

TOPIC: NEUROTRANSMITTERS OF THE ANS

Neurotransmitters of the ANS

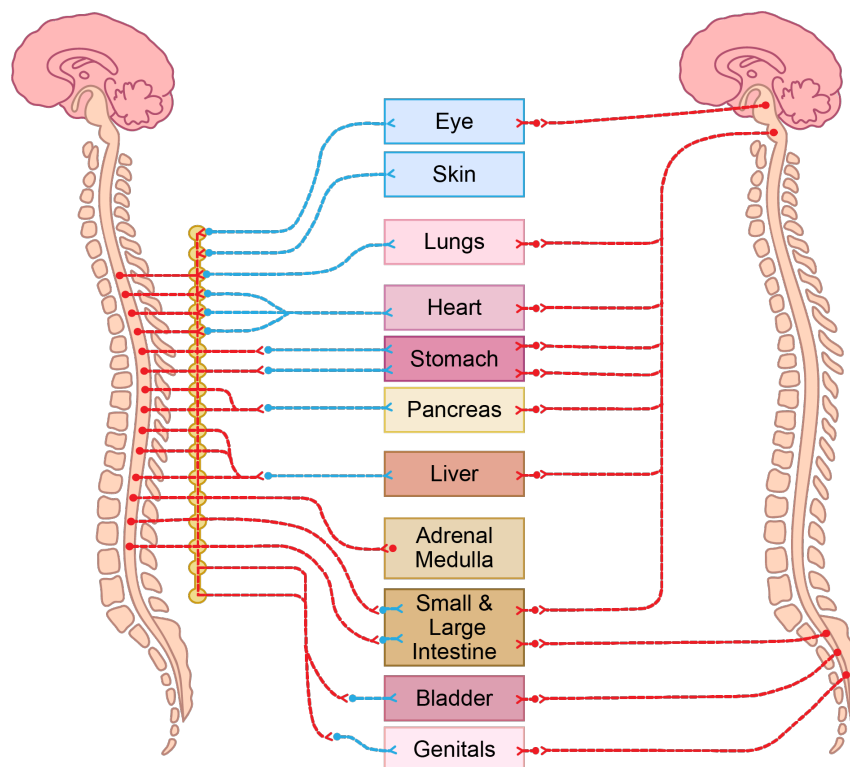
- The autonomic nervous system uses _____ neurotransmitters.

Division of ANS	Preganglionic Fibers Release:	Postganglionic Fibers Release:
Sympathetic Division	Acetylcholine (ACh)	Mostly Norepinephrine (____adrenaline) Epinephrine (adrenaline) Acetylcholine (ACh)
Parasympathetic Division	Acetylcholine (ACh)	Acetylcholine (ACh)

- **Cholinergic Fibers:** Release acetylcholine.
 - Sympathetic _____ganglionic fibers.
 - Parasympathetic preganglionic fibers.
 - Parasympathetic _____ganglionic fibers.
- **Adrenergic Fibers:** Release norepinephrine and epinephrine.
 - Sympathetic _____ganglionic fibers.

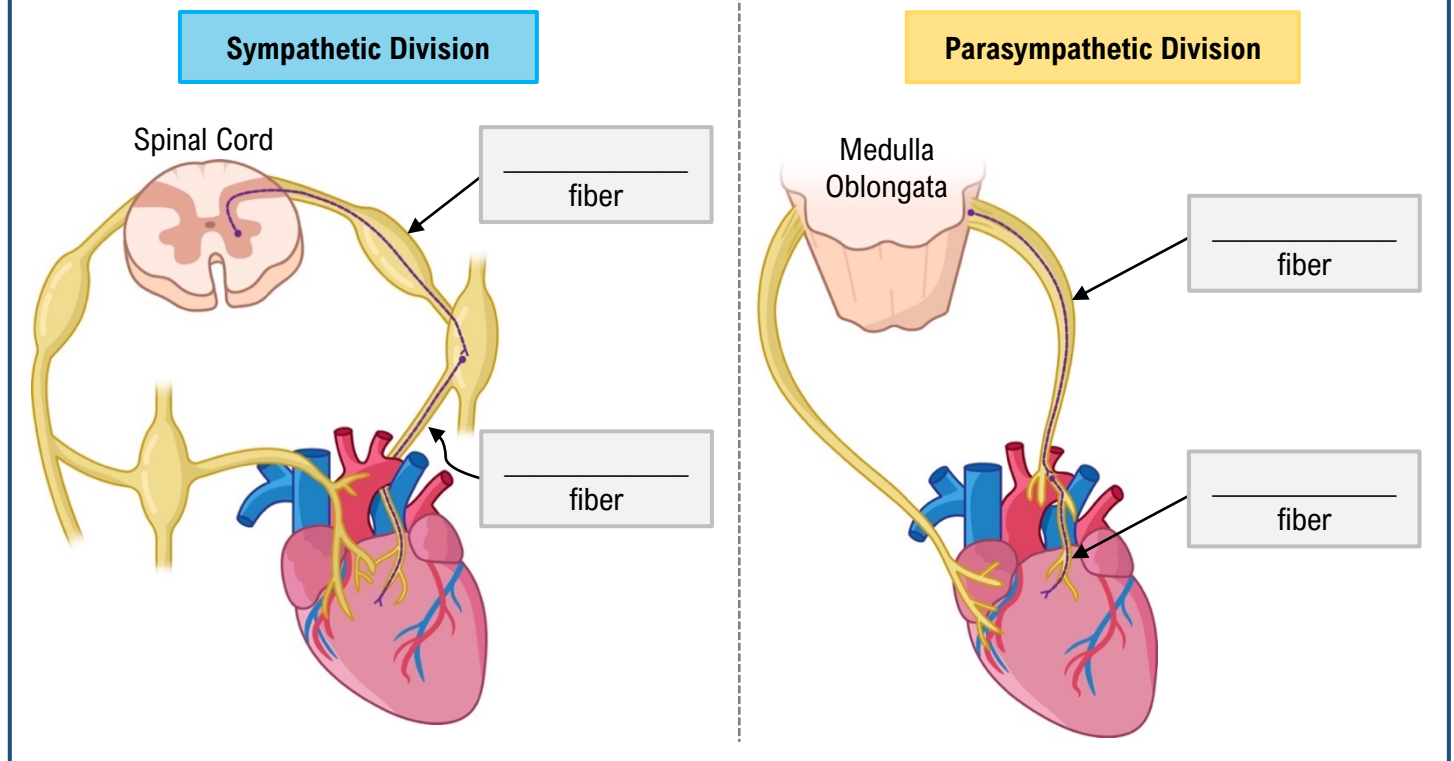
_____ Nervous System

_____ sympathetic Nervous System



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EXAMPLE: The image below depicts innervation in the sympathetic and parasympathetic nervous system. Label the cholinergic and adrenergic fibers.



PRACTICE: _____ and _____ are the major neurotransmitters released by autonomic nervous system neurons.

- a) Nicotine; muscarine.
- b) Acetylcholine; norepinephrine.
- c) Acetylcholine; serotonin.
- d) Noradrenaline; adenosine.

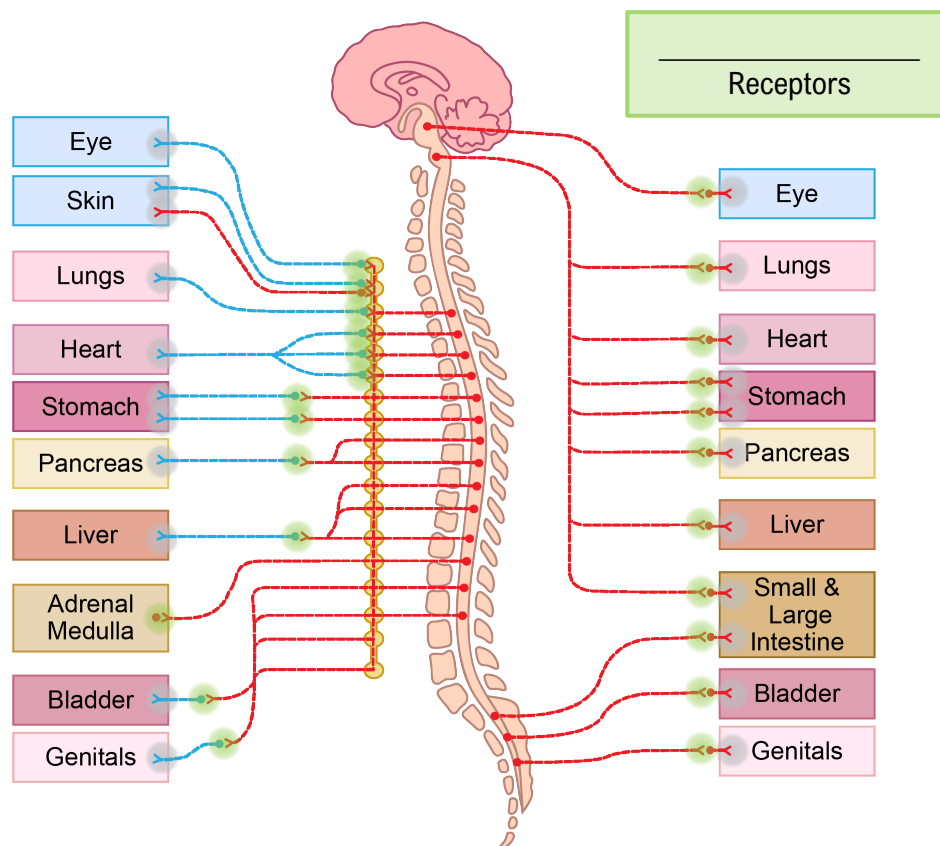
PRACTICE: The neurotransmitter released at all synapses in the parasympathetic division is:

- a) Serotonin.
- b) Norepinephrine.
- c) Epinephrine.
- d) Acetylcholine.

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Neurotransmitter Receptors

- **Neurotransmitter Receptor:** membrane receptor that is activated by a neurotransmitter.
 - Receptors can be classified by the **neurotransmitter** they _____ to.
- **Adrenergic Receptor:** binds to _____ epinephrine and norepinephrine.
- **Cholinergic Receptor:** binds to acetylcholine.
 - **Nicotinic Receptor:** type of cholinergic receptor; highly abundant.
 - Located at _____ synapse between pre- & postganglionic fibers in the ANS.
 - Also present in the adrenal _____.



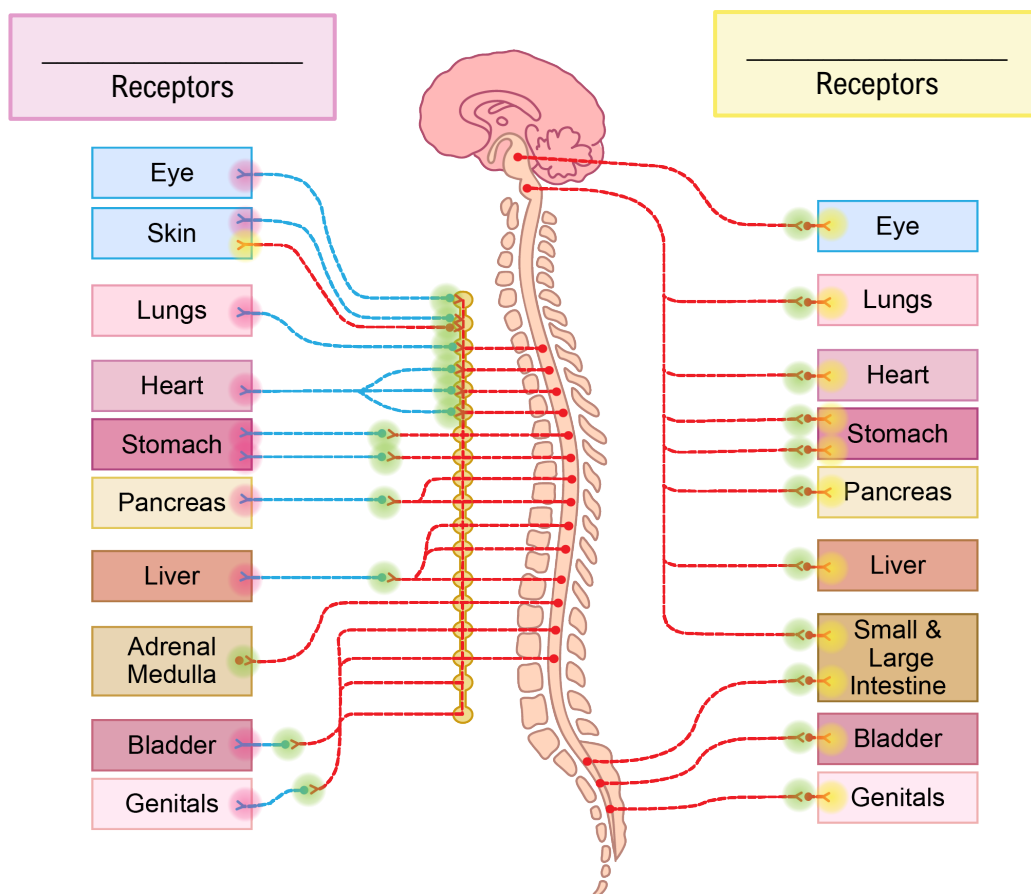
EXAMPLE: Where would you find a cholinergic nicotinic receptor?

- At a parasympathetic effector.
- At the synapse between two preganglionic fibers.
- At a sympathetic effector.
- At the synapse between a preganglionic & postganglionic fiber.

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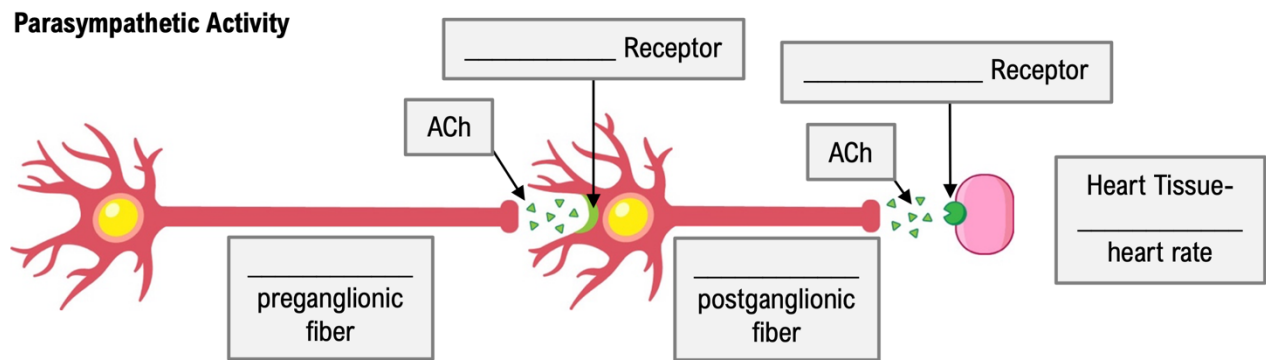
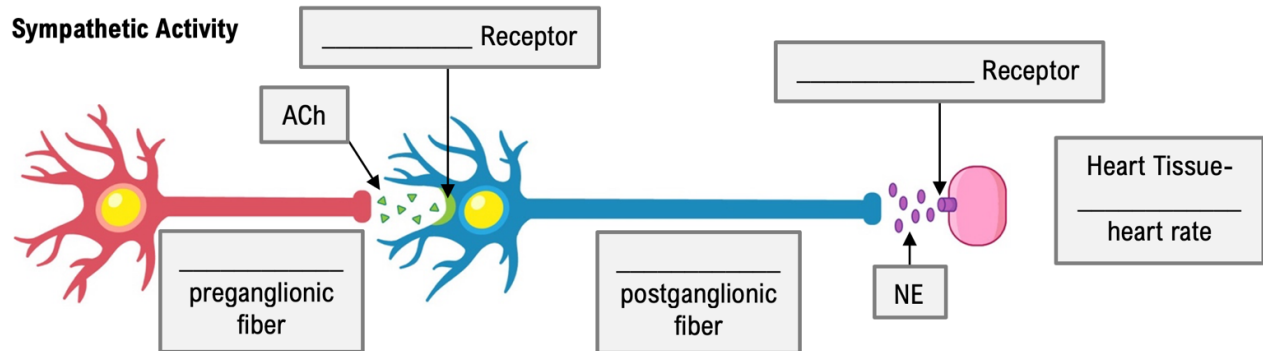
Receptors at Target Organs

- **Muscarinic Receptors:** Type of cholinergic receptor; located at _____ parasympathetic target organs.
 - Also present in the sympathetic system, at _____ glands.
- **Adrenergic Receptors:** Most commonly found in sympathetic target organs.
- Two primary types:
 1. Alpha (α) receptors
 2. Beta (β) receptors



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EXAMPLE: Fill in the blanks using the terms: *cholinergic*, *adrenergic*, *nicotinic*, *muscarinic*, *beta*, *increased*, and *decreased*.



PRACTICE: What are the two types of receptors found in the parasympathetic system?

- a) Cholinergic and adrenergic.
- b) Nicotinic and muscarinic.
- c) Nicotinic and alpha receptors.
- d) Muscarinic and beta receptors.