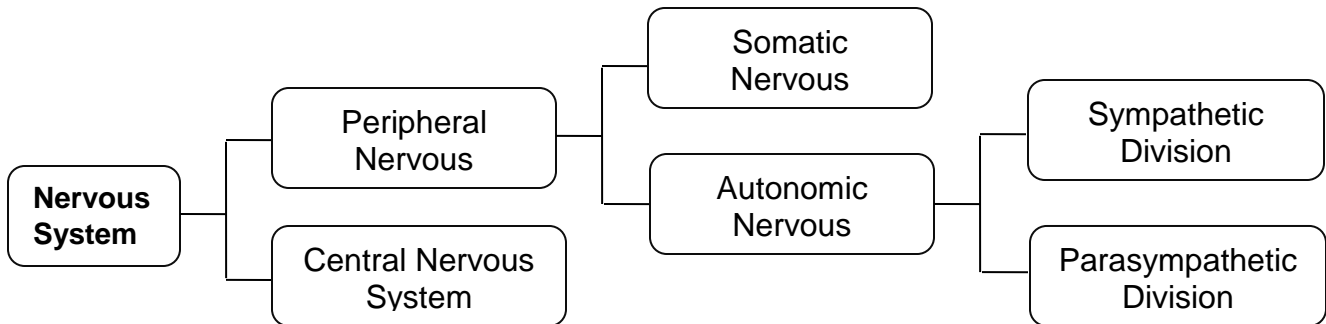




Sympathetic vs. Parasympathetic Systems



Differences in the autonomic nervous system:

	Sympathetic Nervous System	Parasympathetic Nervous System
CNS Region	Thoracolumbar	Craniosacral
Location of peripheral ganglion	Close to spinal cord	Close to target organ
Preganglionic fibers	Short	Long
Postganglionic fibers	Long	Short
Ganglionic synapse response	ACh on nicotinic receptor	ACh on nicotinic receptor
Neuron-target synapse response	NE on α - or β -adrenergic receptor	ACh on muscarinic receptor
Neural divergence	Extensive	Minimal
Inactivation of neurotransmitter at synapse	Uptake into varicosity, diffusion	Enzymatic, diffusion
Systemic effect	Alarm: "fight or flight"	Homeostasis: "rest and digest"



Responses of major organs to autonomic nerve impulses:

Organ	Sympathetic Stimulation (Alarm; Fight or Flight)	Parasympathetic Stimulation (Homeostasis; Rest & Digest)
Heart	<ul style="list-style-type: none"> - Dilation of coronary arteries - Increased heart rate - Increased force of contraction - Increased rate of pacemaker conduction 	<ul style="list-style-type: none"> - Constriction of coronary arteries - Slows heart rate - reduces contraction and conduction
Arteries	Constrict	Dilate
Lungs	Dilate tracheal and bronchial passageways	<ul style="list-style-type: none"> - Constrict tracheal and bronchial passageways - Increased bronchial gland secretions
Liver	<ul style="list-style-type: none"> - Increased glycogen breakdown - Glucose synthesis and release 	<ul style="list-style-type: none"> - Increased glycogen storage - Glycogen synthesis
Gall Bladder	Relaxation	Contraction
G.I. Tract	<ul style="list-style-type: none"> - Vasoconstriction - Inhibition of peristalsis and secretion - Constrict sphincters 	<ul style="list-style-type: none"> - Peristalsis - Secretion - Dilate sphincters
Kidney	Constriction, leading to decreased urine production	Dilate
Bladder	Decreased need to urinate	Increased need to urinate
Eye	<ul style="list-style-type: none"> - Dilation of the pupils - Allows far vision 	<ul style="list-style-type: none"> - Constriction of the pupils - Stimulates tear secretion - Allows for near vision
Salivary Glands	Viscous salivary secretions containing enzymes	Lots of watery salivary secretions
Sweat Glands	Increased sweat excretion	None
Pancreas	Decreased insulin secretion	Increased insulin secretion
Adipose Tissue	<ul style="list-style-type: none"> - Lipolysis - Fatty acid release 	
Skeletal Muscles	<ul style="list-style-type: none"> - Increased force of contraction - Glycogen breakdown - Facilitation of ACh release at the neuromuscular junction 	None

