Evaluation and Management of ADHD in Preschool and Elementary Children

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No disclosures relevant to the content of this talk.

I will not address off label use of any product during this talk

Preschoolers? Aren’t they too young?

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ADHD: Clinical Practice Guideline for the Dignosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents

SUBCOMMITTEE ON ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, STEERING COMMITTEE ON QUALITY IMPROVEMENT AND MANAGEMENT

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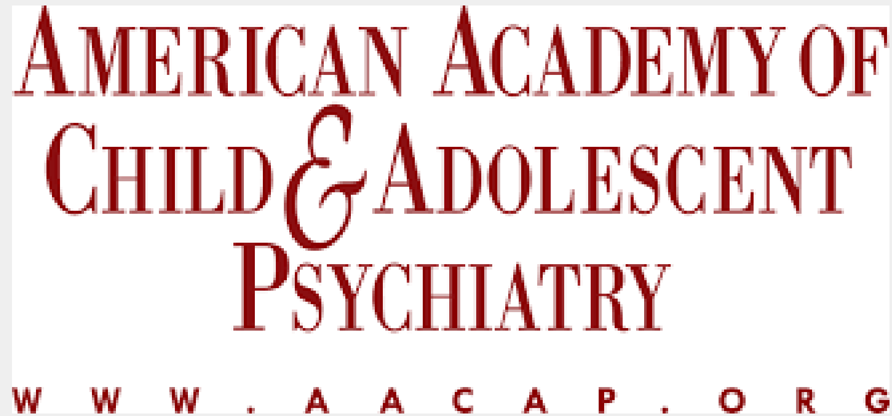
The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://pediatrics.aappublications.org/content/early/2011/10/14/peds.2011-2654

AAP ADHD Guidelines Key Action Statement 1

1. The primary care clinician should initiate an evaluation for ADHD for any child **4 through 18 years** of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity



Practice Parameter for the Evaluation and Treatment of Children and Adolescents with ADHD

Screening

AACAP- “Screening for ADHD should be part of every Mental Health Assessment regardless of the Chief Complaint.”

SHOULD EVERY CHILD BE SCREENED FOR ADHD?

We screen for: ASD, developmental delays, hearing, vision, PKU, Scoliosis

Help me remember. Maybe I’m confused. Is there another neurodevelopmental disorder for which we don’t recommend early intervention?

How do we decide what to screen for?

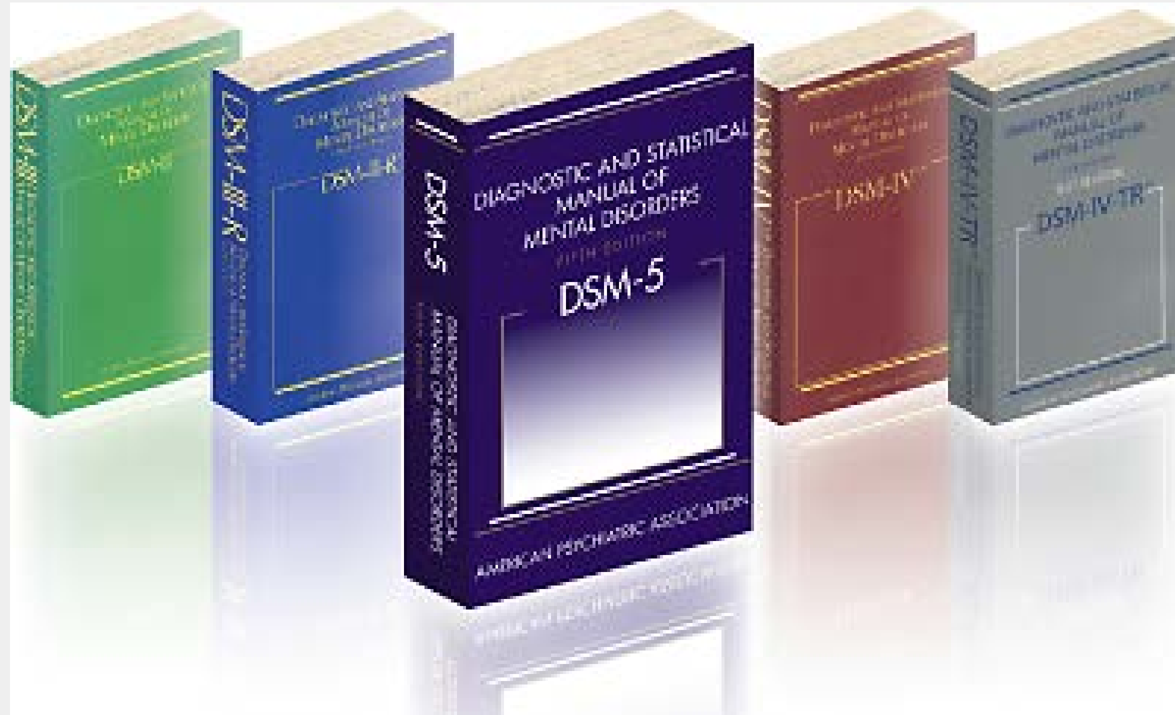
Common Conditions ADHD 5-10% of the population

Conditions That Cause Morbidity ADHD associated with increased risk: of school failure/underperformance, suicide, depression, anxiety, early death, addiction, accidents, traumatic ER visits, criminality, problems with job performance, underemployment, divorce

Conditions for which there are treatments that improve outcomes Stimulant medication has been demonstrated to decrease the risk of all of these sometimes completely eliminating the risk, as in the case of children treated before the age of nine and SUD risk.

OK...I'll get off my soap box.

DIAGNOSIS


DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS
FIFTH EDITION
DSM-5
AMERICAN PSYCHIATRIC ASSOCIATION
DSM-IV
DSM-IV-TR

DSM 5 Criteria For ADHD

A. Symptoms 6/9- Inattentive and/or 6/9 Hyperactive/Impulsive Symptoms for longer than 6 months & **more common than developmentally expected**

B. Symptom onset before age 12

C. Symptoms occur in more than one setting

D. Symptoms interfere with or reduce the quality of social, academic or occupational functioning

E. Symptoms are not better explained by something else

Elements of Diagnostic Work Up

AACAP ADHD Practice Parameter

Structured Interviews

Parent/Child Parent Child

Rating Scales

Parent/Teacher

Conners Rating Scales

ADHD-RS IV

Medical and Developmental History

Pregnancy: Exposures, Prematurity

Birth: Trauma/asphyxia

Medical Problems: Snoring, seizures, thyroid issues, genetic syndromes

Head Injuries

Developmental Milestones   Speech/Language Gross and Fine Motor

Sleep!

Social History

Environment(s) when child was an infant/toddler

Preschool environment(s)

Home environment(s)

One trusted/unconditional adult?

Family History ADHD but also

Intellectual disability Neurological Problems/Seizures

LD

Thought disorders

Anxiety Disorders Jail time??

ODD/CD

OCD

Depression/Mood disorders

Addiction/SUD

ASD

Examination

Mental Status Examination

Neurological Exam: Tics/Tremor,Coordination, Handwriting, Soft Signs

Cardiovascular Exam

Assess Growth and Weight

AACAP Diagnosis Parameters

If the medical history is negative then laboratory/neurological studies are not indicated.

Psychological/Neuropsychological testing is not mandatory for the diagnosis of ADHD but should be performed if intellectual disability or learning disability are expected.

Psychological/Educational Testing

“In the vast majority of cases, these learning disorders will be comorbid with the ADHD, and it is recommended strongly that the patient’s ADHD be optimally treated before such testing. It could then be firmly concluded that any deficits identified are clearly the result of a learning disorder and not due to inattention to the test materials.”

-AACAP

Practice Parameter on ADHD

So how is the diagnosis made?
DSM 5 Criteria
AAP Guideline recommends strict adherence to the criteria and careful evaluation

DSM 5 Criteria For ADHD

A. Symptoms 6/9- Inattentive and/or 6/9 Hyperactive/Impulsive Symptoms for longer than 6 months & **more common than developmentally expected**

Management of ADHD in Presc ×
NICHQVanderbiltAssessment-F ×
James
file:///Users/jameswiley/Downloads/NICHQVanderbiltAssessment-FULL.pdf

Symptoms	Never	Occasionally	Often	Very Often
1. Does not pay attention to details or makes careless mistakes with, for example, homework	0	1	2	3
2. Has difficulty keeping attention to what needs to be done	0	1	2	3
3. Does not seem to listen when spoken to directly	0	1	2	3
4. Does not follow through when given directions and fails to finish activities (not due to refusal or failure to understand)	0	1	2	3
5. Has difficulty organizing tasks and activities	0	1	2	3
6. Avoids, dislikes, or does not want to start tasks that require ongoing mental effort	0	1	2	3
7. Loses things necessary for tasks or activities (toys, assignments, pencils, or books)	0	1	2	3
8. Is easily distracted by noises or other stimuli	0	1	2	3
9. Is forgetful in daily activities	0	1	2	3
10. Fidgets with hands or feet or squirms in seat	0	1	2	3
11. Leaves seat when remaining seated is expected	0	1	2	3
12. Runs about or climbs too much when remaining seated is expected	0	1	2	3
13. Has difficulty playing or beginning quiet play activities	0	1	2	3
14. Is "on the go" or often acts as if "driven by a motor"	0	1	2	3
15. Talks too much	0	1	2	3
16. Blurts out answers before questions have been completed	0	1	2	3
17. Has difficulty waiting his or her turn	0	1	2	3
18. Interrupts or intrudes in on others' conversations and/or activities	0	1	2	3
19. Argues with adults	0	1	2	3
20. Loses temper	0	1	2	3

Not all of the school age items apply to preschoolers

Loses things

Delays tasks that require sustained mental effort

We need a preschool specific rating scale

DSM 5 Criteria For ADHD

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E. Symptoms are not better explained by something else

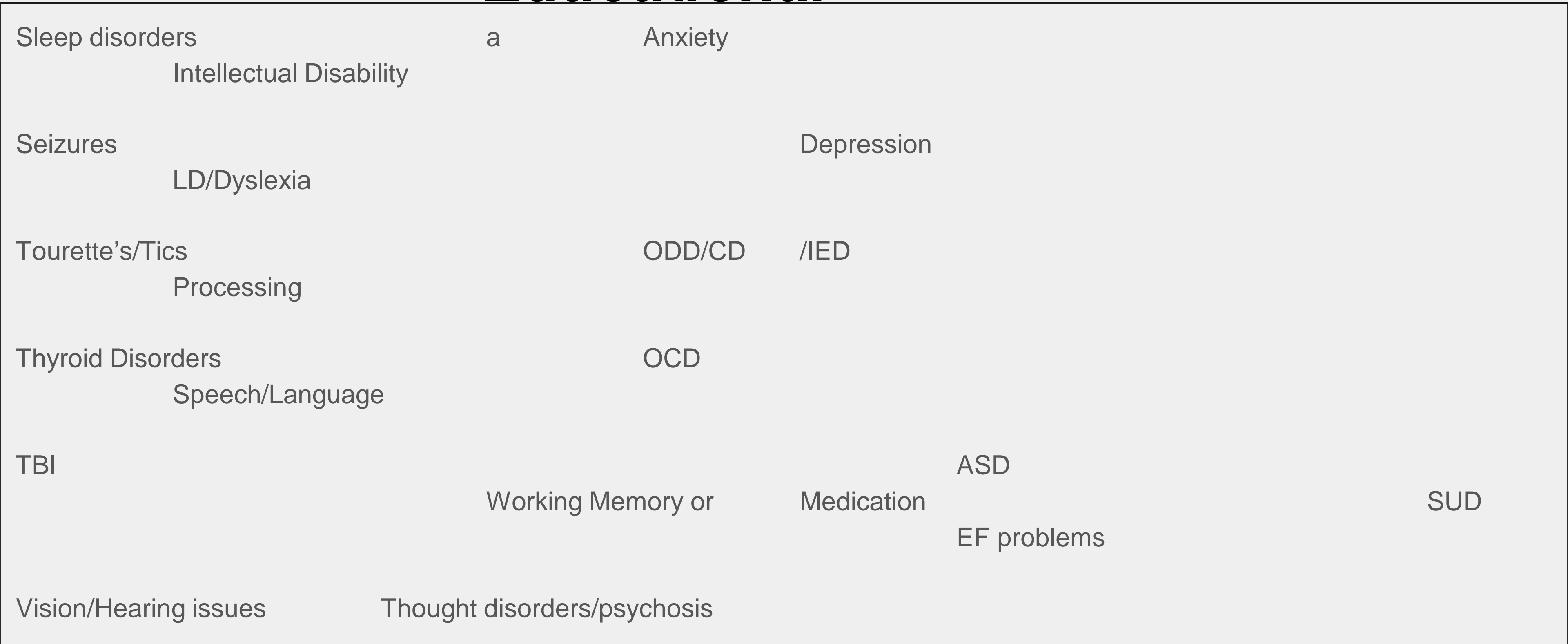
I’m 4 years old

For example

Something *Else*

Medical ***Psychiatric***

Educational



FDA Cleared Objective Biomarkers for ADHD

QbTest CPT with Motion

NEBA QEEG theta/beta ratio

Neuro-imaging

3000 studies
Not recommended clinically at this time but may be the future

AAP Guideline

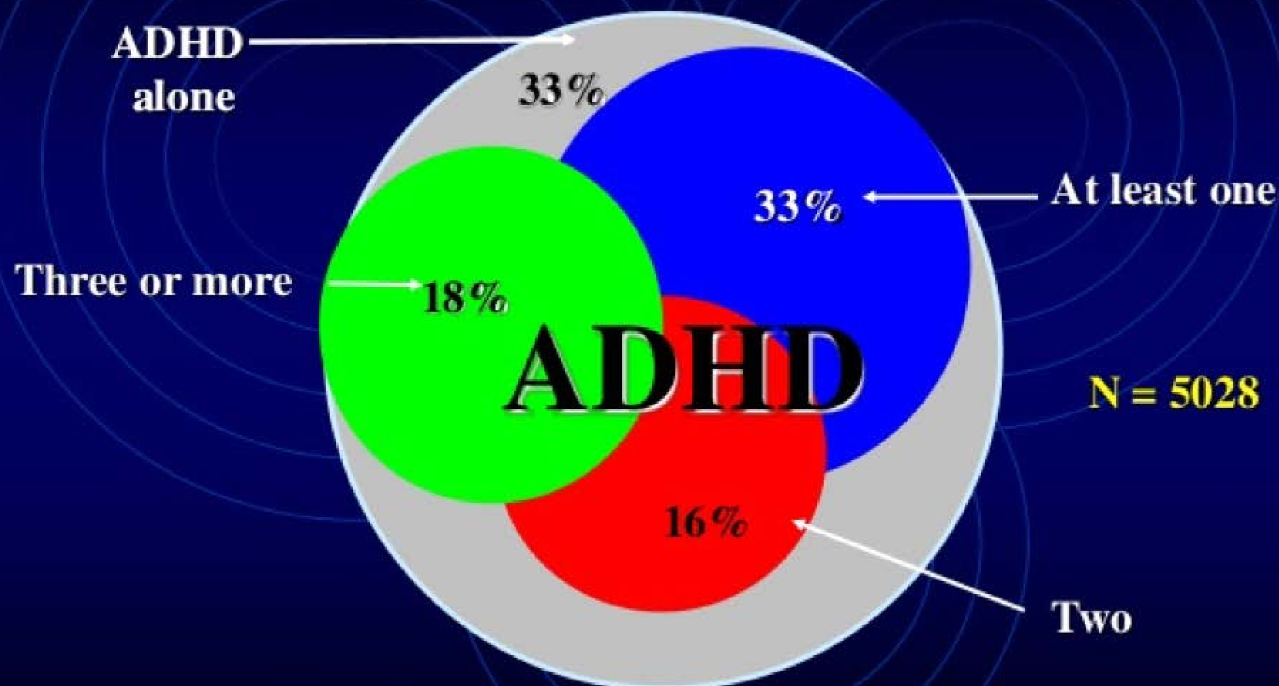
Patients should be evaluated for co-morbid conditions

The CHICKEN or the EGG

(or BOTH)

Co-Morbidity is is the rule not the exception...

….including preschoolers...


Number of Comorbidities in US Children with ADHD
ADHD alone
33%
At least one
33%
Three or more
18%
ADHD
N = 5028
16%
Two
Larson et al. Pediatrics 2011;127(3):462-70

Medical Conditions

Autism spectrum disorder
Sleep Disorders
Oppositional Defiant disorder/ Conduct disorder
Anger hypomania Mania
Depressive Disorders
Obsessive-Compulsive disorders
anxiety disorders
Tics/ tourette disorder

ADHD
INATTENTIVE PRESENATION

ADHD
COMBINED PRESENTATION

ADHD
HYPERACTIVE/ IMPULSIVE PRESENATION

SOCIAL
NON-VERBAL LD
SPECIAL COMMUNICATION

LANGUAGE
EXPRESSIVE
RECEPTIVE
MIXED REC-EXP
STUTTERING
WRITTEN EXPRESSION
DYSPRAXIA

ACADEMIC
DYSGRAPHIA
DYSLEXIA
DYSCALXULIA

PROCESSING
AUDITORY
VERBAL
SENSORY
INFORMATION

EXECUTIVE FUNCTION
CUEING
WORKING MEMORY
TIME PERCEPTION
ORGANIZATION
PRIORITIZATION

NON-MEDICAL CONDTIONS

“Sometimes the Best Diagnosis is No Diagnosis.”

Nelson Handal, MD

Immaturity (Birth date last half of the school year)

80th percentile hyperactivity, impulsivity (Linebacker /Cheerleader Syndrome)

Behavior problems not related to a psychological diagnosis (B.A.D.)

Unhealthy Classroom Environment

Chaotic Home Environment

Victim of Bullying

Odd (not ODD)

TREATMENT

Non-Guideline Treatments

Supplements: Omega 3/6 80/20% Fatty Acids-mixed results studies but can't

hurt. Megavitamins can increase disruptive behavior. Fe and Zn

Exercise: Several studies support improved attention with exercise

Good for health in general and mental health in particular

Recess: Demonstrated to improve standardized test scores for all

Sleep: No one pays attention well if they don't sleep well

Nutrition: Elimination diets have been eliminated. Healthy diet limiting

preservatives and dyes? Food sensitivities/allergies < 1%

Neurofeedback: Studies conflicting with expert consensus that it is not effective

AAP Guidelines: ADHD Treatment

AAP Guideline: Key Action Statement 5

5. Recommendations for treatment of children and youth with ADHD vary depending on the child's age

Preschoolers 4-5 Year Olds

a. For preschool aged children (4-5 years of age) the primary care clinician should prescribe evidence-based parent and/or teacher administered behavior therapy as the first line of treatment (quality of evidence A/strong recommendation)

Behavior Therapy

Behavior therapy represents a broad set of specific interventions that have a common goal of modifying the physical and social environment to alter or change behavior. Behavior therapy usually is implemented by TRAINING PARENTS in specific techniques that improve their abilities to modify and shape their child's behavior and to improve the child's ability to regulate his her own behavior.

Evidence Based Behavioral Therapy

Intervention Type	Description	Typical Outcome(s)	Effect Size
Behavioral parent training (BPT)	Behavior-modification principles provided to parents for implementation in home settings	Improved compliance with parental commands; improved parental understanding of behavioral principles; high levels of parental satisfaction with treatment	.55
Behavioral classroom management	Behavior-modification principles provided to teachers for implementation in classroom settings	Improved attention to instruction; improved compliance with classroom rules; decreased disruptive behavior; improved work productivity	.61

HHS
Agency for Healthcare Research and Quality

2011 Report

- Triple P
- PCIT
- Incredible Years
- New Forest Parenting Programme

Preschool ADHD Treatment Study PATS

Behavioral interventions were more effective in preschoolers than in school aged children and adolescents and didn’t cause side effects.

Medication was effective but not as effective and with more side effects than medication use in school aged children.

It can be difficult to refer kids to behavioral therapy with qualified mental health professionals (so) all *(physicians)* have in their tool kit is medication.

William Pelham, Jr PhD Chair of Psychology at FIU

Of note, only 37 of 279 enrolled parents thought that the behavior training resulted in significant or satisfactory improvement (Greenhill et al., 2006a).

13%

It’s a start.

Behavioral Therapy, while important is unlikely to lead to symptom remission.

AAP Guideline for Medication in Preschoolers

“...may prescribe **methylphenidate** if the behavior interventions do not provide significant improvement and there is moderate-to severe continuing disturbance in the child’s function.”

In areas where evidence-based behavioral treatments are not available the clinician needs to weigh the risks of starting medication at an early age against the harm of delaying diagnosis and treatment (quality of evidence B /recommendation)

Ritalin (*methylphenidate)* should not be used in children under the age of 6 years old because it has not been studied in this age group.

http://www.fda.gov/downloads/Drugs/DrugSafety/ucm089090.pdf

amphetamines

EVEKEO FDA approved down to age 3
Go Figure.

Preschooler Medication Take Home Points

8/9 Studies found MPH to be effective as in school aged patients

Slightly lower mean dose   .7 mg/kg compared to 1 mg/kg

Slower metabolism, start with shorter acting medication

More emotional side effects--irritability, crying especially after med effect wears off

13% discontinued medication due to side effects

Lower and slower titration compared to school aged kids

Although Amphetamines are FDA approved down to age 3, Methylphenidate is the preferred medication.

AAP Guideline: Elementary School-aged Children

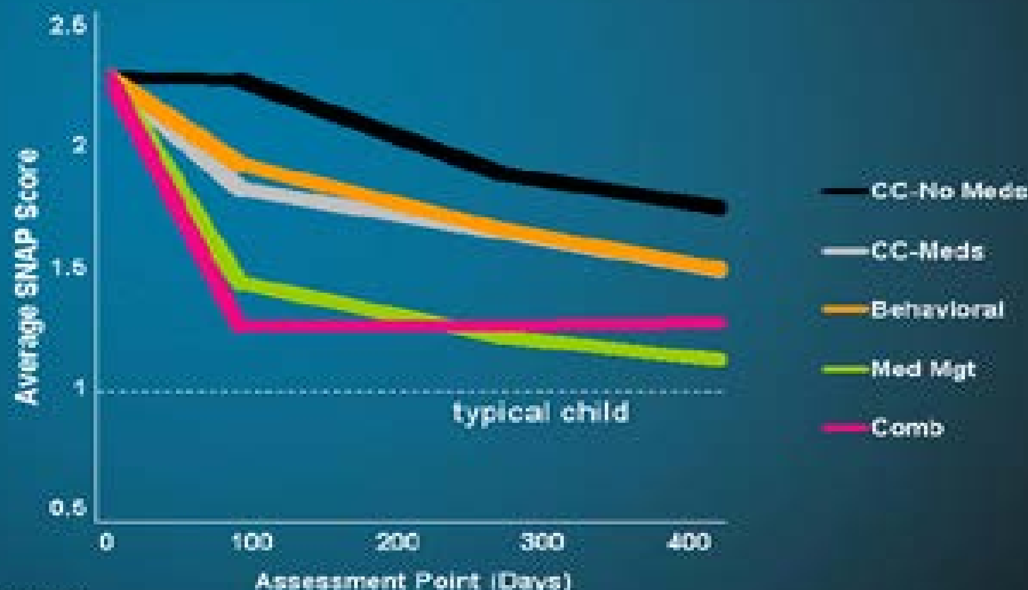
b. For elementary school–aged children (6–11 years of age), the primary care clinician should prescribe US Food and Drug Administration–approved medications for ADHD (quality of evidence A/strong recommendation) and/or evidence-based parent and/or teacher-administered behavior therapy as treatment for ADHD, preferably both (quality of evidence B/strong recommendation).

Multimodal Treatment of ADHD
MTA Study 1999

Teacher-Rated Inattention: Community Control Children Separated By Medication Use

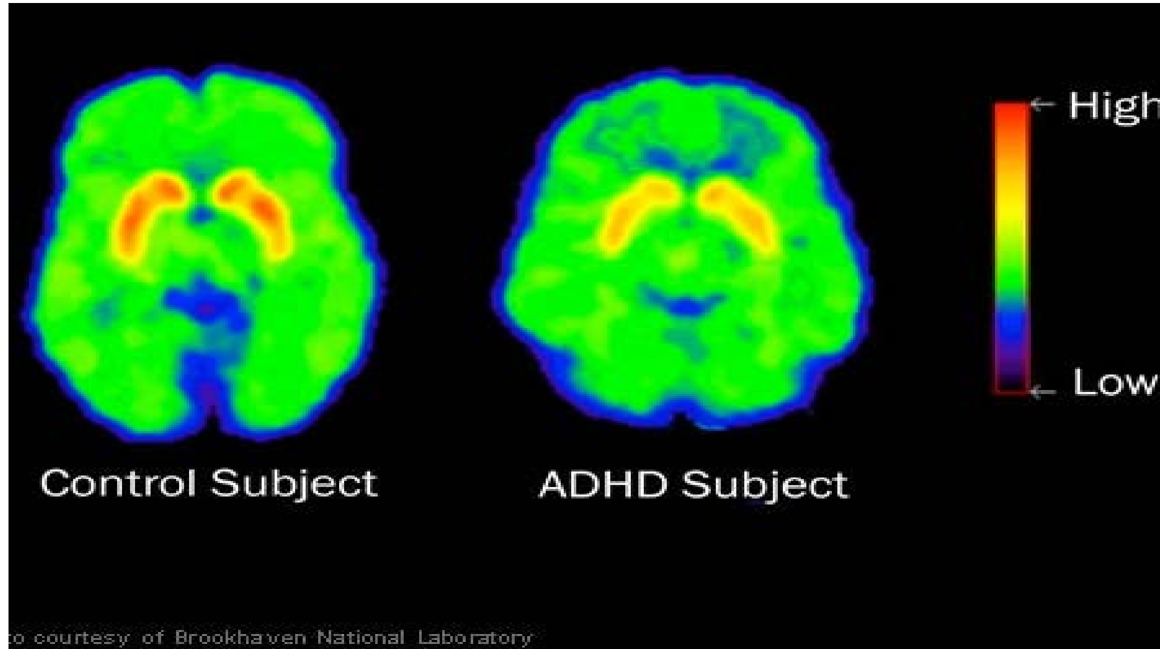
Key Differences, Med Mgt vs CC:

- Initial Titration
- Dose
- Dose Frequency
- #Visits/year
- Length of Visits
- Contact w/schools



Abbreviations: Med Mgt, medication management; CC, community control.

Jensen PS, et al. *J Dev Behav Pediatr Pediatr.* 2001;22:60-73.



Why does medication work?

Improves the connection and activation of the strial-frontal network resulting in better regulation of the Default Mode Network

But I don’t want to medicate my kid.

Right. But what about treating your child’s ADHD?

ADHD MEDICATIONS

FDA APPROVED

Methylphenidate

Dextromethylphenidate

Amphetamine

Dextoamphetamine

Atomoxitine

Guanfacine XR

Clonidine XR

NON-FDA APPROVED

Caffeine

Nicotine

Alcohol

Marijuana

Cocaine and other narcotics

Xanax

FDA APPROVED ADHD MEDICATIONS

GOOD ONES

CONCERTA

ADDERALL XR

VYVANSE

DAYTRANA

FOCALIN XR

STRATERRA

METADATE

RITALIN

BAD ONES

CONCERTA

ADDERALL XR

VYVANSE

DAYTRANA

FOCALIN XR

STRATTERRA

METADATE

RITALIN

“WE’VE TRIED EVERYTHING.”

TRIED LOW DOSES OF SEVERAL MEDICATIONS

TRIED A LOT OF DOSES OF ONE CLASS OF MEDICATION

THREW MEDICATION AT THE WALL TO SEE IF IT WOULD STICK

Five Ds of ADHD Control

DRUG

DOSE

DELIVERY SYSTEM

DURATION OF ACTION

DAILY

Drug - STIMULANTS OR NON-STIMULANTS

NON-STIMULANTS	STIMULANTS
STRATTERA	METHYLPHENIDATE
INTUNIV	MIXED AMPHETAMINE SALTS
KAPVAY	DEXTROAMPHETAMINE

AAP Guideline: Stimulants vs Non-Stimulants and 1 more thing

The evidence is particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended-release guanfacine, and extended-release clonidine (in that order) (quality of evidence A/strong recommendation).

The school environment, program, or placement is a part of any treatment plan. *(No quality of evidence sited, emphasis mine)*

Drug - STIMULANTS

AMPHETAMINES

ADDERALL

ADDERALL XR

DEXTROAMPHETAMINE

DEXTROAMPHETAMINE ER

VYVANSE

METHYLPHENIDATE

RITALIN and RITALIN LA

METADATE CD and ER

CONCERTA

DAYTRANA (tha patch)

QUILLIVANT XR (liquid)

85%

Of ADHD patients respond to stimulant medication and they are the treatment of choice

40%

Only respond to one class of stimulants or the other
MPH or AMP

AAP Guideline 6. Dose titration

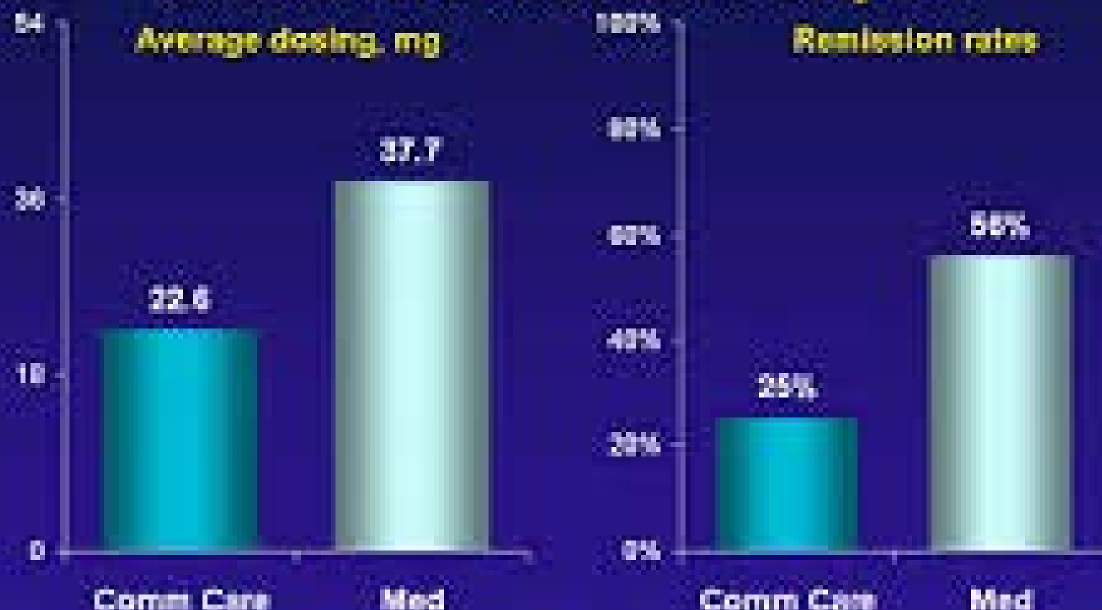
6. The primary care clinician should titrate doses of medication for ADHD to achieve maximum benefit with minimum adverse effects (quality of evidence B/strong recommendation).

AAP Guideline

Because stimulants might produce positive but suboptimal effects at a low dose in some children and youth, titration to maximum doses that control symptoms without adverse effects is recommended instead of titration strictly on a milligram-per-kilogram basis.

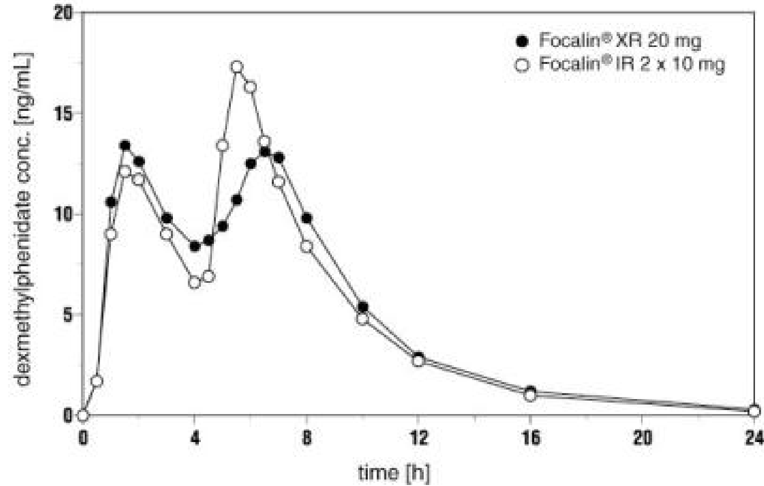
MTA Study: Titrate Dose to Maximize Benefit

Remission rates increased with increasing dose

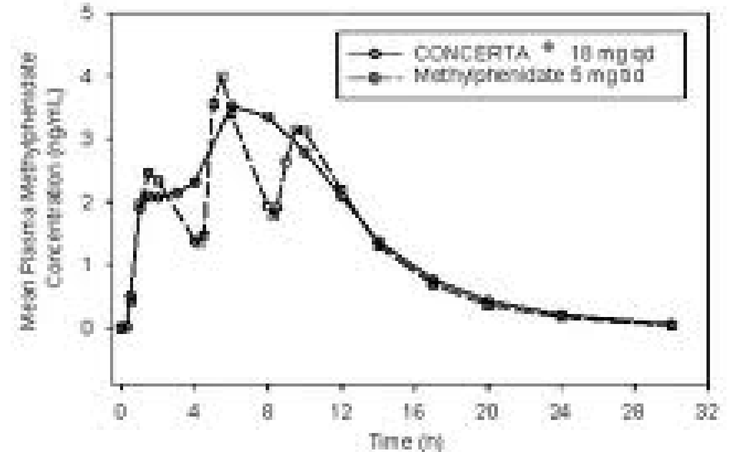


Delivery System-time release technology

BEADED TECHNOLOGY



OROS Technology



Therapeutic Window

Zombie Zone

YOU ZONE

ADHD Zone

Possible Short Term Side effects of Stimulants

Decreased appetite

Stomachache or headache

Flattening or blunting of personality

Increase in HR and/or BP

Tremor/Tic

Mood issues-depressed or angry

Paranoia, hallucinations

Safe in the Long Term

Cardiovascular-multiple large studies have not found association with sudden death, serious CV events such as stoke, heart attack

Growth- MTA study found that in treating daily over the long term 1cm of decrease in final adult height. At least 2 studies since then have not found a difference.

Addiction Risk-treatment with stimulants before age 9 is associated with elimination of the 2 to 3 fold increase in risk for SUD/addiction. After 9 no difference

Long Term Stimulant Medication Benefits

In addition to reducing addiction risk:

Long term benefits in school performance- reduces the rate of repeating a grade in half

Decreases traumatic ED visits, accidents

Decreases risk of criminality in adults (ODD/CD symptoms in kids)

Summary

Diagnosis of ADHD in preschoolers and school age children requires careful evaluation but not psychological/educational testing

DSM 5 criteria should be followed carefully at all ages

Co-morbidity is common and confounds treatment (See you tomorrow PM!)

Behavioral Therapy is the first line of treatment for preschoolers with ADHD and important for school aged children. Still, it is unlikely to be the only treatment in 87% of preschoolers

Stimulants are safe, effective and should be administered with care by providers with sound clinical knowledge at doses that lead to symptom remission and improved function

Thank you