

PHB



OFFICE: BUILDING No. 3/314, OFFICE-1, GAUSHALA ROAD, SHAMLI DISTRICT SHAMLI (U.P.) – 247776
Mobile: +91-9719638415
Email: arvindrkgit@gmail.com

Course Name : D. Pharm
Year : First Year
Subject Name : Pharmaceutical Chemistry
Topic Name : Antidepressants

Antidepressants are a class of drugs that reduce symptoms of depressive disorders by correcting chemical imbalances of neurotransmitters in the brain. Chemical imbalances may be responsible for changes in mood and behavior.

Chemical Classification of antipsychotic drugs:

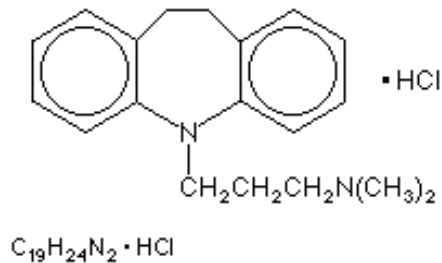
- 1. Monoamine oxidase inhibitors (MAOIs): E.g.:** Tranylcypromine, Phenelzine and Isocarboxazid.
- 2. Tricyclic antidepressants: E.g.:** Imipramine, Nortriptyline, Amitriptyline, doxepin and Desipramine.
- 3. Atypical antidepressants: E.g.:** Trazodone, Mirtazapine, Vortioxetine, Vilazodone and Bupropion.
- 4. Selective serotonin reuptake inhibitors (SSRIs): E.g.:** Fluoxetine, Paroxetine, Sertraline, Citalopram, Escitalopram
- 5. Serotonin and norepinephrine reuptake inhibitors (SNRIs): E.g.:** Duloxetine, Venlafaxine, Desvenlafaxine and Levomilnacipran
- 6. Miscellaneous Drugs: E.g.:** Lithium, Quetiapine

Drug Mechanism of action:

S. No.	Drug	Mechanism
1.	Imipramine Hydrochloride	inhibiting the neuronal reuptake of the neurotransmitters norepinephrine and serotonin.
2.	Venlafaxine	increasing serotonin levels, norepinephrine, and dopamine in the brain by blocking transport proteins and stopping their reuptake at the presynaptic terminal.
3.	Sertraline	inhibition of CNS neuronal uptake of serotonin (5HT).
4.	Escitalopram	enhances serotonergic activity by binding to the orthosteric (i.e. primary) binding site.
5.	Paroxetine	block the serotonin reuptake transporter (SERT) and thus increase the concentration of synaptic serotonin.
6.	Amitriptyline Hydrochloride	blocking the norepinephrine or serotonin transporter (NET or SERT) at presynaptic terminals.
7.	Fluoxetine	blocking the reuptake of serotonin into presynaptic serotonin neurons.
8.	Duloxetine	blocking the reuptake of serotonin into presynaptic serotonin neurons.
9.	Citalopram	inhibition of CNS neuronal reuptake of serotonin (5-HT).

10.	Fluvoxamine	blocks reuptake of serotonin at the sodium-dependent serotonin transporter (SERT) of the neuronal membrane, enhancing actions of serotonin on 5HT1A autoreceptors
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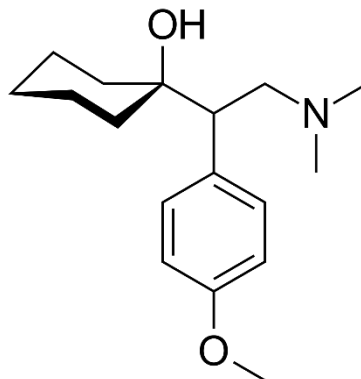
Imipramine Hydrochloride



3- (10,11-Dihydro - 5H – dibenzo [b, f] azepin -5-yl) -N, N-dimethyl -1-propanamine ·

- ❖ Imipramine is a tricyclic antidepressant used to treat symptoms of depression.
- ❖ It is also effective in treating anxiety and panic disorder.
- ❖ Imipramine may also be used off-label for nocturnal enuresis and chronic pain.
- ❖ Imipramine is taken by mouth.

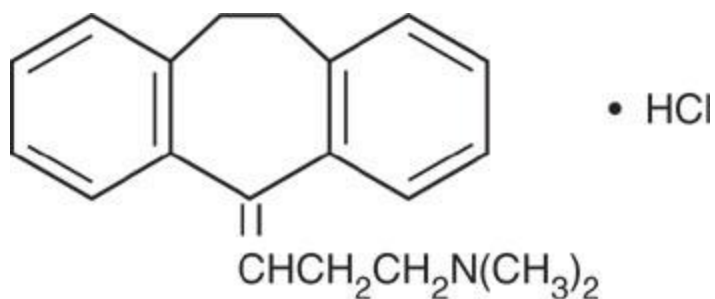
Venlafaxine



1-[2-(dimethylamino)-1-(4-methoxyphenyl)ethyl]cyclohexanol,

- ❖ Venlafaxine is a serotonin and norepinephrine reuptake inhibitor widely used as an antidepressant.
- ❖ Venlafaxine is a synthetic phenethylamine bicyclic derivative with antidepressant activity.
- ❖ Venlafaxine and its active metabolite, O-desmethylvenlafaxine (ODV), are potent inhibitors of neuronal serotonin and norepinephrine reuptake and weak dopamine reuptake inhibitors.
- ❖ This agent may reduce hormone-related vasomotor symptoms.

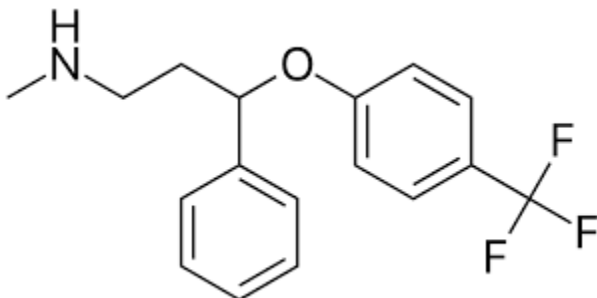
Amitriptyline Hydrochloride



3-(10,11-dihydro-5H-dibenzo[a,d]cycloheptene-5-ylidene)-N,N-dimethylpropan-1-amine

- ❖ Amitriptyline is used to treat symptoms of depression.
- ❖ Amitriptyline is in a class of medications called tricyclic antidepressants.
- ❖ It works by increasing the amounts of certain natural substances in the brain that are needed to maintain mental balance.

Fluoxetine



N-methyl-3-phenyl-3-[4-(trifluoromethyl)phenoxy]propan-1-amine

- ❖ Fluoxetine is used to treat depression, obsessive-compulsive disorder (OCD), bulimia nervosa, premenstrual dysphoric disorder (PMDD), and panic disorder.
- ❖ It is also used together with olanzapine to treat depression that is part of bipolar disorder and treatment resistant depression in patients who have received at least 2 previous treatments but did not work well.