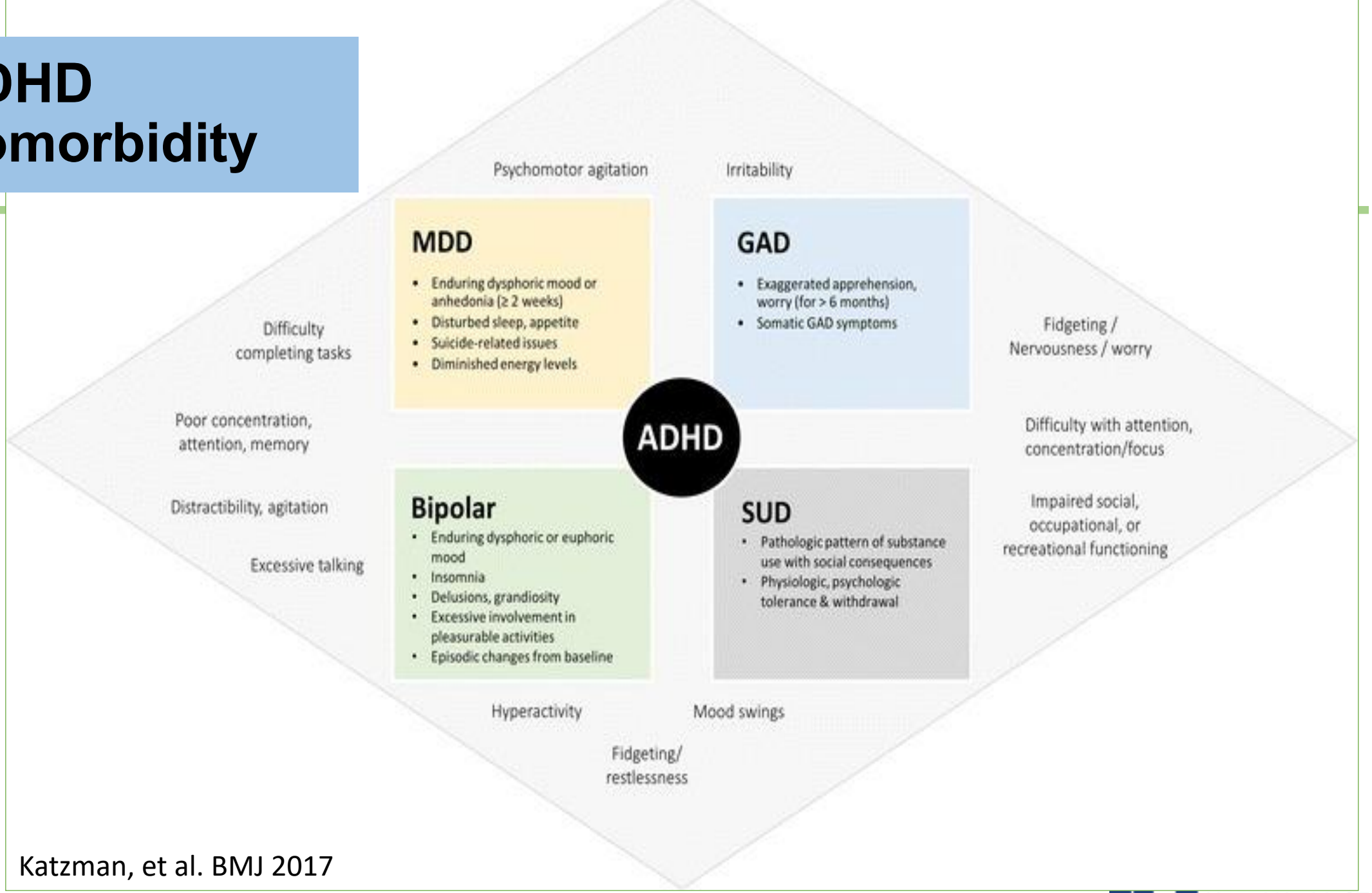
ADHD Comorbidity



Katzman, et al. BMJ 2017

Differentiating the Differential Diagnosis

DDX	Shared Symptoms	Differentiating Feature
Anxiety (33%)	Fidgety, difficulty concentrating	ADD Sx only when anxious, Persistent fear and worries. Risk avoidance vs risk taking, Somatic symptoms
Sleep Disorders (20-50%) Insomnia, deprivation, apnea, screen time, Sleep Phase D/O	↓Memory, inattention,	Sx improve with sleep, onset & course of Sx., Daytime sleepiness.
Substance Use(15%)	↓Memory, attention difficulties, impaired functioning	Presence of of substance use, onset & course i, Sx dur
Depression (17%)	↓ concentration and memory	Activity related to mood, loss of interest in activities, withdrawal, low energy
Bipolar D/O	Impulsive, hyperactive, ↑risk taking	Episodic, Sx fluctuate with mood, Onset & course of d/o, grandiosity, Psychosis?
Psychosis	Often first presents in young adults as ↓ concentration, exec. Functioning, memory	Late Sx onset, suspiciousness, withdrawal, unusual thinking, hallucinations
Tourette's/Tic D/O (5-20%) 60% of TD have comorbid ADHD	Poor impulse control, +/- hyperactivity	ADHD onset earlier (preschool), Tics mid elementary school
PTSD	Hyperarousal, reactive, impaired concentration	Hypervigilant vs inattention. Intrusive memories, Course of d/o
ASD (14%)	Inattention to what adults want	May be hyper focused on their interests, Social communication deficits
Learning D/O/ID (esp. Language/Auditory proc.)	Apparent inattention during language-based activities	Related to processing speed or inability to sustain level of concentration to compensate. Does better on tasks not impaired by LD
Other medical Conditions MTBI, TBI, Medication SE.	Inattention, memory. ,impulsivity	Onset & Course. Thyroid, Anemia, arrythmia- Hx PE and labs to differentiate

Danielson ML, et Al. 2018

Office Evaluation of ADHD

ADHD IS A CLINICAL DIAGNOSIS

- **Rule out other causes of impaired attention and check for comorbidities**
  - If found, these need to be addressed first, then ADHD reassessed.

Assessment **Includes:**

- **Chronological history of symptoms**
  - Home, school, work, and relationships
  - Past treatment and response
- **Request and review previous records/testing**, if available, preferably from childhood
- **Rating Scales**
  - SCREENS
    - **ADULT ADHD SCALES ASRS, Conners, Brown**
    - **Kids- Vanderbilt, Conners, SNAP Etc.)**
    - **PHQ 9, GAD, CRAFFT or other screens for common comorbidities**
- **Mental Health Assessment** (Including SUD & safety screen)
  - Patient Interview and Mental Status Exam
- Physical Assessment, Urine drug screens and other labs as indicated by medical assessment)

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Adult ADHD Screening Tools

FREE

- **ASRS SCREEN:** Adult **A**DHD **S**elf-**R**eport Scale (6 item screen)
  - https://www.hcp.med.harvard.edu/ncs/ftpdir/adhd/6Q_ASRS_English.pdf

- **Adult ADHD Self-Report Scale (ASRS) v1.1** (18 items)
  - SRS 6 item screen plus other helpful
  - https://contentmanager.med.uvm.edu/docs/default-source/ahec-documents/adult_adhd_self_report_scale.pdf?sfvrsn=2

NOT FREE

- Adult ADHD Clinical Diagnostic Scale (ACDS) v1.2
- Brown Attention-Deficit Disorder Symptom Assessment Scale (BADDS) for Adults
- Conners' Adult ADHD Rating Scales (CAARS). available from MHS systems
- DIVA 2.0 – Comprehensive diagnostic interview for Adult ADHD

Use what is included in your EHR

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Screening Tools Are Not Diagnostic!

95% of individuals without childhood ADHD who initially screened positive on symptom checklists were excluded from late-onset ADHD diagnosis after further evaluation!

- There was no evidence for adult-onset ADHD independent of a complex psychiatric history.
- Individuals seeking treatment for late-onset ADHD may be valid cases; However, more commonly, symptoms represent non impairing cognitive fluctuations, a comorbid disorder, or the cognitive effects of substance use.
- **False positive, late-onset ADHD cases are common without careful assessment.**
  - Clinicians should carefully assess impairment, psychiatric history, and substance use before treating potential late-onset cases.
- **Late Onset? → Consider psychiatric consultation, referral, and/or Neuropsychological Testing**

Sibley MH, et al., AJ Psychiatry 2018

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Refer for Psychiatry Consultation and/or Neuropsychological Testing?

Psychiatric Consultation or Referral?

- Diagnostic clarification and treatment recommendations
- Complex, atypical or late onset presentation (New symptoms in an adult or older adolescent is unlikely to be ADHD)
- Multiple comorbidities, Severe dysfunction
- Self Injury, Suicidal or homicidal ideation, possible psychosis or mania
- Substance use or dependence
- Previous treatment failures

➢ Call ACCESS MH with questions, consultation request or referral assistance

Neuropsychological Evaluation?

- Diagnostic clarification
- Late (post pubertal) onset
- Multiple comorbidities
- Learning/Intellectual Disabilities
- Traumatic Brain Injury
- Cognitive decline
- Complex presentations
- Concerns about possible malingering

➢ When referring, ask specific referral questions, note complications, and reasons why testing is necessary.

➢ AMHCT can help with referrals

The Primary Goals of Treatment

- **Minimize the impact of ADHD symptoms on patient's functioning, while maximizing their ability to adapt, compensate and cope**.
- **Medication management** temporarily reduces symptoms to facilitate developmental gains and maximize the effectiveness of interventions.
- **The primary treatments for ADHD are behavioral, psychosocial and academic interventions,** that facilitate the development of lifelong adaptation, positive self esteem, as well as to address comorbid conditions.

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RECOMMENDED PRIMARY CARE INTERVENTION

(Non-Pharmacological Interventions)

- **Review and refer for further assessment if needed, to clarify diagnosis or assess comorbid conditions. (Dx needs to be clarified before Tx).**
- **Provide education about ADHD over the lifespan.**
  - "**Don't necessarily grow out of it but can grow into it.**"
  - Use their own screen/interview answers as prompt for discussion or target symptoms.
  - **Executive functioning* deficits are often primary deficit in adult ADHD.**
    - *The ability to plan, organize, prioritize, and execute tasks and to reassess, modify and modify as needed to achieve goals.
    - Developing self regulation and organization (sticky accelerator +Bad brakes → learn to drive better!
  - **Review and recommend behavioral approaches, lifestyle and psychosocial interventions**.
  - **The importance of providing structure and routine in home and work**.
    - SLEEP, EATING, EXERCISE, SCREENTIME
- **Supply Patient Handouts, Resources**
  - ADDA www.ADD.org
  - CHADD www.CHADD.org
  - CDC ADHD Guide https://www.cdc.gov/ncbddd/adhd/index.html
  - ADDitude Magazine https://www.additudemag.com/

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Recommendations
Therapy Referral?

- Recommend/Refer for Appropriate Therapy for Comorbid Conditions
  - Address any Substance Use issues.
  - CBT (identifies and addresses dysfunctional thinking and behavior patterns)
  - Family or other counseling for relational issues, if needed.
  - Referral for ADHD/Executive Functioning or Organizational Coaching.
- If in school, refer for assessment and addressing any accommodations or other interventions as needed
- Referral for Psychiatric consultation and treatment if needed (for Dx clarity, Tx recommendations or med management)
- AMHCT can assist with consultations or referral

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Medication Management of ADHD

Attention is a dynamic process that involves:

- The ability to **select and maintain focus** on important stimuli.
  - Even when boring
- **Not be distracted** by competing stimuli  (or background noise)
- Need to be able to **shift back and forth fluidly** and dynamically between scanning background and maintaining focus.
  - Ex. Driving a Car

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ACTION OF ADHD MEDICATIONS

"Know your ingredients"

Medications for ADHD work by:

- Increasing both NOREPINEPHERINE (NE) and/or DOPAMINE (DA) activity in the Prefrontal Cortex (PFC)
- Norepinephrine and Dopamine have different, complimentary effects on attention and executive functioning.

Arnsten. JAACAP 4.2012

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NOREPINEPHERINE – Increases Central Focus

Norepinephrine

- **Activates an Alpha-2-Adrenergic receptor on Pre-Frontal Cortex (PFC) Glutamate neuron that promotes more attention to the central focus or the main "signal."**
  - This amplification in the signal "volume" has the effect of helping to maintain interest, even with lower levels of stimulation.
    - Ex. Classroom lecture vs video game
  - **↑ NE→ ↑ A2A→ ↑ Signal Strength =**

  - To much NE activity can result in "overstimulation" or "hyperarousal"
    (think three shots of espresso, irritability, jitteriness, insomnia)

Arnsten. JAACAP 4.2012

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DOPAMINE – Suppresses Background Distraction

Dopamine

- Acts on PFC Glutamate receptors that inhibit background signal strength.
- **Increases ability to suppresses attention to non-essential "background noise" (Distractions)** !
- Too much Dopaminergic activity can lead to too much suppression of background simulation.
  - Often referred to as being "emotionally flat."

Arnsten. JAACAP 4.2012

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ADHD MEDICATIONS

FDA APPROVED		Non-FDA Approved ("Off-Label")
STIMULANTS	**NON-STIMULANTS**	
METHYLPENIDATE	**ALPHA ADRENERGIC AGONISTS**	
AMPHETAMINE	Guanfacine ER (Intuniv) 6-17yo	Guanfacine IR
	Clonidine ER *(Kapvay©)*, (*Onyda XR©)* 6-17yo	Clonidine IR
		ANTIDEPRESSANTS
	NE REUPTAKE INHIBITORS	Bupropion
	Atomoxetine (Strattera©)	TCAs (Imip, nortript., etc.)
	Viloxazine (Qelbree©)	**NARCOLEPSY MEDS** off off label
		Modafinil, Armodafinil
		Other, "off off off label") – Amantadine, Memantine?

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PSYCHOSTIMULANT MEDICATIONS

- **Drugs of First Choice**
  - Have 80-90% success

- **All stimulants used in the USA are either**

  Methylphenidate or **Amphetamine** derivatives.

- **Easy! Only 2 drugs to choose between!**

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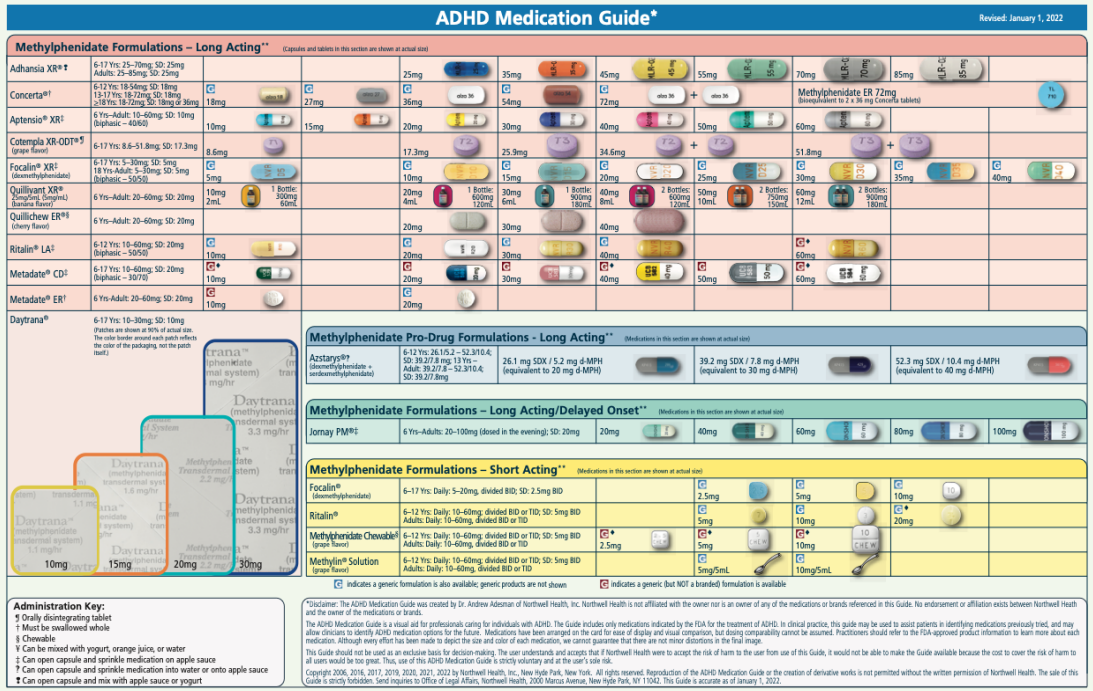
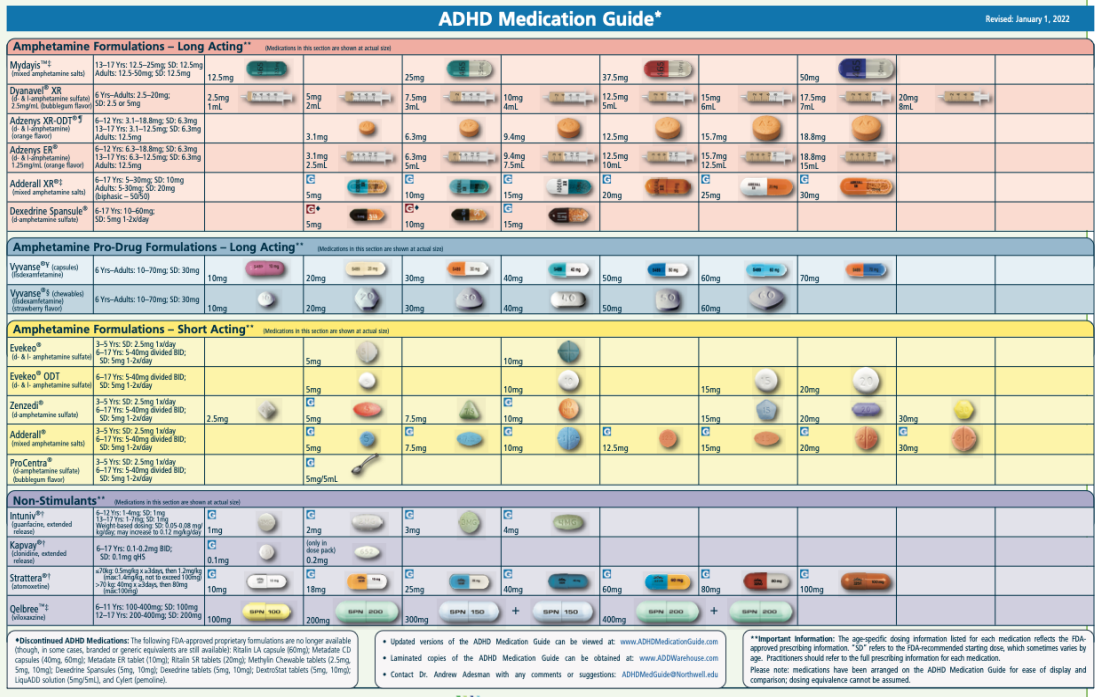
No Such Luck

Currently, 34 different ADHD Medications 😱 😱 😱





ADHD MEDICATION GUIDE- Northwell Health

ADHDMEDICATIONGUIDE.COM

Also available (but no nice pictures), Medication Table: Compiled by me, in this presentation and available to download at AMHCT WWW.ACCESSMHCT.COM >Resources

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Why are there so many?

Stimulants have some idiosyncratic Pharmacokinetic and Pharmacodynamic properties:

- **IR is very short acting** (2 - 4 hour)
- **Stimulants have different effects when blood level is increasing vs decreasing**
- **Maximum benefit occurs while the blood level is slowly increasing**
- **Benefits and adverse effects are different at onset, peak and offset.**
  - Too rapid offset can cause side effects such as rebound irritability
  - Insomnia can be caused by either rebound or over extended duration
- **Therefore, the dosage curve is very important, and this varies with each medication, preparation, and individual.**

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“It’s All About the Curve”

The Ideal Dosage Curve

- **Rapid Onset, followed by slow increase and gradual offset.**
- **Sufficient duration of action** of benefit
  - But not too long to interfere with sleep
- Ideally, once a day administration.
- Minimum adverse effects.

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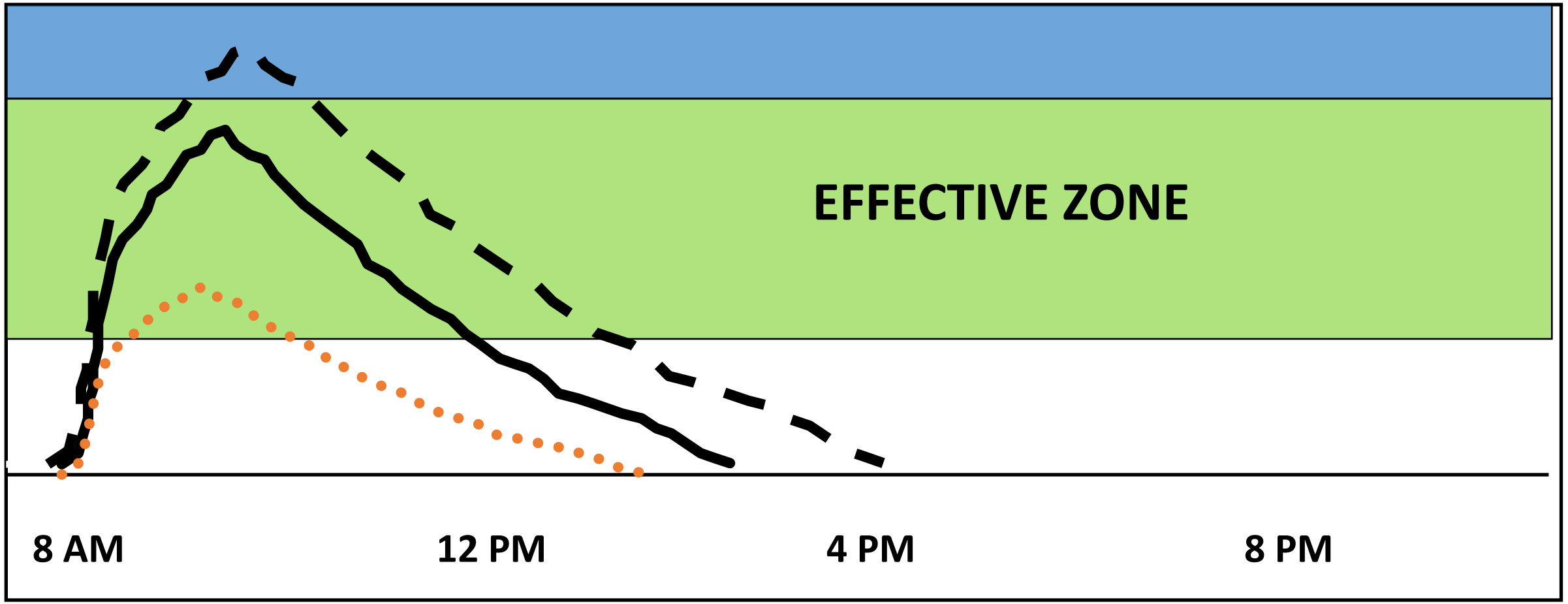
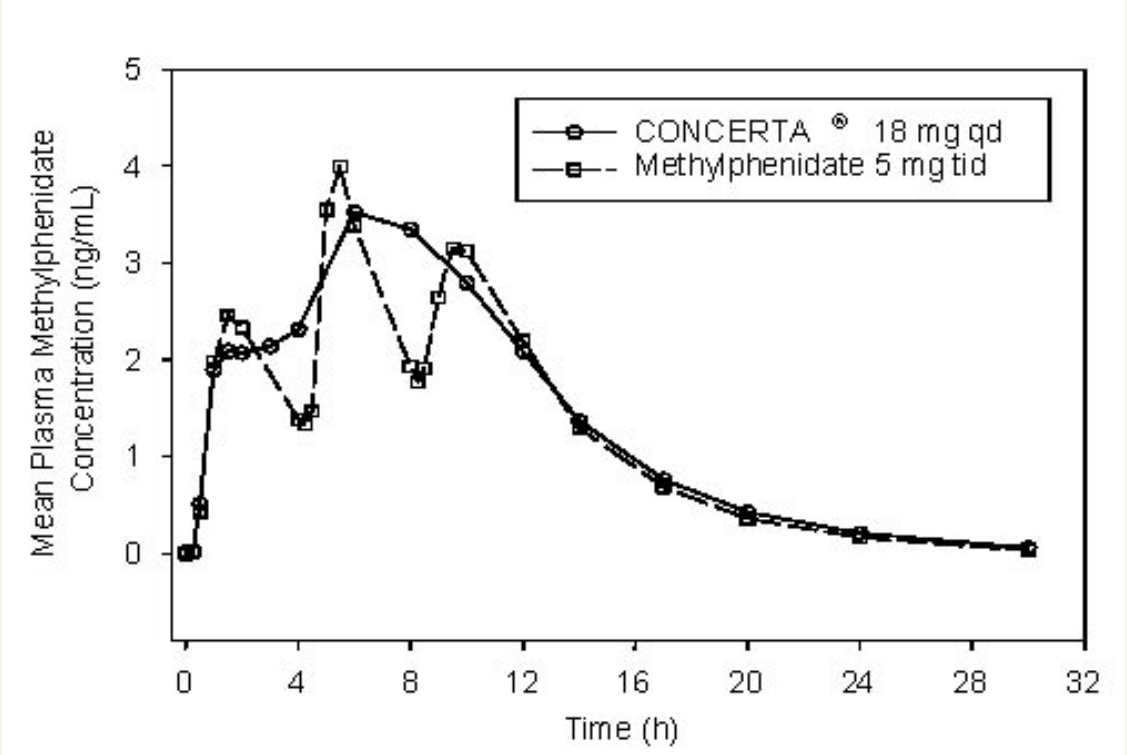
DOSE CURVE -Immediate Release stimulant

Individual Response



Dosage Curve – Extended Release

- "Concerta" vs immediate release MPH



From Package Insert

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What's the Difference?- How to Choose?

- **Primary Ingredient**
- **Administration Form**
- **Duration of Action & Mechanism of Extended Release)**
- **Cost to Family**
  - Generic
    - More often on formulary
  - Brand
    - On-Formulary vs Non-Formulary (May be $20 vs $600)

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What's the Difference? – *Primary Ingredient*

Stimulants

- All stimulants in the USA are either **Methylphenidate or Amphetamine** derivatives.
- 80-90% effective reducing ADHD symptoms by ~50%
- **Both increase norepinephrine and dopamine levels** by inhibiting reuptake transporter functioning.
- **Amphetamine also stimulates direct neurotransmitter release**.
  - As such Amphetamine may have greater potency, affecting onset, benefit, and adverse effects.
    - (1mg AMPH =+/-2mg MPH)
    - The direct release of dopamine also contributes to the abuse potential of amphetamines.
- **Patients may respond differently to each.**
  - Most respond to either but some respond better to one or the other

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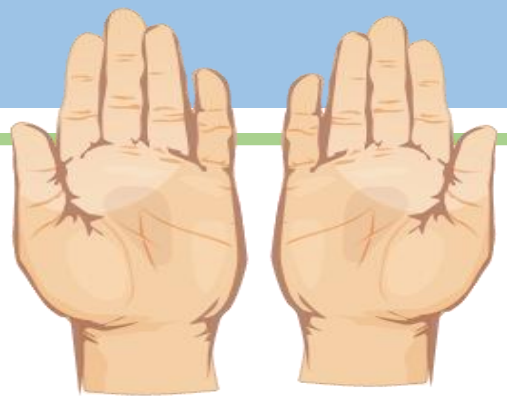
What's the Difference?

Primary Ingredient- Stereoisomer



- **Enantiomers-** Both Amph and MPH have D & L isomers
  - Receptors may only fit one symmetry, like gloves.
  - Therefore, different Isomers may have different effects.
  - Different preparations may have different combinations of Isomers

  Mono-isomer, Racemic (50:50) or (various combinations of D & L "Mixed Salts")
- **Methylphenidate** is usually racemic mixture with both **Dextro** (right twisted) and **Levo** (left twist) molecules or pure Dex-MPH
  - **Only right-handed isomer (D) is active**
  - *5* mg Dex-Methylphenidate *(Focalin©)* = 10mg of (racemic) MPH *(Ritalin©)*
- **Amphetamine - Both D & L forms are active**
  - **D ~3x more potent. L- lasts longer, is less potent, and has more adverse effects (esp. cardiovascular).**

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What's the Difference?
Administration Form

- **Tablet**
  - Chewable
  - Oral Disintegrating
- **Capsule**
  - Sprinkle-able
  - Dissolvable
- **Liquid**
  - Concentrate
  - Suspension
- **Patch**

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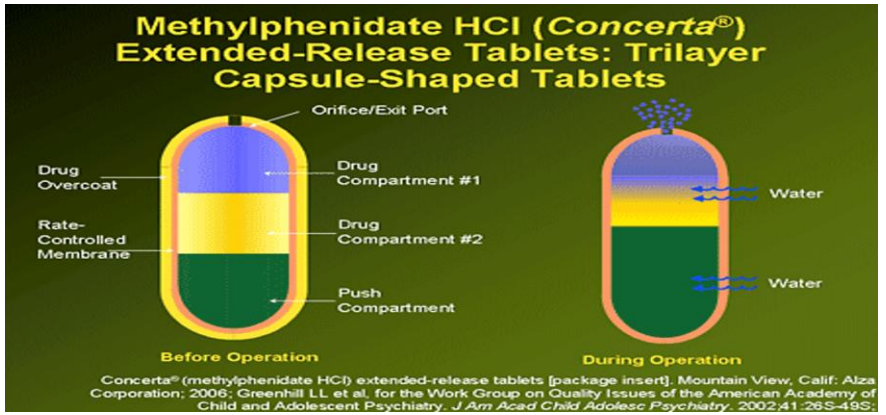
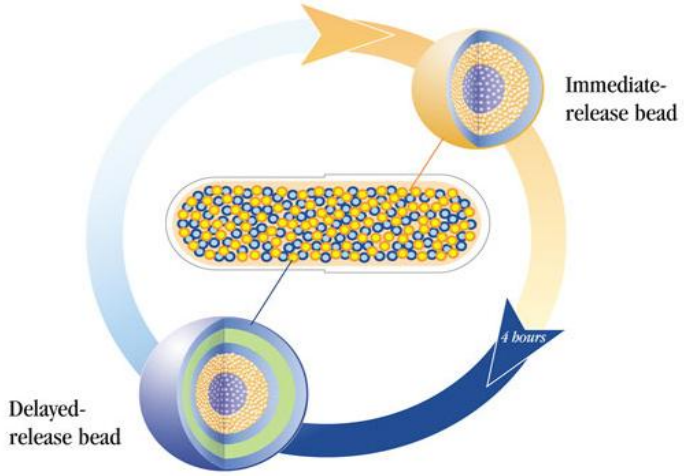
What's the Difference?
Mechanism and Duration of Release

- **Extended Release (ER) forms can last from 8-16 hours**
- **Each Brand uses their own proprietary mechanism of extending release**.
  - Most use **coated microbeads** in caps or suspensions
  - Can also be. **multi-layered tablets, osmotic pumps, prodrug formulation, patches, etc.**
  - Brand vs Generic:
    - Despite being the same medication, brands and generics "equivalents" can have similar, but not identical specific mechanism of release.
  - ER is affected by how the pill is made, not only the ingredients.
  - ER release may vary with manufacturer





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What's the Difference?
Ratio of IR and ER Components

- **Formulations can also vary the proportion of immediate to slow- release components.**
- Most have 50:50 immediate to Extended Release
  - Some Notable Exceptions
    - "*Concerta©*" (22% IR/78% continuous release via osmotic pump)
    - "*Metadate CD ©*" (*30% IR/60% ER (now only in generic)*
    - *"Journay©"(100% delayed/extended release)*
    - *Azstarys© (16% IR/84% Prodrug-ER)*
    - *"Vyvanse©" (100% Prodrug-ER)*

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“Prodrug” Formulations

Prodrugs→ need to be metabolized before active

- **May have smoother dose curve** than multiphasic extended-release preparations
- **May have reduced abuse potential, due to need to be converted by the body before active & slow onset)**

Lis-Dexamphetamine (Vyvanse©)

- Pro drug that is converted to dexamphetamine (hydrolysis) by erythrocytes in the blood stream
- “Vyvanse” can have delayed onset 1-2 hours due to delay in conversion
- Capsules and Chewable formulations, available in generic form
- Duration 12-14 hours

Ser-Dexmethylphenidate & Dexmethylphenidate (Azstarys©)

- **Serine-dexmethylphenidate is a “pro drug*”** that is converted to dexmethylphenidate in the LOWER GI tract
- Onset may take up to 3 hours since it is converted in the Lower GI tract,
- **IR Dexmethylphenidate** is added to have benefit during the first hours
- Duration is 10-13 hours
- Initial dose: *26.1/5.2mg /day → Increase in steps* to 52.3 mg/10.4 mg (can be opened and sprinkled

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Unique Formulations of Methylphenidate – Modified/Delayed Release

"*JOURNAY PM©*" (methylphenidate)

Delayed, Extended Release 20-80mg Capsules

- To be **given at bedtime! Evening administration only!**
- Initial release delayed for 8-10 hours then peak release at 16-18 hours after ingestion followed by slow decline (more than half released after peak).
- Clinical response reported to be 22-24 hours after initial administration
- Can be sprinkled - (but do not chew)

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Non-Stimulants – Alpha Adrenergic Agonists

- **Pre-Frontal Cortex**
  - **DIRECT NE AGONIST** - (A2A) receptor on PFC Glutamate neuron
  - **Promotes more attention to the central focus or "signal."**
  - **No Dopamine Activity** = less effect than stimulants
- **Locus Coeruleus**
  - Down-regulates NE in Locus Coeruleus
  - Decreasing adrenaline "Fight or flight"

Kollins SH 2011

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Non-Stimulants:
Alpha Adrenergic Agonists

- **IR is off label and ER FDA only approved for age 6-17**. Both work.
- **Guanfacine, Guanfacine ER** 24 hr.. ("*Intuniv*©")
  - 1-4mg a day. ER once a day, IR divide 2x/day
- **Clonidine, Clonidine ER** 12 hr..("*Kapvay*©"), clonidine patch.
  - ER 0.1- 0.4mg a day ER 2x a day, IR divide 3-4x/day
  - "EER" (*Onyda XR*© 1x a day Liquid
- **Not a controlled substance, low abuse potential**
- **Must be given every day**
- **May take a week or two to see benefit!**
- Side effects: Sedation, headaches, depression, hypotension, rebound hypertension [wean off gradually]

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Alpha Agonists - Indications

- ADHD with poor response to Stimulants
- Severe hyperactivity / impulsivity
- Aggression / ODD / Over-reactivity
- Tics (+/- ADHD)
- ADHD with atypical features (irritability)
- ADHD with Insomnia, sleep onset problems, (1º or 2º to meds)
- ADHD with comorbid anxiety

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Non-Stimulants – NE Reuptake Inhibitors
ATOMOXETINE (Strattera ®)

- Approved by FDA for children and adults
- ACTIONS
  - Selective PFC Norepinephrine Reuptake Inhibitor (indirect action)
  - No DA effects, therefore, is less effective than stimulants

  - Not controlled substance! Low abuse potential!
  - May give once a day with 24hr duration. (although inconvenient, may work better divided bid). Start 25-40mg, increase q1-4wk to max 100mg
  - Must be taken daily (including weekends and vacations)
  - Full benefit of dose not seen for about 2-4 weeks or more

  - IRRITATING TO GI TRACT, tastes terrible, do not bite or open capsule.
    - Fat Soluble, should be taken with meal with fat (toast with butter, peanut butter, ice cream)
  - Other Side effects: Headaches, fatigue, agitation
  - Hepatic cytochrome P450 2D6 pathway (~5% slow, 5% ultrarapid)
  - Black Box Warning: Suicidal ideation, mania, liver enzyme (RARE)

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Non-Stimulants – NE Uptake Inhibitors
VILOXAZINE ("QELBREE©")

- Approved for children and adults
  - **NE reuptake inhibitor l**ike atomoxetine, however…
  - However **also has some DA and Serotonin modulation activity** as well
  - Supposedly 50-70% effective, but effect not as robust as stimulants
- Had been approved and used since the 1970s & 80s as an antidepressant in Europe
- Easier dose titration, Start at 100 or 200 and increase Q2W up to 400mg (no generic)
- Possibly faster onset of action than Atomoxetine (but still takes at least 1-2 weeks)

- **Not bitter tasting or irritating to the stomach**
- Can be open and sprinkled on food
- Adverse effects: Sedation, mood changes
  - Black Box Suicidality warning
  - Need to monitor for mood changes, Suicidal ideation
  - Potential to precipitate manic episodes in patients with bipolar disorder.
  - Sedation or insomnia, irritability(3%), Nausea or increased appetite
  - Strong CYP 1A2 inhibitor (contraindicated with Cymbalta)

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NE Reuptake Inhibitors- Who am I using it for?

- Response ~50- 60 % (not stimulant naïve)
- Patients who failed at least 2 stimulant
- **ADHD with Substance Use**
- **ADHD with Anxiety**
- **ADHD with PTSD**
- **ADHD with Irritability**
- **ADHD with Tics**
- **ADHD with ASD**
- Also consider it for:
  - Patients with problems evening/ early AM
  - Patients who need continuous medication benefit

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Off label Alternatives

- **Bupropion** (Wellbutrin©, Zyban©) Not approved. Consultation suggested
  - NDRI antidepressant
  - Can be effective for treating ADHD in adolescents and adults.
  - May be used for adolescents or adults with Depression and ADHD or complex cases of ADHD, including patients with substance use.
  - 75-300MG (IR, ER and XL), Generic
  - Side effects include out of control behaviors, irritability, insomnia, and rarely, seizures. Black-Box Suicide risk warning

- Modafinil (Provigil©):
  - Off-Off label. Very infrequently used in ADHD by psychiatry/neurology If other medication not tolerated or with co-occurring narcolepsy. Should be monitored for rash/SJS

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Methylphenidate Extended Release

Racemic unless otherwise spec,	Release, IR/ER	Duration	Dose range – GENERIC AVAILABLITY
OROS-MPH *("Concerta©")*	22% IR/78% Continuous (generics	12 hr.	18-72mg/day /GENERICS
Dex-Methylphenidate XR (*"Focalin XR©"*)	Biphasic 50/50 IR/Delayed (**d-mph only)**	8-10 hr.	5-30mg/day /GENERIC
Methylphenidate CD (*"Metadate CD©"*)	Biphasic 30/70	8 hr.	1—60mg GENERIC ONLY
"Quillichew©/Quillivant©"	Biphasic 20/80	8-10hr	20-60mg (no generic but may be on formulary) Chewable or suspension
Methylphenidate LA *"Ritalin LA©"*	Biphasic 50/50 – Generic available	8 hr.	10-60mg/GENERIC
"Contempla XR ODT©"	Biphasic 25/75	11 hours	8.6-51.8mg (Oral disintegrating) 6-17 Y/O
"Aptensio XR©"	Biphasic Beads (37/63)	12 hour	10-60mg BRAND ONLY
"Relexxii©"	OROS (22/78)	12 hour	18-72 (like "Concerta" More sizes/BRAND)
"Journay PM©"	100% delayed release	9-12hr	20-100mg
Ser-Dex-MPH/Dex-MPH "ASTARYZ©"	16%IR/84%prodrug	10-13	26.1/5.2mg-52.3/10.4mg

Amphetamine Extended Release

	Release (IR/ER)	Duration	Dose range
Mixed Amph. Salts ER *"Adderall XR©" 25%L/75%D*	Biphasic 50:50	8-12hr	5-60mg/d
Lis-Dexamphetamine *D-amph attached to lysine ("*Vyvanse©*")*	Pro drug continuous* Cap or chewable	8-12 hr.	20-70mg 1-2hr delay (40mg ~ 20mg MAS XR),
Dextroamphetamine SR (*Dexedrine Spansule©")*	Biphasic, 50:50		5-60mg/d
Amphetamine 50:50 D:L "Dynavel©"	Biphasic 20/80	12 hr.	2.5-30mg Susp or tablet
Mixed Amph. Salts ER *"Mydayis©" 25%L Amph /75%D-amph*	Triphasic 33% IR, XR and XXR	14-16hr	12.5-50mg
*Amphetamine 50:50 D:L ("*Adzenys XR©*")*	Biphasic 50:50	10-12	ODT or liquid

Immediate Release Stimulants

Methylphenidate	Form	Duration	Dose range
Methylphenidate (“*Ritalin©*”)	50:50 D/L)	3-5 hours	Start 5mg Max60mg or 2mg/d,(div. bid-tid)
Dex-Methylphenidate) *(“Focalin©”)*	100% D-MPH	3-5 hr.	Start 2.5mg, Max 40mg/d divided bid or tid
MPH Chewable and solution (“*Methylin©*”)	50/50 D/L	3-5hr	Start 2.5mg children, 5mg adults Max 60mg div bid or tid
Amphetamine			
Dextro-Amphetamine *(“Zenzedi©”)*	100% D-Amph.	3-5hr	2.5mg, 1-3x/d to 60mg/d (divided bid-tid) Off label for adult ADHD
Mixed Amphetamine Salts *(”Adderall©”)*	75%D/25%L-Amph	4-6 hr.	5mg bid, max 60mg (divided)
Amphetamine “Evekeo© & ODT)	50:50 D/L- Amph ”like Benzedrine”	4-6hr	5-40mg qd-tid
Dextro-Amphetamine (*“Procentra©”)* oral sol.	D-Amphetamine	3-6hr	Liquid 5mg/ml, 5-40mg divided. Bid- tid (3-17y)

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Non -Stimulants

Alpha Agonists	Form	Duration	Dose range
Clonidine IR Generic available	IR Tablet, can crush or split	4-6 hr.	0.1--0.4mgdivided bid-qid Not FDA approved -ADHD
Clonidine ER (Kapvay©) *Generic only*	Slow-release tablet Do not spilt or crush	12 hr.	0.1mg-0.4mg/div bid Approved 6-17
Clonidine XR (Onyda XR©)	Slow-release Suspension	24 hr.	Approved 6-17
Guanfacine IR *(Tenex©)* *Generic only available*	Tablet, Can crush or split	8-12 hr.	1-4mg div bid Not FDA approved -ADHD
Guanfacine ER (*Intuniv©*) Generic available	Slow-release tablet Do not split or crush	24 hr.	0.1-0.4mg/d Approved 6-17
NE Reuptake Inhibitors			
Atomoxetine (Strattera ©) *Generic available*	Capsule: Do not open, chew or sprinkle	24 hr.	20-100mg/d max adults
Qelbree© (Viloxazine©)	Capsule: Can be sprinkled	24hr	100-400mg

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Dose Conversion/Equivalents

Methylphenidate	Amphetamine
36mg Concerta© =	= 20mg Vyvanse©
20mg Ritalin LA© =	= 10mg Adderall XR©
10mg Focalin XR © =	= 5mg Adderall© IR 8am and noon
10mg methylphenidate IR, 8am and noon =	5mg d-amphetamine IR, AM &Noon

CONVERSION CALCULATOR→ www.adhddosecalc.com

STIMULANT TRIAL – Before you start

- **No additional physical exam is needed** if there has been annual PE with history of good health or assessed for initial Dx.
- **Assess cardiac risk history (if not at initial assessment)**
  - Rule out history of hypertension, arrythmia, angina, syncope, family Hx of sudden cardiac death, or cardiac abnormalities
  - Cardiology referral, only if cardiac risks are identified.
  - Otherwise, no need for EKG prior to starting stimulants.
- **Address comorbid mental health and substance use d/o first,**
  - Refer and collaborate with therapist.
  - Start ADHD meds when stable. If comorbid issues are mild, may consider cautious trial of ADHD meds first. Have low threshold for psychiatric consultation (AMHCT?)
- **Other contraindications:**
  - SUD, Glaucoma, Thyrotoxicosis,
  - Anorexia (+/- ARFID or +/-Bulimia
  - Psychosis. Recommend ACCESS MH or psychiatric consult with Bipolar d/o, Moderate to severe anxiety, depression or multiple comorbidities.

AAP Clinical Practice Guideline. PEDIATRICS Volume 144, number 4, October 2019

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ADHD Medication Trial Algorithm

1. **Non-Pharmacological Interventions**, if needed add medication
2. **Stimulant #1Trial** (MPH ER or AMPH ER)→Adjust dose/curve, or..
3. **Stimulant #2 Trial** (Other stimulant) → Adjust dose/curve or…
4. **Trial of Alpha Agonist** (or NE Reuptake inhibitor)
   a) Consider adding stimulant (start in low doses)
5. **Trial of NE Reuptake Inhibitor**
6. **Reassess / Consult / Refer if poor or unexpected response**

CALL ACCESS-MHCT AT ANYTIME ALONG THE WAY

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Suggested Titration Doses

Same for Children, Teens or Adults

METHYLPHENIDATE

- MPH OROS ("Concerta©")
  - 18mg -> 36mg -> 54mg>72mg (max)
- Dexmethylphenidate XR ("Focalin XR ©")
  - 10mg-> 20mg->30mg>40mg (max)

AMPHETAMINE

- Lis-dexamphetamine (Vyvanse©)
  - 20mg>40mg>60mg(70mg Max)
- Mixed Amphetamine Salts XR ("Adderall XR©")
  - 10mg>20mg>30mg (60mg/day max)

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Starting ADHD Medication – STIMULANTS

- **Informed Consent:**
  - Review what to expect including adverse effects and possible benefits with patient.
    - AACAP ADHD MEDICATION GUIDE
  - Remind them that this is a controlled drug, take only as directed, and do not dispense.
  - Medication is only part of treatment that includes temporarily reduces symptoms while behavioral and lifestyle interventions improve long term adaptation and outcome.
- **Start with MPH (or AMPH) Extended-Release Preparations**
  - I usually start with MPH, as AMPH has higher risk of misuse, adverse effects, exacerbating anxiety, tics, bipolar cycling, psychosis.
  - Use on-Formulary/Generic formulations first
- **"Try on different Sizes" to find what works best**
  - **Start at low doses increasing every +/-2 weeks to medium and then higher dose.**
  - * I often titrate slower in adults (2-4 weeks) due to less collateral information and structured observations (home/parents/school/therapist)

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Starting Stimulant Medication

- **Medication is to be taken daily, <u>not PRN</u>**
  - Once stable may consider be skipped weekends or non work days if no social or behavioral non work issues (a minority)
- **Check-in at least every other increase, instruct patient to call if adverse effect occurs**.
  - "Goal is to find how the medicine works for you, and what dose fits best."
- **Ask patient to note timing & duration of benefit or any adverse effect**.
  - Does it occur during onset (am), peak (afternoon) or offset (evening)?
  - Use this information to adjust or change medication to maximize benefit, duration and minimize adverse for this individual.
- **Utilize screening tool** (ASRS/Vanderbilt) for each visit to help track progress
- **Record weight, blood pressure, and pulse.**
  - (after dosage changes and then every 6 months).
- **Check CPMRS each visit/prescription**
- Get Collateral input, if available
- Increase until you achieve good effect, significant adverse effects or maximum dosage.

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ADVERSE EFFECT of STIMULANT MEDICATIONS

COMMON	Motor/Less Common
• **GI:** • Decreased Appetite/Weight Loss/Stomachache	• Overactive/jittery
• **Difficulty Falling Asleep**	• **Tics** (may bring out, exacerbate or diminish)

• **Mood changes**:
  • "Rebound" irritability, Dysphoria Mood flattening), Anxiety, mood lability, Social withdrawal
	• BFRBs (Body Focused Repetitive Behaviors)
	  • Picking, Hairpulling, Nail Biting

• **Headaches**	
• **Cardiovascular (Tachycardia/ Hypertension) Dizziness**	
• **Growth Delay/Decrease**	

Assessment of Adverse Effects or Poor Response

- **Review compliance**
- **Check for other medications**, caffeine, nicotine, decongestants, nutritional supplements. (High fat meals, Orange juice & vitamin C decreases AMP levels), recreational substances?
- **Review the timing of the adverse reaction (and benefits)**
  - Onset before or after medication started or adjusted?
  - Adverse effects that occur during onset, peak or “offset” can often be addressed by changing dosing, schedule or preparation

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Timing of Effects - Adjust the Curve, if needed

Good Response, but:

- **Too Slow Onset?** (Ex. with Vyvanse)
  - Give earlier, or
  - Change to formulation with higher % of IR component or add AM IR dose of same drug
- **Too Short Duration?**
  - Change to different, longer acting formulation, or
  - **Add late afternoon or early evening "homework dose"** of IR to extend duration (watch appetite and sleep)
- **Too Long Duration?** (Ex. sleep or late appetite issues)
  - Change to shorter acting formulation, or
  - Give earlier
- **Rebound or Offset Adverse Effects?**
  - Change to Different, Slower Taper ER, or add small IR dose just before rebound, or
  - Decrease Dose
- **Peak Adverse Effects**
  - Change dose>or formulation> try different stimulant

If inadequate response or side effects limit response→ switch to different drug (ex. MPH→ Amph.), **reconsider diagnosis**.

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Sleep Disturbance -
Non-Medication Tx

- **Review history**
  - Onset of issues, bedtime routine
  - Other causes, stress, anxiety
  - Other medications, caffeine or other substance use
- **If sleep issues pre-dated medication initiation…**
  - **Educate patient about sleep and sleep hygiene**
    - "**Sleep Hygiene**"-
      - Establish calm, consistent bedtime routines; Sleep environment. They may need direct assistance in establishing routines and skills.
      - **Removal of electronics/**turn off alerts before winding down, screen light tricks brain. Takes 1-2 hours
    - **Refer to therapy CBT or i-CBT**
- **Call ACCESS MH for assistance or consultation**

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Sleep Disturbance
Medication Related Sleep Problems-

If problems only since medication started..

Stimulants can delay sleep onset if they last too long

- Try shorter acting preparation of same drug.
- Switch to different medication. Consider Alpha agonist or NE reuptake inhibitor.

- **However, sleep onset issues may occasionally be due to rebound, or sometimes the ADHD symptoms return after the meds have worn off**.
  - (These patients may actually fall sleep better with some medication still active in their systems).
  - Consider trying a longer acting stimulant formulation!
- **If they wake and eat, check for dose related daytime appetite suppression and address**.

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Sleep Disturbance - Medication Tx

- As an adjunct, if necessary, to other interventions:
- **ALPHA AGONISTS**
  - (Clonidine is more sedating than Guanfacine; IR is more sedating than ER,)
- **Clonidine IR**
  - 0.05 mg (1/2 of 0.1 mg tab) –0.2 usually does it (but can go up 0.4mg).30 minutes prior to bed
  - Additional side effects include sleep architecture changes such as vivid dreams and reduced REM
  - Can sometimes exacerbate middle insomnia (if you wake up as or after it is wearing off)
  - Warn not to take more extra doses or more than prescribed
- **Melatonin**
  - 1 to 10 mg (3-5mg 45-60 min before sleep). Dosage is not weight dependent and less is often better
  - Decreases sleep latency but doesn't increase duration
  - Dietary supplement; not regulated; use same brand
  - Can be used chronically; well tolerated;
  - Use slow release if there is middle insomnia

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Treatment of Common Adverse Effects – Appetite/Weight Loss

- Obtain baseline information on appetite and eating pattern.
- About 30-50% have some decrease in appetite for lunch (and sometimes breakfast)
  - Check for binge eating after medication wears off
- May be transient, sometimes decreases in 2 weeks. Monitor weight
- **Timing?**
  - If only at peak (lunch) > decrease dose, change ER type (less AM IR component)
    - If no improvement, switch stimulant or to non stimulant
  - If all day > Decrease dose, switch stimulants, or consider non-stimulant
    - NRI, Alpha Agonist or Bupropion (not approved)
- **Strategic eating**: Breakfast, Planned Snacks (pre prepared), Increase caloric density, especially evenings. Divide and conquer dinner (half meal with family & finish when medication wears off, if needed).

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Other Common Adverse Effects- Management

Headaches

- Commonly occur during onset/absorption, 45 to 90 minutes
- Address by giving with meal, changing slow-release prep or dosage
- Switch or combine with Alpha Agonist

Rebound

- Increased irritability (easily bothered), dysphoria or increased activity level that occurs during "offset" as medication wears off and may last ½ to 2 hours.
- Switch to slower release preparation, decrease dose, or try small dose or IR stimulant before rebound starts
- Switch medication to different stimulant, add or switch to non stimulant

Emotionality, anxiety, dysphoric or flattened mood, Social withdrawal. Check pattern,

- If during peak, onset or offset→ adjust dosage curve accordingly
- If occurs throughout day→ adjust total dosage or change medication.
- Consider non stimulants or bupropion (off label).
- r/o comorbid condition

Cardiovascular issues

- Tachycardia, palpitations, chest pain, fainting: Stop medication, reassess cardiovascular health and check for comorbid anxiety or substance use.
- Monitor for Hypertension (can increase bp by 5mm/hg or more). Adjust dose, change stimulant or non stimulants

Growth (in kids)

- Informed consent, monitor growth curve.

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Stops Working?

Generics?!

- !! Check for change in generic when a medication “stops working”
  - IR formulations>No real difference between brand and generic
  - However, with Extended Release, how the pill is made is important and variations between generic manufacturers can occasionally make significant differences in release/absorption.
- **Stops working at noon?**
  - Only the IR is working.→ Switch ER type
- **Stops working morning?**
  - Try switching to different dosage, formulation or stimulant.
- **Stops working all day?**
  - Check for changes such as, other medications, stresses, substance, comorbidities
  - Switch formulation> stimulant or Add or switch to non stimulant.
  - Change in diet or supplements? (ex. High fat or high acid (OJ) can interfere with Amphetamine absorption and speed elimination

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COMORBID CONDITIONS- SUBSTANCE USE

- **Always Check/Screen for SUD,** including Vaping
- **Refer for therapy, obtain consultation.**(AMHCT can help)
- **If Substance Use is mild or intermittent:**
  - Educate impact of drug use, including attention.
  - Consider cautious trial using nonstimulants.
  - if poor response, or high risk, consider ER stimulant formulations with decreased abuse potential (avoid IR stimulants/Adderall).
- **If Substance Use is moderate to severe:** First treat SUD, then reassess attention, if/when stable. Then consider use of non stimulant
- **Give 30 - day refills and Check refill frequency**
- **Always Check CPMRS/PDMP** before prescribing and with every refill
- **Consider home environment, including risk of abuse or diversion, and if other family members have SUD, or are recovering Avoid stimulant Rx (especially IR).**

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Comorbid Conditions:
ANXIETY

- Anxiety has 30% prevalence in teens and Adults and is Co- Morbid with ADHD in 1/3.
- Anxiety can present with impaired concentration & restlessness.
- Refer to therapy and collaborate with therapist,
- **Stimulant medications can sometimes increase anxiety** or occasionally cause anxiety like symptoms on their own.
- **If anxiety is moderate to severe: Treat anxiety first, then reevaluate.**
- **However, stimulants can also occasionally improve co-morbid mild anxiety**,(esp. if worried about school or work) a careful trial can be helpful (you will know quickly). Start low, go slow. If no improvement, treat anxiety first with therapy +/- SSRI medication, then reevaluate.
- **Alpha agonists** alone or in combination with stimulants can decrease anxiety related side effects, hyper-arousal and outbursts, but do not directly treat anxiety directly. **Viloxazine or Atomoxetine** may address ADHD without exacerbating and possibly, helping anxiety.
- Referral and consultation with ACCESS Mental Health or another psychiatric provider.

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Addressing Comorbid Conditions:
Depression

- Screen with PHQ9 Mood disorders can be co morbid with ADHD
- Impaired concentration, loss of interest and decreased effort can sometimes appear like Inattentive ADHD.
- **When Co-occurring both need treatment**. Collaborate with therapist
- If Depression is mild, may consider treating ADHD first along with CBT and reassess.
- Though not approved for ADHD, Bupropion can sometimes be used to treat Depression that has co morbid.
- Use caution with Antidepressants + Stimulants due to increase risk of activation, Serotonin syndrome.
- Psychiatric consultation or referral is recommended.

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Comorbid Conditions:
Post Traumatic Stress Disorder

- Hyper-arousal, high reactivity and impulsivity are common in PTSD.
- People with PTSD are often very sensitive to the adrenergic side effects of stimulants.
- **Alpha agonists** are often very helpful alone or in combination with Stimulants as they down regulate arousal and block some of the adverse effects of the stimulants and act as an adjunct.

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Comorbid Conditions:
Tourette's, Tic Disorders or BFRBs

- Motor tics are common in childhood
- Impulsivity and hyperarousal are common in Tic disorders
- 50-60 % Tourette's have ADHD, (25 % have OCD)
- ADHD Sx often more disabling than tics
- Treatment
  - Stimulants can either worsen or reduce preexisting tics. Start low, go slow.
  - If Tics or BFRBs start or worsen following medication, Discontinue and try alternatives
  - **Alpha agonists are first line for Tic D/O &Tourette's and 2nd line for ADHD**
  - Atomoxetine or Viloxazine have a reduced incidence of worsening tics
  - Bupropion can sometimes exacerbate tics as well
  - Consult psychiatry for 3rd line alternatives or referral for behavioral tx

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Comorbid Conditions:
Severe Mental Illness/ Psychosis, Bipolar Disorder,

- **Referral to a psychiatric provider for consultation/management .**
- **First onset of a psychosis** often appears in late adolescence & young adulthood looking like late onset ADHD with attention, concentration and executive functioning difficulties. Refer for further assessment, psychiatrist or STEP program. Early intervention is key.
- **Bipolar D/O)**: Episodic mood disorder with periods of depression or mania that are distinct from baseline and lasting a week or more.
  - Impulsivity, activity and impaired attention vary with mood episodes. (If attention deficits are episodic, its not ADHD)
  - This is a highly complex and severe disorder that usually requires multi-modal therapeutic interventions including complicated pharmacological treatment with SGAs and other mood stabilizers.
- CALL ACCESS Mental Health for referral or consultation

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ADHD with Pregnancy and Lactation

ACCESS Mental Health and Substance Use For Moms

- **https://www.accessmhct.com/moms/**

Pregnancy

Poor data most studies on pts with SUD

- Amphetamine – recommendations are to avoid
- Methylphenidate: no teratogenicity, but possible vasoconstriction of placenta
- Women who discontinued psychostimulants during pregnancy were more likely to experience clinically significant depressive symptoms during pregnancy than women who continued treatment with stimulants.
- Other studies have documented that women with ADHD may also be more vulnerable to postpartum depression
- **Mild to moderate ADHD:**
  - Try non pharmacological Tx
  - Monitor closely for depression and anxiety (exercise CBT, Diet)
- **Severe** ADHD - Obtain consultation and weigh risk/benefits
- **Breast Feeding**
  - Stimulants are generally compatible with breastfeeding, minimal cross over to milk. However Extended release may have lowest risk.
  - Avoid Guanfacine and clonidine - suppress lactation and cross over to infant
  - Atomoxetine: Not enough data, not recommended

Baker AS, et al. 2022

https://infantrisk.com/content/adhd-medications-and-breastfeeding

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Coping With Medication Shortages

- **FDA Drug Shortage Database → https://dps.fda.gov/drugshortages**
- **Have patient contact multiple pharmacies, and ask about…**
  - Availability of different doses of same prescribed medication
  - Available alternatives of same base drug (Methylphenidate of Amphetamine)
- First, try prescribing same total dose of same brand or generic.
- If necessary, try equivalent dose of different "brand" of same base ER drug
  - Prior auth may be needed if trying non formulary brand.
  - If need to switch to shorter acting preparation, consider extending with immediate release medication (if no substance use issues)*
  - Consider changing to immediate release of same drug (will need to to give equivalent total dosing but divided into multiple doses over the day).*
- If necessary, change between amphetamine and methylphenidate.
- Check dose equivalents when changing medications or formulations
- Changing to non-stimulant is not recommended due to delay in onset of benefit.

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Dose Conversion/Equivalents

Methylphenidate	Amphetamine
36mg Concerta© =	= 20mg Vyvanse©
20mg Ritalin LA© =	= 10mg Adderall XR©
10mg Focalin XR © =	= 5mg Adderall© IR 8am and noon
10mg methylphenidate IR, 8am and noon =	5mg d-amphetamine IR, AM &Noon

CONVERSION CALCULATOR→ www.adhddosecalc.com

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AMHCT is a state supported program that offers free, timely behavioral health consultation for primary care practitioners including:

- **Free Telephone Consultations 9-5 M-F** with a Child and Adolescent Psychiatrist at the time of, or within 30 minutes of your call.
- **Linkage to Care Assistance** for families to appropriate local behavioral health services.
- **Face to Face Psychiatric Consultation** to assist with diagnosis, recommendations for medication management, treatment and appropriate community-based care. AMHCT does not provide treatment.
- **Interim Support** for Families or patient provided by a licensed clinician or family peer specialist.
- **Communication back to your office** on outcomes of consultations or care linkage services.
- **Now funded to serve serve youth through age 21**

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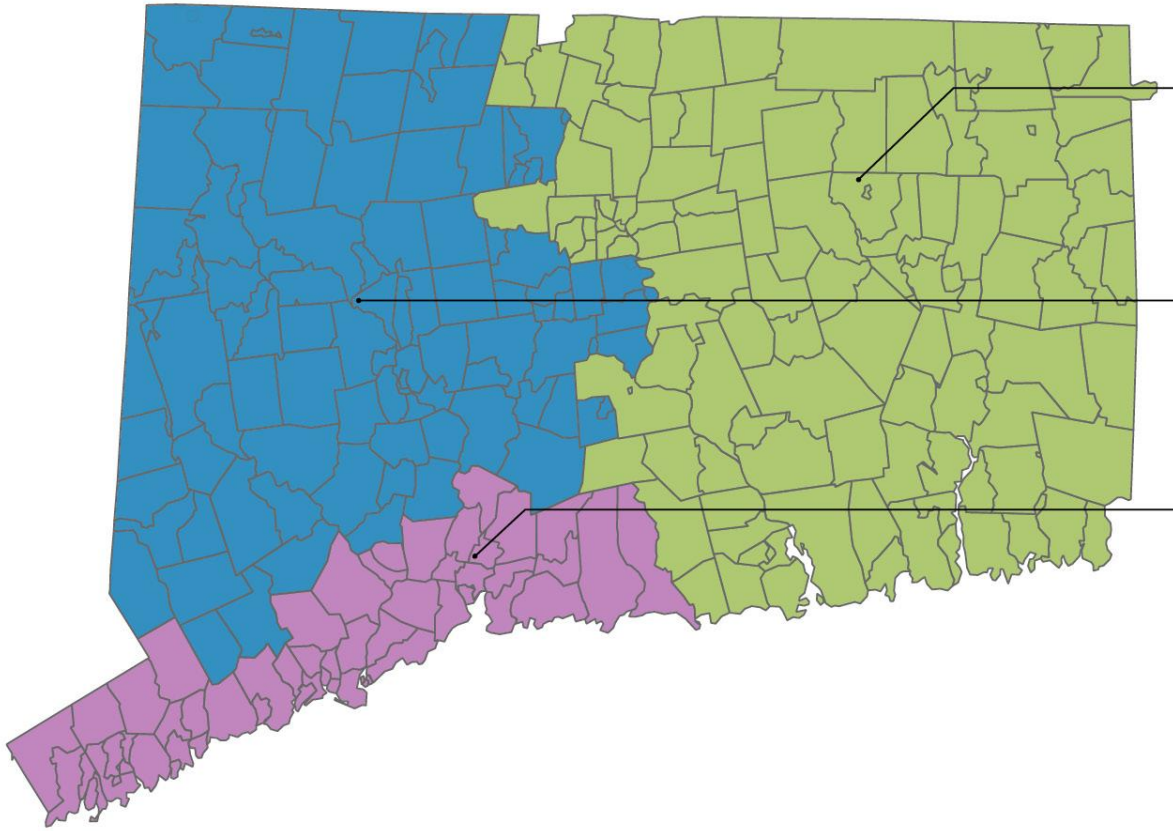
Call us with any questions, need for resources, assistance with referrals



Hartford Hospital Hub:
855-561-7135

Wheeler Clinic Hub:
855-631-9835

Yale Child Study Hub:
844-751-8955

WWW.ACCESSMHCT.COM

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Resources for Patients

1. **AACAP Medication Guide**: Made for parents but very nice of medications for patients
   - AACAP.org → **ADHD: Parents' Medication Guides**
   - https://www.aacap.org/AACAP/Families_and_Youth/Family_Resources/Parents_Medication_Guides.aspx#:~:text=ADHD%3A%20Parents%E2%80%99%20Medication%20Guide

2. **CDC.GOV** Many useful resources for Adults and youth.
   - https://www.cdc.gov/adhd/articles/adhd-across-the-lifetime.html

3. **ADDA: Attention Deficit Disorder Association**
   - www.ADA.org

4. **CHADD: Children & Adults with Attention Deficit Disorder**
   - www.CHADD.org

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Resources for Practitioners

- **ACCESS MENTAL HEALTH CT** **WWW.ACCESSMHCT.COM**
  - Call us with questions or have us follow the patient along with you”
  - ADHD Med Table, ADHD Toolkit, Webinars, PowerPoints, etc.
  - ADHD MEDICATION CHART - R Miller
  - ACCESS MH for MOMS
- **NORTHWELL HEALTH ADHD MEDICATION GUIDE** www.adhdmedicationguide.com
- **STIMULANT DOSE EQUIVALENT CALCULATOR.** https://adhddosecalc.com/
- **AAFP Adult ADHD Toolkit**
  - https://www.aafp.org/family-physician/patient-care/prevention-wellness/emotional-wellbeing/adhd-toolkit/assessment-and-diagnosis.html
    - (VERY comprehensive, includes tools, forms, handouts etc.)
- **CDC.GOV** Learn about AD/HD Disorder. Across the Lifespan
  - https://www.cdc.gov/adhd/articles/adhd-across-the-lifetime.html
- **FDA Drug Shortage Database**
  - https://dps.fda.gov/drugshortages

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Methylphenidate Extended Release

Racemic unless otherwise spec,	Release, IR/ER	Duration	Dose range – GENERIC AVAILABLITY
OROS-MPH *("Concerta©")*	22% IR/78% Continuous (generics	12 hr.	18-72mg/day /GENERICS
Dex-Methylphenidate XR (*"Focalin XR©"*)	Biphasic 50/50 IR/Delayed (**d-mph only)**	8-10 hr.	5-30mg/day /GENERIC
Methylphenidate CD (*"Metadate CD©"*)	Biphasic 30/70	8 hr.	1—60mg GENERIC ONLY
"Quillichew©/Quillivant©"	Biphasic 20/80	8-10hr	20-60mg (no generic but may be on formulary) Chewable or suspension
Methylphenidate LA *"Ritalin LA©"*	Biphasic 50/50 – Generic available	8 hr.	10-60mg/GENERIC
"Contempla XR ODT©"	Biphasic 25/75	11 hours	8.6-51.8mg (Oral disintegrating) 6-17 Y/O
"Aptensio XR©"	Biphasic Beads (37/63)	12 hour	10-60mg BRAND ONLY
"Relexxii©"	OROS (22/78)	12 hour	18-72 (like "Concerta" More sizes/BRAND)
"Journay PM©"	100% delayed release	9-12hr	20-100mg
Ser-Dex-MPH/Dex-MPH "ASTARYZ©"	16%IR/84%prodrug	10-13	26.1/5.2mg-52.3/10.4mg

Amphetamine Extended Release

	Release (IR/ER)	Duration	Dose range
Mixed Amph. Salts ER *"Adderall XR©" 25%L/75%D*	Biphasic 50:50	8-12hr	5-60mg/d
Lis-Dexamphetamine *D-amph attached to lysine ("*Vyvanse©*")*	Pro drug continuous* Cap or chewable	8-12 hr.	20-70mg 1-2hr delay (40mg ~ 20mg MAS XR),
Dextroamphetamine SR (*Dexedrine Spansule©")*	Biphasic, 50:50		5-60mg/d
Amphetamine 50:50 D:L "Dynavel©"	Biphasic 20/80	12 hr.	2.5-30mg Susp or tablet
Mixed Amph. Salts ER *"Mydayis©" 25%L Amph /75%D-amph*	Triphasic 33% IR, XR and XXR	14-16hr	12.5-50mg
*Amphetamine 50:50 D:L ("*Adzenys XR©*")*	Biphasic 50:50	10-12	ODT or liquid

Immediate Release Stimulants

Methylphenidate	Form	Duration	Dose range
Methylphenidate (“*Ritalin©*”)	50:50 D/L)	3-5 hours	Start 5mg Max60mg or 2mg/d,(div. bid-tid)
Dex-Methylphenidate) *(“Focalin©”)*	100% D-MPH	3-5 hr.	Start 2.5mg, Max 40mg/d divided bid or tid
MPH Chewable and solution (“*Methylin©*”)	50/50 D/L	3-5hr	Start 2.5mg children, 5mg adults Max 60mg div bid or tid
Amphetamine			
Dextro-Amphetamine *(“Zenzedi©”)*	100% D-Amph.	3-5hr	2.5mg, 1-3x/d to 60mg/d (divided bid-tid) Off label for adult ADHD
Mixed Amphetamine Salts *(”Adderall©”)*	75%D/25%L-Amph	4-6 hr.	5mg bid, max 60mg (divided)
Amphetamine “Evekeo© & ODT)	50:50 D/L- Amph ”like Benzedrine”	4-6hr	5-40mg qd-tid
Dextro-Amphetamine (*“Procentra©”)* oral sol.	D-Amphetamine	3-6hr	Liquid 5mg/ml, 5-40mg divided. Bid- tid (3-17y)

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Non -Stimulants

Alpha Agonists	Form	Duration	Dose range
Clonidine IR Generic available	IR Tablet, can crush or split	4-6 hr.	0.1--0.4mgdivided bid-qid Not FDA approved -ADHD
Clonidine ER (Kapvay©) *Generic only*	Slow-release tablet Do not spilt or crush	12 hr.	0.1mg-0.4mg/div bid Approved 6-17
Clonidine XR (Onyda XR©)	Slow-release Suspension	24 hr.	Approved 6-17
Guanfacine IR *(Tenex©)* *Generic only available*	Tablet, Can crush or split	8-12 hr.	1-4mg div bid Not FDA approved -ADHD
Guanfacine ER (*Intuniv©*) Generic available	Slow-release tablet Do not split or crush	24 hr.	0.1-0.4mg/d Approved 6-17
NE Reuptake Inhibitors			
Atomoxetine (Strattera ©) *Generic available*	Capsule: Do not open, chew or sprinkle	24 hr.	20-100mg/d max adults
Qelbree© (Viloxazine©)	Capsule: Can be sprinkled	24hr	100-400mg

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Dose Conversion/Equivalents

Methylphenidate	Amphetamine
36mg Concerta© =	= 20mg Vyvanse©
20mg Ritalin LA© =	= 10mg Adderall XR©
10mg Focalin XR © =	= 5mg Adderall© IR 8am and noon
10mg methylphenidate IR, 8am and noon =	5mg d-amphetamine IR, AM &Noon

CONVERSION CALCULATOR→ www.adhddosecalc.com