

اسئلة الوزاري

What is a major difference between the somatic nervous system and the autonomic nervous system (ANS)?

- a- Somatic nervous system neurons are unmyelinated, while ANS neurons are myelinated
- b- Somatic nervous system neurons synapse in ganglia, while ANS neurons do not
- c- Somatic nervous system responses are voluntary, while ANS responses are involuntary
- d- Somatic nervous system neurons innervate smooth muscle, while ANS neurons innervate skeletal muscle
- e- Responses in the somatic division are generally slower than those in the ANS

Which of the following features describes the parasympathetic nervous system?

- a- Diffuse response
- b- Extensive preganglionic fiber branching
- c- Ganglia close to the spinal cord
- d- Short postganglionic fibers
- e- Originate from thoracolumbar region of spinal cord.

وزاري ٢٠٢٢

. Which of the following features describes the parasympathetic nervous system?

- a) Diffuse response
- b) Extensive preganglionic fiber branching
- c) Ganglia close to the spinal cord
- d) Short postganglionic fibers
- e) Wide distribution

. Activation of the sympathetic nervous system results in all the following effects EXCEPT:

- a) Shifting of blood flow from cutaneous blood vessels to the skeletal muscle
- b) Relaxation of bronchial smooth muscles
- c) Decrease of intestinal tone and peristaltic activity
- d) Preserve energy store and enhance gluconeogenesis and storage of glycogen
- e) Increase the visual field by inducing active mydriasis

اسئلة تجميع للجابر الثالث من مختلف الجامعات (امتحان المد)

- Which of the following site-neurotransmitter associations is NOT true?

- A) Sympathetic ganglia - Norepinephrine
- B) Parasympathetic ganglia - Acetylcholine
- C) Neuromuscular junction - Acetylcholine
- D) Postganglionic sympathetic - Norepinephrine
- E) Postganglionic parasympathetic - Acetylcholine

- The release of acetylcholine from the storage vesicles is inhibited by:

- A) Black widow spider venom
- B) Hemicholinium
- C) Botulinum toxin
- D) Neostigmine
- E) Edrophonium

- The heart responds to acetylcholine by decreasing in rate and force of contraction as it binds to:

- A) M1-Gq receptor
- B) M2-Gi receptor
- C) M3-Gs receptor
- D) M1-Gs receptor
- E) M2-Gq receptor

- Which of the following drugs inhibits the transport of choline from extracellular fluid into the cytoplasm?

- A) Atropine
- B) Scopolamine
- C) Botulinum toxin
- D) Tropicamide
- E) Hemicholinium

- Nonselective β -blockers are contraindicated in patients with:

- A) Hypertension
- B) Hyperthyroidism
- C) Asthma
- D) Glaucoma
- E) Angina

- What is the primary purpose of administering atropine in cases of organophosphate poisoning?

- A) To penetrate the CNS
- B) To reverse enzyme aging
- C) To prevent muscarinic side effects

- D) To regenerate acetylcholinesterase
- E) To reactivate inhibited acetylcholinesterase

• **Which of the following statements regarding atropine is accurate?**

- A) Atropine primarily acts on nicotinic receptors.
- B) Atropine has a low affinity for muscarinic receptors.
- C) Atropine binds non-competitively to muscarinic receptors.
- D) Atropine's general effects last for about 24 hours when administered orally.
- E) Atropine has little or no action at skeletal neuromuscular junctions.

• **Which of the following statements accurately describes the cardiovascular effects of atropine?**

- A) 0.5 mg of atropine primarily decreases cardiac rate.
- B) At higher doses of atropine, arterial blood pressure decreases significantly.
- C) The predominant effect of low-dose atropine is increased cardiac rate due to M2 receptor blockade.
- D) Atropine has no effect on the sinoatrial node.
- E) Atropine can decrease body temperature.

• **Which of the following statements about scopolamine is accurate?**

- A) It has no CNS effects.
- B) It does not affect short-term memory.
- C) Scopolamine's sedative effects are only observed at lower doses.
- D) Its longer duration of action compared to atropine is due to its faster metabolism.
- E) It can produce euphoria and is prone to abuse.

• **Regarding muscarinic antagonists, which of the following is a short-acting muscarinic antagonist?**

- A) Acridinium
- B) Glycopyrrolate
- C) Ipratropium
- D) Atropine
- E) Tiotropium

• **Which of the following drugs produces mydriasis for 24 hours?**

- A) Neostigmine
- B) Nadolol
- C) Cyclopentolate
- D) Tropicamide
- E) Ipratropium

• **Which drug has a beneficial role in the treatment of Parkinson's disease?**

- A) Pyridostigmine
- B) Tropicamide
- C) Benztropine

- D) Nadolol
- E) Tacrine

• **Regarding the treatment of an overactive bladder, which of the following is a relatively more selective M3 antagonist?**

- A) Oxybutynin
- B) Darifenacin
- C) Phenylephrine
- D) Tolterodine
- E) Trosipium

• **Sympathomimetics are drugs that activate adrenergic receptors. Which of the following is a sympathomimetic drug?**

- A) Neostigmine
- B) Nadolol
- C) Cyclopentolate
- D) Clonidine
- E) Ampicillin

• **Activation of β receptors initiates a series of reactions through the G-protein coupled receptor and second messenger**

- A) cAMP
- B) IP3
- C) Mg^{2+}
- D) DAG
- E) ATP

• **Why does tamsulosin have fewer cardiovascular side effects compared to other drugs targeting $\alpha 1$ receptors?**

- A) It primarily targets $\alpha 1B$ subtype receptors.
- B) It primarily targets $\alpha 2$ subtype receptors.
- C) It selectively targets $\alpha 1A$ subtype receptors.
- D) It selectively targets $\alpha 2C$ subtype receptors.
- E) It selectively targets $\beta 2$ subtype receptors.

• **Which of the following drugs is used for the treatment of benign prostatic hyperplasia (BPH)?**

- A) Phenoxybenzamine
- B) Phentolamine
- C) Alfuzosin
- D) Nadolol
- E) Yohimbine

• **What is the neurotransmitter that is normally released in the sinoatrial node of the heart in response to a blood pressure increase?**

- A) Acetylcholine

- B) Dopamine
- C) Epinephrine
- D) Glutamate
- E) Norepinephrine

• **Parasympathetic nerves arise from the spinal cord from:**

- A) Sacral part
- B) Cranial part
- C) Both of the above
- D) None of the above

• **Which physiological change occurs when the parasympathetic system is activated?**

- A) Increase in heart rate
- B) Inhibition of lacrimation (tears)
- C) Dilation of the pupil (mydriasis)
- D) Increase in gastric motility

• **Which statement is correct regarding the autonomic nervous system?**

- A) Afferent neurons carry impulses from the central nervous system (CNS) to the effector organs.
- B) Preganglionic neurons of the sympathetic system arise from the cranial nerves, as well as from the sacral region.
- C) When there is a sudden drop in blood pressure, the baroreceptors send signals to the brain to activate the parasympathetic system.
- D) The heart receives both sympathetic and parasympathetic innervation.

• **Which physiological change is expected when the sympathetic system is inhibited using a pharmacological agent?**

- A) Reduction in heart rate
- B) Increase in blood pressure
- C) Decrease in fluid secretions
- D) Constriction of blood vessels

• **Why does the somatic nervous system enable a faster response compared to the ANS?**

- a) Somatic motor neurons have ganglia where neurotransmission is mediated by ACh.
- b) Somatic motor neurons have ganglia where neurotransmission is mediated by NE.
- c) Somatic motor neurons are not myelinated.
- d) Somatic motor neurons are myelinated and do not have ganglia.
- e) Somatic motor nervous system has short preganglionic neurons.

• **Regarding the comparison of sympathetic neurons to parasympathetic neurons:**

- a) The sympathetic preganglionic fibers are longer.
- b) The parasympathetic preganglionic fibers are shorter.
- c) The sympathetic postganglionic fibers are shorter.

- d) The parasympathetic postganglionic fibers are longer.
 - e) The sympathetic preganglionic fibers are shorter.
- Which physiological change occurs when the parasympathetic system is activated?
 - a) Increase in heart rate
 - b) Inhibition of lacrimation (tears)
 - c) Dilation of the pupil (mydriasis)
 - d) Increase in gastric motility
 - e) Increase in blood pressure
 - Inhibition of the sympathetic system by using a pharmacological agent causes?
 - a) Reduction in heart rate
 - b) Increase in blood pressure
 - c) Decrease in fluid secretions
 - d) Constriction of blood vessels
 - e) Dilation of the pupil (mydriasis)
 - Which is not correct regarding activation of receptors on the effector organs in the ANS?
 - a) Acetylcholine activates muscarinic receptors.
 - b) Acetylcholine activates nicotinic receptors.
 - c) Epinephrine activates beta-adrenergic receptors.
 - d) Norepinephrine activates alpha-adrenergic receptors.
 - e) Atropine inhibits nicotinic receptors.
 - An elderly man is brought to the emergency room after ingesting a large quantity of prazosin tablets, a drug that blocks α_1 -adrenergic receptors, which mediate effects of epinephrine and norepinephrine on the blood vessels and urinary bladder. Which symptom is most likely to be seen in this patient?
 - a) Reduced heart rate (bradycardia)
 - b) Constriction of blood vessels
 - c) Increased blood pressure
 - d) Reduction in urinary frequency
 - e) Decrease in peripheral vascular resistance
 - The nervous system is divided into two anatomical divisions: the central nervous system (CNS) and the autonomic nervous system (ANS). Effector organs of the ANS include all of the following **EXCEPT**:
 - a) Brainstem
 - b) Arteriolar smooth muscle
 - c) Heart
 - d) Visceral smooth muscles

- e) Glands
- Which statement describes the response when nicotine binds to its target receptor?
 - a) A channel opens and negative ions flow into the cell.
 - b) A channel opens and positive ions flow into the cell.
 - c) Adenylyl cyclase is activated to increase intracellular cAMP.
 - d) Adenylyl cyclase is inhibited leading to decreased intracellular cAMP.
 - e) Phospholipase C is activated to increase intracellular IP3 and DAG.
- Full activation of the sympathetic nervous system, as in maximal exercise, can produce all the following responses **except**:
 - a) Bronchial relaxation.
 - b) Decreases intestinal motility.
 - c) Increased renal blood flow.
 - d) Mydriasis.
 - e) Increased heart rate (tachycardia).
- The symptoms of cholinesterase inhibitor toxicity include:
 - a) Nausea, vomiting.
 - b) Salivation and sweating.
 - c) Miosis.
 - d) Diarrhea.
 - e) All of the above.
- All preganglionic autonomic neurons secrete:
 - a) Epinephrine.
 - b) Acetylcholine.
 - c) Nicotine.
 - d) Dopamine.
 - e) Muscarine.
- The synthesis of acetylcholine is prevented by:
 - a) Atropine.
 - b) Ephedrine.
 - c) Pilocarpine.
 - d) Nicotine.
 - e) Hemicholinium.
- Vagal tone on the heart:
 - a) Increases the heart rate.

- b) Causes a negative inotropic effect.
- c) Is blocked by the use of a muscarinic receptor agonist.
- d) Decreases during rest.
- e) Is blocked by the use of pilocarpine.

• **Which is correct regarding activation of receptors on the effector organs in the ANS?**

- A. Acetylcholine activates adrenergic receptors.
- B. Acetylcholine activates muscarinic receptors.
- C. Epinephrine activates nicotinic receptors.
- D. Norepinephrine activates muscarinic receptors.
- E. The receptors in skeletal muscles use intracellular receptors.

• **Cholinergic stimulation causes:**

- A. Urine retention
- B. Bronchodilatation
- C. Sweating
- D. Tachycardia
- E. Reduced gut motility

• **Nicotinic acetylcholine receptors are found in all the following sites EXCEPT:**

- A. Sympathetic ganglia
- B. Presynaptic nerve endings
- C. Central nervous system
- D. Skeletal muscle motor end plate
- E. Vascular endothelium

• **Stimulation of cardiac M2 cholinergic receptors causes which of the following:**

- A. Decrease in myocardial contractility
- B. Decrease in SA nodal activity and heart rate
- C. Decrease in conduction velocity through the Purkinje fibers
- D. Decrease in coronary blood flow
- E. All of the above

• **Which of the following drugs has the longest duration of AChE inhibition?**

- A. Echothiophate
- B. Neostigmine
- C. Physostigmine
- D. Pyridostigmine
- E. Donepezil

• **A muscarinic blocker that is used as a standard treatment of motion sickness is:**

- A. Pirenzepine
- B. Oxybutynin
- C. Atropine

- D. Tolterodine
- E. Scopolamine

• **Botulinum toxin blocks the release of acetylcholine from cholinergic nerve terminals.**

Which is a possible effect of botulinum toxin?

- A. Skeletal muscle paralysis
- B. Improvement of myasthenia gravis symptoms
- C. Increased salivation
- D. Reduced heart rate
- E. Bronchoconstriction

• **A patient develops urinary retention after an abdominal surgery. Urinary obstruction was ruled out in this patient. Which strategy would be helpful in promoting urination?**

- A. Activating nicotinic receptors
- B. Inhibiting the release of acetylcholine
- C. Inhibiting cholinesterase enzyme
- D. Blocking muscarinic receptors
- E. Administration of botulinum toxin

• **Which of the following drugs could theoretically improve asthma symptoms?**

- A. Bethanechol
- B. Pilocarpine
- C. Pyridostigmine
- D. Atropine
- E. Acetylcholine

• **If an ophthalmologist wants to dilate the pupils for an eye examination, which drug/class of drugs is theoretically useful?**

- A. Muscarinic receptor activator (agonist)
- B. Muscarinic receptor inhibitor (antagonist)
- C. Pilocarpine
- D. Neostigmine
- E. Ecothiophate

• **In Alzheimer's disease, there is a deficiency of cholinergic neuronal function in the brain. Theoretically, which strategy is useful in treating symptoms of Alzheimer's disease?**

- A. Inhibiting the acetylcholinesterase enzyme in the brain
- B. Inhibiting cholinergic receptors in the brain
- C. Inhibiting the release of acetylcholine in the brain
- D. Activating the acetylcholinesterase enzyme in the brain
- E. None of the above

• **A patient with Alzheimer's disease needs treatment for overactive bladder (OAB).**

Which drug is the best choice for this patient?

- A. Darifenacin
- B. Solifenacin

- C. Tolterodine
- D. Oxybutynin
- E. Trospium

• **Which is correct regarding ganglion-blocking drugs?**

- A. Blockade of sympathetic ganglia could result in reduced blood pressure.
- B. Blockade of parasympathetic ganglia could result in reduced heart rate.
- C. Nicotine is a non-depolarizing ganglion blocker.
- D. Atropine is a non-depolarizing ganglion blocker.
- E. Nicotine can be used as a non-depolarizing NMB.

• **Which drug is useful in treating sinus bradycardia?**

- A. Pilocarpine
- B. Atropine
- C. Cisatracurium
- D. Neostigmine
- E. Succinylcholine

• **Which of the following organs receive only sympathetic innervation?**

- A. Adrenal medulla
- B. Lung
- C. Kidney
- D. Pilomotor muscles
- E. Sweat glands

• **Which statement regarding the sympathetic system is false?**

- A. Short preganglionic, long postganglionic fibers
- B. Nerve fibers are widely distributed
- C. Ganglia are located near the organs
- D. Sites of origin are the thoracic and lumbar regions of the spinal cord
- E. Preganglionic fibers are extensively branched

• **Sympatholytics are a group of drugs that:**

- A. Activate cholinergic receptors
- B. Block cholinergic receptors
- C. Activate adrenergic receptors
- D. Block adrenergic receptors
- E. Activate or block the sympathetic system according to the action potentials that arrive at nerve terminals

• **Which statement regarding neurotransmission in cholinergic neurons is NOT correct?**

- A. Choline has a tertiary nitrogen and readily diffuses through the membrane
- B. Black widow spider venom causes all the ACh stored in synaptic vesicles to empty into the synaptic gap
- C. The uptake of choline is the rate-limiting step in ACh synthesis
- D. Choline may be recaptured by a sodium-coupled, high-affinity uptake system that transports

the molecule back into the neuron

E. Choline acetyltransferase catalyzes the reaction of choline with acetyl coenzyme A to form ACh

• **Which statement regarding the mechanisms of acetylcholine signal transduction is NOT correct?**

A. M1 or M3 are Gq protein-coupled receptors that activate phospholipase C, increasing IP3 & DAG

B. M2 receptors are Gi protein-coupled receptors, which increase Ca^{2+} intracellularly

C. Nicotinic receptors are ionotropic receptors

D. Muscarinic receptors have a high affinity for muscarine

E. Nicotinic receptors are classified as NN and NM

All adrenergic receptors and cholinergic muscarinic receptors are G protein-coupled receptors (metabotropic receptors). Metabotropic receptors mediate the effects of ligands by activating a second messenger system inside the cell. The two most widely recognized second messengers are the adenylyl cyclase system and the calcium/phosphatidylinositol system (Figure 3.10B, C).

Study Questions

Choose the ONE best answer.

3.1 Which is correct regarding the sympathetic nervous system?

- A. It generally mediates body functions in “rest-and-digest” mode.
- B. The neurotransmitter at the sympathetic ganglion is norepinephrine (NE).
- C. The neurotransmitter at the sympathetic ganglion is acetylcholine (ACh).
- D. Sympathetic neurons release ACh in the effector organs.

Correct answer = C. The neurotransmitter at the sympathetic and parasympathetic ganglia is acetylcholine. The sympathetic system generally mediates body functions in “fight or flight” mode, and the parasympathetic system generally mediates body functions in “rest-and-digest” mode. Sympathetic neurons release NE, and parasympathetic neurons release ACh in the effector cells.

3.2 Why does the somatic nervous system enable a faster response compared to the ANS?

- A. Somatic motor neurons have ganglia where neuro-transmission is mediated by ACh.
- B. Somatic motor neurons have ganglia where neuro-transmission is mediated by NE.
- C. Somatic motor neurons are not myelinated.
- D. Somatic motor neurons are myelinated and do not have ganglia.

Correct answer = D. Somatic motor neurons are myelinated and have no ganglia. This enables faster transmission in the somatic neurons.

3.3 Which physiological change occurs when the parasympathetic system is activated?

- A. Increase in heart rate
- B. Inhibition of lacrimation (tears)
- C. Dilation of the pupil (mydriasis)
- D. Increase in gastric motility

Correct answer = D. Activation of the parasympathetic system causes an increase in gastric motility, increase in fluid secretions, reduction in heart rate, and constriction of the pupil. In the “rest-and-digest” mode, the parasympathetic system is more active, which helps with digestion.

3.4 Which physiological change is expected when the sympathetic system is inhibited using a pharmacological agent?

- A. Reduction in heart rate
- B. Increase in blood pressure
- C. Decrease in fluid secretions
- D. Constriction of blood vessels

Correct answer = A. Activation of the sympathetic system causes an increase in heart rate, increase in blood pressure, reduction or thickening of fluid secretions, and constriction of blood vessels. Therefore, inhibition of the sympathetic system should theoretically cause a reduction in heart rate, decrease in blood pressure, increase in fluid secretions, and relaxation of blood vessels.

3.5 Which is correct regarding activation of receptors on the effector organs in the ANS?

- A. Acetylcholine activates muscarinic receptors.
- B. Acetylcholine activates adrenergic receptors.
- C. Epinephrine activates nicotinic receptors.
- D. Norepinephrine activates muscarinic receptors.

Correct answer = A. Acetylcholine is the neurotransmitter in the cholinergic system, and it activates both muscarinic and nicotinic cholinergic receptors, not adrenergic receptors. Norepinephrine and epinephrine activate adrenergic receptors, not muscarinic receptors.

3.6 Which statement concerning the parasympathetic nervous system is correct?

- A. The parasympathetic system often discharges as a single, functional system.
- B. The parasympathetic division is involved in near vision, movement of food, and urination.
- C. The postganglionic fibers of the parasympathetic division are long, compared to those of the sympathetic nervous system.
- D. The parasympathetic system controls the secretion of the adrenal medulla.

Correct answer = B. The parasympathetic nervous system maintains essential bodily functions, such as vision, movement of food, and urination. It uses acetylcholine, not norepinephrine, as a neurotransmitter, and it discharges as discrete fibers that are activated separately. The postganglionic fibers of the parasympathetic system are short compared to those of the sympathetic division. The adrenal medulla is under the control of the sympathetic system.

3.7 Which is correct regarding neurotransmitters and neurotransmission?

- A. Neurotransmitters are released from the presynaptic nerve terminals.
- B. Arrival of an action potential in the postsynaptic cell triggers release of neurotransmitter.
- C. Intracellular calcium levels drop in the neuron before the release of neurotransmitter.
- D. Serotonin and dopamine are the primary neurotransmitters in the ANS.

Correct answer = A. Neurotransmitters are released from presynaptic neurons, triggered by the arrival of an action potential in the presynaptic neuron (not in the postsynaptic cell). When an action potential arrives in the presynaptic neuron, calcium enters the presynaptic neuron and calcium levels increase in the neuron before neurotransmitter is released. The main neurotransmitters in the ANS are norepinephrine and acetylcholine.

3.8 An elderly man is brought to the emergency room after ingesting a large quantity of prazosin tablets, a drug that blocks α_1 adrenergic receptors, which mediate effects of epinephrine and norepinephrine on the blood vessels and urinary bladder. Which symptom is most likely to be seen in this patient?

- A. Reduced heart rate (bradycardia)
- B. Dilation of blood vessels (vasorelaxation)
- C. Increased blood pressure
- D. Reduction in urinary frequency

Correct answer = B. Activation of α_1 receptors causes vasoconstriction, reduction in urinary frequency, and an increase in blood pressure, without a direct effect on the heart rate. It may cause reflex tachycardia (increase in heart rate) in some patients. Thus blockade of α_1 receptors could theoretically cause dilation of blood vessels, reduction in blood pressure, and increase in urinary frequency. It should not cause a reduction in heart rate.

3.9 Which statement is correct regarding the autonomic nervous system?

- A. Afferent neurons carry impulses from the central nervous system (CNS) to the effector organs.
- B. Preganglionic neurons of the sympathetic system arise from the cranial nerves, as well as from the sacral region.
- C. When there is a sudden drop in blood pressure, the baroreceptors send signals to the brain to activate the parasympathetic system.
- D. The heart receives both sympathetic and parasympathetic innervation.

Correct answer = D. The heart receives both sympathetic and parasympathetic innervation. Activation of sympathetic neurons increases the heart rate and force of contraction, and activation of parasympathetic neurons reduces the heart rate and force of contraction (slightly). Afferent neurons carry impulses from the periphery to the CNS, and efferent neurons carry signals away from the CNS. Preganglionic neurons of the sympathetic system arise from thoracic and lumbar regions of the spinal cord, whereas the preganglionic neurons of the parasympathetic system arise from cranial nerves and the sacral region. When there is a sudden drop in blood pressure, the sympathetic system is activated, not the parasympathetic system.

3.10 Which is correct regarding membrane receptors and signal transduction?

- A. ANS neurotransmitters bind to membrane receptors on the effector cells, which leads to intracellular events.
- B. Cholinergic muscarinic receptors are ionotropic receptors.
- C. Cholinergic nicotinic receptors are metabotropic receptors.
- D. Metabotropic receptors activate ion channels directly.

Correct answer = A. Neurotransmitters generally bind to membrane receptors on the postsynaptic effector cells and cause cellular effects. Acetylcholine (ACh) binds to cholinergic muscarinic receptors and activates the second messenger pathway in effector cells, which in turn causes cellular events. Receptors that are coupled to second messenger systems are known as metabotropic receptors. Metabotropic receptors do not directly activate ion channels. ACh also binds to cholinergic nicotinic receptors and activates ion channels on the effector cells. The receptors that directly activate ion channels are known as ionotropic receptors.

Quiz A - Pharmacology-3rd Stage

1. Which division of the nervous system is responsible for involuntary control of smooth muscle, cardiac muscle, and glands?
A) Somatic nervous system
B) Autonomic nervous system
C) Central nervous system
D) Peripheral nervous system
E) Enteric nervous system
2. In the sympathetic nervous system, where do preganglionic neurons originate?
A) Cranial nerves III, VII, IX, X
B) Sacral region S2-S4
C) Thoracic and lumbar regions (T1-L2)
D) Cervical spinal cord
E) Brainstem
3. Which organ is innervated only by the sympathetic nervous system and not by the parasympathetic nervous system?
A) Heart
B) Adrenal medulla
C) Lungs
D) Gastrointestinal tract
E) Urinary bladder
4. What is the primary function of the enteric nervous system?
A) Regulation of respiratory rate
B) Control of heart rate
C) Regulation of gastrointestinal motility and secretions
D) Modulation of blood pressure
E) Reflex regulation of skeletal muscles
5. Which neurotransmitter is primarily released by postganglionic sympathetic neurons?
A) Norepinephrine
B) Acetylcholine
C) Dopamine
D) Glutamate
E) Serotonin
6. What is the role of acetylcholinesterase in neurotransmission?
A) Degrades acetylcholine into choline and acetate
B) Blocks neurotransmitter release
C) Facilitates neurotransmitter synthesis

Quiz A - Pharmacology-3rd Stage

- D) Stimulates postsynaptic receptors
- E) Prevents neurotransmitter reuptake

7. What is the primary effect of α_1 -adrenergic receptor activation?

- A) Bronchodilation
- B) Vasoconstriction
- C) Increased heart rate
- D) Inhibition of norepinephrine release
- E) Increased insulin secretion

8. Which drug is used to reverse the effects of non-depolarizing neuromuscular blockers?

- A) Neostigmine
- B) Pilocarpine
- C) Atropine
- D) Diazepam
- E) Dopamine

9. Which adrenergic receptor subtype is primarily responsible for increasing heart rate and contractility?

- A) Alpha-1
- B) Alpha-2
- C) Beta-1
- D) Beta-2
- E) Beta-3

10. Which drug is used as an antidote for atropine toxicity?

- A) Physostigmine
- B) Neostigmine
- C) Pralidoxime
- D) Dopamine
- E) Epinephrine