

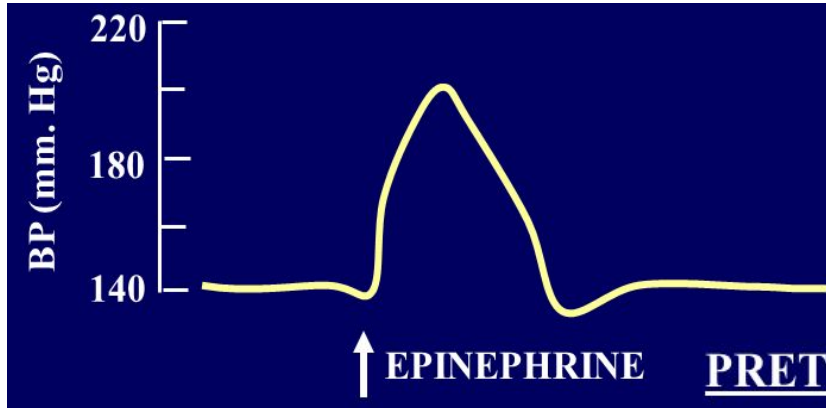
SYMPATHOLYTIC DRUGS

ADRENERGIC
NEURON
BLOCKERS

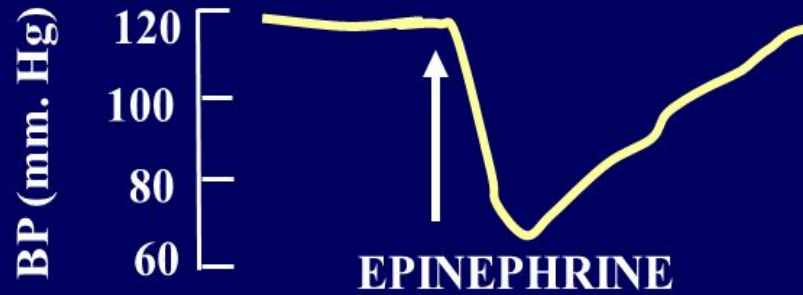
ADRENERGIC
RECEPTOR
BLOCKERS

Adrenergic blocking drugs block stimulation of the sympathetic nervous system.





PRETREAT WITH POB:



ADRENALINE REVERSAL

**Sir Henry Dale,
awarded the Nobel
prize in 1936**



▪ ILOS

Outline the mechanisms of action of adrenergic neuron blockers

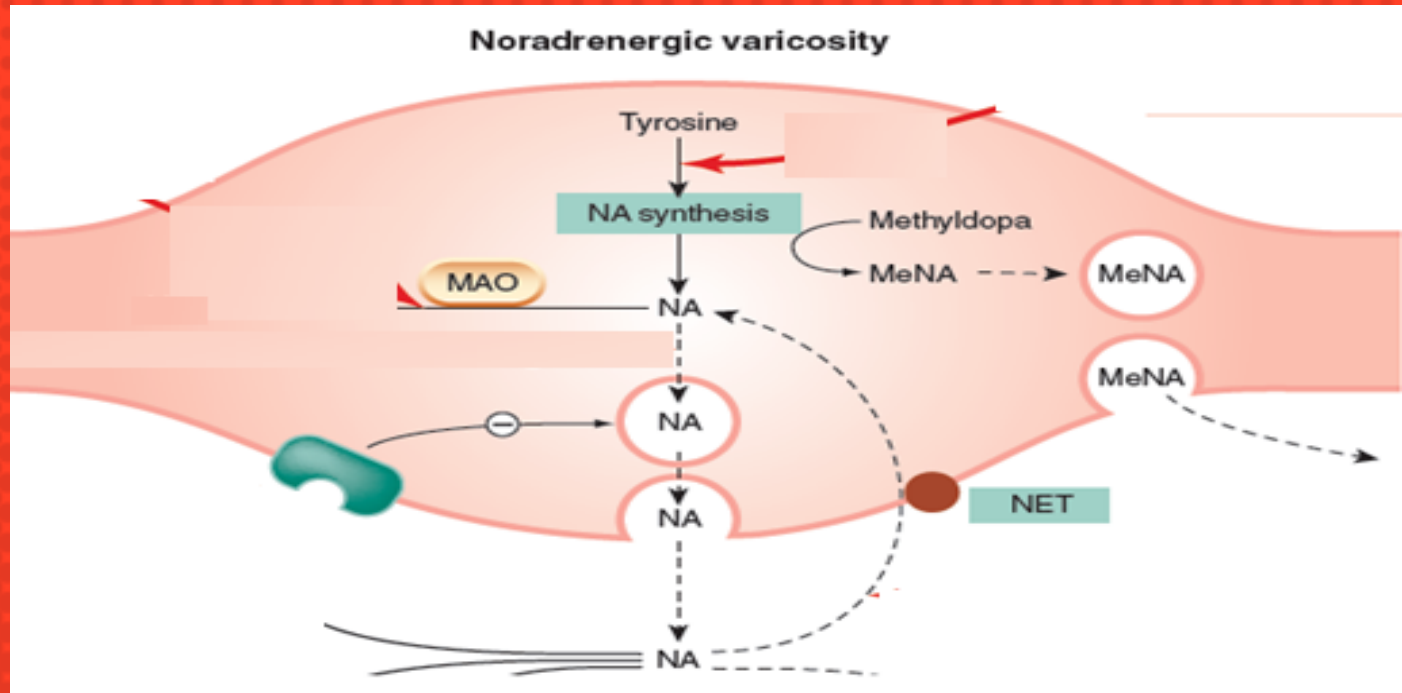
Classify α -receptor blockers into selective & non-selective

▪ Study in detail the pharmacokinetic aspects & pharmacodynamic effects of α adrenergic blockers

MECHANISMS OF ADRENERGIC BLOCKERS

1-Formation of False Transmitters

α -Methyl dopa



MECHANISMS OF ADRENERGIC BLOCKERS

■ 2-Depletion of Storage sites

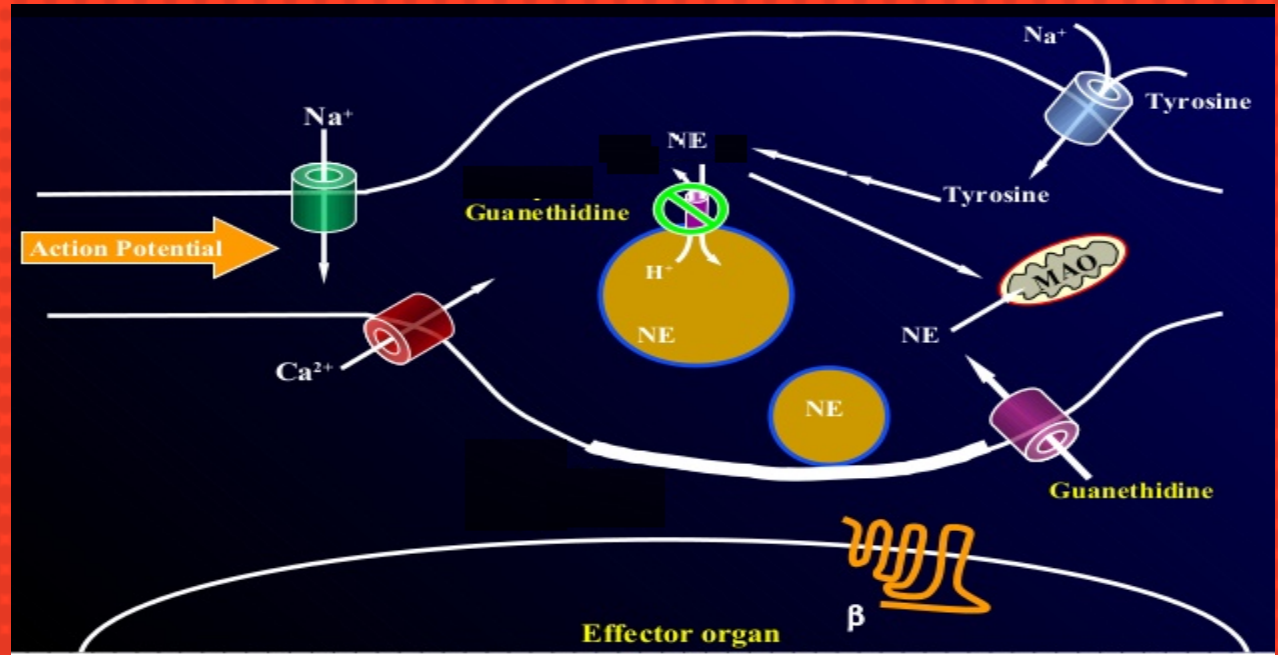
Reserpine



MECHANISMS OF ADRENERGIC BLOCKERS

3-Inhibition of release

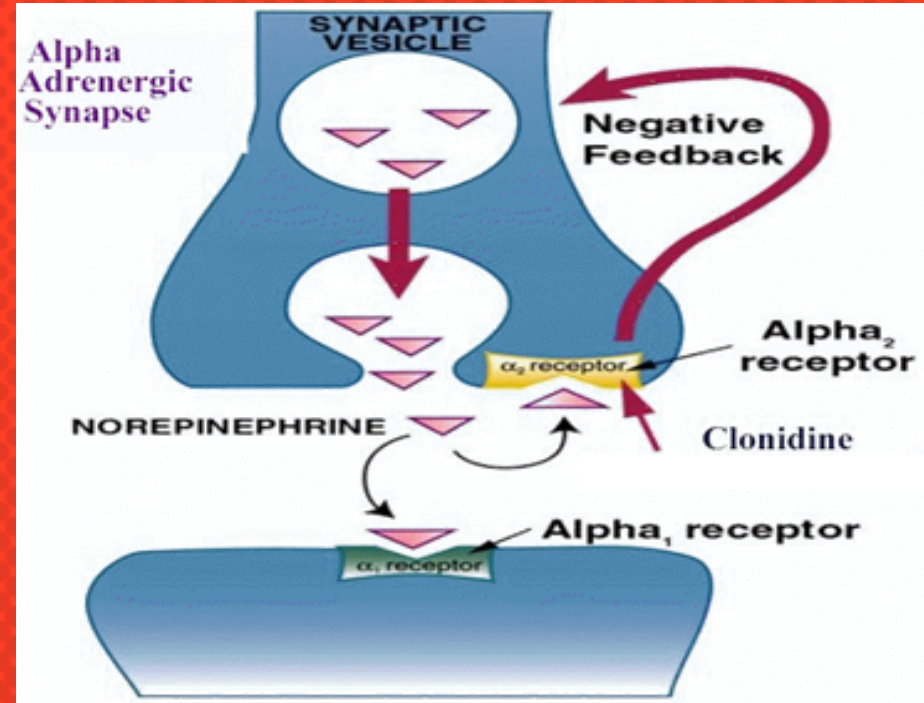
Guanethidine



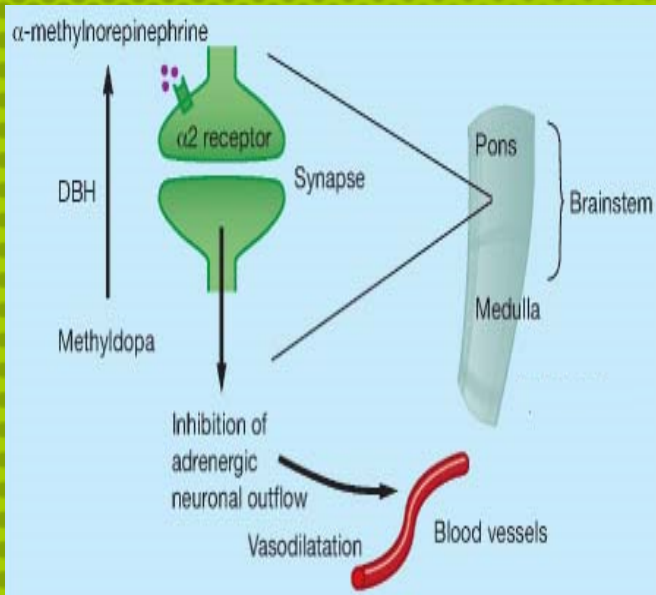
MECHANISMS OF ADRENERGIC BLOCKERS

■ 4-Stimulation of presynaptic α_2 receptors

Clonidine and α -Methyldopa



α -Methyldopa



- Forms false transmitter that is released instead of NE

- Acts centrally as α_2 receptor agonist to inhibit NE release

Drug of choice in the treatment of hypertension in pregnancy (pre-eclampsia - gestational hypertension)

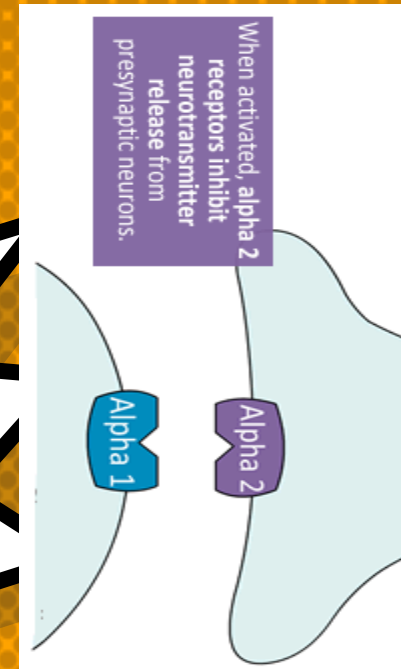
Clonidine

- **Apraclonidine** is used in open angle glaucoma as eye drops. acts by decreasing aqueous humor formation

- Acts directly as α_2 receptor agonist to inhibit NE release

Suppresses sympathetic outflow activity from the brain

Little Used as Antihypertensive agent due to **rebound hypertension** upon abrupt withdrawal



SYNOPSIS

Adrenergic neuron blockers

False neurotransmitter formation

α -Methyldopa

Depletion of stores

Reserpine

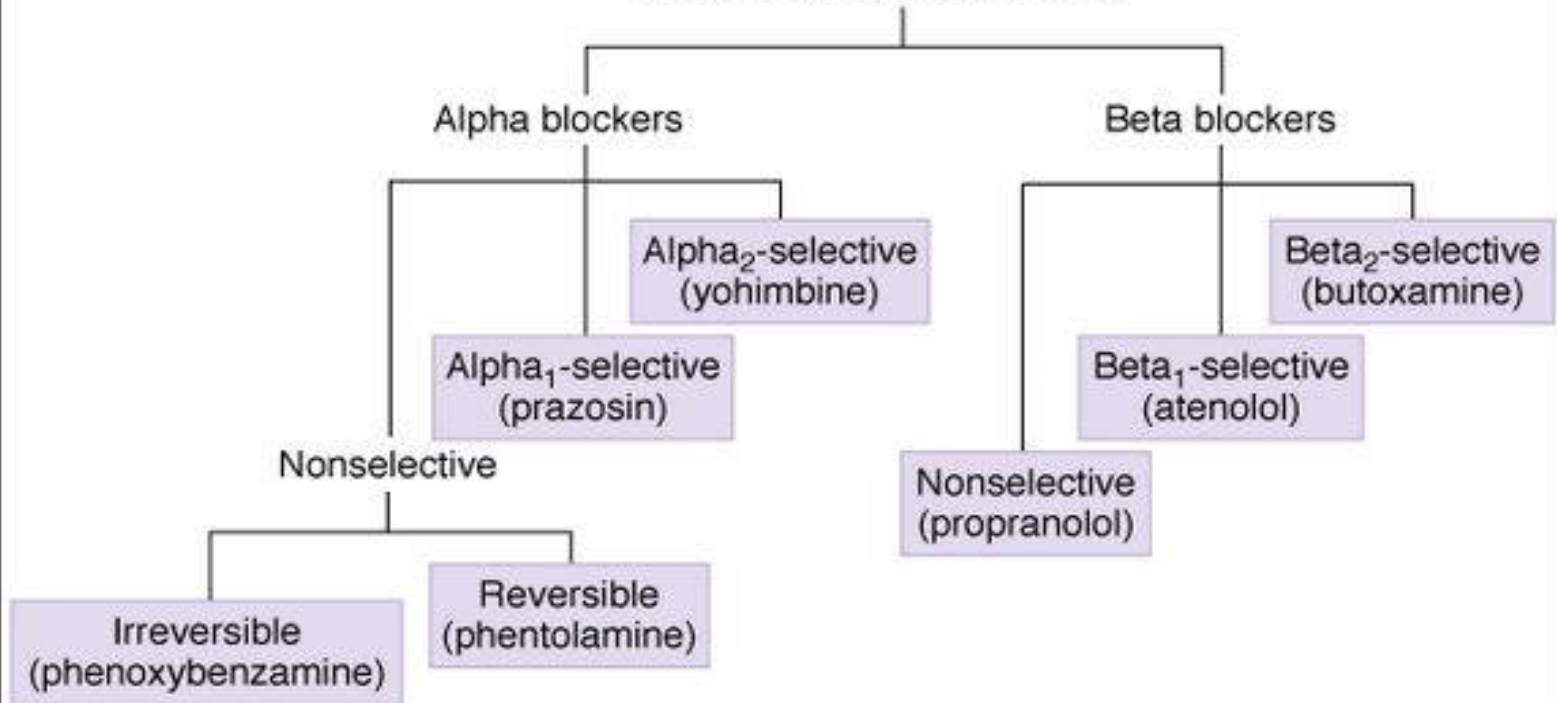
Inhibition of release

Guanethidine

Stimulation of presynaptic α -receptors

**Clonidine
 α -Methyldopa**

Adrenoceptor antagonists

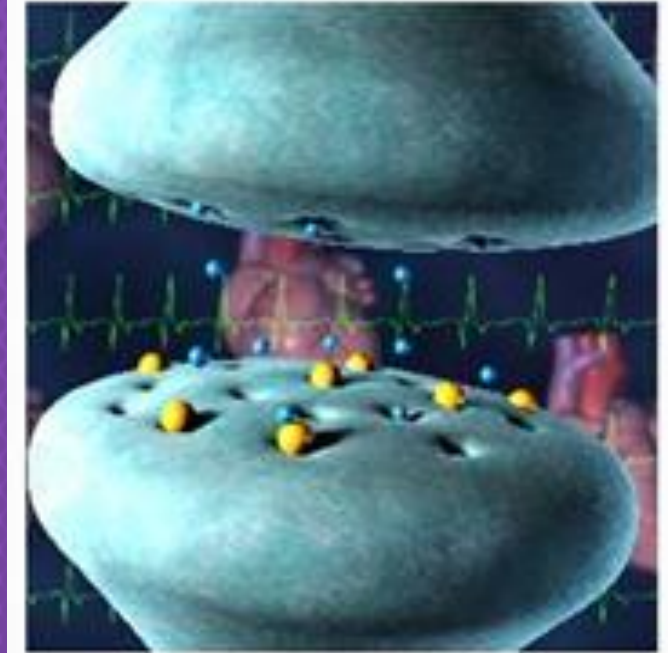


ADRENERGIC RECEPTOR BLOCKERS

They block sympathetic actions by antagonizing:-

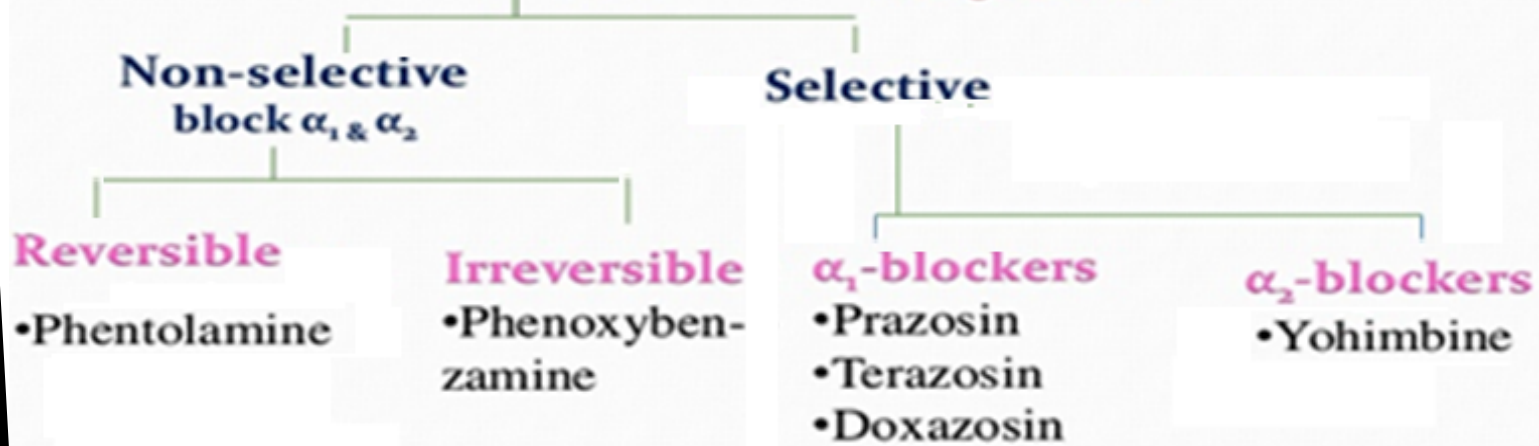
- α -receptor

- β -receptor



CLASSIFICATION

α -Adrenoceptor Antagonists



Selective α_{1A}



Tamsulosin

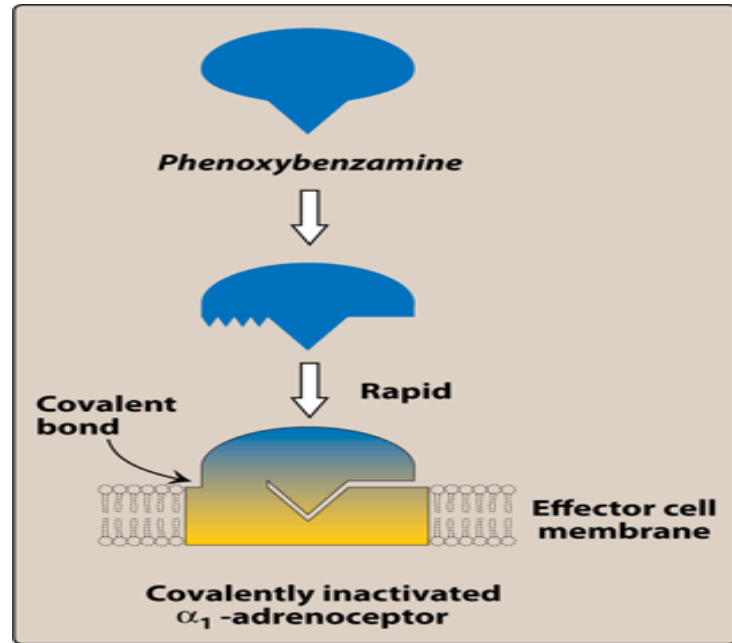
BPH

■ *Non-Selective α -Adrenoceptor Antagonists*

Phenoxybenzamine:

Irreversible blocks
both α_1 and α_2
receptors

Long-acting (24 hrs).

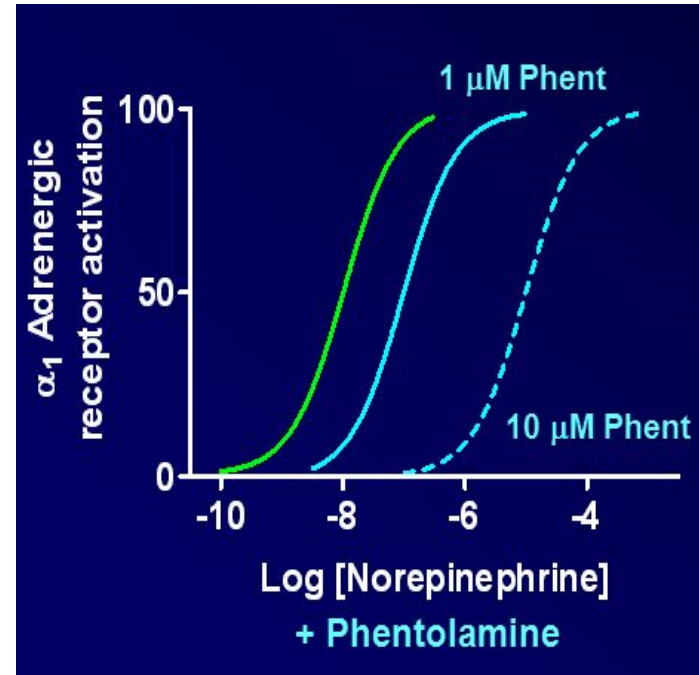


■ *Non-Selective α -Adrenoceptor Antagonists*

Phentolamine

Reversible blocking of
 α_1 & α_2 receptors

■ Short acting (4 hrs)

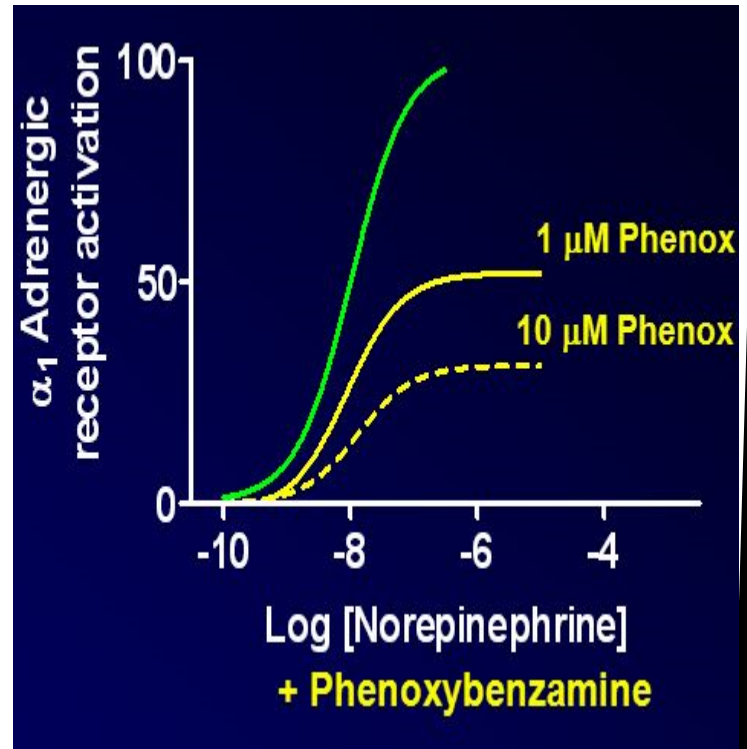


Both drugs cause:

- Postural hypotension

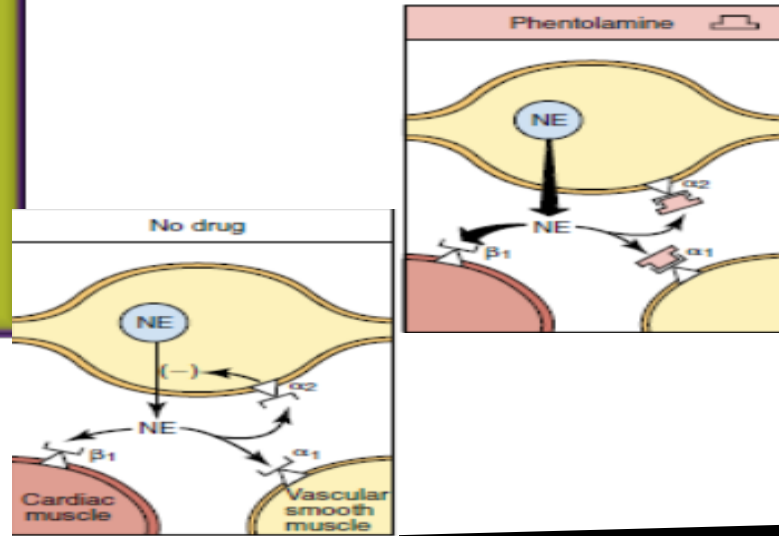
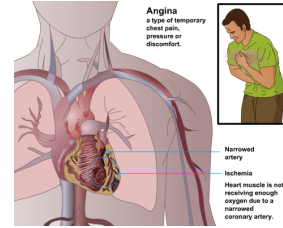
Decrease peripheral vascular resistance

- Increase cardiac output (α_2 block)



■ Both drugs can precipitate arrhythmias and angina and are **contra-indicated** in patients with decreased coronary perfusion

■ Reflex tachycardia



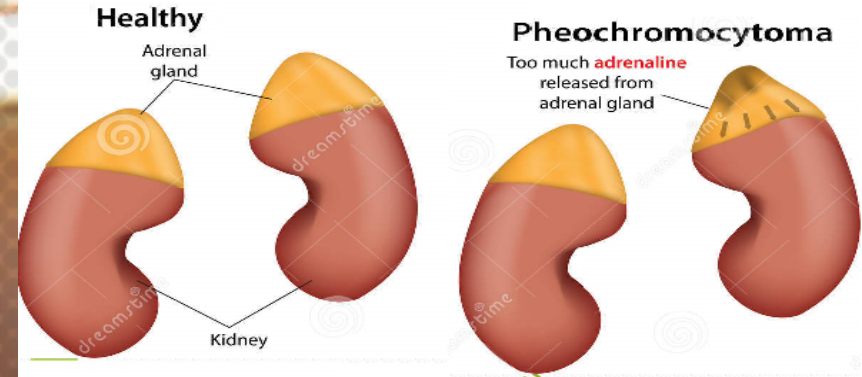
THERAPEUTIC USES:

☐ Pheochromocytoma:

Before surgical removal to protect against hypertensive crisis

"PHEochromocytoma"

- **P**alpitations
- **H**eadache
- **E**pisodic sweating (diaphoresis)



Phentolamine

Dermal necrosis following extravasation of NA

Reversal of local anesthesia

Hypertensive crisis following abrupt withdrawal of clonidine or ingestion of tyramine in patients on MAO inhibitors



Phenoxybenzamine:

Raynaud disease & frostbite



ADRS

Postural hypotension

Nasal stuffiness
or congestion

Vertigo & drowsiness



Stuffy Nose



ADRS

Tachycardia

Headache

Male sexual dysfunction
(inhibits ejaculation)

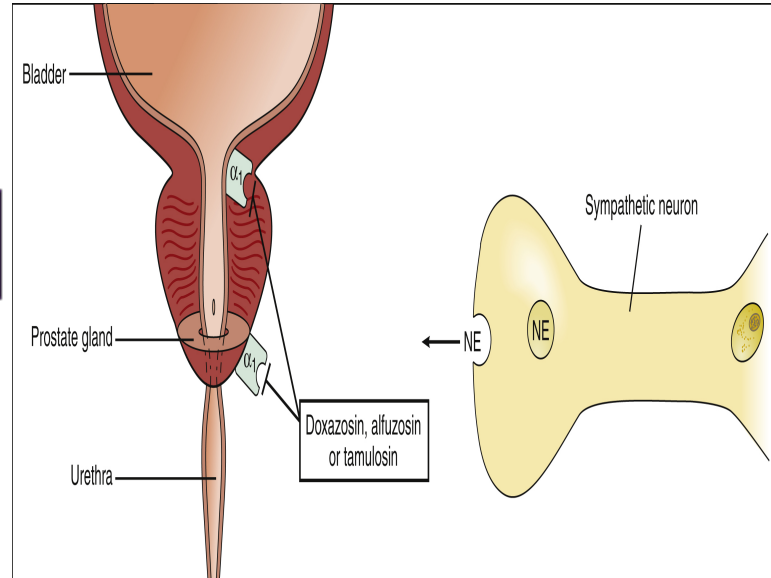


Selective α_1 - Antagonists

Prazosin & doxazosin

Prazosin (short half-life)

Doxazosin, terazosin
(long half life)

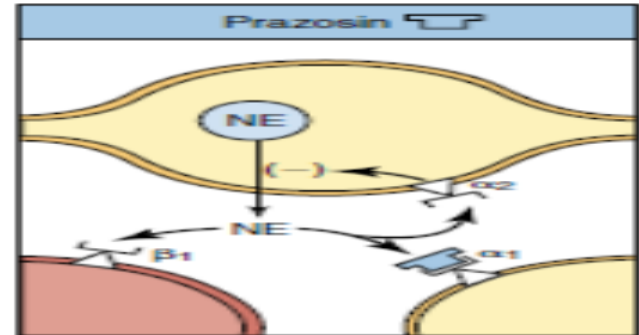


Selective α_1 -Antagonists

- α_1 -antagonists cause:-
- Vasodilatation due to relaxation of arterial and venous smooth muscles
- ❖ Fall in arterial pressure with less tachycardia than with non-selective α blockers

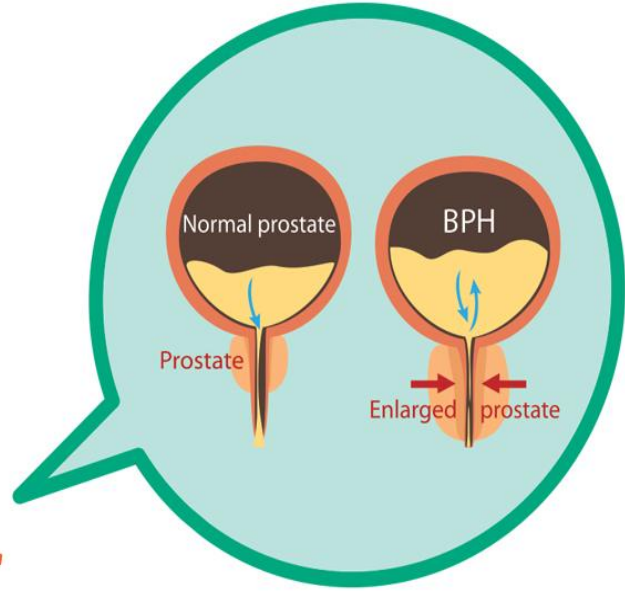


First dose of α_1 receptor blocker may produce an orthostatic hypotensive response that can result in syncope (fainting).



Therapeutic Uses:

Benign
Prostatic
hyperplasia



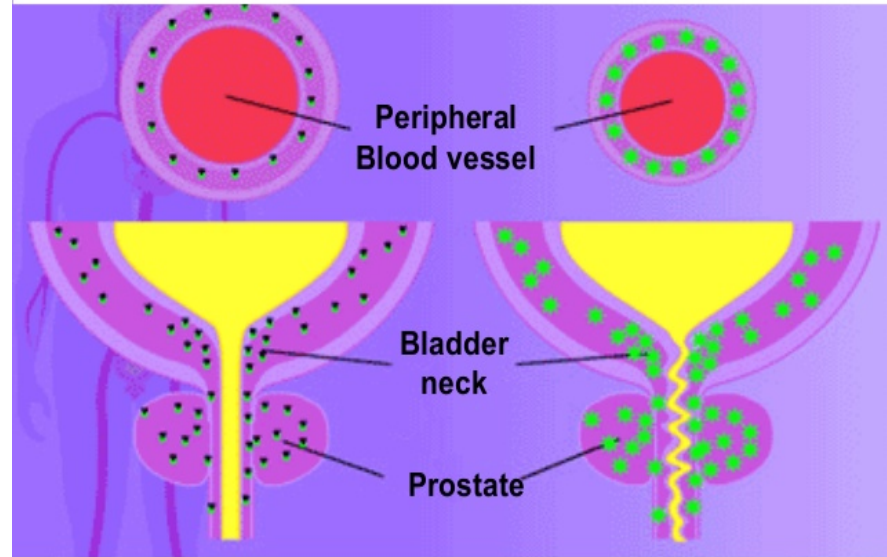
Therapeutic Uses:

Treatment of
hypertension
with prostate
enlargement

PRAZOSIN

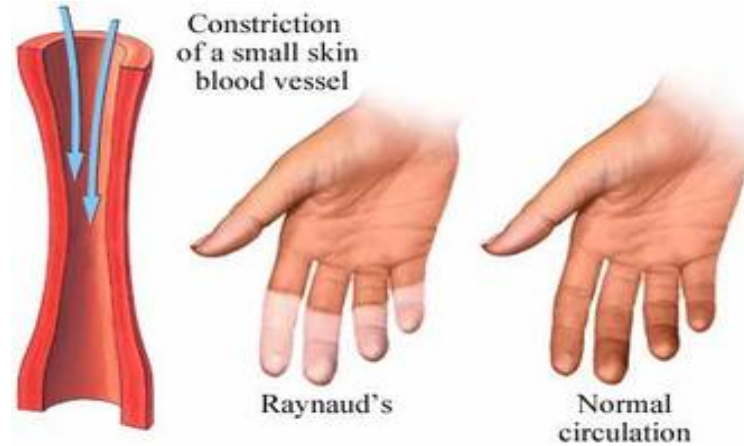
With α_1 Blocker

Without α_1 Blocker



Therapeutic Uses:

Reynaud's disease
(**vasospasm**)



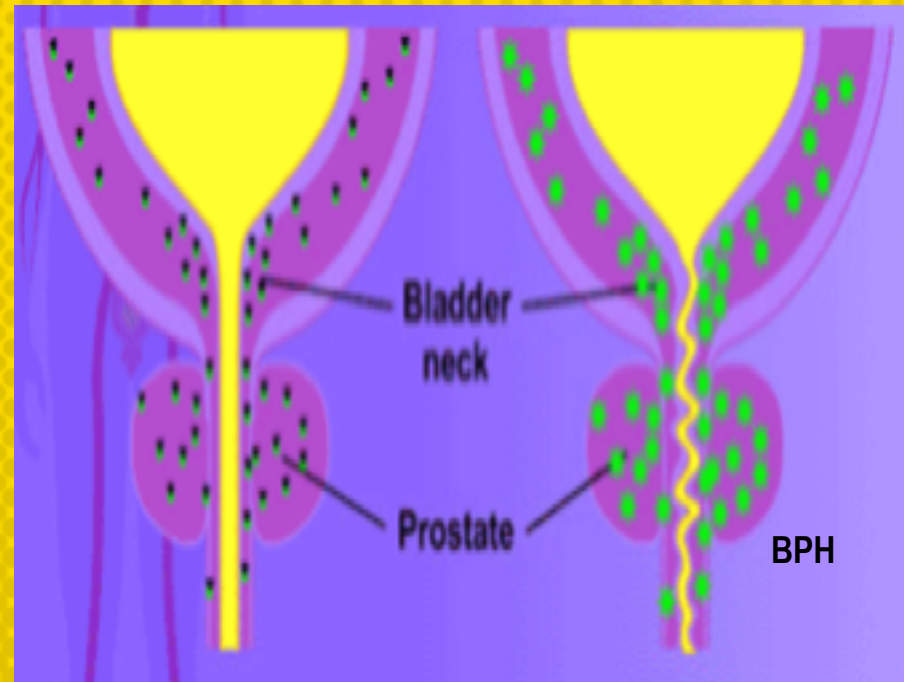
(**Reynaud's disease** causes some areas of the body such as fingers and toes to feel numb and cold in response to cold temperatures or stress)

Selective α 1A-antagonist

**Tamsulosin
(Uroselective)**

❖ α 1A receptors present in prostate

❖ Tamsulosin is used in treatment of benign prostatic hypertrophy (BPH)



Selective α 1A-antagonist

**Tamsulosin
(Uroselective)**

Tamsulosin produces: relaxation of smooth muscles of bladder neck & prostate → improves urine flow

Has minimal effect on blood pressure



α_2 -SELECTIVE ANTAGONISTS

Yohimbine

Used as aphrodisiac in the treatment of erectile dysfunction

Increase nitric oxide release in the corpus cavernosum thus producing vasodilator action and contributing to the erectile process

