



Semester 4



**Antianxiety & Antidepressant drugs**

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# ILOs

- Discuss clinical cases related to drugs used in treatment of anxiety.
- Discuss clinical cases related to drugs used in treatment of depression.

# Sedative hypnotics

## Classification of sedative-hypnotic drugs

**1-Benzodiazepines:** Diazepam

**2-Barbiturates:** Phenobarbital

**3-Other anxiolytic Drugs:** Buspirone

**4-Other newer hypnotic drugs:** Zolpidem, Zaleplon, Eszopiclone, Ramelteon

**5-Antihistamines:** Diphenhydramine

# Antidepressant drugs

## ➤ The amine reuptake inhibitors

- Tricyclic antidepressants (TCAs)
- **Selective serotonin reuptake inhibitors (SSRIs)**
- Serotonin and norepinephrine reuptake inhibitors (SNRIs)
- Norepinephrine reuptake inhibitors (NRIs) → maprotiline

## ➤ The multi-action drugs (atypical antidepressants)

➤ Last option → monoamine oxidase inhibitors (MAOIs)

A 35-year-old woman comes to her physician complaining of not being able to sleep for the past week. She is prescribed zolpidem to be taken at bedtime.

- A. Classify zolpidem and what is its mechanism of action?**
- B. What are the advantages of zolpidem?**

**A. zolpidem** new agent have largely replaced older benzodiazepines for the treatment of insomnia.

- Mechanism of action : the same as benzodiazepine but have a different allosteric binding site

**B. Advantage of newer drugs as hypnotics**

- These agents cause fewer adverse effects than the older benzodiazepine
- Have less potential for tolerance and dependence.
- Shorter duration of action usually decrease daytime sedation and hangover effects.
- Greater selectivity at targeting only GABA A receptors

A 23-year-old male college student is brought to the ER because he cannot be aroused. The patient has a history of depression, and he has been acting depressed over his classes lately. He has a prescription for lorazepam for anxiety and insomnia.

**A. You suspected lorazepam overdose, What drug is used in treating a benzodiazepine toxicity and describe its mechanism?**

## Flumazenil

- Competitive antagonist at benzodiazepine receptors.
- Used to reverse the CNS effects from benzodiazepine overdose.
- Speed recovery from benzodiazepines effects in anesthetic & diagnostic

A 39-year-old woman is taking fluoxetine for major depression

1. What is the mechanism of action?
2. What are the adverse effects ?

## 1. Mechanism of Action

- SSRIs selectively block the neuronal reuptake of 5HT → causing immediate ↑ in the synaptic concentration of 5HT.

## 2. Adverse effects:

- Unlike TCAs, SSRIs are usually administered in the morning because they increase alertness in patients.
- Nervousness, dizziness, and insomnia → decrease with continued use
- Occasionally cause male sexual dysfunction → priapism and impotence → major cause of discontinuation.
- SSRIs should not be used with MAOIs → the combination can cause a potentially fatal ↑ in 5HT conc. in synapses (serotonergic syndrome).

A 48-year-old man has developed depression after the death of his wife. He is prescribed venlafaxine.

1. What is the mechanism of action?
2. What side effects might this patient expect with venlafaxine?

➤ Mechanism of Action

- SNRIs block the neuronal reuptake of 5HT & NE → causing immediate ↑ in the synaptic concentration of 5HT & NE.

➤ Adverse effects → like that of SSRIs

A 43-year-old man with severe hepatic cirrhosis requires a sedative for insomnia. Which of the following sedatives would be the best choice for this patient?

- a. Phenobarbital
- b. Diazepam
- c. Lorazepam
- d. Secobarbital
- e. Flurazepam

**Answer: C**

32-year-old woman is taking ramelteon for chronic insomnia.

Ramelteon binds to

- A. melatonin receptors M1 and M2.
- B. muscarinic receptors M3.
- C. nicotinic receptors.
- D.  $\alpha$ 1-adrenergic receptors.
- E. D2 dopaminergic receptors.

**Answer: A**

24-year-old stockbroker has developed a “nervous disposition.” He is worried about minor matters, and sometimes complains of stomach cramps. There is no history of drug abuse. Diagnosed as suffering from generalized anxiety disorder, he is prescribed buspirone. The patient should be informed to anticipate

**(A)** A need to continually increase drug dosage because of tolerance

**(B)** A significant effect of the drug on memory

**(C)** Additive CNS depression with alcoholic beverages

**(D)** That the drug is likely to take a week or more to begin working

**(E)** That if he stops taking the drug abruptly, he will experience withdrawal signs

**Answer: D**

Which of the following best describes the mechanism of action of benzodiazepines?

- (A)** Activate GABAB receptors in the spinal cord
- (B)** Block glutamate receptors in hierarchical neuronal pathways in the brain
- (C)** Increase frequency of opening of chloride ion channels coupled to GABAA receptors
- (D)** Inhibit GABA transaminase to increase brain levels of GABA
- (E)** Stimulate release of GABA from nerve endings in the brain

**Answer: C**

An 82-year-old woman, otherwise healthy for her age, has difficulty sleeping. Triazolam is prescribed for her at one half of the conventional adult dose. Which statement about the use of triazolam in this elderly patient is accurate?

- (A)** Ambulatory dysfunction is unlikely to occur in elderly patients taking one half of the conventional adult dose
- (B)** Hypertension is a common adverse effect of benzodiazepines in elderly
- (C)** OTC cold medications may antagonize the hypnotic effects of the drug
- (D)** The patient may experience amnesia, especially if she also consumes alcoholic beverages
- (E)** Triazolam does not cause rebound insomnia on abrupt discontinuance

**Answer: D**

A 40-year-old woman has sporadic attacks of intense anxiety with marked physical symptoms, including hyperventilation, tachycardia, and sweating. If she is diagnosed as suffering from a panic disorder, the most appropriate drug to use is

- (A) Alprazolam
- (B) Eszopiclone
- (C) Flurazepam
- (D) Propranolol
- (E) Ramelteon

**Answer: A**

A 34-year-old male patient who was prescribed citalopram for depression has decided he wants to stop taking the drug. When questioned, he said that it was affecting his sexual performance. You find out that he is also trying to overcome his dependency on tobacco products. If you decide to reinstitute drug therapy in this patient, the best choice would be

- (A) Amitriptyline
- (B) Bupropion
- (C) Fluoxetine
- (D) Imipramine
- (E) Venlafaxine

**Answer: B**

A patient under treatment for a major depressive disorder is brought to the emergency department after ingesting 30 times the normal daily therapeutic dose of imipramine. Which of the following would be least useful?

- (A)** Administer bicarbonate and potassium chloride (to correct acidosis and hypokalemia)
- (B)** Administer lidocaine (to control cardiac arrhythmias)
- (C)** Initiate hemodialysis (to hasten drug elimination)
- (D)** Maintain heart rhythm by electrical pacing
- (E)** Use intravenous diazepam to control seizures

**Answer: C**

Concerning the proposed mechanisms of action of antidepressant drugs, which statement is accurate?

- (A) Bupropion inhibits NE and 5-HT reuptake into nerve endings in the CNS
- (B) Chronic treatment with tricyclic antidepressants leads to downregulation of presynaptic autoreceptors
- (C) Decreased levels of NE and 5-HT in cerebrospinal fluid is a characteristic of depressed patients before drug therapy
- (D) Nefazodone activates 5-HT receptors in the CNS
- (E) Selegiline selectively decreases the metabolism of serotonin

**Answer: B**

Which of the following is an antidepressant that is acting as an antagonist at 5-HT<sub>2</sub> receptors and widely used in (low doses) for the management of insomnia?

- (A) Estazolam
- (B) Flurazepam
- (C) Trazodone
- (D) Triazolam
- (E) Zolpidem

**Answer: C**

76-year-old female patient was treated with a benzodiazepine for several weeks after the death of her husband, but she did not like the daytime sedation it caused even at low dosage. Living independently, she has no major medical problems. Because her depressive symptoms are not reduced, you decide on a trial of an antidepressant medication. Which of the following drugs would be the most appropriate choice for this patient?

- (A) Amitriptyline
- (B) Citalopram
- (C) Mirtazapine
- (D) Phenzelzine
- (E) Trazodone

**Answer: B**

Which of the following drugs is most likely to be of value in obsessive-compulsive disorders?

- (A)** Amitriptyline
- (B)** Bupropion
- (C)** Clomipramine
- (D)** Trazodone
- (E)** Venlafaxine

**Answer: C**

THANK YOU

