

1.5.9

Table of Actions for the SNS and PNS and Some Common Drugs

Effector Organ	Sympathetic Effects (receptor)	Parasympathetic Effects (receptor)
Eye (iris)	Contraction of dilator pupillae muscles - mydriasis(α_1)	Contraction of sphincter pupillae muscles – miosis(M)
Eye (ciliary muscle)	Relaxation(β_2) for distant vision	Contraction(M) for accommodation of lens (near vision) and increase aqueous humor outflow into canal of Schlemm
Eye (ciliary body epithelium)	Increased aqueous humor production(β_1)	---
Heart	Increased heart rate, increased force of contraction and increased conduction rate (β_1)	Decreased heart and conduction rate(M), decreased atrial contractility(M)
Arterioles(skin, abdominal viscera, kidney)	Strong vasoconstriction(α_1)	---
Arterioles(skeletal muscle)	Weak vasoconstriction(α_1) Vasodilation (β_2)	---
Vessels(heart)	Vasoconstriction(α_1), Vasodilation(β_2)	---
Lungs	Dilates Bronchioles(β_2)	Constricts bronchioles(M)
Uterus, pregnant	Constriction(α_1), relaxation(β_2)	Contraction(M)
Gastrointestinal tract wall	Decreased tone($\alpha_1, \alpha_2, \beta_2$)	Increased tone(M)
Gastrointestinal tract sphincter	Contraction(α_1)	Relaxation(M)
Gastrointestinal tract secretion	---	Increased(M)
Kidney	Increased renin release(β_1)	---

Effector Organ	Sympathetic Effects (receptor)	Parasympathetic Effects (receptor)
Bladder wall (detrusor muscle)	Relaxation(β_2)	Contraction(M)
Internal urinary sphincter	Contraction(α_1)	Relaxation(M)
Pancreas	Decreased insulin secretion(α_2), decreased exocrine secretion(α)	Increased insulin secretion(M), increased exocrine secretion(M)
Fat cells	Lipolysis(β_3)	---
Liver	Glycogenolysis (α_1, β_2), Gluconeogenesis(α_1, β_2)	Glucose uptake (M3?)
Piloerector muscles of skin	Contraction(α_1)	---
Salivary gland	Constriction of vessels & small production of thick saliva(α_1)	Dilation of vessels & large production of thin saliva(M)
Sweat Gland	Generalized sweating (M); Localized sweating (stress) palms & soles of feet (α_1)	---
Adrenal medullae	Increased secretion of EPI or NE	---

Drug Name	Receptor and antagonist/agonist	Indication(use)
Phenylephrine	α_1 agonist	Mydriatic
Atropine	Muscarinic antagonist	Mydriatic/emergency medicine to increase heart rate
Pilocarpine	Muscarinic agonist	Glaucoma
Betaxolol	Beta antagonist	Glaucoma
Prazosin	α_1 antagonist	High blood pressure, Raynaud's disease
Terazosin	α_1 antagonist	High blood pressure, hyperhidrosis
Atenolol	β_1 antagonist	High blood pressure
Ipratropium (Atrovent)	Muscarinic antagonist	Asthma/COPD
Albuterol	β_2 agonist	Asthma/COPD
Bethanechol	Muscarinic agonist	Postoperative ileus



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