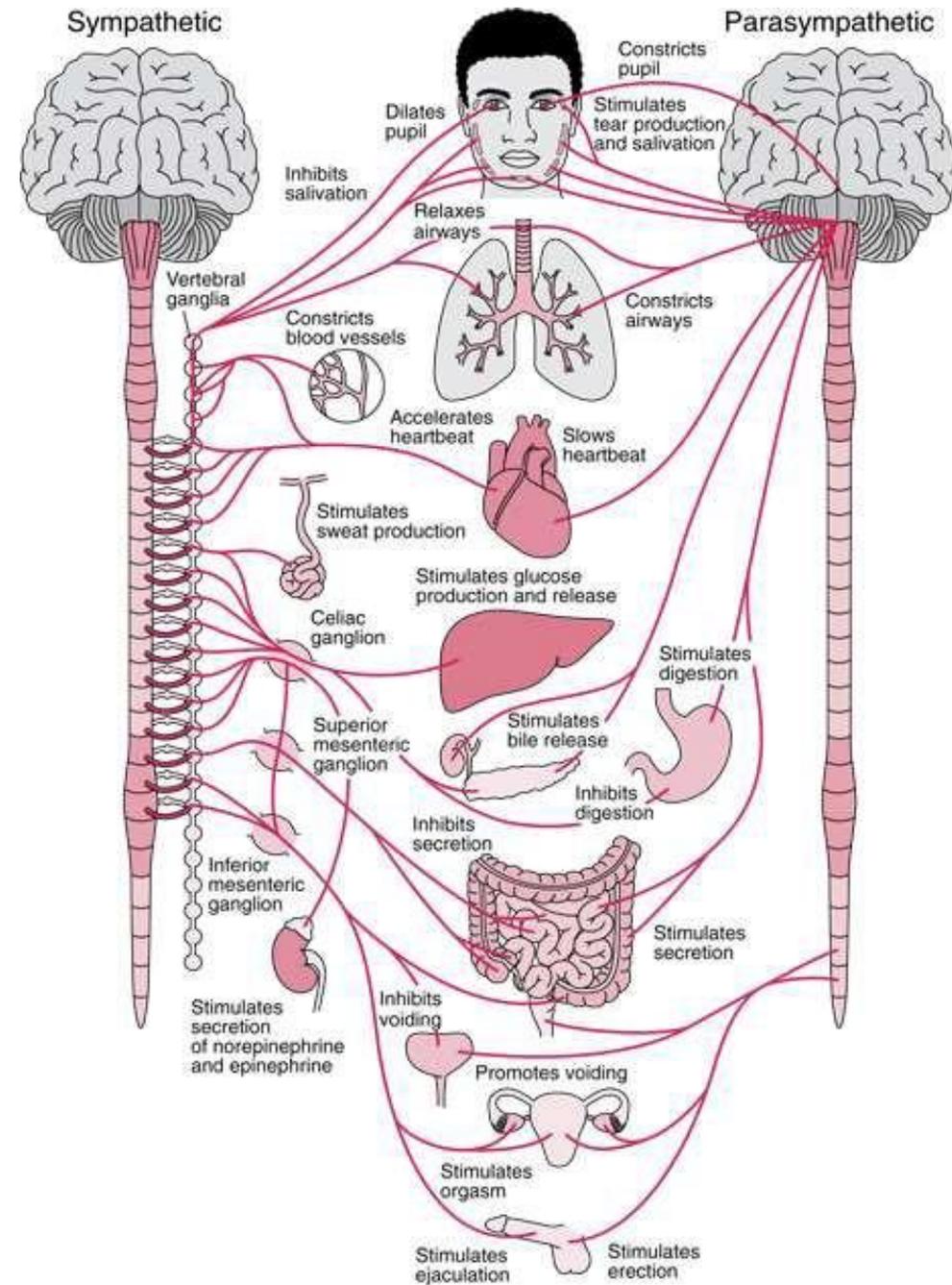


Peripheral Nervous system Pharmacology



Autonomic Nervous System (ANS)

ANS: Classification

- ❑ **Sympathetic NS (SNS)**
- ❑ **Parasympathetic NS (PNS)**

SNS (Adrenergic) : Receptors & action

4 types of adrenergic receptors in organ cells:

- **$\alpha 1$** : Vasoconstriction of blood vessels, Increase blood pressure
Decrease GI motility, Contracts uterus, Dilates pupil.
- **$\alpha 2$** : Inhibits release of Norepinephrine, intestinal secretions
- **$\beta 1$** : Increase heart rate & force of contraction of heart
(cardiac stimulant)
- **$\beta 2$** : Relaxation of smooth muscles in bronchi
(Bronchodilator), uterus, Stimulates insulin secretion

SNS (Adrenergic) : Classification

□ Based on MOA: (3 categories)

i. Direct acting

□ α agonists

- Nonselective
e.g. Epinephrine
- Selective (α_1 and α_2 agonists)
e.g. Phenylephrine

□ β agonists

- Nonselective
e.g. Isoproterenol
- Selective (β_1 & β_2 agonists)
e.g. Salbutamol

ii. Indirect acting (e.g. Amphetamine)

iii. Mixed acting (e.g. Ephedrine)

Adrenergic Drugs: Clinical Uses

1) Cardiovascular system

Cardiac arrest (Adrenaline)

Cardiogenic shock
(Dobutamine, Dopamine)

2) Anaphylactic reaction

Adrenaline

3) Miscellaneous

Prolong action of Local
anesthesia by vasoconstriction
(Adrenaline)

Bronchial asthma by
Bronchodilation (salbutamol,
adrenaline)

Allergic rhinitis (Adrenaline)

Dilating pupil (Ephedrine)

Anti-adrenergic Drugs (Sympatholytic Drugs)

Classification

- Adrenergic neuron blockers
(e.g. Reserpine)
- Adrenergic receptor blockers
(α & β antagonists)

Adverse effects

Hypotension

Bradycardia

Eodema

ANS: Parasympathetic Nervous System (Cholinergic)

Neurotransmitter: Acetylcholine (Ach)

- ❑ **Direct acting** (e.g. Ach, Pilocarpine, Arecoline)

- ❑ **Indirect acting**
 - **Irreversible AChE agents** (e.g. Malathion, Carbaryl)

 - **Reversible AChE agents** (e.g. Physostigmine, Neostigmine)

Cholinergic drugs: MOA

Cholinergic receptors & Responses

Types :

Muscarinic receptors & Nicotinic receptors

Muscarinic responses

- Vasodilation
- Decrease cardiac output
- Increase GI motility,
- Relax of GI sphincters
- Sweating
- Contracts gall bladder
- Bronchoconstriction
- Causes urination
- Increase tone & motility of uterus
- Miosis

Nicotinic responses

- ☐ Muscular fasciculations *تقلصات سريعة وضعيفة*
- ☐ Paralysis (long term action)
- ☐ Release of adrenaline from Adrenal medulla (Increase blood pressure)

Cholinergic Drugs: Clinical Uses

- Myasthenia gravis الوهن العضلي (Neostigmine)
- Glaucoma الماء الأزرق: (Physostigmine 0.5-1%)
- As antidote ترياق او مضاد للسم in atropine poisoning (Physostigmine)
- Urinary retention (Neostigmine)
- In snake bite: specially cobra bite (Neostigmine + atropine to prevent respiratory Paralysis)

Anticholinergic (Parasympatholytic) Drugs

- ❑ **Nonselective muscarinic receptor antagonists** (Atropine, Scopolamine)
- ❑ **Selective muscarinic antagonists** (e.g. Pirenzepine- M_1 antagonists)

Clinical uses

As spasmolytic

Decrease hypermotility of GIT

As pre-anesthetic (Atropine sulfate)

Peptic ulcer (Pirenzepine)

To dilate pupil (Homatropine)

In bronchial asthma (Ipratropium)