

# Medication Management: ADHD

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Samuel H. Zinner, M.D.

Developmental/Behavioral Pediatrics

University of Washington

# ADHD - Etiology

- Neurobiology
  - Neurotransmitters
    - Norepinephrine
    - Dopamine
    - Others

# ADHD - Comorbid conditions

- Learning Difficulties/Learning Disabilities
- Oppositionality and Conduct problems
- Aggressive Outbursts
- Tic Disorders
- Anxiety Disorders
- Mood Disorders
- Developmental Coordination Disorder
- Substance Abuse

# ADHD - Treatment

- NIMH Multimodal Treatment Study of ADHD  
(MTA Study)

- Four groups:

1. Community Care (CC)
2. Medication Management (MedMgt)
3. Behavioral (Beh)
4. Combination (Comb)

- Results:

- Comb & MedMgt superior to Beh and CC for ADHD
- Comb superior to MedMgt, Beh and CC for other areas

# ADHD - Treatment

## MTA Study

### – Treatment Approach Rules Of Thumb:

- ADHD-only or ADHD/CD-ODD  $\Rightarrow$  MedMgt +/- Comb
- ADHD/Anxiety-only  $\Rightarrow$  MedMgt, Beh or Comb
- ADHD/Anxiety/CD-ODD  $\Rightarrow$  Comb

# ADHD - Treatment

- Medications
  - To address core ADHD features
  - To address comorbid features

# ADHD – Treatment

## Key points for medications

- Medication is an integral *part* of treatment.
- Medication is not used for controlling behavior.
- Eyeglasses as an analogy
- Success is attributed to oneself, not to medication
- Avoid “poly-pharmacy” when possible

# ADHD - Treatment

- Medications for core ADHD features
  - Psychostimulants
  - Non-psychostimulants

# ADHD - Treatment

## Core ADHD features:

- Impulsivity
- Inattention
- Hyperactivity
- Distractibility

# ADHD - Treatment

## Psychostimulants

- First used in 1937
- They do not increase one's stimulation
- Very effective
- When ineffective after adequate trial, reconsider the diagnosis

# ADHD – Treatment

## Psychostimulants

- Advantages
  - the most effective Rx option for core ADHD features
- Disadvantages
  - little direct effect on social skills or academics
  - may cause attention overfocusing
  - potential for abuse
  - side effects

# ADHD - Treatment

## Psychostimulants – Key Points

- “START LOW, GO SLOW”!!
- IF ONE DOESN'T WORK, TRY ANOTHER!!
- IF INEFFECTIVE WITH PROPER TRIAL, RECONSIDER DIAGNOSIS!!

# ADHD - Treatment

## Psychostimulants – Key Points

- Long-acting and short-acting available
- Sometimes will use long- and short-acting together
- Consider double-blind, placebo-controlled trial
- Effect is “immediate”

# ADHD - Treatment

## Psychostimulants – Key Points

- If sudden loss of efficacy, not likely due to medication failure
- Usually should take medication 7 days/week
- ADHD is lifelong, and medication may or may not be a continued part of management
- Periodic trials without medication are suggested
- Less likely to abuse drugs as adolescents

# ADHD - Treatment

## Psychostimulants – Side effects

- Usually mild and short-term
- Appetite reduction
- Sleep difficulty
- “Rebound”
- Headache
- Stomachache
- Possible growth impact
- Possible cardiovascular side effects
- They DO NOT cause tics or Tourette syndrome!!!

# ADHD – Treatment

## Medications for core ADHD features

### Psychostimulants

- **Methylphenidate**
- Dexmethylphenidate
- Dextroamphetamine
- Mixed amphetamine salts
- Pemoline

Ritalin [LA,SR], Concerta  
[Metadate CD,ER], Methylin [ER]  
Focalin  
Dexedrine [Spansule], Dextrostat  
Adderall [XR]  
Cylert

### Non-psychostimulants

# ADHD – Treatment

## Medications for core ADHD features

### Psychostimulants

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Ritalin [LA,SR], Concerta  
[Metadate CD,ER], Methylin [ER]  
Focalin
- **Dexmethylphenidate**
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### Non-psychostimulants

# ADHD – Treatment

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### Non-psychostimulants

# ADHD – Treatment

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### Non-psychostimulants

# ADHD – Treatment

## Medications for core ADHD features

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- **Pemoline**

### Non-psychostimulants

# ADHD – Treatment

## Medications for core ADHD features

### Psychostimulants

### Non-psychostimulants

- Norepinephrine Reuptake Inhibitor
- Alpha adrenergic agonists
- Antidepressants
- Anticonvulsants/Mood stabilizers
- Neuroleptics

# ADHD – Treatment

## Medications for core ADHD features

### Non-psychostimulants

#### Advantages

- May avoid psychostimulant side effects
- May be used with stimulants for effect augmentation or dose reduction
- Many treat comorbid conditions of ADHD

#### Disadvantages

- None works as well as psychostimulants (uncertain re: Strattera)
- All have side effects

# ADHD – Treatment

## Medications for core ADHD features

### Non-psychostimulants

#### NE Reuptake Inhibitor

- atomoxetine (Strattera)
  - No abuse potential (not a controlled substance)
  - Few studies comparing atomoxetine with psychostimulants
  - Appetite suppression is most common side effect
  - No cardiovascular effects
  - Usually once daily dosing

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

### Alpha adrenergic agonists

- clonidine (Catapres) (*Esp. useful if used with stimulant*)
- guanfacine (Tenex)

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

### Antidepressants

- tricyclics (*The most studied non-stimulant for ADHD*)
- SSRIs
- others

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

### Antidepressants

- tricyclics (“TCAs”) (*Patience!! 3 weeks for full effect*)
  - imipramine (Tofranil)
  - nortriptyline (Pamelor)
  - amitriptyline (Elavil)
  - clomipramine (Anafranil)
  - protriptyline (Vivactil)
  - desipramine (Norpramin)
- SSRIs
- others

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

### Antidepressants

- tricyclics
- **SSRIs** (*Ineffective for ADHD, but great for comorbidity*)
  - fluoxetine (Prozac)
  - sertraline (Zoloft)
  - paroxetine (Paxil)
  - fluvoxamine (Luvox)
  - citalopram (Celexa)
- others

# ADHD – Treatment

## Medications for core ADHD features

### Non-psychostimulants

#### Antidepressants

- tricyclics
- SSRIs
- others
  - bupropion (Wellbutrin) (*The only established one for ADHD*)
  - venlafaxine (Effexor)
  - mirtazapine (Remeron)
  - nefazodone (Serzone)

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

Anticonvulsants/Mood stabilizers (*effective, but not advised*)

- Carbamazepine (Tegretol)
- Lithium
- Valproic acid (Depakote)

# ADHD – Treatment

Medications for core ADHD features

## Non-psychostimulants

Neuroleptics (*effective but inadvisable*)

- Risperidone (Risperdal)
- Olanzapine (Zyprexa)

# ADHD – Treatment

## Medications for comorbid features

- Tics/Tourette's
- Insomnia
- Aggression
- Anxiety/Obsessions-Compulsions
- Mood disorders
- Enuresis (wetting)

# ADHD – Treatment

## Medications for comorbid features

- Tics/Tourette's
  - Stimulants
  - Alpha adrenergic agonists
  - Neuroleptic agents
    - atypical neuroleptics
    - typical neuroleptics
  - Add a beta-blocker
  - TCA

# ADHD – Treatment

## Medications for comorbid features

### – Insomnia

- Alpha adrenergic agonists
- TCAs

# ADHD – Treatment

## Medications for comorbid features

### – Anger/Aggression

- Anger: SSRI
- Aggression: clonidine or carbamazepine

# ADHD – Treatment

## Medications for comorbid features

- Anxiety/Obsessions-Compulsions
  - Anxiety: SSRIs and TCAs
  - Obsessions-Compulsions: SSRIs

# ADHD – Treatment

## Medications for comorbid features

### – Mood Disorders

- Depression: SSRIs, Bupropion, and TCAs

# ADHD – Treatment

## Medications for comorbid features

- Enuresis (wetting)
  - TCAs
  - DDAVP

# ADHD – Treatment

## Non-medication approaches

- Complementary and Alternative Therapies
  - Guidelines from the National Institutes of Health
    - Assess the safety and effectiveness of the therapy
    - Examine the practitioner's expertise
    - Consider the service delivery
    - Consider the costs
    - Consult your healthcare provider

# ADHD – Treatment

## Non-medication approaches

### – “Alternative” approaches

- Dietary eliminations
- Biofeedback/Hypnotherapy
- Chiropractic
- Homeopathy
- Herbs and dietary supplements

# ADHD – Treatment

## Non-medication approaches

### – “Alternative” approaches

- Dietary eliminations
- Biofeedback/Hypnotherapy
- Chiropractic
- Homeopathy
- Herbs and dietary supplements

# ADHD – Treatment

## Non-medication approaches

- “Alternative” approaches:
  - Herbs and dietary supplements
    - Safety
    - Classes of agents
      - Sedative herbs and supplements
      - Antioxidant supplements
      - Other popular herbs and supplements

# ADHD – Treatment

## Non-medication approaches

- “Alternative” approaches:
  - Herbs and dietary supplements: Classes
    - Sedative herbs and supplements
      - Valerian
      - Lemon balm
      - Kava kava
      - Melatonin
    - Antioxidant supplements
    - Other popular herbs and supplements

# ADHD – Treatment

## Non-medication approaches

- “Alternative” approaches:
  - Herbs and dietary supplements
    - Sedative herbs and supplements
    - Antioxidant supplements
      - Fish oil
      - Pycnogenol (grape seed and pine bark)
    - Other popular herbs and supplements

# ADHD – Treatment

## Non-medication approaches

- “Alternative” approaches:
  - Herbs and dietary supplements
    - Sedative herbs and supplements
    - Antioxidant supplements
    - Other popular herbs and supplements
      - Ginkgo biloba
      - Evening primrose oil
      - Blue-green algae

# ADHD RESOURCES:

## Medication Information

- **Children and Adults with ADHD (CHADD)**
  - [www.chadd.org](http://www.chadd.org)
- **Nat'l Initiative for Children's Healthcare Quality (NICHQ)**
  - [www.nichq.org](http://www.nichq.org)
- **National Institute of Mental Health (NIMH) – ADHD Q&A**
  - [www.nimh.nih.gov/publicat/adhdqa.cfm](http://www.nimh.nih.gov/publicat/adhdqa.cfm)
- **NICHQ ADHD Toolkit**
  - [www.nichq.org/resources/toolkit](http://www.nichq.org/resources/toolkit)

# ADHD - Treatment

## TAKE-HOME POINTS

- Comprehensive management is needed
- Medications are likely useful
- Stimulants generally the best first choice
- Efficacy of any medication is unpredictable
- Don't overlook comorbid conditions