


**Helping to Improve
Inadequately Treated
ADD/ADHD**

Thomas E. Brown, PhD
Associate Director,
Yale Clinic for Attention and Related Disorders
Department of Psychiatry
Yale Medical School



**Practical Interventions for
Post-Secondary Students With
ADD**

1. Educate students & faculty about ADD
2. Resources to “fine-tune” meds
3. Organization/Study Skills guidance
4. Accommodations as needed
5. Scheduled followup with reminders

**Student & Faculty Education
is needed about:**

- ADHD = complex disorder that affects academics and daily life
- Looks like willpower problem, but isn't
- Caused by inherited brain chemistry problems
- Often not noticed until teens or 20's
- Can impact those with high IQ
- Often accompanied by other disorders
- Most effective treatment = fine-tuned meds

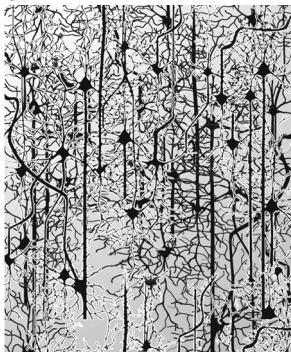
A Chemical Problem

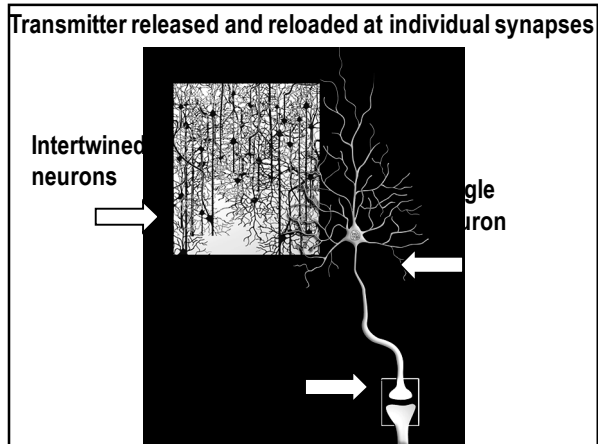
- ADHD is fundamentally a chemical problem
- Most effective treatment is to change the chemistry with medication
- Unless the problematic chemistry is changed, other interventions are not likely to be very effective

In the Human Brain

- 100 billion neurons
- each one linked to >1000 others
- in complex sub-systems
- that have to “talk to each other”
- using low voltage electrical impulses
- that have to jump across gaps
- so fast that 12 can cross in 1/1000 sec.

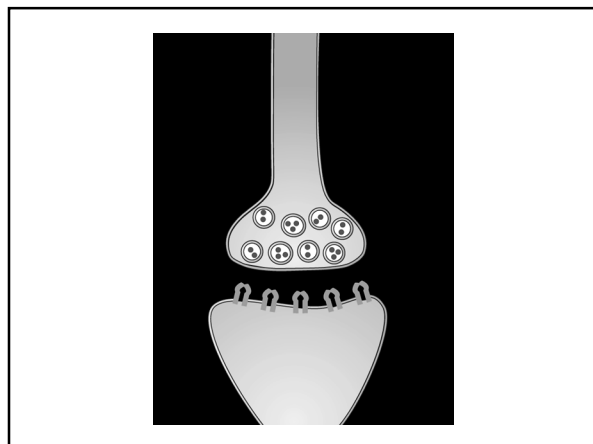
100 Billion Neurons are Intertwined in
The Jungle
Complex Networks Within the Brain



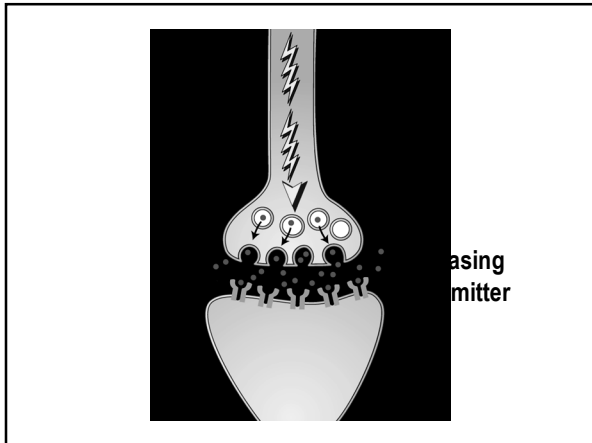


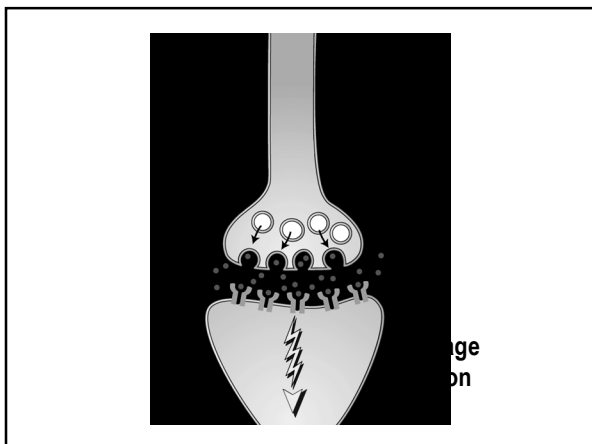
Chemicals Jump the Gaps

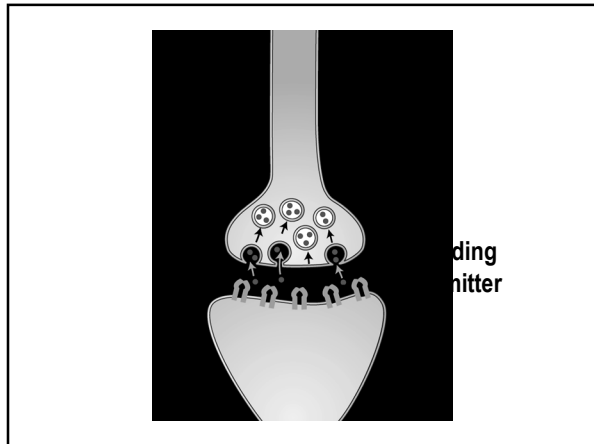
- Inside brain >50 different chemicals are continuously made
- every neuron system uses 1 of them
- stored in little vesicles near tip of neuron
- when electrical impulse comes, mini-dots of that chemical are released,
- cross the gap, fire next neuron, then reload in fractions of a second

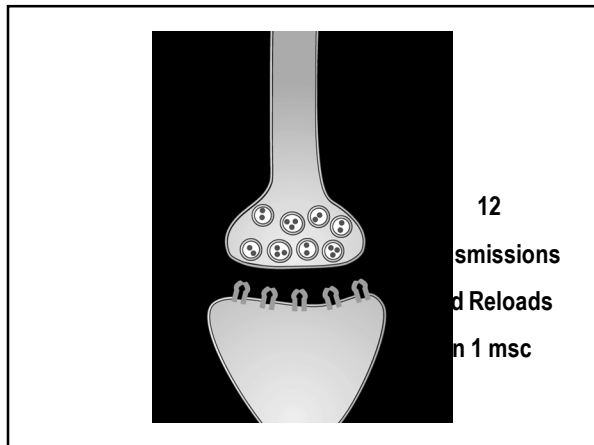












Networks
Depend primarily on 2
chemicals

**dopamine and
norepinephrine**

- control most functions impaired in ADHD
- brain of person with ADHD makes these chemicals
- but does not release & reload effectively
- → control messages often not connecting
- For 80% medications improve this problem.

How Do Medications Alleviate ADHD Sx?

- Meds slow reuptake +/- or increase release of DA or NE
- Not a cure (eyeglasses, not antibiotic)
- Alleviate sx only for duration of action
- Effective amount of stim not related to age, weight or sx severity
- "Fine-tuning" of meds essential
(to optimize dose and timing)

Patients' Fears of Medications for ADHD

- Change personality "zombie"?
- Slow growth? Start tics?
- Lose appetite? Sleep?
- Later drug or alcohol problems?
- Dependence on meds for lifetime?
- Being labeled, attribution problems?
- Reactions of family, teachers, peers?

Medicating for ADHD is less risky than not medicating

- When not treated with appropriate meds, persons with ADHD are at much greater risk of failures in school, jobs, social relationships, and low self esteem. Also doubled risk of substance abuse.
- Appropriate med treatment reduces these risks significantly, e.g. substance abuse.

Medications for ADHD Syndrome

- Demonstrated safe and effective
- Often do not follow mg/kg
- Effective dose not based on age, wt or severity of sx
- Require titration and monitoring to “fine tune” to:
 - individual sensitivity
 - time frames for schedule and tasks

Attention Deficit Hyperactivity Disorder

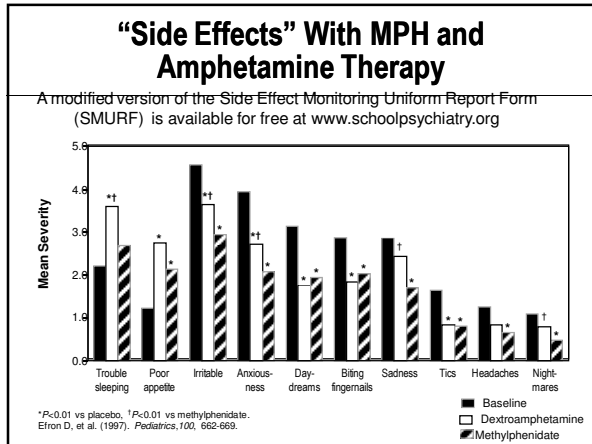
Pharmacologic Treatments

Approved by FDA for ADHD	Not Approved by FDA for ADHD
Stimulants	Antidepressants
Methylphenidate	Tricyclics
Amphetamine compounds	Bupropion
Dextroamphetamine	Antihypertensives
Lisdexamfetamine	Clonidine
	Guanfacine
Nonstimulant	Miscellaneous
Atomoxetine	Combined pharmacotherapy
Intuniv	Modafinil
	Venlafaxine
	Neuroleptics (only in severe cases with monitoring)

Adapted from Wilens TE, et al. *Annu Rev Med*. 2002;53:113-131. Greenhill LL. Childhood attention deficit hyperactivity disorder: pharmacological treatments. In: Nathan PE, Gorman J, eds. *Treatments That Work*. Philadelphia, Pa: Saunders; 1998:42-64.

Stimulant Medications

- ◆ Amphetamine
 - dextroamphetamine (Dexedrine): 4-6 hours
 - d, l amphetamine (Adderall): 4-6 hours
 - Extended release (Adderall-XR) 8-10 hours
 - Lisdexamfetamine (Vyvanse) 10-12 hours
- ◆ Methylphenidate
 - Ritalin: 4 hours
 - Concerta: triphasic, 10-12 hours
 - Metadate CD: biphasic, 8 hrs
 - Focalin (d -isomer) 4 hours
 - Focalin-XR 8 hours
 - Ritalin-LA (biphasic) 6-8 hours



DEA: New Rule

- If permitted under state law, federal regulations now allow multiple prescriptions for stimulants to be issued on the same day, for up to a 90-day supply
- Each prescription must list all the required information and be signed and dated on the date it is issued
- Each prescription (other than the first) must have instructions stating the earliest date on which it may be filled
- If state law is more restrictive, the state law applies

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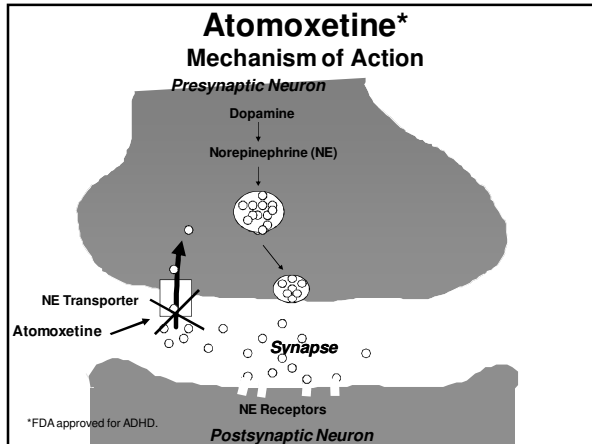
Federal Register, Drug Enforcement Administration. 2007;72:64921-64930. <http://www.fws.gov/gov/cgi-bin/PDFgate.cgi?WAISdocId=009935218531+1+2+0&WAIAction=retrieve>. Accessed January 24, 2008.

Medications Approved for ADHD: Nonstimulants

Medication	Starting dose	Target dose*	Usual daily dosing	Duration of effect
Norepinephrine reuptake inhibitor				
Atomoxetine (Strattera) children <70 kg	0.5 mg/kg/d	1.2 mg/kg/d	Once	Up to 24 hours
Alpha-2a receptor agonist				
Guanfacine (Intuniv) children and adolescents [†]	1 mg/d	1 to 4 mg/d	Once	About 12 hours

*May exceed FDA-approved dose.
[†]Newly FDA-approved.

Pliaska SR et al. J Am Acad Child Adolesc Psychiatry. 2007;46(7):894-921. http://www.aacap.org/galleries/PracticeParameters/JAACAP_ADHD_2007.pdf. Accessed September 19, 2008
 Sallee et al. J Am Acad Child Adolesc Psychiatry. 2009;19(3):215-226. Sallee et al. J Am Acad Child Adolesc Psychiatry. 2009;48(2):155-165.



Some patients don't take their ADHD medications

Because they:

- have prejudices about the disorder
- fear and don't understand ADHD meds
- Don't feel significant benefit
- Experience unpleasant side effects
- Aren't adjusted for time frames/tasks
- Don't have adequate refill system

Medications for ADHD

- Appropriate dose of stimulants is not consistently related to age, weight or sx severity!
- Sometimes meds make sx worse
- Meds vary in speed of onset/offset
- Duration of time frames of coverage duration vary

FINE-TUNING MEDICATION IS CRUCIAL!

Patient Education is needed about medications

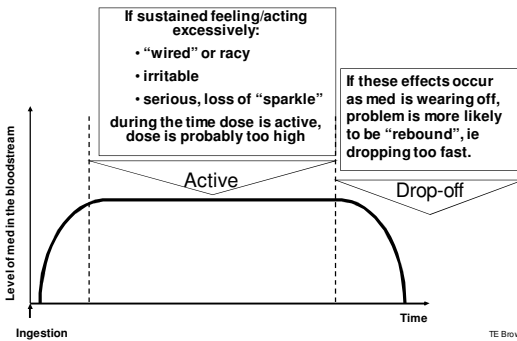
Need to be "fine-tuned" in collaboration with each patient

- Set patient expectations to collaborate
- adjust med, dose or timing to individual needs and body chemistry
- prevent stimulant "rebound"
- Need to report and deal with any side effects
- Security of medications is important
- Giving to others = "dealing"

Time Frames for Coverage

- Most students need coverage for classes and for homework & studying
- "Long-acting" stimulants rarely last more than 10 hours
- Some students do best with long-acting in am and short-acting in late afternoon
- Other students prefer 2 or 3 doses daily of shorter-acting
- Some do best with 2 long-acting doses daily

Time Frames and Rebound



Inadequate Treatment?

- Does student understand range & causes of ADD ?
- Adverse effects of med? While med active? Rebound?
- Functioning significantly better when med is active? (0 to 10 query)
- Coverage adequate for all important time frames?
- Med consistently taken?
- Effect diminished by inadequate sleep, excessive etoh use and/or other drugs?

Overlap btwn ADHD & Reading

- Fluency and comprehension in reading requires:
- not only ability to decode words
- but also ability to sustain focused attention
- Medications used to treat ADHD may be helpful in treatment of dyslexia

Shaywitz & Shaywitz, *Development & Psychopathology*, 2008

Study of Reading Comprehension & Time Pressures in Students with ADHD

145 students aged 13-18 yo

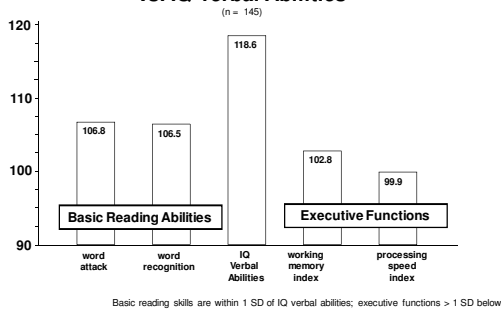
On WISC-IV or WAIS-III IQ Test:

- Verbal Comp Index = 118.6
- Working memory Index = 102.8
- Processing speed index = 99.9
- Basic reading skills = 106.5

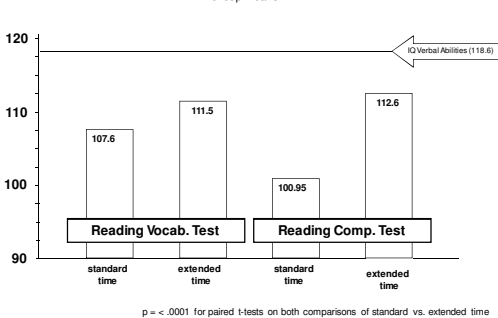
**Nelson-Denny Reading Test
Comprehension 20 min vs 32 min**

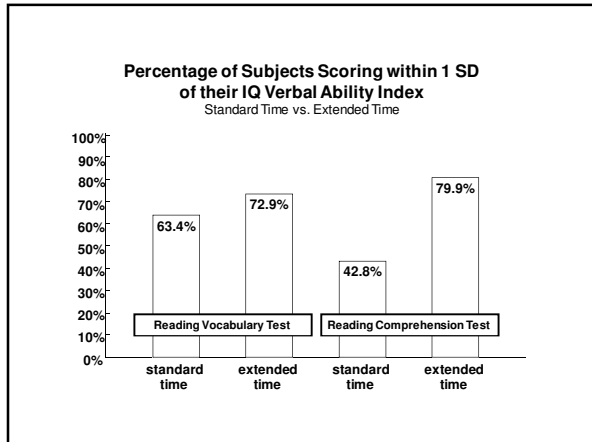
- 53% of ADHD students unable to attempt all 38 questions within standard time
- Under standard time, mean score 17.7 points below mean VCI
- With 12 min extended time, mean discrepancy reduced to 7.4 points

Basic Reading Abilities & Executive Function Indexes vs. IQ Verbal Abilities



Standard vs Extended Time vs IQ Verbal Abilities





Cognitive Behavioral Treatments for:

Defensive attitudes about self & others:

- ◆ “Everyone expects too much from me.”
- ◆ “I may seem smart, but I’m really stupid.”
- ◆ “High goals just bring disappointment.”

These attitudes have cognitive & emotional aspects

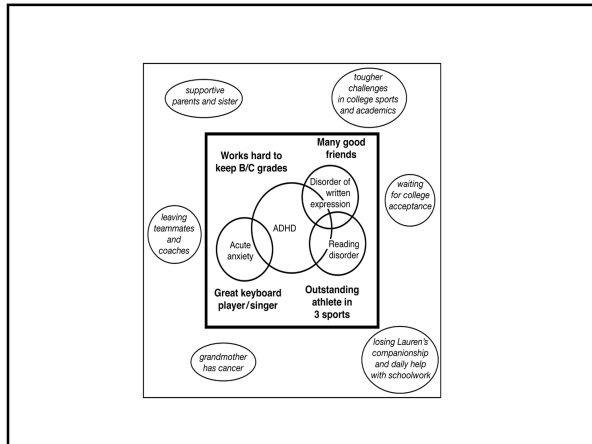
- ◆ “It’s not worth trying; the world is unfair.”

Remedial instruction or Coaching for:

Skill deficiencies that persist

- ◆ Study skills and academic deficits
- ◆ Organization of ideas and stuff
- ◆ Priority setting & time management
- ◆ Budgeting income and spending
- ◆ Monitoring self in conversations

Pills don’t teach skills.



Key Ideas

- ADD/ADHD = developmental impairments of Exec Function
- Often other disorders also present
- Essentially a chemical problem
- Meds alleviate only in time frames
- Fine-tuning of meds is essential
- Accommodations may be helpful.

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