



# Anti- hypertensive



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ADAMC,SANGLI



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# HYPERTENTION

As per WHO , hypertension may be defined as either a sustained systolic blood pressure (SBP) of  $>140\text{mmHg}$ , or a sustained diastolic blood pressure (DBP) of  $>90\text{mmHg}$ .

☒ An agent that reduces high BP, is called an ANTIHYPERTENSIVE.

Causes:

- Increase in total cholesterol level
- Increase in Total Peripheral Resistance (TPR)
- Increase in Cardiac output (CO)
- Increase in blood volume



## Blood Pressure Readings

Blood Pressure Category	Systolic mm Hg (upper number)		Diastolic mm Hg (lower number)	What Your Blood Pressure Readings Mean
Normal	Less than 120	and	Less than 80	Keep checking your blood pressure and making healthy lifestyle choices. This will help make sure your blood pressure stays at a normal level.
Elevated	120 to 129	and	Less than 80	You may be at risk for hypertension. Healthy lifestyle changes can help get your blood pressure back to normal and keep it there.
High Blood Pressure (Hypertension Stage 1)	130 to 139	or	80 to 89	Healthy lifestyle changes may be enough to get your blood pressure back to normal. You may need blood pressure medicine if lifestyle changes alone are not enough.
High Blood Pressure (Hypertension Stage 2)	140 or higher	or	90 or higher	You may need both blood pressure medicines and healthy lifestyle changes to get your blood pressure to normal.
Hypertensive Crisis	Higher than 180	and/ or	Higher than 120	Check your blood pressure again after 5 minutes. If it is still at least 180/120, contact your healthcare provider. If you also have chest pain, trouble breathing, or vision problems, seek care immediately. This is a medical emergency.



# CLASSIFICATION

- 1) ACE InhibitorS
- 2) Angiotensin Receptor Blockers:
- 3) Calcium Channel Blockers:
- 4) Diuretics:
- 5) Sympatholytic
  - Beta Adrenergic blockers:
  - Selective Alpha-
  - Adrenergic blockers:
  - Alpha + Beta Adrenergic blockers
  - Centrally-acting sympatholytics:
- 6) Ganglionic blockers
- 8) Vasodilators
  - Arteriolar
  - Arteriolar + Venodilator –



# Central sympatholytics

## Clonidine

Acting on alpha 2A receptor in medulla/ vasomotor rec  
Decrease symt. Outflow → BP reduce → HR reduces  
In higher dose BP fall is lessmark – No reaction at high dose

P/K –

The peak action takes place in 2-4 hrs, % to 2/3 of the total dose is excreted unchanged in urine. Plasma half life is 8-12hrs. Once given drug acts for 24 hrs.



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- ADRs –
  - Sedation, mental depression,
  - disturbed sleep
  - , dryness of mouth,
  - impotence, constipation,
  - postural hypotension etc.
- Brand-
- Tab. Catapres - 150 micrograms. OD or BD.



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# Methyldopa

- Acts on vasomotor center It decreases the t.p.r.
- Its site of action is said to be different than clonidine. In large doses it inhibits the enzyme dopa decarboxylase in brain and periphery-
- PK –
- Only 1/3 of oral dose is absorbed, it is partially metabolized and remaining is excreted unchanged in urine.
- It remains in blood for 12-24 hrs



# Methyldopa

- ADRs –
  - Postural hypotension is noted in some patients.
  - Reduced mental activity, sedation lethargy,
  - dryness of mouth, fluid retention,
  - weight gain, impotence etc.
- Uses –
  - Because of development of new agents its use has declined.
  - It is used mainly with diuretics. It is safe during pregnancy.
  - It is preferred for pregnancy induced hypertension.
- Brand –
  - Tab. Alphadopa 250mg b.d or t.d.s.



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# Antianginal drugs

**Organic nitrates**



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# ◆ Anti anginal



nitrates,  
beta blockers,  
calcium channel blockers

Nitrates are impotent drugs of this class, they share the same action but differ only in their course of action. The direct action is nonspecific smooth muscle relaxation. This is caused by the formation of nitrous oxide as a free radical.



# MOA-

The most important action is on the smooth muscles of peripheral vascular bed.

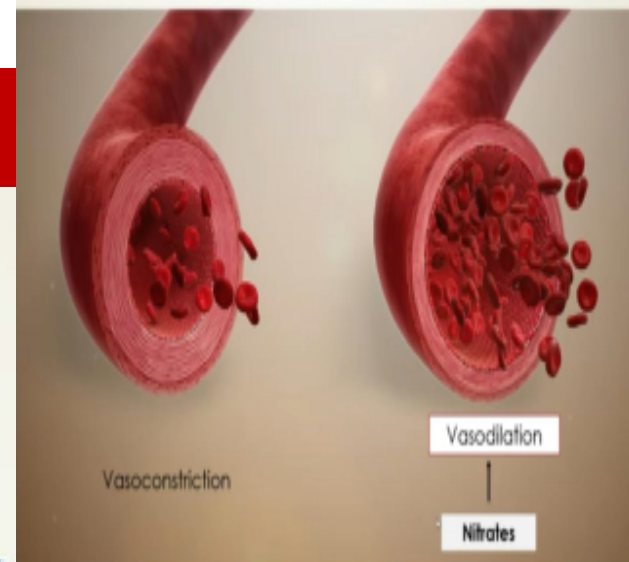
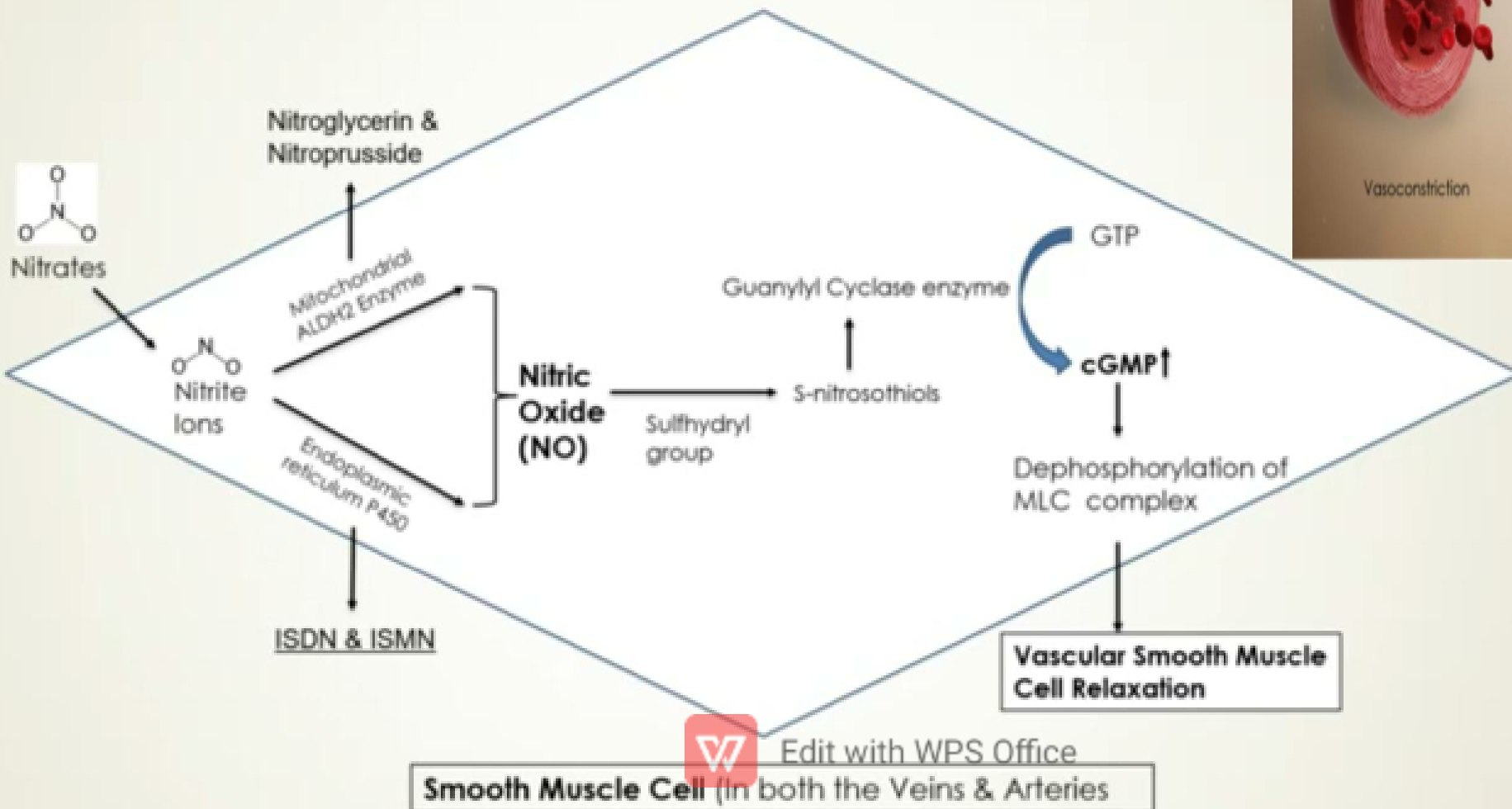
dilate the veins than arteries - peripheral pooling of blood - decreased venous return

i.e. preload on the heart is reduced - decreased cardiac work decreased oxygen demand of heart -reduced cardiac work Nitrates also produce the dilation of arterioles - decrease in tpr.

-over all reduction in afterload of the heart.

- Again it contributes to the reduction in cardiac work. In arterial tree the nitrates preferentially dilate the bigger coronary arteries than arterioles





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Smooth Muscle Cell (in both the Veins & Arteries)



## • P/K-

- lipid soluble and well absorbed for buccal mucosa, intestines, and skin.
- All except isosorbide mononitrate undergo first pass metabolism.
- They are divided into short acting and long acting.
- GTN and isosorbide dinitrate both are short acting drugs if given by sublingual route but are long acting on oral administration.



- ADRS –
- Fullness in head,
- throbbing headache are common.
- Flushing, weakness, sweating,
- palpitation are less frequent.
- Rash is rare.
- Methemoglobinemia
- Monday disease –
- occupational (nitroglycerin plant/dynamite fact.)



# Glyceryl trinitrate (GTN, Nitroglycerine)

- It's a volatile liquid, which is absorbed,
- Sublingual route is used for terminating attack of angina
- it takes 1-2min for complete action.
- The plasma half-life is 2 min; duration of action depends on how much time the drug is available for
- It is rapidly absorbed from the skin, hence its plaster for the cutaneous application are available in the market.
- It gives sustained concentration of the drug for 24hrs and hence the protection is also round the clock. The only drawback is that the patient develops resistance for the drug



# Glyceryl trinitrate (GTN, Nitroglycerine)

- It has also been used by i.v. infusion.
- This route provides rapid, steady, titratable plasma concentration as far as desired.
- It has been successfully used for unstable angina, coronary vasospasm, LVF accompanying MI and in hypertension
- Brand –
- ANGISPAN TR-2.5,6.5mg. Inj.
- NITROJECT 5mg/ml as 5ml and 10ml.
- Does-
- 45 ml NS 5ml inj Nitroject by syringe pump.
- 0.6ml/hr max 3.6ml/hr.





# Isosorbide dinitrate

- It is a solid but similar in properties to GTN.
- It is used at the time of attack by sublingual route as also by oral route in chronic prophylaxis of classical angina.
- Plasma half-life is 40min but sustained release preparation afford protection for 8-10hrs
- Brand –
- Tab. Sorbitrate 5/10mg. SOS or TD



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# THANK YOU!

Kedar joshi



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