

Antiadrenergic or Adrenergic antagonists

- Drugs that inhibit or block the effects of sympathetic NS stimulation by block sympathetic receptors (Sympatholytics)
- ☆ ☆ Classification of adrenergic antagonists drugs based on adrenergic receptor specificity:
- **Alpha- adrenergic blocking drugs** – drugs that block alpha-adrenoceptors of adrenergic nerves that control the vascular system.
- **Beta- adrenergic blocking drugs** – drugs that block beta-adrenoceptors of adrenergic nerves, primarily the beta-receptors of the heart.
- **Alpha- and beta- Adrenergic blocking drugs**

Mechanisms of Action:

Antiadrenergic effects can occur either:

- **Direct** – when α_1 , β_1 , β_2 receptors are blocked by adrenergic antagonists or
- **Indirect** – when α_2 receptors are stimulated by agonist drugs – **indirect acting antiadrenergic drugs**.
- Drugs that stimulate α_2 adrenoceptors inhibit the release of NE → reduction of sympathetic outflow throughout the body (decrease or block the effects of sympathetic NS).
- Centrally active antiadrenergic drugs such as **Clonidine** and related drugs have **agonist effects** at α_2 receptors in the brain which are used primarily in the treatment of hypertension.
- ***Drugs that block α_2 -adrenergic receptors have no recognized clinical significance & have no therapeutic applications.

Receptors blockage	Adrenergic blocking drugs				
Alpha ₁	Prazosin	Tamsulosin	Terazosin	Doxazosin	
Alpha ₁ and Alpha ₂	Phentolamine	Phenoxybenzamine			
Beta ₁	Acebutolol	Atenolol	Betaxolol	Esmolol	Metoprolol
Beta ₁ , Beta ₂	Carteolol	Carvedilol*	Labetalol *	Nadolol	Pindolol
	Propranolol	Timolol			
	*Also blocks Alpha ₁ -adrenoceptor				

Therapeutic applications of alpha blocking drugs

1. Essential hypertension :
2. Reversal of toxicity from alpha₁ agonists:
3. Benign prostatic hyperplasia:
4. Pheochromocytoma
5. Vasospastic disorders:

Adverse effects of alpha₁-blockers

- **Hypotension**
- **Reflex tachycardia:** Alpha-adrenergic blockers can ↑ heart rate by triggering the baroreceptor reflex.
- **Nasal congestion:** blockade of alpha-receptors can dilate the bl. vessels (Vasodilatation) of the nasal mucosa, producing nasal congestion.

- **Therapeutic application of Beta-adrenergic blocking drugs:**
- Angina pectoris: (anti-anginal therapy)
- Hypertension (HT):
- Cardiac dysrhythmias:
- Myocardial infarction (MI):
- Heart failure:
- Hyperthyroidism:
- Pheochromocytoma
- Glaucoma:
- Migraine

Adverse effects of beta₁-blockers

All of the side effects are the result of blocking beta₁-receptors in the heart. Blockade of beta₁ receptors in the kidney does not produce side effect of clinical significance.

- **Bradycardia**
- **Reduced cardiac out put**
- **Precipitation of heart failure**
- **A. V heart block**
- **Rebound cardiac excitation**

Adverse effects of beta₂-blockers:

- **Bronchoconstriction**
- **Inhibition of glycogenolysis:**

- **Nursing consideration:**
 - ✓ The role of the nurse in antiadrenergic drugs involves careful monitoring of the patients condition and providing education.
 - ✓ Assess the patient's condition in relation to disorders in which antiadrenergic drugs are used.
 - ✓ Assess the patients cardiovascular status prior and during administration. Continuous ECG, blood pressure, heart rate.
 - ✓ Assess for conditions that contraindicate the use of antiadrenergic drugs.
 - ✓ Determine the potential nursing diagnoses related to drug therapy and health problems that the drug might cause.
 - ✓ Planning: patient goals and expected outcomes including specific interventions directed to solving or preventing the problem

- **Nursing consideration:**
 - ✓ Intervention with continues observation to ensuring therapeutic effects and minimizing adverse effects
 - ✓ Monitor the patient for signs and symptoms of adverse effects and advice the patient don't stopping antiadrenergic drugs abruptly
 - ✓ Avoid preventable adverse drug effects
 - ✓ Evaluate the effectiveness of drug therapy by confirming that the patient goals and expected outcomes have been met

TABLE 13.4 Selected Adrenergic-Blocking Drugs (Antagonists)

Drug	Primary Receptor Subtype	Primary Uses
acebutolol (Sectral)	Beta ₁	Hypertension, dysrhythmias, angina
alfuzosin (UroXatral)	Alpha ₁	Benign prostatic hyperplasia, (BPH)
atenolol (Tenormin)	Beta ₁	Hypertension, angina
carteolol (Cartrol)	Beta ₁ and beta ₂	Hypertension, glaucoma
carvedilol (Coreg)	Alpha ₁ , beta ₁ , and beta ₂	Hypertension, heart failure, acute MI
doxazosin (Cardura)	Alpha ₁	Hypertension
esmolol (Brevibloc)	Beta ₁	Hypertension, dysrhythmias
metoprolol (Lopressor, Toprol)	Beta ₁	Hypertension
nadolol (Corgard)	Beta ₁ and beta ₂	Hypertension, angina
phentolamine (Regitine)	Alpha	Severe hypertension
prazosin (Minipress)	Alpha ₁	Hypertension
propranolol (Inderal, Innopran XL)	Beta ₁ and beta ₂	Hypertension, dysrhythmias, heart failure
sotalol (Betapace, Sorine)	Beta ₁ and beta ₂	Dysrhythmias
tamsulosin (Flomax)	Alpha ₁	BPH
terazosin (Hytrin)	Alpha ₁	Hypertension
timolol (Blocadren, Timoptic)	Beta ₁ and beta ₂	Hypertension, acute MI, glaucoma