



MASSACHUSETTS
GENERAL HOSPITAL

PSYCHIATRY ACADEMY

Psychopharmacology: Just the Hits

Robert Althoff, MD, PhD

Associate Professor of Psychiatry, Pediatrics, & Psychological Science

Chair, Department of Psychiatry

Larner College of Medicine at the University of Vermont



Faculty Disclosure

I have the following relevant financial relationship with a commercial interest to disclose:

- I receive or have received research support from NIMH, NIDA, and the Klingenstein Third Generation Foundation
- I have ownership equity in WISER Systems, LLC as a partner.



The 20 most common psychiatric medications, their side effects, and how they act





The Top 10

Here are the top 25 psychiatric medications of 2020 based on the total number of prescriptions purchased. Also included is the total spent.

1. [Sertraline \(Zoloft\)](#): Depression (38.22 million prescriptions — \$523 million)
2. [Escitalopram \(Lexapro\)](#): Depression and anxiety (30.6 million prescriptions — \$573 million)
3. [Bupropion \(Wellbutrin\)](#): Depression (28.9 million prescriptions — \$129 million)
4. [Amphetamine/dextroamphetamine \(Adderall\)](#): ADHD (26.24 million prescriptions — \$2.35 billion)
5. [Trazodone](#): Depression (26.21 million prescriptions — \$329 million)
6. [Fluoxetine \(Prozac\)](#): Panic disorder and depression (23.4 million prescriptions — \$654 million)
7. [Duloxetine \(Cymbalta\)](#): Depression and anxiety (22.5 million prescriptions — \$635 million)
8. [Citalopram \(Celexa\)](#): Depression (18.55 million prescriptions — \$151 million)
9. [Alprazolam \(Xanax\)](#): Anxiety and panic disorder (16.78 million prescriptions — \$197 million)
10. [Methylphenidate \(Concerta\)](#): ADHD (15.45 million prescriptions — \$3.28 billion)

[What Are the Top Psych Meds Prescribed? | Psych Central](#)



The Top 10

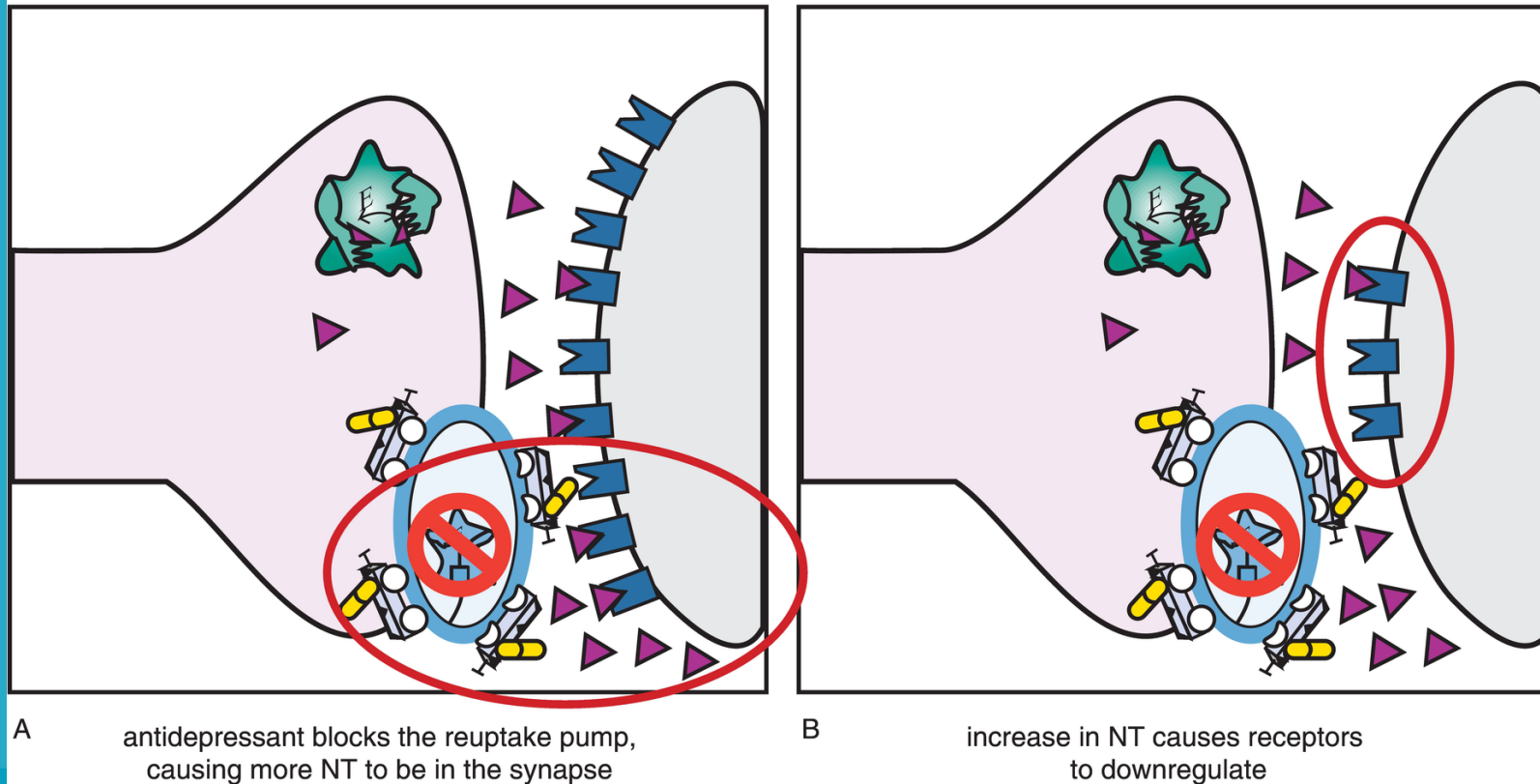
11. [Venlafaxine \(Effexor\)](#): Depression and anxiety (15.02 million prescriptions — \$1.38 billion)
12. [Clonazepam \(Klonopin\)](#): Panic disorder (14.76 million prescriptions — \$178 million)
13. [Buspirone \(Buspar\)](#): Anxiety (14.75 million prescriptions — \$178 million)
14. [Lamotrigine \(Lamictal\)](#): Bipolar disorder (10.8 million prescriptions — \$744 million)
15. [Quetiapine \(Seroquel\)](#): Bipolar disorder and schizophrenia (10.6 million prescriptions — \$236 million)
16. [Lorazepam \(Ativan\)](#): Anxiety (10.56 million prescriptions — \$236 million)
17. [Clonidine \(Kapvay\)](#): ADHD (9.87 million prescriptions — \$672 million)
18. [Amitriptyline \(Elavil\)](#): Depression (9.09 million prescriptions — \$177 million)
19. [Paroxetine \(Paxil\)](#): Depression, OCD, and panic disorder (9.03 million prescriptions — \$141 million)
20. [Lisdexamfetamine \(Vyvanse\)](#): ADHD and [binge eating disorder](#) (8.64 million prescriptions — \$3.01 billion)

[What Are the Top Psych Meds Prescribed? | Psych Central](#)

SSRIs

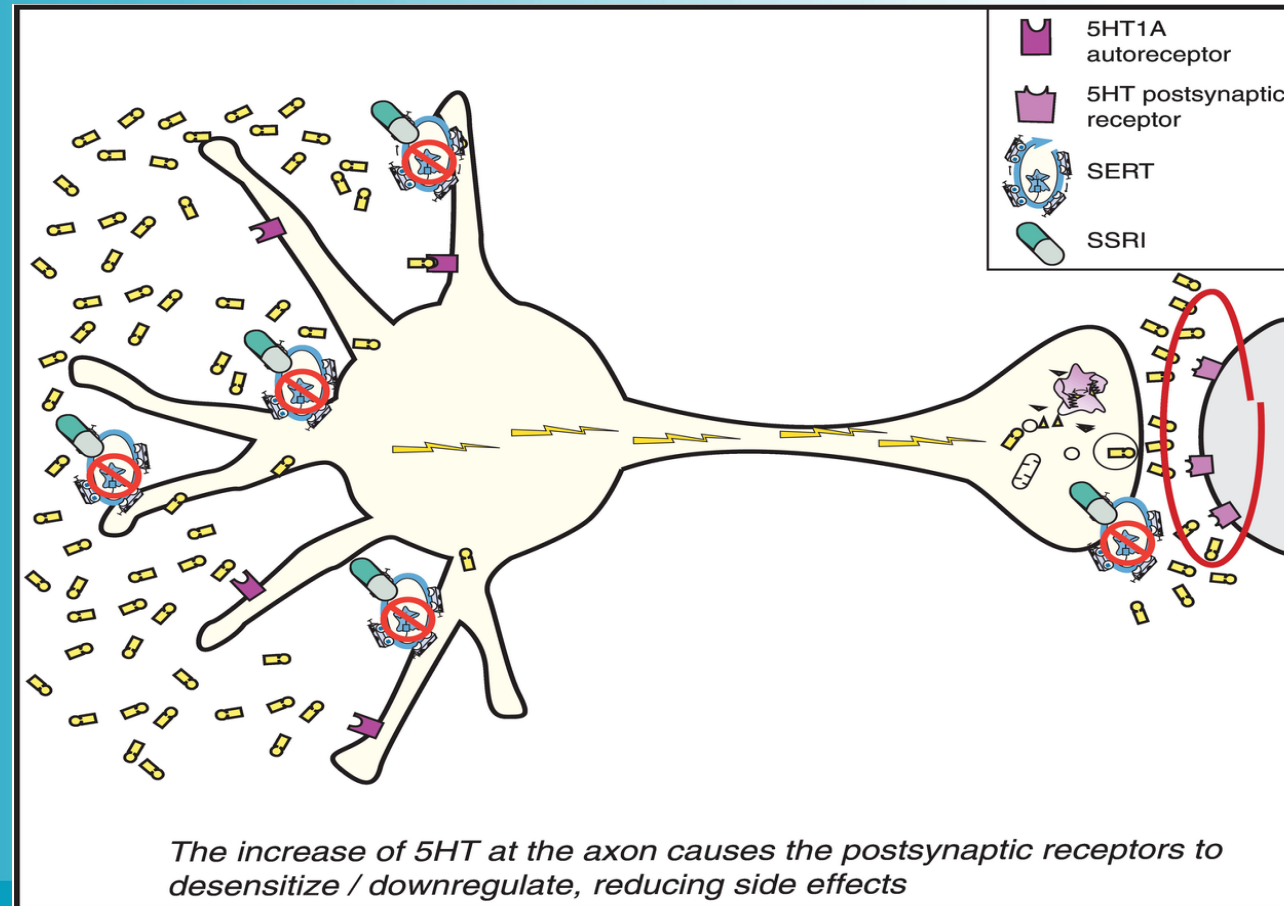
Zoloft (sertraline), Celexa (citalopram), Prozac (fluoxetine),
Lexapro (escitalopram), Paxil (paroxetine)

Neurotransmitter Receptor Hypothesis of Antidepressant Action

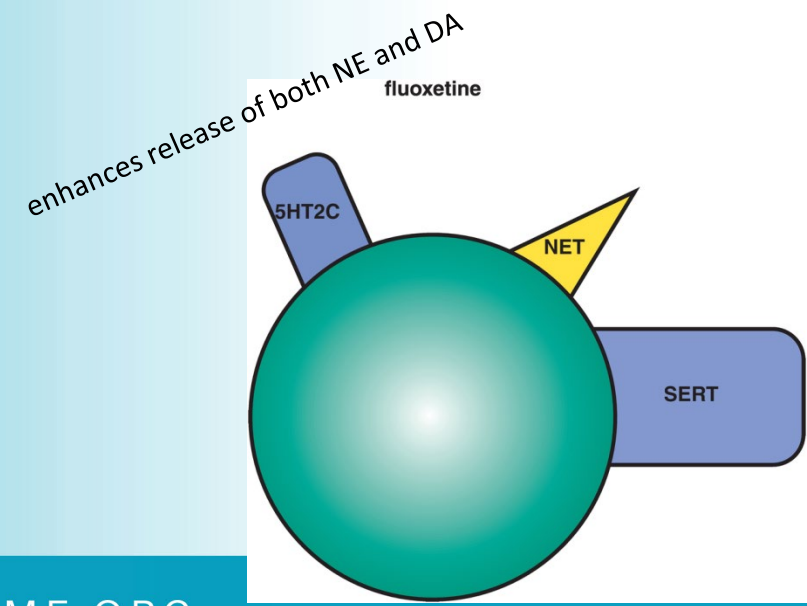
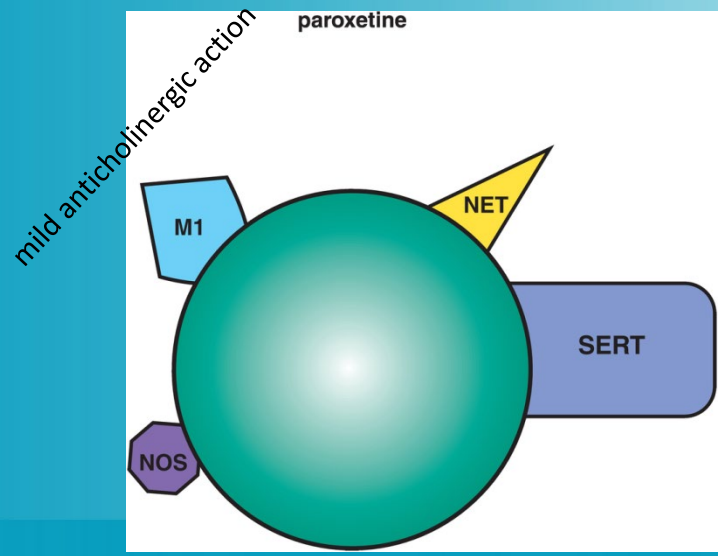
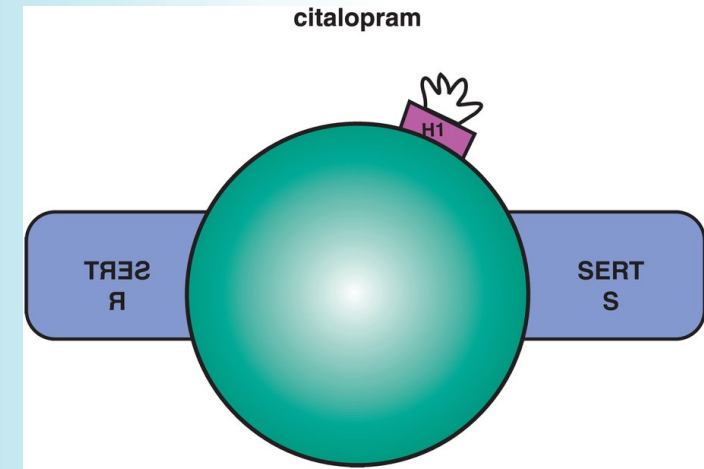
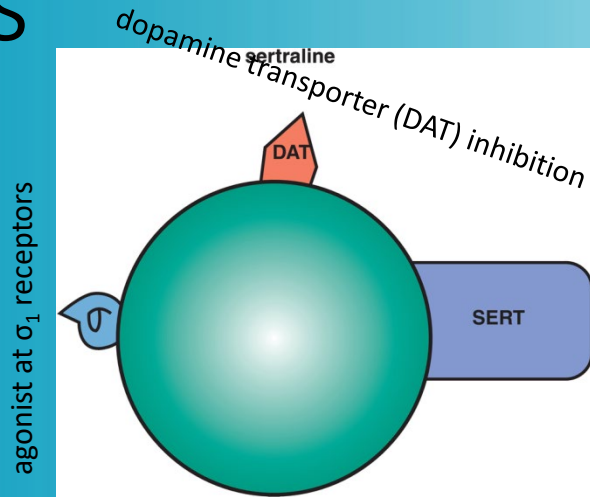


SSRIs

Zoloft (sertraline), Celexa (citalopram), Prozac (fluoxetine),
Lexapro (escitalopram), Paxil (paroxetine)



SSRIs





Zoloft (sertraline)

Commonly Prescribed for

- **Major depressive disorder**
- **Premenstrual dysphoric disorder (PMDD)**
- **Panic disorder**
- **Posttraumatic stress disorder (PTSD)**
- **Social anxiety disorder (social phobia)**
- **Obsessive-compulsive disorder (OCD)**
- **Generalized anxiety disorder (GAD)**

Notable Side Effects

Sexual dysfunction

Gastrointestinal (decreased appetite, nausea, diarrhea, constipation, dry mouth)

Mostly central nervous system (insomnia but also sedation, agitation, tremors, headache, dizziness)

Autonomic (sweating)

Bruising and rare bleeding

Rare hyponatremia

Rare hypotension

Potential Advantages

Patients with atypical depression

Patients with fatigue and low energy

Patients who wish to avoid hyperprolactinemia

Potential Disadvantages

Initiating treatment in anxious patients with some insomnia

Patients with comorbid irritable bowel syndrome

Can require dosage titration



Celexa (citalopram)

Commonly Prescribed for

- **Depression**
- Premenstrual dysphoric disorder (PMDD)
- Obsessive-compulsive disorder (OCD)
- Panic disorder
- Generalized anxiety disorder
- Posttraumatic stress disorder (PTSD)
- Social anxiety disorder (social phobia)

Notable Side Effects

Sexual dysfunction

Gastrointestinal

Mostly central nervous system (insomnia but also **sedation, agitation, tremors, headache, dizziness**)

Autonomic (sweating)

Bruising and rare bleeding

Rare hyponatremia

SIADH (syndrome of inappropriate antidiuretic hormone secretion)

Cardiac at high doses

Potential Advantages

Elderly patients/**medically sick** patients

Patients excessively activated or sedated by other SSRIs

Potential Disadvantages

May require dosage titration to attain optimal efficacy

Can be sedating in some patients



Prozac (fluoxetine)

Commonly Prescribed for

- **Major depressive disorder (ages 8 and older)**
- **Obsessive-compulsive disorder (OCD) (ages 7 and older)**
- **Premenstrual dysphoric disorder (PMDD)**
- **Bulimia nervosa**
- **Panic disorder**
- **Bipolar depression [in combination with olanzapine (Symbyax)]**
- **Treatment-resistant depression [in combination with olanzapine (Symbyax)]**
- **Social anxiety disorder (social phobia)**
- **Posttraumatic stress disorder (PTSD)**

Notable Side Effects

Sexual dysfunction

Gastrointestinal (decreased appetite, nausea, diarrhea, constipation, dry mouth)

Mostly central nervous system (insomnia but also sedation, agitation, tremors, headache, dizziness)

Autonomic (sweating)

Bruising and rare bleeding

Potential Advantages

Patients with atypical depression

Patients with fatigue and low energy

Patients with comorbid eating disorders

Generic is less expensive

Weekly administration

Children with OCD or depression

Potential Disadvantages

Patients with anorexia

Initiating treatment in anxious, agitated patients

Initiating treatment in severe insomnia



Paxil (paroxetine)

Commonly Prescribed for

- Major depressive disorder (paroxetine and paroxetine CR)
- Obsessive-compulsive disorder (OCD)
- Panic disorder (paroxetine and paroxetine CR)
- Social anxiety disorder (social phobia) (paroxetine and paroxetine CR)
- Posttraumatic stress disorder (PTSD)
- Generalized anxiety disorder (GAD)
- Premenstrual dysphoric disorder (PMDD) (paroxetine CR)

Notable Side Effects

Sexual dysfunction

Gastrointestinal

Mostly central nervous system (insomnia but also sedation, agitation, tremors, headache, dizziness)

Autonomic (sweating)

Bruising and rare bleeding

Rare hyponatremia

Withdrawal

Potential Advantages

Patients with anxiety disorders and insomnia

Patients with mixed anxiety/depression

Potential Disadvantages

Patients with hypersomnia

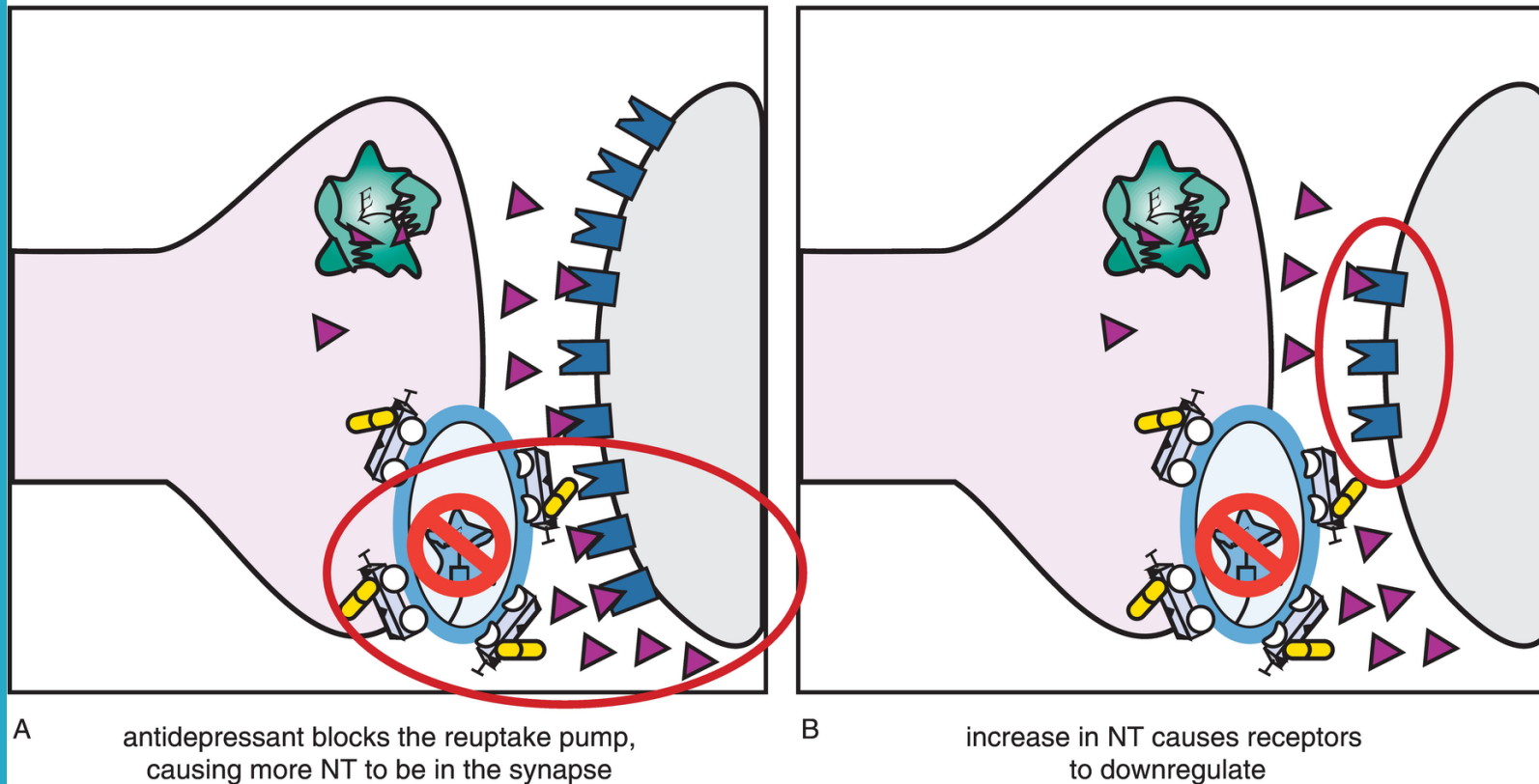
Alzheimer/cognitive disorders

Patients with psychomotor retardation, fatigue, and low energy

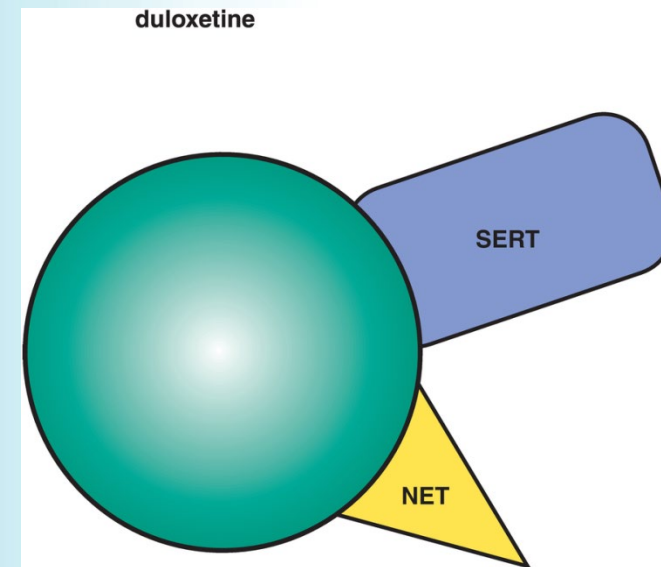
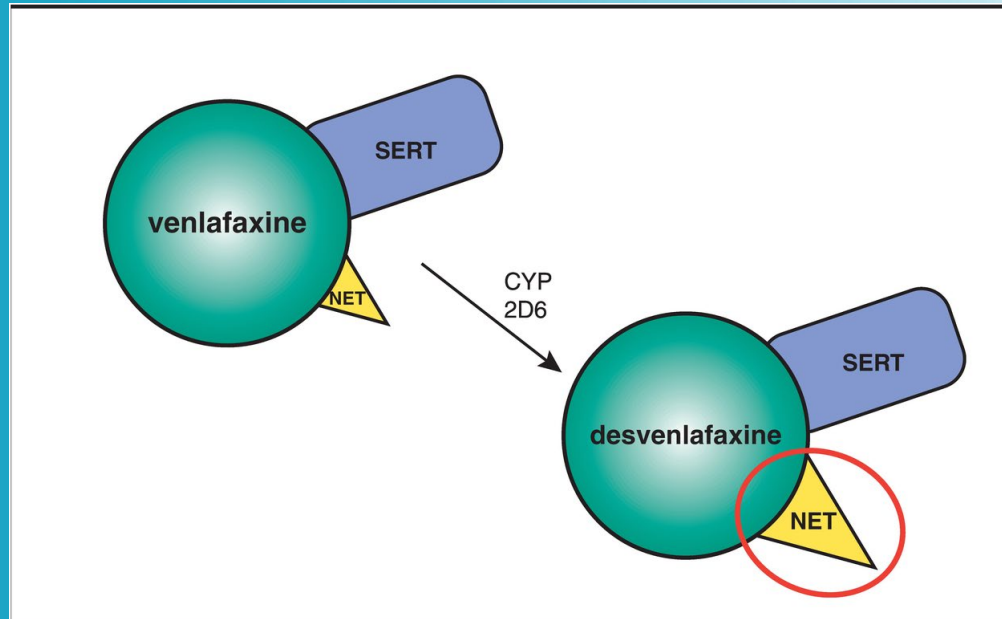
SNRIs

Cymbalta (duloxetine), Effexor XR (venlafaxine HCL ER)

Neurotransmitter Receptor Hypothesis of Antidepressant Action



SNRIs





Effexor (venlafaxine)

Commonly Prescribed for

- Depression
- Generalized anxiety disorder (GAD)
- Social anxiety disorder (social phobia)
- Panic disorder
- Posttraumatic stress disorder (PTSD)
- Premenstrual dysphoric disorder (PMDD)

Notable Side Effects

Most side effects increase with higher doses, at least transiently

Headache, nervousness, insomnia, sedation

Nausea, diarrhea, decreased appetite

Sexual dysfunction

Asthenia, sweating

SIADH (syndrome of inappropriate antidiuretic hormone secretion)

Hyponatremia

Dose-dependent increase in blood pressure

Potential Advantages

Patients with depression that includes motor slowing

Patients with atypical depression

Patients with comorbid anxiety

Depressed patients with somatic symptoms, fatigue, and pain

Patients who do not respond to SSRIs

Potential Disadvantages

Patients sensitive to nausea

Patients with borderline or uncontrolled hypertension

Patients with cardiac disease



Cymbalta (duloxetine)

Commonly Prescribed for

- Major depressive disorder
- Diabetic peripheral neuropathic pain (DPNP)
- Fibromyalgia
- Generalized anxiety disorder, acute and maintenance
- Chronic musculoskeletal pain
- Stress urinary incontinence
- Neuropathic pain/chronic pain
- Other anxiety disorders

Notable Side Effects

Nausea, diarrhea, decreased appetite, dry mouth, constipation

Insomnia, sedation, dizziness

Sexual dysfunction

Sweating

Increase in blood pressure (up to 2 mm Hg)

Urinary retention

Potential Advantages

Patients with physical symptoms of depression

Patients with depression with motor slowing

Patients with atypical depression

Patients with comorbid anxiety

Depressed patients with somatic symptoms, fatigue, and pain

Patients who do not respond to SSRIs

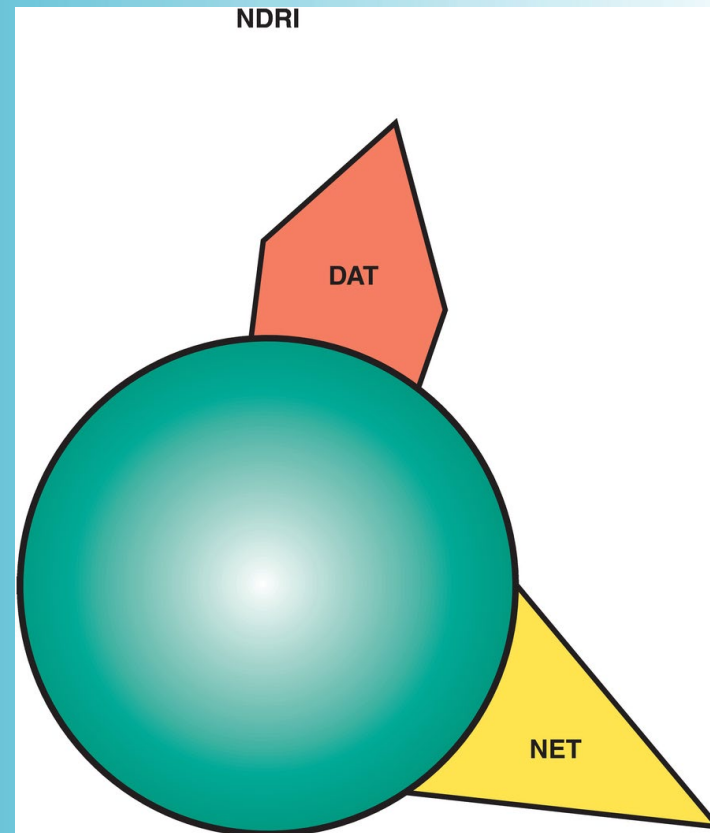
Potential Disadvantages

Patients with urologic disorders, prostate disorders (e.g., older men)

Patients sensitive to nausea



Bupropion (Wellbutrin) an NDRI





Wellbutrin (bupropion)

Commonly Prescribed for

- **Major depressive disorder (bupropion, bupropion SR, and bupropion XL)**
- **Seasonal affective disorder (bupropion XL)**
- **Nicotine addiction (bupropion SR)**
- **Bipolar depression**
- **Attention deficit /hyperactivity disorder (ADHD)**
- **Sexual dysfunction**

Notable Side Effects

Dry mouth, constipation, nausea, weight loss, anorexia, myalgia

Insomnia, dizziness, headache, agitation, **anxiety, tremor**, abdominal pain, tinnitus

Sweating, rash

Hypertension

Rare seizure (more with immediate release)

Potential Advantages

Depression with motor slowing

Atypical depression

Bipolar depression

Patients concerned about sexual dysfunction

Patients concerned about weight gain

Potential Disadvantages

Patients experiencing weight loss associated with their depression

Patients who are excessively activated



Medications used for ADHD

Methylphenidate Formulations – Long Acting** (Capsules and tablets in this section are shown at actual size)										
Adhansia XR® †	6-17 Yrs: 25–70mg; SD: 25mg Adults: 25–85mg; SD: 25mg			25mg	35mg	45mg	55mg	70mg	85mg	
Concerta® †	6-12 Yrs: 18-54mg; SD: 18mg 13-17 Yrs: 18-72mg; SD: 18mg ≥18 Yrs: 18-72mg; SD: 18mg or 36mg	G	G	G	G	G	+		Methylphenidate ER 72mg (bioequivalent to 2 x 36 mg Concerta tablets)	
Aptensio® XR ‡	6 Yrs-Adult: 10–60mg; SD: 10mg (biphasic – 40/60)									
Cotempla XR-ODT® § (grape flavor)	6-17 Yrs: 8.6–51.8mg; SD: 17.3mg						+			
Focalin® XR ‡ (dexamethylphenidate)	6-17 Yrs: 5–30mg; SD: 5mg 18 Yrs-Adult: 5–30mg; SD: 5mg (biphasic – 50/50)	G		G	G	G	G	G	G	G
Quillivant XR® 25mg/5mL (5mg/mL) (banana flavor)	6 Yrs-Adult: 20–60mg; SD: 20mg	10mg 2mL	1 Bottle: 300mg 60mL	20mg 4mL	30mg 6mL	40mg 8mL	50mg 10mL	60mg 12mL	2 Bottles: 900mg 180mL	2 Bottles: 900mg 180mL
Quillichew ER® ¶ (cherry flavor)	6 Yrs-Adult: 20–60mg; SD: 20mg									
Ritalin® LA ‡	6-12 Yrs: 10–60mg; SD: 20mg (biphasic – 50/50)	G		G	G	G		G		
Metadate® CD ‡	6-17 Yrs: 10–60mg; SD: 20mg (biphasic – 30/70)	G		G	G	G	G	G		
Metadate® ER †	6 Yrs-Adult: 20–60mg; SD: 20mg	G		G						
Daytrana®	6-17 Yrs: 10–30mg; SD: 10mg (The color border around each patch reflects the packaging color, not the patch itself.)	G	G	G	G					



Medications used for ADHD

Methylphenidate Formulations – Long Acting/Delayed Onset** (Medications in this section are shown at actual size)

Jornay PM®‡	6 Yrs–Adults: 20–100mg (dosed in the evening); SD: 20mg	20mg 	40mg 	60mg 	80mg 	100mg 
-------------	---	--	--	--	--	---

Methylphenidate Formulations – Short Acting** (Medications in this section are shown at actual size)

Focalin® (dexmethylphenidate)	6–17 Yrs: Daily: 5–20mg, divided BID; SD: 2.5mg BID		 2.5mg	 5mg	 10mg	
Ritalin®	6–12 Yrs: Daily: 10–60mg; divided BID or TID; SD: 5mg BID Adults: Daily: 10–60mg, divided BID or TID		 5mg	 10mg	 20mg	
Methylphenidate Chewable [§] (grape flavor)	6–12 Yrs: Daily: 10–60mg; divided BID or TID; SD: 5mg BID Adults: Daily: 10–60mg, divided BID or TID	 2.5mg	 5mg	 10mg		
Methylin® Solution (grape flavor)	6–12 Yrs: Daily: 10–60mg; divided BID or TID; SD: 5mg BID Adults: Daily: 10–60mg, divided BID or TID		 5mg/5mL	 10mg/5mL		



Medications used for ADHD

Amphetamine Formulations – Long Acting** (Medications in this section are shown at actual size)											
Dyanavel [®] XR (d- & l-amphetamine sulfate)	6 Yrs–Adults: 2.5–20mg; SD: 2.5 or 5mg		5mg	10mg	15mg	20mg					
Dyanavel [®] XR (d- & l-amphetamine sulfate) 2.5mg/mL (bubblegum flavor)	6 Yrs–Adults: 2.5–20mg; SD: 2.5 or 5mg	2.5mg 1mL	5mg 2mL	7.5mg 3mL	10mg 4mL	12.5mg 5mL	15mg 6mL	17.5mg 7mL	20mg 8mL		
Mydayis [®] ‡ (mixed amphetamine salts)	13–17 Yrs: 12.5–25mg; SD: 12.5mg Adults: 12.5–50mg; SD: 12.5mg	12.5mg		25mg		37.5mg		50mg			
Adzenys XR-ODT [®] ¶ (d- & l-amphetamine) (orange flavor)	6–12 Yrs: 3.1–18.8mg; SD: 6.3mg 13–17 Yrs: 3.1–12.5mg; SD: 6.3mg Adults: 12.5mg		3.1mg	6.3mg	9.4mg	12.5mg	15.7mg	18.8mg			
Adzenys ER [®] (d- & l-amphetamine) 1.25mg/mL (orange flavor)	6–12 Yrs: 6.3–18.8mg; SD: 6.3mg 13–17 Yrs: 6.3–12.5mg; SD: 6.3mg Adults: 12.5mg		3.1mg 2.5mL	6.3mg 5mL	9.4mg 7.5mL	12.5mg 10mL	15.7mg 12.5mL	18.8mg 15mL			
Adderall XR [®] ‡ (mixed amphetamine salts)	6–17 Yrs: 5–30mg; SD: 10mg Adults: 5–30mg; SD: 20mg (biphasic – 50/50)		5mg	10mg	15mg	20mg	25mg	30mg			
Dexedrine Spansule [®] (d-amphetamine sulfate)	6–17 Yrs: 10–60mg; SD: 5mg 1-2x/day		5mg	10mg	15mg						
Amphetamine Pro-Drug Formulations – Long Acting** (Medications in this section are shown at actual size)											
Vyvanse [®] ‡ (capsules) (lisdexamfetamine)	6 Yrs–Adults: 10–70mg; SD: 30mg	10mg	20mg	30mg	40mg	50mg	60mg	70mg			
Vyvanse [®] § (chewables) (lisdexamfetamine) (strawberry flavor)	6 Yrs–Adults: 10–70mg; SD: 30mg	10mg	20mg	30mg	40mg	50mg	60mg				

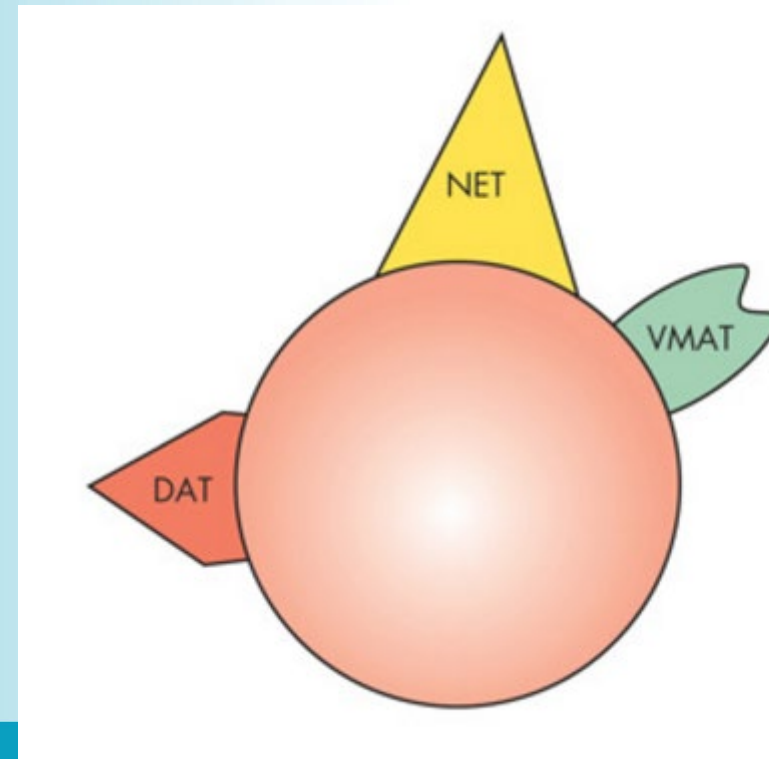
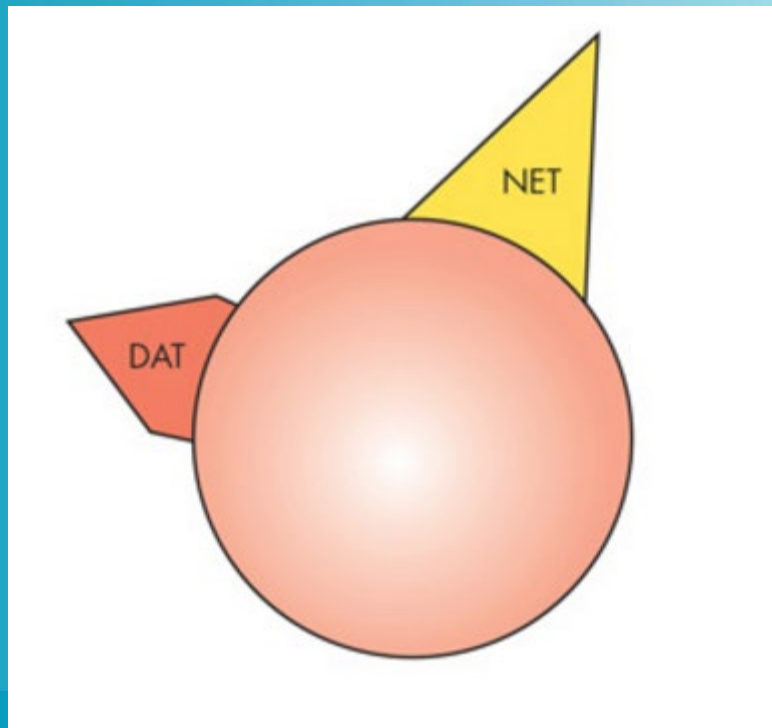


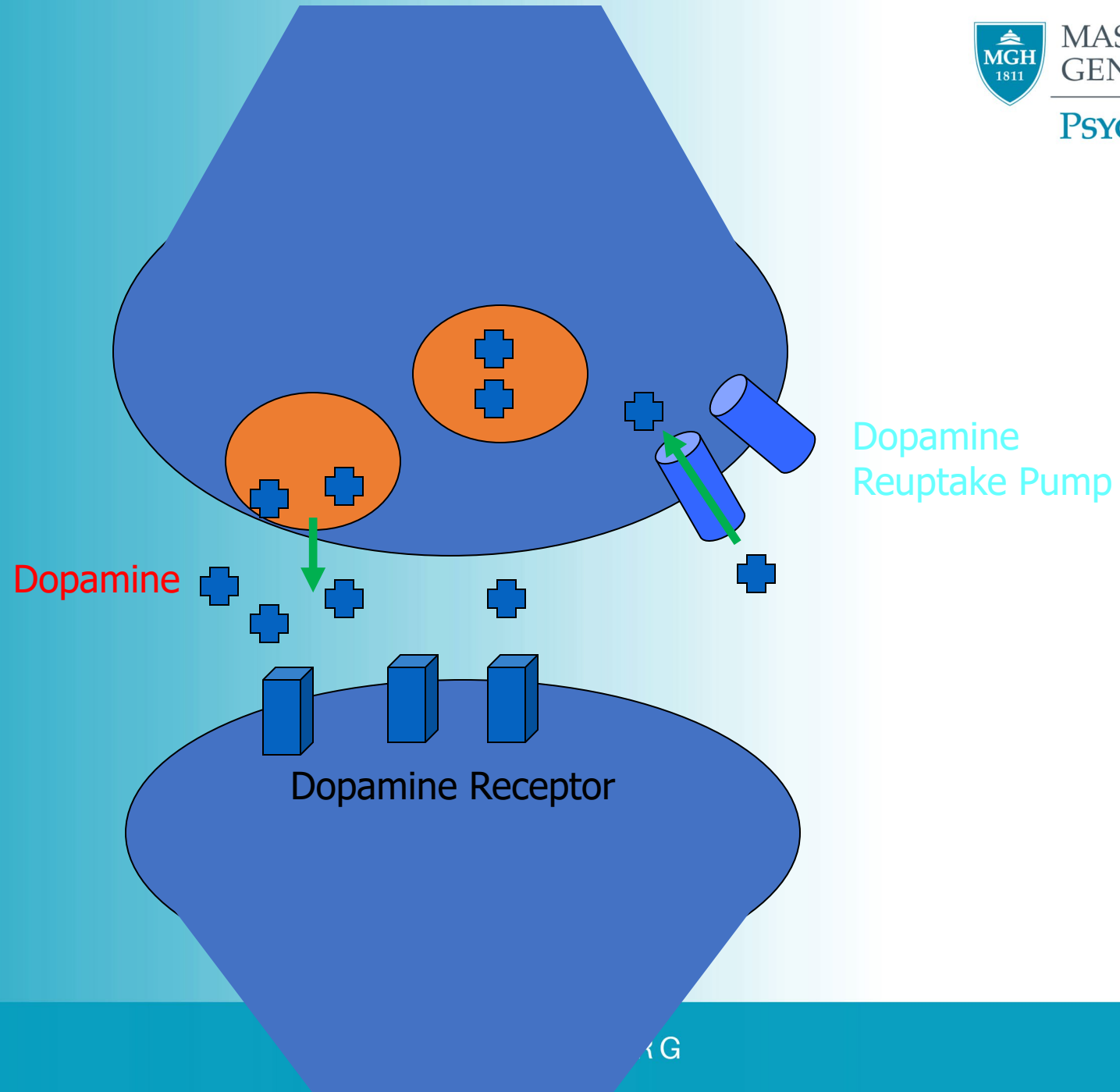
Medications used for ADHD

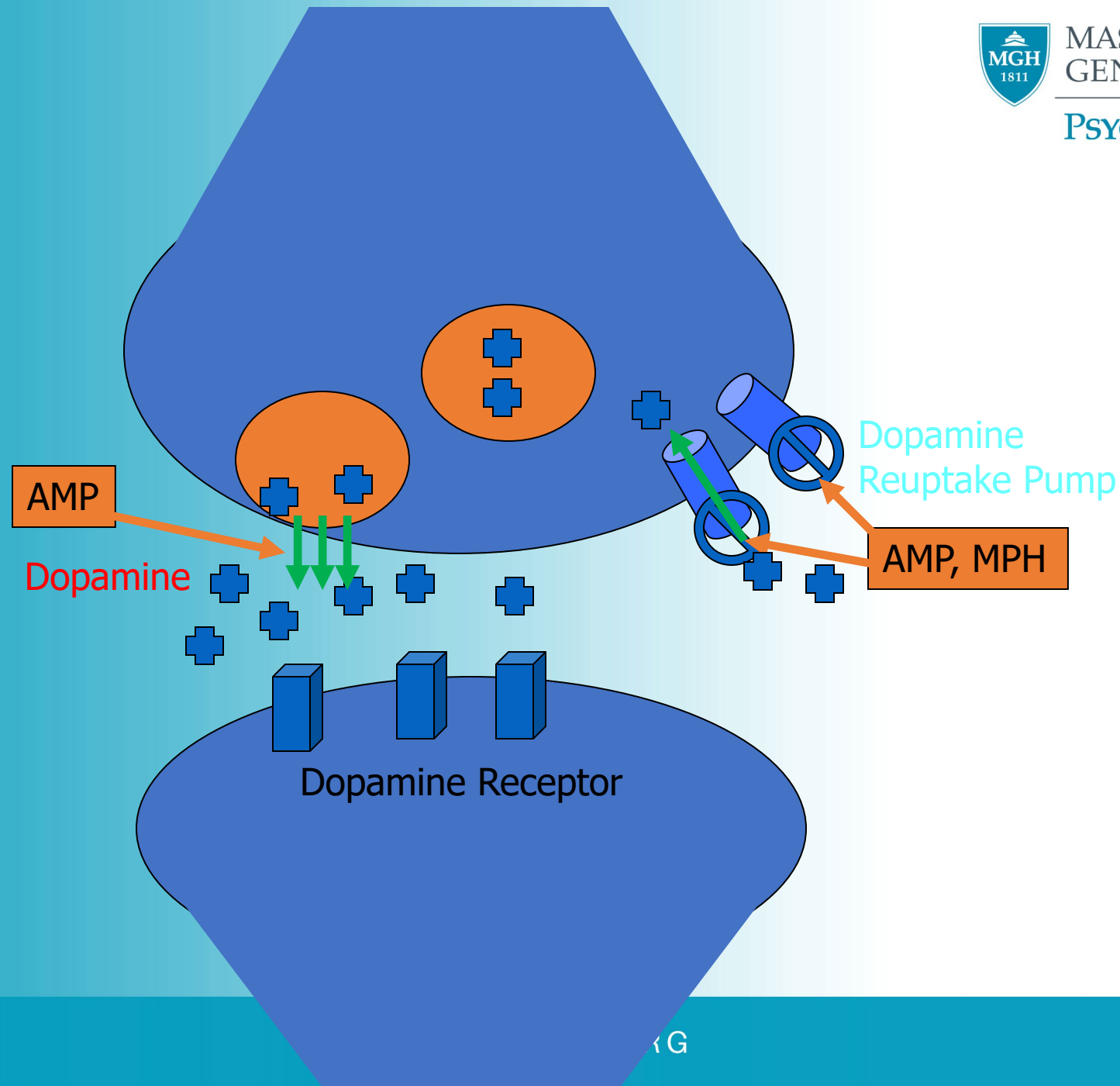
Amphetamine Formulations – Short Acting** (Medications in this section are shown at actual size)																							
Evekeo® (d- & l- amphetamine sulfate)	3-5 Yrs: SD: 2.5mg 1x/day 6-17 Yrs: 5-40mg divided BID; SD: 5mg 1-2x/day		5mg			10mg																	
Evekeo® ODT (d- & l- amphetamine sulfate)	6-17 Yrs: 5-40mg divided BID; SD: 5mg 1-2x/day		5mg			10mg			15mg		20mg												
Zenzedi® (d-amphetamine sulfate)	3-5 Yrs: SD: 2.5mg 1x/day 6-16 Yrs: 5-40mg divided BID; SD: 5mg 1-2x/day	2.5mg		G	5mg		7.5mg		G	10mg		15mg		20mg		30mg							
Adderall® (mixed amphetamine salts)	3-5 Yrs: SD: 2.5mg 1x/day 6-17 Yrs: 5-40mg divided BID; SD: 5mg 1-2x/day		G	5mg		G	7.5mg		G	10mg		G	12.5mg		G	15mg		G	20mg		G	30mg	
ProCentra® (d-amphetamine sulfate) (bubblegum flavor)	3-5 Yrs: SD: 2.5mg 1x/day 6-17 Yrs: 5-40mg divided BID; SD: 5mg 1-2x/day		G	5mg/5mL																			

Psychostimulants

Adderall (amphetamine salts), Vyvanse (lisdexamfetamine), Concerta ER (methylphenidate)









Adderall (mixed amphetamine salts)

Commonly Prescribed for

- **Attention deficit hyperactivity disorder (ADHD) in children ages 3–12 (Adderall)**
- **Attention deficit hyperactivity disorder (ADHD) in children ages 6–17 and in adults (Adderall XR)**
- **Narcolepsy (Adderall)**
- **Treatment-resistant depression**

Notable Side Effects

Insomnia, headache, exacerbation of tics, nervousness, irritability, overstimulation, tremor, dizziness

Anorexia, nausea, dry mouth, constipation, diarrhea, weight loss

Slowing of normal growth in children (controversial)

Palpitations, tachycardia, hypertension

Cardiovascular adverse effects

Potential Advantages

May work in ADHD patients unresponsive to other stimulants, including pure d-amphetamine sulfate

Sustained-release option

Potential Disadvantages

Patients with current or past substance abuse

Patients with current or past bipolar disorder or psychosis



Concerta (methylphenidate)

Commonly Prescribed for

- **Attention deficit hyperactivity disorder (ADHD) in children and adults (approved ages vary based on formulation)**
- **Narcolepsy (Metadate ER, Methylin ER, Ritalin, Ritalin SR)**
- **Treatment-resistant depression**

Notable Side Effects

Insomnia, headache, exacerbation of tics, nervousness, irritability, overstimulation, tremor, dizziness

Anorexia, nausea, dry mouth, constipation, diarrhea, weight loss

Slowing of normal growth in children (controversial)

Palpitations, tachycardia, hypertension

Cardiovascular adverse effects

Potential Advantages

Established long-term efficacy as a first-line treatment for ADHD

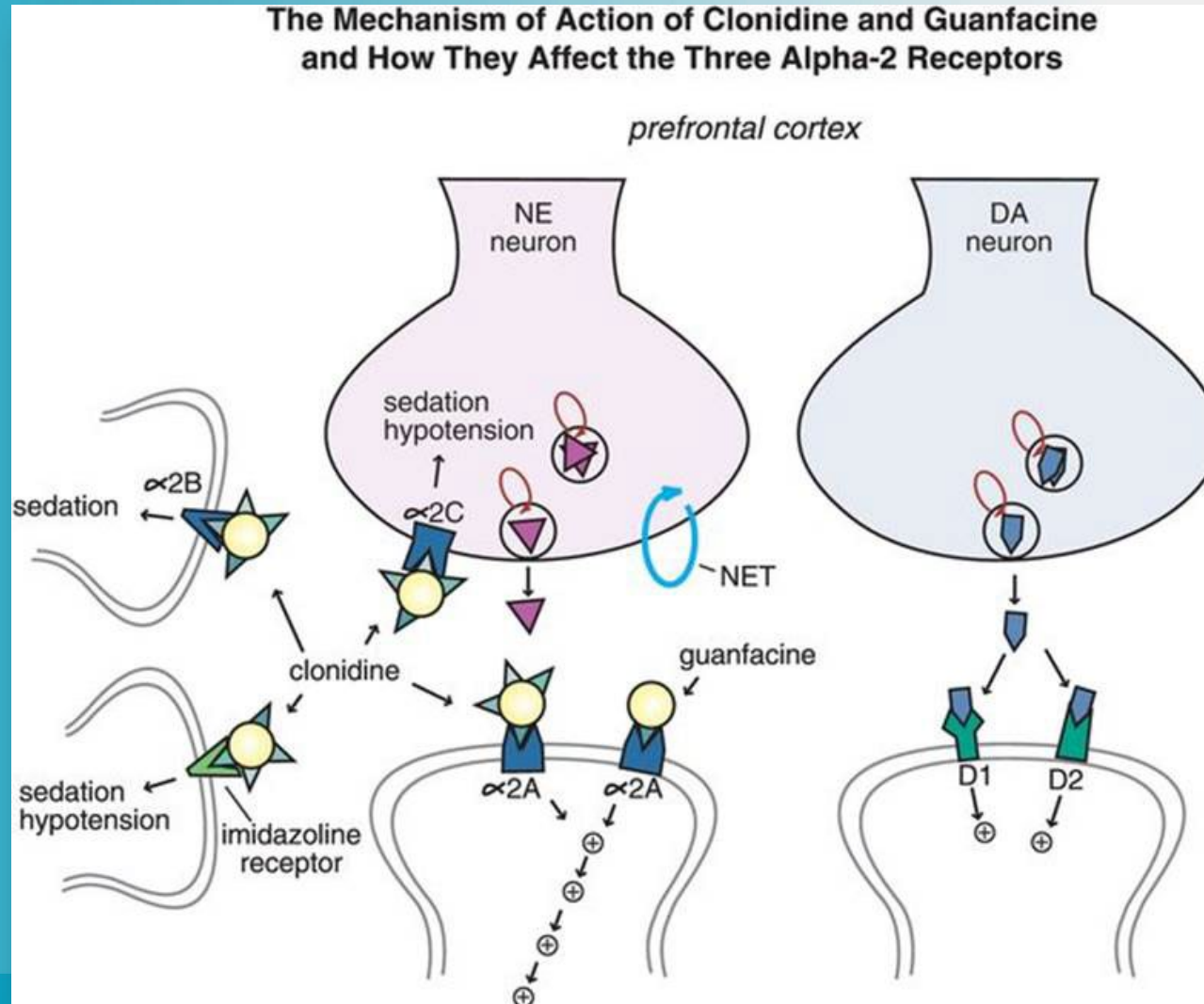
Multiple options for drug delivery, peak actions, and duration of action

Potential Disadvantages

Patients with current or past substance abuse

Patients with current or past bipolar disorder or psychosis

Alpha-agonists





Kapvay/Catapres (clonidine)

Commonly Prescribed for

- **Attention deficit hyperactivity disorder (ADHD) in children and adults**
- **hypertension**

Notable Side Effects

Constipation

Pruritus of skin

Drowsy

Dizziness

Fatigue

General weakness

Orthostatic hypotension

Potential Advantages

Nonstimulant. Little abuse potential

Comes in long acting form

Sedation can be useful in insomnia

Potential Disadvantages

Sedation and hypotension

Less effective than stimulants



Intuniv/Tenex (guanfacine)

Commonly Prescribed for

- **Attention deficit hyperactivity disorder (ADHD) in children and adults**
- **hypertension**

Notable Side Effects

Drowsy, Dizziness, Sedation, Lethargy, Fatigue

Insomnia

Nausea

Hypotension

Weight gain

Headache disorder

Irritability

Potential Advantages

Nonstimulant. Little abuse potential

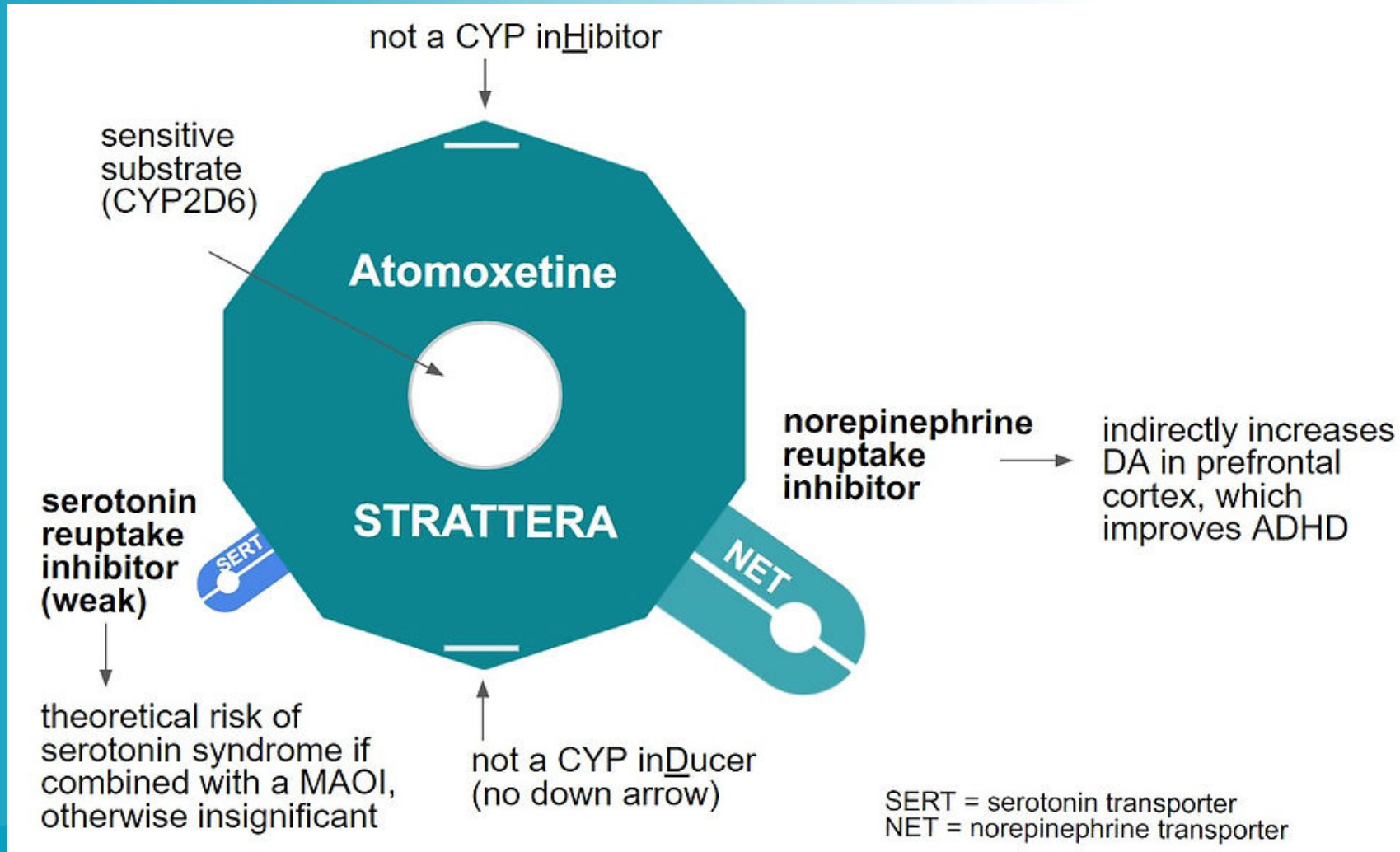
Comes in long acting form

Potential Disadvantages

Sedation and hypotension (less than clonidine)

Less effective than stimulants

Other nonstimulant





Strattera (atomoxetine)

Commonly Prescribed for

- **Attention deficit hyperactivity disorder (ADHD) in children and adults**

Notable Side Effects

- **Nausea**, Vomiting, Abdominal pain
- Drowsy, fatigue, sedation
- Headache disorder
- **Sedation**
- Mood changes
- Depression

Potential Advantages

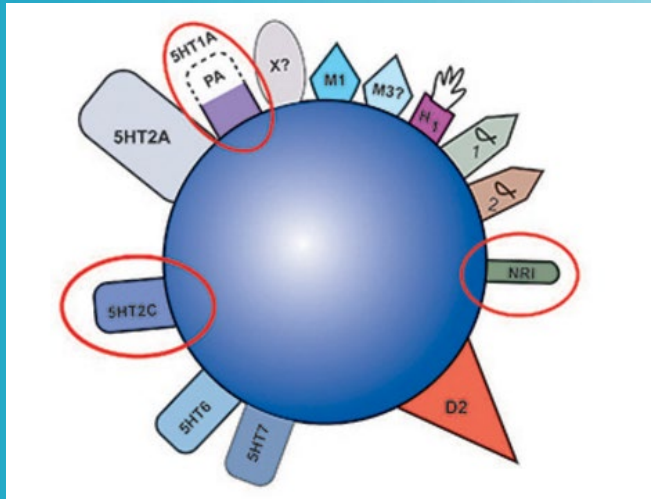
Nonstimulant. Little abuse potential
May be useful with co-occurring anxiety

Potential Disadvantages

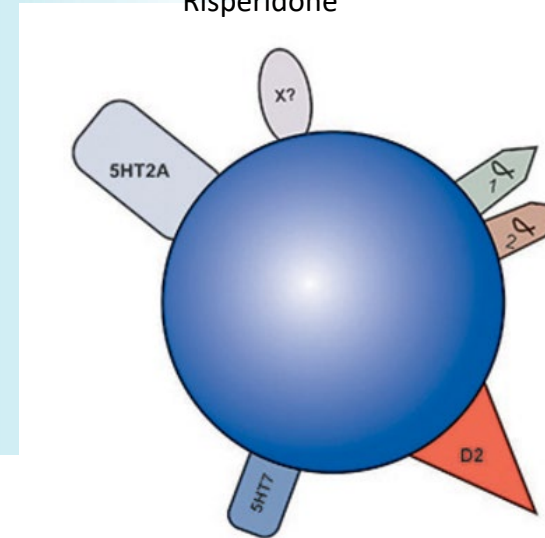
Sedation or insomnia (less than clonidine)
Less effective than stimulants

Antipsychotics

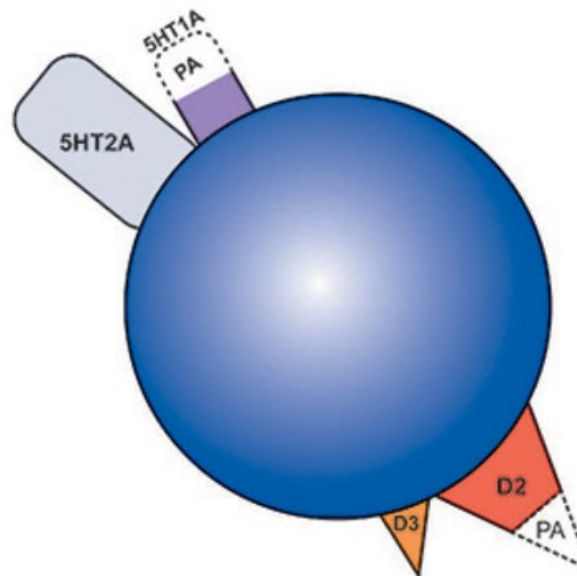
Quetiapine



Risperidone



Aripiprazole



Others:

- Geodon (ziprasidone)
- Zyprexa (olanzapine)
- Latuda (lorasidone)
- Invega (paliperidone)



Seroquel (quetiapine)

Commonly Prescribed for

- Acute schizophrenia in adults (quetiapine, quetiapine XR) and ages 13–17 (quetiapine)
- Schizophrenia maintenance (quetiapine XR)
- Acute mania in adults (quetiapine and quetiapine XR, monotherapy and adjunct to lithium or valproate) and ages 10–17 (quetiapine, monotherapy and adjunct to lithium or valproate)
- Bipolar maintenance (quetiapine, quetiapine XR)
- Bipolar depression (quetiapine, quetiapine XR)
- Depression (quetiapine XR, adjunct)
- Other psychotic disorders
- Mixed mania
- levodopa treatment in Parkinson's disease
- Behavioral disturbances in children and adolescents

Notable Side Effects

May increase risk for diabetes and dyslipidemia

Dizziness, sedation

Dry mouth, constipation, dyspepsia, abdominal pain, weight gain

Tachycardia

Orthostatic hypotension

Theoretical risk of tardive dyskinesia

Rare neuroleptic malignant syndrome

Rare hyperglycemia, stroke, seizure

Potential Advantages

Patients requiring some sedative effect of their medication

Generally well tolerated

Potential Disadvantages

Patients requiring rapid onset of action

Patients who have difficulty tolerating sedation



Risperdal (risperidone)

Commonly Prescribed for

- Schizophrenia, ages 13 and older (oral, long-acting microspheres intramuscularly)
- Delaying relapse in schizophrenia (oral)
- Other psychotic disorders (oral)
- Acute mania/mixed mania, ages 10 and older (oral, monotherapy and adjunct to lithium or valproate)
- Autism-related irritability in children ages 5–16
- Bipolar maintenance (long-acting microspheres intramuscularly, monotherapy and adjunct to lithium or valproate)
- Bipolar depression
- Behavioral disturbances in children and adolescents
- Disorders associated with problems with impulse control

Notable Side Effects

Dose-dependent extrapyramidal symptoms

Dose-related hyperprolactinemia

Rare tardive dyskinesia (much reduced risk compared to conventional antipsychotics)

Dizziness, insomnia, headache, anxiety, sedation

Nausea, constipation, abdominal pain, weight gain

Rare orthostatic hypotension, usually during initial dose titration

Tachycardia, sexual dysfunction

Rare neuroleptic malignant syndrome

Rare hyperglycemia, stroke, seizure

Potential Advantages

Children with behavioral disturbances of multiple causations

Patients who struggle with adherence (injectable)

Potential Disadvantages

Patients for whom elevated prolactin may not be desired



Abilify (aripiprazole)

Commonly Prescribed for

- Schizophrenia (ages 13 and older) (Abilify, Abilify Maintena)
- Maintaining stability in schizophrenia
- Acute mania/mixed mania (ages 10 and older; monotherapy and adjunct)
- Bipolar maintenance (monotherapy and adjunct)
- Depression (adjunct)
- Autism-related irritability in children ages 6 to 17
- Acute agitation associated with schizophrenia or bipolar disorder (IM)
- Bipolar depression
- Other psychotic disorders
- Behavioral disturbances in children and adolescents
- Disorders associated with problems with impulse control

Notable Side Effects

Dizziness, insomnia, akathisia, activation
Nausea, vomiting
Orthostatic hypotension
Constipation
Headache, asthenia, sedation
Theoretical risk of tardive dyskinesia
Rare neuroleptic malignant syndrome
Rare hyperglycemia, stroke, seizure

Potential Advantages

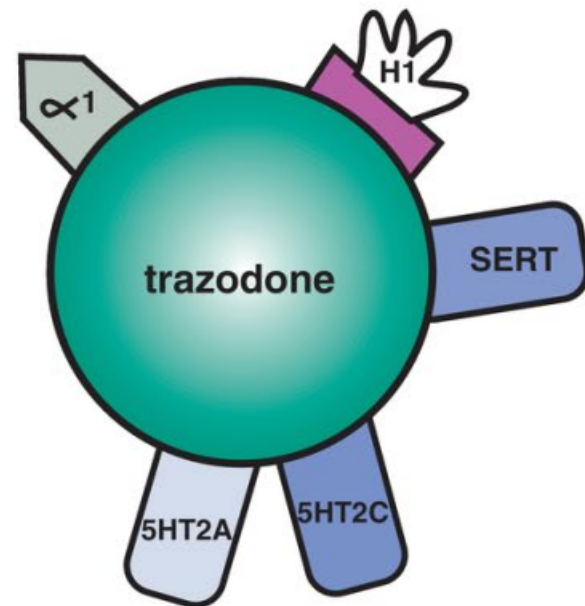
Patients concerned about gaining weight and patients who are already obese or overweight
Patients with diabetes
Patients with dyslipidemia
Patients requiring rapid onset
Patients who wish to avoid sedation

Potential Disadvantages

Patients in whom sedation is desired
May be more difficult to dose for children

Desyrel (trazodone)

**Trazodone as an Antidepressant:
Serotonin Antagonist/Reuptake Inhibitor (SARI)**



antidepressant dose (150-600mg)

**Trazodone as a Hypnotic:
Multifunctional Neurotransmitter Antagonist**



hypnotic dose (25-150mg)



Desyrel (trazodone)

Commonly Prescribed for

- **Depression**
- **Insomnia (primary and secondary)**
- **Anxiety**

Notable Side Effects

Nausea, vomiting, edema, blurred vision,
constipation, dry mouth

Dizziness, **sedation**, fatigue, headache,
incoordination, tremor

Hypotension, syncope

Occasional sinus bradycardia (long-term)

Rare rash

Rare priapism

Potential Advantages

For insomnia when it is preferred to avoid the use of
dependence-forming agents

As an adjunct to the treatment of residual anxiety and insomnia
with other antidepressants

Depressed patients with anxiety

Patients concerned about sexual side effects or weight gain

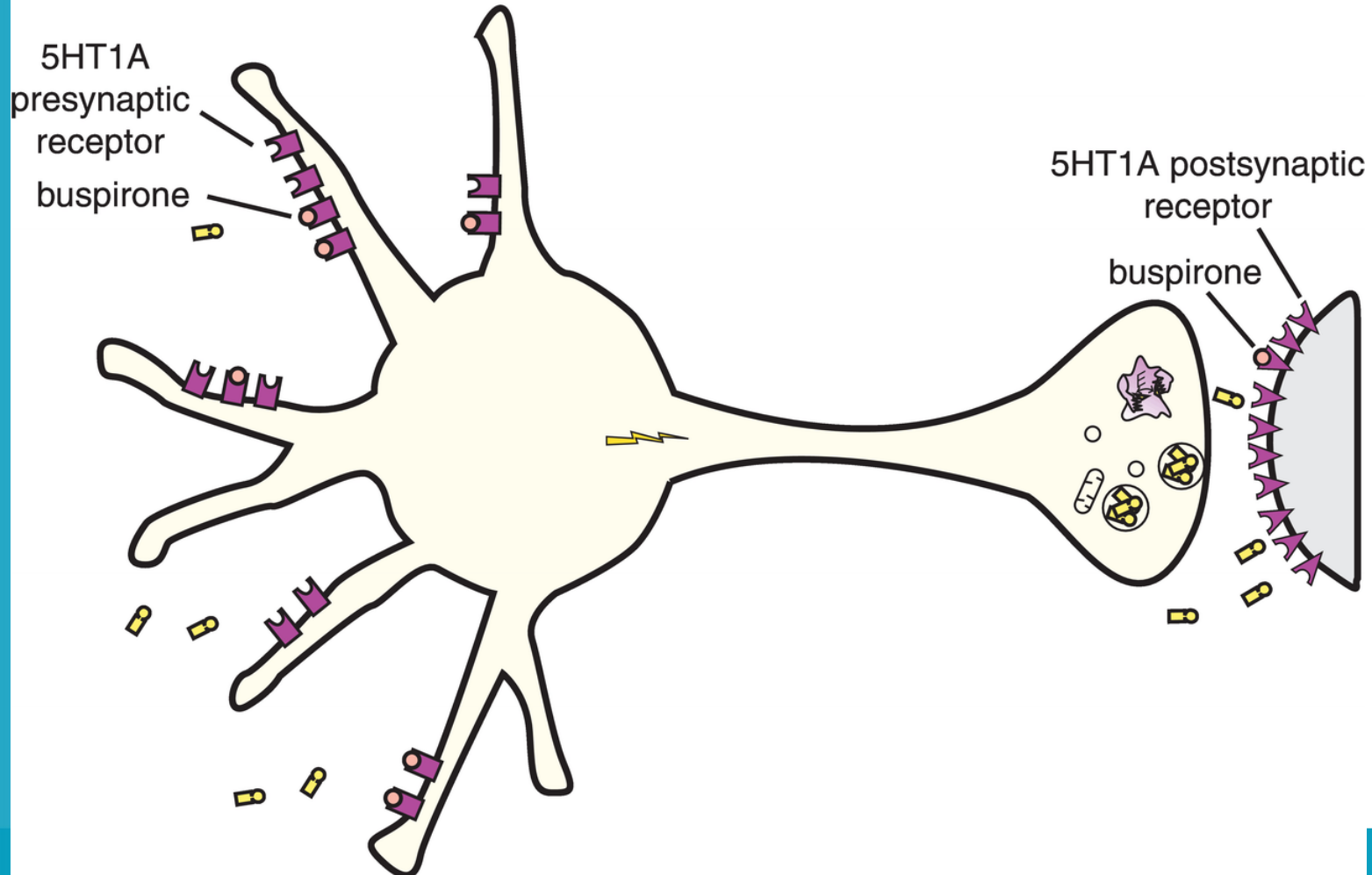
Potential Disadvantages

For patients with fatigue, hypersomnia

For patients intolerant to sedating effects

Buspar (buspirone)

5HT_{1A} Partial Agonist (SPA) Actions in Anxiety





Buspar (buspirone)

Commonly Prescribed for

- Management of anxiety disorders
- Short-term treatment of symptoms of anxiety
- Mixed anxiety and depression
- Treatment-resistant depression (adjunctive)

Notable Side Effects

Dizziness, headache, nervousness, sedation, excitement

Nausea

Restlessness

Rare cardiac symptoms

Potential Advantages

Safety profile

Lack of dependence, withdrawal

Lack of sexual dysfunction or weight gain

Potential Disadvantages

Takes 4 weeks for results, whereas benzodiazepines have immediate effects



Benzodiazepines

Anxiolytics

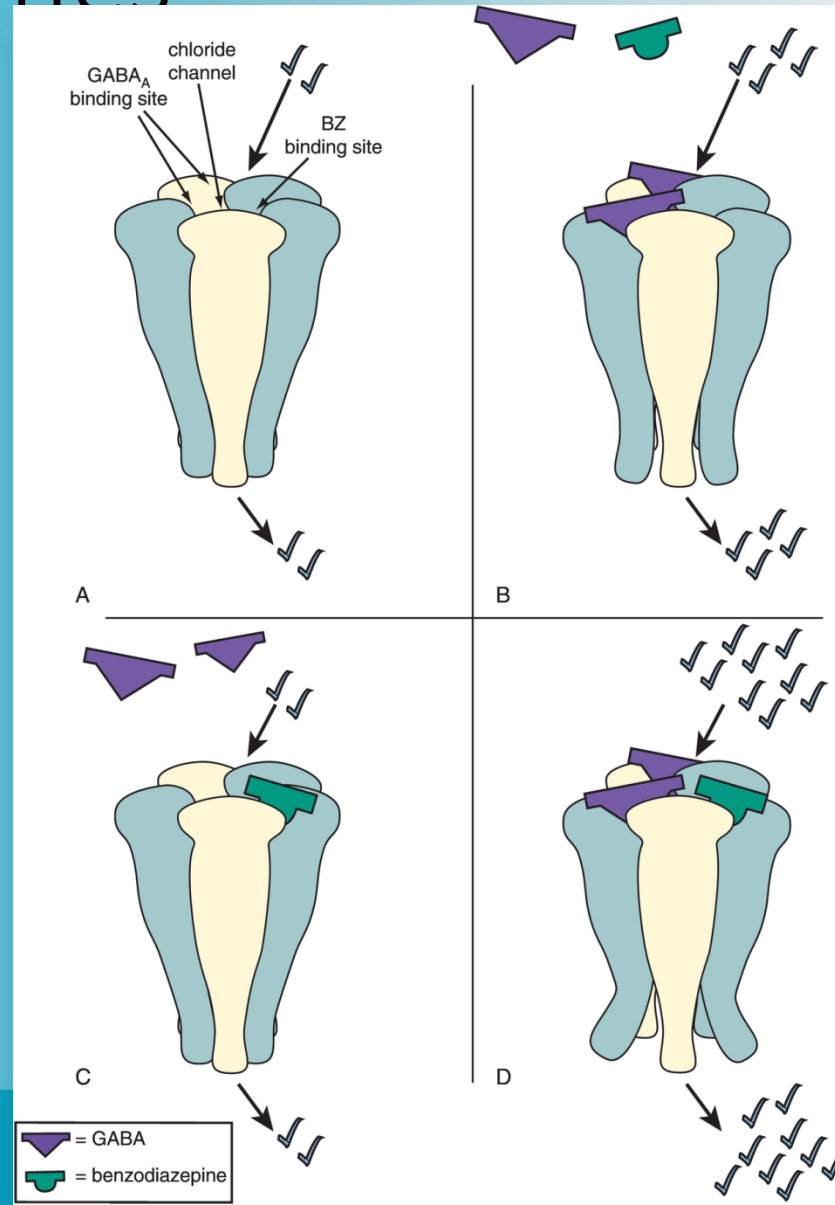
Xanax (alprazolam)

Ativan (lorazepam)

Valium (diazepam)

- Others: Klonopin (clonazepam), Librium (chlordiazepoxide)

Benzodiazepines





Xanax (alprazolam)

Commonly Prescribed for

- **Generalized anxiety disorder (IR)**
- **Panic disorder (IR and XR)**
- Other anxiety disorders
- Anxiety associated with depression
- Premenstrual dysphoric disorder
- Irritable bowel syndrome and other somatic symptoms associated with anxiety disorders
- Insomnia
- Acute mania (adjunctive)
- Acute psychosis (adjunctive)
- Catatonia

Notable Side Effects

Sedation, fatigue, depression
Dizziness, ataxia, slurred speech, weakness
Forgetfulness, **confusion**
Hyperexcitability, nervousness
Rare hallucinations, mania
Rare hypotension
Hypersalivation, dry mouth

Potential Advantages

Rapid onset of action
Less sedation than some other benzodiazepines
Availability of an XR formulation with longer duration of action

Potential Disadvantages

Euphoria may lead to abuse
Abuse especially risky in past or present substance abusers



Ativan (lorazepam)

Commonly Prescribed for

- Anxiety disorder (oral)
- Anxiety associated with depressive symptoms (oral)
- Initial treatment of status epilepticus (injection)
- Preanesthetic (injection)
- Insomnia
- Muscle spasm
- Alcohol withdrawal psychosis
- Headache
- Panic disorder
- Acute mania (adjunctive)
- Acute psychosis (adjunctive)
- Delirium (with haloperidol)
- Catatonia

Notable Side Effects

Sedation, fatigue, depression

Dizziness, ataxia, slurred speech, weakness

Forgetfulness, confusion

Hyperexcitability, nervousness

Pain at injection site

Rare hallucinations, mania

Rare hypotension

Hypersalivation, dry mouth

Potential Advantages

Rapid onset of action

Availability of oral liquid as well as injectable dosage formulations

Potential Disadvantages

Euphoria may lead to abuse

Abuse especially risky in past or present substance abusers

Possibly more sedation than some other benzodiazepines



Valium (diazepam)

Commonly Prescribed for

- Anxiety disorder
- Symptoms of anxiety (short-term)
- Acute agitation, tremor, impending or acute delirium tremens and hallucinosis in acute alcohol withdrawal
- Skeletal muscle spasm due to reflex spasm to local pathology
- Spasticity caused by upper motor neuron disorder
- Convulsive disorder (adjunctive)
- Pre-operative anxiety (injection only)
- Anxiety relief prior to cardioversion (intravenous)
- Initial treatment of status epilepticus (injection only)
- Insomnia
- Catatonia

Notable Side Effects

Sedation, fatigue, depression
Dizziness, ataxia, slurred speech, weakness
Forgetfulness, confusion
Hyperexcitability, nervousness
Pain at injection site
Rare hallucinations, mania
Rare hypotension
Hypersalivation, dry mouth

Potential Advantages

Rapid onset of action
Availability of oral liquid, rectal, and injectable dosage formulations

Potential Disadvantages

Euphoria may lead to abuse
Abuse especially risky in past or present substance abusers
Can be sedating at doses necessary to treat moderately severe anxiety disorder

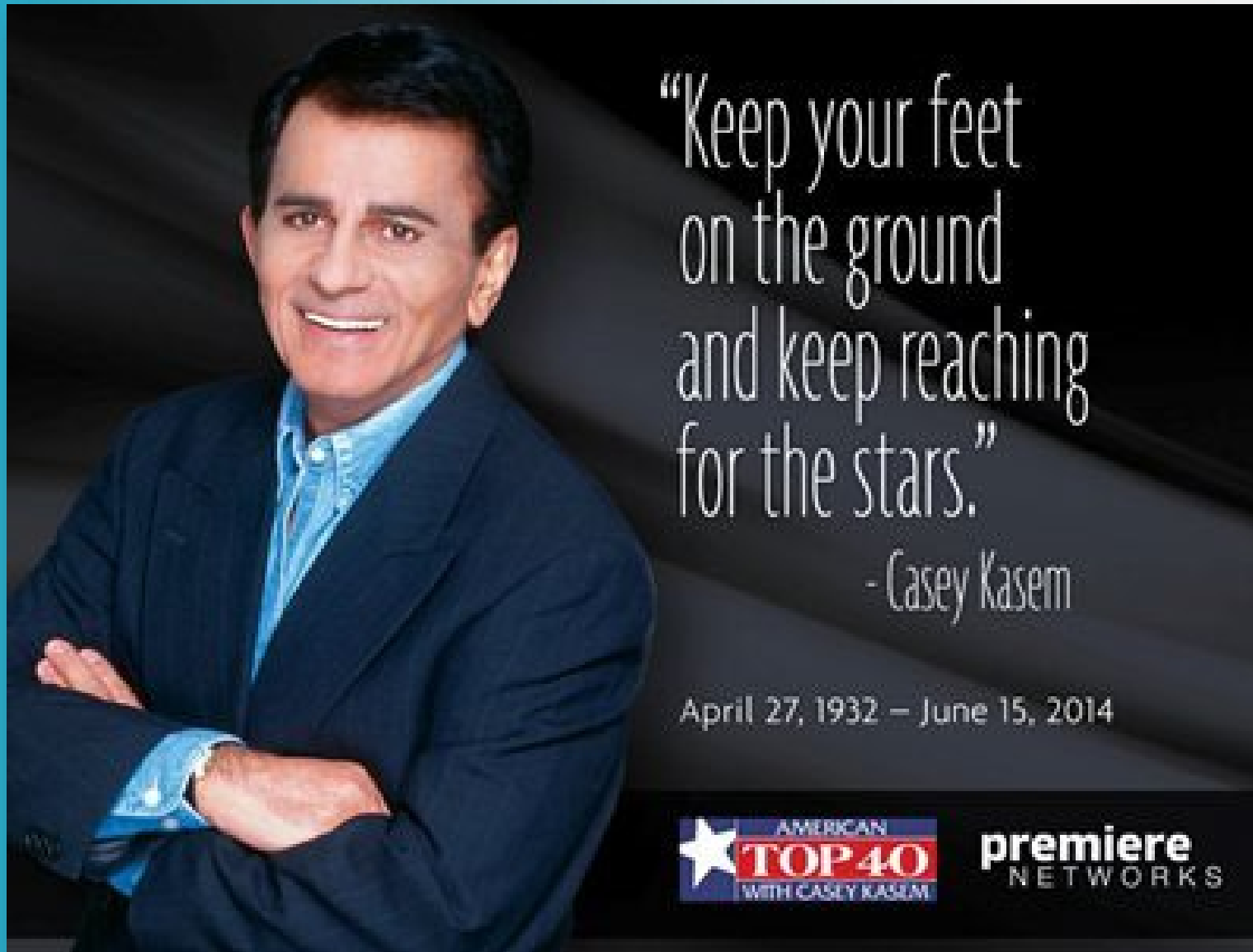


MASSACHUSETTS
GENERAL HOSPITAL

PSYCHIATRY ACADEMY

Others?

- Place them in the Q&A and I'll try to address



“Keep your feet
on the ground
and keep reaching
for the stars.”

- Casey Kasem

April 27, 1932 – June 15, 2014



premiere
NETWORKS

Thank you!



MASSACHUSETTS
GENERAL HOSPITAL

PSYCHIATRY ACADEMY

Email me at: ralthoff@uvm.edu

Follow me on Facebook:
www.facebook.com/childpsychvt

Or Twitter: [@childpsychvt](https://twitter.com/childpsychvt)

Visit our website: <http://www.med.uvm.edu/vccyf>



*Image Credit: U.S.
Department of Energy
Human Genome Program*