

Arterial blood pressure

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Arterial blood pressure

Ventricular systole in big artery / ventricular diastole in big artery

5/0 10/0 mmHg atrium

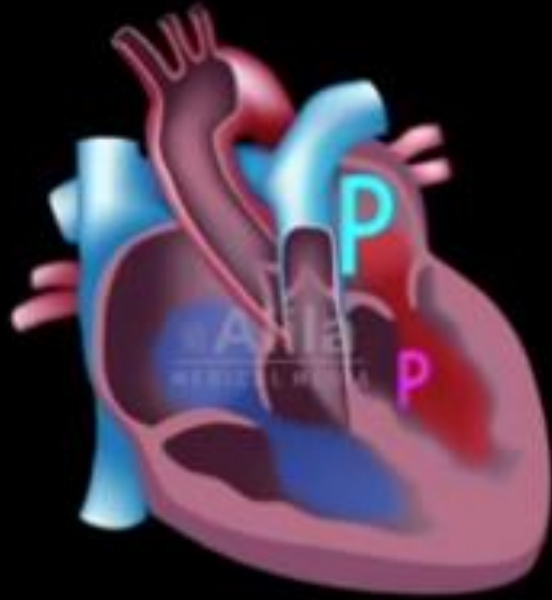
25/0 120/0 mmHg ventricles

80mmHg???

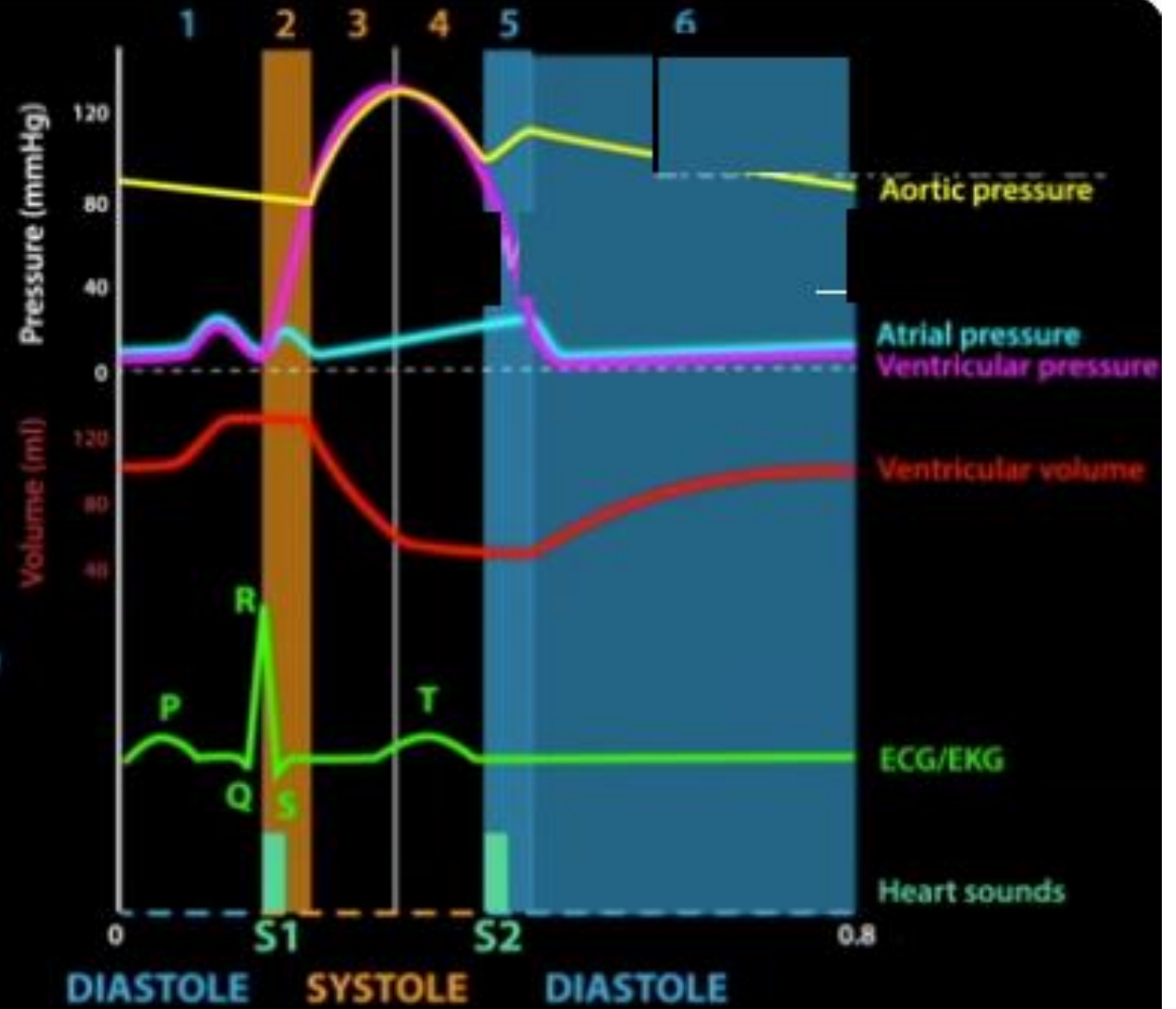
The vessels vasoconstriction

coronary fills during diastole 5% of cardiac output

Constant blood supply the heart and brain cells



- Phase 1 - Atrial depolarization/contraction*
- Phase 2 - Isovolumetric Contraction*
- Phase 3 - Rapid Ejection*
- Phase 4 - Reduced Ejection*
- Phase 5 - Isovolumetric Relaxation*
- Phase 6 - Ventricular Filling*



Individuals with systolic (SBP) and diastolic (DBP) blood pressure in 2 categories are designated to the higher blood pressure category.

SBP (mmHg)		DBP (mmHg)	JNC 7	ACC/AHA 2017
<120	AND	<80	NORMAL BP	NORMAL BP
120-129	AND	<80	Prehypertension	Elevated BP
130-139	OR	80-89	Prehypertension	Stage 1 Hypertension
140-159	OR	90-99	Stage 1 Hypertension	Stage 2 Hypertension
≥160	OR	≥100	Stage 2 Hypertension	Stage 2 Hypertension

Blood hypertension

White coat and masked hypertension

Ambulatory 24hr blood pressure

Essential primary hypertension silent killer

- 95%
- 25-50yr
- Increase SNS

HR, SV, Vasoconstriction, Renin

- increase renin by RAAS

Insulin type 2

Age

Sedentary life

Obesity

Alcohol

Smoking

Secondary hypertension

Younger 5%

Sudden

Refractory not respond to medication

Low renal blood flow

atherosclerosis

vasculitis

aortic dissection

Fibromuscular dysplasia young women

Adrenal glands aldosterone, cortisol, epi and norepi

Hyperthyroidism T3 and T4 hr SV increase

Hypothyroidism T3, T4 increase TPR

Hyperparathyroidism increase TPR Ca+

Obstructive apnea less O2 increase sympathetic

Factors affecting Blood pressure

❖ Blood pressure = cardiac output X total peripheral resistance

- $BP = CO \times TPR$

- $BP = F/A$ depends on radius

First, we want to decide what CO and TPR is , then we get to the right meaning of BP

❖ Cardiac output (Flow)= Heart rate (fast) X Stroke volume (strong)

$$CO (F) = HR \times SV$$

ml/min= Beat/min X ml/ Beat

$$BP = HR \times SV \text{ (preload) } \times TPR \text{ (afterload)}$$

Hypertension treatments

- Angiotensin- converting enzymes inhibitors(ACE)
lisinopril TPR, SV
Vasoconstriction
Sodium/H₂O reabsorption
Aldosterone release
ADH release
- ARBs block angiotensin receptors II losartan
TPR, SV
- Alpha Blockers Doxazosin TPR
epi and norepi vasoconstriction
- Beta Blockers Metoprolol HR, SV
heart
- Calcium Channel Blockers Amiodipine
TPR,HR ,SV
vascular and heart
- Diuretics furosemide SV
sodium and water reabsorption

hypertension crisis

Systolic $>180\text{mmHg}$

Diastolic $> 120\text{mmHg}$

Urgency not damaged

Emergency damaged end organs

myocardial infarctions , aneurysms and brain stroke

Orthostatic hypotension / postural hypotension

- Atypical drop in blood pressure when a person stands up from sitting or lying down, gravity causes arterial pressure to drop
- Transient lasting only through few cardiac cycles
- Less oxygen dizziness or syncope
- Hypovolemic urination diuretics vomiting immobilization
- Heart conditions
- Addison's disease low cortisol
- medications of hypertension
- Decreasing in baroreceptors mechanism

Age diabetes type II or nervous system complication

Orthostatic Hypotension - Diagnosis

- assess medical history of syncope & falls, medications, & medical conditions
- measure blood pressure while the patient is supine, sitting, & standing



a decrease in systolic pressure
of at least 20 mmHg

OR

a decrease in diastolic pressure
of at least 10 mmHg during the
first 3 minutes of standing

