

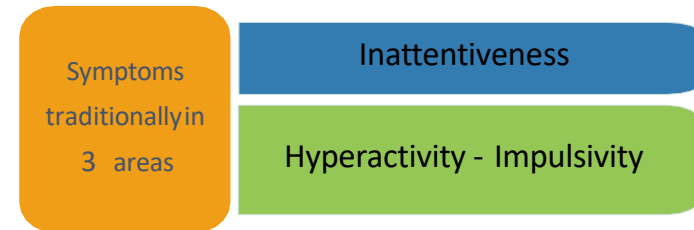
Optimizing Outcomes for Adolescents & Young Adult having Attention Disorders

Mark H. Thomas, M.D.

Tuscaloosa Focus-MD

Clinical Adjunct Assistant Professor –
University of Alabama School of Medicine

What is ADHD ?

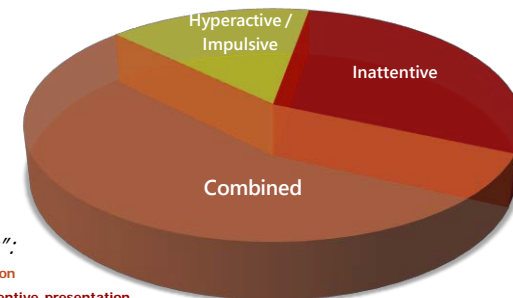


LEARNING OBJECTIVES

At the end of this session, participant will be able to:

- Describe the differences in presentation and needs of adolescents and young adults and how they differ from other age groups
- Recognize the risks of non-treatment or suboptimal care for individuals with ADHD in these age groups
- Design individualized treatment regimens that address the changing needs of adolescents, college students, and young career adults.
- Apply developmentally and culturally appropriate methods to optimize adherence to treatment in young persons with ADHD

Presentations



3 "Presentations":

Combined presentation

Predominantly Inattentive presentation

Predominantly Hyperactive-Impulsivity presentation

WHAT is ADHD?

• Variable attention span

- Does NOT mean "no attention span"
- Can sustain interest in activities with great appeal
 - "Typically, symptoms worsen in situations that require attention or sustained mental effort or that lack intrinsic appeal or novelty (eg., Listening to the teacher in class, do homework, listen to or read long texts, or working in monotonous or repetitive tasks)."

• Neurologic / biologic condition with emotional and behavioral manifestations

- Affects 3 – 6 % of children and adolescents
 - Recent Center for Disease Control study suggested this number increasing (9.6% in 2009 survey of parents)

Contrasting symptoms of HYPERACTIVITY

in children

- Squirms and fidgets
- Runs or climbs excessively
- Cannot play or work quietly
- Talks excessively
- Seems "on the go," driven by a motor

in adolescents & young adults

- Shows inner restlessness
- Fidgets when seated
- Self-selects active jobs
- Talks excessively
- Easily bored
- Feels overwhelmed

Adler L, Cohen J. Psychiatr Clin North Am. 2004.

Contrasting symptoms of INATTENTIVENESS

in children

- Has difficulty sustaining attention
- Is easily distracted and forgetful
- Does not follow through
- Cannot organize
- Loses things
- Does not listen

in adolescents & young adults

- Has difficulty sustaining attention to reading or paperwork
- Is easily distracted and forgetful
- Has poor concentration
- Manages time poorly
- Misplaces things
- Has difficulty finishing tasks

Adler L, Cohen J. Psychiatr Clin North Am. 2004.

Contrasting symptoms of IMPULSIVITY

in children

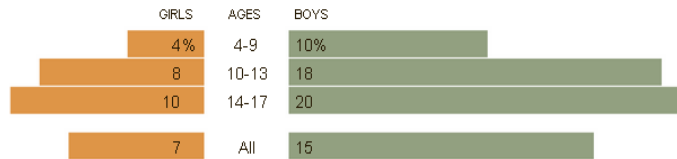
- Blurts out answers
- Cannot wait his or her turn
- Intrudes on or interrupts others
- Frequent tantrums

in adolescents & young adults

- Drives too fast, has traffic accidents
- Impulsively changes jobs
- Is irritable or quick to get angry
- Makes decisions w/o considering consequences
- Impulse shopping

Adler L, Cohen J. Psychiatr Clin North Am. 2004.

Children ages 4 to 17 ever given a diagnosis of A.D.H.D.



<http://www.nytimes.com/interactive/2013/03/31/us/adhd-in-children.html?ref=health>



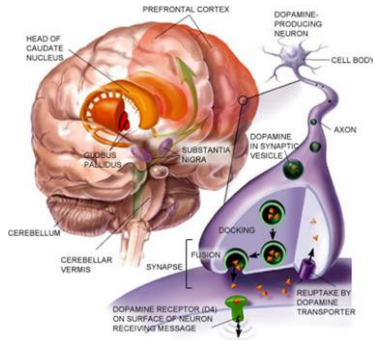
DEFICITS of EXECUTIVE FUNCTIONING

- *In last 15 years, we have realized that ADHD involved symptoms in more than the traditional 3 areas*
- *Dispels myth that ADHD only affects academics & occupational aspects of life*

Executive functions

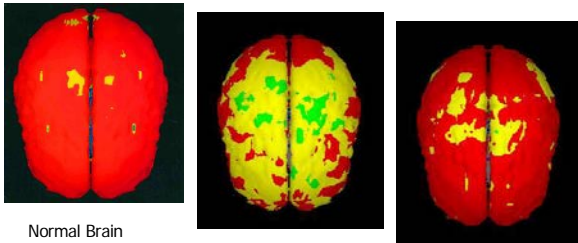
ACTIVATION	<ul style="list-style-type: none"> > Organizing > Setting and maintaining priorities > Initiating tasks.
FOCUS	<ul style="list-style-type: none"> > Maintaining attentiveness > Shifting attention between tasks successfully
EFFORT	<ul style="list-style-type: none"> > Regulating alertness, > Sustaining effort until the completion of a task > Processing speed
EMOTIONAL REGULATION	<ul style="list-style-type: none"> > Awareness of one's own mood > Being able to modulate emotions to appropriately fit the situation > Frustration tolerance > Ability to think before acting or speaking in reaction to emotional stimuli
INTERNALIZING LANGUAGE	<ul style="list-style-type: none"> > Utilizing "self-talk" to control one's behavior and direct future actions.
MONITORING	<ul style="list-style-type: none"> > Monitoring one's own efforts > Self-regulation
WORKING MEMORY	<ul style="list-style-type: none"> > Ability to hold in the conscious areas of the brain information needed to perform one task while performing a different task
COMPLEX PROBLEM SOLVING	<ul style="list-style-type: none"> > Taking an issue or problem apart, analyzing its pieces, and reconstituting and organizing it into new ideas

Brain structures affected by ADHD



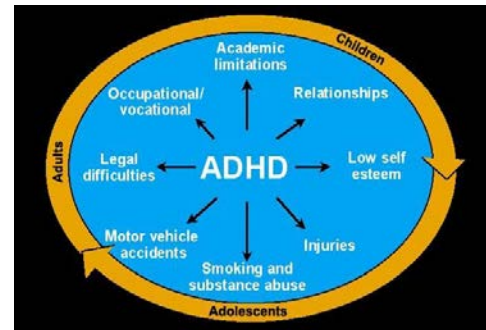
Impact of AD/HD on the lives of Adolescents & Young Adults

SPECT scans surface view from above



In this FUNCTIONAL IMAGING STUDY yellow and green colors show significant decreased activity indicating decrease in perfusion when the subject is performing a concentration task

Potential areas of impairment



CO-MORBID CONDITIONS

Oppositional defiant disorder	59-65%
Conduct disorder	22-43%
Mood disorders / depression	29%
Anxiety disorders	27%
Learning disability	20-25%
Bipolar disorder	11%

Barkley, et al *J Am Acad Child Adolesc Psych*, 1990.
Biederman, et al *Arch Gen Psych*, 1996.

Untreated ADHD and Substance Abuse

Adolescents and young adults with a childhood diagnosis of ADHD

- ~3x more likely to smoke QD
(30.4% vs. 12%)
- consumed more cigarettes in past 6 mo
- ~2x as likely intoxicated >1x in last 6 mo
(23.2% vs. 12%)
- higher rates of EtOH problems overall
(15.5% vs. 8.5%)
- 3x more likely to use < one illicit drug beside MJ
(20.4% vs. 7%)

Molina & Pelham, J Abnml Psych (2003)

Untreated ADHD & Self medication

Students with **untreated ADHD** often self-medicate with

- **Caffeine** (a non-specific stimulant)
- **Nicotine** (a non-specific stimulant)
- ADHD medication Rx'd to others
- **Alcohol** (relief of stress, improves socialization)
- **Marijuana** (relief of anxiety / stress)

Untreated ADHD and Substance Abuse

- Much more likely to try drugs of abuse if not treated optimally
 - Optimal is most of the waking hours 7 days a week 365 days a year at optimal dose for that adolescent
- More difficulty in stopping use/getting into recovery and maintaining stable recovery
- Will aggravate ADHD further
 - Direct chemical effects
 - Preoccupation with drugs competing with focus on tasks at hand – school, job, relationships

Untreated ADHD and Interpersonal Violence

- Interpersonal violence has a multitude of contributing factors from ADHD
 - Poor impulse control
 - Lack of patience
 - Difficulty with seeing consequences
 - Mood lability
- Controlling for CD, there is still an association between ADHD and IPV

Fang X, et al, ARCH GEN PSYCHIATRY/VOL 67 (NO. 11), NOV 2010; 1179

UNTREATED ADHD and driving

ADHD in adolescents and young adults associated with

- Worse driving habits
- **300-400% increase** in motor vehicle collisions (MVCs)
- More accidents at fault
- More accidents with injury
- Greater \$\$\$ damage in accidents
- More speeding tickets
- Greater likelihood of license revoked / suspended

Barkley, *Psychiatric Clin North Am*, 2004

Untreated ADHD related to

- ~3x more likely to smoke QD (30.4% vs. 12%)
- ~2x as likely drunk >1x in last 6 mo (23.2% vs. 12%)
- 3x more likely to use < 1 illicit drug beside MJ (20.4% vs. 7%)
- Greater risk for certain types of accidents and injuries.
- Higher incidence of depression and anxiety
- Increased amount of legal troubles
- Interference with peer and family relationships

Untreated ADHD and Accident Risks

- Adolescents and young adult drivers are at increased risk while driving without meds in effect – inattentive errors most common
- Increased accidents of other kinds
 - Not intending to have sex with that person
 - Not intending to get stuck at that party
 - Not meaning to steal, vandalize
- Increased impulsive unintentional injuries
 - “Watch this”
 - Impulsive suicide

How Does ADHD Impact These?

- Impulse control difficulty
- Early assault on self efficacy
- Struggle to become and remain successful
 - Prone to giving up
 - Prone to taking the "easy way out"
 - Likely to identify with "outer limits life"
 - More likely to try things that will end up being addictive or "door closing" for them
- Lack of "Big Picture View" of life
 - Less future concept
 - Don't see current decisions as relevant to the future
 - "Buying a ticket to a movie they don't really want to see"

Adults with ADHD

- 2x more likely to rarely or never use birth control
- 4x more likely to have contracted a sexually transmitted disease
- 3x more likely to be currently unemployed
- 2x more likely to have problems keeping friends
- 47% more likely to have trouble paying bills

Barkley RA, et al, *J Am Acad Child Adolesc Psychiatry*. 2006

Untreated ADHD and Sports Risks

- Concussions – very common, more risk than previously appreciated
 - Boxing – most intense but not as prevalent
 - Football – much more common but less direct head contact over the shorter term
 - Soccer, basketball, others
 - Cheer
- ADHD individuals will tend to take risks without thinking through
- Tend to be less self aware and self protective
- Appear to move impulsively – often into harm's way
- Appear to repeat the same injuries

Untreated ADHD and Relationship Risks

- ADHD young adults less likely to have good, lasting relationships
 - Impulsiveness
 - Not attentive to other in relationship
 - Some emotional lability
 - Lack of patience
 - Unpredictability
- ADHD treatment seems to help with these

Untreated ADHD and sexual risk behaviors

- Adolescents and young adults with AD/HD
 - Earlier age of first intercourse
 - More sexual partners
 - Less use of birth control
 - More sexually transmitted infections
 - Greater frequency of HIV testing
 - More unintended pregnancies

Barkley, *Handbook of ADHD, 1998.*

Untreated ADHD and Financial/Career problems

- Tend to have lower educational achievement-lower highest educational grade achieved, lower qualifications
- More work related problems – tend to move from job to job
- Close doors due to unreliability and poor references
- Mood lability often a problem for employers

Untreated ADHD and Criminal Behavior

Criminal Behavior In Adjudicated Mandated Drug Treatment Inpatients

- showed that 31% had symptoms indicative of ADHD
- these symptoms were associated with self-reported measures of arrest history, aggressive behavior, drug use, family atmosphere, and family mental health

Baker D. B. et al, *Criminal Justice and Behavior* March 1995 vol. 22 no. 1 33-43

The Good News

- Studies suggest that adequate treatment (usually with stimulant medication) can lessen the frequency of
 - Substance abuse problems
 - Sexual risk behaviors
 - Adverse driving outcomes
- Re-enforces the importance of adequate treatment QD, covering as much of day as feasible

ADHD Treatment Lowers Substance Abuse/Dependence Risk

- Many studies show as much as 6-8 times less risk with optimal treatment
- Life becomes more normal so the risks approach normal
- Allows them to remain in the main stream and not be tossed into the group who is perceived as the “rejects”
- Less desire to self-medicate

ISSUES ARISING AT *TRANSITION* POINTS

- ✓ Loss of support network from parents & teachers
- ✓ Independent decision making
- ✓ Physical distance from physician
- ✓ Increased work load / greater academic challenge
- ✓ Financial pressures
- ✓ Increase in potential distractions
- ✓ Availability of Substances of abuse
- ✓ Compliance issues
- Loss of support network / safety net
- Independent decision making
- Adult responsibilities
- Increased work load
- Financial pressures
- Increase in potential distractions
- Availability of Substances of abuse
- Compliance issues

Issues arising at *TRANSITION* points

Elementary to Middle School

- Expectations to handle more responsibilities
- Change from concrete to abstract thinking
- Peer pressure discouraging achievement
- Increase in potential distractions
- Changing classes
- Puberty!
- Growth spurt leading to physical awkwardness

Middle School to High School

- ❖ More responsibilities
- ❖ Greater complexity of material
- ❖ Peer pressure discouraging Rx use
- ❖ Busier schedule
- ❖ Increase in potential distractions
- ❖ Expanded social opportunities
- ❖ Dating(?)
- ❖ Driving(?)

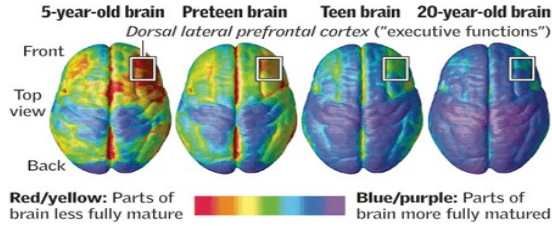
ISSUES ARISING AT TRANSITION POINTS

School year to School year

- Parents and students have hope that ADHD is gone since they may have done well in summer without medication
- Both would like to be off medication if possible
- Peers may be trying to start the school year without meds
- Growth creates larger body mass and dilutes medication and changes metabolism
- If they start with the full dose it will give too many side effects
- Re-titrating can seem too complicated
- Adjustment to the new school year and new teachers
- If repeating grade or changing schools restarting meds may be lost in the commotion

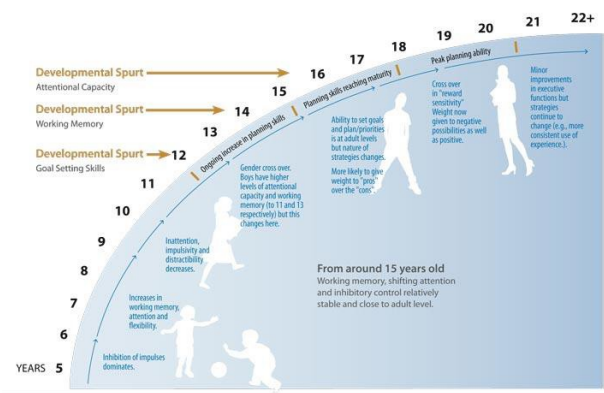
Judgment last to develop

The area of the brain that controls "executive functions" — including weighing long-term consequences and controlling impulses — is among the last to fully mature. Brain development from childhood to adulthood:



Sources: National Institute of Mental Health; Paul Thompson, Ph.D., UCLA Laboratory of Neuro Imaging **Thomas McKay** | The Denver Post

ADHD doesn't mean disaster



**ADHD
 DOESN'T
 MEAN
 DISASTER**

Thirty good things About ADHD

1) Unlimited energy	16) Great long-term memory
2) Will try anything	17) Life and soul of any party
3) Good conversationalist	18) Charming
4) Needs less sleep	19) Warm and loving
5) Good sense of humour	20) Protective about families
6) Very caring	21) Inquisitive
7) Do spontaneous things	22) Doesn't hold a grudge
8) Notice things that other people don't	23) Quick to forgive
9) Understanding of other kids	24) Genuine
10) Can think of new ways of doing things	25) Never boring
11) Likes to help others	26) Perceptive ways to do things
12) Happy and enthusiastic	27) Playful
13) Imaginative - creative	28) Honest
14) Sensitive - compassionate	29) Optimistic
15) Eager to make new friends	30) Inventive

ADHD ≠ disaster

Current & Recent Celebrities with ADHD

- Michael Phelps
- Tim Howard (*US World Cup Goal keeper*)
- Simone Biles
- Shane Victorino (*Boston Red Sox*)
- Howie Mandel
- Ty Pennington (*Extreme Home Makeover*)
- Robin Williams
- Whoopi Goldberg
- Ryan Gosling
- Channing Tatum
- Paris Hilton
- Justin Timberlake
- Adam Levine (*Maroon 5*)
- *Will.I.A.m*
- Solange Knowles

Current & Recent Celebrities with ADHD (cont.)

- Steve Jobs
- Bill Gates
- David Neeleman (*JetBlue Airways*)
- James Carville
- Lisa Ling

Historical figures thought to have ADHD

- Mozart (*died broke*)
- Einstein (*failed elementary*)
- Edison
- Galileo
- daVinci
- Wright bro's (*bike shop failed*)

Choice of medications

• Stimulants remain 1st-line

- Methylphenidates
- Amphetamines

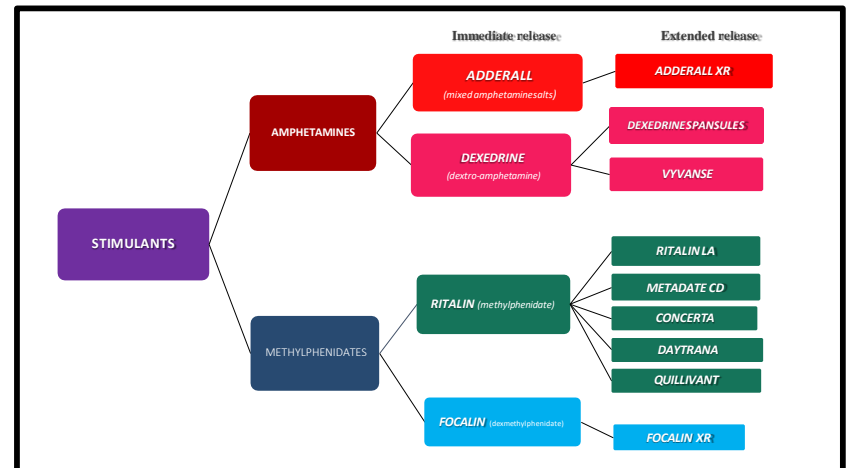
• Second-line medications

- Atomoxetine (*Strattera*)
- Clonidine (*Catapress, Kapvay*)
- Guafancine (*Tenex, Intuniv*)
- Bupropion (*Wellbutrin*)
- Tri-cyclic anti-depressants

• If one does not work, try another (then another)

Treatment options

For adolescents and college students with ADHD



Most common ADVERSE Effects of Stimulants

- Decrease in appetite
- Drymouth
- Sleep disturbance (*may actually improve sleep problems!*)
- Jitteriness
- Palpitations (*perception of heart racing or skipping beats*)
- Mood Swings / Irritability (*usually when Rx wearing off*)
- Headaches
- Stomachaches
- Change in personality / anhedonia
- **Most AEs dissipate within 2-3 weeks if medication is taken QD as body / brain accommodate**

Treatment of ADHD Symptoms

- “Despite claims that stimulant medications are not efficacious with respect to aggression, recent investigations with behavioral observation methodologies in large-group settings have revealed clinically significant reductions of aggressive behavior with stimulant treatment”

• Hinshaw, S P et al, *Stimulant Medication and the Treatment of Aggression in Children With Attentional Deficits. Journal of Clinical Child Psychology* Volume 20, Issue 3, 1991; pages 301-312

Methylphenidates vs. amphetamines

- In a trial of both amphetamine and MPH.
 - approximately 41% of subjects with ADHD responded equally to both MPH and AMPH
 - 44% responded preferentially to one of the classes of stimulants.
- A meta-analysis of the 5 studies in children that compared MPH to AMPH in blinded crossover conditions found
 - about 37% of patients had a clearly better outcome on an AMPH preparation
 - 26% had a clearly better response to MPH
 - the other 37% of stimulant responders responded equally well to either molecule

Arnold LE (2000), *J Atten Disord* 3:200-211

Greenhill, L. et al. (1996). *J Amer Acad of Child & Adolesc Psych*, 35, 1304-1313

Controversy Over Combined Treatment

- In stimulant-responsive children with ADHD, there is no support for adding ambitious long-term psychosocial intervention to improve ADHD and oppositional defiant disorder symptoms. Significant benefits from methylphenidate were stable over 2 years

Abikoff, H et al *Journal of the American Academy of Child & Adolescent Psychiatry* Volume 43, Issue 7, July 2004, Pages 802-811

Medical Treatment

- It appears that long term help for ADHD involves bringing brain function into the range of normal or near normal
- Numerous imaging and genetic studies have made it clear that there is a huge physical component – it appears to be a physical (neurological) disorder with emotional, educational, social and physical consequences

Medications – Are They Safe?

- We don't want to introduce risk while trying to reduce it
 - Stimulants approved since early 1950's. No long term side effects shown
 - Heart risk has not been shown in well done studies
 - One phone survey showed some increased risk but poorly done and no objective verification

Medical Treatment

- What can change brain function?
 - Medications have been the most reliable in bringing brain function to a more normal state
 - Generating interest in an area by example or making it more lively, interesting, using media helps, technology can help to turn on some of the systems that are turned off in ADHD but these are of limited use in specific situations
 - Structure can help performance but not brain function

Stimulants

- Two main types – many forms
 - Methylphenidate (MPH)
 - Dextroamphetamine (DX)
- Close relative worth mentioning
 - Phentermine – used as a last resort but works very well in some

Stimulants

- Inherently short acting – effective duration 3-5 hours in immediate release forms (IR)
- Challenge through the years is to make them last longer
- Goal of treatment is to cover most of the waking hours, events like driving, evening classes...
- Longer acting meds preferred due to reliability and lack of “operator” variability

Stimulants - Preparations

- DX (Dextroamphetamine) longest acting is lisdexamfetamine which is the pro-drug form of dextroamphetamine and lasts between 12-14 hours.
- Adderall XR (Dextroamphetamine double beaded system) targeted for 8-9 hours and may last longer in some

Stimulants - Preparations

- MPH longest acting are Concerta (Oros MPH) 12 hrs and Daytrana MPH transdermal system up to 15 hours with a 12 hour wear time (off label)
- Focalin XR, Metadate CD and Ritalin LA all have a target of 8-9 hours but can last longer in some
- IR MPH is helpful for filling in gaps or boosting higher need times

Non-Stimulants

- Atomoxetine – may last from several hours to up to 24 hours, less effect size than stimulants
- Alpha 2 receptor agonists – guanfacine (Intuniv) and clonidine (Kapvay) are both helpful but also with lesser effect sizes than stimulants
 - These can last 24 hours for Intuniv and more than 12 hours for Kapvay

Off Label Non-stimulant

- Wellbutrin is not as commonly effective for ADHD but can be very helpful in some who have not responded to other treatments (Off label)
- Tricyclic antidepressants (Off label) can also help but have more side effects
- Atypical antipsychotics and other mood stabilizers can help aggression but not core symptoms of ADHD

AAP Dose Titration

- Stimulant dosages usually are not weight dependent
- Begin with low dose of medication, titrate upward, marked variation in individual response
- first dose response may not be the best dose to improve function
- use higher doses to achieve better responses

Medication Types & Forms

• **Non-stimulants**

- Atomoxetine (Strattera)
- Bupropion (Wellbutrin)
- Clonidine (Catapres)
- Clonidine Extended Release (Kapvay)
- Guanfacine (Tenex)
- Guanfacine Extended Release (Intuniv)

AAP Dose Titration

- Reduce dose when higher dose produces side effects or no further improvement
- Best dose for a given patient is the one that leads to optimal effects with minimal side effects
- **Not** lowest dose showing any response
- Use 7 day a week regimen

AAP Medication Recommendations

- If one stimulant does not work at the highest dose without side effects use a different one
- Most will respond well to more than one
- Some respond better to one than another
- Stimulants have safer side effect profile
- Stimulants most studied

Principles of pharmacologic tx of ADHD in adolescents -2

- **Longer acting forms preferred**
 - Increase satisfaction
 - Improve compliance
 - Lessen risk of abuse
- **Reassess dose frequently**
 - Assess for effectiveness
 - Assess for duration of effect
 - Assess for changing needs
- **Most adverse effects diminished or extinguished with consistent QD dosing**
 - Most AEs greatly reduced within 2-3 weeks
 - Appetite suppression takes longer to diminish
- **Frequent monitoring needed for adverse effects, compliance, abuse, diversion**

Principles of pharmacologic tx of ADHD in adolescents

- Start with low dose and gradually taper up to minimize adverse effects
- Aggressively titrate to most effective dose with minimal or no adverse effects
- Most effective dose based on individual response rather than standard mg/kg dose
- Administer meds frequently enough to cover all ADHD symptoms & homework
- Consider co-morbid symptoms

Side Effects

- Side effects occur early in treatment, mild and short-lived
- most common - decreased appetite, stomach-ache or headache, delayed sleep onset, jitteriness, or social withdrawal
- 15% to 30% experience motor tics, most are transient – not a contraindication
- 7 studies with tics before treatment showed no increase with stimulants

Side Effects

- Seizures, well controlled, not contraindicated
- Overfocus if patient is sensitive or dose higher than needed
- No long term growth, height suppression
- Drug holiday – no evidence to support
 - Personal experience, far more side effects, most often NOT A HOLIDAY FOR ANYONE!

Shifting the paradigm

- | <u>Old school paradigm</u> | <u>New paradigm</u> |
|--|---|
| • <i>Minimal effective dose</i> | • Covering all waking hours |
| • <i>Covering only "events"</i>
– e.g. class & studying | • Titrate to optimal dose
– Greatest effectiveness |
| • <i>Frequent Drug holidays</i> | – Longest duration
– With minimal /tolerable adverse effects |
| | • Drug holidays – rare or none |

Keys to compliance

- Spending time to educate patient about ADHD
- Dispel myths about medication
- Discuss possible adverse effects and ways to minimize
- Enlist patient as part of treatment team
- Empower patient with feeling of control
- Negotiate trials on or off medication
- Start with low dose and titrate to effective dose

Results of Old School Paradigm

- Inadequate effectiveness
- More frequent Adverse Effects
- Love / hate relationship with medication
 - Medication seen as inherently "bad" and to be avoided
 - Adolescent often quit taking meds at crucial times
- Long-periods uncovered
 - Greater risk of consequences from untreated ADHD

Drug Holidays

Valid Reasons FOR Drug Holidays

- Weight loss to below acceptable BMI
- Significant AEs on all effective medications
- Risk of abuse or diversion of medication

Valid Reasons AGAINST Drug Holidays

- ADHD affects all areas of life
- One doesn't stop learning after class
- Important tasks to complete in other places
- Extinguishing AEs
- Reducing risk of risky behaviors due to impulsivity
- Consistency
- Driving safety
- Avoid re-titration of meds

Dosing of stimulants

- Many adults [*& college students*] have very long days and need medication in multiple settings other than work [*and school*].
- Total # doses / day taken by a particular patient determined by number of factors
 - tasks to be performed
 - duration of medication action
 - use of XR vs. IR formulations
 - extent of side effects
 - [*considerations of protective effects vs. risky behaviors including driving safety*]
- Subsequent doses are commonly overlapped by 30 minutes [*1 hr*] so that 2nd dose can be absorbed while 1st dose is wearing off in order to minimize rebound effects.

Dodson, William W., J Clin Psychol/In Session 61: 589–606, 2005.

MYTH: Stimulants prescribed for ADHD will cause long-term harm to the heart

- Epidemiologic studies show no evidence of long-term harm in those without underlying heart disease
- Warning labels apply only to those with underlying heart problems
 - *Screening done before starting medication*
- May increase heart rate by \leq 5 bpm or blood pressure by \geq 5 mm Hg
 - *Inconsequential unless BP already high or borderline*

Treating adolescents / young adults with doses above the standard "recommended daily doses"

- 2-fold rationale:
 - (1) the recommended daily dose is simply inadequate for a sizable number adolescent/ young adult patients & larger doses can be used safely with proper monitoring
 - (2) the recommended daily dose assumes a treatment time of ~ 8 hrs
 - most adolescents and especially college students are involved in activities requiring attentiveness for many more hours of the day
 - impossible to treat for 12 - 16 hrs with the same total amount of medication as recommended for 8 hours.

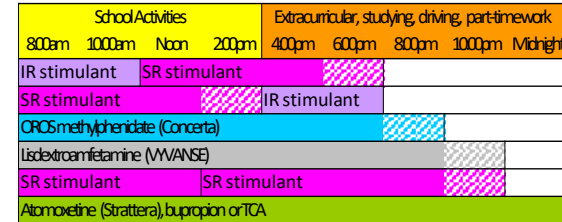
American Academy Of Child & Adolescent Psychiatry

Practice Parameter for Assessment & Tx of

- The clinical trial generally studies extending the effect so to doses of MPH or dextroamphetamine/AD-D, or 72 mg of Concerta.
- Doses in this range should be used only with caution, with frequent monitoring of side effects.
- On average, there is a linear relationship between dose and clinical response: that is, in any group of ADHD subjects, more subjects will be classified as responders and there is a greater reduction in symptoms at the higher doses of stimulant.
- There is no evidence of a global therapeutic window in ADHD patients. Each patient, however, has a unique dose-response curve.

J. Am. Acad. Child Adolesc. Psychiatry, 46:7, July 2007

Options for extending coverage



Maximum medication doses

Brand Name	FDA Max / day	Off-label Max / day
ADDERALL	40	60
ADDERALLXR	30	60
DEXEDRINE SPANSULE	40	60
VYVANSE	70	Not yet known
RITALIN (IR)	60	100
METADATE CD	60	100
RITALIN LA	60	100
CONCERTA	72	108
DAYTRANA (patch)	30	Not yet known
FOCALIN XR	30	50
STRATTERA	Lesser of 1.4mg/kg or 100mg	Lesser of 1.8mg/kg or 100mg

J. Am. Acad. Child Adolesc. Psychiatry, 46:7, July 2007

Comparing atomoxetine to stimulants

- meta-analysis of atomoxetine and stimulant studies
- the effect size for atomoxetine was 0.62 compared with
- 0.91 and 0.95 for immediate-release and long-acting stimulants, respectively

Faraone SV, Spencer TJ, Aleadri M, Pagano C, Biederman J (2003). Comparing the efficacy of medications used for ADHD using metaanalysis. Presented at the 156th Annual Meeting of the American Psychiatric Association, San Francisco, May

Three main questions

- Is medication **STRONG ENOUGH**?
- Does medication last **LONG ENOUGH**?
- Are the **ADVERSE EFFECTS TOO ROUGH**?

Ultimate questions

- **How satisfied** is the student with the medication?
- **What changes** would the student make to the medication is she or he could?

Secondary questions

- Is the patient **complying** with the medication prescription?
- Is the medication being **diverted** to others?

Non-pharmacologic approaches

Accommodations for ADHD

- Not intended to “dumb down” the curriculum
- SHOULD NOT give students receiving accommodations an unfair advantage
- SHOULD “level the playing field”
- SHOULD be a positive, collaborative effort to give each student the same opportunity to succeed
- SHOULD seek to integrate student with peers (and not to isolate or ostracize)
- SHOULD take the view that “all students will do well when they can”
- SHOULD promote spirit of teamwork and normalizing relationships (student <-> student / teacher <-> student)

Effective Accommodations (p. 2)

- Extended time on exams, quizzes, in-class assignments
 - Time to “re-focus”
 - May decrease anxiety
- Reduced-distraction testing
 - No such thing as “distraction free”
 - Other distractions
 - Avoiding rushing when others finish tests quickly
- Note-taking assistance
 - Designated peer note takers
 - Allows listening rather than mechanical dictation
 - Sometimes taking notes may improve focus
 - Providing outline of material (e.g. Powerpoint handout)
- “E-text”
 - Multiple sensory channels
 - Can bore others
- Other tech devices
 - Laptops
 - Digital smart pens

Effective Accommodations FOR ADHD

- Reduce distractions
 - Preferential seating (near teacher, away from halls / window / talkers)
 - Remove excessive items from walls
 - Eliminate extra noises
- Adjust instructional styles
 - Allow more participatory / kinetic / “hands-on” / experiential learning experiences
- Facilitate following instructions
 - Breaking up into smaller tasks
 - Provide written directions
 - Assignment notebooks (checked by teachers at end of each class)
 - On-line syllabus / assignments / homework / test dates
- Avoiding overwhelming student
 - Reduce volume of assignments
 - Eliminate duplication
 - Allow dictation of responses to parent or scribe
 - Allow time to adjust after changing classes

Effective Accommodations (p. 3)

- Build social skills
 - Assign peer tutors
 - Model and practice positive social interactions
- Teach practical skills
 - Study skills / academic “coach”
 - Organizational skills (e.g. color coded note books)
 - Time management skills (e.g. use countdown timer)
 - Self monitoring
- Discipline
 - Clear goals and natural consequences
 - Use incentives rather than punishments
 - Tolerance for fidgeting and emotional ups and downs
 - Allow exercise breaks
 - Gentle redirection
- Boost self-esteem
 - Catching student “being good”
 - Praise and reward positive behaviors / goals reached
 - Set student up for success and not failure
 - Praise effort, don’t expect perfection

ADHD Coaching

A new approach to ADHD

ADHD Coaching

- Purpose is to change behavior, prepare students for future by practical methods
- Evidence-based practice
- Tailored to meet unique needs of individual student
- Offers support, structure, and accountability for their actions to students
- Builds confidence and enhances organizational and time management skills

What is ADHD Coaching?

- Not counseling or delving into deep psychological issues
- More like athletic coaching than psychotherapy
- Grew out of successes seen in Life Coaching & Executive Coaching
- Coaches help students
 - assess their environments
 - identify needs and prioritize ones to tackle
 - set goals
 - offer suggestions and guidance
 - set structure
 - provide support
 - help implement strategies for skill building
 - provide accountability

Typical skills ADHD coaches may target

- Scheduling
- Goal setting
- Confidence building
- Organizing
- Focusing
- Prioritizing
- Persisting at tasks
- Money management
- Driving safety
- Social skills
- Self-discipline
- Self-reliance
- Self-advocacy

Behavioral Interventions

- Gold-standard of treatment is medication
- Lack of research on the effectiveness of treating people with ADHD with psychotherapy
 - CBT found to be EFFECTIVE in ADULTS
 - CBT not found EFFECTIVE in CHILDREN & ADOLESCENTS
- Individual, group, couples treatment options

Behavioral Interventions what the evidence shows

- Family-based interventions
 - Parent training - modifying parenting behavior to improve outcomes
 - One of the most effective treatment approaches (Pelham, 1998)
 - Behavior modification techniques
- School-based interventions
 - Class-room based behavior mod.
 - Academic interventions (instructional modification, peer tutoring, computer-ass't'd instruction, strategy training)
 - Few treatment outcome studies have been done
 - One meta-analysis did show success in both approaches (DuPaul & Eckert, 1997)

Behavioral Interventions

Psychotherapy approaches to treating ADHD:

- Differences between treating children, adolescents, and adults
- Importance of education about the condition
- Positive, strength-based approach: instilling hope
- Understanding common consequences of growing up with ADHD (diagnosed vs undiagnosed)
- Addressing past experiences before behavioral interventions
- Addressing mental health issues that are commonly co-morbid with ADHD (e.g. anxiety, depression)
- Addressing relationship issues (past and present) that are impacted by this diagnosis.

Behavioral Interventions what the evidence shows (cont'd)

- Social skills training
 - “Convincing evidence lacking” (Pelham, 1998)
 - Three studies of combined parent training and social skills training show promise (Frankel et al, 1997; Piffner & McBurnett, 1997; Sheridan, 1996)
- Summer treatment program
 - Intensive 8-wk program using parent training, token economy, positive reinforcement, daily report cards, social skills training, sports skills training, problem solving skills training
 - Large behavioral effects shown (Pelham et al, 1996, 1997, 2004)

Behavioral Interventions

- **Examples of behavioral interventions:**
 - Plan and prepare everything the night before
 - Use visual cues such as posting lists
 - Use an electronic or paper calendar
 - Use newest technology
 - Color coding and an organization system
 - Multiple sets of keys!

Who Impacts Them?

- Media direct/subtle messages and their spokespeople
 - Models
 - Sports stars
 - Actors/actresses
 - Music stars
 - Entertainers
- Blogs
- Internet sites

Who Impacts Them?

- Parents
- Peers
- Other interested adults
 - Teachers
 - Bosses
 - Extended family
 - Faith communities
 - Coaches

What Seems to Predict Positive Impact?

- Literature is difficult to interpret due to changes in the names of the way impact is described
 - Religiosity, faith based practices, spiritual community participation...
 - Sports participation, athletic activity, team sports activity...
 - Family support, extended family interaction, family values assimilation...

What Seems to Predict Positive Impact?

- Community belonging, membership in clubs, extracurricular activity participation...
- Enrichment opportunities, privileged lessons, learning finer things in life
- Healthy parental limits
 - Fighting over-busy syndrome, hurried youth, excessive enrichment/sports/extracurricular activity...
 - Curfew, technology limits, parental controls...

Genetics and Environmental Stressors Interact in some with ADHD

- There appear to be pleiotropic effects of a functional polymorphism of the serotonin transporter promoter gene (5HTTLPR) and childhood adversity on ADHD and violent behavior Retz W et al, Int J Law Psychiatry. 2009 Jul-Aug;32(4):235-43. Epub 2009 May 2.

Common Sense Is It Very Common?

- Parents/family have a job to do in training children
- Respect for authority can be helpful – are schools able to help this?
- Media works against this at times but media is difficult to control
- What goes into the brain seems to come out in some way
- Positive influences help filter input

Spiritual

- Some type of spiritual involvement is preventive of risks
- Harder time staying involved
- Poor impulse control may cause exclusion
- Poor follow through may cause them to give up membership
- May not pick up values and support due to poor connectedness