Attention-Deficit Hyperactivity Disorder in Adults
Fundamentals for the Clinician-Educator

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Topics Covered
1) Epidemiology of ADHD
2) Pathophysiology
3) Models of natural history
4) Evaluation in adults
5) Drug therapy options in adults
6) Integrating drug therapy into long-term management strategies

ADHD Definition
A behavioral disorder that symptomatically presents prior to the age of 7 years.
Behavioral dysfunction must be unremitting and pervasive (2 or more settings) such that it produces impairment.
Core dysfunctions are:
1) Inattentiveness
2) Impulsivity/Hyperactivity

Pathophysiology of ADHD
• A consequence of “the interaction of multiple neurotransmitters” (norepinephrine and dopamine pathways).
• Supported by neuroimaging studies.
• First degree relatives of a child with ADHD have a 4 to 7 fold higher risk of ADHD than controls
• The most heritable of common psychiatric conditions.

Epidemiology in Children
• Childhood prevalence is 3-5% in the U.S. Approximately 2 million U.S. children have the disorder.
• The average age at diagnosis is age 9 years.
• There are “few children with ADHD who have not already come to clinical attention.”
• Early pronounced gender bias (10 males:1 female)
• Co-morbidity, even in childhood, is the rule.
• Pediatricians and FP’s diagnose 75-90% of ADHD.

Natural History - Three Models
1) Universal Decay/Remission - core dysfunctions eventually disappear or are no longer significant enough to cause impairment (adaptation).
2) Persistence - core dysfunctions persist throughout life and continue to cause impairment.
3) Evolution - core dysfunctions give rise to other psychiatric disorders.
Universal Decay/Remission

- First accepted model of the natural history of ADHD.
- Based on the initial rapid decay of the disorder. Up to 1/3 of children diagnosed with the disorder no longer meet criteria at one year.
- 1996 meta-analysis of existing cohorts suggests the rate of decline in prevalence to be 50% every 5 years.
- This formalized model was based on a total of nine small cohorts - with one research group responsible for assembling five of these cohorts.

Decay Model

Prevalence rates:
- Age 20 = 0.84%
- Age 30 = 0.21%
- Age 40 = 0.05%
- Age 50 = 0.01%

Critiqued on the basis of the limited available data, the exclusion of more severe cases of ADHD - including cases with co-morbidity, and clinical evidence of the disorder in adults.

Persistence

- Early recognition that ADHD continues through adolescence.
- Subsequent recognition of adults with concentration problems, impulsivity, poor anger control, job instability, and marital difficulties.
- The principal unsettled issue for models of persistence is at what level and in whom does the disorder persist.

Decay Model Revisited

Recent data on persistence

<table>
<thead>
<tr>
<th>Age</th>
<th>Prevalence Childhood ADHD in Sample (%)</th>
<th>Current Adult ADHD Among Childhood Cases (%)</th>
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<tr>
<td>18-24</td>
<td>7.6</td>
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Overall, blinded clinical interviews classified 36.3% of respondents with retrospectively assessed childhood ADHD as meeting DSM-IV criteria for current ADHD.

Evolution

- Views ADHD as the neurodevelopmental precursor to other psychiatric disorders.
- It suggests that the behavioral dysfunctions present in childhood lead to (or evolve into) already recognized adult disorders including affective disorders, antisocial personality disorder, conduct disorder, and substance abuse disorders.

Summary of Models

- In reality all three models co-exist.
  - 30-60% of cases remit entirely
  - 30-60% of cases persist at a level producing impairment
  - 10-20% of cases evolve into another primary disorder
- Prevalence in adults is likely 1-3%.
- Some adults may have persistence of the disorder but function at a “high level” - particularly if they have been able to avoid situations requiring sustained attention.
- Remission may represent effective adaptation to underlying disorder while persistence and evolution a failure to adapt.

General Internists Encounter ADHD in Two Circumstances

1) Diagnosed during childhood or adolescence
2) Previously unrecognized

Diagnosed in Childhood

Drug treatment in childhood has no demonstrable effect on natural history. Other than severity, there are no clear predictors of persistence.

As the primary provider you should:
1) Document continued impairment in two or more settings.
2) Encourage psychosocial and behavioral interventions for training in organizational and attentional skills.
3) Continue drug therapy when ongoing impairment is present. Tailor therapy based on risk of long-term side effects, comorbidity, and evidence of efficacy.

Previously Unrecognized

There are four steps in recognizing (or ruling out) ADHD in adults:
1) Establish an unremitting historical course.
2) Document global impairment.
3) Catalog current behaviors/symptoms consistent with ADHD.
4) Be conscious of pitfalls.

#1 - Establishing Historical Course

A history of ADHD in childhood is mandatory for the diagnosis. The disorder has a chronic, unremitting course. Impairment that has waxed and waned is not consistent with ADHD.

Clues to the historical course:
- Interviews (even by phone) with the parents of the patient.
- Previous school report cards (if available) - “talks excessively, “disturbs class”, “fails to use time effectively”.
- Long-term psychiatric illness [including substance abuse] that has failed to respond to usual treatments.

#2 - Global Impairment

Take a complete social history including:
- Education - chronic academic underachievement, held back
- Employment - multiple jobs or success only in jobs that do not require sustained attention.
- Relationships - failure to maintain long-term relationships
- Driving record - speeding tickets, running red lights, at-fault traffic accidents

Profound disability in only one arena suggests other etiologies.
#3 - Cataloging Adult Symptoms

- Traditional criteria of inattentiveness/hyperactivity.
- Symptom checklists such as the validated one found at: http://www.med.nyu.edu/psych/assets/adhdscreen18.pdf
- Traditional criteria derived from childhood studies may not fully encapsulate adult form. The Utah Criteria:
  1. affective lability (mood swings)
  2. hot temper (loss of control)
  3. emotional over-reactivity/stress intolerance
  4. disorganization
  5. impatience/impulsivity (buying sprees, reckless driving)
- Remember these behaviors occur across a continuum - only behaviors that are persistent/maladaptive should count.

#4 - Pitfalls

- Diagnosis justifiable when complaints cannot be explained better by another condition. However, probably 60% of adult ADHD is accompanied by co-morbidity.
- Retrospective confirmation susceptible to historical revision.
- Difficulty in recognition in adults produces a more heterogeneous group that is considered for treatment. This complicates treatment for a disorder for which:
  1. There is a paucity of scientific data on treating adults
  2. Standard treatment may be with a controlled substance
  3. Given its orphan status, there are few experts.

Treatment Overview

- Medications
  - Non-stimulant medications
  - Stimulants
- Non pharmacologic treatment
  - Psychotherapy
  - Coaching

ADHD Self-Report Scale

Check the box that best describes how you have felt and reacted yourself over the past week. Then give the completed questionnaire to your healthcare professional during your next appointment to discuss results.

1. How often do you have trouble wrapping up or finishing details of a project, once the challenging parts have been done?
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?
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4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?
5. How often do you fidget or tap with your fingers or feet when you have to sit down for a long time?
6. How often do you feel overly active and compulsive in doing things, like you were driven by a motor?

Add the number of checkmarks that appear in the circles checked. Four (4) or more checkmarks indicates that your symptoms may be consistent with ADHD. If so, be sure to talk with your healthcare provider about an evaluation.

http://www.med.nyu.edu/psych/assets/adhdscreener.pdf

Treatment

A word on endpoints

- Response rate
  - Most studies dichotomize outcomes into response/non-response
  - Response usually defined as:
    1. 30% improvement in standardized symptom scale
    2. Observer-rated improvement (1-2 on CGI scale)
- Effect size
  - Compares change in continuous variable
Non-stimulants

Bupropion: Properties

- aka Wellbutrin® (SR, XL)
- Dopamine, NE, Serotonin reuptake blocker
- Useful in depression, smoking cessation
- AR: Seizures, HTN, insomnia
- Cost:
  - 100 mg TID $35
  - 150 mg BID $70
  - 300 mg QD $109

Bupropion: Studies

- Kuperman 2001
  - 30 patients, 7 weeks
  - 300 mg/d bupropion vs 0.9 mg/kg/d methylphenidate vs placebo
  - Response rate 64% bupropion, 50% MP, 27% placebo (p=0.14)
- Wilens 2001
  - 40 patients, 6 weeks
  - 400 mg/d bupropion vs placebo
  - Response rate 52% bupropion, 11% placebo (p=0.007)

Atomoxetine: Properties

- aka Strattera®
- Inhibitor of the presynaptic norepinephrine transporter
- Specific to ADHD treatment
- AR: Hepatotoxicity, hypertension, tachycardia, GI, insomnia
- Cost: 40 mg BID $172

Atomoxetine: Studies

- Michelson 2003
  - 2 studies: 280 patients, 257 patients; 10 weeks.
  - Placebo lead in design
  - Effect size 0.35, 0.40 p< 0.005
  - BP increase 1-3 mmHg

Desipramine: Properties

- aka Norpramin®
- Tricyclic antidepressant
- AR: anticholinergic effects, arrhythmia, blood dyscrasias
- Cost: 200 mg QD $50
### Desipramine: Studies

- Wilens 1996
  - 41 patients, six weeks
  - 68% response rate in tx group, none in placebo, p < 0.01
  - Adverse effects related to anticholinergic activity

### SSRIs

- Pathophysiology not thought to involve serotonin
- No trials
- Experience in children suggests they can make things worse
- Not recommended

### Stimulants

#### General issues about stimulants

- FDA Schedule II
  - No refills
  - Increasing problems with writing prescriptions in advance
- “Black box” warnings
  - Existing warning re: abuse
  - FDA considering warnings re: cardiac risk, hallucinations

### Stimulant abuse

- Existing research suggests low risk for substance abuse in methylphenidate-treated children
- Appears the big concern is not misuse but diversion
- Few studies on diversion but those that exist (and the lay press) suggest it’s increasing

### Methylphenidate: Properties

- aka Ritalin®, Metadate®, Concerta®
- CNS stimulant, mechanism unclear
- AR: restlessness, insomnia, anorexia, hypertension
- Cost
  - Methylphenidate 10 mg BID $12.25
  - Concerta® 36 mg QD $59.80
Methylphenidate: Studies

• Approx 10 studies, generally 40-80 patients
• Response rates 60-70%
• 3-4 mmHg rise in systolic BP c/w baseline or placebo

Methylphenidate: Studies

• Spencer 2005: “A large trial”
  – 146 patients x 6 weeks
  – 44% reduction in ADHD scores; effect size 1.41
  – Slight increase in pulse, no change in BP
• Barkley 2005
  – Single dose methylphenidate associated with improved scores in driving simulator

Amphetamines: Properties

• aka Adderall®
• sympathomimetic amine, CNS stimulant
• AR: restlessness, insomnia, anorexia, tremor
• Cost: Adderall 10 mg BID $34.75

Amphetamines: Studies

• Spencer 2001
  – 27 patients, 7 weeks
  – 70% response vs 7% placebo
• Paterson 1999
  – 32 patients, 6 weeks
  – 58% response vs. 10% placebo

Medications: Summary

• All studies have short courses and small numbers
• Stimulants appear more potent than non-stimulants
• Non-stimulants have lower potential for abuse, tend to be more expensive
• Cardiovascular risks of stimulants likely greater in older pts

Management Strategies
Choosing a drug

- Primary care docs likely more comfortable with non-stimulants
- Evidence base for stimulants is improving
- Consider comorbidities
- Anecdotal experience suggests lower rates of abuse with methylphenidate

Tracking success

- ADHD symptom scores
  - ASRS-6
  - ASRS-18
- Functional outcomes
  - Social/Relationships
  - Employment
  - Academics

Drug “holidays”?

- Recommended by some to assess need for continued meds
- Not universally accepted

Nonpharmacologic management

- Counseling for psychiatric comorbidity
- CBT for ADHD
  - Almost no data: 1-2 studies of 10 or so patients show promise
  - Good conceptual framework for efficacy
- ADHD life coaches

Summary

- The disorder has biological underpinnings and persists into adulthood.
- In children, primary care physicians make the diagnosis. The bulk of responsibility for care of this large cohort as it enters adulthood will fall to adult primary care physicians.
- If unrecognized in childhood evaluate for an unrelenting, persistent, global impact and the presence of symptoms consistent with ADHD.
- Co-morbidity is common.

Summary

- Data on pharmacotherapy limited but show at least short-term benefit
- There are non-stimulant options that help
- Extend your comfort zone with medications, but don’t live outside it
- Empowerment/coaching is important
ADHD: Case 1

Mr. L is a 25 year old male who presents to establish care. His history is notable for medulloblastoma diagnosed at age 10. He underwent subtotal resection, chemotherapy, and radiation therapy. Complications include growth hormone deficiency and hypothyroidism.

As a teenager, Mr. L was diagnosed with ADHD by a pediatric psychiatrist. He has most recently been treated with amphetamine/dextroamphetamine (Adderall®).

At the recommendation of his pediatrician, Mr. L is establishing care with a physician for adults. He no longer sees the pediatric psychiatrist. He needs his levothyroxine and amphetamine/dextroamphetamine refilled.

Resident subtext:
You like this patient and feel like he’s medically complicated and has been through a lot; to a degree you identify with him because he’s close to your age. He seems to have been successful recently despite his difficulties. You have little expertise in ADHD and believe that because he was diagnosed by a psychiatrist it would be best to continue his amphetamine/dextroamphetamine.

Additional history (if attending physician requests):
Social history is notable for struggles through high school, but gradual improvement in academic performance since; he is starting his second year of law school in the fall. He has had no traffic tickets or at fault traffic accidents. He smokes ½ pack per day and is working on quitting; he drank alcohol and smoked marijuana extensively during his last two years of high school, but that has tapered off since his first year of college. He now drinks 1-2 drinks per week and has not smoked marijuana in two years. He is monogamous with a male partner whom he has known for 1½ years.

ASRS-18 screening questionnaire results are on the back if requested.
# Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Today's Date</th>
<th>Never</th>
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**Part A**

**Part B**
ADHD: Case 2

Ms. J is a 40 year old female with a life long history of disability related to meningomyelocele who is referred from Rehabilitation Medicine for evaluation of fatigue.

She characterizes her fatigue as a persistently low “energy level”. She complains of difficulty concentrating on one thing and associated memory difficulties. Physical and laboratory evaluation is unremarkable. She has been diagnosed with and treated for depression in the past year, although this has not significantly changed how she has felt.

Recently her son was diagnosed with ADHD. Ms. J has heard about ADHD in adults and wonders if she is a candidate for methylphenidate.

Resident subtext:
The patient is pleasant, but has a relatively flattened affect that you have seen before in patients with depression. You suspect that she may be depressed, but you are impressed with her complaints of poor concentration and her son’s diagnosis, and you’re not sure how to “rule out” ADHD. You also know that methylphenidate is sometimes used to treat depression and wonder if a therapeutic trial would be appropriate.

Additional history (if attending physician requests):
Although she is disabled by her meningomyelocele, prior to about 7 months ago she was active within her community and a frequent contributor to a local literary magazine. She completed high school in a total of 5 years due to illness, but had no academic or behavioral difficulties. She has two children with her current husband of 14 years—her daughter is 7 and has been successful in school with no apparent ADHD. The patient doesn’t drive, drinks alcohol only on special occasions, and doesn’t smoke. Her husband works in real estate and has been able to support her family comfortably—fortunately his firm has excellent medical insurance.

Her previous depression treatment consisted of a 4 week trial of paroxetine which she stopped at a dose of 20 mg because it was making her too sleepy. She denies suicidal ideation—“I would never do that to my kids”, but says that things that were previously fun for her are now a struggle to engage in. She is frustrated because she thought that she had learned to accommodate well for her disability but is feeling more and more like she is a burden to her family.

ASRS-18 screening questionnaire results are on the back if requested.
# Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today’s appointment.

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**Part A**

**Part B**
**ADHD: Case 3**

Ms. R is a 33 year old female who comes in for annual pap and pelvic exam but has additional questions about ADHD.

She is a librarian, and has been having difficulty at work because she feels she has trouble remembering things. Her supervisor seems to appreciate the quality of her work, but has issues with what he has described as “forgetfulness.” She reports being told that she frequently neglects to complete assigned tasks, and acknowledges that she finds her work to be interesting some of the time but has trouble with “the boring parts.” She has twice found herself in loud, vocal confrontations with co-workers. She read an article in the New York Times last year which got her thinking about ADHD, and wonders what you think.

**Resident subtext:**
This is one of your favorite patients, and although slightly disgruntled at her bringing up such a complex topic at a preventive visit, you listen to her story. You emerge from the room uncomfortable, as you believe that recent interest in adult ADHD is driven by rising diagnosis and treatment rates in children that are probably inappropriate—that much of ADHD is “medicalization” (and medication) of normal childhood behavior. You are skeptical of whether adult ADHD exists at all and certainly wouldn’t ever consider making the diagnosis yourself. Because of her problems at work you are also wary of getting involved in any kind of disability dispute should you make the diagnosis.

**Additional history (if attending physician requests):**
Ms. R has worked hard to achieve her current position as a librarian. She struggled in school as a child, and her parents hired a tutor to help her get through elementary and junior high. In high school she had generally mediocre grades. After high school she worked for two years in a miscellany of jobs: waiting tables at a local Korean restaurant, telemarketing, and data entry. She attended a local community college for two years, then finished her baccalaureate degree at a small liberal arts college. Her performance in college she describes as “adequate” but she felt she had to put a tremendous amount of work into tasks that others found easy.

After she finished college she worked in several jobs, including a teller at a bank, data entry for a state government office, and clerical work at the local hospital. None of her jobs lasted for more than a year. She had hoped to be a teacher and enrolled in a teaching certificate program but failed out of that program after 3 months. She was accepted to her current job as a school librarian 6 months ago and is anxious about possibly losing this one too.

She has not driven an automobile since she was at the wheel in a fatality accident in high school. She drinks alcohol infrequently, saying “I grew out of that.” She has struggled to quit smoking, a habit she began at 15. She has been in several brief relationships with men, none for longer than two months, and none in the past year.

**ASRS-18 screening questionnaire results are on the back if requested.**
### Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Today's Date</th>
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Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today’s appointment.

1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done? X

2. How often do you have difficulty getting things in order when you have to do a task that requires organization? X

3. How often do you have problems remembering appointments or obligations? X

4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started? X

5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time? X

6. How often do you feel overly active and compelled to do things, like you were driven by a motor? X

#### Part A

7. How often do you make careless mistakes when you have to work on a boring or difficult project? X

8. How often do you have difficulty keeping your attention when you are doing boring or repetitive work? X

9. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly? X

10. How often do you misplace or have difficulty finding things at home or at work? X

11. How often are you distracted by activity or noise around you? X

12. How often do you leave your seat in meetings or other situations in which you are expected to remain seated? X

13. How often do you feel restless or fidgety? X

14. How often do you have difficulty unwinding and relaxing when you have time to yourself? X

15. How often do you find yourself talking too much when you are in social situations? X

16. When you’re in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves? X

17. How often do you have difficulty waiting your turn in situations when turn taking is required? X

18. How often do you interrupt others when they are busy? X

#### Part B
Summary of Teaching Points

1. ADHD has well-established neurobiological underpinnings likely related to genetic polymorphisms in dopamine receptors.

2. The disorder is the most heritable of common psychiatric conditions.

3. Estimates of preponderance of the disorder in males are likely due to bias reflecting the under-recognition of inattentive relative to hyperactive subtypes (more common in males) during childhood.

4. The disorder can persist into adulthood in 30% to perhaps 60% of cases.

5. If assuming the care of a patient diagnosed in childhood document continued global impairment and if present continue pharmacotherapy.

6. If evaluating a patient who may have gone unrecognized in childhood, establish an unremitting historical course with global impairment and symptoms consistent with ADHD. If this cannot be established then ADHD is “ruled out”.

7. Long-term psychiatric illness that has failed to respond to usual treatments can be a clue to an unremitting historical course.

8. Driving record is a useful domain in adults to consider for establishing global impairment.

9. Traditional criteria derived from childhood studies may not fully encapsulate the adult form of the disorder. Consider using a validated checklist to establish symptoms.

10. Co-morbidity is common and should be considered when selecting a drug therapy.

11. Stimulants may be more effective than non-stimulants, but are also more problematic.

12. It's reasonable (but not mandatory) to take someone on long-term medications off for a few weeks for a “drug holiday.”

13. Counselors and coaches can play an important role in co-management.
**Online Resources**

National Institute of Mental Health:
http://www.nimh.nih.gov/HealthInformation/adhdmenu.cfm

Attention Deficit Disorder Association:
http://www.add.org/

Children and Adults with Attention-Deficit/Hyperactivity Disorder:
http://www.chadd.org/

ADDitude magazine:
http://additudemag.com/

ADD Resources (Northwest regional organization):
http://www.addresources.org/

**Bibliography**


ADHD in Adults Summary Handout

Core features

- Trouble concentrating
- Life seems disorganized
- Impulsive / hot tempered
- Symptom pattern since childhood

Pathophysiology – a distinct disorder - probable neurotransmitter dysfunction (dopamine receptor polymorphism)

Clear signs always begin in childhood (< age 7), although some cases may be unrecognized

Family History - very common - runs in families even more than depression or schizophrenia

Evolution into adulthood 30 - 60% seem to resolve

< 20% switch to other psychiatric condition

30 -60% persist (i.e. many adults with ADHD, 1-5% of the population)

Recognizing ADHD in adults

there should be clear signs since childhood (generally unremitting)

- pts should describe having trouble in school

documented impairment in more than one setting:

- job history – trouble keeping a job
- educational record with shortcomings
- relationship trouble – difficulty maintaining them
- driving – especially tickets, moving violations

a very common scenario: presumptive diagnosis of depression / anxiety, but no response to SSRI’s

male:female ratio is close to 1:1 in adults (and is closer to 1:1 in kids than people realize)
boys are more hyperactive: they get diagnosis earlier, overall fewer are missed

always ask about history of / current substance abuse - must document carefully

extremely common comorbidity, patients self-medicate (e.g. nicotine)

many pts show up sure they have ADHD (media hype) – but most don’t meet criteria

**Treatment**

If ADHD diagnosis since childhood and **still impaired** (dysfunction in more than one domain): continue treatment

If continuous symptoms of ADHD since childhood (but no dx): start treatment

**Non-stimulants** (not scheduled substances - antidepressant-type mechanisms)

Reasonable to think of non-stimulants as first line in therapies since there can be diagnostic uncertainty between ADHD and depression, non-stimulants have less abuse potential, and the prescriptions are easier to manage since they are less tightly regulated (can be more easily refilled).

Can be refilled for up to one year. Will take 2-4 weeks to start working.

1. **Bupropion** (Wellbutrin) – other uses: atypical antidepressant, also stop smoking aid

   bid dosing - (SR, 12 hr tabs) (cheaper, generic) (reg strength tid dosing nearly same cost)
   
   100 mg bid, 150 mg bid, or 200 mg bid

   once daily - (XL, 24 hr tabs) (more expensive, brand name)
   
   150 mg once daily or 300 mg once daily
Once daily dosing may be worth the extra cost for some disorganized patients.
Beware: contraindicated in patients with seizure history.

2. Atomoxetine (Strattera) – selective norepinephrine inhibitor

   once daily dosing - 25 mg x 1 wk, 50 mg x 1 wk, then 60 mg once daily

   Cost comparison: generic bupropion < atomoxetine < brand bupropion.
   Beware: may increase BP slightly. Also: 5 cases of fulminant liver failure.

Notes:  SSRI’s - tend not to work in ADHD - may make ADHD patients worse

Consider ADHD when SSRI’s don’t work in patients who you thought might have anxiety disorder or depression.

Stimulants (scheduled substances - considered to have potential for abuse)

May have a role in long-term therapy and can be reasonable to continue patients who have had good efficacy since childhood. But caution: the long-term effects of treating adults for many years as they get older are not known. (e.g. cardiovascular effects)

Schedule II controlled substances: generally no refills allowed.

Quick onset of action: methylphenidate 2-3 days, amphetamines immediate.

1. Methylphenidate (Concerta, Ritalin LA) amphetamine-like

   bid dosing - generic, cheap (start at 5 mg bid, doses go up to 20 mg bid)
   once daily - Concerta (more expensive, brand name) (18-56 mg qd)
   (once daily dosing may be worth the extra cost for some disorganized pts)
Methylphenidate may have lower abuse potential than dextroamphetamine.
Beware: increases in blood pressure and heart rate.

2. **Dextroamphetamine** (Adderal) – same stimulant class as methamphetamine
   
   once daily - 5-30 qd
   
   Beware: significant increases in blood pressure and heart rate, concern for severe cardiovascular problems (e.g. arrhythmia).