

Table 11-5

TABLE 11-5 Comparison of Somatic and Autonomic Divisions		
	SOMATIC	AUTONOMIC
Number of neurons in efferent path	1	2
Neurotransmitter/receptor at neuron-target synapse	ACh/nicotinic	ACh/muscarinic or NE/ α - or β -adrenergic
Target tissue	Skeletal muscle	Smooth and cardiac muscle; some endocrine and exocrine glands; some adipose tissue
Neurotransmitter released from	Axon terminals	Varicosities and axon terminals
Effects on target tissue	Excitatory only; muscle contracts	Excitatory or inhibitory
Peripheral components found outside the CNS	Axons only	Preganglionic axons, ganglia, postganglionic neurons
Summary of function	Posture and movement	Visceral function, including movement in internal organs and secretion; control of metabolism

Figure 11-1

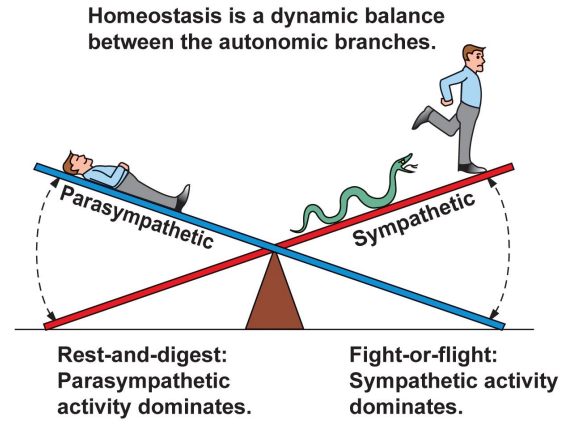


Table 11-4

TABLE 11-4 Comparison of Sympathetic and Parasympathetic Branches		
	SYMPATHETIC	PARASYMPATHETIC
Point of CNS origin	1st thoracic to 2nd lumbar segments	Midbrain, medulla, and 2nd–4th sacral segments
Location of peripheral ganglia	Primarily in paravertebral sympathetic chain; 3 outlying ganglia located alongside descending aorta	On or near target organs
Structure of region from which neurotransmitter is released	Varicosities	Varicosities
Neurotransmitter at target synapse	Norepinephrine (adrenergic neurons)	ACh (cholinergic neurons)
Inactivation of neurotransmitter at synapse	Uptake into varicosity, diffusion	Enzymatic breakdown, diffusion
Neurotransmitter receptors on target cells	Adrenergic	Muscarinic
Ganglionic synapse	ACh on nicotinic receptor	ACh on nicotinic receptor
Neuron-target synapse	NE on α - or β -adrenergic receptor	ACh on muscarinic receptor

Figure 11-2

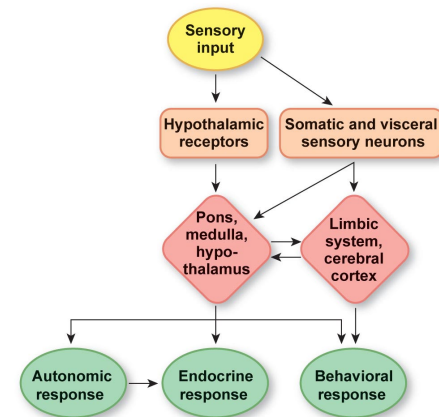


Figure 11-3

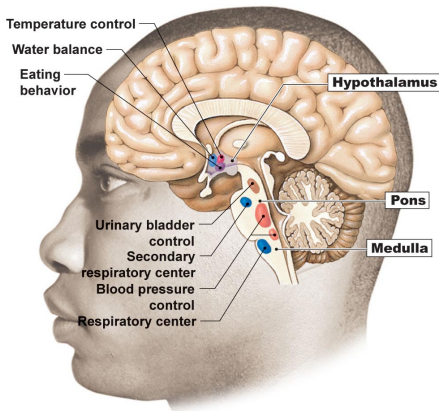


Figure 11-4

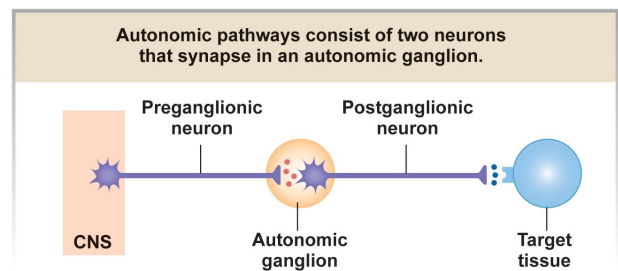


Figure 11-5, overview

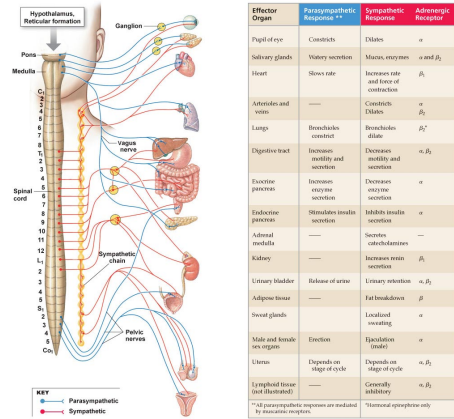


Figure 11-6

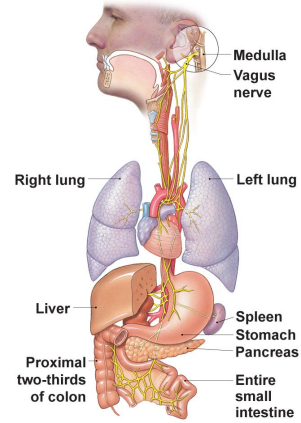


Figure 11-7

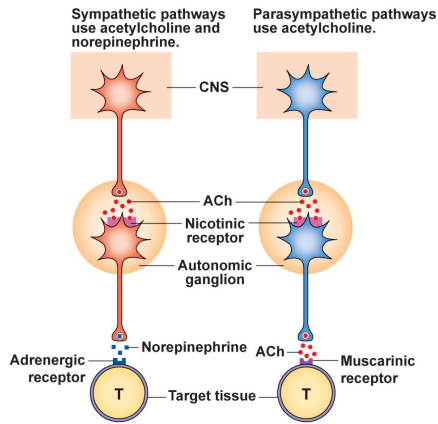


Figure 11-8

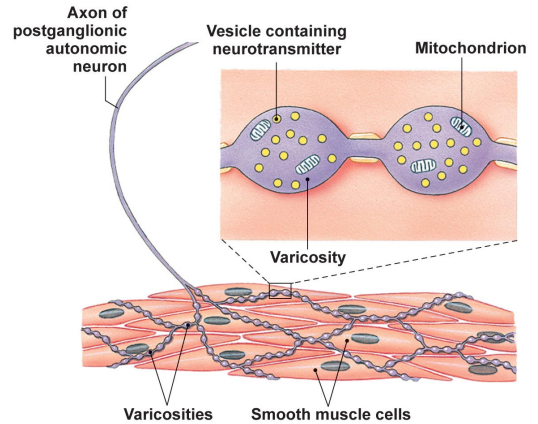


Figure 11-9, overview

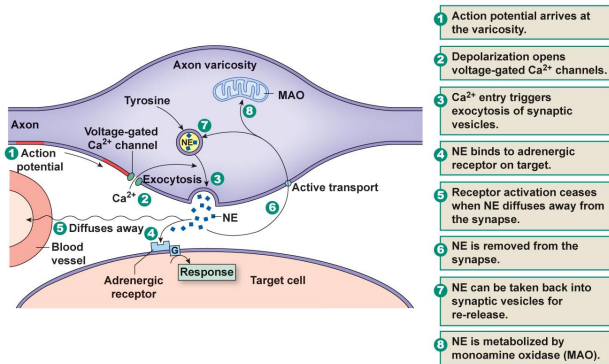


Figure 11-10

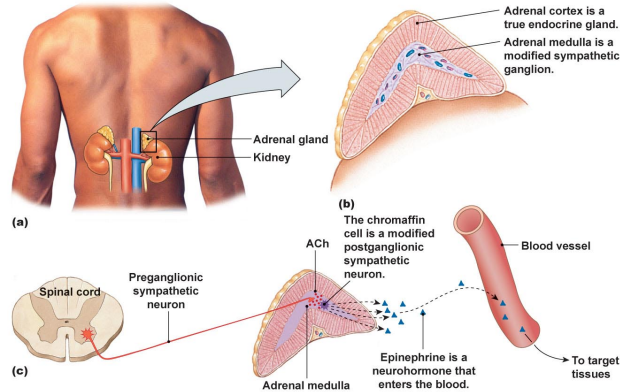


Figure 11-11, overview

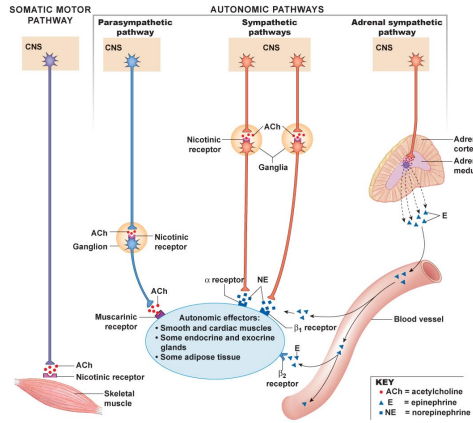


Table 11-1

TABLE 11-1 Postganglionic Autonomic Neurotransmitters

	SYMPATHETIC DIVISION	PARASYMPATHETIC DIVISION
Neurotransmitter	Norepinephrine (NE)	Acetylcholine (ACh)
Receptor types	α - and β -adrenergic	Nicotinic and muscarinic cholinergic
Synthesized from	Tyrosine	Acetyl CoA + choline
Inactivation enzyme	Monoamine oxidase (MAO) in mitochondria of varicosity	Acetylcholinesterase (AChE) in synaptic cleft
Varicosity membrane transporters for	Norepinephrine	Choline