

Medications and the Treatment of Autism Spectrum Disorders

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Why are Psychotropic Medications Prescribed?

- ADHD
- Depression & disorders of mood
- Anxiety
- Schizophrenia
- Seizure disorders
- Aggression
- Autism
- Developmental disabilities, among others...

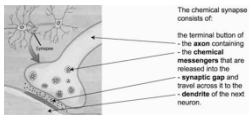
Stimulants

- Methylphenidate (Ritalin)
- Dextroamphetamine (Dexedrine)
- Lisdexamfetamine (Vyvanse)
- Amphetamine-Dextroamphetamine (Adderall)

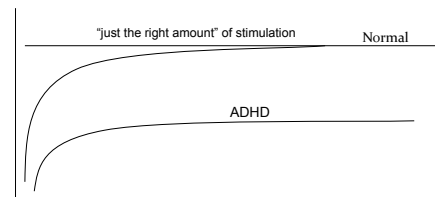
How Stimulants Work

- Stimulants increase the amount and availability of norepinephrine and dopamine.

Synaptic Transmission



Optimal Stimulation



Methylphenidate

Generic Name	Trade Name	Forms	Dosages	Duration
Methylphenidate	Concerta	OROS	18-54 mg	8-12 hr
	Focalin	Fast acting	2.5-10 mg	3-5 hr
	Metadate CD	Ext. release	10-30 mg	8-12 hr
	Metadate ER	Ext. release	10-20 mg	6-8 hr
	Ritalin	Fast acting	5-20 mg	3-4 hr
	Ritalin LA	Long acting	10-40 mg	6-8 hr
	Ritalin SR	Sustained Release	20 mg	6-8 hr
	Daytrana	Patch	27.5 mg to 82.5 mg	Up to 9 hours

Dextroamphetamine

Generic Name	Trade Name	Forms	Dosages	Duration
Dextro-Amphetamine	Dexedrine	Fast acting	5-10 mg	4-6 hr
	Dexedrine	Long acting	5-15 mg	6-8 hr
Lisdexamfetamine	Vyvanse	Long acting	30-70 mg	12 hr

Amphetamine/Dextroamphetamine

Generic Name	Trade Name	Forms	Dosages	Duration
Amphetamine/Dextroamphetamine	Adderall	Fast acting	5-30 mg	4-6 hr
	Adderall XR	Ext. release	5-30 mg	8-10 hr

Effects of Stimulants

- Increase in controlled activity
- More goal-directed activity
- Fewer disruptive impulses
- Less distractibility
- Enhanced attention & concentration
- Changes in others' attitudes

Common Side Effects of Stimulants

- Loss of appetite
- Problems sleeping
- Irritability and anxiety
- Decreased rate of growth

Long Term Side Effects

Current studies suggest a slight decrease in overall height (Caron et al., 2007; Spencer, 2003; Swanson et al., 2007; MTA Cooperative Group, 2001).

DEA Controlled Substance Schedules

Schedule	Description	Examples
Schedule I	High potential for abuse No currently accepted use	Heroin, THC Cocaine
Schedule II	High potential for abuse Has accepted medical use	Morphine Codeine Methylphenidate
Schedule III	Potential for abuse Accepted medical use	Glutethimide Methyprylon
Schedule IV	Low potential for abuse Accepted medical use	Valium Phenobarbital
Schedule V	Low potential for abuse Accepted medical use	Nyquil, etc. Other OTC drugs

Stimulants & Drug Abuse

The research says...

“Although concern has been raised regarding the potential for treatment with stimulants leading to either dependence on them or an increased risk of illicit drug use later on, research has not borne this out.”

(Biederman et al., 2008; Mannuzza et al., 2008; Volkow & Swanson, 2008)

Are Stimulants Effective?

The research says...

Unequivocally “yes.” The bulk of studies have found between 65-85% improvement (measured by reduction in symptoms of ADHD).

Antidepressants

- Tricyclic Antidepressants (TCAs)
- Monoamine Oxidase Inhibitors (MOAIs)
- Selective Serotonin Reuptake Inhibitors (SSRIs)
- “Novel” and “Atypical” Antidepressants
- Lithium (mood stabilizer)

Antidepressants are used for...

- Depression
- ADHD
- Bipolar Disorder
- Anxiety
- Eating Disorders
- Autism

How Antidepressants Work

- Antidepressants increase the amount and availability of the neurotransmitters serotonin and norepinephrine.

Tricyclic Antidepressants (TCA)

Generic Name	Trade Name
Amitriptyline	Elavil
Clomipramine	Anafranil
Desipramine	Norpramin
Doxepin	Adapin, Sinequan
Imipramine	Tofranil
Nortriptyline	Pamelor, Aventyl
Protriptyline	Vivactil
Trimipramine	Surmontil

Monoamine Oxidase Inhibitors (MAOIs)

Generic Name	Trade Name
Isocarboxazid	Marplan
Phenylzine	Nardil
Tranylcypromine	Parnate

Foods to Avoid...

- Certain cheeses
 - Cured or aged meat (e.g. sausage, etc.)
 - Beer, red wine, caffeinated drinks
 - Avocados, chocolate, bananas
- NOTE: This is only a *brief* list of foods to avoid while taking MAOIs

SSRIs

Generic Name	Trade Name
Citalopram	Celexa
Duloxetine	Cymbalta (SSNRI)
Escitalopram	Lexapro
Fluoxetine	Prozac
Fluvoxamine	Luvox (now only generic)
Paroxetine	Paxil
Desvenlafaxine	Pristiq (SSNRI)
Sertraline	Zoloft

Atypical Antidepressants

Generic Name	Trade Name
Amoxapine	Asendin (now only generic)
Bupropion	Wellbutrin
Maprotiline	Ludiomil (now only generic)
Trazodone	Desyrel
Venlafaxine	Effexor

"Dual Action" Antidepressants

Generic Name	Trade Name
Mirtazapine	Remeron
Nefazodone	Serzone (now only generic)

Common Side Effects

- Nausea
- Dry Mouth
- Blurred Vision
- Headache
- Dizziness
- Drowsiness

Antidepressants & Suicide Risk

- In 2003 the British Committee on Safety of Medicines concluded that the risk of suicide in patients treated with SSRIs outweighed benefits. In this country the FDA mandated a “black-box” warning for nearly all anti-depressants, advising that patients be watched carefully for signs of increased agitation suicidal behavior and/or ideation.

Antidepressants & Suicide Risk

- The majority of studies suggest that the benefits of “second generation” antidepressants for moderately to severely depressed patients far outweighed the potential risk of suicide.

• (Ebmeier, Donaghey, & Steele, 2006; Gibbons et al., 2004; Grunebaum et al., 2004;

Anxiolytics

Also known as antianxiety medications

Why are they used?

- Separation Anxiety
- Generalized Anxiety Disorder (GAD)
- Specific Phobias
- Social Phobias
- Obsessive-Compulsive Disorder (OCD)
- Selective Mutism
- Post-Traumatic Stress Disorder (PTSD)

Anxiolytic Drugs

- Benzodiazepines
- Adrenergic drugs
- Antidepressants

Benzodiazepines (Examples)

Generic Name	Trade Name
Diazepam	Valium
Chlordiazepoxide	Librium
Clonazepam	Klonopin
Alprazolam	Xanax
Lorazepam	Ativan

Adrenergic Drugs

Generic Name	Trade Name
Buspirone	BuSpar
Clonidine	Catapres
Guanfacine	Tenex
Propranolol	Inderal

Antidepressants

- Clomipramine (Anafranil), Fluoxetine (Prozac), Fluvoxamine (Luvox), Sertraline (Zoloft) approved for OCD in children
- Other antidepressants often used "off-label" for treatment of anxiety

Antipsychotics

- Conventional
- Atypical

How Antipsychotic Drugs Work

- Antipsychotic medications work by blocking the availability of the neurotransmitter dopamine.

Conventional Antipsychotics...

Generic Name	Trade Name
Chlorpromazine	Thorazine
Fluphenazine	Prolixin
Mesoridazine	Serentil
Prochlorperazine	Compazine
Thioridazine	Mellaril

Conventional Antipsychotics

Generic Name	Trade Name
Thiothixene	Navane
Haloperidol	Haldol
Loxapine	Loxitane
Molindone	Moban
Pimozide	Orap

Atypical Antipsychotics

Generic Name	Trade Name
Aripiprazole	Abilify
Clozapine	Clozaril
Olanzapine	Zyprexa
Paliperidone	Invega
Quetiapine	Seroquel
Risperidone	Risperdal
Ziprasidone	Geodon

Side Effects of Antipsychotics

- Extrapyramidal Side Effects (EPS)
- Anticholinergic Side Effects
- Sedation
- Tardive Dyskinesia

EPS

- Tremors/Shakiness
- "Flat Face" (lack of expression of emotion)
- Lack of arm swing
- Nervousness, pacing, inability to remain seated, wringing hands
- Some EPS is common to all antipsychotic medication

Anticholinergic Side Effects

- Dry mouth
- Blurred vision
- Constipation/diarrhea
- Sweating
- Nausea

Sedation

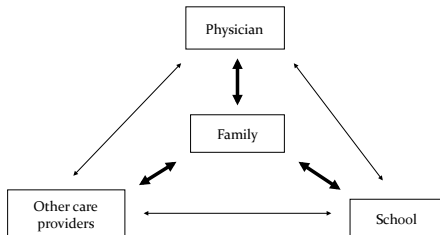
- A common feature of all antipsychotic medications, particularly the conventional neuroleptics.

Tardive Dyskinesia

- Abnormal and persistent body movements (particularly hands and face) resulting from long term use of antipsychotic medication.

Collaboration

Routes of Communication



Facilitating Communication

• Schools...

- DO designate a single point of contact
- DO collect data (work samples, etc.)
- DO take advantage of medication training
- DO encourage parents to share information
- DO utilize the school nurse

- DO keep judgments, assumptions, and comments regarding medication within your scope of training

Facilitating Communication

• Physicians

- DO take time to educate parents regarding medication
- DO discuss alternative treatments (if appropriate)
- DO stress to parents the importance of information sharing
- DO encourage school-physician communication
- DO request communication from school (assessments, etc.)

Facilitating Communication

• Parents

- DO continue to advocate for your child
- DO share information from the physician/care providers
- DO authorize direct communication
- DO learn more about psychiatric medications

