

Table 7.4 Effects of the Sympathetic and Parasympathetic Divisions of the Autonomic Nervous System

Target organ/system	Parasympathetic effects	Sympathetic effects
Digestive system	Increases smooth muscle mobility (peristalsis) and amount of secretion by digestive system glands; relaxes sphincters	Decreases activity of digestive system and constricts digestive system sphincters (for example, anal sphincter)
Liver	No effect	Causes glucose to be released to blood
Lungs	Constricts bronchioles	Dilates bronchioles
Urinary bladder/urethra	Relaxes sphincters (allows voiding)	Constricts sphincters (prevents voiding)
Kidneys	No effect	Decreases urine output
Heart	Decreases rate; slows and steadies	Increases rate and force of heartbeat
Blood vessels	No effect on most blood vessels	Constricts blood vessels in viscera and skin (dilates those in skeletal muscle and heart); increases blood pressure
Glands—salivary, lacrimal, Gastric	Stimulates; increases production of saliva, tears, and gastric juice	Inhibits; result is dry mouth and dry eyes

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Eye (iris)	Stimulates constrictor muscles; constricts pupils	Stimulates dilator muscles; dilates pupils
Eye (ciliary muscle)	Stimulates to increase bulging of lens for close vision	Inhibits; decreases bulging of lens; prepares for distant vision
Adrenal medulla	No effect	Stimulates medulla cells to secrete epinephrine and norepinephrine
Sweat glands of skin	No effect	Stimulates to produce perspiration
Arrector pili muscles attached to hair follicles	No effect	Stimulates; produces “goose bumps”
Penis	Causes erection due to vasodilation	Causes ejaculation (emission of semen)
Cellular metabolism	No effect	Increases metabolic rate; increases blood sugar levels; stimulates fat breakdown
Adipose tissue	No effect	Stimulates fat breakdown