

Maryland Behavioral Health Integration in Pediatric Primary Care (MD BHIPP)

BHIPP Resilience Break:

Treatment of ADHD in Young Children

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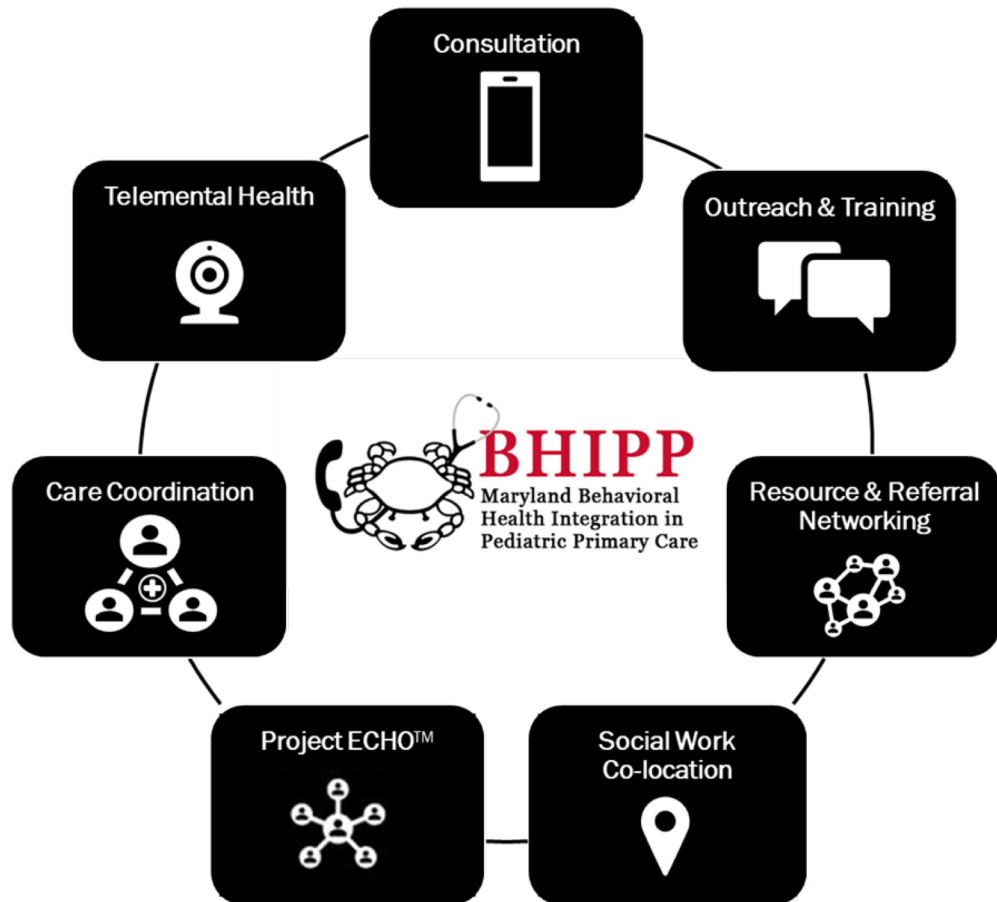


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Who We Are – Maryland BHIPP



Offering support to pediatric primary care providers through free:

- Telephone consultation (855-MD-BHIPP)
- Resource & referral support
- Training & education
- Regionally specific social work co-location (Salisbury University and Morgan State University)
- Project ECHO®
- Direct Telespsychiatry & Telecounseling Services
- Care coordination



Partners & Funding

- BHIPP is supported by funding from the **Maryland Department of Health, Behavioral Health Administration** and operates as a collaboration between the **University of Maryland School of Medicine**, the **Johns Hopkins University School of Medicine**, **Salisbury University** and **Morgan State University**.
- *This program is supported by the **Health Resources and Services Administration (HRSA)** of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$433,296 with approximately 20% financed by non-governmental sources. The contents of this presentation are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS or the U.S. Government. For more information, visit www.hrsa.gov.*



Disclosures

- No conflicts of interest to disclose

Objectives

Describe:

- the approach to the assessment of ADHD in young children
- the rationale for using behavior management training to treat ADHD in young children
- 5 common strategies taught in behavior management training programs.
- the approach to medication management to treat ADHD in young children

Case Example

- Zion* is a 4-year old boy who presents to your clinic with the following:
 - Was kicked out of previous preschool
 - Difficulty listening and following directions
 - Difficulty sitting still in his preschool class – always getting out of his seat and getting in his peers space
 - Tantrums or gets aggressive when told no or that he can't have something he wants
 - Has a hard time getting himself dressed in the morning even though he knows how
 - Has a hard time with transitions, especially if he has to stop playing with his toys and come to dinner or take a bath
 - Does not like to share with his 2-year old sibling, and will get aggressive with sibling if she plays with his toys

ADHD Epidemiology

- **Incidence** in U.S. children ages 3-17 is **9.5%**
- **Increases** with age
 - 2% of children 2-5 years old
 - 9% of children 6-11 years old
 - 12% of children 12-17 years old
- Approximately **one third** (2 million) of children with ADHD received the diagnosis **before age 6**
- Boys twice as likely to be diagnosed
- Primary care physicians now most commonly (53%) make the diagnosis of ADHD

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834391/;](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834391/)

<https://www.childhealthdata.org/browse/survey/results?q=9343&r=1>

Slide from Joyce Harrison, MD



General Diagnostic Challenges for ADHD

- Need to see symptoms in **more than one** setting
- Many behavioral manifestations of ADHD may be **normative** in young children
- ADHD is defined by behavioral characteristics- inattention, hyperactivity and impulsivity-which may be seen in other disorders
- There is no **diagnostic test** for ADHD
- The differential diagnosis is broad
- Environmental situations that affect a child's behavior may be **overlooked**



Rajaprakash & Leppert 2022:

<https://doi.org/10.1542/pir.2020-000612>

Slide from Joyce Harrison, MD

Preschool-Specific Diagnostic Challenges for ADHD

- Young children have a limited range of behaviors to signal distress
- Signs and symptoms must be developmentally inappropriate
- Symptoms must be present for > 6 months
- Impairment varies with the expectations of the child
- Very few symptom rating scales are validated for use in children under 6



Rajaprakash & Leppert 2022:

<https://doi.org/10.1542/pir.2020-000612>

Slide from Joyce Harrison, MD

Clinical Approach

If a child presents with symptoms of *developmentally inappropriate* levels of inattention or hyperactivity/impulsivity present for *more than 6 months*, *across multiple settings* and they *impair function* then it is appropriate to treat the ADHD if the history and physical examination *do not point to another diagnosis*

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7067282/>

Slide from Joyce Harrison, MD



Behavior Management Training Defined

- A treatment modality for improving parent-child relationships and reducing child behavior problems such as:
 - Noncompliance
 - Tantrums
 - Aggression
 - School avoidance
- Can be used to prevent *AND* treat child behavior problems
- Underlying assumption - adults can be taught to become *change agents* for children's behavioral difficulties *by changing their own behavior*



Behavior Management Training: First line treatment for preschoolers with ADHD

- Wolraich et al (2019). ADHD: Clinical Practice Guidelines for the Diagnosis, evaluation, and treatment of Attention-Deficit/Hyperactivity Disorder in children and adolescents. *Pediatrics*, 144(4), e20192528.
- Charach A et al. (2011) Attention Deficit Hyperactivity Disorder: Effectiveness of treatment in at-risk preschoolers; long-term effectiveness in all ages, and variability in prevalence, diagnosis, and treatment. *Comparative Effectiveness Review No. 44*.
www.effectivehealthcare.ahrq.gov/reports/final.cfm

Treating ADHD in Preschoolers

SPECIAL SECTION

Rationale, Design, and Methods of the Preschool ADHD Treatment Study (PATS)

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ABSTRACT

Objective: To describe the rationale and design of the Preschool ADHD Treatment Study (PATS). **Method:** PATS was a National Institutes of Mental Health-funded, multicenter, randomized, efficacy trial designed to evaluate the short-term (5 weeks) efficacy and long-term (40 weeks) safety of methylphenidate (MPH) in preschoolers with attention-deficit/hyperactivity disorder (ADHD). Three hundred three subjects ages 3 to 5.5 years old who met criteria for a primary *DSM-IV* diagnosis of ADHD entered the trial. Subjects participated in an 8-phase, 70-week trial that included screening, parent training, baseline, open-label safety lead-in, double-blind crossover titration, double-blind parallel efficacy, open-label maintenance, and double-blind discontinuation. Medication response was assessed during the crossover titration phase using a combination of parent and teacher ratings. Special ethical considerations throughout the trial warranted a number of design changes. **Results:** This report describes the design of this trial, the rationale for reevaluation and modification of the design, and the methods used to conduct the trial. **Conclusions:** The PATS adds to a limited literature and improves our understanding of the safety and efficacy of MPH in the treatment of preschoolers with ADHD, but changes in the design and problems in implementation of this study impose some specific limitations that need to be addressed in future studies. *J. Am. Acad. Child Adolesc. Psychiatry*, 2006;45(11):1275–1283. **Key Words:** attention-deficit/hyperactivity disorder, preschool, methylphenidate, clinical trials



Theory underlying Behavior Management Programs: Coercive Process Model

Adults inadvertently reinforce undesired behaviors in children

Example:

Child has a tantrum in class when asked to transition to reading time. In response, the child is taken to the office and therefore misses the reading activity that they didn't want to do anyway.



Theory underlying Behavior Management Programs: Coercive Process Model

**Children inadvertently reinforce
undesired behaviors in adults**

Example:

*Child does not put her toys away
after being told repeatedly to do so.
Parent now threatens with a
spanking and child quickly puts her
toys away.*



Common elements of Behavior Management Programs

- Similar underlying theory
- Strategic use of adult attention
- Use of positive reinforcement to build adult-child relationship
- Use of effective limit setting strategies to reduce misbehavior
- Problem-solving skills
- Management of stress/negative affect
- “Homework” to practice new skills



Examples of Behavioral Management Training Programs for Parents by Format

Format	Characteristics	Examples of evidence-based programs
Individualized parent—child coaching	Clinician works w/ parent & child	Parent-Child Interaction Therapy
Group-based parent programs	Clinician works with parents; may include separate child group	Chicago Parent Program
		Incredible Years Program
		Parent Management Training(PMTO)
Leveled programs based on family need	Intervention intensity based on severity of child behavior problems and family need	Triple P
		Family Check-up
		Familias Unidas
Digital/online parenting programs	Individually administered parenting skills education	ezParent
		Infant Net
		Triple P

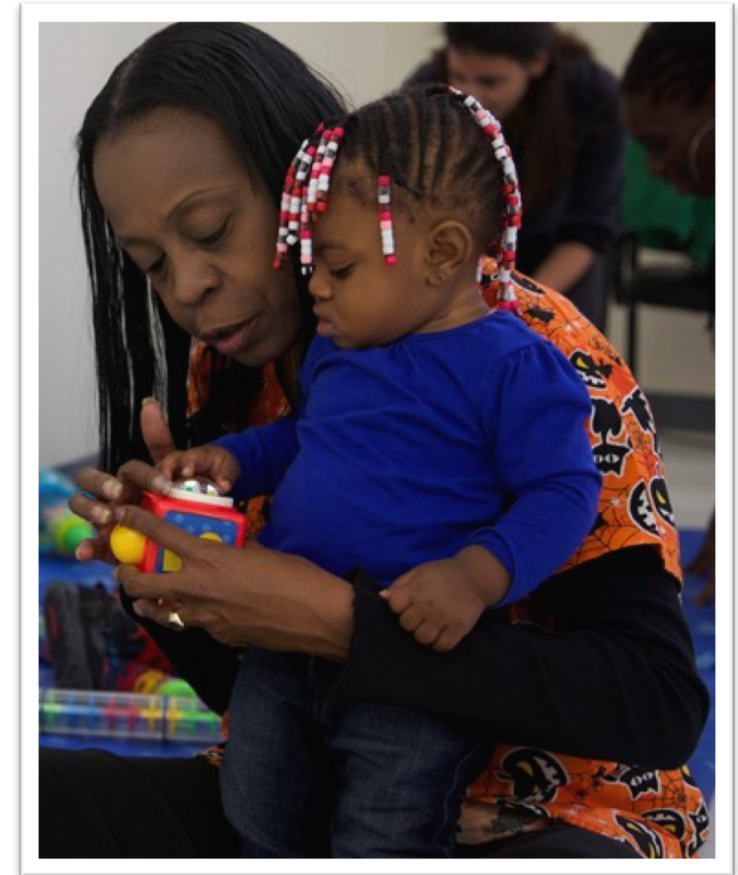
Positive Reinforcement Strategies

1. Child-centered time
2. Descriptive Commenting
3. Establishing routines
4. Strategic use of praise
5. Reward programs



Spending child-centered time

- What is child-centered time?
 - Time adult spends with the child focused on what *the child* wants to do
 - Follow the child's lead
 - Can be as brief as 10-15 minutes/day
- **How does this help?**
 - Reduces likelihood children will use negative behavior to gain parent's attention
 - Promotes feelings of love, warmth, positive self-esteem



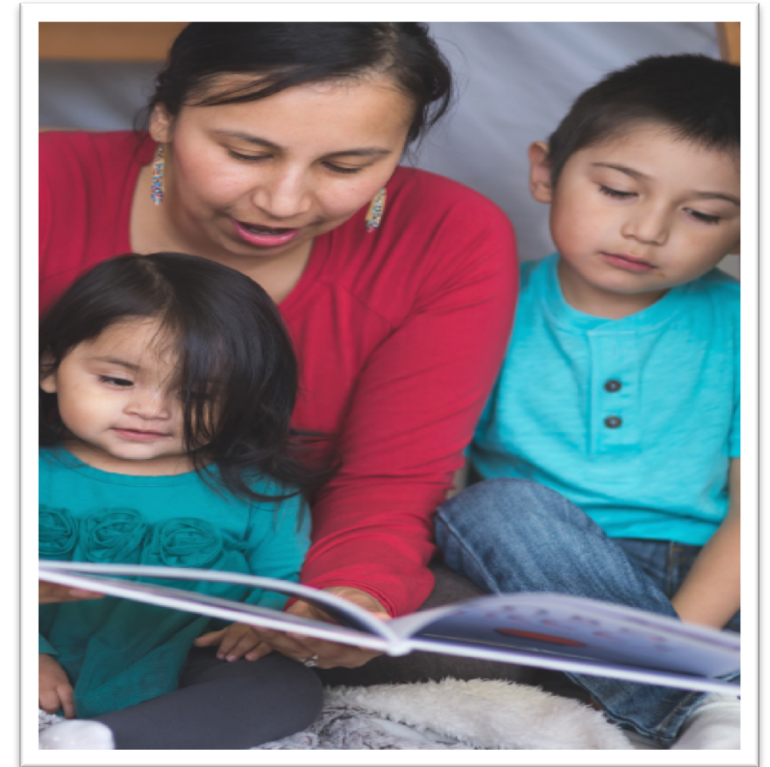
Using Descriptive Commenting

- What is descriptive commenting?
 - Parent describes what the child is doing
 - Like a sports announcer narrating a game
- **How does this help?**
 - Allows parents to teach *without* controlling the interaction
 - Keeps the focus on the child's interests and ideas



Establishing Routines

- What are routines?
 - Behaviors that are regularly practiced
 - Examples: reading before bed, eating dinner together
- **How does this help?**
 - Help children feel safe and in control of their lives
 - Promotes predictability
 - Promotes memory for task steps
 - Reduces stress



Praise

- What is praise?
 - Verbal statements that convey warm, positive feelings to a child
 - Be sincere
 - Praise effort AND performance
 - Should not be mixed with criticism (“I love it when you make your bed. Why can’t you make your bed every morning?”)
- **How does this help?**
 - Gives attention to desirable behaviors
 - Increases the likelihood desired behavior will occur again
 - Reinforces self-esteem, feelings of competence

Types of Praise

- Labeled Praise
 - Positive statements that identify the specific behavior the child is doing or did that the parent likes
 - Example: “I love how hard you are working to clean up your toys”
- Unlabeled Praise
 - Positive but general statements of approval
 - Example: “Good job!” or “You’re such a good boy!”



Labeled praise more powerful than unlabeled praise

Using Reward Programs for Challenging Behaviors

What are rewards?

- Something the child receives to reinforce a specific behavior
- Tangible rewards: stickers, star chart, earning points toward desired reward
- Social rewards: extra time with the parent

How do reward programs help?

- For some challenging behaviors, praise alone may not be effective
Examples: toilet training, reducing aggression, sleeping in their own bed
- Focuses specific attention on the behavior
- Acknowledges to child that parent is aware the behavior is a challenge

Effective Limit Setting Strategies

1. Use Do Statements
2. Use logical consequences
3. Use when/then statements
4. Ignore those behaviors that are “ignorable”
5. Use the 8 keys to effective discipline



Use Do Statements

- What are Do statements?
 - State what the adult wants the child to do
 - Brief
 - Clear
 - Don't communicate that following the instruction is optional
- **How does this help?**
 - Clearly establishes parent's expectations for child

Do Statements

"Put your coat on."

"Please put your toys away now."

"Turn off the TV now and start your homework."

"Take your shoes off when you come into the house, please."

"You must get into the car seat."

Examples of Common Unclear Commands

Unclear Commands	Example	Why this is less effective
Negative command	“Don’t leave your toys out”	States what you <u>don’t</u> want child to do rather than what they should do.
Question command	“Could you put your toys away?”	Communicates child’s compliance is optional
Chain commands	“Put on your shoes, put on your coat, grab your lunch, grab your backpack, and lets go.”	Child does not have the chance to comply with first command before having to comply with several more
Critical commands	“Stop being lazy and get off the couch.”	Causes children to feel badly about themselves and angry about being told to do something

Logical Consequences

- Logical consequences (for children 2+ years)
 - If/then statements describing what the parent will do if the child continues the misbehavior.
 - Consequences should be consistent with misbehavior (i.e., “logical”)
 - Children need to understand cause/effect relationships to benefit
 - To be effective, adult **MUST** follow through on consequence if misbehavior persists
 - Examples:
 - “If you color on the table, then I will take the crayons away.”
 - “If you two keep fighting, then you will both have to go to the office.”
- **How do logical consequences help?**
 - Give children a warning of what will happen if they continue misbehaving
 - Give children control over their choices
 - Reduces adult yelling and nagging

When/Then Statements

- What is a When/Then Statement?
 - Statements that tell the child what they must do in order to get something that the child desires. Then it is up to the child to comply with the original command.
 - “Win/Wins”
 - Examples:
 - “When you clean up the toys, then you can go to recess”
 - “When you say ‘please,’ then I will help you.”
 - “When you finish your homework, then you can go outside.”
- **How do when/thens help?**
 - Establish clear expectations for children while giving them control over their choices

Ignoring Misbehavior

- What is ignoring?
 - Involves not talking to, looking at, or responding to the behavior while it is occurring
 - Once misbehavior stops, adult immediately gives back attention to child
 - Best used to reduce “annoying” behaviors (e.g., whining, tantrums)
- **How does ignoring help?**
 - Removes adult’s reinforcement of misbehavior
 - Reserved only for misbehaviors that are safe to ignore
 - Not recommended for unsafe (e.g., running away from adult by the street) or destructive behaviors (e.g., aggression towards others)
 - Initially ignoring may worsen misbehavior before it gets better

8 Keys to Effective Discipline

(from The Chicago Parent Program)

Regardless of the discipline strategy the adult uses, discipline should:

1. Be tied to a specific behavior
2. Be safe and age appropriate
3. Be predictable
4. Be Controlled
5. Be without rage
6. Be without humiliation
7. Have a positive ending
8. Should make clear to children they are loved, even though the misbehavior is not

Which ADHD Medication to Try First?—School Age

- **Either Methylphenidate or Amphetamine Preparation**
 - AAP Practice Parameter (2019)
 - AACAP Practice Parameter (2021)
- **Guanfacine, Clonidine or Atomoxetine**
 - If concerns about specific stimulant AEs
 - If parental concern about stimulants

Methylphenidate vs Amphetamine (data doesn't include preschoolers)

- Some data and experience support the following points, but they are offered as **opinion**, and are not definitive.
- Adderall (mixed amphetamine salts) is the most popular prescription stimulant street drug.
- Amphetamine reduces craving for cocaine, and is used in some treatment programs to assist with cocaine discontinuation; methylphenidate has no effect.
- Personal experience with patients: some complain of increased motivation on therapeutic doses of Adderall or Adderall XR and don't like this feeling. With switch to methylphenidate preparation, the motivation effect goes away. None have reported this effect on methylphenidate preparations.

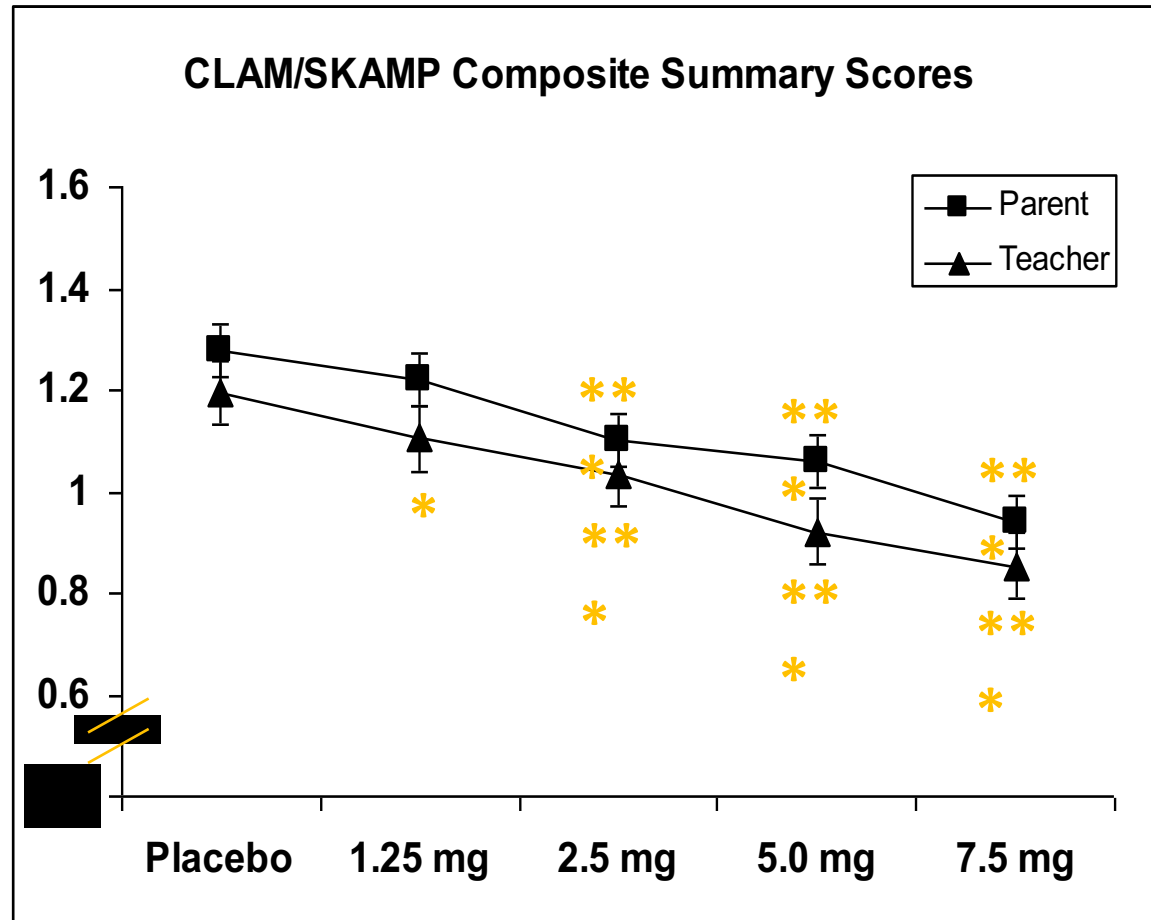
Which ADHD Medication to Try First for Preschoolers (3-5 yo)?

- Methylphenidate—mostly because of data from the NIMH-sponsored multisite *Preschool ADHD Treatment Study (PATS)*
- Greenhill L, Kollins S, Abikoff H, McCracken J, Riddle M, et al. Efficacy and safety of immediate-release methylphenidate treatment for preschoolers with ADHD. *J Am Acad Child Adolesc Psychiatry*. 2006;45:1284-1293

PATS Titration Trial Results

- 165 started titration trial
- 144 completed full 5-week double-blind crossover trial
- 4 doses and placebo randomly for one week each
- Outcome based on blind rater's and parents' consensus:
 - **85% MPH, 10% placebo, 5% no response**
 - **Mean total daily MPH dose = 14.1 mg (\pm 8.1 mg)**

Dose Response: Secondary Efficacy



- Significant Effect for Dose

Parent: $F_{1,156} = 35.83$

Teacher: $F_{1,139} = 39.64$ $p < 0.0001$

- Significantly different from Placebo

* $p < 0.05$

*** $p < 0.001$

Safety Concerns: MPD side-effects are different in preschoolers

- More **appetite decrease** (over 50% of subjects)
- More dysphoria (10% in PATS)
- *Less* insomnia, irritability and anxiety
- Others
 - “**Talks less with others**”:
 - 3% Pb, 3% low dose, **9% high dose**
 - “**Uninterested in others**”:
 - 0% Pb, 0% low dose, **12% high dose**

Firestone et al, JAACAP, 8(1): 13-25, 1998

PATS Six Year Follow-Up: Symptoms persist 5 years in most patients

Riddle M et al. The Preschool Attention-deficit/hyperactivity Disorder Treatment Study (PATs) 6-year follow-up. *Journal Of The American Academy Of Child & Adolescent Psychiatry* . 2013;52:264-278.

Stimulant Delivery Systems

Preparation	Time (hrs)	Methylphenidate	Amphetamine
IR	3-4 4-6	Ritalin Focalin	Adderall/EVEKEO ZENZEDI (dex)
Pulse	7-8	Metadate ER APTENSIO XR	Dex Spansule MYDAYIS
Pearls	8-12	Metadate CD Ritalin LA Focalin XR	Adderall XR
Pump	≤ 12	Concerta	
Modified IR	≤ 12		VYVANSE
Solution/Chewable	3 – 5 (8-12)	**Methylin	PROCENTRA & (ADZENYS ER)
Liquid Susp.	8-12	**QUILLIVANT XR	DYANAVEL XR
Chewable/Disint	8-12	QUILLICHEW ER	VYVANSE//ADZENYS XR-ODT
Patch	≤ 12	DAYTRANA	

Alpha-2 Adrenergic Agonists: Guanfacine and Clonidine

Developed as antihypertensives

Receptor subtypes:

- A prefrontal (attention, inhibition, memory)
- B baroreceptor (blood pressure & pulse)
- C striatum (activity?, stress response?)

Guanfacine: **specific** to A subtype

Clonidine: **nonspecific**: all 3 subtypes; thus, more BP/P changes, somnolence, rebound awakenings, irritability

Dosing α -Adrenergic Agonists in Children & Adolescents >5 yo

	Guanfacine	Clonidine
Start	0.5-1.0	0.05-0.1
Increases	0.5-1.0	0.05-0.1
Max/day	(4.0) 7.0	0.4
Long-acting	Intuniv [®]	Kapvay [®]

- Start generic Intuniv at 1 mg/day (bedtime); increase weekly by 1/mg/day with once daily dosing, *maximum dose 0.012 mg/kg*
- Start generic Kapvay at 0.1 mg at bedtime; increase weekly by 0.1 mg/day weekly with twice daily dosing

Major Problem with Guanfacine in Preschoolers

- Guanfacine ER (Intuniv) is preferred alpha-agonist
 - Safe—main AE is somnolence
 - Once-a-day dosing, given at bedtime may help sleep onset
 - Extended release lowers the peak level, thus reducing severity of AEs
 - **BUT**, Guanfacine ER (Intuniv) is non-crushable pill only; NO liquid formulation
- Regular guanfacine
 - Can be crushed and given in $\frac{1}{2}$ or $\frac{1}{4}$ mg doses during the day
 - Problem is somnolence and other AEs
 - Another problem is higher peak levels

α 2-Adrenergic Agonists (*almost all guanfacine*) or Stimulants for Preschool-Age Children With Attention-Deficit/Hyperactivity Disorder

Table 4. Adverse Effects in a Study of α ₂-Adrenergic Agonists vs Stimulants for Preschool-Age Children With Attention-Deficit/Hyperactivity Disorder

Adverse effect ^a	No. (%) [95% CI]	
	α ₂ -Adrenergic agonist (n = 175)	Stimulants (n = 321) ^b
Daytime sleepiness	66 (38) [30-45]	9 (3) [1-5]
Moodiness/irritability	50 (29) [21-36]	161 (50) [43-57]
Disruptive behavior	49 (28) [19-37]	72 (22) [16-29]
Difficulty with sleep	19 (11) [6-15]	67 (21) [17-25]
Headaches	16 (9) [5-13]	16 (5) [3-7]
Appetite suppression	13 (7) [3-12]	123 (38) [33-44]
Stomachaches	8 (5) [1-8]	42 (13) [9-17]
Skin picking or other repetitive behaviors	8 (5) [1-8]	36 (11) [7-15]

“The most commonly reported adverse effects for α 2-adrenergic agonists were *daytime sleepiness (38%)* and increased *moodiness/irritability (29%)*. For stimulants, the most commonly reported adverse effects were increased moodiness/irritability (50%) and appetite suppression (38%).

The only adverse effect reported more often for children receiving α 2-adrenergic agonists than for children receiving stimulants was increase in daytime sleepiness (38% vs 3%; Table 4)”

Dosing—Consider calling BHIPP for guidance on individual patients

- Methylin (MPD)
 - Start with AM dose, add 2nd dose when it wears off, add 3rd dose, if needed when it wears off
 - Start with 1 to 2.5 mg per dose
 - Increase or decrease, as needed, with expected total daily dose 10-30 mg
- Quillivant
 - Convert total daily Methylin dose to once-a-day Quillivant dose
- Guanfacine (regular)
 - Start with ¼ or ½ mg in AM, add 2nd and 3rd dose as needed
 - FDA recommended maximum daily dose is 0.012 mg/kg

For Positive Outcomes

- Emphasize & support child's strengths
- Emphasize functional outcomes
- Continue treatment as long as needed
- Treat comorbid disorders
- Educate regarding natural history
 - Activity and impulsivity decrease with age
- Be positive because treatments work and most children have good outcomes

Resources

- CDC, National Center on Birth Defects and Developmental Disabilities, Division of Human Development and Disability. Behavior Therapy for Children with ADHD, An Overview. [Behavior Therapy for Children with ADHD: an overview \(cdc.gov\)](#)
- CDC, National Center on Birth Defects and Developmental Disabilities, Division of Human Development and Disability. Behavior Therapy for Young Children with ADHD, What Healthcare Providers Can Do. [Behavior Therapy for Young Children with ADHD: what healthcare providers can do \(cdc.gov\)](#)
- Children and Adults with Attention-Deficit/Hyperactivity Disorder - Improving the lives of people affected by ADHD. CHADD. Accessed September 14, 2021. <https://chadd.org/>
- Dr. Russell A. Barkley - Dedicated to Education and Research on ADHD. Accessed September 14, 2021. <http://www.russellbarkley.org/>
- Society of Clinical Child & Adolescent Psychology. Effective Child Therapy; Behavior Therapy. [Behavior Therapy - Effective Child Therapy](#)
- <https://childmind.org/article/choosing-a-parent-training-program/>
- <https://www.superhealthykids.com/parenting/at-home-flexible-daily-schedule-for-kids/>
- <https://www.amazon.com/Parent-Management-Training-Oppositional-Adolescents/dp/0195386000>



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Thank you!

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