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Sympathetic vs Parasympathetic Nervous System

Exam — Autonomic Nervous System

High-school/pre-med-level questions comparing the sympathetic and parasympathetic divisions of the autonomic nervous system.

29 items — Printable Exam

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1 The autonomic nervous system (ANS) primarily controls:



- A** Voluntary movement of skeletal muscles
- B** Involuntary functions of smooth muscle, cardiac muscle and glands
- C** Transmission of pain from the skin only
- D** Conscious memory and thinking
- E** Reflexes of the knee jerk only

2 Which TWO main divisions make up the autonomic nervous system?



- A** Central and peripheral nervous systems
- B** Somatic and motor systems
- C** Sympathetic and parasympathetic nervous systems
- D** Sensory and motor systems
- E** Cranial and spinal nerves

3 The sympathetic nervous system (SNS) is often described as the:



- A** "Rest and digest" system
- B** "Fight or flight" system
- C** "Memory and learning" system
- D** "Reflex only" system
- E** "Conscious movement" system





4 The parasympathetic nervous system (PSNS) is often described as the:



- A "Fight or flight" system
- B "Rest and digest" system
- C "Pain and temperature" system
- D "Posture and balance" system
- E "Voluntary skeletal movement" system

5 Which of the following effects is MOST characteristic of increased sympathetic activity?



- A Decreased heart rate
- B Increased heart rate and force of contraction
- C Increased saliva production and watery saliva
- D Increased digestive motility
- E Constriction of the pupil (miosis)

6 Which of the following effects is MOST characteristic of increased parasympathetic activity?



- A Bronchodilation and decreased mucus secretion
- B Decreased heart rate and increased digestive activity
- C Increased heart rate and blood pressure
- D Pupil dilation (mydriasis)
- E Reduced saliva secretion





7 Which statement best describes the typical **EFFECT** of sympathetic stimulation on the **BRONCHI** of the lungs?



- A** Constriction of bronchi and increased mucus
- B** Dilation of bronchi to allow more airflow
- C** No effect on airways
- D** Complete closure of airways
- E** Only increased mucus with no diameter change

8 Parasympathetic stimulation of the **BRONCHI** typically causes:



- A** Bronchodilation and less mucus
- B** Bronchoconstriction and increased mucus secretion
- C** No effect on the bronchi
- D** Permanent narrowing of the airways
- E** Airway collapse

9 Sympathetic activation generally causes which change in the eye?



- A** Constriction of pupil (miosis)
- B** Dilation of pupil (mydriasis)
- C** Blindness
- D** No change in pupil size
- E** Inability to focus on distant objects





10 Parasympathetic activation in the eye generally causes:



- A Pupil dilation and loss of near vision
- B Pupil constriction and better near focus
- C No change in pupil size or lens shape
- D Permanent pupil dilation
- E Blinking reflexes only

11 Which of the following is TRUE about the ORIGIN of sympathetic vs parasympathetic preganglionic neurons in the CNS?



- A SNS is craniosacral; PSNS is thoracolumbar
- B Both SNS and PSNS are craniosacral
- C SNS is thoracolumbar; PSNS is craniosacral
- D Both SNS and PSNS originate only in the brain
- E Only SNS has preganglionic neurons

12 Sympathetic and parasympathetic pathways typically differ in the LENGTH of their pre- and postganglionic fibres. Which pattern is usually correct?



- A SNS: short preganglionic, long postganglionic; PSNS: long preganglionic, short postganglionic
- B SNS: long preganglionic, short postganglionic; PSNS: short preganglionic, long postganglionic
- C Both SNS and PSNS have only short preganglionic fibres





- D Both SNS and PSNS have only long postganglionic fibres
- E SNS has no ganglia, PSNS has many

13 Where are most parasympathetic ganglia located?



- A In a chain alongside the spinal cord
- B Inside or very close to the target organs
- C Only in the brainstem
- D Inside skeletal muscles
- E In the dorsal root ganglia

14 Which neurotransmitter is released by ALL preganglionic sympathetic and parasympathetic neurons at their ganglia?



- A Noradrenaline (norepinephrine)
- B Adrenaline (epinephrine)
- C Acetylcholine
- D Dopamine
- E Serotonin

15 Most postganglionic sympathetic neurons release _____ at their target organs, whereas most postganglionic parasympathetic neurons release _____.



- A ACh; ACh





- B ACh; noradrenaline
- C Noradrenaline; ACh
- D Noradrenaline; adrenaline
- E Adrenaline; dopamine

16 Which of the following actions is **MAINLY** under sympathetic control (with little or no parasympathetic influence)?



- A Resting heart rate at 60 bpm
- B Sweat gland activation during exercise
- C Increased digestive motility after a meal
- D Pupil constriction when reading
- E Urination (micturition)

17 Sympathetic stimulation of most systemic blood vessels tends to cause:



- A Vasodilation and a fall in blood pressure
- B Vasoconstriction and a rise in blood pressure
- C No change in vessel diameter
- D Immediate vessel rupture
- E Permanent blocking of blood flow





18 Parasympathetic nerves have **LITTLE** direct effect on most blood vessels. Therefore, a fall in parasympathetic activity alone usually:



- A** Also causes strong vasoconstriction directly
- B** Directly dilates all arterioles
- C** Has minimal direct effect on vessel diameter (SNS is more important)
- D** Stops blood flow
- E** Makes blood vessels disappear

19 Which effect on the **GASTROINTESTINAL TRACT** is correctly matched?



- A** SNS: increases motility and secretion
- B** PSNS: decreases motility and secretion
- C** SNS: decreases motility and blood flow; PSNS: increases motility and secretion
- D** SNS: has no effect; PSNS: stops digestion completely
- E** Both SNS and PSNS always increase GI motility

20 Sympathetic and parasympathetic systems often have opposite effects on the same organ. This is called:



- A** Dual innervation with antagonistic effects
- B** Single innervation with identical effects
- C** Somatic control
- D** Positive feedback
- E** Reflex inhibition





21 Which of the following scenarios best indicates **PREDOMINANT** sympathetic activation?



- A** Resting quietly after a meal, increased bowel sounds, slow heart rate
- B** Sleeping deeply with slow breathing
- C** Running from danger with fast heart rate, pale skin, dilated pupils, dry mouth
- D** Meditating, low heart rate, warm skin, active digestion
- E** Reading calmly after lunch

22 Which of the following scenarios best indicates **PREDOMINANT** parasympathetic activation?



- A** Sprint running with heart pounding and dry mouth
- B** Preparing to give a speech and feeling anxious
- C** Relaxing after a large meal with gurgling intestines and slower heart rate
- D** Suddenly startled by a loud noise
- E** Holding your breath underwater

23 Which statement about the **SOMATIC** motor system vs the **AUTONOMIC** system is correct?



- A** Somatic motor pathways use two neurons in series; autonomic pathways use one
- B** Somatic motor neurons directly innervate skeletal muscle; autonomic pathways use a pre- and postganglionic neuron to reach smooth and cardiac muscle and glands
- C** Somatic system only controls the heart
- D** Autonomic system controls voluntary skeletal muscle





- E** Both systems innervate the same targets with the same neurotransmitters

24 The adrenal medulla is functionally **MOST** similar to which autonomic structure?



- A** A parasympathetic ganglion that releases ACh into the blood
- B** A somatic motor neuron
- C** A modified sympathetic ganglion that releases adrenaline/noradrenaline into the blood
- D** A sensory receptor
- E** A skeletal muscle fibre

25 Which statement about 'basal tone' of SNS and PSNS is **MOST** accurate?



- A** At rest, only PSNS is active; SNS is completely off
- B** At rest, only SNS is active; PSNS is completely off
- C** Both divisions usually have some baseline activity, and the balance shifts depending on the situation
- D** Neither division is active unless a person is in extreme stress
- E** Only one division can be active at any given time

26 Which effect on the **URINARY BLADDER** is **MOST** associated with parasympathetic stimulation?



- A** Relaxation of bladder wall and contraction of internal sphincter (urine retention)





- B** Contraction of bladder wall and relaxation of internal sphincter (promotes urination)
- C** No effect on bladder function
- D** Permanent urine retention
- E** Direct inhibition of kidney filtration

27 Which effect on the **SALIVARY GLANDS** correctly compares SNS and PSNS?



- A** SNS: no saliva; PSNS: no saliva
- B** SNS: large volume of watery saliva; PSNS: thick, sticky saliva
- C** PSNS: large volume of watery saliva; SNS: smaller volume, thicker saliva
- D** Both SNS and PSNS always completely stop salivation
- E** Only SNS innervates salivary glands

28 Which of the following is **NOT** a typical effect of sympathetic activation?



- A** Increased heart rate
- B** Increased blood flow to skeletal muscles
- C** Decreased GI motility
- D** Pupil constriction
- E** Bronchodilation

29 Which of the following is **NOT** a typical effect of parasympathetic activation?





- A Slowing of heart rate
- B Increased intestinal motility
- C Pupil dilation
- D Increased glandular secretion (e.g. saliva, digestive juices)
- E Promotion of urination





#	Ans	Answer Text
1	B	Involuntary functions of smooth muscle, cardiac muscle and glands
2	C	Sympathetic and parasympathetic nervous systems
3	B	"Fight or flight" system
4	B	"Rest and digest" system
5	B	Increased heart rate and force of contraction
6	B	Decreased heart rate and increased digestive activity
7	B	Dilation of bronchi to allow more airflow
8	B	Bronchoconstriction and increased mucus secretion
9	B	Dilation of pupil (mydriasis)
10	B	Pupil constriction and better near focus
11	C	SNS is thoracolumbar; PSNS is craniosacral
12	A	SNS: short preganglionic, long postganglionic; PSNS: long preganglionic,...
13	B	Inside or very close to the target organs
14	C	Acetylcholine
15	C	Noradrenaline; ACh
16	B	Sweat gland activation during exercise
17	B	Vasoconstriction and a rise in blood pressure
18	C	Has minimal direct effect on vessel diameter (SNS is more important)
19	C	SNS: decreases motility and blood flow; PSNS: increases motility and sec...
20	A	Dual innervation with antagonistic effects
21	C	Running from danger with fast heart rate, pale skin, dilated pupils, dry...
22	C	Relaxing after a large meal with gurgling intestines and slower heart ra...
23	B	Somatic motor neurons directly innervate skeletal muscle; autonomic path...
24	C	A modified sympathetic ganglion that releases adrenaline/noradrenaline i...
25	C	Both divisions usually have some baseline activity, and the balance shif...
26	B	Contraction of bladder wall and relaxation of internal sphincter (promot...
27	C	PSNS: large volume of watery saliva; SNS: smaller volume, thicker saliva
28	D	Pupil constriction
29	C	Pupil dilation

