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

Resilience Break: Helping Families Manage ADHD in Primary Care October 8th, 2021

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Personal, Professional or Financial Conflicts of Interest

•None



Learning Objectives

- Be able to screen and assess a child with possible ADHD
- Be able to manage the child's care by working with caregivers and school
- Be able to effectively prescribe medication and manage side effects



Outline

- Background Information
- Clinical Assessment
- Illness Education
- Treatment Overview
- Sleep, Exercise and Substances
- Quick and Simple Behavioral Interventions
- School Advocacy and Consultation
- Medication



Why ADHD?

- Most common chronic illnesses in children and adolescents in the U.S. are asthma, obesity and *ADHD*
- Only about 60% of patients with ADHD get medical care
- Academic, social and emotion consequences are substantial
- Primary care clinicians are best suited to assess and treat ADHD
- Treatments can be provided that are time- and cost-effective



ADHD Treatment & COVID-19: Was/Is a Perfect Hot Mess

• Sleep Interventions

- Disrupted by irregular schedule and less activity
- Medication
 - Minimal useful teacher data for monitoring effect
- Behavior Management Training
 - Parents must manage behavior during school
- School Interventions (eg, 504, IEP)
 - Not as effective during virtual learning











"Philip, if 'twon't make you ill, Try to sit a minute still." So, in earnest tone and rough Spake the father to his tough, While the mother's troubled glance Prophesied a present dance When these two should get a start. And so it made her sick at heart To see the boy hadn't heard His restive father's warning word. He jiggered, And sniggered, And joggled, And boggled, On his chair and squirmed galore: "Philip this doth irk me sore!"

















Prevalence and Natural History of ADHD

- Diagnosis starts about age 3 & peaks age 8
- During normal development, beyond childhood, activity level & impulsivity decrease
 - But, distractibility usually continues into adulthood.
- Natural history: of children diagnosed by age 12:
 - 1/2-3/4 continue into adolescence
 - 1/3-1/2 continue into adulthood
- Earlier onset likely associated with stability of ADHD diagnosis over time
- Estimated prevalence = 6% to 10% (6-17 yo)

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.



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Screening Options for ADHD

- Pediatric Symptom Checklist, 35 or 17 items
 - Problem because doesn't just focus on ADHD
- Daycare and/or Preschool and/or School concerns
 - Problem if staff don't raise valid concerns with parents/caregivers
- Annual Well Checks
 - Problem if parents/ caregivers don't raise valid concerns
 - Symptoms, especially inattention, may not be obvious in the office setting



Screen for ADHD & more: Pediatric Symptom Checklist-17 (PSC-17)

Pediatric Symptom Checklist-17 (PSC-17)

		Please tha	For Office Use				
		NEVER	SOMETIMES	OFTEN	1	A	E
1.	Fidgety, unable to sit still						
2.	Feels sad, unhappy						
3.	Daydreams too much						
4.	Refuses to share						
5.	Does not understand other people's feelings						
6.	Feels hopeless						
7.	Has trouble concentrating						
8.	Fights with other children						
9.	Is down on him or herself						
10.	Blames others for his or her troubles						
11.	Seems to be having less fun						
12.	Does not listen to rules						
13.	Acts as if driven by a motor						
14.	Teases others						
15.	Worries a lot						
16.	Takes things that do not belong to him or her						
17.	Distracted easily						
	(scoring totals)						

Scoring:

 Fill in unshaded box on right with: "Never" = 0, "Sometimes" = 1, "Often" = 2
 Sum the columns.

PSC17 Internalizing score is sum of column I PSC17 Attention score is sum of column A PSC17 Externalizing score is sum of column E PSC-17 Total Score is sum of I, A, and E columns Suggested Screen Cutoff: PSC-17 - 1 \ge PSC-17 - A \ge PSC-17 - E \ge Total Score \ge

Higher Scores can indicate an increased likelihood of a behavioral health disorder being present.

PSC-17 may be freely reproduced.

Caregiver Completing this Form

Created by W Gardner and K Kelleher (1999), and based on PSC by M Jellinek et al. (1988) Formatted by R Hilt, inspired by Columbus Children's Research Institute formatting of PSC-17 • For ages 8-15

- Child self-report and parent-report versions
- Brief version of PSC-35 that correlates well with longer comprehensive measures (e.g., CBCL)
- takes approximately 3–5 minutes for parents/caretakers to complete
- <u>https://www.seattlechildrens.org/globalassets/documents/healthcare-professionals/pal/ratings/psc-17-rating-scale.pdf</u> → PSC-17
- <u>https://www.massgeneral.org/psychiatry/treatments-and-services/pediatric-symptom-checklist</u>
 - Includes multiple language, cartoon version, PSC-17 and PSC-35
- W Gardner, A Lucas, DJ Kolko, JV Campo "Comparison of the PSC-17 and Alternative Mental Health Screens in an At-Risk Primary Care Sample" JAACAP 46:5, May 2007, 611-618





ADHD Items on PSC-17

- 1 Fidgety, unable to sit still
- 3 (Daydreams too much)
- 7 Has trouble concentrating
- 12 (Does not listen to rules)
- 13 Acts as if driven by a motor
- 17 Distracted easily



ADHD: 3 Subtypes in DSM-5

<u>Combined</u>

- 6 of 9 inattention + 6 of 9 hyperactivity/impulsivity items positive
- common
- mostly in boys
- Inattentive
 - 6 of 9 inattention
 - less common
 - mostly in girls and adults
- Hyperactive-Impulsive
 - 6 of 9 H/I symptoms
 - uncommon; may be something else



Child you know well brought by mother for concerns from school

- 6 yo boy (PJ)
- First grade in public school
- Struggled some in kindergarten: very active and sometimes inattentive
- Primary teacher shared with parents concern that learning may be impaired by PJ's trouble focusing and behaviors that disrupt the class
- Primary teacher has given PJ as much individual attention as possible, but that hasn't been sufficient
- Parents have observed that PJ is more active and impulsive than older sister and brother, but have become concerned because his behavior is now disruptive at home
- No history of trauma
- No other neurodevelopmental or cognitive concerns



Vanderbilt – Parent – Inattention

- **1.** Does not pay attention to details or makes careless mistakes, such as in homework.
- 2. Has **difficulty sustaining attention** to tasks or activities.
- **3.** Does not seem to listen when spoken to directly.
- **4. Does not follow through on instruction** and fails to finish schoolwork (not due to oppositional behavior or failure to understand).
- 5. Has **difficulty organizing** tasks and activities.
- 6. Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort.
- 7. Loses things necessary for tasks or activities (school assignments, pencils, or books).
- 8. Is easily distracted by extraneous stimuli.
- 9. Is **forgetful** in daily activities.



Distraction: external vs. internal











Vanderbilt – Parent – Hyperactivity and Impulsivity

- **10.** Fidgets with hands or feet or squirms in seat.
- **11.** Leaves seat when remaining seated is expected.
- 12. Runs about or climbs excessively in situations when remaining seated is expected.
- 13. Has difficulty playing or engaging in leisure activities quietly.
- 14. Is "on the go" or often acts as if "driven by a motor."
- **15.** Talks too much.
- **16.** Blurts out answers before questions have been completed.
- **17.** Has difficulty waiting his or her turn.
- 18. Interrupts or intrudes on others (butts into conversations or games).



Other Dsm-5 ADHD Criteria

- Symptoms persist for 6+ months
- Symptoms present prior to age 12 years
- •Symptoms in 2 or more settings
- •Symptoms impact social, academic or occupational functioning
- Symptoms not due to another disorder



Common Comorbidities

- Behavioral Disorders (ODD 3-5% [but 50% in those with ADHD] CD, IED)
- Learning Disabilities (5-10%)
- Intellectual Disability (2.5%)
- Autism Spectrum Disorder (1-2%)
- Substance Use Disorders
- Anxiety Disorders
- Depressive Disorders
- Demoralization
- Parent-Child Interaction Problems
- Peer Interaction Problems



Vanderbilt – Parent – Oppositional Defiant Disorder = behavior + mood

- **19.**Argues with adults
- 20. Loses temper
- **21**.Actively defies or refuses to comply with adults' requests or rules
- 22. Deliberately annoys people
- 23.Blames others for his or her mistakes or misbehaviors
- 24.Is *touchy or easily annoyed* by others
- 25.Is <u>angry</u> or resentful
- 26.Is spiteful and vindictive



Information for Making the Diagnosis

- Parent reports (Vanderbilt for past week)
- Teacher reports (Vanderbilt for past week)
- Observations in office (problem is absence of a symptom doesn't exclude it)
- Discussion with parents about functional impact



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Illness Education (and more) for ADHD

- ADHD is a common disorder and is no one's fault
- Over 9% of children in the US have received a diagnosis of ADHD (CDC survey data)
- ADHD often runs in families (discuss, again, affected family member's experience)
- Available treatments are effective and outcomes are positive for most children
- Even w/o treatment, hyperactivity & impulsivity decrease with age & are less problematic
- I will work with you and your son's school and any other involved clinicians
- Questions?



FYI (not for family now) Functional Consequences of ADHD in Children

• During Childhood

- Reduced school performance
- Social rejection
- Conduct Disorder in adolescence
- During Adulthood
 - Antisocial Personality Disorder as adult
 - Subsequent substance abuse disorders
 - Poorer occupational performance
 - Higher probability of unemployment
 - Elevated interpersonal conflict
 - Unplanned pregnancy
 - Increased motor vehicle accidents



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Definitive Study: Multimodal Treatment of ADHD (MTA)

- Participants: 579 ages 7.0-9.9 years
- Diagnosis: ADHD Combined Type
- Randomization: to 1 of 4 interventions
- Duration: 4 mo. treatment; 10 mo. maintenance
- Outcomes in multiple domains
- Long-term f/u at 2, 3, & 8 years

A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives Of General Psychiatry* [serial online]. December 1999;56(12):1073-1086.



MTA Design: Random Assignment to Treatment Arm

- Medication (MED; start with stimulant)
- Intensive Psychosocial Intervention (BEH)
- •Combination (COMB = MED + BEH)
- Community Control (CC; referral)



MTA Study: Primary Results

- All 4 groups showed sizable reductions in ADHD symptoms over time.
- For most core ADHD symptoms COMB and MED > BEH and CC.
- COMB > MED for: oppositional, aggressive & internalizing symptoms; teacher-rated social skills; parent-child relations; reading achievement.
- CONCLUSION: Psychosocial & medication treatment important
 JUST DO SOMETHING!



New Medical Treatments

- Monarch eTMS (external Trigeminal Nerve Stimulator)
 - FDA approved 2019 for 7-12 year olds with moderate-to-severe ADHD
 - Approval based on limited data on 62 participants on active or "placebo" device using ADHD rating scale
 - AEs: drowsiness, increased appetite, trouble sleeping, teeth clenching, headache and fatigue
- EndeavorRX video game (TOVA = Test of Variables of Attention)
 - FDA approved in 2020 for 8-12 year olds with mild-to-moderate ADHD
 - Approval based on limited data showing improvement in TOVA but not in academic or behavioral parameters
 - AEs: frustration, headache, dizziness, emotional reaction, aggression



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- Children with ADHD have higher rates of insomnia; stimulant medications can worsen difficulty falling asleep if given too late in the day
- There is a simple brief psychotherapy (CBT) for insomnia in adults; it has been adapted for use in adolescents
- *Sleep hygiene counseling* works but requires persistence!
 - Scheduled regular awakening (but a bit later on weekends for teens)
 - Daytime sleep restriction (no naps) and caffeine restriction
 - Bedtime stimulus control (lights, electronics, music, etc.)
- Melatonin, a sedative at higher doses, is a popular sleep aid, but.....



Melatonin

- Pineal gland hormone regulates 24-hour sleep-wake cycle and other circadian rhythms
- Peak levels during night
- Daytime dose in young adults of 0.1-0.3 mg increased plasma melatonin to normal night range
- Melatonin has **sedative** effect at higher doses
- Adult data: sleep onset about 30 minutes earlier; this effect wears off in about 4 weeks
- OTC melatonin preparations range from 1 to 10 mg
- In a study of 31 melatonin preparations, melatonin varied from -83% to + 478% of labeled content
- USP verified preps are accurate, but cost more and only available in 3 and 5 mgs dosages



Melatonin and Children

- Used by lots of parents with or without recommendation of PCP
- Best efficacy data for autism, some for ADHD
- "Data supporting use of melatonin in developmentally normal children are limited and its long-term safety is unknown." (*Medical Letter*, June 29, 2020)
- Long-term melatonin supplementation can suppress the hypothalamicgonadal axis and may be associated with delayed onset of puberty, possibly by preventing the decline in nocturnal levels of melatonin that occur during the onset of puberty
- Melatonin may be the most benign sedative for sleep onset, with above caveats, although no meds preferred, if possible



- •Just do something—some better than none
- Child's choice
- Rewards (not Snickers)



Substances

- Caffeine in soft drinks and coffee on weekends, if not used on Monday, leads to reduced school performance that day
- •Stimulant abuse and diversion: eg, amphetamine, Adderall
- Marijuana—anxiety treatment that does help while high; but lowers motivation; prevents recovery
- •Alcohol—another anxiety treatment



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Parenting Skills Training (PT) 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 parents can be taught to become *change agents* for their children's behavioral difficulties by <u>changing their own</u> <u>behavior</u>





Common elements of all PT programs

- Similar underlying theory
- Use of positive reinforcement to build parent-child relationship
- Effective limit setting strategies
- Problem-solving skills
- Managing stress/negative affect
- "Homework" to practice new skills





Theory underlying PT Programs: Coercive Family Process Model

Parents inadvertently reinforce undesired behaviors in their children

Example:

Child has a tantrum in the grocery store because he is bored and wants to leave. Embarrassed, parent gives the child some candy to quiet him and quickly leaves the grocery store.





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Theory underlying PT Programs: Coercive Family Process Model

Children inadvertently reinforce undesired behaviors in their parents

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.





Maryland BHIPP

Role of Provider in PT Programs

1. Help parents clarify the child behaviors they really like -- make a plan for consistently reinforcing those desired behaviors

- 2. Help parents to identify most problematic behaviors, and to -- make a plan for:
 - (a) reducing the attention they give to those behaviors,
 - (b) setting effective limits on those behaviors
 - (c) following through on their limits



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School Interventions

- With recent return to school (from COVID), problems at school more likely
- 504 plans often helpful and sufficient
- IEP may be needed in comorbid learning or other problems
- Getting the parent(s) to make a formal, written request is most important
- Getting teacher ratings of past week on Vanderbilt obviously important



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Pediatric Psychopharmacology Level 1: ADHD

Drug (mode of action)	Indication	FDA Approval/ Approved Age	Level of Evidence	Generic
Methylphenidate (stimulant)	ADHD	Yes; ≥ 6	A	Yes
Amphetamine (stimulant)	ADHD	Yes; <u>></u> 6	A	Yes
Guanfacine (α-2 adren. agonist)	ADHD	Yes; <u>></u> 6	A	Yes
Clonidine (α-2 adren. agonist)	ADHD	Yes;> 6	A	Yes
Atomoxetine (NRI)	ADHD	Yes; ≥ 6	A	Yes



Effect Sizes

- Stimulants for ADHD
- Guanfacine/Clonidine
- •Atomoxetine 0.6

1.0

0.6

- SSRIs for anxiety/OCD 0.7
- SSRIs for MDD 0.2
- ES = <u>change active change placebo</u> S.D.



Safety Profile of Four Medication Classes in Level 1 for Children and Adolescents

Safety Criteria	Stimulants	α-2 Adrenergic Agonists	Norepinephrine Reuptake Inhibitors (NRIs)	Selective Serotonin Reuptake Inhibitors
FDA youth approval	<u>></u> 6 years	<u>></u> 6 years	<u>></u> 6 years	<u>></u> 6 years
10+ years on market	>50 years	>20 years	>10 years	>25 years
Overdose harm low	low	very low	very low	very low
No major FDA boxed warning	dependency		"suicidality"	"suicidality"
Low long term health risk	growth deceleration	none known	none known	none known



Which ADHD Medication to Try First?

- 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

- 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.



Stimulant Delivery Systems

Preparation	<u>Time (hrs)</u>	<u>Methylphenidate</u>	<u>Amphetamine</u>
■ IR	3-4 4-6	Ritalin Focalin	Adderall/EVEKEO ZENZEDI (dex)
Pulse	7-8	Metadate ER APTENSIO XR	Dex Spansule MYDAYIS
 Pearls 	8-12	<i>Metadate CD Ritalin LA</i> Focalin XR	Adderall XR
Pump	<u><</u> 12	Concerta	
 Modified IR 	<u><</u> 12		VYVANSE
 Solution//Chewable 	3-5 (8-12)	Methylin//methylp PROCEN	TRA & (ADZENYS ER)
 Liquid Susp. 	8-12	QUILLIVANT XR	DYANAVEL XR
Chewable//DisintPatch	8-12 <u><</u> 12	QUILLICHEW ER VYVANSE/ DAYTRANA	//ADZENYS XR-ODT



ADHD Medication Guide*

Methylphenidate Derivatives – Long Acting/Extended Release										
Quillivant XR [®] 25mg/5ml (5mg/ml) (Banana Flavor)	Dose: 10mg 2ml	1 Bottle: 300mg 60ml Dose: 20mg 4ml	1 Bottle	e: Dose: 30mg 6ml	1 Bottle: 900mg 180ml	Dose: 40mg 8ml	Bottles: 600mg 120ml	e: 9 1	Bottles: Dose: 50mg 150ml	2 Bottles: 900mg 180ml
Concerta®†	18mg otzo 18	27mg 0120 27 65	36mg 0120 36	C 54mg atza 54	5 72mg	alza 36 + alza 36	6			
Focalin [®] XR ‡ (dexmethylphenidate)	5mg 🕺 😭 5		10mg 🦉 🚬	5 15mg	5 20mg 🤇	5 25mg	5 30mg		5mg	40mg 🖉 🗧 🦻
2 Ritalin [®] LA ‡	10mg 🦉 🐔		20mg 📲 👷	C 30mg 2 2	e 40mg 🧶	R40				
Metadate® CD ‡	10mg		20mg 📑 🖉	C 30mg 28 8	e 40mg 🤮	50mg	E 60mg	Som of Care		
2 Methylin® ER	10mg 💿		20mg 🕥							
Ritalin [®] SR			20mg 🐨	G			Jerivatives – Sn	ort Acting/I	mmediate Keleas	e G G
3 Daytrana®	Davtrana® 33 mg/hr 33							10mg 10		
	ha ^m Daytrana ^m idate (methylphenidate ystem) transdermal system)					Ritalin®		5mg 🕖	10mg 🗿	G 20mg) G
	Daytrana" Daytr (methylphenidais (methylphenidais (methylphenidais)) masdermal syntem) transdermi				2	Methylin®		5mg 🔘	10mg 🕐	20mg 🎱
em Methytphenidate Transdermal Syster 2.2 mg/hr					2	Methylin [®] Chewable [§] (Grape Flavor)	2.5mg	5mg 5 CHEW	10mg 10 CHE W	
	Daytrana methylphonidute transfermal system 1.6 mg/hr	1.0 10 (methyla) transdorm dermal System 1.6 t 2.2 mg/hr	Mothy D. Trained ans	aytrana" Daytr tityi deri Datray e astronomia	2	Methylin [®] Solution (Grape Flavor)		5mg/5ml	10mg/5ml	G
fana Day	Day transfer of the second secon									
*Disclaimer: The ADHD Medication Guide was created by Dr. Andrew Adesman of the North Shore-LIJ Health System. The North Shore-Long Islam Jewish Health System is not affiliated with the owner of any of the brands referenced in this Guide.										
transe Beneric	This Guide should not be used as an exclusive basis for decision-making. The user understands and accepts that if the health system were to accept the risk of harm to all users would be too great. Thus, use of this ADHD Medication Guide is strictly voluntary and at the user's sole risk.									
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Main Side Effects of Stimulants

Most Common

- •Gl upset
- Appetite suppression
- Difficulty falling asleep
- Less Common
 - Long-term suppression of growth (2 cm, 2.7 kg, 3 years)
 - Tics
 - Cardiac/Hemodynamic (small increases)
 - Dysphoria (young patients)
 - Behavioral/cognitive constriction (high dose)
 - *RARE: serious cardiovascular events



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



Dosing α-Adrenergic Agonists

	<u>Guanfacine</u>	<u>Clonidine</u>
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 <u>once daily</u> dosing
- Start generic Kapvay at 0.1 mg at bedtime; increase weekly by 0.1 mg/day weekly with <u>twice</u> <u>daily</u> dosing



Atomoxetine: Strattera®

- Selective norepinephrine reuptake inhibitor
- Metabolized by cytochrome P450 (CYP) 2D6 isoenzyme (CYP2D6)
- Depending on race, up to 10% of patients may be poor metabolizers; & may have higher plasma and brain drug levels at comparable doses



Atomoxetine Adverse Events

- "Common"
 - Nausea
 - Vomiting
 - Fatigue
 - Decreased appetite
 - Abdominal pain
 - Somnolence
- Warnings & Precautions: suicidal ideation, severe liver injury, serious cardiovascular events, major BP&P changes, others



Viloxazine (Qelbree)

- New (to US market in April, 2021) norepinephrine reuptake inhibitor (NRI)
- Similar to atomoxetine (Strattera) with fewer Warnings and Precautions in FDA package insert
- BUT.....first marketed in Europe in 1976, primarily as antidepressant
- FDA orphan designation (not approval) for narcolepsy and cataplexy in 1984
- Withdrawn from worldwide market in 2002 for business reasons
- After 45 years, being marketed by different company for ADHD in US
- Bottom line: Suggest waiting and watching



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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



References and Resources

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For resources related to the COVID-19 pandemic, please visit us at <u>BHIPP Covid-19 Resources</u>.

