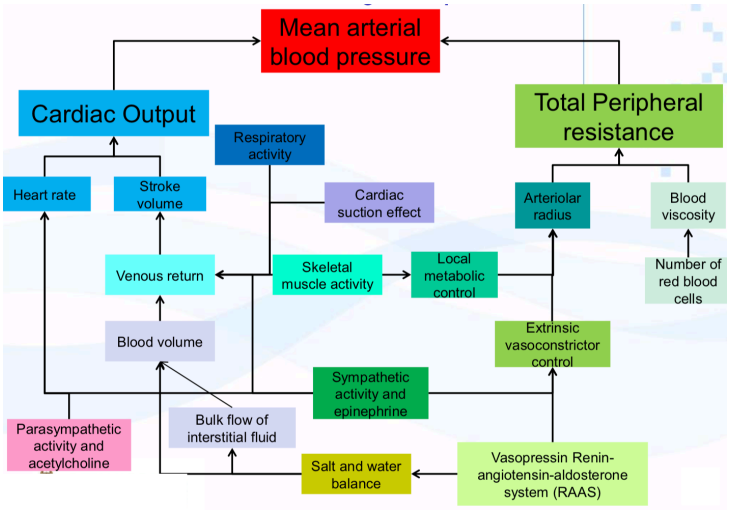
FLG 332 – STUDY THEME 3 : CARDIOVASCULAR SYSTEM

STUDY THEME 3.1-ARTERIAL BLOOD PRESSURE AND CONTROL

NB for Theme 3: Know definitions , key markers , Treatments , The target of the drugs and the effect on Blood Pressure. BMI is NB! (See page 8)

1- FACTORS INFLUENCING BLOOD PRESSURE



Blood Pressure (BP) : The pressure of the circulating blood on the walls of blood vessels.

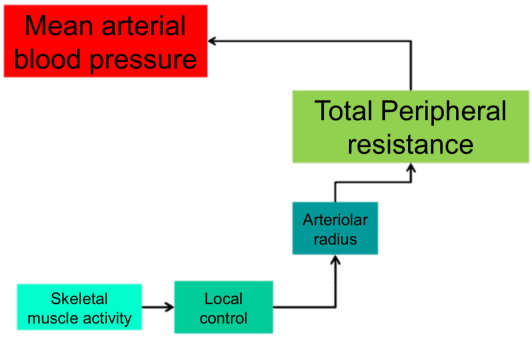
Influenced by:

1. Cardiac Output (CO)
2. Peripheral vascular resistance
3. Volume of circulating blood
4. Viscosity of blood
5. Elasticity of vessel walls

1- LOCAL FACTORS INFLUENCING BLOOD PRESSURE

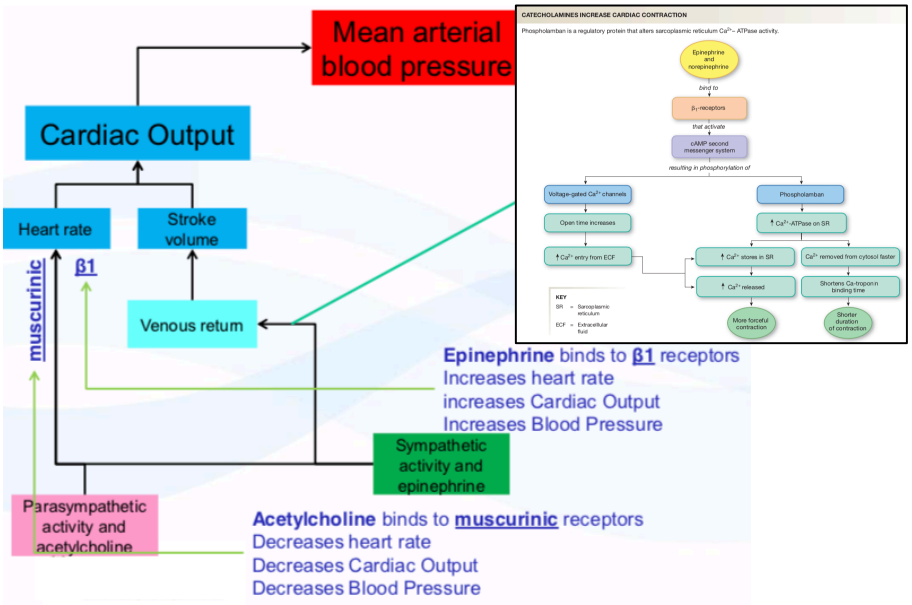
	Vasodilation
Oxygen	↓
Carbon dioxide	↑
Acids (lactate)	↑
K^+	↑
Osmolarity	↑
Adenosine	↑
Prostaglandins	↑

Factor	Effect
Heat	Vasodilation
Cold	
Shear stress	Vasodilation
Stretch	Vasoconstriction

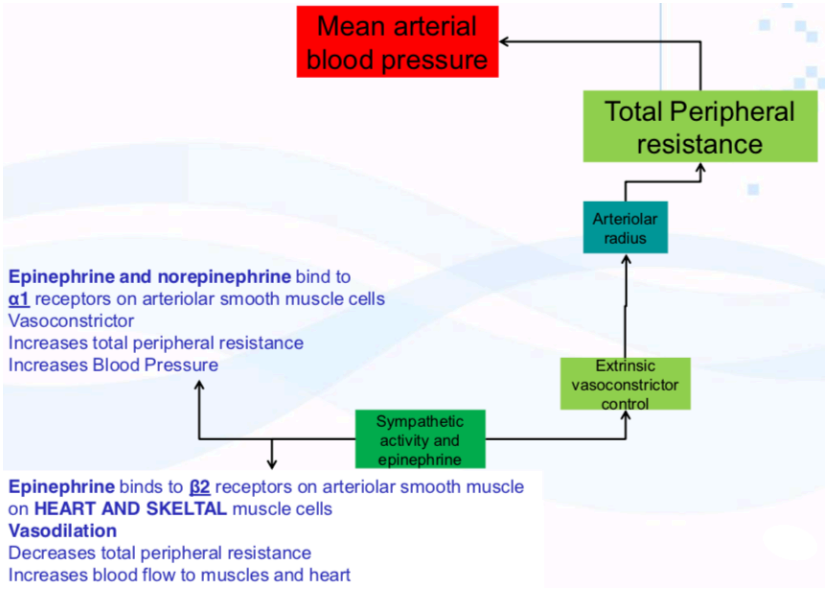


Substance	Effect	Source
Endothelin	Vasoconstriction	Endothelial cells
Nitric oxide	Vasodilation	Endothelial cells
Histamine	Vasodilation	Some circulating white blood cells Specialized connective tissue cells

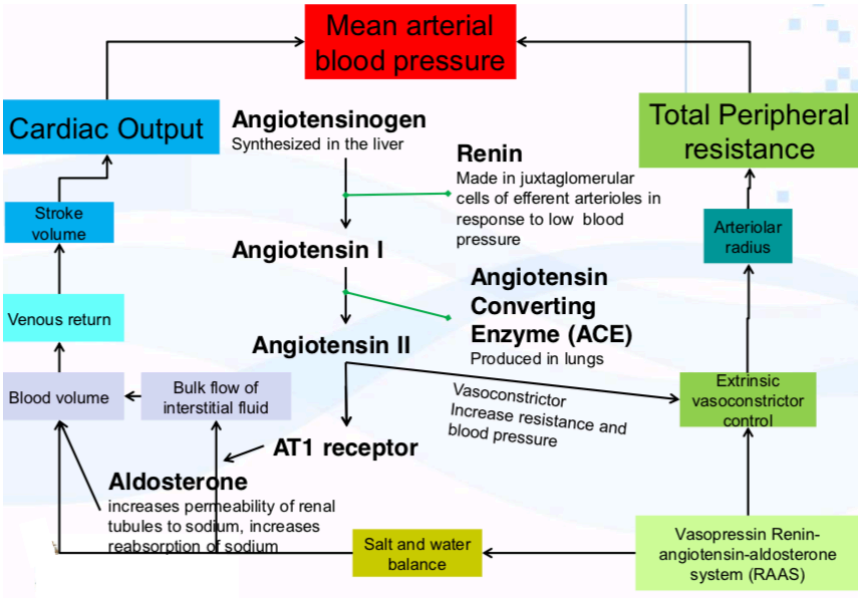
3- PARASYMPATHETIC AND SYMPATHETIC FACTORS INFLUENCING BLOOD PRESSURE



Sympathetic Nervous system increases BP and **Parasympathetic Nervouss system** decreases BP.
-The sympathetic and Parasympathetic nerves regulate the Baroreceptor reflex which works to maintain BP at a constant rate.



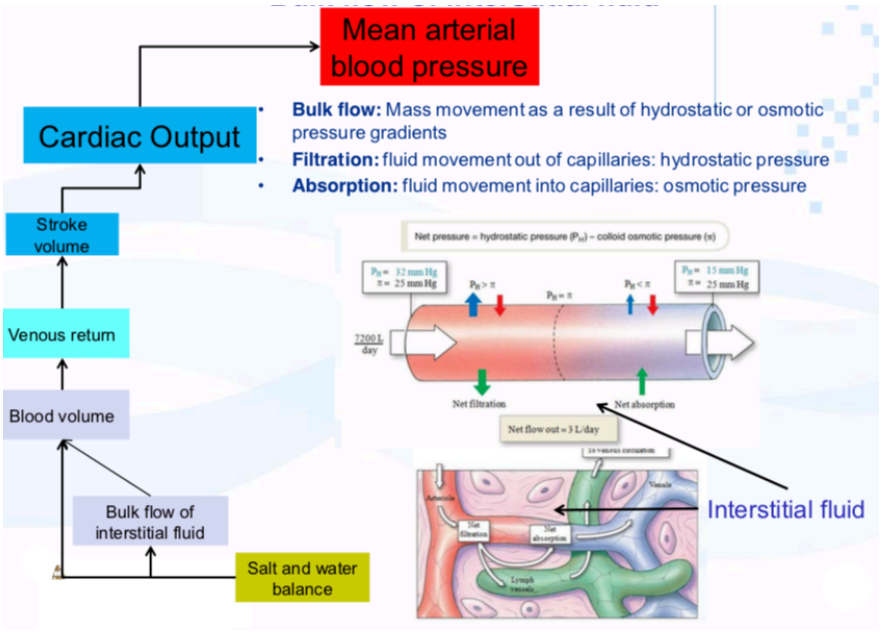
4- RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM (RAAS)



RAAS: Signaling pathway responsible for regulating BP

- Triggered by low BP or certain nerve impulses (eg. Stressful situations)
- Angiotensin II causes blood vessels to constrict and thus increases BP
- Angiotensin II stimulates Aldosterone release which causes the renal tubules to retain Na+ and Water and excrete k+
- Angiotensin II and Aldosterone work together to increase blood volume , BP and Na+ levels .

5-BULK FLOW OF INTERSTITIAL FLUID



Bulk Flow: kidney is the major site for bulk flow transport.

- Dependent on pressure: Volumes of fluid move from an area of higher presue in a capillary bed to an area of lower pressure in the tissues via **Filtration**
- Movement of fluid from an area of high pressure in the tissues to an area of low pressure in the capallaries via **Reabsorption**