Comorbid Problems in Children and Adults with ADHD: Current Medication Interventions

CANP State Conference
March 22, 2013
Monterey, CA
Susan R. Opas, PhD, CPNP, CPMHS
Workshop Objectives

• Review defining symptoms and behaviors, diagnostics, and pharmacologic management, for children and adults with ADHD & comorbid conditions by:
  – Identifying common characteristics expressed by individuals with ADHD
  – Utilizing diagnostic criteria for mental health disorders in children and adults initially diagnosed with ADHD
Workshop Objectives con’t

• Identify mental health disorders that commonly co-exist for children and adults with ADHD
• Discuss similarities and differences between medication-induced secondary mental health behaviors and co-existing disorders
• Determine applicable therapeutic interventions for individuals with co-morbid ADHD
• Describe the nurse practitioner’s role to promote healthy outcomes for children and adults with disorders associated with ADHD
ADHD Diagnostic Criteria, Including the DSM

• DSM-IV symptoms apparent before age 7 yr*
• Some impairments present in ≥ 2 settings
• Clear evidence of impairment in social, academic or occupational functioning
• Symptoms not apparent with exclusive PPD, Schizophrenia or other Psychosis, or better accounted for by mental health issues - mood, dissociative or personality disorder
Case Studies

• At the start of this workshop you will be given a range of case studies where you, the participant, will be given the opportunity to evaluate, diagnose and prescribe appropriate medications and doses.

• Throughout the workshop, we will return to the cases as topic areas and therapeutic medications are presented.
DSM-IV-R ADHD 314.0

6 Inattentive or 9 Combined Criteria

- **314.00 Inattentive**
  - poor attention to detail / careless mistakes
  - difficulty sustaining attention in tasks or play
  - poor follow through of instruction or task completion
  - difficulty organizing
  - reluctant to engage in activity of sustained mental effort
  - loses necessary supplies
  - easily distracted
  - forgetful in daily activities

- **314.01 Hyperactive / Impulsive**
  - fidgets & squirms
  - leaves seat although a requirement
  - runs about / climbs excessively
  - difficulty playing quietly
  - “on the go” “driven by a motor”
  - talks excessively
  - blurts out before question completion
  - difficulty waiting turn
  - interrupts or intrudes on others
ADHD CO-morbidities

- ODD Oppositional Defiant Disorder 30-50%
  - Negative, disobedient, hostile toward authority
- Conduct Disorder 10-20%
  - Violates basic rights of others
- Anxiety Disorder >30%
  - Massive &/or persistent fear, to the point of panic or immobility or somatizations (tics)
- Obsessive Compulsive Disorder to 20%
- Mood Disorders 20%
  - Apprehension, agitation, depression
- Learning Disabilities 15-20% (30)
Deficiencies in Dopamine Regulation of Cognition, Behavior and Mood

DEFICIENCY
Decreased Attention
Cognitive Slowing
Decreased Motivation
Apathy

DOPAMINE
Drive
Pleasure
Cognitive Function
Mood
Emotion
Appetite
Aggression
Sex
Impulse

NOREPINEPHRINE
Energy
Interest
Anxiety
Irritability

SEROTONIN
Psychostimulants: First Line of ADHD Medication Treatment

• Methylphenidate class
  – 1mg/kg/day body wt (.5mg/kg dexamethylphenidate)

• Dextedrine-dextroamphetamine class
  – .8 mg/kg/day body wt

• Dose preparation and durations
  immediate-release, short duration 3-5 hours average
  divided release, moderate duration 4-6 hours variable
  divided release, long duration 6-12 hours average
  continuous release, long duration 9 hours
Stimulants: Methylphenidate: ADHD Prescriptive Intervention

- Methylphenidates (MPH)
- @ 1mg/kg/day*
  - IR (immediate release/short acting) 3-4hr
    - Ritalin (methylphenidate/Methylin, Methylin solution
      - 5-20mg tablets in 5mg increments, solution 10mg/5ml
    - Focalin (0.5mg/kg/day) 2.5-10mg tablets
  - Mid-Range, School day coverage 4-6hr
    - Methylin ER enteric coated tablets 5-20mg
    - Metadate CD capsules 10-50mg in 10mg increments
    - Ritalin LA capsules 10-30mg in 10mg increments
    - Focalin XR capsules 5-20mg increments
  - Long acting 8-12hr
    - Concerta oros technology tablets 18, 27, 36, 54mg
    - Daytrana transdermal patch 10, 15, 20, 30mg
Stimulant: Mixed Amphetamine Salts
ADHD Prescriptive Intervention

• Dexedrine/Dextroamphetamine derived combination salts (@0.8mg/kg/day starting dose)
  – IR (immediate release) 3-5hr duration, 5-20mg tabs in 5mg increments
    • Dexedrine (dextroamphetamine)
    • Adderall (mixed amphetamine salts)
  – School day 3-6hr
    • Dexedrine spansules 5, 15mg capsules
  – Day long 8-12hr
    • Adderall XR 5-30mg capsules in 5mg increments
    • Vyvanse 20-70mg capsules in 10mg increments
Stimulant Side Effects

- Appetite suppression while medication is active: can lead to growth suppression or binge eating, headaches from dehydration and low serum glucose
- Delayed sleep onset: increased level of alertness or increased energy level at bedtime
- Dulled mood while medication is active
- Rebound of increased emotionality, irritability, hyperactivity
Optional “First Line” ADHD Prescriptive Interventions

- **Atomoxetine**
  - Strattera 1.2-1.4mg/kg/day caps 1 or 2 divided doses (black box warnings related to suicidality, BP/HR elevations, elevated ALT)
- **Bupropion**
  - Wellbutrin 75mg tab tid - 200SR bid
- **Nortriptyline**
  - Pamelor 10-25mg caps 1-2xdaily ECG prior to increase beyond 50mg/day
- **Methamphetamine**
  - Desoxyn 5mg tabs actions similar to methylphenidate dosing 1-3 times daily
- **Guanfacine**
  - Intuniv 1,2,4 mg extended release daily dose, monitor for tiredness
- **Modafinil**
  - Provigil 100mg tab 1-2xdaily
    - Sparlon (Cephalon application for FDA approval for use in children withdrawn due to reports of Stevens-Johnson Syndrome)
    - Medication still prescribed to adults for narcolepsy and shift change jobs
- **Magnesium Pemoline**
  - Cylert no longer available due to potential liver damage
Prognosis for Children with ADHD

- Symptom improvement via learned compensatory & coping strategies
- 30-40% “outgrow” in adolescence, do well as adults
- 50-60% persist & experience social, occupational difficulties
- 10-15% develop severe antisocial problems of depression, substance abuse

• Belief through the 1980s: stimulants effective in only 50% adults

• 2 1990’s studies results:
  – Timed study of 6 months treatment: Rx vs Placebo
  – 78% improved in the Rx treatment group
  – 4% improved in the Placebo group

  – Ongoing study that included co-morbidities
  – 73% improved with Rx treatment
  – 23% improved with placebo
Mental Health Issues (Co-morbidities) which Confound ADHD

**ADHD**
- Poor concentration
- Day dreaming
- Difficulty to focus on task
- Restlessness
- Poor sleep
- Mood disturbance

**Oppositional Defiant/ Conduct Disorder**
- Memory problems
- Fear & Avoidance
- Crying
- Poor self-concept
- Failure to complete tasks
- Aggression
- Sensation seeking

**Anxiety Disorders**
- Memory problems
- Fear & Avoidance
- Crying
- Quiet
- Withdrawn

**Mood Disorders**
- Memory problems
- Fear & Avoidance
- Crying
- Quiet
- Withdrawn

**Shared Symptoms**
- Poor concentration
- Day dreaming
- Difficulty to focus on task
- Restlessness
- Poor sleep
- Mood disturbance
ADHD Co-Morbid Disorders

- Oppositional Defiant Disorder
- Conduct Disorder
- Antisocial Personality Disorder
- Autism Spectrum Disorder
- Generalized Anxiety Disorder
- Obsessive-Compulsive Disorder
- Tourettes and Transient Tic Disorder
- Depression
- Post-Traumatic Stress Disorder
- Non-Suicidal Self-Injury
Adjunct Medication Therapy for ADHD – Impulsive or Disruptive Mood Control

- Alpha-2-adrenergic agonists
  - clonidine (Catapres) NEW LA; guanfacine (Tenex & INTUNIV)
- Beta blocker
  - Propranolol (Inderal)
- Tricyclic antidepressants (TCAs)
  - nortriptyline (Pamelor); imipramine (Tofranil); desipramine (Norpramine); amitriptyline (Elavil)
- Second generation, atypical anti-psychotics
  - risperidone (Risperdal); aripiprazole (Abilify)
  - clozapine (Clozaril); quetiapine (Seroquel); olanzapine (Zyprexa); ziprasidone (Geodon)
- Anticonvulsants: Neuroleptics
- 1st generation: clonazepam (Klonopin)
- 2nd generation: carbamazepine (Tegretol); divalproex Na (Depakote)
- 3rd generation: gabapentin (Neurontin); lamotrigine (Lamictal); topiramate (Topamax), oxcarbazepine (Trileptal)
- Lithium salt
Oppositional Defiant Disorder (ODD) DSM 313.81

• Pattern of negativistic, hostile, defiant behaviors existing ≥ 6 months causing clinically significant social, academic or occupational impairment; including frequent:
  – Argues; loses temper; actively defies, refuses to comply; deliberately annoys; blames others for one’s mistakes; easily annoyed; angry, resentful; spiteful or vindictive
Conduct Disorder
(CD) DSM 312.8-

• Repetitive &/or persistent violation of rules or social norms at least x1 in 6 mo, x3 in 12 mo
• Aggression to people or animals
  – Bullying, fighting, cruelty; use of a weapon; stealing under personal force; using sexual force
• Deliberate destruction of property w-w/o fire
• Theft by use of
  – Lying or deceit; shoplifting, breaking in
• Serious rule violation
  – Running away; staying out, breaking curfew; school truancy before age 15
Medication choices for ODD/CD

(a) = adult; (c) = children’s daily dosing

• α-2 agonists:
  – Clonidine 0.1-0.4mg (c); 0.4-0.6mg (a) ÷ bid
  – Guanfacine 0.5-3mg ÷ bid, qD in sustained release

• β-blocker:
  – Propranolol 80-960mg qD, may take 8 wks (a)

• TCAs
  – Nortriptyline 20-50mg ÷ bid, ecg beyond 50mg effects in 7-28 days, can be qD
  – Clomipramine 20-max based on side effects
Medication choices for ODD/CD
(a) = adult; (c) = children’s daily dosing

• Anticonvulsants – neuroleptics
  – Clonazepam .25mg
  – Carbamazepine 50-400mg (c) ÷ bid, 300-1600mg (a)
  – Oxcarbamazepine
  – Divalproex 125-500mg bid (c), max 60mg/kg/d (a)
  – Gabapentin 300-400mg qD, max 900-3600 (a)
  – Lamotrigine 50mg to 100-500mg qD or ÷ bid (a-c)
  – Topiramate 25mg bid to 1300mg qD (a)
• Lithium 150-600mg ÷ bid
Medication choices for ODD/CD

(a) = adult; (c) = children’s daily dosing

- **Atypical antipsychotics, 2nd generation**
  - Risperidone 0.25-4mg (c) 4-6mg (a) ÷ qD
  - Aripiprazole 5-40mg ÷ qD
  - Clozapine 25-100, single at lowest to bid
  - Quetiapine 25-100mg (c) 150-750mg (a) HS
  - Olanzapine 2.5-20mg (a)
  - Ziprasidone 20-80mg qD
Antisocial Personality Disorder
DSM 301.7

• Pervasive disregard for rights of others since age 15, persistent beyond age 18 w/history of CD
  – Repeated acts having grounds for arrest
  – Deceitful acts against others for personal profit or pleasure
  – Persistent impulsivity or failure to plan
  – Irritability, aggression leading to assaults or fights
  – Reckless disregard for safety to self and others
  – Irresponsibility leading to inconsistent work behaviors and failure to honor financial obligations
  – Lack of remorse seen as indifference or rationalization
Autism Spectrum Disorder (ASD) DSM 299.00

• > 6 qualitative impairments in social interactions, communicative language and symbolic play, present before age 3. Such as:
  – Non-verbal social behaviors; developmentally appropriate peer relationships; spontaneous information sharing; social/emotional reciprocity
  – Delayed or absent speech; initiation or continuing conversation; idiosyncratic language; imitative play
  – Intense or hyper-focused abnormally encompassing preoccupation with patterns; sustained adherence to non-functional routines or rituals; stereotypic, repetitive motor mannerisms; focus on parts vs whole
Internalized emotional problems

• Anxiety
  – Has fears or concerns whether real or imagined
  – May be overwhelmed by thoughts or actions that are difficult to control

• Depression
  – Feels neglected due to lack of appropriate social skills
  – Feels rejected due to aggressive behavior
Deficiencies in Serotonin Regulation of Cognition, Behavior and Mood

DOPAMINE
- Drive
- Pleasure

NOREPINEPHRINE
- Energy
- Interest

SEROTONIN
- Cognitive Function
- Mood
- Emotion

- Appetite
- Aggression
- Sex

- Anxiety
- Irritability

- Impulse
Adjunct Medication Therapy for ADHD
Expression of Anxiety, Depression

• Selective Serotonin Reuptake Inhibitors (SSRIs)
  – Fluoxetine (Prozac); sertraline (Zoloft); citalopram (Celexa); paroxetine (Paxil);
    fluvoxamine (Luvox); escitalopram; duloxetine (Cymbalta)

• Norepinephrine Dopamine Reuptake Inhibitors (NDRI)
  – Bupropion (Wellbutrin); atomoxetine (Strattera)

• Selective Serotonin Norepinephrine Reuptake Inhibitors (SNRI)
  – Venlafaxine (Effexor)

• Serotonin-2 Antagonists/Reuptake Inhibitors (SARI)
  – Trazodone (Desyrel)

• Benzodiazepines
  – Alprazolam (Xanax); lorazepam (Ativan); diazepam (Valium)

• Tricyclic Antidepressants
  – (see previous slide on impulse-mood disruption)
Adjunct Medication Therapy for ADHD
Expression of Anxiety, Depression

- Selective Serotonin Reuptake Inhibitors (SSRIs)
  - fluoxetine (Prozac) 10-80mg
    - 10mg/5mL solution 1-2mL in very young children
  - sertraline (Zoloft) 50-200mg, 25mg start (c)
  - citalopram (Celexa) 10-60*mg,
    - *recent FDA warning against doses > 40mg, q-t interval issues
  - paroxetine (Paxil) 10-60mg
    - Some evidence prenatal exposure leads to newborn orthopedic problems
  - fluvoxamine (Luvox) 50-300mg
  - escitalopram (Lexapro)
  - duloxetine (Cymbalta)
    - Not FDA approved under 18 years of age
Deficiencies in Norepinephrine Regulation of Cognition, Behavior and Mood

DEFICIENCY
- Decreased Attention
- Cognitive Slowing
- Decreased Motivation
- Apathy

DOPAMINE
- Drive
- Pleasure

NOREPINEPHRINE
- Energy
- Interest
- Decreased Alertness
- Lethargy

SEROTONIN
- Mood
- Emotion
- Cognitive Function
- Anxiety
- Irritability
- Impulse
- Sex
- Appetite
- Aggression
Adjunct Medication Therapy for ADHD
Expression of Anxiety, Depression

• Norepinephrine Dopamine Reuptake Inhibitors (NDRI)
  – Bupropion (Wellbutrin) 225-450mg, 150-300mg SR qD
  – Atomoxetine (Strattera) (see slide on ADHD alternatives)
• Selective Serotonin Norepinephrine Reuptake Inhibitors (SNRI)
  – Venlafaxine (Effexor) 75-375mg qD
• Serotonin-2 Antagonists/Reuptake Inhibitors (SARI)
  – Trazodone (Desyrel) 25-100mg (c), 150-600mg (a) qD
• Noradrenergic/Specific Serotonergic Antidepressant (NaSSA)
  – Mirtazapine (Remeron) 15-60mg qD
Adjunct Medication Therapy for ADHD
Expression of Anxiety, Depression

- Benzodiazepines
  - Alprazolam (Xanax) 0.25, 0.5, 1, 2mg
  - Lorazepam (Ativan) 0.5, 1, 2mg
  - Diazepam (Valium) 2, 5, 10mg
Overanxious Disorder of Childhood
Generalized Anxiety Disorder (GAD) DSM 300.02

• Excessive anxiety and worry occurring more days than not, for ≥ 6 months
• Difficulty controlling worry
• Anxiety and worry associated w/ONE of the following:
  – Restlessness, keyed up, on edge
  – Easily fatigued
  – Difficulty concentrating: mind goes blank
  – Irritability
  – Muscle tension
  – Disrupted sleep
• Significant distress, impaired social/academic functioning
• Symptoms are not due to other physical, emotional, medical indicators
Obsessive-Compulsive Disorder (OCD) DSM 300.3

• Obsessions
  – Recurrent & persistent thoughts, impulses, images felt to be intrusive & inappropriate enough to cause marked anxiety or distress
  – Thoughts, impulses & images are not excessive worry of real life
  – Individual tries to ignore, suppress or neutralize thoughts, impulses, images by alternative thinking or actions
  – Individual recognizes the thoughts, impulses, images are his/her own

• Compulsions
  – Repetitive behaviors the individual feels driven to perform in response to an obsession
  – The behaviors are directed toward reduction or prevention of dreaded outcomes, although they may not be realistically associated or may be excessive

• The individual generally realizes the excessive nature or questionable reality of the behaviors’ benefits

• The obsessions and compulsions cause marked distress, consume time, interfere with normal social/academic/occupational functioning
Expressions of Anxiety

• Compulsions behind the obsessions of Obsessive Compulsive Disorder
  – Wash
  – Check
  – Repeat
  – Arrange
  – Order
  – Touch
  – Count
Transient Tic and Tourette’s Disorder
DSM 307.23, 307.21

• Tourette’s: Multiple motor & ≥ 1 vocal sudden, rapid, recurrent, non-rhythmic stereotyped movement or utterance expressed many times in a day, but not necessarily concurrent over 1 year, with no longer than a 3-month tic-free period

• Transient: movements or utterances nearly every day for ≥ 4 weeks, but no longer than 12 months

• Onset prior to age 18 years

• Not due to physiological effects of a medication or medical condition
Post-Traumatic Stress Disorder (PTSD) DSM 309.81

- Child experienced, witnessed, was confronted with events of actual/threatened death or serious injury/integrity to self or others, and intensely responded with fear, helplessness, horror
- The traumatic event is recurrently experienced in images, thoughts, dreams, flashbacks initiated by symbolic cues causing intense psychological/physiological distress
  - young children may express through repetitive play
- Child is persistently avoidant, detached to thought associations, aspect recollections, current and future life events, and a sense of the future
- There is persistent irritability, lack of concentration, hypervigilance, and sleep disturbance
- Clinically significant impairment in social, academic function
Major Depressive Disorder (MDD) DSM 296.2x single episode 296.3x recurring

• > 5 of 9 symptoms persistent over 2 weeks recurring nearly every day either self-reported or observed that represent a change from previous function:
  – Depressed mood (can be irritability in children) most of the day
  – Marked loss of interest or pleasure in daily acts
  – Significant change in weight or appetite: gain or loss
  – Sleep change: insomnia or hypersomnia
  – Psychomotor agitation or retardation
  – Fatigue, loss of energy
  – Feeling worthless or having inappropriate guilt
  – Indecision, inability to concentrate
  – Recurring thoughts of death or suicide, with or without a plan
Major Depressive Disorder (MDD) Manic Episode

• > 3 symptoms persisting > 1 week
  – Inflated self-esteem
  – Decreased need for sleep, do well on 3 hours
  – Talkative with pressure to keep talking
  – Racing thoughts, flight of ideas
  – Distractibility
  – Increase in goal-directed activities, psychomotor agitation
  – Involvement in excessive, pleasurable activities bearing significant consequences
Dysthymic Disorder
DSM 300.4

• Depressed mood (irritability) extending more than 2 years (adults) 1 year (children)
  – Poor appetite, overeating
  – Insomnia, hypersomnia
  – Low energy, fatigue
  – Low self-esteem
  – Poor concentration, difficulty making decisions
  – Hopelessness
Non-Suicidal Self-Injury (NSSI) DSM-V
– Impulsive-Control Disorder NOS 312.3x

• “Direct, deliberate destruction of one’s own body tissue in the absence of suicidal intent”
  – Biting, burning, cutting, inserting objects in and under the skin, pinching, picking, scratching
Specific Developmental Disorders

• Learning disabilities
  – Cognitive disabilities: Low IQ, slow information processing from short-term memory, “dyslexic” features
  – Visual-motor processing deficit
  – Central auditory processing deficit

• Motor difficulties
  – Fine motor
  – Gross motor
Multimodal Therapy

- Poly-pharmacy
- Behavior modification
- Psychosocial individual/group support
- Educational therapy
- Academic modifications/accommodations
- Good humor
Referral Resources

- Neurology
- Occupational therapy
- Mental health providers: psychiatrists, psychologists, social workers, group therapy facilitators
- Regional Centers
- Autism/autism spectrum specialists
- Schools: psychologists, administrators, counselors, teachers, nurses
- Educational therapists, tutors, peer tutors, learning centers
- Health educators, nutritionists, coaches
- Parenting/parent groups, CHADD
Professional Website Resources

- [www.justice.gov/dea](http://www.justice.gov/dea)
- [www.aap.org](http://www.aap.org):
  - Guidelines for ADHD diagnosis and treatment including
  - nichq Vanderbilt ADHD parent and teacher rating scales
- [www.apa.org](http://www.apa.org)
- [www.jaacap.org](http://www.jaacap.org)
- [www.hcp.med.harvard.edu/ncs/asrs.php](http://www.hcp.med.harvard.edu/ncs/asrs.php)
Educational Website Resources

- www.chadd.org
- www.chadd.org/attention_magazine
- www.help4adhd.org
- www.add.org
- www.addclasses.com
- www.additudemag.com
- www.addwarehouse.com
- www.supportforadd.com
- www.ldanatl.org
Resources - Journals

- American Journal of Psychiatry
- Archives of Pediatric and Adolescent Medicine
- Journal of the American Academy of Child and Adolescent Psychiatry
- Journal of Child Psychiatry
- Journal of Pediatrics
- Pediatrics
- Journal of Attention Disorders
What is your ADHD quotient?