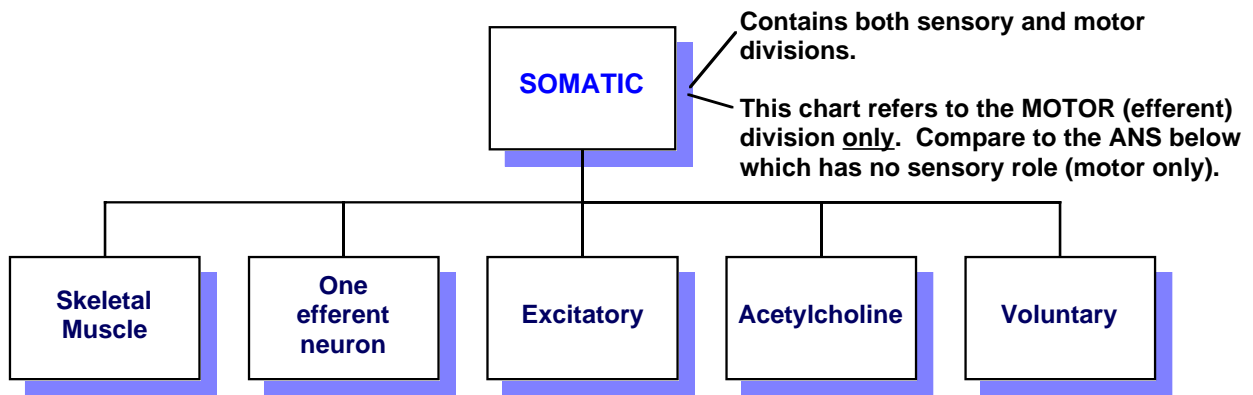


OVERVIEW:

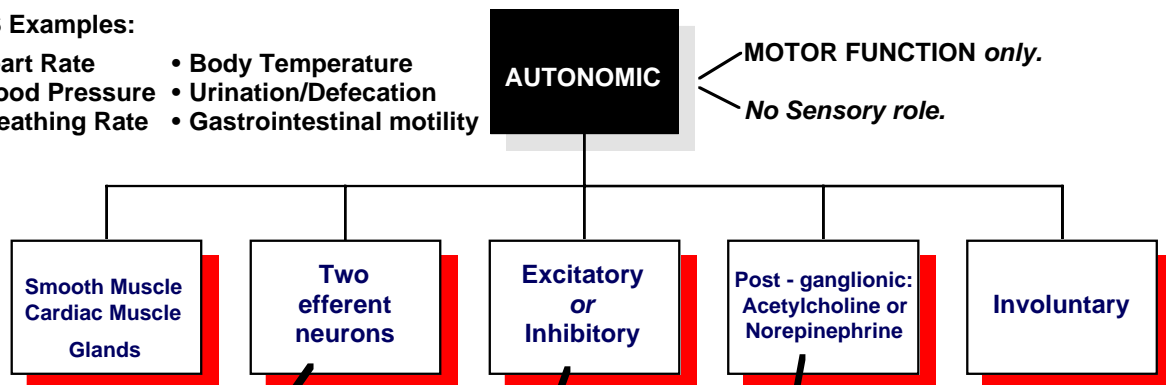
AUTONOMIC NERVOUS SYSTEM

PERIPHERAL NERVOUS SYSTEM



ANS Examples:

- Heart Rate
- Blood Pressure
- Breathing Rate
- Body Temperature
- Urination/Defecation
- Gastrointestinal motility



Notice the distinction here from the **Somatic Nervous System**, which is always excitatory.

Norepinephrine also stimulates the adrenal medulla gland (above kidney). This gland produces *additional norepinephrine* but **mostly** (80%) **EPINEPHRINE** (adrenalin), released into blood and may act as a neurotransmitter.

1. Pre - ganglionic Neuron:

Dendrite & cell body located in the CNS (spinal cord/brain). Axon exits the CNS. Proceeds to an **autonomic ganglion** (outside CNS). **Always produces ACh.**

2. Post - ganglionic Neuron:

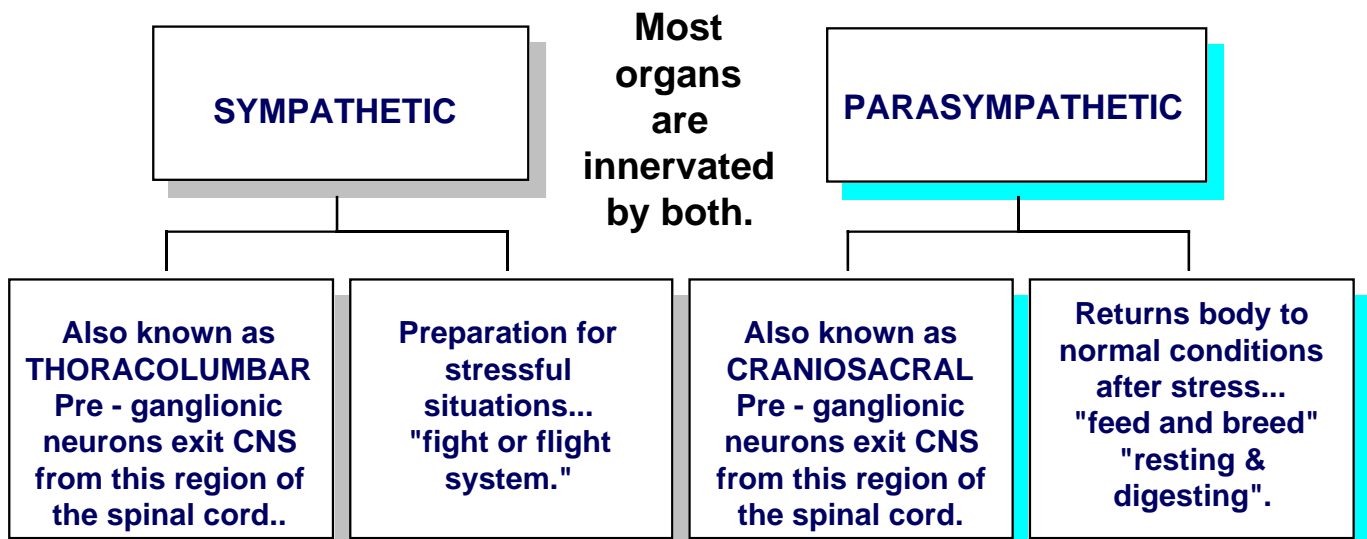
This term is actually a misnomer. The neuron is not exactly "post" ganglionic, since the cell body is situated within the autonomic ganglion. Nevertheless, we refer to it as entirely within the ANS. Produces *either Acetylcholine or Norepinephrine.*

One Exception

to the general two efferent neuron pathways found in the ANS:

There is **no post - ganglionic neuron to the adrenal medulla** (only 1 pre - ganglionic). i.e., **direct route** to adrenal medulla (no connection to an autonomic ganglion). ACh.

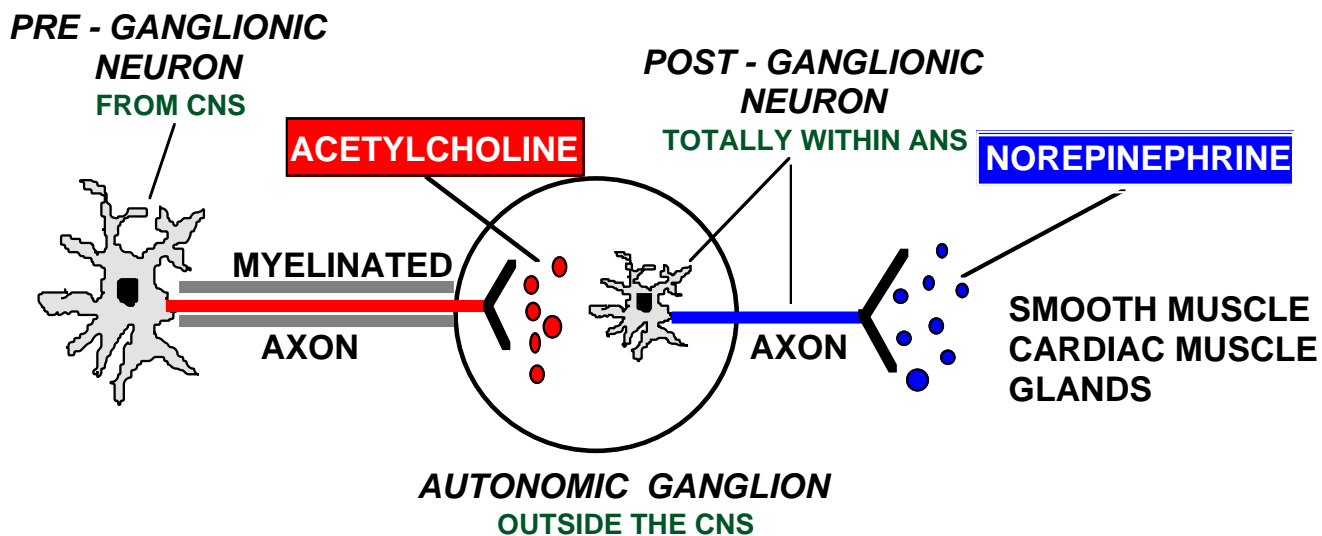
TWO DIVISIONS of the AUTONOMIC NERVOUS SYSTEM...



Generally, the sympathetic and parasympathetic nervous systems have opposite effects on cells/organs.

Both may be active; the overall effect is influenced by the degree which one may predominate over the other and the particular nature of receptor sites.

SYMPATHETIC DIVISION of ANS: NEUROTRANSMITTERS



EXCEPTION #1 Innervation of the **ADRENAL MEDULLA**.
The myelinated, Acetylcholine - producing pre - ganglionic axon shown above goes directly to the adrenal medulla (not a 2 neuron efferent pathway- only 1!).
Result: Adrenal medulla releases its own norepinephrine, but mostly epinephrine (adrenalin), which is carried via the blood stream to responsive receptor sites .

EXCEPTION #2 Innervation of **SWEAT GLANDS, EXT. GENITALIA, SOME SK. MUSCLE BLOOD VESSELS**.
Here, the post- -ganglionic neuron releases **Acetylcholine**, not norepinephrine.

