Knowledge Category 8

Psychopharmacology

What is a psychoactive drug?

a chemical that interacts with the NS to alter mood, consciousness, perception, and/or behavior

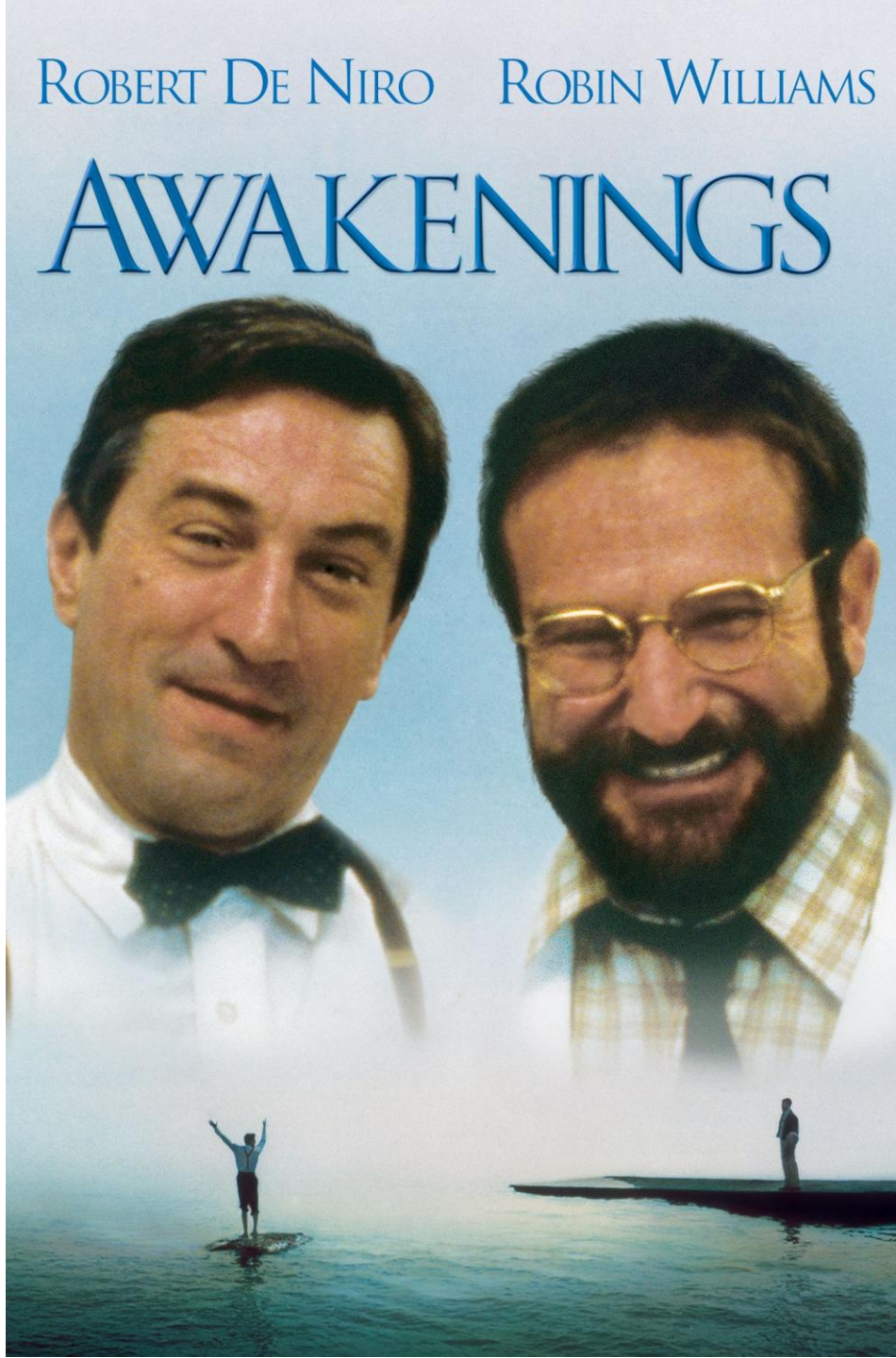
How these drugs exert their effects

by increasing or decreasing ….

the production of neurotransmitters (NT)
the re-uptake of NT
the release of neurotransmitters or

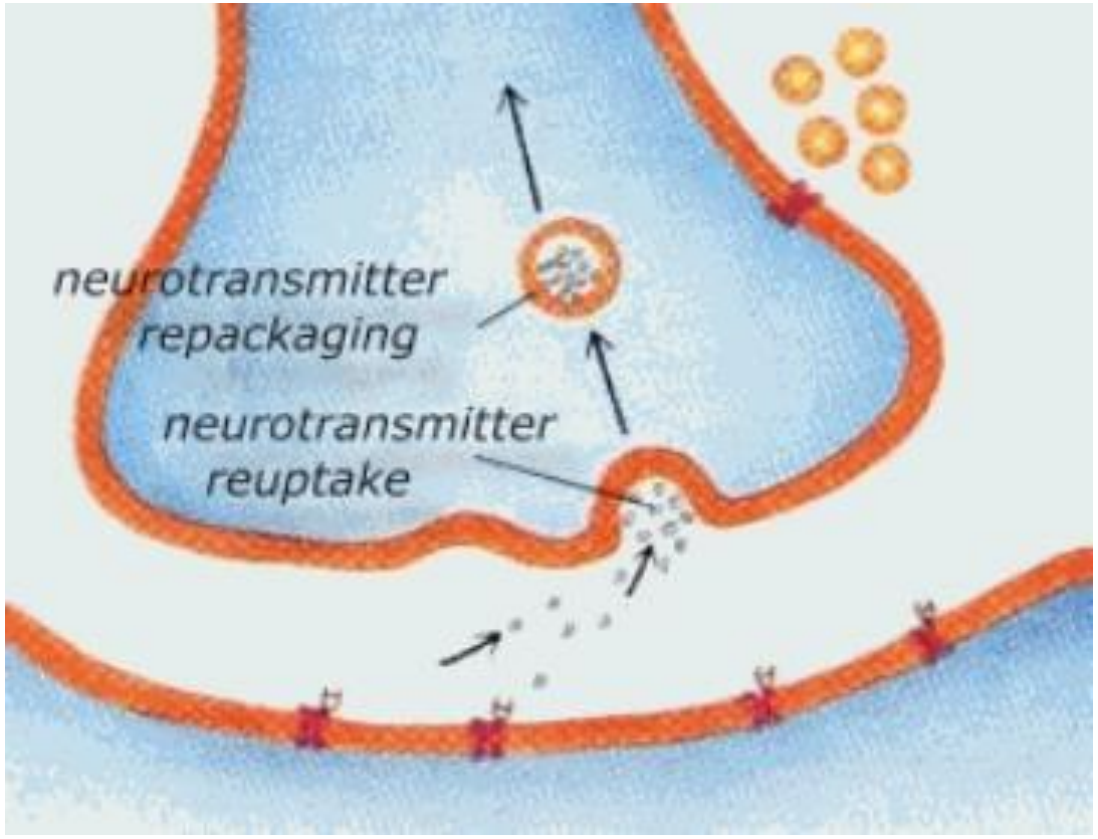
by facilitating, mimicking, or blocking the effects of neurotransmitters at receptor sites

For the EPPP, generic names are more important than brand names

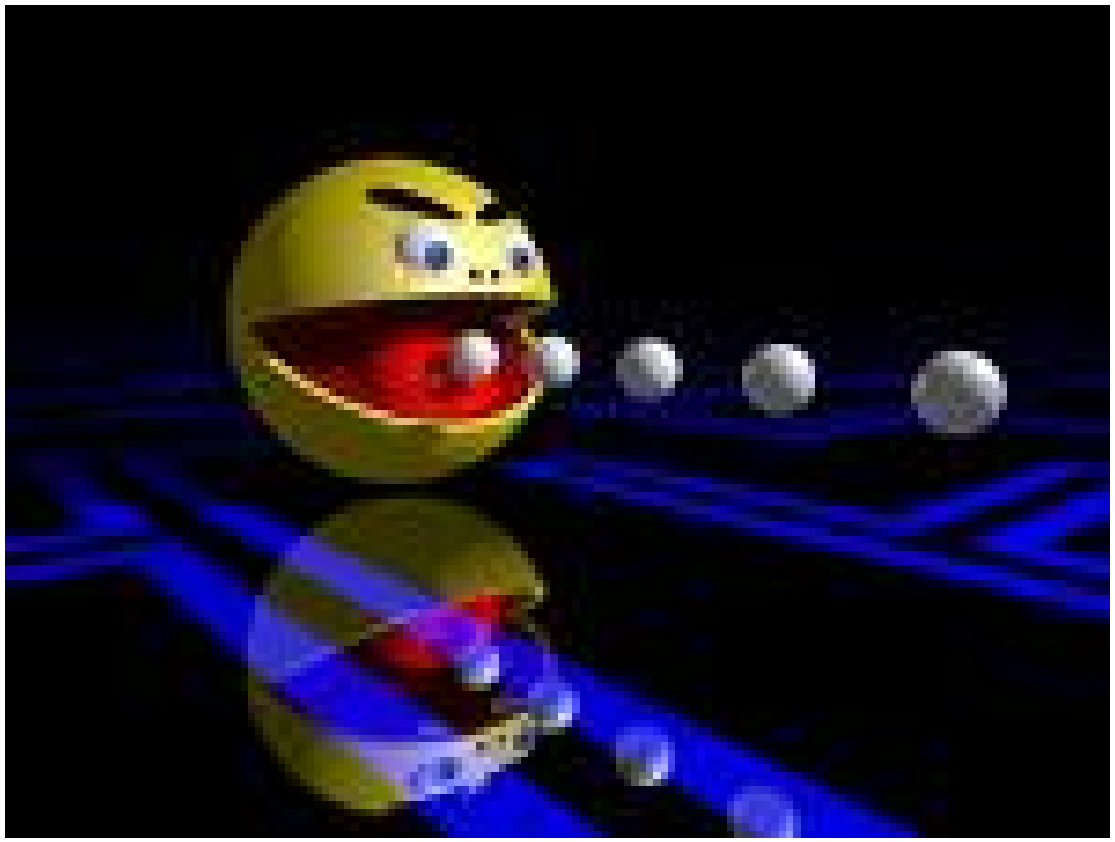


Terminating synaptic activity

Re-uptake



Enzyme degradation



The Effects of Psychotropic Drugs are Defined as Follows

AGONISTS

DIRECT: mimic the effect of a NT at the receptor site

INDIRECT: bind to a receptor (other than that used by the NT) to facilitate the action of the NT

INVERSE AGONISTS

Produce effects opposite to what the NT or the agonist does

antagonists block the agonist's effect without causing any response on its own

PARTIAL AGONISTS

produce effects that are similar to (but less than) the effects produced by a neurotransmitter or an agonist

ANTAGONISTS

DIRECT: attaches to the NT receptor to block it

INDIRECT: bind to a receptor (other than that used by the NT) to inhibit the action of the NT

Who Prescribes Psychotropics

most frequently by physicians in primary care visits followed by medical specialty offices (e.g., psychiatrists and neurologists).

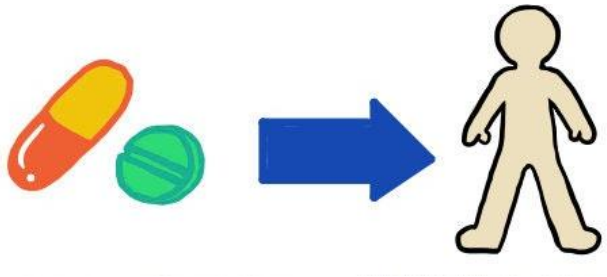
Exceptions: antipsychotics and antimanics
most often provided in medical specialty offices

Pharmacology

The study of the effect of chemicals on living tissues

Pharmacodynamics

What the drug does to the body



Physiological and biochemical basis of action

1. Dose-response relationship
2. Receptor binding/affinity
3. Potency + efficacy

Pharmacokinetics

What the body does to the drug

Changes in drug concentration via physiologic processes

1. Absorption
2. Distribution
3. Metabolism
4. Excretion

Older Adults

Medication-related problems are a common due to

the use of multiple medications
noncompliance with medication regimens
decreased or increased sensitivity to drug effects

age-related changes in drug absorption,
distribution, metabolism,
and excretion

Start low & go slow

Pharmacokinetics

Race & Ethnicity

Pharmacokinetic differences in drug response linked to differences in metabolism

Asian & African American - more sensitive to the therapeutic and side effects of neuroleptics, benzodiazepines, lithium, and some antidepressants

start low and go slow

Major Categories of Psychoactive Drugs

- Antidepressants
- Antipsychotics
- Anti-alcohol drugs
- Mood stabilizers
- Sedative-hypnotics
- Beta blockers
- Narcotic analgesics
- Psychostimulants

ANTIPSYCHOTICS

TREAT SCHIZOPHRENIA & BIPOLAR DISORDER

1ST GEN (TYPICAL)

Block dopamine receptors (D2) in the brain

Phenothiazine, thioxanthene, butyrophenone

Treatment for schizophrenia, and acute symptoms of mania, delusions and hallucinations associated with major depressive disorder, and organic psychoses

More effective for positive symptoms of schizophrenia

DOPAMINE HYPOTHESIS

overactivity at dopamine receptors caused by of oversensitivity of the receptors or excessive dopamine levels

Amphetamine increases DA and in users can produce schizophrenic like symptoms

Giving DA agonist drugs worsens symptoms in people with schizophrenia

ANTIPSYCHOTICS

TREAT SCHIZOPHRENIA & BIPOLAR DISORDER

dibenzodiazepine, benzisoxazole, thienobenzodiazepine, dibenzothiazepine

Treats schizophrenia, other disorders with psychotic symptoms, Bipolar Disorder that has not responded to a mood stabilizer, depression and suicidality, alcohol and drug addiction, hostility, and the motor symptoms of Huntington's disease, Parkinson's disease, and other movement disorders

alleviates both the positive and negative symptoms of schizophrenia – generally more effective than typical but are slower to work

2ND GEN (ATYPICAL)

act on D4 and other dopamine receptors

act on receptors for other NTs including serotonin and glutamate

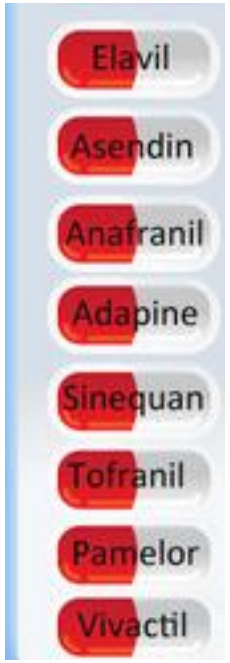
ANTIDEPRESSANTS
MAJOR DEPRESSIVE DISORDER

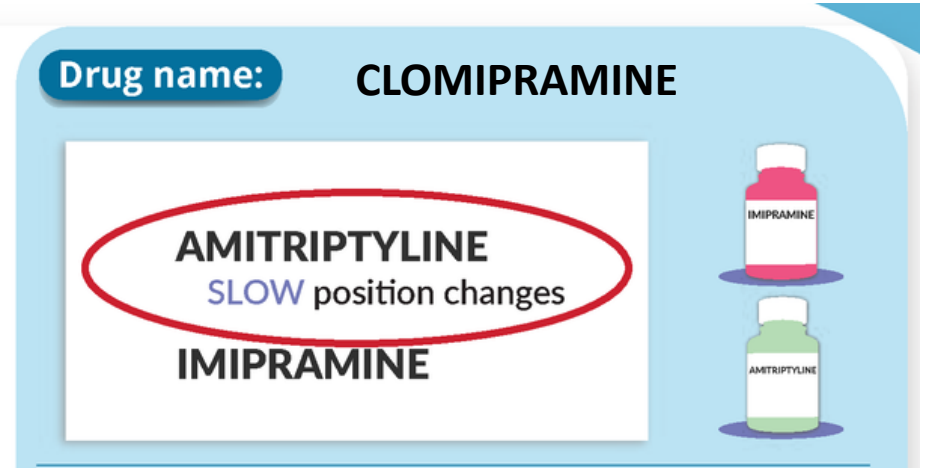
PERSISTENT SADNESS

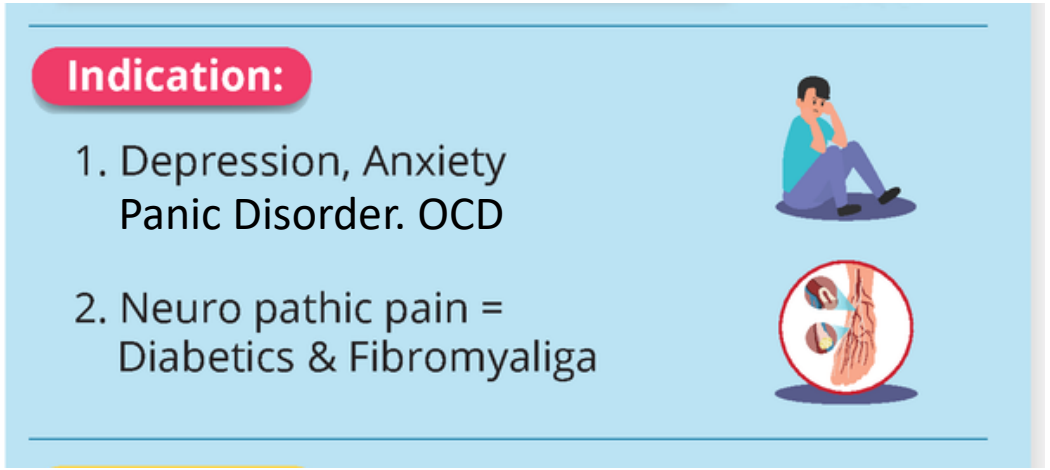
LOSS of INTEREST

5 CLASSES

1. TRICYCLIC ANTIDEPRESSANTS (TCAs)
2. SELECTIVE SEROTONIN REUPTAKE INHIBITORS (SSRIs)
3. SEROTONIN & NOREPINEPHRINE REUPTAKE INHIBITORS (SNRIs)
4. MONOAMINE OXIDASE INHIBITORS (MAOIs)
5. ATYPICAL ANTIDEPRESSANTS







Inhibit re-uptake of
Serotonin & Catecholamines
Individually customizable

Supports the catecholamine hypothesis

most effective for depressions that involve decreased appetite and weight loss, early morning awakening and other sleep disturbances, psychomotor retardation, and anhedonia.

Very useful for alleviating the vegetative, somatic symptoms of depression.

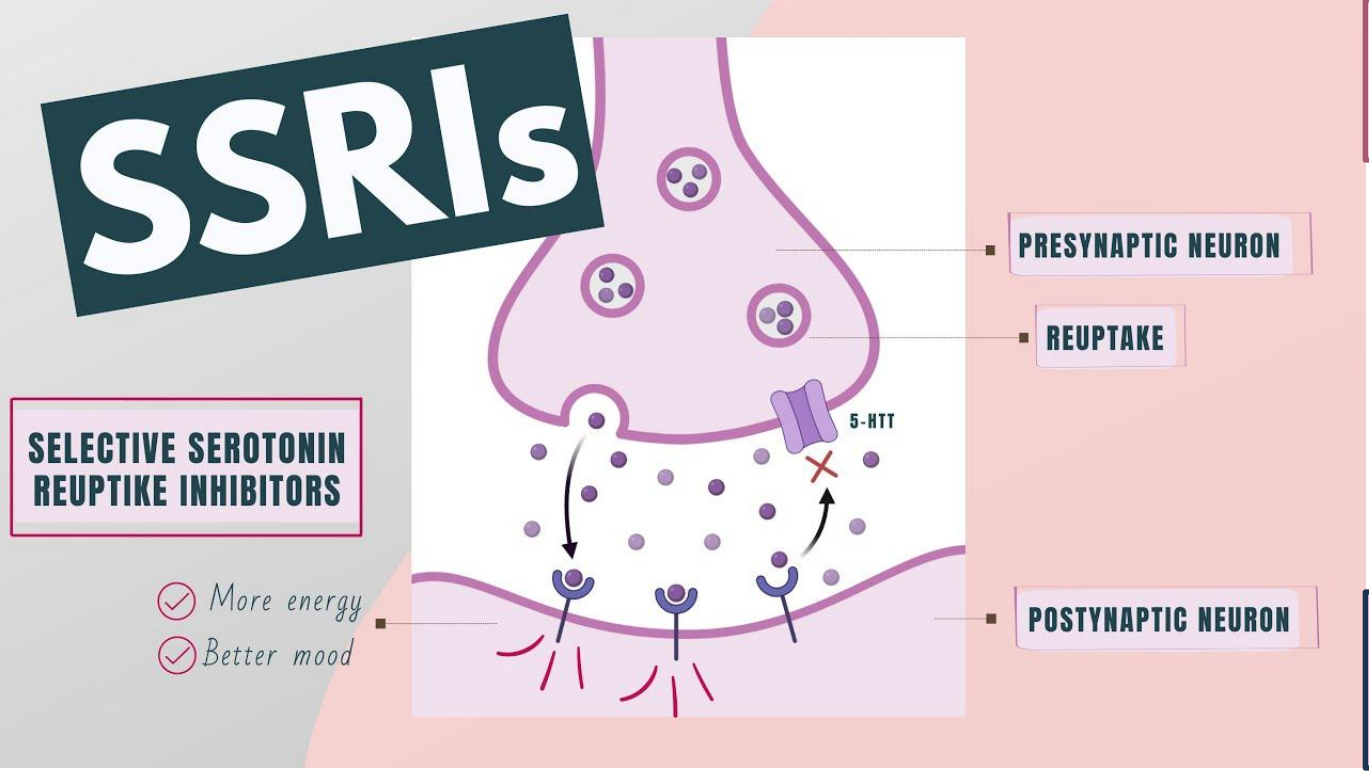
Also helpful for bulimia, and enuresis

Overdose Symptoms

ataxia, impaired concentration, agitation, severe hypotension, fever, cardiac arrhythmia, delirium, seizures, and coma

prescribed in small quantities for patients at high risk for suicide

Never take with any MAO inhibitor needs a two-week washout period



fluoxetine, fluvoxamine, paroxetine, sertraline.

Very effective for melancholic depression

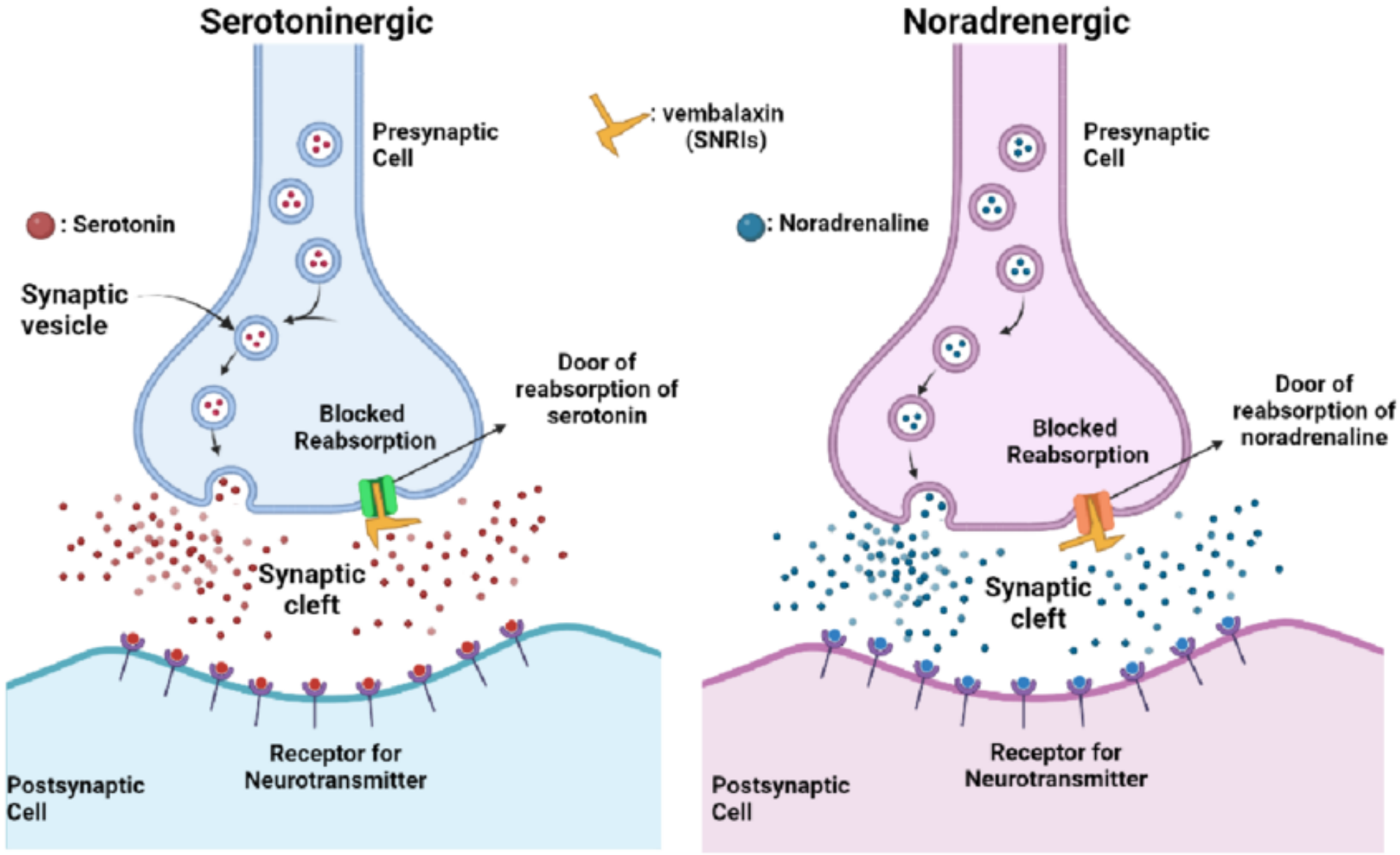
also Obsessive-Compulsive symptoms, Bulimia, Panic Disorder, and PTSD

Most people see results in 2-4 weeks
Some 6-8 weeks

Compared to TCAs - generally safer

SSRI in conjunction with an MAOI or other serotonergic agent may result in **serotonin syndrome**

Serotonin and norepinephrine reuptake Inhibitors SNRIs



SNRI	SSRI
SNRI refers to an antidepressant medicine that acts on neurotransmitters in the brain to affect mood	SSRI refers to the antidepressant medicine that acts on a neurotransmitter in the brain to influence mood
Inhibit the reuptake of both serotonin and norepinephrine	Inhibit the reuptake of serotonin
Used to treat major depressive disorders, Generalized Anxiety Disorder, Social Anxiety Disorder, OCD, and some pain syndromes	Used to treat moderate to severe depression, anxiety disorders, panic disorders, OCD and PTSD
Causes more complicated side effect than SSRI	Causes less severe side effects
Less tolerant	More tolerant
More cost-effective	Less cost-effective
Venlafaxine	Fluoxetine

MONOAMINE OXIDASE INHIBITORS (MAOIS)

MAOIs inhibit monoamine oxidase A (MAO-A) in the nerve terminals, which increases the amount of norepinephrine (NE) and serotonin (5-HT) avaible.

Examples	Used against
• Isocarboxazid (Marplan)	• Depression
• Phenelzine (Nardil)	• Bulimia nervosa
• Tranylcypromanine (Parnate)	• Obsessive-compulsive disorders
• Selegiline (Emsam	• Panic attacks

MOA also breaks down NE, 5-HT, and dopamine

MOA inhibitors thus increases NE, 5-HT, and DA

atypical depression that involve anxiety, reversed vegetative symptoms (e.g., hypersomnia, hyperphagia), and interpersonal sensitivity

Interactions with MAOIs

RARELY PRESCRIBED TODAY
b/c of drug & food interactions

Hypertensive Crisis

MAOI is taken with barbiturates, amphetamines, antihistamines, or with foods containing the amino acid tyramine.

Symptoms = severe headache, stiff neck, rapid heart rate, nausea, vomiting, sweating, and sensitivity to light.
Seek emergency treatment.

ATYPICAL ANTIDEPRESSANTS

* RESERVED for INDIVIDUALS that do not RESPOND to other ANTIDEPRESSANTS
* COMMON MEDICATIONS:
  - MIRTAZAPINE
  - TRAZODONE
  - NEFAZODONE
  - VILAZODONE
  - VORTIOXETINE
  - BUPROPION

NDRI: NE + DA re-uptake inhibitor

Major Depressive Disorder and the depressive phase of Bipolar Disorder

Zyban

Bupropion (Wellbutrin) does not affect Serotonin. It blocks NE and DA reuptake Also blocks Ach nicotinic receptors

Tolerance

Same dose produces less effect

More is needed to produce same effect

Tissue Tolerance

Tolerance develops to some effects and not others (e.g. morphine)

Cross Tolerance

Tolerance develops to a drug within a particular group results in tolerance to another drug in the same group

e.g. alcohol and ether

Withdrawal

Physical and psychological symptoms when the drug is suddenly withheld

Symptoms are often opposite to the drug's effect