Clarity Education Systems

Flashcards

Medications

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Legal Statement:

The educational materials provided herein are designed as part of a PMHNP certification review system. These information cards aim to assist in the retention of key components related to common mental health medications. While they serve as a helpful tool for educational and informational purposes, they are not exhaustive and should not be used as a substitute for professional clinical care practices.

It is important to emphasize that these materials are intended solely for the enhancement of your knowledge and understanding in preparation for the PMHNP certification. They are not to be used as a reference in actual clinical prescribing scenarios.

For a comprehensive and detailed overview of medications, including indications, contraindications, side effects, interactions, and dosing, we strongly recommend consulting Davis's Drug Guide for Nurses (19th ed., 2023), Stahl's Essential Psychopharmacology (7th ed., 2020), or Prescribing Mental Health Medication: The practitioner's guide (3rd ed., 2021). These guides are authoritative and thorough resources for safe and effective medication management in clinical practice.

By using these educational materials (Clarity Education Systems), you acknowledge and agree to the limitations outlined above and accept that the primary source for clinical decision-making should always be a reliable and comprehensive drug reference guide and evidence-based clinical practice guideline resources.

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Medications

Quick Reference

Antidepressants

1. **Selective Serotonin Reuptake Inhibitors (SSRIs)**
   - Fluoxetine (Prozac): Major depressive disorder, obsessive-compulsive disorder (OCD), bulimia nervosa, panic disorder.
   - Sertraline (Zoloft): Major depressive disorder, OCD, panic disorder, post-traumatic stress disorder (PTSD), social anxiety disorder, premenstrual dysphoric disorder.
   - Citalopram (Celexa): Major depressive disorder.
   - Escitalopram (Lexapro): Major depressive disorder, generalized anxiety disorder.
2. **Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)**
   - Venlafaxine (Effexor XR): Major depressive disorder, generalized anxiety disorder, social anxiety disorder, panic disorder.
   - Duloxetine (Cymbalta): Major depressive disorder, generalized anxiety disorder, fibromyalgia, chronic musculoskeletal pain, neuropathic pain associated with diabetes.
3. **Tricyclic Antidepressants (TCAs)**
   - Amitriptyline (Elavil): Major depressive disorder, neuropathic pain, migraine prophylaxis.
   - Nortriptyline (Pamelor): Major depressive disorder.
4. **Atypical Antidepressants**
   - Bupropion (Wellbutrin): Major depressive disorder, seasonal affective disorder, smoking cessation.
   - Mirtazapine (Remeron): Major depressive disorder.

Antipsychotics

1. **First-Generation (Typical) Antipsychotics**
   - Haloperidol (Haldol): Schizophrenia, acute psychosis, Tourette syndrome.
   - Chlorpromazine (Thorazine): Schizophrenia, bipolar disorder, nausea/vomiting.
2. **Second-Generation (Atypical) Antipsychotics**
   - Risperidone (Risperdal): Schizophrenia, bipolar disorder, irritability associated with autistic disorder.
   - Olanzapine (Zyprexa): Schizophrenia, bipolar disorder.
   - Quetiapine (Seroquel): Schizophrenia, bipolar disorder, major depressive disorder (adjunctive treatment).
   - Aripiprazole (Abilify): Schizophrenia, bipolar disorder, major depressive disorder (adjunctive treatment), irritability associated with autistic disorder, Tourette syndrome.
   - Clozapine (Clozaril): Treatment-resistant schizophrenia, recurrent suicidal behavior in schizophrenia or schizoaffective disorder.

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Medications

Quick Reference cont.

Mood Stabilizers

- Lithium: Bipolar disorder (maintenance and acute mania).
- Valproate (Depakote): Bipolar disorder, seizure disorders, migraine prophylaxis.
- Carbamazepine (Tegretol): Bipolar disorder, seizure disorders, trigeminal neuralgia.
- Lamotrigine (Lamictal): Bipolar disorder, seizure disorders.

Anxiolytics

- **Benzodiazepines**
  - Alprazolam (Xanax): Generalized anxiety disorder, panic disorder.
  - Lorazepam (Ativan): Anxiety disorders, insomnia, status epilepticus.
  - Diazepam (Valium): Anxiety disorders, muscle spasms, seizure disorders, alcohol withdrawal syndrome.
- **Non-Benzodiazepine Anxiolytics**
  - Buspirone (BuSpar): Generalized anxiety disorder.

Stimulants (ADHD)

- Amphetamines
  - Adderall (Mixed amphetamine salts): Attention-deficit/hyperactivity disorder (ADHD), narcolepsy.
  - Lisdexamfetamine (Vyvanse): ADHD, binge eating disorder.
- Methylphenidate
  - Ritalin, Concerta: ADHD, narcolepsy.

Others

- Beta-Blockers
  - Propranolol (Inderal): Performance anxiety, hypertension, migraine prophylaxis.
- Alpha-2 Agonists
  - Clonidine (Catapres): ADHD, hypertension, opioid withdrawal.

Sertraline

Zoloft/SSRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Obsessive-Compulsive Disorder (OCD), Panic Disorder, Post-Traumatic Stress Disorder (PTSD), Social Anxiety Disorder (social phobia), Premenstrual Dysphoric Disorder (PMDD)

Off-Label Uses
- Generalized Anxiety Disorder (GAD), Eating Disorders (e.g., Bulimia Nervosa), Premature Ejaculation

Dosing
- The initial dose typically starts low, e.g., 25-50 mg/day for most indications, with gradual increases up to 200 mg/day based on response and tolerability.

Side Effects
- Nausea, Diarrhea, Insomnia, Dry mouth, Fatigue, Dizziness, Sexual dysfunction

Adverse Reactions
- Serotonin Syndrome: A potentially life-threatening condition.
- Increased risk of bleeding, especially when used with NSAIDs, aspirin, or other drugs affecting coagulation.
- Hyponatremia, especially in older adults.
- Suicidal thoughts and behavior in adolescents and young adults.

Metabolized By
- Primarily metabolized by the liver enzymes CYP2B6.
- Inhibits CYP2D6 and CYP3A4.

Required Assessments
- Baseline assessment of symptoms to determine severity and monitor effectiveness.
- Regular monitoring for signs of suicidal ideation, especially in young adults and during the initial treatment period.
- Periodic assessment of liver function tests due to metabolism pathways.

Clinical Pearls
- Abrupt discontinuation should be avoided to prevent withdrawal symptoms; tapering off is recommended.
- False-positive urine immunoassay screening tests for benzodiazepine.
- DO NOT USE IF: the patient is taking an MAOI, pimozide, and thioridazine.

Citalopram

Celexa/SSRI

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Anxiety Disorders, Obsessive-Compulsive Disorder (OCD), Panic Disorder, Premenstrual Dysphoric Disorder (PMDD), Post-Traumatic Stress Disorder (PTSD)

Dosing
- Initial: Typically starts at 20 mg once daily; may increase to a maximum of 40 mg/day based on response and tolerability.
- Note: Doses above 40 mg/day are not recommended due to the risk of QT interval prolongation. Elderly patients MAX dose of 20 mg.

Side Effects
- Nausea, Dry mouth, Somnolence (drowsiness), Insomnia, Increased sweating, Tremor, Diarrhea, Sexual dysfunction

Adverse Reactions
- QT Interval Prolongation: This can lead to an increased risk for ventricular arrhythmias.
- Increased risk of suicidal thoughts and behaviors in children, adolescents, and young adults.
- Serotonin Syndrome: Especially when used with serotonergic drugs.
- Withdrawal symptoms with abrupt discontinuation.

Metabolized By
- Primarily metabolized by CYP2C19, with contributions from CYP3A4 and CYP2D6. Weak inhibitor of CYP2D6.

Required Assessments
- Assessment of the severity of depressive symptoms at baseline and periodically throughout treatment.
- Monitoring for signs of suicidal ideation and behavior, especially during the initial treatment months and during dose changes.
- Electrocardiogram (ECG) in patients with known heart conditions due to risk of QT prolongation.

Clinical Pearls
- Caution is advised in patients with a history of cardiac conditions due to the risk of QT interval prolongation.
- Avoid abrupt discontinuation to minimize withdrawal symptoms; gradual dose reduction is recommended.
- DO NOT USE IF: the patient is taking an MAOI, pimozide, and thioridazine.

Escitalopram

Lexapro/SSRI

FDA Approved Indications
- Major Depressive Disorder (MDD; ages 12 and up), Generalized Anxiety Disorder (GAD)

Off-Label Uses
- Obsessive-Compulsive Disorder (OCD), Social Anxiety Disorder, Panic Disorder, Post-Traumatic Stress Disorder (PTSD), Premenstrual Dysphoric Disorder (PMDD)

Dosing
- Initial 10 mg/day; increase to 20 mg/day if necessary; single-dose administration, morning or evening.
- Some patients require dosing with 30 or 40 mg.
- Recommended dose 10 mg/day with hepatic impairment.
- Note: For elderly or hepatic impairment, a lower initial dose of 5-10 mg/day may be considered. 10 mg of escitalopram may be comparable in efficacy to 40 mg of citalopram with fewer side effects.

Side Effects
- Nausea, Insomnia, Fatigue, Sexual dysfunction, Dry mouth, Sweating, Increased anxiety, Constipation

Adverse Reactions
- Suicidal thoughts/behavior in children, adolescents, and young adults.
- Serotonin Syndrome, especially when used with other serotonergic or MAOI drugs.
- Increased risk of bleeding, particularly with concomitant use of NSAIDs, aspirin, or other drugs that affect coagulation.

Metabolized By
- Primarily metabolized by CYP2C19, with minor involvement of CYP3A4 and CYP2D6.
- No significant actions on CYP450 enzymes.

Required Assessments
- Monitor for the emergence of suicidal thoughts and behaviors, especially during initial treatment periods or dose changes.

Clinical Pearls
- Takes several weeks to achieve full therapeutic effect (~ 6 weeks).
- Often considered one of the SSRIs with a more favorable side effect profile, particularly concerning gastrointestinal side effects.
- The S-enantiomer of citalopram, escitalopram, is more potent, allowing for lower doses with effective treatment outcomes.

Fluoxetine

Prozac, Sarafem/SSRI

FDA Approved Indications
- Major Depressive Disorder (MDD; ages 8 and older), Obsessive-Compulsive Disorder (OCD; ages 7 and older), Bulimia Nervosa, Panic Disorder, Premenstrual Dysphoric Disorder (PMDD) (Sarafem), Bipolar depression and treatment-resistant depression [in combination with olanzapine (Symbyax)]

Off-Label Uses
- Post-Traumatic Stress Disorder (PTSD), Social Anxiety Disorder

Dosing
- 20–80 mg for depression and anxiety disorders
- 60–80 mg for bulimia

Side Effects
- Nausea, Headache, Insomnia, Anxiety, Sexual dysfunction, Dry mouth, Diarrhea, Fatigue

Adverse Reactions
- Suicidal thoughts/behaviors in children, adolescents, and young adults.
- Serotonin Syndrome when combined with serotonergic or MAOI drugs.
- Risk of bleeding, especially if used with NSAIDs, aspirin, or other drugs that affect coagulation.
- Mania or hypomania in susceptible individuals.

Metabolized By
- Primarily metabolized by CYP2D6, with minor contributions from CYP2C9 and CYP3A4. Inhibits CYP2D6 and CYP3A4

Required Assessments
- Monitoring for the emergence of suicidal ideation, especially at the beginning of treatment or when doses are changed.
- Monitoring for signs of serotonin syndrome, especially when initiating treatment or increasing dose.

Clinical Pearls
- Has a long half-life, which can be beneficial for adherence but requires caution when discontinuing or switching medications due to potential for interactions or withdrawal symptoms.
- May be taken with or without food.
- Due to its activating effects, taking it in the morning is often recommended to avoid insomnia.
- DO NOT USE IF: the patient is taking an MAOI, thioridazine, pimozide, or tamoxifen.

Fluvoxamine

Luvox/SSRI

FDA Approved Indications
- Obsessive-Compulsive Disorder (OCD; fluvoxamine and fluvoxamine CR), Social anxiety disorder (fluvoxamine CR)

Off-Label Uses
- Panic Disorder, Major Depressive Disorder (MDD), Post-Traumatic Stress Disorder (PTSD), Generalized anxiety disorder (GAD)

Dosing
- Initial dose for OCD in adults: 50 mg at bedtime, with gradual increases up to 300 mg/day based on response and tolerability. 100–200 mg/day for depression; 100–300 mg/day for social anxiety disorder.
- The starting dose is typically lower for children and adolescents, around 25 mg at bedtime, with slow titration.

Side Effects
- Nausea, Headache, Insomnia, Dizziness, Dry mouth, Gastrointestinal discomfort, Sexual dysfunction

Adverse Reactions
- Suicidal thoughts and behavior in children, adolescents, and young adults.
- Serotonin Syndrome when used with serotonergic drugs.
- Increased risk of bleeding, especially when combined with NSAIDs, aspirin, or other anticoagulants.
- Withdrawal symptoms with abrupt discontinuation.

Metabolized By
- Primarily metabolized by the liver enzymes CYP1A2, with lesser contributions from CYP2C9, CYP3A4, and CYP2D6.
- Inhibits CYP3A4, CYP1A2, and CYP2C9/2C19.

Required Assessments
- Monitor for the emergence of suicidal thoughts and behaviors, especially during initial treatment periods or dose changes.

Clinical Pearls
- Unlike other SSRIs, fluvoxamine may be more sedating and is often taken at bedtime.
- Abrupt discontinuation should be avoided to minimize the risk of withdrawal symptoms; tapering off the medication gradually is recommended.
- DO NOT USE IF: the patient is taking an MAOI, thioridazine, pimozide, tizanidine, or ramelteon.

Paroxetine

Paxil, Brisdelle/SSRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), Panic Disorder, Social Anxiety Disorder (SAD), Obsessive-Compulsive Disorder (OCD), Post-Traumatic Stress Disorder (PTSD), Premenstrual Dysphoric Disorder (PMDD) (Paxil, Paxil CR), Vasomotor symptoms associated with menopause (Brisdelle)

Off-Label Uses
- Premature Ejaculation, Chronic Headaches, Diabetic Neuropathy

Dosing
- Dosing varies by condition, generally starting from 10-20 mg daily, with potential adjustments up to 50 mg/day for some conditions.
- For menopausal vasomotor symptoms, the dosing is typically lower.
- Vasomotor symptoms: 7.5 mg at bedtime
- Anxiety disorders and OCD: 10–60 mg/day (12.5–75 mg CR)

Side Effects
- Nausea, Drowsiness, Dizziness, Insomnia, Sexual dysfunction, Weight gain, Dry mouth, Constipation

Adverse Reactions
- Suicidal thoughts/behaviors in children, adolescents, and young adults.
- Serotonin Syndrome when used in combination with serotonergics.
- Increased risk of bleeding, especially when used with NSAIDs, aspirin, or other drugs that affect coagulation.
- Withdrawal symptoms with abrupt discontinuation.

Metabolized By
- Primarily metabolized by CYP2D6. Inhibits its own metabolism, CYP2D6.

Required Assessments
- Monitoring for emergence of suicidal ideation, especially at the beginning of treatment or when doses are adjusted.

Clinical Pearls
- **M**ay be beneficial for patients with anxiety disorders but requires caution in those who may be at risk for sedation-related issues.
- Higher risk of weight gain and withdrawal symptoms; gradual discontinuation is recommended.
- Paroxetine should be used cautiously in older adults and those with angle-closure glaucoma.
- DO NOT USE IF: the patient is taking an MAOI, thioridazine, pimozide, or tamoxifen.

Vilazodone

Viibryd/SSRI-SPARI

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Generalized Anxiety Disorder (GAD) (limited evidence), Obsessive-Compulsive Disorder (OCD) (limited evidence)

Dosing
- Initial: 10 mg once daily for 7 days
- Titration: Increase to 20 mg once daily for another 7 days
- Maintenance: Typically, 20-40 mg once daily
- Taken with food to enhance absorption

Side Effects
- Diarrhea, Nausea, Vomiting, Insomnia, Dizziness, Sexual dysfunction

Adverse Reactions
- Increased risk of suicidal thoughts and behaviors in children, adolescents, and young adults.
- Serotonin Syndrome, mainly when used with other serotonergic drugs.
- Risk of bleeding, primarily when used with NSAIDs, aspirin, or other drugs affecting coagulation.

Metabolized By
- Primarily metabolized by CYP3A4, with contributions from CYP2C19 and CYP2D6.

Required Assessments
- Monitoring for the emergence of suicidal ideation, especially during initial treatment or when changing doses
- Evaluation for signs of Serotonin Syndrome, particularly when combined with other serotonergic agents

Clinical Pearls
- Vilazodone must be taken with food to ensure adequate absorption and maximize efficacy.
- Dual-acting serotonin reuptake inhibitor plus 5HT1A partial agonist.
- It offers a potentially favorable side effect profile regarding weight gain and sexual side effects compared to other SSRIs, though individual responses vary.
- Close monitoring for signs of activation of mania or hypomania in patients with bipolar disorder is necessary.
- Nonresponse to vilazodone in elderly may require consideration of mild cognitive impairment or Alzheimer disease.

SSRIs

Key Points To Know

- Time to Therapeutic Effect: SSRIs may take approximately 6 weeks to achieve their full therapeutic effect. This delay is crucial for patient counseling regarding the effectiveness of the treatment.
- Tramadol Interactions: Tramadol, a pain medication, can increase the risk of seizures in patients already taking antidepressants.
- Interactions with TCAs: Mixing SSRIs with tricyclic antidepressants can make the side effects of tricyclics worse because it increases the amount of tricyclics in the blood.
- Serotonin Syndrome Risk: There is a significant risk of serotonin syndrome, a potentially fatal condition when SSRIs are combined with monoamine oxidase inhibitors (MAOIs). This syndrome is due to excessive accumulation of serotonin in the central nervous system.
- MAOI Guidelines: After discontinuing an SSRI, it is recommended to wait at least 5 half-lives of the drug before starting an MAOI to avoid interactions that could lead to serotonin syndrome.
- Increased Bleeding Risk: SSRIs, when combined with anticoagulants like warfarin or non-steroidal anti-inflammatory drugs (NSAIDs), can increase the risk of bleeding.
- Effectiveness of SSRIs with NSAIDs: NSAIDs may impair the effectiveness of SSRIs, potentially reducing the antidepressant's benefit.
- Children and Adolescents: The risks and benefits of pharmacological treatment versus non-treatment with antidepressants in children and adolescents must be carefully weighed and documented. Particular attention should be given to monitoring for the activation of suicidal ideation in this population.
- Pregnancy and Breastfeeding: Most SSRIs are categorized as Pregnancy Category C (Paroxetine is Category D), indicating that risk to the fetus cannot be ruled out. The use of SSRIs during breastfeeding should also be considered cautiously, with attention to the potential risks/benefits.
- Patient and Caregiver Education: Patients and their caregivers should be warned about the possibility of activating side effects, such as increased anxiety or agitation, especially early in treatment. They should be advised to report such symptoms immediately.
- Monitoring for Suicidal Ideation: It is crucial to monitor all patients, especially children and adolescents, for the activation of suicidal thoughts or behaviors, particularly in the early stages of treatment or during dosage adjustments.

Desvenlafaxine

Pristiq/SNRI

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Generalized Anxiety Disorder (GAD), Vasomotor symptoms associated with menopause, Neuropathic Pain Panic Disorder, Social Anxiety Disorder, Post-traumatic stress disorder (PTSD), Premenstrual dysphoric disorder (PMDD)

Dosing
- Standard starting dose: 50 to 100 mg once daily, with or without food.
- Some patients may benefit from doses up to 400 mg/day, although higher doses have not been shown to be more effective and may increase side effects.

Side Effects
- Nausea; Dry mouth; Dizziness; Sweating; Insomnia; Constipation; Sexual dysfunction; Increased blood pressure

Adverse Reactions
- Withdrawal syndrome: Notable if the medication is abruptly stopped.
- Suicidal thoughts and behavior in adolescents and young adults.
- Serotonin Syndrome: Particularly when combined with other serotonergic agents or MAOIs.

Metabolized By
- Primarily metabolized by UGT enzymes, with minimal involvement of the CYP3A4 enzyme.

Required Assessments
- Baseline assessment of depressive symptoms and periodic monitoring throughout treatment.
- Blood pressure monitoring due to potential for increases.
- Monitoring for suicidal ideation, especially during initial treatment phases or dose adjustments.

Clinical Pearls
- The risk of withdrawal symptoms necessitates a gradual tapering of the dose when discontinuing rather than abrupt cessation.
- Neutral effect on body weight compared to other antidepressants.
- Due to the risk of increased blood pressure, it may be less preferred in patients with uncontrolled hypertension.
- DO NOT USE IF: the patient has uncontrolled angle-closure glaucoma or if the patient is taking an MAOI.

Venlafaxine

Effexor, Effexor XR/SNRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), Social Anxiety Disorder (SAD), Panic Disorder

Off-Label Uses
- Neuropathic Pain, Obsessive-Compulsive Disorder (OCD), Post-Traumatic Stress Disorder (PTSD), Migraines (Prophylaxis), Vasomotor symptoms associated with menopause

Dosing
- The initial dose is 37.5 mg once daily (extended-release) or 25–50 mg divided into 2–3 doses (immediate-release) for a week, if tolerated. The daily dose is generally no faster than 75 mg every 4 days until the desired efficacy is reached. The max dose is generally 375 mg/day.
- Usually, try doses at 75 mg increments for a few weeks prior to incrementing by an additional 75 mg.

Side Effects
- Headache, nervousness, insomnia, sedation; Nausea, diarrhea, decreased appetite; Sexual dysfunction (abnormal ejaculation/orgasm, impotence); Asthenia, sweating; SIADH (syndrome of inappropriate antidiuretic hormone secretion); Hyponatremia; Dose-dependent increase in blood pressure

Adverse Reactions
- Suicidal thoughts/behaviors in children, adolescents, and young adults.
- Serotonin Syndrome when used with other serotonergic drugs or MAOIs.

Metabolized By
- Primarily metabolized by CYP2D6 to its active metabolite, desvenlafaxine, and CYP3A4.

Required Assessments
- Baseline and periodic monitoring of depressive or anxiety symptoms.
- Regular blood pressure and heart rate checks
- Monitoring for suicidal ideation.

Clinical Pearls
- Careful monitoring for blood pressure is recommended, particularly at higher doses.
- Gradual dose tapering is advised to minimize withdrawal symptoms, which can be particularly severe with venlafaxine.
- DO NOT USE IF: the patient has uncontrolled angle-closure glaucoma or if the patient is taking an MAOI.

Duloxetine

Cymbalta/SNRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), Diabetic Peripheral Neuropathic Pain, Fibromyalgia, Chronic Musculoskeletal Pain

Off-Label Uses
- Stress Urinary Incontinence (outside the US), Chronic Fatigue Syndrome, Chemotherapy-induced Peripheral Neuropathy, Osteoarthritis Pain

Dosing
- 40 to 60 mg/day in 1–2 doses for depression
- 60 mg once daily for diabetic peripheral neuropathic and fibromyalgia
- 60 mg once daily for generalized anxiety disorder
- 40 mg twice daily for stress urinary incontinence

Side Effects
- Nausea, Dry mouth, Sleepiness, Fatigue, Constipation, Increased sweating, Appetite changes

Adverse Reactions
- Suicidal thoughts/behaviors in children, adolescents, and young adults.
- Liver damage: Severe but rare, particularly in those with pre-existing liver conditions or those who consume substantial amounts of alcohol.
- Serotonin Syndrome: When combined with other serotonergic drugs.
- Increased blood pressure and heart rate.

Metabolized By
- Primarily metabolized by CYP1A2 and CYP2D6 in the liver.

Required Assessments
- Evaluation of depressive/anxiety symptoms before/during treatment.
- Blood pressure should be monitored before starting and periodically.
- Liver function tests before starting treatment, especially in patients with a history of liver disease or heavy alcohol use.

Clinical Pearls
- Duloxetine is effective for both psychiatric and pain conditions.
- It has a risk of increasing blood pressure, necessitating regular monitoring in patients with hypertension or cardiovascular risk.
- Abrupt discontinuation should be avoided.
- Caution is advised with significant alcohol use or liver disease.
- DO NOT USE IF: the patient has uncontrolled angle-closure glaucoma or if the patient is taking an MAOI.

Milnacipran

Savella/SNRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Generalized Anxiety Disorder (GAD), Social Anxiety Disorder (SAD), Panic Disorder

Off-Label Uses
- Neuropathic Pain, Obsessive-Compulsive Disorder (OCD), Post-Traumatic Stress Disorder (PTSD), Migraines (Prophylaxis), Vasomotor symptoms associated with menopause

Dosing
- The initial dose is 37.5 mg once daily (extended-release) or 25–50 mg divided into 2–3 doses (immediate-release) for a week, if tolerated. The daily dose is generally no faster than 75 mg every 4 days until the desired efficacy is reached. The max dose is generally 375 mg/day.
- Usually, try doses at 75 mg increments for a few weeks prior to incrementing by an additional 75 mg.

Side Effects
- Headache, nervousness, insomnia, sedation; Nausea, diarrhea, decreased appetite; Sexual dysfunction (abnormal ejaculation/orgasm, impotence); Asthenia, sweating; SIADH (syndrome of inappropriate antidiuretic hormone secretion); Hyponatremia; Dose-dependent increase in blood pressure

Adverse Reactions
- Suicidal thoughts/behaviors in children, adolescents, and young adults.
- Serotonin Syndrome when used with other serotonergic drugs or MAOIs.

Metabolized By
- Primarily metabolized by CYP2D6 to its active metabolite, desvenlafaxine, and CYP3A4.

Required Assessments
- Baseline and periodic monitoring of depressive or anxiety symptoms.
- Regular blood pressure and heart rate checks
- Monitoring for suicidal ideation.

Clinical Pearls
- Careful monitoring for blood pressure is recommended, particularly at higher doses.
- Gradual dose tapering is advised to minimize withdrawal symptoms, which can be particularly severe with venlafaxine.
- DO NOT USE IF: the patient has uncontrolled angle-closure glaucoma or if the patient is taking an MAOI.

Levomilnacipran

Fetzima/SNRI

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Fibromyalgia, Chronic/neuropathic pain syndromes

Dosing
- The initial dose is 20 mg once daily for 2 days, then increased to 40 mg once daily; it can be increased by 40 mg/day every 2 or more days. The maximum recommended dose is 120 mg once daily.

Side Effects
- Nausea, Constipation, Hyperhidrosis (excessive sweating), Increased heart rate, Erectile dysfunction, Vomiting, Palpitations

Adverse Reactions
- Hypertension or increased blood pressure, Urinary hesitation or retention, Seizures

Metabolized By
- Primarily metabolized by cytochrome P450 3A4 (CYP3A4), renally excreted.

Required Assessments
- Blood pressure and heart rate monitoring before initiation and periodically during treatment.
- Assessment of renal function, as dosing adjustments may be necessary for patients with severe renal impairment.
- Monitoring for signs of serotonin syndrome or neuroleptic malignant syndrome (NMS)-like reactions.

Clinical Pearls
- Use with caution in patients with a history of seizures and those with bipolar disorder unless treated with a concomitant mood-stabilizing agent.
- Use with caution in patients with controlled angle-closure glaucoma.
- Warn patients and their caregivers about the possibility of activating side effects.
- Monitor patients for activation of suicidal ideation, especially in children and adolescents.
- DO NOT USE IF: the patient has uncontrolled angle-closure glaucoma or is taking an MAOI.

SNRIs

Key Points To Know

- Time to Therapeutic Effect: SNRIs may take approximately 6 weeks to achieve their full therapeutic effect. This delay is crucial for patient counseling regarding the effectiveness of the treatment.
- Elderly patients may be more sensitive to side effects: increased blood pressure, hyponatremia, and falls due to sedation or orthostatic hypotension. Dosing should start low and be increased slowly.
- Tramadol Interactions: Tramadol, a pain medication, can increase the risk of seizures in patients already taking antidepressants.
- MAOI Guidelines: After discontinuing an SNRI, it is recommended to wait at least 5 half-lives of the drug before starting an MAOI to avoid interactions that could lead to serotonin syndrome.
- Pediatrics - safety and efficacy vary by drug and indication; some SNRIs are approved for use in children for conditions like anxiety and depressive disorders. The risk of suicidal thoughts and behaviors is increased in children, adolescents, and young adults.
- For patients with renal impairment, dose adjustments may be necessary due to decreased drug clearance.
- Patients with Hepatic Impairment: reduced metabolism can lead to increased drug levels and a heightened risk of side effects. Lower starting doses and cautious titration are advised.
- Pregnancy - SNRIs cross the placenta and can affect the fetus. Risks include preterm birth, low birth weight, and pulmonary hypertension in the newborn. Abrupt discontinuation or dose reduction should be avoided due to the risk of withdrawal symptoms in the mother and potential risks to the fetus. Excretion in Breast Milk - SNRIs are excreted in breast milk. While adverse effects in breastfed infants are rare, monitoring for side effects is recommended.
- Blood Pressure Monitoring – SNRIs can increase blood pressure and heart rate; regular monitoring is recommended, especially in patients with pre-existing hypertension or cardiovascular disease.
- Suicidal Ideation – all patients, especially those in high-risk groups, should be monitored for worsening depression and the emergence of suicidal thoughts and behaviors.
- Medication Interactions – SNRIs can interact with a wide range of medications, including other antidepressants, anticoagulants, and certain over-the-counter products, leading to adverse reactions like serotonin syndrome.

Amitriptyline

Elavil/TCA

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Neuropathic Pain; Migraine Prophylaxis; Chronic Pain Management; Fibromyalgia; Insomnia; Anxiety Disorders

Dosing
- For depression: The starting dose is typically 25 mg orally at bedtime; may increase by 25 mg gradually every 3-7 days; 75 mg/day in divided doses; increase to 150 mg/day; maximum 300 mg/day.
- Lower doses are often used for pain or migraine prophylaxis.

Side Effects
- Dry mouth, Sedation, Blurred vision, Constipation, Weight gain, Dizziness, Urinary retention, Tachycardia, Sexual dysfunction, Sweating, Rash, Itching

Adverse Reactions
- Cardiac arrhythmias; Orthostatic hypotension; Increased risk of suicidal thoughts and behavior; Paralytic ileus, hyperthermia (TCAs + anticholinergic agents); Lowered seizure threshold; Orthostatic hypotension; QTc prolongation; Hepatic failure; drug-induced parkinsonism; Increased intraocular pressure

Metabolized By
- Primarily metabolized by CYP1A2 and CYP2D6.

Required Assessments
- Baseline ECG (>50, history of QTc prolongation, arrhythmia, recent MI, HF, or taking pimozide, thioridazine, antiarrhythmics, moxifloxacin, sparfloxacin).
- Before treatment and assess for diabetes/dyslipidemia; monitor BMI.
- Baseline/periodic serum potassium and magnesium measurements.

Clinical Pearls
- Death may occur in overdose.
- Take it at bedtime to help with sleep and chronic pain.
- May benefit patients with IBS, especially the elderly.
- Add or initiate other antidepressants with caution for up to 2 weeks after discontinuing amitriptyline.
- TCAs can increase the QTc interval.
- Use with caution: bradycardic or taking beta-blockers, calcium channel blockers, clonidine, digitalis or are hypokalemic/hypomagnesemia or taking diuretics, stimulant laxatives, intravenous amphotericin B, glucocorticoids, tetracosactide).

Amoxapine

Asendin /TCA

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Anxiety Disorders, Bipolar Depression (limited evidence), Insomnia, Neuropathic/chronic pain

Dosing
- Initial dose of 25 mg 2–3 times/day; increase gradually to 100 mg 2–3 times/day or a single dose at bedtime; maximum 400 mg/day (may dose up to 600 mg/day in the inpatient setting).

Side Effects
- Dry mouth, Sedation, Constipation, Blurred vision, Dizziness, Nausea, Restlessness, Weight gain or loss, Sexual dysfunction, Sweating

Adverse Reactions
- Suicidal thoughts and behavior in children, adolescents, and young adults; Extrapyramidal symptoms and tardive dyskinesia, especially with high doses or long-term use; Neuroleptic Malignant Syndrome (NMS), seizures - rare but serious; Orthostatic hypotension; Cardiac arrhythmias; QTc prolongation.

Metabolized By
- Substrate for CYP2D6

Required Assessments
- Baseline ECG is recommended for patients over age 50.
- Monitor weight and BMI.
- Neurological assessment for tardive dyskinesia.
- Liver function and electrolyte tests before starting treatment and periodically thereafter.

Clinical Pearls
- Acts as both a TCA and a dopamine antagonist.
- Abrupt discontinuation should be avoided to minimize the risk of withdrawal symptoms; tapering off the medication gradually is recommended.
- Its use should be closely monitored in patients with a history of cardiovascular disease due to the potential for arrhythmias.
- Avoid the use of ETOH.

Desipramine

Norpramin/TCA

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Anxiety, Insomnia, Neuropathic Pain/Chronic Pain, Treatment-Resistant Depression

Dosing
- Depression: 100–200 mg/day, with initial doses starting at 25 mg/day at bedtime; dose can be increased by 25 mg every 3–7 days. The maximum dose is 300 mg/day.
- Chronic Pain: 50–150 mg/day.

Side Effects
- Blurred vision, Constipation, Urinary retention, Increased appetite, Dry mouth, Nausea, Diarrhea, Heartburn, Unusual taste in the mouth, Weight gain, Fatigue, Weakness, Dizziness, Sedation, Headache, Anxiety, Nervousness, Restlessness, Sexual dysfunction, Sweating

Adverse Reactions
- Paralytic ileus, hyperthermia (TCAs + anticholinergic agents); Lowered seizure threshold, rare seizures; Orthostatic hypotension, sudden death, arrhythmias, tachycardia, QTc prolongation; Hepatic failure, drug-induced parkinsonism, increased intraocular pressure; Blood dyscrasias, rare induction of mania, rare activation of suicidal ideation and behavior

Metabolized By
- Substrate for CYP450 2D6 and 1A2; is the active metabolite of imipramine, formed by demethylation via CYP450 1A2.
- Half-life approximately 24 hours; food does not affect absorption.

Required Assessments
- Baseline ECG for patients over age 50 due to risk of QTc prolongation.
- Monitor weight and BMI during treatment.
- Baseline and periodic serum potassium and magnesium measurements for patients at risk for electrolyte disturbances.

Clinical Pearls
- Less sedating and a more tolerable side effect profile than other TCAs; can benefit patients requiring daytime alertness.
- Valuable option for patients with comorbid pain and depression.
- Careful monitoring for cardiac effects, especially in older patients or those with pre-existing heart conditions.

Doxepin

Silenor/TCA

FDA Approved Indications
- Depression and/or Anxiety, Insomnia (Silenor for sleep maintenance), Dermatitis, and Lichen Simplex Chronicus (topical)

Off-Label Uses
- Anxiety, Neuropathic Pain/Chronic Pain, Treatment-Resistant Depression, Psychotic Depressive Disorders, Involutional Depression, Manic-Depressive Disorder

Dosing
- Depression/Anxiety: 75–150 mg/day; can increase gradually to a maximum of 300 mg/day.
- Insomnia: 3–6 mg at bedtime, not within 3 hours of a meal.
- Chronic Pain: 50–150 mg/day.
- Topical for Dermatitis/Lichen Simplex: Apply thin film 4 times a day.

Side Effects
- Sedative effects, dry mouth, constipation, blurred vision; Weight gain; Dizziness, sedation, hypotension; Topical: Burning, stinging, itching, swelling at the application site

Adverse Reactions
- Paralytic ileus, hyperthermia (with anticholinergic agents); Orthostatic hypotension, arrhythmias, tachycardia, QTc prolongation; Lowered seizure threshold, hepatic failure, drug-induced parkinsonism; Increased intraocular pressure, psychosis, mania, suicidality

Metabolized By
- Metabolized by CYP2D6; half-life approximately 8–24 hours.

Required Assessments
- Baseline ECG is recommended for certain populations.
- Signs of worsening depression or the emergence of suicidal thoughts.
- Regular monitoring for side effects, especially in patients at risk for cardiovascular issues.

Clinical Pearls
- Low-dose Doxepin (Silenor) for insomnia does not carry a risk of dependence or tolerance.
- Patients should be cautioned about potential interactions with alcohol and the need for dietary restrictions if combined with MAOIs.
- Doxepin may cause unique symptoms like photosensitivity or blue-green urine, which patients should be informed about.

Imipramine

Tofranil/TCA

FDA Approved Indications
- Major Depressive Disorder, Enuresis (bedwetting) in children

Off-Label Uses
- Chronic pain, Incontinence in adults, Vascular headache prophylaxis, Cluster headache, Insomnia, Adjunct for treatment-resistant depression

Dosing
- Depression: Adults: 75–150 mg/day, may increase gradually; max 300 mg/day; Geriatric: Start with 25 mg at bedtime, up to 100 mg/day; Children over 12 years: 25–50 mg/day; not to exceed 100 mg/day.
- **Enuresis**: Children ≥6 years: Start with 25 mg at bedtime, increase to 50 mg for children under 12 and up to 75 mg for older children if needed.

Side Effects
- Anticholinergic effects (dry mouth, constipation, urinary retention, blurred vision), Sedation, weight gain, dizziness; Nausea, diarrhea, unusual taste, Sexual dysfunction, sweating

Adverse Reactions
- Hypotension, arrhythmias, QTc prolongation; Seizures, especially in overdose, Suicidal thoughts, particularly in children and adolescents, Serotonin syndrome when combined with other serotonergic drugs

Metabolized By
- Liver, primarily via CYP2D6; forms active metabolite desipramine.

Required Assessments
- Monitor blood pressure and heart rate.
- Baseline ECG in patients over 50 or with cardiovascular disease.
- Regularly assess weight and BMI.
- Check for signs of suicidal ideation, especially during dose changes.

Clinical Pearls
- Caution in patients with a history of cardiovascular disease.
- Avoid abrupt withdrawal to prevent withdrawal symptoms.
- Not recommended for patients with recent myocardial infarction or those who are breastfeeding.
- Dosing at bedtime can help minimize daytime drowsiness.
- Imipramine should be used with extreme caution in combination with MAO inhibitors due to the risk of hypertensive crisis and serotonin syndrome. Ensure a washout period of at least 14 days.
- Monitor for and educate about possible interactions with OTC products and complementary therapies, such as St. John's wort, which may increase the risk of serotonin syndrome.

Nortriptyline

Pamelor/TCA

FDA Approved Indications
- Major Depressive Disorder

Off-Label Uses
- Chronic Neurogenic Pain, Anxiety Disorders, Insomnia

Dosing
- PO (Adults): 25 mg 3–4 times daily, up to 150 mg/day.
- PO (Geriatric Patients or Adolescents): 30–50 mg/day in divided doses or as a single dose.

Side Effects
- Drowsiness, Fatigue, Blurry vision, Dry eyes and mouth, Hypertension, Constipation, Arrhythmias, Weight gain

Adverse Reactions
- Cardiac arrhythmias, especially in patients with existing heart conditions

Contraindications
- Recent myocardial infarction, Narrow-angle glaucoma, Concomitant use with Monoamine Oxidase Inhibitors (MAOIs) or within 14 days of discontinuing an MAOI

Precautions
- Baseline and periodic electrocardiograms (ECGs) should be conducted in patients with cardiovascular disease.
- Use with caution in patients with a history of seizures.

Metabolized By
- Metabolized in the liver primarily by CYP2D6 enzyme.

Required Assessments
- Regular monitoring of cardiovascular status, especially in elderly patients or those with a history of cardiac disease.
- Monitor for symptoms of serotonin syndrome when used concurrently with other serotonergic drugs.

Clinical Pearls
- A valuable option for patients with depressive symptoms that are complicated by chronic pain conditions.
- Due to its anticholinergic effects, is not recommended for elderly patients.

Clomipramine

Anafranil/TCA

FDA Approved Indications
- Obsessive-Compulsive Disorder (OCD)

Off-Label Uses
- Major Depression, Treatment-resistant Depression, Anxiety Disorders, Neuropathic/Chronic Pain, Insomnia

Dosing
- PO (Adults): 25 mg once daily, ↑ over 2-wk period to 100 mg/day in divided doses. May be further ↑ over several wk up to 250–300 mg/day in divided doses; PO (Children >10 yr): 25 mg once daily initially, ↑ over 2-wk period to 3 mg/kg/day or 100 mg/day (whichever is smaller) in divided doses. May further ↑ to 3 mg/kg/day or 200 mg/day (whichever is smaller) in divided doses. Once stabilizing dose is reached, entire daily dose may be given at bedtime.

Side Effects
- Nausea, Dry mouth, Vomiting, Constipation, Headache

Adverse Reactions
- Increased risk of seizures, particularly at higher doses; Cardiac arrhythmias, especially in elderly patients

Precautions
- Baseline electrocardiogram (ECG) is recommended for patients over 50 years old and those with a history of cardiac disease; Caution is advised when performing tasks that require alertness.

Contraindications
- Concomitant use with MAOIs or within 14 days of discontinuing an MAOI due to the risk of SS and hypertensive crisis; History of seizures.

Metabolized By
- Primarily by the cytochrome P450 enzyme system, particularly CYP2D6..

Required Assessments
- Regularly assess for anticholinergic side effects.
- History of cardiovascular disease should have regular follow-up ECGs to monitor for potential arrhythmias.

Clinical Pearls
- Often a first-line treatment in cases where SSRIs are ineffective.
- Can be beneficial for patients with comorbid insomnia.
- Efficacy in treating neuropathic pain and chronic pain.
- Do not discontinue medication abruptly to avoid withdrawal symptoms.

Beers

Criteria 2024

The American Geriatrics Society (AGS) Beers Criteria provides guidelines for healthcare professionals to improve the safety of prescribing medications for older adults. It lists potentially inappropriate medications (PIMs) that pose higher risks than benefits for this population.

Key Components of the AGS Beers Criteria:

1. Potentially Inappropriate Medications (PIMs) in Older Adults:
   - Medications that should generally be avoided in older adults due to their risk of adverse effects outweighing the benefits.
2. Medications to Avoid in Older Adults with Specific Conditions:
   - Drugs that can exacerbate certain diseases or conditions. For example, avoiding NSAIDs in patients with chronic kidney disease or heart failure.
3. Medications to Use with Caution:
   - Medications that require careful consideration and monitoring due to their potential risks, but which may be appropriate for some.
4. Drug-Drug Interactions:
   - Combinations of medications that should be avoided or used with caution in older adults due to increased risk of harmful interactions.
5. Drug-Disease Interactions:
   - Medications that can worsen existing medical conditions. For instance, certain anticholinergic drugs can exacerbate dementia or cognitive impairment.
6. Medications to Avoid or Dose Adjust Based on Kidney Function:
   - Drugs that need dose adjustment or should be avoided in patients with reduced kidney function to prevent toxicity.

Anticholinergics
Antiarrhythmics
Antithrombotics
Antidepressants
Antipsychotics
Benzodiazepines
Non-benzodiazepine Hypnotics
Sulfonylureas, Long-acting
NSAIDs
Muscle Relaxants
Cardiovascular
Hormones
Pain Medications
Gastrointestinal
Endocrine

Aripiprazole

Abilify/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (ages 13 and older), Acute and mixed mania episodes associated with Bipolar I Disorder (ages 10 and older), Maintenance treatment of Bipolar I Disorder, Irritability associated with Autistic Disorder (ages 6-17), Tourette's Disorder (ages 6-18), As an adjunct for Major Depressive Disorder (adults)

Off-Label Uses
- Treatment-resistant depression

Dosing
- Detailed. See medication guidelines.
- Schizophrenia: PO (Adults): 10 or 15 mg once daily; doses up to 30 mg/day have been used; increments in dosing should not be made before 2 wk at a given dose. PO (Children 13–17 yr): 2 mg once daily; ↑ to 5 mg once daily after 2 days, and then to target dose of 10 mg once daily after another 2 days; may further ↑ dose in 5-mg increments if needed (max: 30 mg/day).
- Depression: PO (Adults): 2–5 mg once daily, may titrate upward at 1-wk intervals to 5–10 mg once daily (max: 15 mg/day).

Side Effects
- Nausea, Anxiety, Drowsiness, Constipation, Orthostatic hypotension (sudden drop in blood pressure when standing up), Increased salivation, Akathisia (restlessness)

Adverse Reactions
- Increased mortality in elderly patients with dementia-related psychosis (not approved for dementia-related psychosis), NMS

Metabolized By
- Primarily metabolized in the liver by CYP2D6 and CYP3A4 enzymes.

Required Assessments
- Monitor BMI and lipid profiles regularly; Blood glucose levels should be monitored, especially in patients with existing diabetes or those susceptible to diabetes; Assess blood pressure regularly due to the potential for orthostatic hypotension.

Clinical Pearls
- Aripiprazole has a unique mechanism of action as a partial agonist at dopamine D2 receptors.
- Cautious in patients with a history of seizures, cardiovascular disease, or conditions that could be exacerbated by drops in blood pressure.

Brexpiprazole

Rexulti/2 Antipsychotic

FDA Approved Indications
- Schizophrenia, Adjunctive treatment for Major Depressive Disorder

Off-Label Uses
- Acute and mixed episodes of mania associated with Bipolar Disorder, Other Psychotic Disorders, Bipolar Depression, Dementia-related behavioral disturbances

Dosing
- Detailed. See medication guidelines.
- Schizophrenia: PO (Adults): 1 mg once daily on Days 1–4, then ↑ to 2 mg once daily on Days 5–7, then ↑ to 4 mg once daily on Day 8 (not to exceed 4 mg once daily).
- PO (Children 13–17 yr): 0.5 mg once daily on Days 1–4, then ↑ to 1 mg once daily on Days 5–7, then ↑ to 2 mg once daily on Day 8. May ↑ dose by 1 mg/day on weekly basis (not to exceed 4 mg once daily).
- MDD: PO (Adults): 0.5 or 1 mg once daily initially, may be ↑ to 2 mg once daily (not to exceed 3 mg once daily).

Side Effects
- Increased appetite, Weight gain, Constipation, Akathisia (feeling of restlessness), Somnolence (excessive drowsiness), Abnormal dreams, Anxiety, Dizziness

Adverse Reactions
- Increased mortality in elderly patients with dementia-related psychosis (not approved for this indication); NMS; Tardive Dyskinesia (TD) - involuntary movements of the face, tongue, or other parts of the body. Discontinue if symptoms occur

Metabolized By
- Primarily metabolized by the liver through CYP3A4 and to a lesser extent CYP2D6 enzymes.

Required Assessments
- Monitor blood pressure (B/P) and complete blood count (CBC).
- Regularly monitor weight and Body Mass Index (BMI).

Clinical Pearls
- Brexpiprazole has a lower propensity for causing certain side effects compared to other atypical antipsychotics, such as less pronounced metabolic disturbances.
- It can be particularly useful in patients partially responsive or intolerant to other therapies due to its unique pharmacologic profile.

Cariprazine

Vraylar/2 Antipsychotic

FDA Approved Indications
- Schizophrenia, Acute treatment of manic or mixed episodes associated with Bipolar I Disorder, Bipolar Depression

Off-Label Uses
- Maintenance treatment of Bipolar Disorder, Treatment-Resistant Depression

Dosing
- Schizophrenia or Acute Treatment of Mania/Mixed Episodes Associated with Bipolar I Disorder: PO (Adults): 1.5 mg once daily; may ↑ to 3 mg once daily on Day 2; further dosage adjustments can be made in increments of 1.5 mg or 3 mg depending on response/tolerability (max dose = 6 mg once daily).
- Depressive Episodes Associated with Bipolar I Disorder or Adjunctive Treatment of MDD: PO (Adults): 1.5 mg once daily; may ↑ to 3 mg once daily on Day 15 depending on response/tolerability (max dose = 3 mg once daily).

Side Effects
- Extrapyramidal symptoms (EPS), including restlessness, tremors, muscle stiffness, Akathisia (restlessness), Weight gain, Hyperglycemia (high blood sugar), and Sedation

Adverse Reactions
- NMS
- Agranulocytosis - a severe decrease in white blood cells
- Orthostatic hypotension
- Increased mortality in elderly patients with dementia-related psychosis

Metabolized By
- Metabolized primarily by the liver using the CYP3A4 enzyme, with minor contribution from CYP2D6.

Required Assessments
- Monitor B/P and CBC regularly.
- Regularly monitor weight and Body Mass Index (BMI).

Clinical Pearls
- This medication requires gradual titration to minimize the risk of side effects, particularly EPS and akathisia.
- Careful consideration should be given when prescribing this drug to patients with a known cardiovascular disease or those who are prone to hypotension.
- Cariprazine's efficacy and side effects should be closely monitored during the initial weeks of treatment and periodically thereafter.

Chlorpromazine

Thorazine/1 Antipsychotic

FDA Approved Indications
- Schizophrenia, Nausea and Vomiting, Preoperative Anxiety, Psychosis, Combativeness in acute behavioral situations

Dosing
- PO (Adults): Psychoses: 10–25 mg 2–4 times daily; may ↑ by 20–50 mg every 3–4 days (usual dose is 200 mg/day; up to 1 g/day). Bipolar disorder: 10–25 mg 2–4 times daily; may ↑ by 20–50 mg every 3–4 days (usual dose range is 400–800 mg/day). Also available in IV/IM.

Side Effects
- Hypotension (especially orthostatic hypotension), Weight gain, Priapism (prolonged erection), Akathisia (restlessness), EPS, Dry eyes, Sedation, Blurred vision, Constipation, Dry mouth, Photosensitivity

Adverse Reactions
- NMS
- Agranulocytosis

Contraindications
- History of glaucoma, Bone marrow suppression, Severe liver disease, Black box warning for elderly patients with dementia-related psychosis due to an increased risk of death associated with its use.

Metabolized By
- Metabolized primarily in the liver; extensive first-pass metabolism.

Required Assessments
- Monitor blood pressure, pulse, and respirations regularly.
- CBC to detect early signs of blood dyscrasias or agranulocytosis.
- Liver Function Tests (LFTs) due to the risk of hepatotoxicity.
- Regular eye examinations due to the risk of ocular changes and to monitor for early signs of glaucoma.

Clinical Pearls
- Due to its sedative properties, chlorpromazine is often used in acute settings to manage agitation and violent behavior.
- It can cause significant orthostatic hypotension.
- Patients on chlorpromazine should be counseled on the importance of maintaining hydration and avoiding overheating, due to impaired perspiration from its anticholinergic effects.
- Long-term use is associated with an increased risk of developing TD.
- Sun protection is advised due to photosensitivity reactions; patients should wear protective clothing and apply sunscreen when outdoors.

Clozapine

Clozaril/2 Antipsychotic

FDA Approved Indications
- Treatment-resistant schizophrenia, Reduction of recurrent suicidal behavior in patients with schizophrenia or schizoaffective disorder

Dosing
- PO (Adults): 12.5 mg 1–2 times daily initially; ↑ by 25–50 mg/day over a period of 2 wk up to target dose of 300–450 mg/day. May then be ↑ by up to 100 mg/day once or twice weekly (not to exceed 900 mg/day). Treatment should be continued for at least 2 yr in patients with suicidal behavior.

Side Effects
- Hyper-salivation, Dizziness, Tachycardia, Sweating, Sedation, Significant weight gain, Diabetes

Adverse Reactions
- NMS, Seizures, Agranulocytosis, Myocarditis, and cardiomyopathy, Increased mortality in elderly patients with dementia-related psychosis

Contraindications
- Hypersensitivity to clozapine or any component of the formulation, Myeloproliferative disorders, Uncontrolled epilepsy, Severe central nervous system depression, or comatose states; Elderly patients, especially those with dementia-related psychosis

Metabolized By
- Liver, primarily metabolized by CYP1A2.

Required Assessments
- Regular blood tests to monitor for agranulocytosis.
- B/P and pulse should be regularly monitored.
- ANC must be monitored weekly for the first 6 months, every 2 weeks for the next 6 months, and monthly thereafter.
- BMI, fasting blood glucose (CBG), and lipid profiles due to metabolic syndrome risks.

Clinical Pearls
- Clozapine is considered the gold standard for treatment-resistant schizophrenia.
- It is the only antipsychotic indicated for reducing suicidal behavior in high-risk populations.
- Requires enrollment in a REMS program due to its risk of agranulocytosis, which necessitates regular monitoring of the ANC.
- Discontinuation ANC <1000/mcL.
- Immediately reporting symptoms of infection.

Haloperidol

Haldol/1 Antipsychotic

FDA Approved Indications
- Schizophrenia, Acute and chronic psychotic disorders, Tics, and vocal utterances of Tourette's disorder

Off-Label Uses
- Bipolar disorder (especially manic episodes), Delirium

Dosing
- PO (Adults): 0.5–5 mg 2–3 times daily. Patients with severe symptoms may require up to 100 mg/day; PO Geriatric Patients: 0.5–2 mg twice daily initially; may be gradually ↑ as needed; PO (Children 3–12 yr or 15–40 kg): 0.25–0.5 mg/day given in 2–3 divided doses; increase by 0.25–0.5 mg every 5–7 days; maximum dose: 0.15 mg/kg/day (up to 0.75 mg/kg/day for Tourette's syndrome or 0.15 mg/kg/day for psychoses). Also available in IM and IV.

Side Effects
- EPS, Akathisia, Galactorrhea (unexpected milk production and secretion), Blurred vision, Headache, Dry mouth

Adverse Reactions
- NMS - a life-threatening reaction that can cause high fever, muscle rigidity, and altered mental status; Seizures; Increased mortality in elderly patients with dementia-related psychosis

Contraindications
- Should not be used with alcohol due to increased CNS depression, Avoid concurrent use with lithium = encephalopathy.

Metabolized By
- Primarily in the liver, notably CYP3A4.

Required Assessments
- Monitor blood pressure, pulse, and respiration regularly.
- CBC with differential to detect potential blood disorders early.
- LFTs to monitor for hepatic impairment or damage.

Clinical Pearls
- It has a strong antiemetic effect and is often used in emergency settings to manage severe agitation.
- Lower doses should be considered initially.
- Patients on haloperidol should be closely monitored for metabolic changes, and preventive measures should be taken to minimize the risk of diabetes and lipid abnormalities.

Lurasidone

Latuda/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (ages 13 and up), Bipolar Depression (ages 10 and up)

Off-Label Uses
- Acute Mania, Treatment-Resistant Depression, Mixed Depression

Dosing
- Schizophrenia: PO (Adults): 40 mg once daily (not to exceed 160 mg once daily); PO (Children 13–17 yr): 40 mg once daily (not to exceed 80 mg once daily).
- Depressive Episodes Associated with Bipolar I Disorder: PO (Adults): 20 mg once daily (not to exceed 120 mg once daily); PO (Children 10–17 yr): 20 mg once daily (not to exceed 80 mg once daily).

Side Effects
- Somnolence (drowsiness), Akathisia (restlessness), Nausea, Parkinsonism (motor symptoms similar to those seen in Parkinson's disease, such as tremor, rigidity, bradykinesia), Agitation

Adverse Reactions
- Dizziness, Cognitive and motor impairment, Increased mortality in elderly patients with dementia-related psychosis

Contraindications
- Should not be taken with ketoconazole (strong CYP3A4 inhibitor) or rifampin (strong CYP3A4 inducer).

Metabolized By
- Metabolized primarily in the liver via the CYP3A4 enzyme.

Required Assessments
- Monitor for signs of hyperglycemia and diabetes.
- Regularly monitor weight gain and manage diet and exercise.
- Check for orthostatic hypotension and syncope signs, especially upon initiation and dose adjustment.
- Assess for seizures in patients with a history of seizure disorders.
- Closely monitor for suicidal ideation, particularly in younger age groups and during initial treatment phases.

Clinical Pearls
- Take with food (at least 350 calories) to enhance absorption.
- Regular psychiatric assessments are recommended to monitor for effectiveness and any emergence of depressive or manic symptoms, especially in patients with bipolar disorder.

Olanzapine

Zyprexa/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (ages 13 and older), Acute Mania and Mixed Episodes associated with Bipolar I Disorder (ages 13 and older), Maintenance treatment of Bipolar Disorder

Off-Label Uses
- Behavioral issues and impulsivity, Treatment-resistant depression

Dosing
- Detailed. See medication guidelines. Also available in IM.
- Schizophrenia: PO (Adults – Most Patients): 5–10 mg/day initially; may ↑ at weekly intervals by 5 mg/day (not to exceed 20 mg/day); PO (Children 13–17 yr): 2.5–5 mg/day initially; may ↑ at weekly intervals by 2.5–5 mg/day.
- Acute Manic or Mixed Episodes Associated With BD 1: PO (Adults): 10–15 mg/day initially (use 10 mg/day when used with lithium or evaporate); may ↑ every 24 hr by 5 mg/day (not to exceed 20 mg/day); PO (Children 13–17 yr): 2.5–5 mg/day initially; may ↑ by 2.5–5 mg/day.

Side Effects
- Dizziness, Agitation, Sedation, Orthostatic hypotension, Constipation, Significant weight gain, EPS, NMS

Adverse Reactions
- Increased mortality in elderly patients with dementia-related psychosis

Contraindications
- Should not be taken with ketoconazole (strong CYP1A2 inhibitor) or rifampin (strong CYP1A2 inducer).

Metabolized By
- Metabolized primarily in the liver via the CYP1A2 enzyme.

Required Assessments
- Monitor blood glucose levels and manage for signs of hyperglycemia.
- Regular monitoring of BMI and weight gain.
- CBC and LFTs to detect potential blood and liver issues.
- Blood pressure, pulse, and respiratory rate should be regularly checked.
- ECG monitoring in patients with pre-existing heart conditions.

Clinical Pearls
- One of the fastest-acting antipsychotics.
- It has a notable risk for metabolic disturbances.
- Olanzapine should be used with caution in patients with a history of seizures or conditions predisposing them to seizures.

Paliperidone

Invega/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (ages 12 and older), Schizoaffective Disorder

Off-Label Uses
- Bipolar Disorder, Behavioral disturbances related to Dementia

Dosing
- Detailed. See medication guidelines. Also available in IM
- Schizophrenia: PO (Adults): 6 mg once daily; may titrate by 3 mg/day at intervals of at least 5 days (range 3–12 mg/day); PO (Children 12–17 yr): 3 mg once daily; may titrate by 3 mg/day at intervals of at least 5 days (not to exceed 6 mg if <51 kg or 12 mg if ≥51 kg).
- Schizoaffective Disorder: PO (Adults): 6 mg/day; may titrate by 3 mg/day at intervals of at least 4 days (range 3–12 mg/day).

Side Effects
- Somnolence (excessive drowsiness), Orthostatic hypotension (sudden drop in blood pressure upon standing), Akathisia (restlessness), EPS, Parkinsonism-like movements, Hyperprolactinemia, Hyper-salivation

Adverse Reactions
Increased mortality in elderly patients with dementia-related psychosis, QT interval prolongation,
Contraindications
- Caution in patients with reduced renal function due to decreased clearance of the drug, Avoid use in combination with other drugs known to prolong the QT interval

Metabolized By
- Primarily excreted unchanged in the urine and has minimal hepatic (CYP2D6 and 3A4) metabolism.

Required Assessments
- Monitor BMI, fasting glucose, and lipid profiles, and renal function.
- Regular cardiovascular monitoring may be required due to the risk of orthostatic hypotension and QT prolongation.
- Monitor prolactin levels (sexual dysfunction, menstrual irregularities, or long-term osteoporosis).

Clinical Pearls
- Paliperidone is the active metabolite of risperidone.
- It is available in both oral and extended-release injectable forms.
- Due to its potential for prolonging the QT interval, a baseline ECG is recommended, particularly in patients with cardiac history or concurrent use of other QT-prolonging drugs.

Quetiapine

Seroquel/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (acute treatment for ages 13-17; maintenance for adults), Bipolar Disorder (acute mania episodes ages 13-17; maintenance for adults), MDD (as adjunctive therapy for adults)

Off-Label Uses
- Treatment-resistant anxiety, Insomnia

Dosing
- Detailed. See medication guidelines. Available in XR and immediate.
- Schizophrenia: PO (Adults): Extended release: 300 mg once daily, ↑ by 300 mg/day (not to exceed 800 mg/day); PO (Children 13–17 yr): Immediate release: 25 mg twice daily on Day 1, ↑ to 50 mg twice daily on Day 2, then ↑ to 100 mg twice daily on Day 3, then ↑ to 150 mg twice daily on Day 4, then ↑ to 200 mg twice daily on Day 5; may then ↑ by no more than 100 mg/day (not to exceed 800 mg/day).
- Depression: PO (Adults): ER: 50 mg once daily on Days 1 and 2, then ↑ to 150 mg once daily starting on Day 3 (not to exceed 300 mg/day).

Side Effects
- Dizziness, Headache, Somnolence (excessive drowsiness), Significant weight gain, Diabetes, NMS, Seizures

Adverse Reactions
- Increased mortality in elderly patients with dementia-related psychosis

Contraindications
- Contraindicated during lactation as it can pass into breast milk and potentially harm a nursing infant.

Metabolized By
- Metabolized in the liver primarily by CYP3A4.

Required Assessments
- B/P and pulse should be monitored, especially during titration.
- Regular monitoring of blood glucose levels and lipid profiles.
- Regular psychiatric assessments to monitor for effectiveness and any emergence of depressive or manic symptoms.

Clinical Pearls
- Its sedative properties make it useful for managing sleep disturbances.
- Due to the risk of weight gain and diabetes, lifestyle interventions such as dietary counseling and regular physical activity should be initiated.
- A baseline ECG may be considered in patients with cardiovascular risk factors due to the potential for heart rhythm disturbances.

Risperidone

Risperdal/2 Antipsychotic

FDA Approved Indications
- Schizophrenia (ages 13 and up), Bipolar Mania (acute or mixed episodes), Irritability associated with autistic disorder (ages 5 and up)

Off-Label Uses
- Bipolar Depression, Impulsivity in various contexts, Behavioral disturbances related to dementia and in children

Dosing
- Detailed. See medication guidelines. Available in IM and SUBQ.
- Schizophrenia: PO (Adults): 1 mg twice daily, ↑ by 1–2 mg/day no more frequently than every 24 hr to 4–8 mg daily; PO (Children 13–17 yr): 0.5 mg once daily, ↑ by 0.5–1.0 mg no more frequently than every 24 hr to 3 mg daily. May administer half the daily dose twice daily if drowsiness persists.
- Acute Manic or Mixed Episodes Associated With BD 1: PO (Adults): 2–3 mg/day as a single daily dose, dose may be ↑ at 24-hr intervals by 1 mg (range 1–5 mg/day).

Side Effects
- Sedation; Weight gain; Increased prolactin levels, leading to possible galactorrhea, amenorrhea, and gynecomastia; Rhinitis; EPS; Dizziness; Aggression; Insomnia; Skin rash; Changes in libido; NMS

Adverse Reactions
- EPS can be common, especially at higher doses; Severe orthostatic hypotension; QT prolongation on ECG

Contraindications
- Caution in patients with a history of seizures

Metabolized By
- Primarily by CYP2D6; the pathway can be affected by both inducers and inhibitors of this enzyme.

Required Assessments
- Monitor B/P and pulse, especially during titration.
- Monitor BMI, fasting blood glucose levels, and lipid profiles.
- Assess for signs of EPS and TD.
- Evaluate prolactin levels if symptoms of increased prolactin occur.

Clinical Pearls
- More likely than some other atypical antipsychotics to cause EPS.
- Risperidone can be used effectively in children for certain indications.
- The potential for weight gain and associated metabolic issues.

Ziprasidone

Geodon/2 Antipsychotic

FDA Approved Indications
- Schizophrenia, Acute Agitation in Schizophrenia (intramuscular injection), Bipolar Disorder (treatment of manic and mixed episodes, and as maintenance therapy)

Dosing
- Detailed. See medication guidelines.
- Schizophrenia: PO (Adults): 20 mg twice daily initially; dose increments may be made at 2-day intervals up to 80 mg twice daily. IM (Adults): 10–20 mg as needed up to 40 mg/day; may be given as 10 mg every 2 hr or 20 mg every 4 hr.
- Acute Manic or Mixed Episodes Associated with BD 1: PO (Adults): 40 mg twice on first day, then 60 or 80 mg twice daily on 2nd day, then 40–80 mg twice daily.

Side Effects
- Dizziness, EPS, Drowsiness, Nausea, Prolonged QT interval on EKG, NMS

Adverse Reactions
- Prolonged QT interval, which can lead to serious cardiac arrhythmias; NMS, a life-threatening reaction that includes hyperthermia, muscle rigidity, and altered mental status

Caution
- Increased mortality in elderly patients with dementia-related psychosis, Risk for falls, Must be taken with at least 500 calories to ensure adequate absorption, Avoid concurrent use with CNS depressants due to the potential for additive sedative effects
- Contraindicated during lactation as it can pass into breast milk and potentially harm a nursing infant

Metabolized By
- Primarily by the liver through CYP3A4 enzymes.

Required Assessments
- Regular EKGs to monitor for prolongation of the QT interval.
- Monitor B/P and pulse, especially during initiation and dose changes.
- Regularly assess BMI, fasting glucose levels, and lipid profiles.

Clinical Pearls
- Ziprasidone is unique among atypical antipsychotics for its relatively lower risk of weight gain and metabolic disturbances.
- It requires a high-calorie meal for optimal absorption.
- Given its risk of QT prolongation, ziprasidone should be used cautiously.
- Careful consideration of cardiac risk factors.

Fluphenazine

Prolixin/1 Antipsychotic

FDA Approved Indications
- Psychotic Disorders, Schizophrenia, Chronic Schizophrenia

Dosing
-

Side Effects
- Extrapyramidal symptoms (EPS), Photosensitivity, Sedation, Tardive dyskinesia, Agranulocytosis (severe drop in white blood cells)

Adverse Reactions
- NMS, Prolonged QT interval leading to arrhythmias

Contraindications
- Severe liver disease, Severe cardiovascular disease, Concurrent use with Pimozide, History of glaucoma, Bone marrow depression

Metabolized By
- Metabolized primarily by the liver, particularly CYP2D6.

Required Assessments
- Regularly monitor B/P, pulse, and respirations.
- ECG monitoring is recommended to detect changes in cardiac conduction, particularly QT prolongation.
- Monitor for signs of agranulocytosis, such as fever, sore throat, and other signs of infection, and perform regular CBCs.
- Assess for the development of EPS and tardive dyskinesia.

Clinical Pearls
- Patients should be educated about the potential for photosensitivity and advised to use sunscreen and protective clothing when exposed to sunlight.
- Given the risk of tardive dyskinesia with long-term use, patients should be regularly evaluated for involuntary movements, and alternative treatments should be considered if symptoms develop.
- Has a high potential for causing EPS, so concurrent use of anticholinergic medications may be necessary.
- The medication can cause significant sedation, which may impact daily functioning.
- Due to the risk of agranulocytosis, patients should be informed about the importance of reporting signs of infection promptly.

Antipsychotics

Key Points To Know

- Mechanism of Action: Blocks dopamine receptors in the brain; alters dopamine release and turnover.
- Peripheral Effects: Anticholinergic properties; alpha-adrenergic blockade.
- Hypersensitivity: Possible cross-sensitivity among phenothiazines.
- Contraindications: Angle-closure glaucoma and CNS depression
- Precautions: Symptomatic cardiac disease; Exposure to temperature extremes; Severely ill or debilitated patients; Respiratory insufficiency, diabetes, prostatic hypertrophy, or intestinal obstruction; May decrease seizure threshold
- Specific Drug Warnings: Clozapine may cause agranulocytosis.
- Potential Adverse Effects: Neuroleptic malignant syndrome; Akathisia, extrapyramidal side effects, parkinsonian effects, dystonia, tardive dyskinesia
- Drug Interactions: Additive hypotension with alcohol, antihypertensives, nitrates; Phenobarbital may increase metabolism and decrease effectiveness; Additive CNS depression with other CNS depressants; Lithium may decrease blood levels and effectiveness of phenothiazines; May decrease therapeutic response to levodopa; Increased risk of agranulocytosis with antithyroid agents
- Monitoring: Mental status (orientation, mood, behavior); BP, heart rate, respiratory rate (frequently during dosage adjustment); Akathisia, extrapyramidal side effects, parkinsonian effects, dystonia, tardive dyskinesia, neuroleptic malignant syndrome
- Patient Instructions:
  - Take medication exactly as directed
  - Do not skip doses or double up on missed doses
  - Abrupt withdrawal can cause withdrawal symptoms
  - Change positions slowly to avoid orthostatic hypotension
  - Avoid driving or other activities requiring alertness until response is known
  - Avoid alcohol and other CNS depressants
  - Use sunscreen and protective clothing to prevent photosensitivity
  - Avoid temperature extremes
  - Increase dietary fiber, fluids, and activity to minimize constipation
  - Maintain good oral hygiene to minimize dry mouth
  - Notify healthcare professional of all medications before treatment or surgery
  - Routine follow-up exams and continued participation in psychotherapy are important

Bupropion

Wellbutrin/NDRI

FDA Approved Indications
- Major Depressive Disorder (MDD), Seasonal Affective Disorder (SAD), Smoking Cessation Aid

Off-Label Uses
- Management of Sexual Dysfunction, ADHD

Dosing
- Detailed. See medication guidelines. Available in IR and 12 or 24 hour XR.
- Depression: PO (Adults): IR: 100 mg twice daily initially; after 3 days may ↑ to 100 mg 3 times daily; after at least 4 wk of therapy, may ↑ up to 450 mg/day in divided doses; 24–hr extended-release (Wellbutrin XL): 150 mg once daily in the morning, may be ↑ after 4 days to 300 mg once daily; some patients may require up to 450 mg/day.

Side Effects
- Weight loss, Insomnia, Agitation, Dizziness

Adverse Reactions
- Increased risk of seizures

Contraindications
- History of eating disorders such as bulimia or anorexia due to the increased risk of seizures; Patients undergoing abrupt discontinuation of alcohol or sedatives (including benzodiazepines)

Metabolized By
- Primarily metabolized in the liver through the CYP2B6 enzyme.

Required Assessments
- Monitor for changes in mood, behavior, or suicidal ideation, especially during the early phases of treatment or during dose changes.
- Regular assessment of blood pressure, as bupropion can cause hypertension in some cases.

Clinical Pearls
- It is often used as an adjunct in patients with depression who have not responded fully to other antidepressants.
- Due to its stimulating effects, bupropion is useful in patients with depressive symptoms that include lethargy and hypersomnia.
- Take earlier in the day to minimize the risk of insomnia.
- It is important to avoid use in patients with a high risk of seizures, including those with a history of head trauma, brain tumor, or severe hepatic cirrhosis, and eating disorders.
- Patients should be advised not to consume alcohol during treatment.

Trazodone

Desyrel/SARI

FDA Approved Indications
- Depression

Off-Label Uses
- Insomnia, Anxiety

Dosing
- Depression: PO (Adults): 150 mg/day in 3 divided doses; ↑ by 50 mg/day every 3–4 days until desired response (not to exceed 400 mg/day in outpatients or 600 mg/day in hospitalized patients); PO Geriatric Patients: 75 mg/day in divided doses initially; may be ↑ every 3–4 days.
- Insomnia: PO (Adults): 25–100 mg at bedtime.

Side Effects
- Sedation (commonly used therapeutically for insomnia), Nausea, Vomiting, Edema, Dry mouth, Orthostatic hypotension, Blurred vision, Lightheadedness

Adverse Reactions
- Priapism (a prolonged and painful erection that is a medical emergency), Sexual dysfunction, Serotonin Syndrome

Contraindications
- Concomitant use with alcohol (ETOH) as it may enhance CNS depressant effects

Caution
- Increased mortality in elderly patients with dementia-related psychosis, Risk for falls, Must be taken with at least 500 calories to ensure adequate absorption, Avoid concurrent use with CNS depressants due to the potential for additive sedative effects

Metabolized By
- Metabolized primarily in the liver by CYP3A4.

Required Assessments
- Monitor blood pressure regularly.
- Assess for signs of serotonin syndrome.
- Assess for sexual side effects, including symptoms of priapism.

Clinical Pearls
- Trazodone is often prescribed for sleep due to its sedative effects.
- Caution should be exercised when prescribing trazodone to individuals with a history of cardiac arrhythmias.

Mirtazapine

Remeron/NaSSA

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Generalized Anxiety Disorder (GAD), Post-Traumatic Stress Disorder (PTSD), Panic Disorder

Dosing
- PO (Adults): 15 mg/day as a single bedtime dose initially; may be ↑ every 1–2 wk up to 45 mg/day.

Side Effects
- Weight gain, Sedation, Constipation, Dry mouth, Increased appetite, Hypotension

Adverse Reactions
- Increased risk of suicidal ideation and behavior, particularly in children, adolescents, and young adults under 24 years old during initial treatment phases

Contraindications
- Concomitant use with Monoamine Oxidase Inhibitors (MAOIs) can result in serious, sometimes fatal, reactions due to the risk of serotonin syndrome; Use with caution in patients with a history of seizures

Metabolized By
- Metabolized primarily in the liver by CYP2D6, CYP1A2, and CYP3A4.

Required Assessments
- Monitor weight and appetite due to significant potential for weight gain.
- Regular assessment for signs of orthostatic hypotension.
- Mental health status should be monitored closely, especially for worsening depression or emergence of suicidal thoughts and behaviors.

Clinical Pearls
- Mirtazapine is more sedating at lower doses.
- Appetite-stimulating effects can be beneficial in patients who have depression with significant weight loss or anorexia.
- Educate patients about the risk of sudden drop in blood pressure when standing up from sitting or lying positions.
- Mirtazapine should not be discontinued abruptly due to the risk of withdrawal symptoms; it should be tapered.

Vilazodone

Viibryd/SPARI

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Anxiety, Obsessive-Compulsive Disorder (OCD)

Dosing
- PO (Adults): 10 mg once daily for one wk, then 20 mg once daily for one wk; dose may be ↑ to 40 mg once daily (recommended dose = 20–40 mg/day). Concurrent use of strong CYP3A4 inhibitors: not to exceed 20 mg/day; Concurrent use of strong CYP3A4 inducers (if used for >14 days): may need to ↑ dose up to 2-fold (daily dose should not exceed 80 mg).

Side Effects
- Nausea, Diarrhea, Vomiting, Sweating, Dry mouth, Headache, Sexual dysfunction

Adverse Reactions
- Risk of suicidal thoughts and behaviors, especially in young adults, teenagers, and children, Serotonin Syndrome

Metabolized By
- Metabolized in the liver primarily by CYP3A4.

Required Assessments
- Monitor mental status to assess for signs of worsening depression or emergent suicidal thoughts and behaviors.
- Monitor for signs of gastrointestinal upset, particularly nausea and diarrhea, which can be significant shortly after initiation.
- Assess sexual function due to the common side effect of sexual dysfunction, discussing openly as this may impact compliance.

Clinical Pearls
- Vilazodone should be taken with food to enhance absorption and decrease gastrointestinal side effects.
- Starting dose and titration need to be managed carefully to minimize side effects, especially gastrointestinal ones.
- Given its profile, vilazodone is a viable option for patients who have not responded adequately to other antidepressants or those who experience significant sexual side effects from other medications.

Valproic Acid

Depakote/Anticonvulsant

FDA Approved Indications
- Acute Mania associated with Bipolar Disorder, Complex Partial Seizures, Migraine Prophylaxis

Off-Label Uses
- Bipolar Depression, Maintenance treatment of Bipolar Disorder, Adjunctive treatment in psychosis and schizophrenia

Dosing
- Detailed. See medication guidelines. Available in IM as well.
- BD: PO (Adults): Depakote: Initial dose of 750 mg/day in divided doses initially, titrated rapidly to desired clinical effect or trough plasma levels of 50–125 mcg/mL (not to exceed 60 mg/kg/day). Depakote ER: Initial dose of 25 mg/kg once daily; titrated rapidly to desired clinical effect of trough plasma levels of 85–125 mcg/mL (not to exceed 60 mg/kg/day).

Side Effects
- Sedation, Tremors, Abdominal pain, Weight gain, Hair loss, Thrombocytopenia (low platelet count, dose-related and reversible)

Adverse Reactions
- Hepatotoxicity, Pancreatitis, Polycystic Ovarian Syndrome (PCOS) in women, Teratogenic effects

Important Interactions
- When used with lamotrigine, valproic acid can increase the risk of lamotrigine-induced rash, including serious skin reactions; lamotrigine dose should be reduced by 50% when co-administered with valproic acid.

Metabolized By
- Primarily metabolized via the glucuronidation pathway, which is mediated by the enzyme UDP-glucuronosyltransferase (UGT), leading to the formation of valproate glucuronide

Required Assessments
- Regular monitoring of blood levels.
- LFTs are critical before starting therapy and periodically thereafter.
- Monitoring for signs of pancreatitis and thrombocytopenia.
- Females of childbearing age should discuss potential risks due to teratogenic effects and the possibility of PCOS.

Clinical Pearls
- Patients should be counseled on diet and exercise.

Lithium

Eskalith/Mood Stabilizer

FDA Approved Indications
- Bipolar Disorder (for the treatment of manic episodes and maintenance)

Off-Label Uses
- Bipolar Depression, MDD as adjunct therapy, Neutropenia

Dosing
- Detailed. See medication guidelines.
- PO (Adults and Children >12 yr): Extended-release tablets: 450–900 mg twice daily or 300–600 mg 3 times daily initially; usual maintenance dose is 450 mg twice daily or 300 mg 3 times daily.

Side Effects
- Nausea, Diarrhea, Vomiting, Edema, Sedation, Fine tremor, Polyuria, Excessive thirst, Acne, Hypothyroidism

Adverse Reactions
- Lithium toxicity

Precautions
- Cardiac malformations (Ebstein's anomaly) and babies with increased birth weight.

Contraindications
- Concomitant use with haloperidol is discouraged due to the risk of toxic encephalopathy.

Metabolized By
- Lithium is not metabolized but is excreted primarily through the kidneys.

Required Assessments
- Regular monitoring of lithium serum levels is essential to avoid toxicity.
- Target Levels: Acute Mania: 0.8-1.2 mEq/L; Maintenance: 0.6-1.2 mEq/L; Toxicity occurs at levels >1.5 mEq/L
- Monitor kidney and thyroid function
- Regularly monitor WBC, electrolytes, glucose, ECG, and BMI.
- Lithium levels should be checked 5-7 days after starting treatment or after any dosage change, and every 3-6 months during maintenance.

Clinical Pearls
- Clinically proven to reduce suicidality
- First-line treatment for bipolar mania
- Patients should be advised to maintain consistent sodium and fluid intake to prevent lithium toxicity.

Lamotrigine

Lamictal/Anticonvulsant

FDA Approved Indications
- Bipolar I Disorder (maintenance treatment to delay the time to occurrence of mood episodes in patients treated for acute mood episodes with standard therapy)

Off-Label Uses
- Bipolar Depression, Bipolar Mania, MDD, Adjunctive therapy in the treatment of Psychosis and Schizophrenia

Dosing
- Detailed. See medication guidelines.
- BD: PO (Adults): 25 mg once daily for first 2 wk, then 50 mg once daily for next 2 wk, then 100 mg once daily for 1 wk, then 200 mg once daily

Side Effects
- Dizziness, Headache, Nausea, Sedation

Adverse Reactions
- Stevens-Johnson Syndrome (SJS): A severe and potentially life-threatening skin reaction characterized by painful red or purplish rash that spreads and blisters, causing the top layer of skin to die and shed; Cough; Mucosal lesions

Precautions
- Monitor closely for signs of rash, especially within the first 2 to 8 weeks of treatment or when increasing the dosage. Discontinue if rash occurs.
- The risk of serious skin reactions from SJS is increased in the early stages of treatment and with higher than recommended starting doses or faster dose escalation.

Metabolized By
- Primarily by the liver through glucuronic acid conjugation.

Required Assessments
- Monitor for signs of hypersensitivity reactions, especially skin rashes, which may necessitate discontinuation of treatment.

Clinical Pearls
- Lamotrigine is notable for its efficacy in managing and preventing bipolar depression without inducing mania.
- Dosing must be carefully titrated to minimize the risk of adverse effects.
- Interactions with other drugs, such as valproate.
- Educate patients about the signs and symptoms of SJS.
- Often preferred for long-term treatment.

Carbamazepine

Tegretol/Anticonvulsant

FDA Approved Indications
- Partial Seizures, Generalized Tonic-Clonic (Grand Mal) Seizures, Acute Manic and Mixed Episodes associated with Bipolar Disorder

Off-Label Uses
- Bipolar Depression, Maintenance treatment of Bipolar Disorder, Adjunctive therapy for Psychosis and Schizophrenia

Dosing
- Detailed. See medication guidelines.
- Acute Manic or Mixed Episodes Associated with BD 1: PO (Adults): 200 mg twice daily; ↑ by 200 mg/day until optimal response is achieved; not to exceed 1600 mg/day.

Side Effects
- Sedation, Dizziness, Nausea, Headache, Vomiting

Adverse Reactions
- SJS, TEN, Blood dyscrasias such as aplastic anemia and agranulocytosis

Precautions
- Testing for the HLA-B*1502 allele is recommended in patients with Asian ancestry before starting treatment, as it is associated with an increased risk of developing severe skin reactions like SJS and TEN.

Metabolized By
- Primarily by CYP3A4; induces its own metabolism (auto-induction) leading to variable plasma levels.

Required Assessments
- Therapeutic drug monitoring is essential, with a target plasma concentration range of 4-12 mg/mL.
- CBC, platelets, and reticulocytes should be monitored before therapy, at six weeks, three months, and periodically thereafter.
- Monitor for signs of liver dysfunction and changes in skin integrity.

Clinical Pearls
- Due to auto-induction, dosage adjustments may be required.
- Interacts with a wide array of drugs by inducing liver enzymes.
- Patients should report any signs of fever, sore throat, rash, or unusual bleeding or bruising.
- Caution with a history of cardiac, hepatic, or renal impairment.
- Avoid grapefruit juice to prevent fluctuations in drug levels and potential interactions.

Oxcarbazepine

Trileptal/Anticonvulsant

FDA Approved Indications
- Partial Seizures

Off-Label Uses
- Bipolar Disorder

Dosing
- Detailed. See medication guidelines (especially for IR and children).
- Adjunctive therapy or monotherapy (extended-release): 600 mg once daily for 1 wk; may ↑ by 600 mg/day at weekly intervals up to 1200–2400 mg once daily

Side Effects
- Sedation, Headache, Nausea, Dizziness, Ataxia, Vomiting

Adverse Reactions
- Hyponatremia; Risk of SJS and TEN, especially in patients with a history of these reactions to carbamazepine or those who are HLA-B*1502 allele positive

Metabolized By
- Metabolized in the liver to its active metabolite, monohydroxy derivative (MHD), primarily via cytosolic enzymes and not by CYP450, which minimizes interactions with drugs metabolized by CYP enzymes.

Required Assessments
- Monitor sodium levels regularly, especially during the first few months of treatment or after any dosage adjustments.
- Be vigilant for signs and symptoms of severe skin reactions, and discontinue oxcarbazepine if signs and symptoms suggestive of SJS or TEN occur.

Clinical Pearls
- Oxcarbazepine is a structural derivative of carbamazepine.
- Patients should be educated about the signs of low sodium like headache, confusion, seizures, and increased seizure frequency, especially if they are on other medications that lower sodium levels.
- Inform patients of the early signs of severe skin reactions and advise them to report any rash immediately, particularly in the initial stages of treatment or following a dosage increase.
- Despite its benefits, caution should be exercised when switching from carbamazepine to oxcarbazepine in patients who have had hypersensitivity reactions to carbamazepine, as cross-reactivity may occur.

Mood

Things to Remember

Before Prescribing:

1. Comprehensive Evaluation:
   - Conduct a thorough psychiatric and medical history.
   - Assess for comorbid conditions (e.g., anxiety, substance use).
2. Baseline Measurements:
   - Obtain baseline weight, blood pressure, and lab tests (e.g., complete blood count, liver function tests, kidney function tests).
3. Specific Medication Considerations:
   - Lithium: Check thyroid function, renal function, and electrolyte levels.
   - Valproic Acid: Assess liver function and platelet count.
   - Carbamazepine: Obtain liver function tests, complete blood count, and consider HLA-B*1502 testing in patients of Asian descent to assess the risk for Stevens-Johnson syndrome.
4. Screen for Pregnancy:
   - Evaluate pregnancy status and discuss the risks of mood stabilizers during pregnancy.
5. Patient and Family Education:
   - Discuss potential benefits and risks of medication.
   - Importance of adherence and the need for regular monitoring.
6. Medication Interactions:
   - Review current medications to assess for potential drug interactions.

After Prescribing:

1. Regular Monitoring:
   - Lithium: Monitor serum levels, renal function, and thyroid function every 3-6 months.
   - Valproic Acid: Monitor serum levels, liver function, and platelet count.
   - Carbamazepine: Monitor serum levels, liver function, and CBC.
2. Assess Response and Side Effects:
   - Evaluate improvement in mood symptoms and any adverse effects.
   - Adjust dosage or switch medications if necessary.
3. Monitor for Toxicity:
   - Be vigilant for signs of toxicity, especially for medications with narrow therapeutic windows like lithium and carbamazepine.
4. Long-term Follow-Up:
   - Maintain ongoing communication with the patient to monitor progress and address any concerns.
   - Periodically reassess the need for continued medication.
5. Support and Education:
   - Provide ongoing education about the importance of adherence and the potential side effects.
   - Encourage lifestyle modifications that can support mood stability (e.g., regular sleep patterns, avoidance of alcohol and drugs).

Lorazepam

Ativan/Benzodiazepine

FDA Approved Indications
- Anxiety Disorders; Short-term relief of symptoms of anxiety or anxiety associated with depressive symptoms

Off-Label Uses
- Insomnia, Catatonia, Alcohol withdrawal, Acute psychosis, Panic disorder, Acute mania as an adjunct, Delirium (often in combination with haloperidol)

Dosing
- Available in PO, IV and IM dosing. Anxiety: PO (Adults): IR tablets: 1–3 mg 2–3 times daily (up to 10 mg/day). ER capsules: Give total daily dose of lorazepam IR tablets (at the previous three times daily dose) and administer once daily in the morning. If dose ↑ needed, switch to lorazepam immediate-release tablets to ↑ the dose; once stable response achieved, may switch back to equivalent daily dose of ER.

Side Effects
- Fatigue, Depression, Sedation, Ataxia

Adverse Reactions
- Withdrawal symptoms upon discontinuation, especially after long-term use; Respiratory depression, particularly when combined with other CNS depressants

Contraindications
- Severe respiratory insufficiency, Sleep apnea syndrome, Severe hepatic impairments, Myasthenia gravis, Acute narrow-angle glaucoma, Pregnancy and lactation due to potential adverse effects on the fetus or newborn

Precautions
- High abuse potential, classified as a Schedule IV; Should be used with caution in the elderly or debilitated patients due to increased risk of sedation and falls; Only recommended for short-term use due to risks of dependence and tolerance

Metabolized By
- Metabolized in the liver (CYP3A4) and excreted mainly by the kidneys.

Clinical Pearls
- Caution against engaging in activities that require mental alertness.
- In managing alcohol withdrawal or delirium, lorazepam is often preferred due to its relatively lower risk of precipitating hepatic encephalopathy compared to other benzodiazepines.

Clonazepam

Klonopin/Benzodiazepine

FDA Approved Indications
- Panic Disorder, Myoclonic Seizures

Off-Label Uses
- Insomnia, Catatonia, Acute Mania or Psychosis (as an adjunct), Other Anxiety Disorders

Dosing
- PO (Adults): 0.5 mg 3 times daily; may ↑ by 0.5–1 mg every 3 days. Total daily maintenance dose not to exceed 20 mg. Panic disorder: 0.125 mg twice daily; ↑ after 3 days toward target dose of 1 mg/day (some patients may require up to 4 mg/day); PO (Children ≤10 yr or ≤30 kg): Initial daily dose 0.01–0.03 mg/kg/day (not to exceed 0.05 mg/kg/day) given in 2–3 equally divided doses; ↑ by no more than 0.25–0.5 mg every 3 days until therapeutic blood levels are reached (not to exceed 0.2 mg/kg/day).

Side Effects
- Fatigue, Depression, Sedation, Daytime grogginess, Confusion

Adverse Reactions
- Withdrawal symptoms may appear 3 to 5 days after abrupt discontinuation, including seizures, tremors, and anxiety

Contraindications
- Severe liver disease, Acute narrow-angle glaucoma

Precautions
- Long-acting benzodiazepine, which can increase the risk of falls, especially in elderly patients; Schedule IV; Withdrawal effects may not be immediate due to the long half-life of the drug

Metabolized By
- Primarily by the liver through the cytochrome P450 system, particularly CYP3A4.

Required Assessments
- Monitor CBC and LFTs with prolonged therapy; Regularly assess the need for continued therapy, especially if used long-term

Clinical Pearls
- Can cause daytime grogginess.
- Withdrawal from clonazepam should be gradual.
- Patients should be informed about the risk of falls, particularly older adults, and strategies should be implemented to reduce this risk.

Alprazolam

Xanax/Benzodiazepine

FDA Approved Indications
- Generalized Anxiety Disorder (GAD), Panic Disorder

Off-Label Uses
- Insomnia, Premenstrual Dysphoric Disorder (PMDD), Acute Mania (as an adjunct), Catatonia

Dosing
- Anxiety: PO (Adults): 0.25–0.5 mg 2–3 times daily (not to exceed 4 mg/day); PO Geriatric Patients: Begin with 0.25 mg 2–3 times daily.
- Panic Attacks: PO (Adults): 0.5 mg 3 times daily; may be ↑ by 1 mg or less every 3–4 days as needed (not to exceed 10 mg/day). ER tablets: 0.5–1 mg once daily in the morning, may be ↑ every 3–4 days by not more than 1 mg/day; up to 10 mg/day (usual range 3–6 mg/day).

Side Effects
- Fatigue, Depression, Forgetfulness, Memory Impairment, Sedation, Slurred speech, Dependence

Adverse Reactions
- Withdrawal symptoms, including seizures, upon abrupt discontinuation

Contraindications
- Concomitant use with grapefruit or grapefruit juice, Concurrent use of alcohol

Precautions
- Short-acting with a high potential for addiction and dependence; recommended only for short-term use; Increased risk of falls, especially in elderly patients; Schedule IV

Metabolized By
- Primarily by the liver via CYP3A4 enzyme.

Required Assessments
- Check liver/renal function, as well as CBC, during long-term therapy
- Monitor for withdrawal symptoms and manage tapering schedules carefully to avoid abrupt discontinuation and associated risks

Clinical Pearls
- Due to its short half-life, withdrawal symptoms can occur quickly if the medication is stopped abruptly.
- Educate on the risks of concomitant use of other CNS depressants, such as alcohol, antidepressants, antihistamines, and opioids.
- Caution against activities requiring mental alertness.

Buspirone

Buspar/Anxiolytic

FDA Approved Indications
- Anxiety Disorders, Short-term treatment of anxiety

Off-Label Uses
- Treatment-Resistant Depression (as an adjunct), Mixed Depression and Anxiety

Dosing
- PO (Adults): 7.5 mg twice daily; may ↑ by 5 mg/day every 2–4 days as needed (not to exceed 60 mg/day). Usual dose is 10–15 mg twice daily; PO (Children ≥6 yr): 5 mg once daily; may ↑ by 5 mg/day every 2–7 days as needed. Usual dose is 7.5–30 mg twice daily

Side Effects
- Nausea, Dizziness, Headache, Nervousness, Jitteriness, Restlessness

Adverse Reactions
- Rare, but may include SS when combined with other serotonergic agents

Contraindications
- Severe renal impairment, Severe hepatic impairment

Precautions
- Takes 4 to 6 weeks to become fully effective, and patients should be advised of the delayed onset of action; Does not cause dependence, making it a suitable alternative to benzodiazepines for long-term use

Metabolized By
- Metabolized primarily by the liver through the CYP3A4 enzyme.

Required Assessments
- Regular monitoring of liver and renal function is recommended in patients with pre-existing conditions or those on long-term therapy
- Monitor for signs of nervousness or jitteriness, especially at the start of treatment

Clinical Pearls
- Can be used as an adjunct in treating depression (mixed anxiety).
- Does not cause sedation or dependence.
- Buspirone can be safely combined with SSRIs and SNRIs.
- Buspirone should not be discontinued abruptly, although it does not typically cause withdrawal symptoms; a gradual taper may be preferred to monitor for any return of anxiety symptoms.

Propranolol

Inderal/Beta Blocker

FDA Approved Indications
- Essential Tremor, Hypertension, Angina Pectoris, Migraine Prophylaxis, Cardiac Arrhythmias

Off-Label Uses
- Panic, Akathisia

Dosing
- Panic Disorder: PO: 40-320 mg/day PO; can be in divided doses/PRN.

Side Effects
- Fatigue, Weakness, Impotence, Arrhythmias, Bradycardia, Congestive Heart Failure (CHF), Pulmonary Edema

Adverse Reactions
- Abrupt withdrawal can cause life-threatening arrhythmias, hypertension, and myocardial ischemia

Contraindications
- Heart block greater than first-degree, Uncompensated Congestive Heart Failure, Severe bradycardia

Precautions
- Monitor blood pressure and pulse regularly; Caution patients about the risk of orthostatic hypotension and rising slowly in sitting or lying position; Beta-blockers can induce bronchospasm

Metabolized By
- Metabolized primarily by the liver through CYP2D6 and CYP1A2 enzymes.

Required Assessments
- B/P and heart rate before starting and regularly during therapy.
- Monitor for signs of heart failure.
- Assess for signs of depression or mood changes (can cross the blood-brain barrier and may affect mood).

Clinical Pearls
- Propranolol is effective for managing physical symptoms of anxiety, such as tremors, palpitations, and sweating, making it particularly useful for performance anxiety.
- It can also be used to manage symptoms of akathisia, a movement disorder that can be caused by antipsychotic medications.
- Propranolol should be used with caution in diabetic patients as it can mask the symptoms of hypoglycemia.

Dextroamphetamine

Adderall/Stimulant

FDA Approved Indications
- ADHD (ages 3 and older), Narcolepsy

Off-Label Uses
- Obesity (short-term management), Treatment-Resistant Depression

Dosing
- Detailed. See medication guidelines. Also in transdermal.
- PO (Adults): 5–40 mg/day in divided doses. SR capsules should not be used as initial therapy; PO (Children ≥6 yr): 5 mg 1–2 times daily, ↑ by 5 mg daily at weekly intervals (maximum: 40 mg/day). SR capsules should not be used as initial therapy.

Side Effects
- Increased anxiety, Insomnia, Decreased appetite, Weight loss, Elevated BP, Abdominal pain

Adverse Reactions
- Potential for addiction and abuse; Cardiovascular events such as sudden death, stroke, and myocardial infarction, particularly in patients with pre-existing heart conditions

Contraindications
- Known hypersensitivity or idiosyncrasy to the sympathomimetic amines, Hyperthyroidism, Glaucoma, Agitated states, History of drug abuse, During or within 14 days following the administration of MAOIs

Precautions
- Schedule II; Use caution in patients with pre-existing cardiovascular conditions; Monitor for signs of abuse, misuse, and addiction

Metabolized By
- Metabolized primarily by the liver through the CYP2D6 enzyme.

Required Assessments
- B/P and heart rate to detect cardiovascular changes.
- Monitor weight and appetite, especially in children.
- Assess for signs of anxiety, insomnia, and behavioral changes

Clinical Pearls
- Adderall is a first-line treatment for ADHD.
- It should be taken early in the day to minimize the risk of insomnia.
- Given its potential for appetite suppression, patients should be advised to maintain a balanced diet and monitor their weight regularly.
- Periodic "drug holidays" may be considered.

Methylphenidate

Ritalin, Concerta/Stimulant

FDA Approved Indications
- ADHD in children and adults, Narcolepsy

Off-Label Uses
- Treatment-Resistant Depression

Dosing
- Detailed. See medication guidelines. Available in IR and SR.
- ADHD: PO (<65 yr): IR: 5–20 mg 2–3 times daily. Concerta and Relexxii: 18–36 mg once daily in the morning initially, may be titrated as needed up to 72 mg/day. PO (Children ≥6 yr [Ritalin LA for 6–12 yr]): IR: 0.3 mg/kg/dose or 2.5–5 mg before breakfast and lunch; may ↑ dose by 0.1 mg/kg/dose or by 5–10 mg/day at weekly intervals (not to exceed 60 mg/day or 2 mg/kg/day). Ritalin LA: 20 mg once daily; may ↑ by 10 mg/day at weekly intervals (max = 60 mg/day). Concerta : 18 mg once daily in the morning initially, may be titrated as needed up to 54 mg/day (6–12 yr old) or up to 72 mg/day (13–17 yr old).

Side Effects
- Insomnia, Decreased appetite, Elevated BP, Increased anxiety, Increased restlessness, Affect lability (emotional instability), Tics

Adverse Reactions
- Potential for abuse and dependence; Cardiovascular events such as sudden death, stroke, and myocardial infarction, especially in patients with pre-existing heart conditions

Contraindications
- Anxiety, tension, and agitation; Glaucoma; Tics or a family history or diagnosis of Tourette's syndrome; During or within 14 days following the administration of MAOIs

Metabolized By
- Primarily by the liver via de-esterification to ritalinic acid, with minor involvement of cytochrome P450 enzymes.

Required Assessments
- B/P and heart rate to detect cardiovascular changes.
- Monitor weight and appetite, particularly in children.
- Periodic evaluation for the development or exacerbation of tics

Clinical Pearls
- First-line treatment in pediatric populations.
- Administer the medication early in the day.
- Risks associated with misuse and diversion. Schedule II.

Lisdexamfetamine

Vyvanse/Stimulant

FDA Approved Indications
- ADHD (ages 6 and older), Binge Eating Disorder

Off-Label Uses
- Obesity (short-term management), Treatment-Resistant Depression

Dosing
- ADHD: PO (Adults and Children ≥6 yr): 30 mg once daily; may ↑ by 10–20 mg/day at weekly intervals, up to 70 mg/day.
- Binge ED: PO (Adults): 30 mg once daily; may ↑ by 20 mg/day at weekly intervals, up to target dose of 50–70 mg/day.

Side Effects
- Insomnia, Decreased appetite, Elevated BP, Headache, Anorexia, Increased heart rate

Adverse Reactions
- Potential for abuse and dependence; Cardiovascular events such as sudden death, stroke, and myocardial infarction, particularly in patients with pre-existing heart conditions

Precautions
- Classified as a Schedule II; The medication has a duration of action of 10-12 hours, which should be considered when scheduling doses to minimize the impact on sleep; Use with caution in patients with a history of cardiovascular conditions or hypertension
- Concurrent use of MAOIs or within 14 days of MAOI use

Metabolized By
- A prodrug that is converted to the active form, dextroamphetamine, primarily in the blood.

Required Assessments
- B/P and heart rate to detect cardiovascular changes.
- Monitor weight and appetite, especially in children.
- Assess for signs of anxiety, insomnia, and behavioral changes

Clinical Pearls
- Administer the medication in the morning to reduce the risk of insomnia and sleep disturbances.
- Given its potential for appetite suppression, patients should be encouraged to maintain a balanced diet and monitor their weight.
- The prodrug formulation of lisdexamfetamine reduces the potential for misuse compared to other amphetamine products.

Guanfacine

Intuniv/Alpha-2A AA

FDA Approved Indications
- ADHD

Off-Label Uses
- Oppositional Defiant Disorder (ODD), Conduct Disorder

Dosing
- Immediate-release and extended-release tablets should not be interchanged.
- ADHD: PO (Adults and Children ≥6 yr): Extended-release: 1 mg once daily in morning or evening; may be ↑ by 1 mg/day at weekly intervals to achieve dose of 1–4 mg/day (6–12 yr) or 1–7 mg-day (13–17 yr) when used as monotherapy or 1–4 mg/day when used as adjunctive therapy.

Side Effects
- Sedation, Dizziness, Fatigue, Low B/P, Bradycardia, Dry mouth

Adverse Reactions
- Severe hypotension, Bradycardia, Syncope (fainting)

Precautions
- Not as effective in adults compared to children; More effective for symptoms of hyperactivity and impulsivity than for inattention; Due to its sedative effects, it is recommended to dose at night

Metabolized By
- Metabolized primarily by the liver, particularly CYP3A4.

Required Assessments
- Monitor B/P and heart rate regularly, especially at the start of treatment and during dose adjustments.
- Monitor for signs of excessive sedation and dizziness, particularly during the initial phase of treatment.

Clinical Pearls
- Guanfacine is effective for managing hyperactivity and impulsivity in children with ADHD, often used as an adjunct to stimulant medications.
- The extended-release formulation (Intuniv) allows for once-daily dosing, improving compliance and reducing symptom fluctuations.
- Due to its sedative properties, dosing guanfacine at night can help minimize daytime sedation and improve treatment adherence.
- It can be a good alternative for children who do not tolerate stimulants well or who have comorbid conditions like oppositional defiant disorder or conduct disorder.
- Gradual titration to minimize the risk of hypotension and bradycardia.

Clonidine

Catapres, Kapvay/Alpha-2 AA

FDA Approved Indications
- ADHD (Kapvay), Hypertension (Catapres)

Off-Label Uses
- Tourette's Disorder, Anxiety Disorders, Conduct Disorder, Opioid Withdrawal, Menopausal Flushing, Clozapine-induced Hypersalivation

Dosing
- Detailed. See medication guidelines. Available in IR and ER.
- ADHD: ER: (children >6 yr): 0.1 mg once daily at bedtime; after 1 wk, ↑ dose to 0.1 mg in am and at bedtime (max dose = 0.4 mg/day); IR: 0.05 mg once daily at bedtime; then ↑ every 3–7 days to 0.05 mg twice daily; then 0.05 mg 3 times daily; then 0.05 mg 4 times daily.

Side Effects
- Dry mouth, Dizziness, Sedation, Constipation, Fatigue, Headache

Adverse Reactions
- Severe hypotension, Bradycardia, Syncope (fainting), Rebound hypertension upon abrupt discontinuation

Precautions
- Clonidine is more sedating than guanfacine, which may limit its daytime use; Gradual dose tapering is necessary to prevent rebound hypertension and withdrawal symptoms

Metabolized By
- Mainly metabolized to 4-hydroxyclonidine (4-OH clonidine) by the action of the CYP2D6 enzyme in the liver.

Required Assessments
- B/P and heart rate, start of treatment, and during dose adjustments.
- Monitor for signs of excessive sedation and dizziness.
- Assess for signs of constipation and manage as needed.

Clinical Pearls
- The ER formulation (Kapvay) allows for smoother control of symptoms with once-daily dosing, reducing fluctuations in drug levels.
- Often dosed at night to minimize daytime sedation and improve sleep.
- Clonidine is also useful in managing symptoms of Tourette's Disorder, anxiety disorders, and conduct disorder.
- In opioid withdrawal, clonidine can help alleviate symptoms such as anxiety, agitation, and muscle aches.
- Manages menopausal flushing and clozapine-induced hypersalivation.
- Clonidine should not be discontinued abruptly.

Atomoxetine

Strattera/SNRI

FDA Approved Indications
- ADHD (ages 6 and older)

Off-Label Uses
- Treatment-Resistant Depression

Dosing
- PO (≥6 yr and <70 kg): 0.5 mg/kg/day initially; may ↑ every 3 days to a daily target dose of 1.2 mg/kg, given as a single dose in the morning or evenly divided doses in the morning and late afternoon/early evening (not to exceed 1.4 mg/kg/day or 100 mg/day whichever is less); PO (≥6 yr and >70 kg): 40 mg/day initially; may ↑ every 3 days to a daily target dose of 80 mg/day given as a single dose in the morning or evenly divided doses in the morning and late afternoon/early evening; may further ↑ after 2–4 wk up to 100 mg/day.

Side Effects
- Sedation, Fatigue, Decreased appetite, Elevated BP, Nausea, Dry mouth

Adverse Reactions
- Suicidal ideation in children and adolescents, Severe liver injury (rare)

Contraindications
- Concurrent use with MAOIs or within 14 days of MAOI use, Narrow-angle glaucoma, Pheochromocytoma

Metabolized By
- Metabolized primarily by the liver, particularly CYP2D6.

Required Assessments
- Regularly monitor B/P and heart rate to detect cardiovascular changes.
- Monitor for liver dysfunction, such as jaundice or elevated liver enzymes.
- Assess for changes in mood, behavior, or suicidal ideation.

Clinical Pearls
- The delayed onset of action requires patient and caregiver education on the importance of adherence to the prescribed regimen and the expectation of gradual symptom improvement.
- Educate patients about the potential for sedation and fatigue.
- Atomoxetine may reduce appetite, which can impact growth in children; regular monitoring of weight and growth is recommended.
- Patients and caregivers should be aware of the signs of liver dysfunction and advised to seek medical attention if symptoms such as dark urine, yellowing of the skin or eyes, or persistent abdominal pain occur.
- Takes 4 to 6 weeks to become fully effective.

ADHD

Things to Remember

Before Prescribing:

1. Comprehensive Evaluation:
   - Conduct a thorough medical and psychiatric history.
   - Assess for comorbid conditions (e.g., anxiety, depression, learning disabilities).
2. Baseline Measurements:
   - Record baseline height, weight, blood pressure, and heart rate.
   - Obtain a family history of cardiovascular disease or sudden death.
3. Screen for Substance Use:
   - Evaluate for current or past substance use disorders.
4. Consider Contraindications:
   - Identify contraindications such as severe cardiovascular conditions, glaucoma, or hyperthyroidism.
5. Patient and Family Education:
   - Discuss potential benefits and risks of medication.
   - Explain the importance of adherence and possible side effects.
6. Behavioral and Psychosocial Interventions:
   - Consider non-pharmacological treatments and their integration with medication.

After Prescribing:

1. Regular Monitoring:
   - Monitor height, weight, blood pressure, and heart rate regularly.
   - Schedule follow-up visits to assess efficacy and side effects.
2. Assess Response and Side Effects:
   - Evaluate improvement in ADHD symptoms and any adverse effects.
   - Adjust dosage or change medication if necessary.
3. Monitor for Misuse or Diversion:
   - Be vigilant for signs of medication misuse or diversion.
   - Educate patient and family about the importance of proper medication use and storage.
4. Reassess Comorbid Conditions:
   - Monitor for emergence or changes in comorbid psychiatric or medical conditions.
5. Long-term Follow-Up:
   - Maintain ongoing communication with the patient, family, and school (if applicable) to monitor progress and address any concerns.
   - Periodically reassess the need for continued medication as the child grows older.

Tranylcypromine

Parnate/MAOI

FDA Approved Indications
- Depression

Dosing
- PO (Adults): 30 mg/day in 2 divided doses (morning and afternoon); after 2 wk can ↑ by 10 mg/day, at 1–3 wk intervals, up to 60 mg/day in 2 divided doses.

Side Effects
- Seizures, Confusion, Dizziness, Drowsiness, Blurred vision, Tinnitus, Hypertensive crisis, Edema, Tachycardia, Orthostatic hypotension, Sexual dysfunction, Urinary retention, Agranulocytosis, Leukopenia, Thrombocytopenia

Adverse Reactions
- Hypertensive crisis, especially when consuming foods containing tyramine; Severe CNS reactions when combined with SSRIs, amphetamines, or dopamine

Contraindications
- Concurrent use of SSRIs, amphetamines, or drugs that increase serotonin, norepinephrine, or dopamine levels; Pheochromocytoma; Cardiovascular disease; Severe or frequent headaches; Liver disease; Severe renal impairment

Precautions
- Avoid foods high in tyramine, such as aged cheeses, cured meats, fermented products, and certain alcoholic beverages, to prevent hypertensive crisis

Metabolized By
- Primarily by the liver through monoamine oxidase pathways.

Required Assessments
- B/P and heart rate, signs of edema and fluid retention, daily weight.
- Regular monitoring for signs of blood dyscrasias, including CBCs to detect agranulocytosis, leukopenia, and thrombocytopenia.
- Regular glucose monitoring as MAOIs can affect glucose metabolism

Clinical Pearls
- Must adhere strictly to dietary restrictions to avoid consuming foods high in tyramine, which can precipitate severe hypertensive episodes.
- Educate patients and caregivers about the signs and symptoms of hypertensive crisis.
- Regular eye examinations to detect any visual disturbances.

Mirtazapine

Remeron/NaSSA

FDA Approved Indications
- Major Depressive Disorder (MDD)

Off-Label Uses
- Generalized Anxiety Disorder (GAD), Post-Traumatic Stress Disorder (PTSD), Panic Disorder

Dosing
- PO (Adults): 15 mg/day as a single bedtime dose initially; may be ↑ every 1–2 wk up to 45 mg/day.

Side Effects
- Weight gain, Sedation, Constipation, Dry mouth, Increased appetite, Hypotension, Dizziness

Adverse Reactions
- Agranulocytosis, Increased cholesterol and triglycerides, SS when combined with other serotonergic agents

Precautions
- Can be more sedating at lower doses; Use caution in patients with a history of seizures or bipolar disorder, as it may precipitate manic episodes

Contraindications
- Concurrent use with Monoamine Oxidase Inhibitors (MAOIs) or within 14 days of discontinuing an MAOI

Metabolized By
- Metabolized primarily via CYP2D6, CYP1A2, and CYP3A4 enzymes.

Required Assessments
- Regular monitoring of weight and appetite.
- Periodic monitoring of cholesterol and triglyceride levels.
- Monitor for signs of agranulocytosis, such as fever, sore throat, or signs of infection, and perform regular complete CBCs.

Clinical Pearls
- Taken at bedtime to minimize the impact of sedation during the day.
- The medication can be beneficial for patients who experience weight loss or poor appetite associated with depression.
- Mirtazapine has a lower risk of sexual side effects.

Isocarboxazid

Marplan/MAOI

FDA Approved Indications
- MDD, particularly when other antidepressants have failed

Dosing
- PO (Adults): 10 mg twice daily; may be ↑ every 2–4 days by 10 mg, up to 40 mg/day by the end of the first wk, then may ↑ by up to 20 mg every wk, up to 60 mg/day in 2–4 divided doses. After optimal response is obtained, dose should be slowly ↓ to lowest effective amount (40 mg/day or less).

Side Effects
- Dizziness, Drowsiness, Dry mouth, Nausea, Constipation, Orthostatic hypotension, Insomnia, Headache, Weight gain

Adverse Reactions
- Hypertensive crisis, especially when consuming foods containing tyramine; SS when combined with other serotonergic agents; Severe liver dysfunction; Blood dyscrasias, including agranulocytosis, leukopenia, and thrombocytopenia

Contraindications
- Concurrent use of SSRIs, SNRIs, TCAs, or other MAOIs; Pheochromocytoma; Cardiovascular disease; Severe liver or renal impairment; History of severe or frequent headaches

Precautions
- Avoid foods high in tyramine, such as aged cheeses, cured meats, fermented products, and certain alcoholic beverages, to prevent hypertensive crisis

Metabolized By
- Primarily by the liver through monoamine oxidase pathways.

Required Assessments
- B/P and heart rate, signs of edema and fluid retention, daily weight.
- Regular monitoring for signs of blood dyscrasias, including CBCs to detect agranulocytosis, leukopenia, and thrombocytopenia.
- Regular glucose monitoring as MAOIs can affect glucose metabolism

Clinical Pearls
- Given the risk of serious drug interactions, a thorough review of all medications, including over-the-counter and herbal supplements, is necessary to avoid adverse effects.
- Risk of sedation and dizziness, caution when performing tasks that require alertness, such as driving or operating heavy machinery.

Esketamine

Spravato/NMDA RA

FDA Approved Indications
- Treatment-Resistant Depression, MDD with acute suicidal ideation

Dosing
- Intranasal (Adults): Induction phase (Wk 1–4): 56 mg (2 sprays in each nostril) twice weekly; may ↑ dose based on response and tolerability up to 84 mg (3 sprays in each nostril) twice weekly. Maintenance phase (Wk 5–8): 56 mg (2 sprays in each nostril) or 84 mg (3 sprays in each nostril) once weekly. Maintenance phase (Wk 9 and beyond): 56 mg (2 sprays in each nostril) or 84 mg (3 sprays in each nostril) once weekly or every other wk.
- Dosing for Depression with acute SI: Intranasal (Adults): 84 mg (3 sprays in each nostril) twice weekly for 4 wk; may ↓ dosage to 56 mg (2 sprays in each nostril) twice weekly based on tolerability. Reevaluate patient for continued need for treatment after 4 wk.

Side Effects
- Dizziness, Sedation, Dissociation, Nausea, Vomiting, Increased blood pressure, Anxiety, Headache, Fatigue

Adverse Reactions
- Potential for abuse and dependence; Increased risk of suicidal thoughts, particularly in young adults; Hypertensive crisis

Precautions
- Requires monitoring for at least 2 hours after administration due to the potential for sedation, dissociation, and increased blood pressure
- Aneurysmal vascular disease or arteriovenous malformation; History of intracerebral hemorrhage

Metabolized By
- Primarily by the liver via CYP2B6 and CYP3A4.

Required Assessments
- B/P should be monitored before and after administration.
- Monitor for signs of dissociation and sedation 2 hours post-dose.
- Assess for changes in mood, behavior, and signs of suicidal ideation.

Clinical Pearls
- Esketamine is administered via a nasal spray.
- It is typically used in conjunction with an oral antidepressant to manage treatment-resistant depression or acute suicidal ideation.
- Rapid onset of action.
- Patients should arrange for transportation after each treatment session.
- Consideration for the patient's history of substance use disorders.

Hydroxyzine

Vistaril/Antihistamine

FDA Approved Indications
- Anxiety, Sedation, Pruritus (itching), Nausea and vomiting

Off-Label Uses
- Insomnia, Adjunct treatment for alcohol withdrawal, Preoperative sedation, Allergic conditions

Dosing
- PO (Adults): Antianxiety: 25–100 mg 4 times/day, not to exceed 600 mg/day. Preoperative sedation: 50–100 mg single dose. Antipruritic: 25 mg 3–4 times daily.

Side Effects
- Drowsiness, Dizziness, Dry mouth, Blurred vision, Constipation, Urinary retention

Adverse Reactions
- QT prolongation, particularly when used in combination with other QT-prolonging medications; Seizures; Confusion, particularly in the elderly

Contraindications
- Early pregnancy due to potential teratogenic effects; Concurrent use with other CNS depressants may increase sedative effects

Precautions
- Use with caution in elderly patients due to increased risk of sedation and confusion; Patients with a history of cardiac arrhythmias or other significant cardiac conditions should be monitored for QT prolongation; Caution in patients with glaucoma, prostatic hyperplasia, or urinary retention due to anticholinergic effects

Metabolized By
- Metabolized primarily in the liver to its active metabolite, cetirizine, which is excreted in the urine.

Required Assessments
- Excessive sedation, especially in the elderly.
- Assess for signs of QT prolongation in patients with cardiac conditions or those taking other QT-prolonging drugs

Clinical Pearls
- Can cause anticholinergic side effects: dry mouth, constipation, and urinary retention, which should be monitored, especially in older adults.
- The medication can be beneficial for patients with anxiety who also have pruritus or allergic conditions due to its antihistaminic properties.

Prazosin

Minipress/Alpha-1 AB

FDA Approved Indications
- Hypertension

Off-Label Uses
- PTSD-related nightmares and sleep disturbances, Benign Prostatic Hyperplasia (BPH), Raynaud's Phenomenon

Dosing
- PTSD-Related Nightmares & Sleep Disruption: Initial: 1 mg PO qHS; Maintenance: 1 mg PO qHS initially; may increase dose to 2 mg qHS; adjust dose based on response and tolerability in 1-2 mg increments q7days; not to exceed 15 mg/day

Side Effects
- Dizziness, Headache, Drowsiness, Nausea, Weakness, Palpitations, Nasal congestion, Orthostatic hypotension

Adverse Reactions
- Syncope, especially with the first dose; Severe hypotension; Priapism

Precautions
- Risk of "first-dose" orthostatic hypotension and syncope, especially in the elderly and those taking other antihypertensive medications; Use with caution in patients with renal impairment; Gradual dose titration is recommended to minimize the risk of hypotension

Metabolized By
- Metabolized primarily by the liver.

Required Assessments
- Monitor B/P regularly, start of therapy/during dose adjustments.
- Monitor for signs of orthostatic hypotension.
- Assess for any adverse reactions such as dizziness, palpitations, or syncope

Clinical Pearls
- To minimize the risk of first-dose hypotension, it is often recommended to start with a low dose and take the first dose at bedtime.
- Regular follow-up appointments are essential to monitor blood pressure and adjust dosages as necessary.
- In patients with BPH, prazosin can improve urinary flow by relaxing smooth muscle in the bladder neck and prostate.

Benztropine

Cogentin/Anticholinergic

FDA Approved Indications
- Parkinsonism; EPS caused by antipsychotic medications

Off-Label Uses
- Acute dystonic reactions

Dosing
- Parkinsonism: PO: 1–2 mg/day in 1–2 divided doses (0.5–6 mg/day).
- Acute Dystonic Reactions: IM IV: 1–2 mg, then 1–2 mg PO twice daily.
- Drug-Induced Extrapyramidal Reactions: PO IM IV: 1–4 mg given once or twice daily (1–2 mg 2–3 times daily may also be used PO).

Side Effects
- Dry mouth, Blurred vision, Constipation, Urinary retention, Tachycardia, Drowsiness, Confusion

Adverse Reactions
- Hyperthermia (especially in hot weather); Paralytic ileus (intestinal blockage); Severe anticholinergic effects

Contraindications
- Narrow-angle glaucoma; Tardive dyskinesia (may worsen symptoms); Myasthenia gravis

Precautions
- Caution in elderly due to increased risk of cognitive impairment and anticholinergic side effects; Caution in patients with a history of urinary retention, prostatic hypertrophy, or gastrointestinal obstructions

Metabolized By
- Metabolized in the liver.

Required Assessments
- Monitor for signs of anticholinergic side effects.
- Assess for cognitive changes, especially in older adults.
- Monitor for urinary retention and constipation.

Clinical Pearls
- Patients should be cautioned about the risk of heatstroke, as it can decrease sweating; stay hydrated and avoid excessive heat.
- Given the risk of paralytic ileus, monitor for signs of severe constipation or intestinal blockage, and advise patients to report any significant changes in bowel habits.
- Benztropine should be used cautiously in patients with a history of glaucoma, as it can increase intraocular pressure.

Deutetrabenazine

Austedo/VMAT2 Inhibitor

FDA Approved Indications
- Chorea associated with Huntington's Disease, Tardive Dyskinesia

Dosing
- Tardive Dyskinesia: PO: IR tablets (Austedo): 6 mg twice daily; may ↑ dose by 6 mg/day at weekly intervals (max dose = 48 mg/day) based on tolerability. ER tablets (Austedo XR): 12 mg once daily; may ↑ dose by 6 mg/day at weekly intervals (max dose = 48 mg/day) based on tolerability to reduce tardive dyskinesia.

Side Effects
- Sedation, Fatigue, Diarrhea, Dry mouth, Insomnia, Anxiety, Depression, Akathisia

Adverse Reactions
- Neuroleptic Malignant Syndrome (NMS); QT prolongation; Severe depression and suicidality, particularly in patients with Huntington's disease; Parkinsonism

Contraindications
- Patients with Huntington's disease who are actively suicidal or have untreated/inadequately treated depression; Hepatic impairment; Use of MAOIs within 14 days; Concurrent use of reserpine or within 20 days of discontinuing reserpine

Precautions
- Use with caution in patients with a history of QT prolongation or other significant cardiac disease, Gradual dose titration is necessary to minimize side effects

Metabolized By
- Metabolized primarily by the liver via the cytochrome P450 system, particularly CYP2D6.

Required Assessments
- Regularly monitor for signs of depression and suicidal ideation.
- ECG monitoring for patients at risk of QT prolongation.
- Assess for signs of NMS.

Clinical Pearls
- Given the potential for worsening depression and suicidality, regular psychiatric evaluations are essential, especially in patients with a history of mood disorders.
- Gradual titration of the dose helps to minimize side effects and improve tolerability.

Valbenazine

Ingrezza/VMAT2 Inhibitor

FDA Approved Indications
- Tardive Dyskinesia

Dosing
- Tardive Dyskinesia: PO: 40 mg once daily; after 1 wk, ↑ to 80 mg once daily.
- Chorea Associated with Huntington's: PO: 40 mg once daily; ↑ by 20 mg/day every 2 wk until achieve recommended dose of 80 mg once daily.

Side Effects
- Drowsiness, Fatigue, Dry mouth, Constipation, Blurred vision, Headache

Adverse Reactions
- QT prolongation, NMS, Parkinsonism, Severe hypersensitivity reactions

Contraindications
- Concurrent use of monoamine oxidase inhibitors (MAOIs)

Precautions
- Use with caution in patients with a history of cardiac arrhythmias or other significant heart disease, Gradual dose titration is recommended to minimize side effects

Metabolized By
- Metabolized primarily by the liver via the cytochrome P450 system, particularly CYP3A4 and CYP2D6.

Required Assessments
- Regularly monitor for signs of depression and suicidal ideation.
- ECG monitoring for patients at risk of QT prolongation.
- Assess for signs of NMS.

Clinical Pearls
- Due to the risk of QT prolongation, patients with a history of cardiac arrhythmias should be monitored closely, and any new symptoms such as palpitations or syncope should be reported immediately.
- Educate patients and caregivers about the signs and symptoms of NMS, such as hyperthermia, muscle rigidity, altered mental status, and autonomic instability, and advise them to seek immediate medical attention if these occur.
- Given the potential for worsening depression and suicidality, regular psychiatric evaluations are essential, especially in patients with a history of mood disorders.
- Gradual titration of the dose helps to minimize side effects.

Cyproheptadine

Periactin/Antihistamine

FDA Approved Indications
- Allergic conditions (e.g., allergic rhinitis, allergic conjunctivitis), Dermatographic urticaria

Off-Label Uses
- Appetite stimulant, Serotonin syndrome, Migraine prophylaxis, Cushing's syndrome (secondary to ACTH-secreting tumors)

Dosing
- PO (Adults): 4 mg every 8 hr (range 4–20 mg/day in 3 divided doses; up to 0.5 mg/kg/day); PO (Children 6–14 yr): 2–4 mg every 8–12 hr (not to exceed 16 mg/day); PO (Children 2–6 yr): 2 mg every 8–12 hr (not to exceed 12 mg/day).

Side Effects
- Drowsiness, Dizziness, Dry mouth, Constipation, Increased appetite and weight gain, Blurred vision, Urinary retention

Adverse Reactions
- Severe anticholinergic effects (e.g., severe confusion, hallucinations), Acute angle-closure glaucoma, Paradoxical CNS stimulation

Contraindications
- Newborn or premature infants, Nursing mothers, Elderly or debilitated patients, Angle-closure glaucoma, Stenosing peptic ulcer, Prostatic hypertrophy, Bladder neck obstruction, Pyloroduodenal obstruction, Concurrent use of MAO inhibitors

Precautions
- Caution with a history of asthma or other respiratory conditions, Avoid alcohol and other CNS depressants due to additive sedative effects, Gradual dose titration may be necessary to minimize side effects

Metabolized By
- Metabolized primarily by the liver.

Required Assessments
- Monitor for signs of excessive sedation.
- Signs of anticholinergic side effects, especially in elderly patients.
- Monitor weight and appetite when used as an appetite stimulant

Clinical Pearls
- Due to the potential for increased appetite and weight gain, patients using cyproheptadine as an appetite stimulant should have regular weight monitoring and dietary counseling.

Dantrolene

Dantrium/Muscle Relaxant

FDA Approved Indications
- Malignant Hyperthermia (prevention and treatment), Chronic Spasticity (associated with upper motor neuron disorders such as spinal cord injury, stroke, cerebral palsy, or multiple sclerosis)

Dosing
- NMS: IV (Adults): 1–2.5 mg/kg initially; if rapid resolution of hyperthermia and rigidity is observed, may follow with 1 mg/kg every 6 hours (max dose = 10 mg/kg/day). After the patient is stabilized and symptoms have resolved, consider taper over days to weeks (do not abruptly discontinue).

Side Effects
- Drowsiness, Dizziness, Weakness, Fatigue, Diarrhea, Nausea, Photosensitivity, Hepatotoxicity (liver toxicity)

Adverse Reactions
- Hepatotoxicity, Pleural effusion with pericarditis

Contraindications
- Active hepatic disease (e.g., hepatitis, cirrhosis)

Metabolized By
- Metabolized in the liver at least in part by the CYP450 enzyme system and is excreted in the urine.

Required Assessments
- Regular LFTs before starting therapy and periodically during treatment.
- Monitor for signs of muscle weakness and other CNS effects.
- Assess for signs of pleural effusion and pericarditis.

Clinical Pearls
- Provide symptomatic treatment of neuroleptic malignant syndrome.
- Used in the management of malignant hyperthermia, a rare but potentially fatal condition triggered by certain anesthetics.
- The medication works by inhibiting calcium release from the sarcoplasmic reticulum of skeletal muscle cells, reducing muscle contractions and hypermetabolism.
- For chronic spasticity, can improve muscle tone and function.
- Due to its potential for causing drowsiness and dizziness, patients should be advised to avoid driving or operating heavy machinery.
- In emergency settings, dantrolene is administered intravenously for rapid action in treating malignant hyperthermia, with oral forms used for prophylaxis and chronic conditions.

Bromocriptine

Parlodel/Dopamine Agonist

FDA Approved Indications
- Parkinson's Disease, Hyperprolactinemia, Acromegaly, Type 2 Diabetes (Cycloset formulation)

Off-Label Uses
- NMS, Adjunct treatment for certain types of pituitary tumors

Dosing
- NMS: PO (Adults): 2.5-5 mg PO 2-3 times/day; not to exceed 45 mg/day.
- Parkinsonism: PO (Adults): 1.25 mg 1–2 times daily, ↑ by 2.5 mg/day in 2–4 wk intervals (range is 2.5–100 mg/day in divided doses; up to 40 mg/day have been used).

Side Effects
- Nausea, Vomiting, Headache, Dizziness, Fatigue, Constipation, Orthostatic hypotension, Nasal congestion

Adverse Reactions
- Cardiac valvulopathy, Pulmonary fibrosis, Pleural effusion, Retroperitoneal fibrosis, Severe hypotension, Hallucinations, Impulse control disorders (e.g., gambling, hypersexuality)

Contraindications
- Uncontrolled hypertension, Severe ischemic heart disease, Peripheral vascular disorders

Metabolized By
- Metabolized primarily by the liver via the cytochrome P450 system, particularly CYP3A4.

Required Assessments
- Monitor B/P regularly.
- Assess for signs of cardiac valvulopathy and pulmonary fibrosis.
- Monitor liver function tests periodically.
- Regularly evaluate for impulse control disorders, especially in patients with Parkinson's disease.

Clinical Pearls
- The medication can cause significant gastrointestinal side effects, which can often be mitigated by taking it with food.
- Due to its potential for causing orthostatic hypotension, teach to rise slowly from sitting or lying positions to prevent dizziness and falls.
- Educate patients about the risk of impulse control disorders, and monitor for changes in behavior, especially in those being treated for Parkinson's disease.

Buprenorphine

Suboxone/POA

FDA Approved Indications
- Opioid Use Disorder (OUD), Pain Management (moderate/severe pain)

Dosing
- Detailed. See drug guides. Sublingual administration.

Side Effects
- Nausea, Vomiting, Constipation, Headache, Sweating, Insomnia, Dizziness, Sedation

Adverse Reactions
- Respiratory depression, Hepatotoxicity, Severe allergic reactions (anaphylaxis), QT prolongation

Contraindications
- Severe respiratory impairment, Acute/severe asthma in an unmonitored setting/in the absence of resuscitative equipment, Paralytic ileus

Precautions
- Use with caution in patients with a history of respiratory disorders, head injury, or increased intracranial pressure; Monitor for signs of misuse, abuse, and addiction; Gradual dose titration is necessary to minimize withdrawal symptoms and other side effects

Metabolized By
- Metabolized primarily by the liver via the cytochrome P450 system, particularly CYP3A4.

Required Assessments
- Monitor LFTs periodically.
- Assess for signs of respiratory depression, especially during initiation and dose adjustments.
- Signs of withdrawal symptoms and adjust dosage as necessary.

Clinical Pearls
- Buprenorphine is a partial opioid agonist that provides effective pain relief and is used to treat opioid use disorder by reducing cravings and withdrawal symptoms.
- Suboxone combines buprenorphine with naloxone to deter intravenous misuse; naloxone has minimal bioavailability when taken sublingually but precipitates withdrawal if injected.
- Patients should be educated about the risk of constipation and the importance of using laxatives or stool softeners as needed.

Disulfiram

Antabuse/ADI

FDA Approved Indications
- Alcohol Dependence

Dosing
- PO (Adults): 500 mg/day for 1–2 wk, then 250 mg/day (up to 500 mg/day).

Side Effects
- Drowsiness, Fatigue, Headache, Metallic/garlic-like taste, Skin rash, Acne

Adverse Reactions
- Hepatotoxicity; Severe disulfiram-alcohol reaction (flushing, tachycardia, nausea, vomiting, hypotension, and potentially severe cardiovascular collapse)

Contraindications
- Concurrent use of alcohol or metronidazole, Severe myocardial disease, Coronary occlusion, Psychosis

Precautions
- Use with caution in patients with a history of liver disease, diabetes, hypothyroidism, epilepsy, cerebral damage, nephritis, or polyneuritis; Avoid alcohol in all forms, including in foods, sauces, medications, and personal care products (like mouthwash and cologne) to prevent a disulfiram-alcohol reaction

Metabolized By
- Metabolized primarily by the liver.

Required Assessments
- Regular LFTs before starting therapy and periodically during treatment.
- Monitor for signs of hepatotoxicity, such as jaundice or dark urine.
- Importance of avoiding alcohol.

Clinical Pearls
- Disulfiram is used as an alcohol deterrent; it works by inhibiting the enzyme aldehyde dehydrogenase, leading to the accumulation of acetaldehyde when alcohol is consumed, causing unpleasant effects.
- The unpleasant effects of the disulfiram-alcohol reaction can deter patients from consuming alcohol, thus aiding in maintaining sobriety.
- Disulfiram can cause drowsiness and fatigue, so patients should be cautioned about engaging in activities requiring mental alertness, such as driving or operating heavy machinery.

Naltrexone

ReVia, Vivitrol/OA

FDA Approved Indications
- Alcohol Dependence, Opioid Dependence

Dosing
- To be used only after patient has been opioid-free for 7-10 days and after negative naloxone challenge.
- PO: 25 mg initially, then observation for 1 hr, then 50 mg once daily starting on day 2; flexible dosing regimens can be employed to accommodate patient convenience or ensure compliance; IM: 380 mg in gluteal muscle every 4 weeks for maintenance of abstinence
- Alcohol Dependence: Treatment in patients who have been able to abstain from alcohol in outpatient settings before treatment initiation; PO: 50 mg once daily for ≤12 weeks; IM: 380 mg in gluteal muscle every 4 weeks for maintenance of abstinence.

Side Effects
- Nausea, Headache, Dizziness, Fatigue, Anxiety, Insomnia, Injection site reactions (for Vivitrol), Liver enzyme abnormalities

Adverse Reactions
- Hepatotoxicity (rare, but dose-related)

Contraindications
- Acute hepatitis or liver failure, Current opioid use or opioid dependence (risk of precipitated withdrawal)

Metabolized By
- Metabolized primarily by the liver.

Required Assessments
- LFTs before starting therapy and periodically during treatment.
- Monitor for signs of hepatotoxicity, such as jaundice or dark urine.
- Assess for adherence to treatment and monitor for any signs of depression or suicidal ideation.

Clinical Pearls
- Reduces cravings/prevents relapse in alcohol and opioid dependence by blocking the euphoric and sedative effects of alcohol and opioids.
- The ER injectable form (Vivitrol) provides the benefit of monthly dosing, which can improve adherence compared to the daily oral form (ReVia).
- important to carry a medical alert card or a medical alert bracelet indicating that they are taking naltrexone.
- Will not experience the usual effects of opioids if they attempt to use them while on naltrexone, and this could lead to overdose if they take large amounts in an attempt to overcome the blockade.

Methadone

Dolophine/Opioid Agonist

FDA Approved Indications
- Pain Management (moderate to severe pain), Opioid Use Disorder (maintenance treatment and detoxification)

Off-Label Uses
- Severe chronic pain in patients requiring long-term opioid treatment

Dosing
- Very detailed dosing. See medication guidelines.

Side Effects
- Drowsiness, Dizziness, Nausea/Vomiting, Constipation, Sweating, Dry mouth

Adverse Reactions
- Respiratory depression; QT prolongation and torsades de pointes; Hypotension; Severe allergic reactions; Overdose and death; particularly in opioid-naïve individuals

Contraindications
- Significant respiratory depression, Acute or severe asthma in an unmonitored setting or in the absence of resuscitative equipment, Hypercarbia, Paralytic ileus

Metabolized By
- Metabolized primarily by the liver via the cytochrome P450 system, particularly CYP3A4, CYP2B6, and CYP2C19.

Required Assessments
- Respiratory status, especially during initiation and dose adjustments
- Regular ECGs to monitor for QT prolongation in patients at risk.
- Monitor LFTs periodically.
- Assess for signs of sedation, respiratory depression, and overdose.
- Monitor for signs of misuse, abuse, and addiction.

Clinical Pearls
- Long-acting opioid agonist used for pain management and as part of medication-assisted treatment (MAT) for opioid use disorder.
- Maintenance treatment for opioid use disorder can help reduce cravings, prevent withdrawal symptoms, and decrease the risk of relapse when used as part of a comprehensive treatment program.
- Methadone can cause significant constipation, so patients should be advised on the use of laxatives or stool softeners and encouraged to maintain adequate hydration and fiber intake.