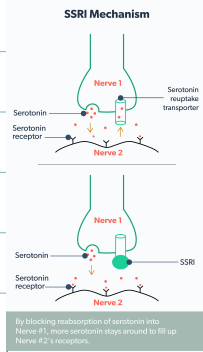


Antidepressant:

- Use: major depression, take 4-6 wks (neural bridging tx: Benzo) Use for 6-12 months.
- Factors to determine the agent: Cost, comorbidities, Patient state, side effects.

① SSRI - Mon: Inhibits reuptake S-HT₂ from synaptic cleft. + ↑ brain plasticity



- Adv: low incidence side effects, No food restrictions, Safer
- Side effects: # of serotonin receptors in the body
 - GI: Nausea, Diarrhea
 - Sleep: Insomnia + Vivid dreams
 - Headach + Weight changes.

① Fluoxetine: longest half life, Safe in pregnancy, ↑ Anti-psychotic.

SE: Sexual dysfxn, Weight Neutral. (Not resolved) Tx: ↓ Dose, chemoagent

② Sertraline: ↑ GI symptoms, SE: Sexual dysfxn - odd bupropion or Sildenafil.

③ Paroxetine: Drug-Drug interaction (↓ CYP 2D6), Weight Gain

SE: Anticholinergic effects (Sedation, Wt gain, Constipation)

Sexual Dysfxn

⊖ Withdrawal phenomena. bc 70% (↓ t_{1/2}).

④ Fluvoxamine: Use: OCD

SE: Drug interactions (↓ CYP)

⑤ Citalopram + Escitalopram

SE: QT prolongation

SSRI + opiate (transdermal) or SSRI + MAOI.

No use 9 wks before and after.

⊖ other side effects:

⊖ Serotonin Syndrome: Cause: Combination of drugs working on Serotonin receptors (SSRI + triptan)

Drugs that increase serotonin may be found in over-the-counter medicines (e.g., dextromethorphan, St. John's wort). They can cause serotonin syndrome when taken in high doses or in combination with other serotonergic agents.

Symptoms: Tach, ↑ BP, Diaphoresis. ↑ NM: Electric Jolt Movement + ↑ Reflexes

GI: hyperactive bowels → diarrhea, tremor, Myoclonic Jerks.

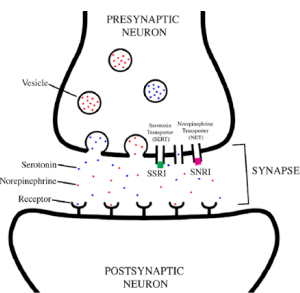
Tx: stop Meds, propofol + ECT in ER.

Add Benzo.

⊖ ↓ Na, Seizure, ↓ platelets, ↑ level of warfarin.

② SNRIs: Mon: Inhibits reuptake of S-HT + NE in synaptic cleft.

SE: Same as SSRIs.



① Venlafaxine + Desvenlafaxine (active metabolite)

Use: GAD, Neuropathic pain, depressive Disorders.

Short t_{1/2} → to stop drug we should taper + Once-daily dosing.

SE: ↑ BP.

② Duloxetine: use: Depression + Neuropathic pain + Fibromyalgia.

SE: No HTN crisis + More Constipation + Hepatotoxicity.

③ Bupropion. MOA: NE-Dopamine Reuptake Inhibitors.

Use: ADHD, Smoke cessation

SE: Paresthesia, Seizures, Least causing Sexual Dysfxn.

CF: - epilepsy → Eating disorder → MAOIs / stimulants use is not

④ Serotonin Agonist and Antagonist =

Trazodone + Nefazodone MOA: high dose: Agonist low dose: Anti-A.

Use: Insomnia (due to Sedation effect) + Depression.

SE: Orthostatic hypotension + Sedation → Priapism + Liver failure ⇒ sales ↓
Use it with SSRI

Ⓢ Not used: Sexual SE + No effect on REM sleep.

⑤ Mirtazapine: MOA ⇒ α₂-adrenergic inhibition ⇒ ↑ 5-HT + NE. low dose ⇒ work on Histamine Receptors ↑ wt High Dose ⇒ NE receptor ⇒ ↑ activity

Use: Major depression in elderly (sleep + appetite).

SE: Sedation + wt gain (↑ appetite).

Inhibitory effects	Consequences
Central & peripheral muscarinic acetylcholine receptors	Tachycardia, delirium, dilated pupils, flushing, decreased sweating, hyperthermia, ileus, urinary retention
Peripheral α ₁ -adrenergic receptors	Peripheral vasodilation (orthostatic hypotension)
Cardiac fast sodium channels	Conduction defects, arrhythmias
Presynaptic (noradrenaline & serotonin) neurotransmitter reuptake	Antidepressant & anxiolytic effects, seizures, tremors
Histamine (H ₁) receptors	Sedation, increased appetite

⑥ Cyclic Anti-Depressant.

MOA: Inhibition of reuptake of NE + Serotonin ⇒ long t_{1/2} ⇒ over dose lethality.

SE: Anti-HAM: Histamine: Sedation, wt gain cholinergic (Muscarinic): Dry mouth, Constipation, CF ⇒ hypotension + urinary retention Cardiovascular: Arrhythmias + ECG changes.

b-A ⇒ Tricyclic ⇒ 1. Tertiary amines (3 Ns). More SEs.

Use: Amitriptyline: insomnia

Clomipramine: OCD.

Imipramine: enuresis

1. Doxepin: chronic pain + sleep Aid

2. Secondary amines (2 Ns) less SEs.

Nortriptyline: chronic pain + Use in Geriatric. Desipramine: least HAM.

b-B = Tetra Cyclin ⇒ Amoxapine. Metabolites of Anti-Psychotic
↳ Cause EPS.

Major complications of TCAs—3Cs:
Cardiotoxicity
Convulsions
Coma

Ⓢ other SE: Ⓢ Overdose: arrhythmias, tremor, hypotension, hyperreflexia.
One wk enough. Block Na⁺ channel ⇒ W Na⁺ Pacing. delirium + Coma.

Ⓢ Seizure

Ⓢ Serotonergic effect: ↑ Brection/ ejaculation anorgasmia.

⑦ MAOIs. MOA: Inhibits amines degradation (NE, Serotonin, Dopamine, Tyramine) Irreversibly.

• Phenelzine (Nardil).

• Tranylcypromine (Parnate).

• Isocarboxazid (Marplan).

MAO-A ⇒ 5-HT + NE. + Dopamine } Both A+B
MAO-B ⇒ phenethylamine Tyramine }

Use: depression with atypical features (Hypersomnia, ↑ appetite, extremities feeling)
Not use in refractory depression.

SE: Ⓢ Serotonin Syndrome ⇒ Progress to hyperthermia, Rhabdomyolysis, RF, death

⊖ HTN crisis: MAOI + Rich food with tyramine (cheese + Red wine, chicken liver...)
OR Sympathomimetics.

Symptoms: Headache, Sweating, Nausea, Photophobia, arrhythmias, ↑ BP.

⊖ Orthostatic hypotension (MC)

⊖ Paresthesia with B6 deficiency Pts.

* Selegiline: transdermal patch MAOIs ⇒ Use in depression (with low dose).
Adv: No food restriction.
Avoid: opiates, decongestants, Serotonergic drugs.

- OCD: SSRIs (in high doses), TCAs (clomipramine).
- Panic disorder: SSRIs, SNRIs, TCAs, MAOIs.
- Eating disorders: SSRIs (in high doses), TCAs.
- Persistent depressive disorder (dysthymia): SSRIs, SNRIs (e.g., venlafaxine, duloxetine).
- Social anxiety disorder (social phobia): SSRIs, SNRIs, MAOIs.
- GAD: SSRIs, SNRIs (venlafaxine), TCAs.
- Posttraumatic stress disorder: SSRIs.
- Irritable bowel syndrome: SSRIs, TCAs.
- Enuresis: TCAs (imipramine).
- Neuropathic pain: TCAs (amitriptyline and nortriptyline), SNRIs.
- Chronic pain: SNRIs, TCAs.
- Fibromyalgia: SNRIs.
- Migraine headaches: TCAs (amitriptyline).

Smoking cessation: Bupropion.
Premenstrual dysphoric disorder: SSRIs.
Insomnia: Mirtazapine, trazodone, TCAs (doxepin).

Lithium toxicity	
Etiology	Acute toxicity Impaired excretion Chronic toxicity Decreased renal perfusion (↓ lithium clearance) • Dehydration • Thiazide diuretics, NSAIDs, ACE inhibitors
Clinical features	Acute toxicity Gastrointestinal: nausea, vomiting, diarrhea Lithium toxicity: tremor Chronic toxicity: increased Lithium concentration, appetite Ataxia, renal dysfunction, seizures
Treatment	Intensive hydration Hemodialysis (severe cases)

Mood stabilizer ⇒ Lithium + Anti-Convulsant.

Use: acute mania + mania episodes maintenance in Bipolar + Schizoaffective Disorders.

⇒ + antidepressants, Antipsychotics, for aggression and Impulsivity (PD) + Alcohol

① Lithium: - Use: Acute mania, Prophylaxis for Mania and depression (BS) ↓ risk of suicide.

⊖ Pharma: Metabolized by kidney, Onset: 5 days, Monitor after 4-5 days of induction

PT BEER ⇒ Pregnant, Thyroid, Benign leukocytosis, ECG, Electrolytes, Renal.

Range: 0.6-1.2, Toxic: 1.5 lethal: 2

⊖ SE: - alter mental status, tremors, convulsions -- death.

- Nephrogenic DI

⊖ ↑ risk of Cystine anomaly

- GI symptoms

(pregnant women take lithium)

- wt gain + Sedation.

② Carbamazepine: Use: mania + mixed features, rapid cycling for bipolar

MOA: Block Na⁺ channels, ↓ AP. Onset: 5-7 days

SE: - Neural tube defects (pregnant test before)

- SIADH, ↓ Na⁺, Pancytopenia + agranulocytosis

mut.
(ox carbazepine)
↓ risk of
hepatic
toxic.

- GI + CNS Symptoms: Ataxia + confusion + ↑ risk of hepatitis

The following factors increase Li⁺ levels:

- NSAIDs (e.g., ibuprofen)
- Aspirin (+/-)
- Thiazide diuretics
- Dehydration
- Salt deprivation
- Sweating (salt loss)
- Impaired renal function

- Stevens-Johnson Syndrome:

⊖ Auto Induction: ↑ dose ⊖ Toxicity.

CYP 450 ↑↑

Blood levels are useful for lithium, valproic acid, carbamazepine, and clozapine. Remember the 8-12 rule for therapeutic windows of lithium (0.8-1.2), carbamazepine (8-12), and valproic acid (80-120).

③ Valproic Acid: + Carbamazepine + Drug for Myoclonic seizures.

MOA: ↑ GABA Concentration.

SE: Neural tube defects, hyperammonemia, Pancreatitis.

④ Lamotrigine: Use: Bipolar depression.

MOA: Glu, Asp Modulation.

SE: Headache, Dizziness... Stevens Johnson Syndrome (Life threatening).

* Valproate ↑ Lamotrigine while Lamotrigine ↓ valproate (GAD)

⑤ Gabapentin + Pregabalin: Use: Anxiety + Neuropathic pain, Fibromyalgia. ↓ in Bipolar.

⑥ Topiramate + Topiramate ⇒ - Benefits: Wt loss Use: Impulsive disorders. - SE: Cognitive slowing

Mood stabilizers in bipolar disorder		
	Indications	Adverse effects
Lithium	Manic & depressive features	Diabetes insipidus Hypothyroidism Tremor • Ebstein anomaly (teratogenic)
Valproate	Manic features	Hepatotoxicity • Neural tube defects (teratogenic)
Carbamazepine	Manic features	Aplastic anemia SIADH • Neural tube defects (teratogenic)
Lamotrigine	Depressive features	Benign rash • Stevens-Johnson syndrome

Anxiolytic / Hypnotic ⇒ BDZ + barbiturates + buspirone.

⊖ Use: Anxiety Disorders, Spasm, Sleep, Seizures.

① BDZ: MOA: ↑ GABA effect.

Use: anxiety and akathisia

* long Acting [t_{1/2}: 20 hrs].

- Diazepam: Use: Detox from Alcohol, For Sedative, Hypnotic, anxiolytic, Muscle spasm.

- Clonazepam: Use: Panic attacks, Avoid in Renal Dysfunction.

* Intermediate [6-20].

- Alprazolam: anxiety, Panic attacks.

- Lorazepam: لا يفرز في البول + With haloperidol to sedate agitated pts

Not Metabolized by Liver [LOT] ← + Oxazepam + Temazepam ⇒

* short: Midazolam. Use: Prehospital.

I-B: * Non-BDZ Hypnotics. Zolpidem (Ambien)/Zaleplon (Sonata)/Eszopiclone (Lunesta)

MOA: GABA-A receptor Agonist (on GABA).

Use: Insomnia.

SE: Anterograde amnesia + Para somnia

{ sleepwalking, eating... }

① Diphenhydramine:

MoA: Anti (H1)

SE: تقيط الكلى و السعال

② Rameleton, MoA: Melatonin agonist Use: sleep aid.

③

2-B: Non-BDZ Anxiolytics

No risk of dependence

↳ Muscle

④ Buspirone: ⑤ 5HT agonist ⇒ ↓ serotonergic effects

relaxant, Anti-Conv...

Use: Combination with other agents (weak, slow onset)

for PTSD

⑥ Hydroxyzine: ⑦ Anti Histamine effects.

Use: BDZ is low & short term medication.

⑧ Propranolol: ⑨ Beta-blocker.

⑩ treat autonomic effects of panic attack, social phobia & Akathisia.

Barbiturates (e.g., butalbitol, phenobarbital, amobarbital, pentobarbital)