

## Alpha-2 Agonists (Sympathoplegics)

$\alpha_2$  agonists are a class of medication which act on  $\alpha_2$  adrenergic receptors to yield a decreased sympathetic outflow centrally. By decreasing sympathetic outflow, these drugs treat hypertensive symptoms. Clonidine, is a commonly used antihypertensive drug which can lead to rebound hypertension if therapy is abruptly ceased.  $\alpha_2$ -Methyldopa is another antihypertensive agent, which is particularly helpful in pregnancy, as it treats pregnancy-induced hypertension and pre-eclampsia. Along with its  $\alpha_2$  agonist activity, it also works by interrupting dopamine formation. This drug, however, may result in a Coombs+ hemolytic anemia.



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### Indications

#### Hypertension

[Hiker-BP](#)

Drugs of this class are used to treat hypertension, as they reduce peripheral resistance by stimulating presynaptic  $\alpha_2$  adrenoceptors in the central nervous system.

#### Renal disease

[Kidneys](#)

These drugs may be used in patients with renal disease as they do not cause a decrease in blood flow to the kidney.

### Mechanism of Action

#### Centrally acting Alpha-2 Agonist

[C-Brain on Afro \(2\) Tutu Dragonist](#)

The primary mechanism of action of  $\alpha_2$  agonists is stimulation of presynaptic  $\alpha_2$  receptors in the central nervous system. Drugs of this class are centrally acting and decrease sympathetic outflow, as they activate medullary presynaptic  $\alpha_2$  adrenoceptors. Remember that  $\alpha_2$  activation decreases sympathetic outflow.

### Drugs

#### Clonidine

[Clown-dine](#)

Clonidine activates  $\alpha_2$  receptors, which causes inhibition of norepinephrine release from synaptic vesicles. Clonidine is frequently administered with a diuretic, and may produce side effects of lethargy, dry mouth and constipation.

#### Rebound Hypertension

[Bouncing Hiker-BP](#)

An adverse side effect of clonidine includes severe rebound hypertension in the case of abrupt withdrawal.

#### Alpha-Methyldopa

[Afro Metal-dough-boy](#)

Methyldopa decreases total peripheral resistance by reducing sympathetic outflow from the CNS. It is used to treat moderate or mild hypertension and can be used together with a diuretic for increased effect.

#### Pregnancy

[Pregnant-woman](#)

This drug may be used to treat hypertension during pregnancy.

### **Coombs (+) Hemolytic Anemia**

Positive-Comb Hemolysing-RBCs from Anemia-Anemone

Methyldopa usage may lead to drug-induced immune-mediated hemolysis, leading to a positive direct Coombs test.

### **SLE Like Syndrome**

Dressed like a Loopy-butterfly

Patients taking methyldopa may develop an SLE-like syndrome, with symptoms like fever, pericarditis, arthralgias and malaise, with positive anti-nuclear antibodies.