SSRIs and Antipsychotics: Guidance on the Road Less Traveled

Robert Hilt, MD, FAAP
Associate Professor of Child Psychiatry
University of Washington
Director Partnership Access Line and Med 2nd Opinion 2015
Disclosure Statement

• I have no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider of commercial services discussed in this activity.
Learning Objectives

• Participants will learn when it can be appropriate to initiate a SSRI or antipsychotic for a pediatric patient.

• Participants will learn how to provide informed consent for the ongoing use of these medications, and know what side effects deserve explicit monitoring.
In Brief

• Whether or not you initiate a SSRI or antipsychotic, appropriate use and monitoring is valued
Your impressions are correct: Medications for kids are more common

- Before the 1980s, psychiatric medications were unusual for kids
- Then it became much more accepted
  - 280% increase 1987-1996
    - Mostly represents acceptance of ADHD prescribing
  - 20% increase 2001-2010
- Multiple medication use has increased as well
  - 700% increase 1987-1996
  - 200% increase 1997-2007

Olfson et al 2002
Medco Health Solutions Report
Comer et al 2010
Use is Not Uniform Among Populations

- Private insurance = slightly more likely to receive ADHD medications
- Medicaid = slightly more likely to receive psychiatric medications in general
- Foster care ~ twice the rate as other Medicaid children
  - Higher frequency of disorders
  - More common history of neglect/abuse
More than just ADHD

- ADHD meds an accepted part of pediatric primary care practice

- Other psychiatric medications, not so much
A Case

- A 15 year old boy
- Has Major Depression, seeing a counselor
- Counselor sends him to see you, to request a medication
- Still depressed, not making progress in therapy
- You are thinking about starting a SSRI
  - What do you say about side effect risks?
  - What needs to be monitored?
  - How to dose?
  - When do you see him back?
Why Consider Depression Meds?

- Untreated, remission takes 6 months to 1 year
- Recurrence rate 70% after 1 episode
- Depression linked to other problems
  - Conduct disorder, substance abuse
- Continued problems into adulthood
  - Increased mortality, more mental disorders

Birmaher B, 2005 AACAP annual meeting
AACAP supplement to FDA black box 10/31/04
Mild versus Severe

- **Degree of life impairment**
  - Going to school, doing sports, etc

- **Degree of symptoms**
  - Suicidal, hopeless

- **Rating scales**
  - Self assessment (a scale of 1-10...)
  - SMFQ
  - PHQ-9

- Important as mild depression often self resolves
**SMFQ**

- Relatively depression specific
  - 60% sensitivity
  - 85% specificity
- Age 6 and up
- No fee for use
- Score relates to severity

By Angold and Costello, 1987

Free download at http://devepi.duhs.duke.edu/mfq.html
SSRI Medications

- Fluoxetine (Prozac)
- Sertraline (Zoloft)
- Citalopram (Celexa)
- Escitalopram (Lexapro)
- Fluvoxamine (Luvox)
- Paroxetine (Paxil)
SSRI Q & A

- What do they do?
  - Increase serotonin levels between the serotonin releasing synapses in the brain
- Why does that help?
  - We don’t really know
  - Rapid vs. Delayed responses
    - Brain accommodation changes to increased serotonin is likely the key
- Why might one SSRI help a specific patient and not another?
  - We don’t really know
Some of what makes SSRIs different

<table>
<thead>
<tr>
<th>DRUG</th>
<th>HALF LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine</td>
<td>4-6 days</td>
</tr>
<tr>
<td>Citalopram</td>
<td>33-37 hours</td>
</tr>
<tr>
<td>Sertraline</td>
<td>26 hours</td>
</tr>
<tr>
<td>Paroxetine</td>
<td>21 hours</td>
</tr>
<tr>
<td>Fluvoxamine</td>
<td>15 hours</td>
</tr>
</tbody>
</table>
## Positive Adolescent Depression Trials

<table>
<thead>
<tr>
<th>Number of Separate Studies</th>
<th>Drug</th>
<th>Drug much or very much improved</th>
<th>Placebo much or very much improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three</td>
<td>Fluoxetine</td>
<td>52-61%</td>
<td>33-37%</td>
</tr>
<tr>
<td>One</td>
<td>Sertraline</td>
<td>63%</td>
<td>53%</td>
</tr>
<tr>
<td>One</td>
<td>Citalopram</td>
<td>47%*</td>
<td>45%*</td>
</tr>
<tr>
<td>One</td>
<td>Escitalopram</td>
<td>64%</td>
<td>53%</td>
</tr>
</tbody>
</table>

*Note this measure was not the primary outcome variable for this trial.

### Known negative RCTs per the primary outcome variable

<table>
<thead>
<tr>
<th>Number of Separate Studies</th>
<th>Drug</th>
<th>Drug much or very much improved</th>
<th>Placebo much or very much improved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three</td>
<td>Paroxetine</td>
<td>49-69%</td>
<td>46-67%</td>
</tr>
<tr>
<td>Two</td>
<td>Venlafaxine</td>
<td>50-68%</td>
<td>41-61%</td>
</tr>
<tr>
<td>Two</td>
<td>Mirtazapine</td>
<td>54-60</td>
<td>41-57</td>
</tr>
<tr>
<td>One</td>
<td>Escitalopram</td>
<td>63%</td>
<td>52%</td>
</tr>
<tr>
<td>One</td>
<td>Citalopram</td>
<td>CGI not reported</td>
<td>CGI not reported</td>
</tr>
</tbody>
</table>

FDA brief, 2004; GSK website; K Wagner 2009 AACAP annual meeting presentation; MHRA UK website
Understanding Depression Trials

• High placebo response rates
  • “placebo” is not equivalent to “no treatment”
• Mild depression spontaneously remits
  • excluded the severely depressed in “pharma” trials

• Only 1 non-pharmaceutical industry sponsored SSRI depression study published on kids
TADS—Treatment of Adolescent Depression Study

- 439 adolescents
- 12 week treatment
- Moderate to severe depression
  - ~30% with suicidality
- More than half had comorbid psychiatric illness
- Randomized to:
  - fluoxetine
  - fluoxetine plus CBT
  - CBT alone
  - placebo

TADS, 2005
TADS Medication Protocol

• Starting dose fluoxetine 10mg

• Increased at week two to 20mg if no side effects

• Mean final dose was ~30mg/day
## TADS Results

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Response Rate (CGI ≤2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine plus CBT</td>
<td>73%</td>
</tr>
<tr>
<td>Fluoxetine</td>
<td>62%</td>
</tr>
<tr>
<td>CBT</td>
<td>48%</td>
</tr>
<tr>
<td>Placebo</td>
<td>35%</td>
</tr>
</tbody>
</table>

- Suicidal “events” decreased with all active treatments
  - CBT use was clearly helpful with this problem
TADS: primary results

A Children’s Depression Rating Scale-Revised Scores

- Placebo
- CBT Alone
- Fluoxetine Alone
- Fluoxetine With CBT
Response rates equalized after TADS switched to community care

<table>
<thead>
<tr>
<th>Week #</th>
<th>Fluoxetine + CBT</th>
<th>Fluoxetine</th>
<th>CBT</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 (study)</td>
<td>73%</td>
<td>62%</td>
<td>48%</td>
<td>35%</td>
</tr>
<tr>
<td>36</td>
<td>86%</td>
<td>81%</td>
<td>81%</td>
<td>82%</td>
</tr>
</tbody>
</table>

Early fluoxetine improved depression more quickly, but did not change the 9 month outcome.
Medicating Major Depression

- First line medication option:
  - Fluoxetine (3 RCT’s, 3 positive)

- Second line Medication options:
  - Sertraline (1RCT, 1 positive)
  - Citalopram (2RCT’s, 1 positive)
  - Escitalopram (2RCT, 1 positive)

- Start low, go slow
- Change one medicine at a time
- Use the full dose range, wait 4-6 weeks each increase
- If fails, try a second SSRI
  - ~50% of the time this strategy works
But Aren’t SSRI’s Dangerous?

- FDA Black Box in 2004 warned of suicidality 2x greater on med versus on placebo
FDA had to re-analyze trial data

- Even in depression research, suicidality was often not specifically or prospectively studied
- “Emotional lability” vs. suicidality
  - To determine what “emotional lability” meant, had to go back to the original data sets
### SSRIs and suicidality

<table>
<thead>
<tr>
<th>Drug</th>
<th>Risk Ratio (RR)</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venlafaxine</td>
<td>8.8</td>
<td>(1.1-70)</td>
</tr>
<tr>
<td>Sertraline</td>
<td>2.2</td>
<td>(0.48-9.6)</td>
</tr>
<tr>
<td>Paroxetine</td>
<td>2.2</td>
<td>(0.7-6.5)</td>
</tr>
<tr>
<td>Mirtazapine</td>
<td>1.6</td>
<td>(0.06-38)</td>
</tr>
<tr>
<td>Fluoxetine</td>
<td>1.5</td>
<td>(0.7-3.2)</td>
</tr>
<tr>
<td>Citalopram</td>
<td>1.4</td>
<td>(0.5-3.5)</td>
</tr>
</tbody>
</table>

Overall Black Box warning states about 2-fold increase for the class of SSRIs.

T Hammad, T Laughren, J Racoosin (2006)
What Is Suicidality?

• Not all one thing
  ▫ Thoughts of self harm
  ▫ Self harm actions (like cutting)
  ▫ Thoughts of suicide
  ▫ Plans for committing suicide
  ▫ Action steps for committing suicide (gather pills)
But, No SSRI Risk Smoking Gun

- Population studies in Sweden, Italy, Europe, Australia, and U.S. all show decreased youth suicide rates with increasing antidepressant use.
- Completed suicide case series show little association with SSRI use.

Suicide Is Rare, Suicidality Is Common

- US suicide data:
  - ~2,000 completed suicides per year (up to age 19)
  - 3rd leading cause of death in age 10-19
  - Males ~370 attempts/completion
  - Females ~3,600 attempts/completion
  - 17-19% of teenagers think about committing suicide each year

S Kennebenk and L Bonin, UpToDate, 2007
S Kutcher and D Gardner, 2008, CDC 2013
How To Make Sense of SSRI Suicidality?

- Agitation long known to be an SSRI effect
- Agitation + mood/anxiety disorder = suicidality?
  - High dose starts in adults associated with SI
- Energy improving = more suicidal motivation?

- Risk/benefit analysis clearly favors SSRI use for moderate to severe depression
  - Less clear benefit for mild depression
Other SSRI Side Effects
SSRI Side Effect: Serotonin Syndrome

- If overdose on SSRIs (not seen with usual doses)
- If SSRI combined with other serotonergic medications
  - MAOI
  - Other SSRIs
  - Triptans (rare)
  - Opiates (rare)
  - Stimulants (rare)
Serotonin Syndrome

- Cognitive: confusion, hallucination, agitation, hypomania, coma
- Autonomic: shivering, sweating, fever, diarrhea, nausea, increased pulse
- Somatic: hyperreflexia, myoclonus, tremor

- Treat by stopping drug, give support
SSRI SE: Altered Platelet Function

- SSRIs inhibit platelet reuptake of serotonin too
- Platelets use serotonin in their aggregation signaling
- Increased bleeding time may happen with SSRI
  - Easy bruising is the early sign

- For kids only a caution for major surgery or presence of other bleeding problems
SSRI SE: Hyponatremia

- Seen in up to 2% of geriatric patients using SSRIs
- An unusual occurrence in non-geriatric patients
- Not something requiring active monitoring in kids
- Child a renal disorder, some chance this side effect would be significant
SSRI SE: Prolonged QT interval

- Like most other psych meds
- Outlier was citalopram at doses above 40mg
  - FDA says don’t dose higher
- Felt to be a very rare problem
- SSRIs prospectively studied and given to post MI or other cardiac patients showed no induced risks or QT changes

- Active monitoring not required for kids

From Braunwald's Heart Disease - A Textbook of Cardiovascular Medicine, 9th ed, 2011
# SSRI Side Effects Summary

<table>
<thead>
<tr>
<th>Common (&gt;10%)</th>
<th>Less Common</th>
<th>Notable Rare Reactions (≤2% )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insomnia</td>
<td>Agitation</td>
<td>New Suicidality</td>
</tr>
<tr>
<td>Sedation</td>
<td>Restlessness</td>
<td>Serotonin syndrome</td>
</tr>
<tr>
<td>Appetite change (up ≈ down)</td>
<td>Impulsivity</td>
<td>Easy bleeding</td>
</tr>
<tr>
<td>Nausea</td>
<td>Irritability</td>
<td>Hyponatremia</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>Silliness</td>
<td>Mania</td>
</tr>
<tr>
<td>Headache</td>
<td>Constipation</td>
<td>Prolonged QT interval</td>
</tr>
<tr>
<td>Sexual dysfunction</td>
<td>Dizziness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tremor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td></td>
</tr>
</tbody>
</table>

From Hilt R, Peds Annals 2012
How to Balance Suicidality and the Decision to Use SSRI’s

- Recognize suicidal thoughts are common
- Completed suicide is very rare
- Depression and Anxiety can be serious problems
- SSRI’s do work for depression in kids
  - Probably more reliable benefit the older the child
The SSRI Startup Discussion

- **Must** discuss the suicidality warning
  - If new SI happens, stop med immediately
- “Side effects first, benefits later”
  - Irritability, sleep changes, appetite changes, GI upset
- Talk about follow up plan
  - 1-2 week phone or in person check in screening for side effects, agitation, new suicidality
  - 4-6 week appointment to decide what to do with dosage
What About the Rest?

- **SNRI**
  - Venlafaxine, duloxetine
- **TCA**
  - amitriptyline, nortriptyline, imipramine
- **Unique agents**
  - bupropion
  - trazodone
  - mirtazapine
Serotonin NE Reuptake Inhibitor

- **Venlafaxine**
  - more side effects than adults
    - 7 of 16 kids on max 75mg c/o significant nausea
  - short half life (5-11 hours) likely related to withdrawal symptoms
- **Duloxetine**
  - no data on kids
  - half life 12 hours, fewer reported withdrawal probs

T Hammad, T Laughren, 2006
JA Dopheide, 2006
Tricyclics

- 6 TCA child studies showed no MDD benefit
- Clomipramine:
  - 1 study showed it on par with paroxetine for MDD (no placebo arm, by Braconnier et al. 2003)
    - But paroxetine not clearly better than placebo in RCTs
  - Cardiac concerns, toxicity in overdose mean should avoid in children
Unique Agents

- **Buproprion**
  - weak inhibition of NE and DA reuptake
    - true mechanism of action unknown
  - Can lower seizure threshold, esp. at >400mg QD
    - Bulimics have added seizure risk on medicine
  - adolescent 1/2 life 20 hours (adults 14 hours)
  - no RCT in children for depression
  - consider if also have ADHD
  - antismoking effects not as strong as with adults
Unique Agents

- **Trazodone**
  - 5HT2A receptor antagonist
  - serotonin reuptake inhibitor
  - no good pediatric information
  - usual adult dosage 100-400mg per day for MDD
  - 1/2 life in adults is 7 hours
  - may use as add-on sleep aide to other SSRI
    - may precipitate serotonin syndrome
  - rare potential for arrhythmia (caution if cardiac disease)
  - priapism
Unique Agents

• **Mirtazapine**
  ▫ antagonizes presynaptic alpha 2 autoreceptors
    • increases central NE and 5HT
  ▫ inhibits histamine, 5HT2 and 5HT3
  ▫ No positive result child data, only RCTs negative
  ▫ Consider if want help with sleep onset, appetite
SSRI’s for Anxiety

• Actually are more effective in child anxiety than for depression
• Great data about them helping for OCD, GAD
  ▫ Less info about other anxiety problems

• 1st line choices based on the anxiety RCT evidence:
  ▫ Sertraline
  ▫ Fluoxetine
Childhood Anxiety (CAMS)

- Multisite RCT, funded by the NIMH
  - separation anxiety
  - generalized anxiety
  - social phobia

- 488 children between the ages of 7 - 17
  - 14 sessions of CBT (Coping Cat)
  - Sertraline
    - (average final dose by week 8 was 125-150mg/day)
  - Combination treatment
  - Placebo

Walkup JT, Albano AM et al, 2008
CAMS Results:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% of Responders (CGI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBT plus Sertraline</td>
<td>81%</td>
</tr>
<tr>
<td>CBT</td>
<td>60%</td>
</tr>
<tr>
<td>Sertraline</td>
<td>55%</td>
</tr>
<tr>
<td>Placebo</td>
<td>24%</td>
</tr>
</tbody>
</table>

*much or very much improved on CGI*
## Suggested SSRI Dosages

<table>
<thead>
<tr>
<th>Medication</th>
<th>Usual Adolescent Starting Dose</th>
<th>Increase Increment (after 4 -6 weeks)</th>
<th>Max Dosage</th>
<th>Youth RCT benefits</th>
<th>Youth FDA Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine</td>
<td>10mg/day</td>
<td>10-20mg</td>
<td>60mg</td>
<td>Yes</td>
<td>MDD, OCD</td>
</tr>
<tr>
<td>Sertraline</td>
<td>25-50 mg/day</td>
<td>25-50mg</td>
<td>200mg</td>
<td>Yes</td>
<td>OCD</td>
</tr>
<tr>
<td>Escitalopram</td>
<td>5mg/day</td>
<td>5-10mg</td>
<td>20mg</td>
<td>Yes</td>
<td>MDD</td>
</tr>
<tr>
<td>Citalopram</td>
<td>10mg/day</td>
<td>10-20mg</td>
<td>40mg</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

--If a pre-adolescent, would decrease these dosages by ~ 1/3<sup>rd</sup> to 1/2
Antipsychotics
Antipsychotics

• Ideal world
  ▫ mental health specialists handle all prescribing

• Real world
  ▫ primary care pressured to originate or continue these meds
Antipsychotics- What do we really know?

- Treat psychosis, but also benefits in:
  - Mania/bipolar disorder
  - Tic and Tourette's disorder
  - Irritability associated with autism
  - Impulsive aggression of conduct disorder/ODD
  - Explosive affect & impulsive aggression
Antipsychotics (1st Generation)

- Chlorpromazine (Thorazine)
- Fluphenazine (Prolixin)
- Haloperidol (Haldol)
- Perphenazine (Trilafon)
- Thioridazine (Mellaril)
- Thiothixene (Navane)

- Generally not being used now in kids due to extrapyramidal symptoms
Atypical Antipsychotics (2nd gen.)

- Aripiprazole (Abilify)
- Olanzapine (Zyprexa)
- Quetiapine (Seroquel)
- Risperidone (Risperdal, Invega)
- Ziprasidone (Geodon)

  - Asenapine (Saphris)
  - Clozapine (Clozaril, FazaClo)
  - Lurasidone (Latuda)
  - Iloperidone (Fanapt)
Atypical Antipsychotics

• 99% of antipsychotic prescriptions for children are atypicals
• Big business for big pharma
  ▫ ~1/3 of WA medicaid pharmacy budget was taken up by antipsychotics in 2010
• Atypical hallmark is serotonin receptor antagonism in addition to D2 activity
  ▫ lower EPS
  ▫ lower TD
Early Onset Schizophrenia

• All atypical antipsychotics (4 of 5) studied have shown benefit over baseline
• Some difference in time to onset of effect
  ▫ aripiprazole took 4 weeks vs placebo (PANSS)
  ▫ olanzapine took 2 weeks vs placebo (BPRS-C)
  ▫ risperidone took 8 days vs placebo (PANSS)
• The few trials comparing two antipsychotics found no difference (except clozapine)
• Response rates 26-35% placebo versus 46-88%
AAP for Pediatric Bipolar Disorder

• Studies of the following all showed benefit
  ▫ olanzapine
  ▫ risperidone
  ▫ quetiapine
  ▫ aripiprazole

• Roughly similar effect sizes

• So choose one based on side effects
Irritibility/Aggression as an AAP indication

• Maladaptive aggression
  ▫ inappropriate intensity/frequency/duration
  ▫ associated with PDD, conduct d/o, ADHD
  ▫ atypical antipsychotics often prescribed
• risperidone if conduct d/o, low IQ
  ▫ (ES 0.9, combined n=875)
• methylphenidate if comorbid ADHD
  ▫ (ES 0.9, combined n=844)
• consider lithium with conduct disorder
  ▫ (ES 0.5, combined n=195)

E Pappadopulos et al 2006
Other roles for Antipsychotics

- Treat psychosis, but also benefits in:
  - Mania/bipolar disorder
  - Tic and Tourette's disorder
  - Irritability associated with autism
  - Severe oppositional defiant disorder
  - Impulsive aggression of conduct disorder
  - Explosive affect & impulsive aggression
Risperidone (Risperdal)

- ½ life 20 hours
- available liquid, dissolving tab, tabs, depot
- doses over 6mg per day behave like 1st generation antipsychotic in adults
- for aggression treatment, usually don’t need doses greater than 2mg
- TD incidence reported less than 0.5%

- The usual 1st line choice antipsychotic
  - Relatively predictable benefits
  - Lots of research in kids
Olanzapine (Zyprexa)

- ½ life 30 hours
- tablets, oral disintegrating, IM
- Major side effects
  - weight gain doesn’t plateau
  - cholesterol, glucose
  - Sedation
- Bipolar
  - One large RCT showed benefit

Though has good psychiatric impacts, side effects limit its use

Tohen M et al 2007
Quetiapine (Seroquel)

- ½ life 6 hours
- some prescribe just as sleep aide
  - Please don’t do this! Risking permanent TD from a childhood sleep aide is not reasonable
- lower potency, may be experienced as “milder”

- Less consistent benefits on aggression, bipolar, schizophrenia unless using high doses
Aripiprazole (Abilify)

- ½ life 75 hours
- Pills, IM form available
- Novel: mixed agonist/antagonist
  - Often takes much longer to see benefits
  - some get agitation because of the med
- Reputation as weight neutral—**not true** in kids

- If need to help right away, not my preferred choice
- Much more hit-or-miss than the other antipsychotics
Ziprasidone

- ½ life 7 hours
- tablet, IM
- perceived need for EKG has lowered usage
- relatively weight neutral
- IM form for agitation tx. (not PO)
Lurasidone (adult use)

- NO data in kids yet
- no antihistaminic activity
- no weight gain or metabolic problems in adults
- some akathisia and EPS making it more like risperidone or typicals
- seems to have a relatively rapid onset of clinical activity
- For adults, shown to have benefit for bipolar depression
FDA Approvals

- **Schizophrenia**
  - Risperidone, Aripiprazole, Quetiapine, Olanzapine
    - (age 13 and older)
  - Paliperidone (age 12 and older)
  - Molindone and Haloperidol (age 12 and older)

- **Acute Mania (ages 10 years and older)**
  - Risperidone, Aripiprazole, Quetiapine, Olanzapine, Ziprasidone

- **Irritability associated with autism**
  - Risperidone (5 - 16 years)
  - Aripiprazole (6 - 17 years)
Atypical Antipsychotic Risks

<table>
<thead>
<tr>
<th>Common Side Effects (&gt;10%)</th>
<th>Less Common Side Effects</th>
<th>Notable Rare Reactions (≤2%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gain (olanzapine &gt; others)</td>
<td>Tremors</td>
<td>Tardive Dyskinesia</td>
</tr>
<tr>
<td>Muscle rigidity</td>
<td>Nausea or abdominal pain</td>
<td>Neuroleptic Malignant Syndrome</td>
</tr>
<tr>
<td>Parkinsonism</td>
<td>Akathisia (restlessness)</td>
<td>Lowered blood cell counts</td>
</tr>
<tr>
<td>Constipation</td>
<td>Headache</td>
<td>Elevated liver enzymes</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>Agitation</td>
<td>Prolonged QT interval</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Orthostasis</td>
<td>(ziprasidone &gt; others)</td>
</tr>
<tr>
<td>Somnolence/fatigue</td>
<td>Elevated glucose</td>
<td>Tachycardia</td>
</tr>
<tr>
<td></td>
<td>Elevated cholesterol/triglycerides</td>
<td></td>
</tr>
</tbody>
</table>

From Hilt R, 2012
## Atypical Antipsychotic Monitoring

<table>
<thead>
<tr>
<th>Monitoring recommendation</th>
<th>Frequency Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height and weight</td>
<td>At baseline and at each follow-up (at least every 6 months)</td>
</tr>
<tr>
<td>Fasting blood sugar, TG, Cholesterol</td>
<td>At least every 6 months</td>
</tr>
<tr>
<td>Screen for stiffness, movement disorder or tardive dyskinesia (like AIMS exam)</td>
<td>At least every 6 months</td>
</tr>
<tr>
<td>CBC with Diff</td>
<td>Once to catch if any suppression, a few months after initiation</td>
</tr>
<tr>
<td>BP/Pulse</td>
<td>at least once after starting medication</td>
</tr>
<tr>
<td>Cardiac history</td>
<td>At baseline, get EKG if in doubt about risk from a mild QT increase</td>
</tr>
</tbody>
</table>

From Hilt R, 2012
Reminder: Medications will not resolve...

- Family stress/conflict
- Abuse/neglect
- Poor parenting strategies
- School stress/conflict
- Strong willed temperament
- Intellectual deficits
- Developmental impairments
Questions?

Robert.hilt@seattlechildrens.org